IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

OMNI MEDSCI, INC., *Plaintiff*, v. SAMSUNG ELECTRONICS, CO. LTD., SAMSUNG ELECTRONICS AMERICA, INC., FOSSIL GROUP, INC., FOSSIL STORES I, INC., FOSSIL PARTNERS, L.P., ONEPLUS TECHNOLOGY (SHENZHEN) CO., LTD., and ŌURA HEALTH OY, *Defendants*.	Civil No. 2:24-cv-01070-JRG-RSP JURY TRIAL DEMANDED

DEFENDANTS' INVALIDITY AND
SUBJECT MATTER ELIGIBILITY CONTENTIONS

Pursuant to Patent Rules 3-3 and 3-4 and the Docket Control Order entered by the Court (Dkt. 46), Defendants Samsung Electronics, Co. Ltd., Samsung Electronics America, Inc. (collectively "Samsung"), Fossil Group, Inc., Fossil Stores I, Inc., Fossil Partners, L.P. (collectively "Fossil"), and Ōura Health Oy ("Oura") (collectively "Defendants") hereby provide their Invalidity Contentions to Omni MedSci, Inc. ("Omni" or "Plaintiff").

Defendants' Invalidity Contentions include the accompanying claim charts concerning U.S. Patent Nos. 9,055,868 ("the '868 Patent"); 9,651,533 ("the '533 Patent"); 10,517,484 ("the '484 Patent"); 10,874,304 ("the '304 Patent"); 11,160,455 ("the '455 Patent"); 12,193,790 ("the '790 Patent") (collectively the "Asserted Patents").[1]

Defendants also submit their Subject Matter Eligibility Contentions concerning the

[1] The '484, '455, and '790 Patents are asserted against only Samsung and Fossil, not Oura.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Asserted Patents in accordance with the Court's July 25, 2019, Standing Order Regarding Subject Matter Eligibility Contentions Applicable to All Patent Infringement Cases Assigned to Chief District Judge Rodney Gilstrap ("Standing Order") and the Docket Control Order.

I. Introduction

As disclosed in its respective P. R. 3-1 Infringement Contentions served on Defendants, Plaintiff asserts the following patents and claims:

Patent	Asserted Claims[2]	Omni's Alleged Priority Date	Chart Prefix
'868 Patent	Samsung: 7, 9 Fossil: 7-9 Oura: 7, 9	September 3, 2002	A
'533 Patent	Samsung: 11, 12 Fossil: 12 Oura: 11, 12	December 31, 2012	B
'484 Patent	Samsung: 8-10 Fossil: 8-9 Oura: n/a	December 31, 2012	C
'304 Patent	Samsung: 11, 14-16, 19-22 Fossil: 11, 14, 19-20 Oura: 11-14, 19-20	December 31, 2012	D
'455 Patent	Samsung: 1-3, 8-10, 15 Fossil: 1, 8 Oura: n/a	December 31, 2012	E
'790 Patent	Samsung: 7 Fossil: 7 Oura: n/a	December 31, 2012	F

The claims identified above are referenced as "the Asserted Claims" unless reference is made specifically with respect to particularly identified one or more of the Asserted Patents and/or one or more of the Asserted Claims. By identifying Omni's alleged priority date for the Asserted Claims of each patent above, Defendants do not concede that Omni's claims of priority are correct.

[2] *See* n.1.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Further, the citation of prior art herein and the accompanying exhibits are not intended to reflect Defendants' claim construction contentions, which will be disclosed in due course in accordance with the Docket Control Order. Instead, Defendants' Invalidity Contentions and Subject Matter Eligibility Contentions as set forth herein and in the accompanying exhibits may reflect Plaintiff's apparent claim constructions based on its Infringement Contentions, with which Defendants disagree.

As further detailed in and supported by these Invalidity Contentions, Defendants contend that each of the Asserted Claims is invalid under at least 35 U.S.C. §§ 101, 102, 103, and/or 112.[3] Defendants reserve the right to prove the invalidity of the Asserted Claims on bases other than those required to be disclosed in these disclosures pursuant to P.R. 3-3.

II. Amendment / Supplementation

Defendants' Invalidity Contentions and Subject Matter Eligibility Contentions pertain to the Asserted Claims as identified in Plaintiff's Infringement Contentions. To the extent the Court later allows Plaintiff to amend its infringement contentions and/or assert one or more claims other than the Asserted Claims, Defendants reserve the right to modify, amend, or supplement these Invalidity Contentions and Subject Matter Eligibility Contentions accordingly—for example, to show the invalidity and/or ineligibility of any such newly Asserted Claims.

These Invalidity Contentions and Subject Matter Eligibility Contentions are based on Defendants' current understanding of the Asserted Claims and Plaintiff's apparent view of the scope of those claims as shown, for example, in Plaintiff's Infringement Contentions. A *Markman*

[3] References to Title 35 of the United States Code are to statutes prior to amendment under the America Invents Act ("AIA"), to the extent that the Asserted Patents have effective filing dates prior to applicable AIA effective dates, and to the current statutory provisions with respect to Asserted Patents having effective filing dates after the applicable AIA effective dates.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Order in this case has not yet been issued, and in no way should these Invalidity Contentions and Subject Matter Eligibility Contentions be taken as any admission or acquiescence by Defendants as to the proper scope of the Asserted Claims and/or proper claim constructions of terms and phrases recited in those claims. By identifying prior art that anticipates and/or renders obvious the Asserted Claims, Defendants do not admit that the claim limitations are capable of construction, do not admit that any claim limitations are supported with an appropriate written description and enabling disclosure in the applicable patent specifications, and do not adopt Plaintiff's apparent claim constructions or admit the accuracy of any particular claim construction.[4] Defendants reserve all rights to later challenge or oppose any claim constructions advanced by Plaintiff and to present their own claim construction positions as permitted by the Court.

Defendants further reserve the right to revise these Invalidity Contentions and Subject Matter Eligibility Contentions in view of the Court's construction of terms and phrases recited in one or more of the Asserted Claims, additional information obtained during discovery, additional infringement theories put forth by Plaintiff during fact and/or expert discovery, any findings as to the priority date(s) of the Asserted Claims, and/or positions that Plaintiff, its fact witnesses, or its expert witness(es) may take concerning claim construction, infringement, and/or invalidity issues, as permitted by the Court. Defendants further reserve the right to supplement their accompanying P.R. 3-4(b) document productions should they later discover additional prior art documents, information, testimony, prior art systems and related documentation, and/or software or hardware

[4] Defendants do not concede that Plaintiff's apparent interpretation of the claims is correct, but rather assert the well-established principle that whatever infringes a claim if later in time anticipates if earlier in time. *Bristol-Myers Squibb Co. v. Ben Venue Labs., Inc.*, 246 F.3d 1368, 1378 (Fed. Cir. 2001). Thus, where Plaintiff for purposes of its infringement case alleges that a feature of an accused product meets a particular limitation recited in one or more of the Asserted Claims, then that feature, should it be found in the prior art, would also cause that limitation to be met for invalidity purposes.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

code, including information provided by third parties after the date of service of these Invalidity Contention and Subject Matter Eligibility Contentions.

Additionally, Plaintiff has not identified in its contentions regarding the level of ordinary skill in the art for any of the Asserted Patents. Thus, Defendants have based their Invalidity and Subject Matter Eligibility Contentions on the level of skill in the art apparent from the face of the asserted patents. For the avoidance of doubt, Defendants contend that the asserted claims are invalid for the reasons set forth in their Invalidity and Subject Matter Eligibility contentions under any plausible definition of the level of ordinary skill for each of the Asserted Patents. Nevertheless, Defendants reserve the right to revise these Invalidity Contentions and Subject Matter Eligibility Contentions in response to any position taken by Plaintiff on the level of ordinary skill in the art applicable to a given Asserted Patent.

Defendants may further rely on inventor admissions concerning the scope or state of the prior art relevant to the Asserted Claims, the patent prosecution histories of the Asserted Patents, related patents and/or patent applications, any deposition or trial testimony of the named inventors on the Asserted Patents, and the papers filed and any evidence produced or submitted by Plaintiff in connection with these cases or other related litigation. Defendants reserve the right to contend that one or more of the Asserted Claims are invalid under 35 U.S.C. § 102(f) in the event Defendants obtain evidence that one or more of the named inventors did not invent the subject matter in the Asserted Claims.

Prior art not included in these Invalidity Contentions and Subject Matter Eligibility Contentions, whether known or not known to Defendants, may become relevant. Defendants are currently unaware of the extent, if any, to which Plaintiff will contend that limitations of the Asserted Claims are not disclosed in the prior art identified in these Invalidity Contentions and

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Subject Matter Eligibility Contentions. Accordingly, Defendants reserve the right to identify other references that would disclose the allegedly missing limitation(s) of the claimed method, device, or system.

The references identified in these Invalidity Contentions and Subject Matter Eligibility Contentions, which include the attached claim charts, may disclose the elements of the Asserted Claims explicitly and/or inherently, render those elements alone or in combination obvious to those of ordinary skill in the art even absent an explicit or inherent disclosure, and/or they may be relied upon to show the state of the art in the relevant time frame. References identified in these Invalidity Contentions and Subject Matter Eligibility Contentions, as well as the "References Cited" on the face of the Asserted Patents and the patents cited within the body of the Asserted Patents, may be used to illustrate, but not limit the scope of, the state of the art to which the Asserted Patents pertain (i.e., at a time prior to the date of alleged inventions of the Asserted Claims of the Asserted Patents). Moreover, Defendants reserve the ability to rely on later-identified sources of information, including but not limited to witness testimony and other discovery, to establish the state of the art in the relevant time frame pertaining to the Asserted Patents.

Because discovery has just recently begun, Defendants anticipate that additional prior art and invalidity bases may be found. Defendants' investigation and analysis of the prior art is continuing, and thus Defendants reserve the right to supplement, amend, and/or revise the information provided herein as Defendants conduct further investigation and/or analysis, including identifying, charting, and relying on additional references.

Additionally, in view of likely third-party discovery that will be taken, Defendants reserve the right to present additional items of prior art under 35 U.S.C. §§ 102(a), (b), (e), and/or (g) and/or § 103 located during discovery or further investigation, and to assert contentions of

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

invalidity under 35 U.S.C. §§ 102(c), (d), or (f). For example, Defendants expect to issue subpoenas to third parties believed to have knowledge, documents, and/or other evidence concerning invalidity of one or more of the Asserted Claims.

In addition to the positions and prior art identified in these Invalidity Contentions and Subject Matter Eligibility Contentions (including the accompanying claim charts), Defendants also incorporate by reference all invalidity contentions and subject matter eligibility contentions, prior art,[5] and invalidity claim charts (including, without limitation, all anticipation positions, obviousness positions [including all prior art combinations and motivations to combine], indefiniteness positions, written description positions, and non-enablement positions) concerning one or more of the Asserted Patents, as disclosed at any time. This includes without limitation disclosures in previous or related litigation, in United States Patent & Trademark Office ("USPTO") proceedings, by the Plaintiff, by any other parties accused of patent infringement by the Plaintiff, or by the named inventors or any individuals associated with the prosecution and/or any form of post-grant review or reexamination of the Asserted Patents.

Specifically, for example, Defendants identify, as prior art upon which they may rely to show the invalidity of the Asserted Claims, the prior art references disclosed by parties in any other litigation (including inter partes review and/or reexamination proceedings) involving one or more of the Asserted Patents, any patent related to any of the Asserted Patents, and/or any other patent allegedly assigned to Plaintiff claiming priority to the Asserted Patents (collectively, "Other Omni Proceedings").

Plaintiff has a present and ongoing duty to produce to Defendants all relevant documents

[5] Prior art appearing in the file histories of the Asserted Patents is not required to be separately produced by Defendants under P. R. 3-4(b).

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

from any Other Omni Proceedings, including but not limited to all prior art, invalidity contentions, and expert reports on invalidity (among other relevant items).

Defendants reserve the right to supplement or otherwise amend these Invalidity Contentions and Subject Matter Eligibility Contentions in response to any relevant discovery provided by third parties, Plaintiff, opening or rebuttal expert reports, fact or expert depositions, or in response to any claim construction ruling(s) issued by this Court (regardless of how and when such ruling is made). Defendants also reserve the right to supplement or otherwise amend these Invalidity Contentions and Subject Matter Eligibility Contentions in response to any rebuttal evidence disclosed by Plaintiff or as otherwise may be necessary or appropriate under the circumstances.

III. P. R. 3-3(a) – Identification of Prior Art

Pursuant to P.R. 3-3(a), and subject to Defendants' reservations of rights, Defendants identify each item of prior art that anticipates or renders obvious the Asserted Claims below.[6]

A. U.S. Patent No. 9,055,868

Invalidity claim charts identifying disclosures in the references identified in the tables below as to the Asserted Claims of the '868 Patent are provided in attached Exhibits A1 through A10.

[6] Defendants' disclosure of prior art is premised on the alleged priority dates of the Asserted Patents as identified in Plaintiff's Infringement Contentions. Defendants contend Plaintiff is not entitled to the alleged priority dates and reserve the right to modify, amend, or supplement their invalidity contentions with additional prior art references if any Asserted Claim is shown to not be entitled to the respective alleged priority date or if Plaintiff alleges any other priority date for any of the Asserted Claims. Notwithstanding that reservation of rights, Defendants also reserve the right to argue that they have been unduly prejudiced should Plaintiff allege a different priority date for any of the Asserted Claims, and that accordingly Plaintiff should not be allowed to do so.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Table 1-A: Prior Art Patents and Printed Publications for the ’868 Patent

Patent No. or Title (Primary Inventor/Author)	**Date of Issue/ Publication**	**Filing Date**
US 2003/0208113 (“Mault”) [Ex. A1]	Nov. 6, 2003	July 18, 2001
US 6,067,463 (“Jeng”) [Ex. A2]	May 23, 2000	Jan. 5, 1999
US 5,891,022 (“Pologe”) [Ex. A3]	April 6, 1999	Sept. 25, 1996
US 2002/0198473 (“Kumar”) [Ex. A4]	Dec. 26, 2002	March 28, 2002
US 2004/0002634 (“Nihtila”) [Ex. A5]	Jan. 1, 2004	June 28, 2002
JP 2000-74829 (“Shigeki”) [Ex. A6]	Sept. 2, 1999	March 14, 2000
US 6,168,563 (“Brown”) [Ex. A7]	Jan. 2, 2001	March 17, 1999
US 2002/0049389 (“Abreu”) [Ex. A8]	April 25, 2002	Feb. 23, 2001
US 6,602,191 (“Quy”) [Ex. A9]	Aug. 5, 2003	Dec. 15, 2000
US 5,830,137 (“Scharf”) [Ex. A10]	Nov. 3, 1998	Nov. 18, 1996

Table 2-A: Prior Art Systems and Inventions for the ’868 Patent

Name of System or Invention	**Date of Sale / Offer for Sale / Public Use / Known by Others**
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by ChoiceMMed, including but not limited to ChoiceMMed MD300C318T, and its accessories (e.g., sensor probe)	At least as early as 2011-05-20
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Criticare Systems, Inc., including but not limited to Criticare 504, and its accessories (e.g., sensor probe)	At least as early as 1988
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by GE Marquette Medical Systems, Inc., including but not limited to Dash 2000 Patient Monitor, and its accessories (e.g., sensor probe)	At least as early as 1999
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Masimo Corp., including but not limited to Rad-5 and Rad-5v Signal Extraction Pulse Oximeters, Radical, Rad-57™, SET® Pulse Oximetry Devices and Rainbow SET™ Devices, and their accessories (e.g., sensor probe)	At least as early as 2004 (Rad-5/ Rad-5v), 2007 (Radical), 2008 (Rad-57™), 2009 (SET®/Rainbow SET™).
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Mindray DS USA, Inc, including but not limited to Accutorr V, and its accessories (e.g., sensor probe)	At least as early as 2008

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Name of System or Invention	Date of Sale / Offer for Sale / Public Use / Known by Others
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Covidien AG / Nellcor Puritan Bennett Inc., including but not limited to Nellcor OxiMax Pulse Oximeters, Nellcor N-595 Pulse Oximter, Nellcor OxiMax N-600X Pulse Oximeter, and their accessories (e.g., sensor probe)	At least as early as 2002 (OxiMax Pulse Oximeters and OmniMax N-595), 2011 (OxiMax N-600X)
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Nonin Medical, Inc., including but not limited to Onyx, PalmSAT™, and Nonin® Model 7500 Digital Pulse Oximeter, Nonin Onyx® 9500, and their accessories (e.g., sensor probe)	At least as early as 1988 (Onyx), 2007 (PalmSAT™), 2007 (Nonin Onyx® 9500), and 2008 (Nonin® Model 7500)
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Novametrix Medical Systems Inc., including but not limited to Novametrix Model 513 and Model 2001, and their accessories (e.g., sensor probe)	At least as early as 1999 (Model 513) and 2007 (Model 2001)
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Respironics, Inc., including but not limited to Models 920, 920M and 920M PLUS Pulse Oximeter, and their accessories (e.g., sensor probe)	At least as early as 1999 (Model 920 and 920M) and 2007 (Model 920M PLUS)
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Smiths Medical, including but not limited to BCI 3304 Oximeter, and its accessories (e.g., sensor probe)	At least as early as 2008
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Utech Co., Ltd., including but not limited to UT100 Handheld Pulse Oximeter, and its accessories (e.g., sensor probe)	At least as early as 2010
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Welch Allyn, including but not limited to Propaq® CS Vital Signs Monitor and Propaq® Encore Vital Signs Monitor, and their accessories (e.g., sensor probe)	At least as early as 2011 (Propaq® Encore Vital Signs Monitor) and 2012 (Propaq® CS Vital Signs Monitor)
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Philips Medical Systems, including but not limited to M4529A DigitalHandheld Pulse Oximeter, and its accessories (e.g., sensor probe)	At least as early as 2007
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Palco Labs Inc, including but not limited to Model 120 Mini Pulse Oximeter, and its accessories (e.g., sensor probe)	At least as early as 2007

Name of System or Invention	Date of Sale / Offer for Sale / Public Use / Known by Others
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by BCI Inc., including but not limited to Capnocheck® Sleep Capnograph/Oximeter, and its accessories (e.g., sensor probe)	At least as early as 2007
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Datex-Ohmeda, including but not limited to TuffSat, and its accessories (e.g., sensor probe)	At least as early as 2007

For each of the prior art devices identified above, Defendants have listed and produced documents as evidence of the relevant features and functionality to the extent that they are presently available and have been located. Defendants have obtained or are in the process of attempting to obtain the identified devices and will make them available for inspection to the extent they are obtained. To the extent that one or more documents (*e.g.*, user manual) may be used to describe aspects of a particular device, that device is a single reference for prior art purposes under 35 U.S.C. § 102. Some or all of the corroborating references may also separately qualify as prior art publications under 35 U.S.C. § 102 and may be used as invalidating references under 35 U.S.C. §§ 102 and/or 103.

Further, Defendants are actively searching for information regarding at least the systems, devices, and/or inventions listed above in Table 2-A.

Discovery is ongoing, and Defendants may serve third parties with document subpoenas. One or more of these devices, along with related documentation, may be invalidating, and Defendants reserve the right to supplement these contentions accordingly. Defendants continue to investigate each of the identified devices, including through potential discovery needed to be obtained via third party subpoenas, and reserve the right to supplement these contentions and accompanying claim charts after further investigation.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Defendants' reference to a particular product, device, or software program in these contentions should be interpreted as a reference to the system itself as well as to any corresponding patents, publications, or product literature relating to the cited system. Upon information and belief, the systems were publicly disclosed, used, sold, or offered for sale in the United States before the alleged priority date of the Asserted Claims of the '868 Patent. Defendants' investigation of such prior art systems is still ongoing, and discovery has not yet been received from third parties who may have information concerning such prior art systems. Accordingly, subsequent discovery may reveal information that affects the disclosures and contentions herein. For example, subsequent discovery may provide additional information regarding whether any of the third-party prior art systems anticipate or render obvious the Asserted Claims of the '868 Patent. As such, Defendants reserve all rights to supplement their invalidity contentions.

Many of the inventive, research, design, and development activities concerning these systems and technologies occurred in the United States before the alleged priority date of the Asserted Claims of the '868 Patent. Defendants have obtained, and are in the process of obtaining, additional information regarding the dates by which the cited products and services were publicly disclosed, used, sold, or offered for sale, the circumstances under which the research, design, and development activities were conducted, and the identities of the individuals involved in such activities through publicly available patents, publications, and product literature. The actual dates, circumstances, and identities of individuals will be the subject of third-party discovery during this lawsuit, which Defendants reserve the right to rely upon to corroborate the prior art status of the prior art identified herein. Defendants reserve the right to modify, amend, or supplement these contentions if additional information becomes available during the course of this lawsuit. Furthermore, Defendants will make all such devices, software programs, or other products in

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Defendants' possession, custody, or control available for inspection by Plaintiff.

Consequently, Defendants reserve the right to amend, modify, or supplement these Invalidity Contentions should additional information become available to them through discovery.

In addition, Defendants identify, responsive to Plaintiff's Infringement Contentions, the patents, publications, and/or systems listed in Tables 1-A and 2-A as evidence of the state of the art as it relates to physiological monitoring devices / systems.

Each of these references show that the concept of "physiological monitoring" is not novel and was well-known for many years before the alleged priority date of the '868 Patent, as discussed in more detail in Section IV.B (obviousness). In light of the references discussed herein, the Asserted Claims of the '868 Patent cannot be valid.

Each prior art patent, publication, or product identified above was either effectively filed or issued (for patents), published (for publications) or known, used, offered for sale or sold (for products) before either the earliest claimed priority date of the '868 Patent to which it is applied for invalidity, and none appears to have been abandoned, suppressed, or concealed, so each such reference also constitutes evidence of prior invention pursuant to 35 U.S.C. § 102(g), if it is in the U.S. The persons or entities involved with each such invention include the named inventors on the above-identified patents, the authors listed on the above-identified publications, and the entities and individuals identified in connection with the above-identified products.

Because Defendants have not yet completed discovery in this case, including taking depositions of the named inventors, and otherwise obtaining discovery from Plaintiff and third parties, Defendants reserve the right to supplement these contentions with facts, documents, or other information learned at a later point through discovery or further investigation.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

B. U.S. Patent No. 9,651,533

Invalidity claim charts identifying disclosures in the references identified in the tables below as to the Asserted Claims of the '533 Patent are provided in attached Exhibits B1 through B8.

Table 1-B: Prior Art Patents and Printed Publications for the '533 Patent

Patent No. or Title (Primary Inventor/Author)	Date of Issue/ Publication	Filing Date
US 2011/0028802 ("Addison") [Ex. B1]	February 3, 2011	July 31, 2009
US 2015/0057511[7] ("Basu") [Ex. B2]	February 26, 2015	March 27, 2013
US 2005/0049468 ("Carslon") [Ex. B3]	March 3, 2005	September 3, 2003
US 2012/0197093 ("LeBoeuf") [Ex. B4]	August 2, 2012	January 25, 2012
US 9,241,676 ("Lisogurski") [Ex. B5]	January 26, 2016	May 31, 2012
US 9,596,990 ("Park") [Ex. B6]	March 21, 2017	November 6, 2013
US 8,923,918 ("Kreger") [Ex. B7]	December 30, 2014	December 18, 2010
US 7,507,207 ("Sakai") [Ex. B8]	March 24, 2009	October 5, 2004

Table 2-B: Prior Art Systems and Inventions for the '533 Patent

Name of System or Invention	Date of Sale / Offer for Sale / Public Use / Known by Others
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by ChoiceMMed, including but not limited to ChoiceMMed MD300C318T, and its accessories (e.g., sensor probe)	At least as early as 2011-05-20
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Criticare Systems, Inc., including but not limited to Criticare 504, and its accessories (e.g., sensor probe)	At least as early as 1988
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by GE Marquette Medical Systems, Inc., including but not limited to Dash 2000 Patient Monitor, and its accessories (e.g., sensor probe)	At least as early as 1999
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Masimo Corp., including but not limited to Rad-5 and Rad-5v Signal	At least as early as 2004 (Rad-5/ Rad-5v), 2007 (Radical), 2008 (Rad-

[7] Invalidity contentions relying on this reference herein will make reference to the Provisional Application No. 61/616524, which is incorporated by reference into Basu.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Name of System or Invention	Date of Sale / Offer for Sale / Public Use / Known by Others
Extraction Pulse Oximeters, Radical, Rad-57™, SET® Pulse Oximetry Devices and Rainbow SET™ Devices, and their accessories (e.g., sensor probe)	57™), 2009 (SET®/Rainbow SET™).
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Mindray DS USA, Inc, including but not limited to Accutorr V, and its accessories (e.g., sensor probe)	At least as early as 2008
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Covidien AG / Nellcor Puritan Bennett Inc., including but not limited to Nellcor OxiMax Pulse Oximeters, Nellcor N-595 Pulse Oximter, Nellcor OxiMax N-600X Pulse Oximeter, and their accessories (e.g., sensor probe)	At least as early as 2002 (OxiMax Pulse Oximeters and OmniMax N-595), 2011 (OxiMax N-600X)
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Nonin Medical, Inc., including but not limited to Onyx, PalmSAT™, and Nonin® Model 7500 Digital Pulse Oximeter, Nonin Onyx® 9500, and their accessories (e.g., sensor probe)	At least as early as 1988 (Onyx), 2007 (PalmSAT™), 2007 (Nonin Onyx® 9500), and 2008 (Nonin® Model 7500)
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Novametrix Medical Systems Inc., including but not limited to Novametrix Model 513 and Model 2001, and their accessories (e.g., sensor probe)	At least as early as 1999 (Model 513) and 2007 (Model 2001)
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Respironics, Inc., including but not limited to Models 920, 920M and 920M PLUS Pulse Oximeter, and their accessories (e.g., sensor probe)	At least as early as 1999 (Model 920 and 920M) and 2007 (Model 920M PLUS)
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Smiths Medical, including but not limited to BCI 3304 Oximeter, and its accessories (e.g., sensor probe)	At least as early as 2008
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Utech Co., Ltd., including but not limited to UT100 Handheld Pulse Oximeter, and its accessories (e.g., sensor probe)	At least as early as 2010
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Welch Allyn, including but not limited to Propaq® CS Vital Signs Monitor and Propaq® Encore Vital Signs Monitor, and their accessories (e.g., sensor probe)	At least as early as 2011 (Propaq® Encore Vital Signs Monitor) and 2012 (Propaq® CS Vital Signs Monitor)
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Philips Medical	At least as early as 2007

Name of System or Invention	Date of Sale / Offer for Sale / Public Use / Known by Others
Systems, including but not limited to M4529A DigitalHandheld Pulse Oximeter, and its accessories (e.g., sensor probe)	
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Palco Labs Inc, including but not limited to Model 120 Mini Pulse Oximeter, and its accessories (e.g., sensor probe)	At least as early as 2007
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by BCI Inc., including but not limited to Capnocheck® Sleep Capnograph/Oximeter, and its accessories (e.g., sensor probe)	At least as early as 2007
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Datex-Ohmeda, including but not limited to TuffSat, and its accessories (e.g., sensor probe)	At least as early as 2007

For each of the prior art devices identified above, Defendants have listed and produced documents as evidence of the relevant features and functionality to the extent that they are presently available and have been located. Defendants have obtained or are in the process of attempting to obtain the identified devices and will make them available for inspection to the extent they are obtained. To the extent that one or more documents (*e.g.*, user manual) may be used to describe aspects of a particular device, that device is a single reference for prior art purposes under 35 U.S.C. § 102. Some or all of the corroborating references may also separately qualify as prior art publications under 35 U.S.C. § 102 and may be used as invalidating references under 35 U.S.C. §§ 102 and/or 103.

Further, Defendants are actively searching for information regarding at least the systems, devices, and/or inventions listed above in Table 2-B.

Discovery is ongoing, and Defendants may serve third parties with document subpoenas. One or more of these devices, along with related documentation, may be invalidating, and

Defendants reserve the right to supplement these contentions accordingly. Defendants continue to investigate each of the identified devices, including through potential discovery needed to be obtained via third party subpoenas, and reserve the right to supplement these contentions and accompanying claim charts after further investigation.

Defendants' reference to a particular product, device, or software program in these contentions should be interpreted as a reference to the system itself as well as to any corresponding patents, publications, or product literature relating to the cited system. Upon information and belief, the systems were publicly disclosed, used, sold, or offered for sale in the United States before the alleged priority date of the Asserted Claims of the '533 Patent. Defendants' investigation of such prior art systems is still ongoing, and discovery has not yet been received from third parties who may have information concerning such prior art systems. Accordingly, subsequent discovery may reveal information that affects the disclosures and contentions herein. For example, subsequent discovery may provide additional information regarding whether any of the third-party prior art systems anticipate or render obvious the Asserted Claims of the '533 Patent. As such, Defendants reserve all rights to supplement their invalidity contentions.

Many of the inventive, research, design, and development activities concerning these systems and technologies occurred in the United States before the alleged priority date of the Asserted Claims of the '533 Patent. Defendants have obtained, and are in the process of obtaining, additional information regarding the dates by which the cited products and services were publicly disclosed, used, sold, or offered for sale, the circumstances under which the research, design, and development activities were conducted, and the identities of the individuals involved in such activities through publicly available patents, publications, and product literature. The actual dates, circumstances, and identities of individuals will be the subject of third-party discovery during this

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

lawsuit, which Defendants reserve the right to rely upon to corroborate the prior art status of the prior art identified herein. Defendants reserve the right to modify, amend, or supplement these contentions if additional information becomes available during the course of this lawsuit. Furthermore, Defendants will make all such devices, software programs, or other products in Defendants' possession, custody, or control available for inspection by Plaintiff.

Consequently, Defendants reserve the right to amend, modify, or supplement these Invalidity Contentions should additional information become available to them through discovery.

In addition, Defendants identify, responsive to Plaintiff's Infringement Contentions, the patents, publications, and/or systems listed in Tables 1-B and 2-B as evidence of the state of the art as it relates to physiological monitoring devices / systems.

Each of these references show that the concept of "physiological monitoring" is not novel and was well-known for many years before the alleged priority date of the '533 Patent, as discussed in more detail in Section IV.B (obviousness). In light of the references discussed herein, the Asserted Claims of the '533 Patent cannot be valid.

Each prior art patent, publication, or product identified above was either effectively filed or issued (for patents), published (for publications) or known, used, offered for sale or sold (for products) before either the earliest claimed priority date of the '533 Patent to which it is applied for invalidity, and none appears to have been abandoned, suppressed, or concealed, so each such reference also constitutes evidence of prior invention pursuant to 35 U.S.C. § 102(g), if it is in the U.S. The persons or entities involved with each such invention include the named inventors on the above-identified patents, the authors listed on the above-identified publications, and the entities and individuals identified in connection with the above-identified products.

Because Defendants have not yet completed discovery in this case, including taking

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

depositions of the named inventors, and otherwise obtaining discovery from Plaintiff and third parties, Defendants reserve the right to supplement these contentions with facts, documents, or other information learned at a later point through discovery or further investigation.

C. U.S. Patent No. 10,517,484

Invalidity claim charts identifying disclosures in the references identified in the tables below as to the Asserted Claims of the '484 Patent are provided in attached Exhibits C1 through C14.

Table 1-C: Prior Art Patents and Printed Publications for the '484 Patent

Patent No. or Title (Primary Inventor/Author)	**Date of Issue/ Publication**	**Filing Date**
US 9,241,676 ("Lisogurski") [Ex. C1]	Jan. 26, 2016	May 31, 2012
US 2015/0057511 ("Basu") [Ex. C2]	Feb. 26, 2015	Mar. 27, 2013
US 6,616,613 ("Goodman") [Ex. C3]	Sep. 9, 2003	Apr. 29, 2000
WO 2012/099536 ("Kassim") [Ex. C4]	Jul. 26, 2012	Jan. 20, 2011
US 9,095,291 ("Soller") [Ex. C5]	Aug. 4, 2015	Aug. 7, 2009
US 11,638,532 ("Poeze") [Ex. C6]	May 2, 2023	Jul. 1, 2010
US 2012/0150047 ("Terumoto") [Ex. C7]	June 14, 2012	Nov. 14, 2011
US 8,172,761 ("Rulkov") [Ex. C8]	May 8, 2012	Oct. 4, 2011
US 2011/0066050 ("Moon") [Ex. C9]	Mar. 17, 2011	Sep. 15, 2009
US 2005/0049468 ("Carlson") [Ex. C10]	Mar. 3, 2005	Sep. 3, 2003
US 8,108,036 ("Tran") [Ex. C11]	Jan. 31, 2012	Jun. 18, 2009
Plug-and-Play, Single-Chip Photoplethysmography ("Chandrasekar") [Ex. C12]	Sep. 2012	N/A
US 8,923,918 ("Kreger") [Ex. C13]	Dec. 30, 2014	Dec. 18, 2010
US 7,507,207 ("Sakai") [Ex. C14]	Mar. 24, 2009	Oct. 5, 2004

Table 2-C: Prior Art Systems and Inventions for the '484 Patent

Name of System or Invention	**Date of Sale / Offer for Sale / Public Use / Known by Others**
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by ChoiceMMed, including but not limited to ChoiceMMed MD300C318T, and its accessories (e.g., sensor probe)	At least as early as 2011-05-20
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Criticare Systems,	At least as early as 1988

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Name of System or Invention	Date of Sale / Offer for Sale / Public Use / Known by Others
Inc., including but not limited to Criticare 504, and its accessories (e.g., sensor probe)	
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by GE Marquette Medical Systems, Inc., including but not limited to Dash 2000 Patient Monitor, and its accessories (e.g., sensor probe)	At least as early as 1999
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Masimo Corp., including but not limited to Rad-5 and Rad-5v Signal Extraction Pulse Oximeters, Radical, Rad-57™, SET® Pulse Oximetry Devices and Rainbow SET™ Devices, and their accessories (e.g., sensor probe)	At least as early as 2004 (Rad-5/ Rad-5v), 2007 (Radical), 2008 (Rad-57™), 2009 (SET®/Rainbow SET™).
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Mindray DS USA, Inc, including but not limited to Accutorr V, and its accessories (e.g., sensor probe)	At least as early as 2008
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Covidien AG / Nellcor Puritan Bennett Inc., including but not limited to Nellcor OxiMax Pulse Oximeters, Nellcor N-595 Pulse Oximter, Nellcor OxiMax N-600X Pulse Oximeter, and their accessories (e.g., sensor probe)	At least as early as 2002 (OxiMax Pulse Oximeters and OmniMax N-595), 2011 (OxiMax N-600X)
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Nonin Medical, Inc., including but not limited to Onyx, PalmSAT™, and Nonin® Model 7500 Digital Pulse Oximeter, Nonin Onyx® 9500, and their accessories (e.g., sensor probe)	At least as early as 1988 (Onyx), 2007 (PalmSAT™), 2007 (Nonin Onyx® 9500), and 2008 (Nonin® Model 7500)
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Novametrix Medical Systems Inc., including but not limited to Novametrix Model 513 and Model 2001, and their accessories (e.g., sensor probe)	At least as early as 1999 (Model 513) and 2007 (Model 2001)
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Respironics, Inc., including but not limited to Models 920, 920M and 920M PLUS Pulse Oximeter, and their accessories (e.g., sensor probe)	At least as early as 1999 (Model 920 and 920M) and 2007 (Model 920M PLUS)
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Smiths Medical, including but not limited to BCI 3304 Oximeter, and its accessories (e.g., sensor probe)	At least as early as 2008

Name of System or Invention	Date of Sale / Offer for Sale / Public Use / Known by Others
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Utech Co., Ltd., including but not limited to UT100 Handheld Pulse Oximeter, and its accessories (e.g., sensor probe)	At least as early as 2010
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Welch Allyn, including but not limited to Propaq® CS Vital Signs Monitor and Propaq® Encore Vital Signs Monitor, and their accessories (e.g., sensor probe)	At least as early as 2011 (Propaq® Encore Vital Signs Monitor) and 2012 (Propaq® CS Vital Signs Monitor)
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Philips Medical Systems, including but not limited to M4529A DigitalHandheld Pulse Oximeter, and its accessories (e.g., sensor probe)	At least as early as 2007
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Palco Labs Inc, including but not limited to Model 120 Mini Pulse Oximeter, and its accessories (e.g., sensor probe)	At least as early as 2007
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by BCI Inc., including but not limited to Capnocheck® Sleep Capnograph/Oximeter, and its accessories (e.g., sensor probe)	At least as early as 2007
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Datex-Ohmeda, including but not limited to TuffSat, and its accessories (e.g., sensor probe)	At least as early as 2007

For each of the prior art devices identified above, Defendants have listed and produced documents as evidence of the relevant features and functionality to the extent that they are presently available and have been located. Defendants have obtained or are in the process of attempting to obtain the identified devices and will make them available for inspection to the extent they are obtained. To the extent that one or more documents (*e.g.*, user manual) may be used to describe aspects of a particular device, that device is a single reference for prior art purposes under 35 U.S.C. § 102. Some or all of the corroborating references may also separately qualify as prior art publications under 35 U.S.C. § 102 and may be used as invalidating references under 35

U.S.C. §§ 102 and/or 103.

Further, Defendants are actively searching for information regarding at least the systems, devices, and/or inventions listed above in Table 2-C.

Discovery is ongoing, and Defendants may serve third parties with document subpoenas. One or more of these devices, along with related documentation, may be invalidating, and Defendants reserve the right to supplement these contentions accordingly. Defendants continue to investigate each of the identified devices, including through potential discovery needed to be obtained via third party subpoenas, and reserve the right to supplement these contentions and accompanying claim charts after further investigation.

Defendants' reference to a particular product, device, or software program in these contentions should be interpreted as a reference to the system itself as well as to any corresponding patents, publications, or product literature relating to the cited system. Upon information and belief, the systems were publicly disclosed, used, sold, or offered for sale in the United States before the alleged priority date of the Asserted Claims of the '484 Patent. Defendants' investigation of such prior art systems is still ongoing, and discovery has not yet been received from third parties who may have information concerning such prior art systems. Accordingly, subsequent discovery may reveal information that affects the disclosures and contentions herein. For example, subsequent discovery may provide additional information regarding whether any of the third-party prior art systems anticipate or render obvious the Asserted Claims of the '484 Patent. As such, Defendants reserve all rights to supplement their invalidity contentions.

Many of the inventive, research, design, and development activities concerning these systems and technologies occurred in the United States before the alleged priority date of the Asserted Claims of the '484 Patent. Defendants have obtained, and are in the process of obtaining,

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

additional information regarding the dates by which the cited products and services were publicly disclosed, used, sold, or offered for sale, the circumstances under which the research, design, and development activities were conducted, and the identities of the individuals involved in such activities through publicly available patents, publications, and product literature. The actual dates, circumstances, and identities of individuals will be the subject of third-party discovery during this lawsuit, which Defendants reserve the right to rely upon to corroborate the prior art status of the prior art identified herein. Defendants reserve the right to modify, amend, or supplement these contentions if additional information becomes available during the course of this lawsuit. Furthermore, Defendants will make all such devices, software programs, or other products in Defendants' possession, custody, or control available for inspection by Plaintiff.

Consequently, Defendants reserve the right to amend, modify, or supplement these Invalidity Contentions should additional information become available to them through discovery.

In addition, Defendants identify, responsive to Plaintiff's Infringement Contentions, the patents, publications, and/or systems listed in Tables 1-C and 2-C as evidence of the state of the art as it relates to physiological monitoring devices / systems.

Each of these references show that the concept of "physiological monitoring" is not novel and was well-known for many years before the alleged priority date of the '484 Patent, as discussed in more detail in Section IV.B (obviousness). In light of the references discussed herein, the Asserted Claims of the '484 Patent cannot be valid.

Each prior art patent, publication, or product identified above was either effectively filed or issued (for patents), published (for publications) or known, used, offered for sale or sold (for products) before either the earliest claimed priority date of the '484 Patent to which it is applied for invalidity, and none appears to have been abandoned, suppressed, or concealed, so each such

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

reference also constitutes evidence of prior invention pursuant to 35 U.S.C. § 102(g), if it is in the U.S. The persons or entities involved with each such invention include the named inventors on the above-identified patents, the authors listed on the above-identified publications, and the entities and individuals identified in connection with the above-identified products.

Because Defendants have not yet completed discovery in this case, including taking depositions of the named inventors, and otherwise obtaining discovery from Plaintiff and third parties, Defendants reserve the right to supplement these contentions with facts, documents, or other information learned at a later point through discovery or further investigation.

D. U.S. Patent No. 10,874,304

Invalidity claim charts identifying disclosures in the references identified in the tables below as to the Asserted Claims of the '304 Patent are provided in attached Exhibits D1 through D19.

Table 1-D: Prior Art Patents and Printed Publications for the '304 Patent

Patent No. or Title (Primary Inventor/Author)	**Date of Issue/ Publication**	**Filing Date**
US 2015/0057511A1 ("Basu") [Ex. D1]	2/26/2015	3/27/2013
US 2005/0049468A1 ("Carlson") [Ex. D2]	3/3/2005	9/3/2003
US 6,616,613 ("Goodman") [Ex. D3]	9/9/2003	4/27/2000
US 6,519,037B2 ("Jung") [Ex. D4]	2/11/2003	6/1/2001
WO 2012/99536 ("Kassim") [Ex. D5]	7/26/2012	1/20/2011
US 2011/0237911A1 ("Lamego") [Ex. D6]	9/29/2011	3/28/2011
US 2010/0217102A1 ("LeBoeuf") [Ex. D7]	8/26/2010	1/21/2010
US 9,241,676 ("Lisogurski") [Ex. D8]	1/26/2016	5/31/2012
US 5,746,206 ("Mannheimer") [Ex. D9]	5/5/1998	6/10/1996
US 2003/0208113A1 ("Mault") [Ex. D10]	11/6/2003	7/18/2001
US 2011/0082711A1 ("Poeze") [Ex. D11]	4/7/2011	10/5/2010
US 5,891,022 ("Pologe") [Ex. D12]	4/6/1999	9/25/1996
US 8,108,036 ("Tran") [Ex. D13]	1/31/2012	6/18/2009
US 2012/0197093A1 ("Valencell") [Ex. D14]	8/2/2012	1/25/2012

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Patent No. or Title (Primary Inventor/Author)	Date of Issue/ Publication	Filing Date
D. Chandrasekar, et al., "Plug-and-Play, Single-Chip Photoplethysmography" ("Chandrasekar2012") [Ex. D15]	8/28/2012 - 9/1/2012	received 3/29/12
US 7,507,207 ("Sakai") [Ex. D16]	3/24/2009	10/5/2004
US 8,923,918 ("Kreger") [Ex. D17]	12/30/2014	12/18/2010
US 2006/0184040 ("Keller") [Ex. D18]	8/17/2006	12/7/2005
US 7,139,076 ("Marbach") [Ex. D19]	11/21/2006	8/8/2003

Table 2-D: Prior Art Systems and Inventions for the '304 Patent

Name of System or Invention	Date of Sale / Offer for Sale / Public Use / Known by Others
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by ChoiceMMed, including but not limited to ChoiceMMed MD300C318T, and its accessories (e.g., sensor probe)	At least as early as 2011-05-20
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Criticare Systems, Inc., including but not limited to Criticare 504, and its accessories (e.g., sensor probe)	At least as early as 1988
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by GE Marquette Medical Systems, Inc., including but not limited to Dash 2000 Patient Monitor, and its accessories (e.g., sensor probe)	At least as early as 1999
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Masimo Corp., including but not limited to Rad-5 and Rad-5v Signal Extraction Pulse Oximeters, Radical, Rad-57™, SET® Pulse Oximetry Devices and Rainbow SET™ Devices, and their accessories (e.g., sensor probe)	At least as early as 2004 (Rad-5/ Rad-5v), 2007 (Radical), 2008 (Rad-57™), 2009 (SET®/Rainbow SET™).
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Mindray DS USA, Inc, including but not limited to Accutorr V, and its accessories (e.g., sensor probe)	At least as early as 2008
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Covidien AG / Nellcor Puritan Bennett Inc., including but not limited to Nellcor OxiMax Pulse Oximeters, Nellcor	At least as early as 2002 (OxiMax Pulse Oximeters and OmniMax N-595), 2011 (OxiMax N-600X)

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Name of System or Invention	Date of Sale / Offer for Sale / Public Use / Known by Others
N-595 Pulse Oximter, Nellcor OxiMax N-600X Pulse Oximeter, and their accessories (e.g., sensor probe)	
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Nonin Medical, Inc., including but not limited to Onyx, PalmSAT™, and Nonin® Model 7500 Digital Pulse Oximeter, Nonin Onyx® 9500, and their accessories (e.g., sensor probe)	At least as early as 1988 (Onyx), 2007 (PalmSAT™), 2007 (Nonin Onyx® 9500), and 2008 (Nonin® Model 7500)
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Novametrix Medical Systems Inc., including but not limited to Novametrix Model 513 and Model 2001, and their accessories (e.g., sensor probe)	At least as early as 1999 (Model 513) and 2007 (Model 2001)
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Respironics, Inc., including but not limited to Models 920, 920M and 920M PLUS Pulse Oximeter, and their accessories (e.g., sensor probe)	At least as early as 1999 (Model 920 and 920M) and 2007 (Model 920M PLUS)
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Smiths Medical, including but not limited to BCI 3304 Oximeter, and its accessories (e.g., sensor probe)	At least as early as 2008
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Utech Co., Ltd., including but not limited to UT100 Handheld Pulse Oximeter, and its accessories (e.g., sensor probe)	At least as early as 2010
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Welch Allyn, including but not limited to Propaq® CS Vital Signs Monitor and Propaq® Encore Vital Signs Monitor, and their accessories (e.g., sensor probe)	At least as early as 2011 (Propaq® Encore Vital Signs Monitor) and 2012 (Propaq® CS Vital Signs Monitor)
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Philips Medical Systems, including but not limited to M4529A DigitalHandheld Pulse Oximeter, and its accessories (e.g., sensor probe)	At least as early as 2007
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Palco Labs Inc, including but not limited to Model 120 Mini Pulse Oximeter, and its accessories (e.g., sensor probe)	At least as early as 2007

Name of System or Invention	Date of Sale / Offer for Sale / Public Use / Known by Others
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by BCI Inc., including but not limited to Capnocheck® Sleep Capnograph/Oximeter, and its accessories (e.g., sensor probe)	At least as early as 2007
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Datex-Ohmeda, including but not limited to TuffSat, and its accessories (e.g., sensor probe)	At least as early as 2007

For each of the prior art devices identified above, Defendants have listed and produced documents as evidence of the relevant features and functionality to the extent that they are presently available and have been located. Defendants have obtained or are in the process of attempting to obtain the identified devices and will make them available for inspection to the extent they are obtained. To the extent that one or more documents (*e.g.*, user manual) may be used to describe aspects of a particular device, that device is a single reference for prior art purposes under 35 U.S.C. § 102. Some or all of the corroborating references may also separately qualify as prior art publications under 35 U.S.C. § 102 and may be used as invalidating references under 35 U.S.C. §§ 102 and/or 103.

Further, Defendants are actively searching for information regarding at least the systems, devices, and/or inventions listed above in Table 2-D.

Discovery is ongoing, and Defendants may serve third parties with document subpoenas. One or more of these devices, along with related documentation, may be invalidating, and Defendants reserve the right to supplement these contentions accordingly. Defendants continue to investigate each of the identified devices, including through potential discovery needed to be obtained via third party subpoenas, and reserve the right to supplement these contentions and accompanying claim charts after further investigation.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Defendants' reference to a particular product, device, or software program in these contentions should be interpreted as a reference to the system itself as well as to any corresponding patents, publications, or product literature relating to the cited system. Upon information and belief, the systems were publicly disclosed, used, sold, or offered for sale in the United States before the alleged priority date of the Asserted Claims of the '304 Patent. Defendants' investigation of such prior art systems is still ongoing, and discovery has not yet been received from third parties who may have information concerning such prior art systems. Accordingly, subsequent discovery may reveal information that affects the disclosures and contentions herein. For example, subsequent discovery may provide additional information regarding whether any of the third-party prior art systems anticipate or render obvious the Asserted Claims of the '304 Patent. As such, Defendants reserve all rights to supplement their invalidity contentions.

Many of the inventive, research, design, and development activities concerning these systems and technologies occurred in the United States before the alleged priority date of the Asserted Claims of the '304 Patent. Defendants have obtained, and are in the process of obtaining, additional information regarding the dates by which the cited products and services were publicly disclosed, used, sold, or offered for sale, the circumstances under which the research, design, and development activities were conducted, and the identities of the individuals involved in such activities through publicly available patents, publications, and product literature. The actual dates, circumstances, and identities of individuals will be the subject of third-party discovery during this lawsuit, which Defendants reserve the right to rely upon to corroborate the prior art status of the prior art identified herein. Defendants reserve the right to modify, amend, or supplement these contentions if additional information becomes available during the course of this lawsuit. Furthermore, Defendants will make all such devices, software programs, or other products in

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Defendants' possession, custody, or control available for inspection by Plaintiff.

Consequently, Defendants reserve the right to amend, modify, or supplement these Invalidity Contentions should additional information become available to them through discovery.

In addition, Defendants identify, responsive to Plaintiff's Infringement Contentions, the patents, publications, and/or systems listed in Tables 1-D and 2-D as evidence of the state of the art as it relates to physiological monitoring device/system.

Each of these references show that the concept of "physiological monitoring" is not novel and was well-known for many years before the alleged priority date of the '304 Patent, as discussed in more detail in Section IV.B (obviousness). In light of the references discussed herein, the Asserted Claims of the '304 Patent cannot be valid.

Each prior art patent, publication, or product identified above was either effectively filed or issued (for patents), published (for publications) or known, used, offered for sale or sold (for products) before either the earliest claimed priority date of the '304 Patent to which it is applied for invalidity, and none appears to have been abandoned, suppressed, or concealed, so each such reference also constitutes evidence of prior invention pursuant to 35 U.S.C. § 102(g), if it is in the U.S. The persons or entities involved with each such invention include the named inventors on the above-identified patents, the authors listed on the above-identified publications, and the entities and individuals identified in connection with the above-identified products.

Because Defendants have not yet completed discovery in this case, including taking depositions of the named inventors, and otherwise obtaining discovery from Plaintiff and third parties, Defendants reserve the right to supplement these contentions with facts, documents, or other information learned at a later point through discovery or further investigation.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

E. U.S. Patent No. 11,160,455

Invalidity claim charts identifying disclosures in the references identified in the tables below as to the Asserted Claims of the ’455 Patent are provided in attached Exhibits E1 through E18.

Table 1-E: Prior Art Patents and Printed Publications for the ’455 Patent

Patent No. or Title (Primary Inventor/Author)	**Date of Issue/ Publication**	**Filing Date**
US 2015/0057511A1 (“Basu”) [Ex. E1]	2/26/2015	3/27/2013
US 2005/0049468A1 (“Carlson”) [Ex. E2]	3/3/2005	9/3/2003
US 6,616,613 (“Goodman”) [Ex. E3]	9/9/2003	4/27/2000
US 6,519,037B2 ("Jung") [Ex. E4]	2/11/2003	6/1/2001
WO 2012/99536 (“Kassim”) [Ex. E5]	7/26/2012	1/20/2011
US 2011/0237911A1 (“Lamego”) [Ex. E6]	9/29/2011	3/28/2011
US 2010/0217102A1 (“LeBoeuf”) [Ex. E7]	8/26/2010	1/21/2010
US 9,241,676 (“Lisogurski”) [Ex. E8]	1/26/2016	5/31/2012
US 5,746,206 (“Mannheimer”) [Ex. E9]	5/5/1998	6/10/1996
US 2003/0208113A1 (“Mault”) [Ex. E10]	11/6/2003	7/18/2001
US 2011/0082711A1 (“Poeze”) [Ex. E11]	4/7/2011	10/5/2010
US 5,891,022 (“Pologe”) [Ex. E12]	4/6/1999	9/25/1996
US 8,108,036 (“Tran”) [Ex. E13]	1/31/2012	6/18/2009
US 2012/0197093A1 (“Valencell”) [Ex. E14]	8/2/2012	1/25/2012
D. Chandrasekar, et al., “Plug-and-Play, Single-Chip Photoplethysmography” (“Chandrasekar2012”) [Ex. E15]	8/28/2012 - 9/1/2012	received 3/29/12
US 7,507,207 ("Sakai") [Ex. E16]	3/24/2009	10/5/2004
US 8,923,918 ("Kreger") [Ex. E17]	12/30/2014	12/18/2010
US 8,725,226 (“Isaacson”) [Ex. E18]	5/13/2014	11/13/2009

Table 2-E: Prior Art Systems and Inventions for the ’455 Patent

Name of System or Invention	**Date of Sale / Offer for Sale / Public Use / Known by Others**
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by ChoiceMMed, including but not limited to ChoiceMMed MD300C318T, and its accessories (e.g., sensor probe)	At least as early as 2011-05-20
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Criticare Systems,	At least as early as 1988

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Name of System or Invention	Date of Sale / Offer for Sale / Public Use / Known by Others
Inc., including but not limited to Criticare 504, and its accessories (e.g., sensor probe)	
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by GE Marquette Medical Systems, Inc., including but not limited to Dash 2000 Patient Monitor, and its accessories (e.g., sensor probe)	At least as early as 1999
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Masimo Corp., including but not limited to Rad-5 and Rad-5v Signal Extraction Pulse Oximeters, Radical, Rad-57™, SET® Pulse Oximetry Devices and Rainbow SET™ Devices, and their accessories (e.g., sensor probe)	At least as early as 2004 (Rad-5/ Rad-5v), 2007 (Radical), 2008 (Rad-57™), 2009 (SET®/Rainbow SET™).
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Mindray DS USA, Inc, including but not limited to Accutorr V, and its accessories (e.g., sensor probe)	At least as early as 2008
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Covidien AG / Nellcor Puritan Bennett Inc., including but not limited to Nellcor OxiMax Pulse Oximeters, Nellcor N-595 Pulse Oximter, Nellcor OxiMax N-600X Pulse Oximeter, and their accessories (e.g., sensor probe)	At least as early as 2002 (OxiMax Pulse Oximeters and OmniMax N-595), 2011 (OxiMax N-600X)
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Nonin Medical, Inc., including but not limited to Onyx, PalmSAT™, and Nonin® Model 7500 Digital Pulse Oximeter, Nonin Onyx® 9500, and their accessories (e.g., sensor probe)	At least as early as 1988 (Onyx), 2007 (PalmSAT™), 2007 (Nonin Onyx® 9500), and 2008 (Nonin® Model 7500)
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Novametrix Medical Systems Inc., including but not limited to Novametrix Model 513 and Model 2001, and their accessories (e.g., sensor probe)	At least as early as 1999 (Model 513) and 2007 (Model 2001)
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Respironics, Inc., including but not limited to Models 920, 920M and 920M PLUS Pulse Oximeter, and their accessories (e.g., sensor probe)	At least as early as 1999 (Model 920 and 920M) and 2007 (Model 920M PLUS)
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Smiths Medical, including but not limited to BCI 3304 Oximeter, and its accessories (e.g., sensor probe)	At least as early as 2008

Name of System or Invention	Date of Sale / Offer for Sale / Public Use / Known by Others
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Utech Co., Ltd., including but not limited to UT100 Handheld Pulse Oximeter, and its accessories (e.g., sensor probe)	At least as early as 2010
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Welch Allyn, including but not limited to Propaq® CS Vital Signs Monitor and Propaq® Encore Vital Signs Monitor, and their accessories (e.g., sensor probe)	At least as early as 2011 (Propaq® Encore Vital Signs Monitor) and 2012 (Propaq® CS Vital Signs Monitor)
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Philips Medical Systems, including but not limited to M4529A DigitalHandheld Pulse Oximeter, and its accessories (e.g., sensor probe)	At least as early as 2007
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Palco Labs Inc, including but not limited to Model 120 Mini Pulse Oximeter, and its accessories (e.g., sensor probe)	At least as early as 2007
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by BCI Inc., including but not limited to Capnocheck® Sleep Capnograph/Oximeter, and its accessories (e.g., sensor probe)	At least as early as 2007
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Datex-Ohmeda, including but not limited to TuffSat, and its accessories (e.g., sensor probe)	At least as early as 2007

For each of the prior art devices identified above, Defendants have listed and produced documents as evidence of the relevant features and functionality to the extent that they are presently available and have been located. Defendants have obtained or are in the process of attempting to obtain the identified devices and will make them available for inspection to the extent they are obtained. To the extent that one or more documents (*e.g.*, user manual) may be used to describe aspects of a particular device, that device is a single reference for prior art purposes under 35 U.S.C. § 102. Some or all of the corroborating references may also separately qualify as prior art publications under 35 U.S.C. § 102 and may be used as invalidating references under 35

U.S.C. §§ 102 and/or 103.

Further, Defendants are actively searching for information regarding at least the systems, devices, and/or inventions listed above in Table 2-E.

Discovery is ongoing, and Defendants may serve third parties with document subpoenas. One or more of these devices, along with related documentation, may be invalidating, and Defendants reserve the right to supplement these contentions accordingly. Defendants continue to investigate each of the identified devices, including through potential discovery needed to be obtained via third party subpoenas, and reserve the right to supplement these contentions and accompanying claim charts after further investigation.

Defendants' reference to a particular product, device, or software program in these contentions should be interpreted as a reference to the system itself as well as to any corresponding patents, publications, or product literature relating to the cited system. Upon information and belief, the systems were publicly disclosed, used, sold, or offered for sale in the United States before the alleged priority date of the Asserted Claims of the '455 Patent. Defendants' investigation of such prior art systems is still ongoing and discovery has not yet been received from third parties who may have information concerning such prior art systems. Accordingly, subsequent discovery may reveal information that affects the disclosures and contentions herein. For example, subsequent discovery may provide additional information regarding whether or not any of the third-party prior art systems anticipate or render obvious the Asserted Claims of the '455 Patent. As such, Defendants reserve all rights to supplement their invalidity contentions.

Many of the inventive, research, design, and development activities concerning these systems and technologies occurred in the United States before the alleged priority date of the Asserted Claims of the '455 Patent. Defendants have obtained, and are in the process of obtaining,

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

additional information regarding the dates by which the cited products and services were publicly disclosed, used, sold, or offered for sale, the circumstances under which the research, design, and development activities were conducted, and the identities of the particular individuals involved in such activities through publicly available patents, publications, and product literature. The actual dates, circumstances, and identities of individuals will be the subject of third party discovery during this lawsuit, which Defendants reserve the right to rely upon to corroborate the prior art status of the prior art identified herein. Defendants reserve the right to modify, amend, or supplement these contentions if additional information becomes available during the course of this lawsuit. Furthermore, Defendants will make all such devices, software programs, or other products in Defendants' possession, custody, or control available for inspection by Plaintiff.

Consequently, Defendants reserve the right to amend, modify, or supplement these Invalidity Contentions should additional information become available to them through discovery.

In addition, Defendants identify, responsive to Plaintiff's Infringement Contentions, the patents, publications, and/or systems listed in Tables 1-E and 2-E as evidence of the state of the art as it relates to physiological monitoring devices / systems.

Each of these references show that the concept of "physiological monitoring" is not novel and was well-known for many years before the alleged priority date of the '455 Patent, as discussed in more detail in Section IV.B (obviousness). In light of the references discussed herein, the Asserted Claims of the '455 Patent cannot be valid.

Each prior art patent, publication, or product identified above was either effectively filed or issued (for patents), published (for publications) or known, used, offered for sale or sold (for products) before either the earliest claimed priority date of the '455 Patent to which it is applied for invalidity, and none appears to have been abandoned, suppressed, or concealed, so each such

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

reference also constitutes evidence of prior invention pursuant to 35 U.S.C. § 102(g), if it is in the U.S. The persons or entities involved with each such invention include the named inventors on the above-identified patents, the authors listed on the above-identified publications, and the entities and individuals identified in connection with the above-identified products.

Because Defendants have not yet completed discovery in this case, including taking depositions of the named inventors, and otherwise obtaining discovery from Plaintiff and third parties, Defendants reserve the right to supplement these contentions with facts, documents, or other information learned at a later point through discovery or further investigation.

F. U.S. Patent No. 12,193,790

Invalidity claim charts identifying disclosures in the references identified in the tables below as to the Asserted Claims of the '790 Patent are provided in attached Exhibits F1 through F14.

Table 1-F: Prior Art Patents and Printed Publications for the '790 Patent

Patent No. or Title (Primary Inventor/Author)	**Date of Issue/ Publication**	**Filing Date**
US 9,241,676 ("Lisogurski") [Ex. F1]	Jan. 26, 2016	May 31, 2012
US 2015/0057511 ("Basu") [Ex. F2]	Feb. 26, 2015	Mar. 27, 2013
US 6,616,613 ("Goodman") [Ex. F3]	Sep. 9, 2003	Apr. 29, 2000
WO 2012/099536 ("Kassim") [Ex. F4]	Jul. 26, 2012	Jan. 20, 2011
US 9,095,291 ("Soller") [Ex. F5]	Aug. 4, 2015	Aug. 7, 2009
US 11,638,532 ("Poeze") [Ex. F6]	May 2, 2023	Jul. 1, 2010
US 2012/0150047 ("Terumoto") [Ex. F7]	June 14, 2012	Nov. 14, 2011
US 8,172,761 ("Rulkov") [Ex. F8]	May 8, 2012	Oct. 4, 2011
US 2011/0066050 ("Moon") [Ex. F9]	Mar. 17, 2011	Sep. 15, 2009
US 2005/0049468 ("Carlson") [Ex. F10]	Mar. 3, 2005	Sep. 3, 2003
US 2008/0242958 ("Al-Ali") [Ex. F11]	Oct. 2, 2008	Mar. 26, 2008
Plug-and-Play, Single-Chip Photoplethysmography ("Chandrasekar") [Ex. F12]	September 2012	N/A
US 8,923,918 ("Kreger") [Ex. F13]	Dec. 30, 2014	Dec. 18, 2010
US 7,507,207 ("Sakai") [Ex. F14]	Mar. 24, 2009	Oct. 5, 2004

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Table 2-F: Prior Art Systems and Inventions for the ’790 Patent

Name of System or Invention	Date of Sale / Offer for Sale / Public Use / Known by Others
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by ChoiceMMed, including but not limited to ChoiceMMed MD300C318T, and its accessories (e.g., sensor probe)	At least as early as 2011-05-20
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Criticare Systems, Inc., including but not limited to Criticare 504, and its accessories (e.g., sensor probe)	At least as early as 1988
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by GE Marquette Medical Systems, Inc., including but not limited to Dash 2000 Patient Monitor, and its accessories (e.g., sensor probe)	At least as early as 1999
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Masimo Corp., including but not limited to Rad-5 and Rad-5v Signal Extraction Pulse Oximeters, Radical, Rad-57™, SET® Pulse Oximetry Devices and Rainbow SET™ Devices, and their accessories (e.g., sensor probe)	At least as early as 2004 (Rad-5/ Rad-5v), 2007 (Radical), 2008 (Rad-57™), 2009 (SET®/Rainbow SET™).
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Mindray DS USA, Inc, including but not limited to Accutorr V, and its accessories (e.g., sensor probe)	At least as early as 2008
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Covidien AG / Nellcor Puritan Bennett Inc., including but not limited to Nellcor OxiMax Pulse Oximeters, Nellcor N-595 Pulse Oximter, Nellcor OxiMax N-600X Pulse Oximeter, and their accessories (e.g., sensor probe)	At least as early as 2002 (OxiMax Pulse Oximeters and OmniMax N-595), 2011 (OxiMax N-600X)
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Nonin Medical, Inc., including but not limited to Onyx, PalmSAT™, and Nonin® Model 7500 Digital Pulse Oximeter, Nonin Onyx® 9500, and their accessories (e.g., sensor probe)	At least as early as 1988 (Onyx), 2007 (PalmSAT™), 2007 (Nonin Onyx® 9500), and 2008 (Nonin® Model 7500)
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Novametrix Medical Systems Inc., including but not limited to Novametrix Model 513 and Model 2001, and their accessories (e.g., sensor probe)	At least as early as 1999 (Model 513) and 2007 (Model 2001)

Name of System or Invention	Date of Sale / Offer for Sale / Public Use / Known by Others
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Respironics, Inc., including but not limited to Models 920, 920M and 920M PLUS Pulse Oximeter, and their accessories (e.g., sensor probe)	At least as early as 1999 (Model 920 and 920M) and 2007 (Model 920M PLUS)
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Smiths Medical, including but not limited to BCI 3304 Oximeter, and its accessories (e.g., sensor probe)	At least as early as 2008
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Utech Co., Ltd., including but not limited to UT100 Handheld Pulse Oximeter, and its accessories (e.g., sensor probe)	At least as early as 2010
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Welch Allyn, including but not limited to Propaq® CS Vital Signs Monitor and Propaq® Encore Vital Signs Monitor, and their accessories (e.g., sensor probe)	At least as early as 2011 (Propaq® Encore Vital Signs Monitor) and 2012 (Propaq® CS Vital Signs Monitor)
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Philips Medical Systems, including but not limited to M4529A DigitalHandheld Pulse Oximeter, and its accessories (e.g., sensor probe)	At least as early as 2007
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Palco Labs Inc, including but not limited to Model 120 Mini Pulse Oximeter, and its accessories (e.g., sensor probe)	At least as early as 2007
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by BCI Inc., including but not limited to Capnocheck® Sleep Capnograph/Oximeter, and its accessories (e.g., sensor probe)	At least as early as 2007
Pulse oximeters or similar products publicly disclosed, used, sold, or offered for sale by Datex-Ohmeda, including but not limited to TuffSat, and its accessories (e.g., sensor probe)	At least as early as 2007

For each of the prior art devices identified above, Defendants have listed and produced documents as evidence of the relevant features and functionality to the extent that they are presently available and have been located. Defendants have obtained or are in the process of

attempting to obtain the identified devices and will make them available for inspection to the extent they are obtained. To the extent that one or more documents (*e.g.*, user manual) may be used to describe aspects of a particular device, that device is a single reference for prior art purposes under 35 U.S.C. § 102. Some or all of the corroborating references may also separately qualify as prior art publications under 35 U.S.C. § 102 and may be used as invalidating references under 35 U.S.C. §§ 102 and/or 103.

Further, Defendants are actively searching for information regarding at least the systems, devices, and/or inventions listed above in Table 2-F.

Discovery is ongoing, and Defendants may serve third parties with document subpoenas. One or more of these devices, along with related documentation, may be invalidating, and Defendants reserve the right to supplement these contentions accordingly. Defendants continue to investigate each of the identified devices, including through potential discovery needed to be obtained via third party subpoenas, and reserve the right to supplement these contentions and accompanying claim charts after further investigation.

Defendants' reference to a particular product, device, or software program in these contentions should be interpreted as a reference to the system itself as well as to any corresponding patents, publications, or product literature relating to the cited system. Upon information and belief, the systems were publicly disclosed, used, sold, or offered for sale in the United States before the alleged priority date of the Asserted Claims of the '790 Patent. Defendants' investigation of such prior art systems is still ongoing, and discovery has not yet been received from third parties who may have information concerning such prior art systems. Accordingly, subsequent discovery may reveal information that affects the disclosures and contentions herein. For example, subsequent discovery may provide additional information regarding whether any of the third-party

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

prior art systems anticipate or render obvious the Asserted Claims of the '790 Patent. As such, Defendants reserve all rights to supplement their invalidity contentions.

Many of the inventive, research, design, and development activities concerning these systems and technologies occurred in the United States before the alleged priority date of the Asserted Claims of the '790 Patent. Defendants have obtained, and are in the process of obtaining, additional information regarding the dates by which the cited products and services were publicly disclosed, used, sold, or offered for sale, the circumstances under which the research, design, and development activities were conducted, and the identities of the individuals involved in such activities through publicly available patents, publications, and product literature. The actual dates, circumstances, and identities of individuals will be the subject of third-party discovery during this lawsuit, which Defendants reserve the right to rely upon to corroborate the prior art status of the prior art identified herein. Defendants reserve the right to modify, amend, or supplement these contentions if additional information becomes available during the course of this lawsuit. Furthermore, Defendants will make all such devices, software programs, or other products in Defendants' possession, custody, or control available for inspection by Plaintiff.

Consequently, Defendants reserve the right to amend, modify, or supplement these Invalidity Contentions should additional information become available to them through discovery.

In addition, Defendants identify, responsive to Plaintiff's Infringement Contentions, the patents, publications, and/or systems listed in Tables 1-F and 2-F as evidence of the state of the art as it relates to physiological monitoring devices / systems.

Each of these references show that the concept of "physiological monitoring" is not novel and was well-known for many years before the alleged priority date of the '790 Patent, as discussed in more detail in Section IV.B (obviousness). In light of the references discussed herein, the

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Asserted Claims of the ’790 Patent cannot be valid.

Each prior art patent, publication, or product identified above was either effectively filed or issued (for patents), published (for publications) or known, used, offered for sale or sold (for products) before either the earliest claimed priority date of the ’790 Patent to which it is applied for invalidity, and none appears to have been abandoned, suppressed, or concealed, so each such reference also constitutes evidence of prior invention pursuant to 35 U.S.C. § 102(g), if it is in the U.S. The persons or entities involved with each such invention include the named inventors on the above-identified patents, the authors listed on the above-identified publications, and the entities and individuals identified in connection with the above-identified products.

Because Defendants have not yet completed discovery in this case, including taking depositions of the named inventors, and otherwise obtaining discovery from Plaintiff and third parties, Defendants reserve the right to supplement these contentions with facts, documents, or other information learned at a later point through discovery or further investigation.

G. State of the Art

Defendants identify, responsive to Plaintiff’s infringement contentions, the references listed in Tables 1-A through 1-F, Tables 2-A through 2-F, and the following patents, publications, and systems as evidence of the state of the art as it relates to each of the Asserted Patents:

- U.S. Patent No. 3,514,538
- U.S. Patent No. 3,789,601
- U.S. Patent No. 4,015,595
- U.S. Patent No. 4,589,078
- U.S. Patent No. 4,591,659
- U.S. Patent No. 4,941,236
- U.S. Patent No. 5,028,787
- U.S. Patent No. 5,222,496,
- U.S. Patent No. 5,254,388
- U.S. Patent No. 5,259,381
- U.S. Patent No. 5,267,152
- U.S. Patent No. 5,334,916

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

- U.S. Patent No. 5,348,002
- U.S. Patent No. 5,370,114
- U.S. Patent No. 5,527,261
- U.S. Patent No. 5,555,882
- U.S. Patent No. 5,590,652
- U.S. Patent No. 5,632,272
- U.S. Patent No. 5,638,818
- U.S. Patent No. 5,687,721
- U.S. Patent No. 5,746,206
- U.S. Patent No. 5,795,300
- U.S. Patent No. 5,807,261
- U.S. Patent No. 5,830,137
- U.S. Patent No. 5,879,294
- U.S. Patent No. 5,924,069
- U.S. Patent No. 6,018,673
- U.S. Patent No. 6,064,898
- U.S. Patent No. 6,067,463
- U.S. Patent No. 6,081,782
- U.S. Patent No. 6,108,634
- U.S. Patent No. 6,120,460
- U.S. Patent No. 6,126,595
- U.S. Patent No. 6,152,876
- U.S. Patent No. 6,158,245
- U.S. Patent No. 6,168,563
- U.S. Patent No. 6,171,237
- U.S. Patent No. 6,172,743
- U.S. Patent No. 6,174,291
- U.S. Patent No. 6,178,343
- U.S. Patent No. 6,278,975
- U.S. Patent No. 6,285,454
- U.S. Patent No. 6,293,915
- U.S. Patent No. 6,336,900
- U.S. Patent No. 6,343,223
- U.S. Patent No. 6,393,311
- U.S. Patent No. 6,483,976
- U.S. Patent No. 6,505,133
- U.S. Patent No. 6,553,242
- U.S. Patent No. 6,584,336
- U.S. Patent No. 6,591,239
- U.S. Patent No. 6,591,239
- U.S. Patent No. 6,602,191
- U.S. Patent No. 6,605,038
- U.S. Patent No. 6,608,562
- U.S. Patent No. 6,648,820

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

- U.S. Patent No. 6,705,990
- U.S. Patent No. 6,705,991
- U.S. Patent No. 6,801,799
- U.S. Patent No. 6,816,266
- U.S. Patent No. 6,886,964
- U.S. Patent No. 6,912,413
- U.S. Patent No. 6,937,885
- U.S. Patent No. 6,961,599
- U.S. Patent No. 6,990,365
- U.S. Patent No. 7,031,728
- U.S. Patent No. 7,236,811
- U.S. Patent No. 7,346,174
- U.S. Patent No. 7,403,804
- U.S. Patent No. 7,507,207
- U.S. Patent No. 7,624,028
- U.S. Patent No. 7,658,613
- U.S. Patent No. 7,899,506
- U.S. Patent No. 8,095,195
- U.S. Patent No. 8,108,036
- U.S. Patent No. 8,125,331
- U.S. Patent No. 8,172,761
- U.S. Patent No. 8,326,390
- U.S. Patent No. 8,537,343
- U.S. Patent No. 8,670,819
- U.S. Patent No. 8,725,226
- U.S. Patent No. 8,764,651
- U.S. Patent No. 8,923,918
- U.S. Patent No. 9,055,868
- U.S. Patent No. 9,241,676
- U.S. Patent No. 9,392,946
- U.S. Patent No. 9,596,990
- U.S. Patent No. 9,651,633
- U.S. Patent No. 9,820,658
- U.S. Patent No. 10,517,484
- U.S. Patent No. 10,729,335
- U.S. Patent No. 10,729,335
- U.S. Patent No. 10,874,304
- U.S. Patent No. 11,160,455
- U.S. Patent No. 11,242,072
- U.S. Patent No. 11,330,993
- U.S. Patent No. 11,342,072
- U.S. Patent No. 12,193,790
- “Plug-and-Play, Single-Chip Photoplethysmography”, by D. Chandrasekar, B. Arnetz, P. Levy, A. Basu

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

- "Supercontinuum generation from ~1.9 to 4:5 μm in ZBLAN fiber with high average power generation beyond 3:8 μm using a thulium-doped fiber amplifier" by O. Kulkarni, V. Alexander, M. Kumar, M.Freeman, M. N. Islam, F. Terry, Jr., M. Neelakandan, and A. Chan
- "Supercontinuum Generation in Silica Fibers by Amplified Nanosecond Laser Diode Pulses" by C. Xia, M. Kumar, M. Cheng, O. Kulkarni, M. Islam, A. Galvanauskas, F. Terry, Jr., M. Freeman, D. Nolan, and W. Wood
- "Towards a Wearable Non-invasive Blood Glucose Monitoring Device" by J. Anders, J. Solanki, O. Choudhary, S. Chouksey, N. Malvia, P. Chaturvedi, and P. Sen
- "Open Data Kit Sensors: Mobile Data Collection with Wired and Wireless Sensors" by R. Chaudhri, W. Brunette, M. Goel, R. Sodt, J. VanORden, M. Falcone, G. Borriello
- "Android Based Body Area Network for the Evaluation of Medical Parameters" by M. Wagner, B. Kuch, C. Cabrera, P. Enoksson, A. Sieber
- "Noninvasice Cardiac Output Estimation Using a Novel Photoplethsymogram Index" by L. Wang, E. Pickwell-MacPherson, Y.P. Liang, Y.T. Zhang
- "Towards a Wearable Non-invasive Blood Glucose Monitoring Device" by J. Andrews, J. Solanki, O. Choudhary, S. Chouksey, N. Malvia, P. Chaturvedi, P. Sen

IV. P. R. 3-3(b) – Invalidity Grounds

Pursuant to P.R. 3-3(b), Defendants contend that certain prior art references below anticipate one or more Asserted Claims and that to the extent the identified prior art references do not anticipate the Asserted Claims, those claims are invalid as obvious under 35 U.S.C. §103. Each anticipatory prior art reference, either alone or in combination with other prior art, also renders the Asserted Claims invalid as obvious. In particular, each anticipatory prior art reference may be combined with (1) information generally known to persons skilled in the art at the time of the alleged invention, and/or (2) any of the other identified prior art references. To the extent that Plaintiff contends that any of the anticipatory prior art fails to disclose one or more limitations of the Asserted Claims, Defendants contend that any difference between the reference and the corresponding patent claims would have been obvious to one of ordinary skill in the art. Thus, all anticipation charts should be interpreted as both reflecting anticipation by the reference as well as invalidity due to single reference obviousness, to the extent that Plaintiff contends that any limitation is missing.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

A. Anticipation

As stated above, Defendants incorporate by reference all other invalidity contentions related to the Asserted Patents served on or otherwise provided to Plaintiff, whether past or future. In accordance with P.R. 3-3(a), prior art references anticipating the Asserted Claims are provided below. The prior art listed below anticipates the Asserted Claims under the proper construction of the claims and/or under Plaintiff's apparent interpretation of the claims reflected by Plaintiff's Complaint and Infringement Contentions.

1. U.S. Patent No. 9,055,868

The Asserted Claims of the '868 Patent are anticipated and/or rendered obvious by prior art. Pursuant to P.R. 3-3(a), Defendants identify the prior art references that anticipate or render obvious the '868 Patent Asserted Claims in the claim charts of Exhibits A1 through A10 (collectively "Appendix A") which are hereby incorporated by reference as if fully set forth herein. The claim charts of Appendix A show how these prior art references teach or suggest each and every element of the '868 Patent Asserted Claims. For each reference or combination of references suggested by each chart and/or herein, Defendants indicate whether the prior art renders the claim anticipated and/or obvious pursuant to P.R. 3-3(b).

In addition to contending that the '868 Patent Asserted Claims are invalid in view of the prior art references cited in the claim charts of Appendix A, Defendants further contend that the '868 Patent Asserted Claims are invalid as anticipated and/or obvious under U.S.C. §§ 102(a), 102(b), and/or 103 in view of public knowledge and uses and/or offers for sale of products and services related to the subject matter of the cited references. As discovery is ongoing, Defendants continue to investigate these items and to reserve the right to amend or supplement these contentions to include additional information or documents regarding such products and/or systems. In addition to contending that the '868 Patent Asserted Claims are invalid in view of the

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

explicit disclosures of the prior art references cited in the claim charts of Appendix A, Defendants further contend that the knowledge of skill evidenced by those references render those claims invalid. Defendants further contend that, even if a prior art reference does not expressly disclose all limitations as arranged or combined in the same manner as an asserted claim, a skilled artisan reading the reference would at once envisage the claimed arrangement or combination. *See, e.g.*, *Kennametal Inc. v. Ingersoll Cutting Tool Co.*, 780 F.3d 1376 (Fed. Cir. 2015).

Defendants' reference to particular components, circuits, software programs, devices, or products in the claim charts of Appendix A should be interpreted alternatively as both as a reference to the product itself and to any corresponding patents, publications, or product literature cited in Appendix A that relates to the cited component, circuit, software program, device, or product. In addition, Defendants may rely on other documents or things that have not yet been located to support its contentions regarding such prior art component(s), circuit(s), software program(s), device(s) or product(s) that are referenced in the charts.

Defendants incorporate by reference, as if set forth fully herein, all prior art cited during the prosecution of the '868 Patent, all prior art cited during reexamination proceedings of the '868 Patent, all prior art as described in any future *inter partes* review proceedings of the '868 Patent, and all prior art disclosed during previous litigation proceedings.

Defendants further identify and hereby incorporate by reference as if set forth fully herein the prior art references and invalidity contentions as described in any Other Omni Proceedings wherein invalidity contentions have been, or will be, provided regarding the '868 Patent, its foreign counterparts, or any parent or child patent of the '868 Patent. Defendants reserve the right to use any and all portions of the publication, related publications, commercial embodiments of the publication, and other evidence that is discovered in these lawsuits to demonstrate and/or evidence

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

the components, functionality, and capabilities of the devices and systems disclosed in the references charted.

Where Defendants identify a particular figure in a prior art reference, the identification should be understood to encompass the caption and description of the figure, as well as any text relating to the figure in addition to the figure itself. Similarly, where an identified portion of text refers to a figure, embodiment, or other material, the identification should be understood to include the referenced figure, embodiment, or other material as well. Consistent with P.R. 3-3(c), Defendants' citations to specific statements, figures, or disclosures in a prior art reference are sufficient to put Plaintiff on notice where each element of each asserted claim is found in the prior art. However, it should be recognized that a person of ordinary skill in the art would generally read a prior art reference as a whole and in the context of other publications, literature, and general knowledge in the field. To understand and interpret any specific statement or disclosure in a prior art reference, a person of ordinary skill in the art would rely upon other information including other publications and general scientific or engineering knowledge. Defendants therefore reserve the right to rely upon other unidentified portions of the prior art references and on other publications and expert testimony to provide context and to aid understanding and interpretation of the identified portions.

Defendants also reserve the right to rely upon other portions of the prior art references, other publications, and the testimony of experts to establish that the alleged inventions would have been obvious to a person of ordinary skill in the art, including the basis of modifying or combining certain cited references. To the extent any limitation is deemed not to be exactly met by an item of prior art, then any purported differences are such that the claimed subject matter as a whole would have been obvious to one skilled in the art at the time of the alleged invention, in view of

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

the state of the art and knowledge of those skilled in the art. To the extent that an element of an Asserted Claim is not anticipated, the claim is rendered obvious by combination with one or more other prior art references identified in Appendix A.

2. U.S. Patent No. 9,651,533

The Asserted Claims of the '533 Patent are anticipated and/or rendered obvious by prior art. Pursuant to P.R. 3-3(a), Defendants identify the prior art references that anticipate or render obvious the '533 Patent Asserted Claims in the claim charts of Exhibits B1 through B8 (collectively "Appendix B") which are hereby incorporated by reference as if fully set forth herein. The claim charts of Appendix B show how these prior art references teach or suggest each and every element of the '533 Patent Asserted Claims. For each reference or combination of references suggested by each chart and/or herein, Defendants indicate whether the prior art renders the claim anticipated and/or obvious pursuant to P.R. 3-3(b).

In addition to contending that the '533 Patent Asserted Claims are invalid in view of the prior art references cited in the claim charts of Appendix B, Defendants further contend that the '533 Patent Asserted Claims are invalid as anticipated and/or obvious under U.S.C. §§ 102(a), 102(b), and/or 103 in view of public knowledge and uses and/or offers for sale of products and services related to the subject matter of the cited references. As discovery is ongoing, Defendants continue to investigate these items and to reserve the right to amend or supplement these contentions to include additional information or documents regarding such products and/or systems. In addition to contending that the '533 Patent Asserted Claims are invalid in view of the explicit disclosures of the prior art references cited in the claim charts of Appendix B, Defendants further contend that the knowledge of skill evidenced by those references render those claims invalid. Defendants further contend that, even if a prior art reference does not expressly disclose all limitations as arranged or combined in the same manner as an asserted claim, a skilled artisan

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

reading the reference would at once envisage the claimed arrangement or combination. *See, e.g.*, *Kennametal Inc. v. Ingersoll Cutting Tool Co.*, 780 F.3d 1376 (Fed. Cir. 2015).

Defendants' reference to particular components, circuits, software programs, devices, or products in the claim charts of Appendix B should be interpreted alternatively as both as a reference to the product itself and to any corresponding patents, publications, or product literature cited in Appendix B that relates to the cited component, circuit, software program, device, or product. In addition, Defendants may rely on other documents or things that have not yet been located to support its contentions regarding such prior art component(s), circuit(s), software program(s), device(s) or product(s) that are referenced in the charts.

Defendants incorporate by reference, as if set forth fully herein, all prior art cited during the prosecution of the '533 Patent, all prior art cited during reexamination proceedings of the '533 Patent, all prior art as described in any future *inter partes* review proceedings of the '533 Patent, and all prior art disclosed during previous litigation proceedings.

Defendants further identify and hereby incorporate by reference as if set forth fully herein the prior art references and invalidity contentions as described in any Other Omni Proceedings wherein invalidity contentions have been, or will be, provided regarding the '533 Patent, its foreign counterparts, or any parent or child patent of the '533 Patent. Defendants reserve the right to use any and all portions of the publication, related publications, commercial embodiments of the publication, and other evidence that is discovered in these lawsuits to demonstrate and/or evidence the components, functionality, and capabilities of the devices and systems disclosed in the references charted.

Where Defendants identify a particular figure in a prior art reference, the identification should be understood to encompass the caption and description of the figure, as well as any text

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

relating to the figure in addition to the figure itself. Similarly, where an identified portion of text refers to a figure, embodiment, or other material, the identification should be understood to include the referenced figure, embodiment, or other material as well. Consistent with P.R. 3-3(c), Defendants' citations to specific statements, figures, or disclosures in a prior art reference are sufficient to put Plaintiff on notice where each element of each asserted claim is found in the prior art. However, it should be recognized that a person of ordinary skill in the art would generally read a prior art reference as a whole and in the context of other publications, literature, and general knowledge in the field. To understand and interpret any specific statement or disclosure in a prior art reference, a person of ordinary skill in the art would rely upon other information including other publications and general scientific or engineering knowledge. Defendants therefore reserve the right to rely upon other unidentified portions of the prior art references and on other publications and expert testimony to provide context and to aid understanding and interpretation of the identified portions.

Defendants also reserve the right to rely upon other portions of the prior art references, other publications, and the testimony of experts to establish that the alleged inventions would have been obvious to a person of ordinary skill in the art, including the basis of modifying or combining certain cited references. To the extent any limitation is deemed not to be exactly met by an item of prior art, then any purported differences are such that the claimed subject matter as a whole would have been obvious to one skilled in the art at the time of the alleged invention, in view of the state of the art and knowledge of those skilled in the art. To the extent that an element of an Asserted Claim is not anticipated, the claim is rendered obvious by combination with one or more other prior art references identified in Appendix B.

3. U.S. Patent No. 10,517,484

The Asserted Claims of the '484 Patent are anticipated and/or rendered obvious by prior

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

art. Pursuant to P.R. 3-3(a), Defendants identify the prior art references that anticipate or render obvious the '484 Patent Asserted Claims in the claim charts of Exhibits C1 through C14 (collectively "Appendix C") which are hereby incorporated by reference as if fully set forth herein. The claim charts of Appendix C show how these prior art references teach or suggest each and every element of the '484 Patent Asserted Claims. For each reference or combination of references suggested by each chart and/or herein, Defendants indicate whether the prior art renders the claim anticipated and/or obvious pursuant to P.R. 3-3(b).

In addition to contending that the '484 Patent Asserted Claims are invalid in view of the prior art references cited in the claim charts of Appendix C, Defendants further contend that the '484 Patent Asserted Claims are invalid as anticipated and/or obvious under U.S.C. §§ 102(a), 102(b), and/or 103 in view of public knowledge and uses and/or offers for sale of products and services related to the subject matter of the cited references. As discovery is ongoing, Defendants continue to investigate these items and to reserve the right to amend or supplement these contentions to include additional information or documents regarding such products and/or systems. In addition to contending that the '484 Patent Asserted Claims are invalid in view of the explicit disclosures of the prior art references cited in the claim charts of Appendix C, Defendants further contend that the knowledge of skill evidenced by those references render those claims invalid. Defendants further contend that, even if a prior art reference does not expressly disclose all limitations as arranged or combined in the same manner as an asserted claim, a skilled artisan reading the reference would at once envisage the claimed arrangement or combination. *See, e.g.*, *Kennametal Inc. v. Ingersoll Cutting Tool Co.*, 780 F.3d 1376 (Fed. Cir. 2015).

Defendants' reference to particular components, circuits, software programs, devices, or products in the claim charts of Appendix C should be interpreted alternatively as both as a

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

reference to the product itself and to any corresponding patents, publications, or product literature cited in Appendix C that relates to the cited component, circuit, software program, device, or product. In addition, Defendants may rely on other documents or things that have not yet been located to support its contentions regarding such prior art component(s), circuit(s), software program(s), device(s) or product(s) that are referenced in the charts.

Defendants incorporate by reference, as if set forth fully herein, all prior art cited during the prosecution of the '484 Patent, all prior art cited during reexamination proceedings of the '484 Patent, all prior art as described in any future *inter partes* review proceedings of the '484 Patent, and all prior art disclosed during previous litigation proceedings.

Defendants further identify and hereby incorporate by reference as if set forth fully herein the prior art references and invalidity contentions as described in any Other Omni Proceedings wherein invalidity contentions have been, or will be, provided regarding the '484 Patent, its foreign counterparts, or any parent or child patent of the '484 Patent. Defendants reserve the right to use any and all portions of the publication, related publications, commercial embodiments of the publication, and other evidence that is discovered in these lawsuits to demonstrate and/or evidence the components, functionality, and capabilities of the devices and systems disclosed in the references charted.

Where Defendants identify a particular figure in a prior art reference, the identification should be understood to encompass the caption and description of the figure, as well as any text relating to the figure in addition to the figure itself. Similarly, where an identified portion of text refers to a figure, embodiment, or other material, the identification should be understood to include the referenced figure, embodiment, or other material as well. Consistent with P.R. 3-3(c), Defendants' citations to specific statements, figures, or disclosures in a prior art reference are

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

sufficient to put Plaintiff on notice where each element of each asserted claim is found in the prior art. However, it should be recognized that a person of ordinary skill in the art would generally read a prior art reference as a whole and in the context of other publications, literature, and general knowledge in the field. To understand and interpret any specific statement or disclosure in a prior art reference, a person of ordinary skill in the art would rely upon other information including other publications and general scientific or engineering knowledge. Defendants therefore reserve the right to rely upon other unidentified portions of the prior art references and on other publications and expert testimony to provide context and to aid understanding and interpretation of the identified portions.

Defendants also reserve the right to rely upon other portions of the prior art references, other publications, and the testimony of experts to establish that the alleged inventions would have been obvious to a person of ordinary skill in the art, including the basis of modifying or combining certain cited references. To the extent any limitation is deemed not to be exactly met by an item of prior art, then any purported differences are such that the claimed subject matter as a whole would have been obvious to one skilled in the art at the time of the alleged invention, in view of the state of the art and knowledge of those skilled in the art. To the extent that an element of an Asserted Claim is not anticipated, the claim is rendered obvious by combination with one or more other prior art references identified in Appendix C.

4. U.S. Patent No. 10,874,304

The Asserted Claims of the ’304 Patent are anticipated and/or rendered obvious by prior art. Pursuant to P.R. 3-3(a), Defendants identify the prior art references that anticipate or render obvious the ’304 Patent Asserted Claims in the claim charts of Exhibits D1 through D19 (collectively “Appendix D”) which are hereby incorporated by reference as if fully set forth herein. The claim charts of Appendix D show how these prior art references teach or suggest each and

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

every element of the ’304 Patent Asserted Claims. For each reference or combination of references suggested by each chart and/or herein, Defendants indicate whether the prior art renders the claim anticipated and/or obvious pursuant to P.R. 3-3(b).

In addition to contending that the ’304 Patent Asserted Claims are invalid in view of the prior art references cited in the claim charts of Appendix D, Defendants further contend that the ’304 Patent Asserted Claims are invalid as anticipated and/or obvious under U.S.C. §§ 102(a), 102(b), and/or 103 in view of public knowledge and uses and/or offers for sale of products and services related to the subject matter of the cited references. As discovery is ongoing, Defendants continue to investigate these items and to reserve the right to amend or supplement these contentions to include additional information or documents regarding such products and/or systems. In addition to contending that the ’304 Patent Asserted Claims are invalid in view of the explicit disclosures of the prior art references cited in the claim charts of Appendix D, Defendants further contend that the knowledge of skill evidenced by those references render those claims invalid. Defendants further contend that, even if a prior art reference does not expressly disclose all limitations as arranged or combined in the same manner as an asserted claim, a skilled artisan reading the reference would at once envisage the claimed arrangement or combination. *See, e.g.*, *Kennametal Inc. v. Ingersoll Cutting Tool Co.*, 780 F.3d 1376 (Fed. Cir. 2015).

Defendants’ reference to particular components, circuits, software programs, devices, or products in the claim charts of Appendix D should be interpreted alternatively as both as a reference to the product itself and to any corresponding patents, publications, or product literature cited in Appendix D that relates to the cited component, circuit, software program, device, or product. In addition, Defendants may rely on other documents or things that have not yet been located to support its contentions regarding such prior art component(s), circuit(s), software

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

program(s), device(s), or product(s) that are referenced in the charts.

Defendants incorporate by reference, as if set forth fully herein, all prior art cited during the prosecution of the '304 Patent, all prior art cited during reexamination proceedings of the '304 Patent, all prior art as described in any *inter partes* review proceedings of the '304 Patent, and all prior art disclosed during previous litigation proceedings.

Defendants further identify and hereby incorporate by reference as if set forth fully herein the prior art references and invalidity contentions as described in any Other Omni Proceedings wherein invalidity contentions have been, or will be, provided regarding the '304 Patent, its foreign counterparts, or any parent or child patent of the '304 Patent. Defendants reserve the right to use any and all portions of the publication, related publications, commercial embodiments of the publication, and other evidence that is discovered in these lawsuits to demonstrate and/or evidence the components, functionality, and capabilities of the devices and systems disclosed in the references charted.

Where Defendants identify a particular figure in a prior art reference, the identification should be understood to encompass the caption and description of the figure, as well as any text relating to the figure in addition to the figure itself. Similarly, where an identified portion of text refers to a figure, embodiment, or other material, the identification should be understood to include the referenced figure, embodiment, or other material as well. Consistent with P.R. 3-3(c), Defendants' citations to specific statements, figures, or disclosures in a prior art reference are sufficient to put Plaintiff on notice where each element of each asserted claim is found in the prior art. However, it should be recognized that a person of ordinary skill in the art would generally read a prior art reference as a whole and in the context of other publications, literature, and general knowledge in the field. To understand and interpret any specific statement or disclosure in a prior

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

art reference, a person of ordinary skill in the art would rely upon other information including other publications and general scientific or engineering knowledge. Defendants therefore reserve the right to rely upon other unidentified portions of the prior art references and on other publications and expert testimony to provide context and to aid understanding and interpretation of the identified portions.

Defendants also reserve the right to rely upon other portions of the prior art references, other publications, and the testimony of experts to establish that the alleged inventions would have been obvious to a person of ordinary skill in the art, including the basis of modifying or combining certain cited references. To the extent any limitation is deemed not to be exactly met by an item of prior art, then any purported differences are such that the claimed subject matter as a whole would have been obvious to one skilled in the art at the time of the alleged invention, in view of the state of the art and knowledge of those skilled in the art. To the extent that an element of an Asserted Claim is not anticipated, the claim is rendered obvious by combination with one or more other prior art references identified in Appendix D.

5. U.S. Patent No. 11,160,455

The Asserted Claims of the ’455 Patent are anticipated and/or rendered obvious by prior art. Pursuant to P.R. 3-3(a), Defendants identify the prior art references that anticipate or render obvious the ’455 Patent Asserted Claims in the claim charts of Exhibits E1 through E18 (collectively “Appendix E”) which are hereby incorporated by reference as if fully set forth herein. The claim charts of Appendix E show how these prior art references teach or suggest each and every element of the ’455 Patent Asserted Claims. For each reference or combination of references suggested by each chart and/or herein, Defendants indicate whether the prior art renders the claim anticipated and/or obvious pursuant to P.R. 3-3(b).

In addition to contending that the ’455 Patent Asserted Claims are invalid in view of the

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

prior art references cited in the claim charts of Appendix E, Defendants further contend that the '455 Patent Asserted Claims are invalid as anticipated and/or obvious under U.S.C. §§ 102(a), 102(b), and/or 103 in view of public knowledge and uses and/or offers for sale of products and services related to the subject matter of the cited references. As discovery is ongoing, Defendants continue to investigate these items and to reserve the right to amend or supplement these contentions to include additional information or documents regarding such products and/or systems. In addition to contending that the '455 Patent Asserted Claims are invalid in view of the explicit disclosures of the prior art references cited in the claim charts of Appendix E, Defendants further contend that the knowledge of skill evidenced by those references render those claims invalid. Defendants further contend that, even if a prior art reference does not expressly disclose all limitations as arranged or combined in the same manner as an asserted claim, a skilled artisan reading the reference would at once envisage the claimed arrangement or combination. *See, e.g.*, *Kennametal Inc. v. Ingersoll Cutting Tool Co.*, 780 F.3d 1376 (Fed. Cir. 2015).

Defendants' reference to particular components, circuits, software programs, devices, or products in the claim charts of Appendix E should be interpreted alternatively as both as a reference to the product itself and to any corresponding patents, publications, or product literature cited in Appendix E that relates to the cited component, circuit, software program, device, or product. In addition, Defendants may rely on other documents or things that have not yet been located to support its contentions regarding such prior art component(s), circuit(s), software program(s), device(s) or product(s) that are referenced in the charts.

Defendants incorporate by reference, as if set forth fully herein, all prior art cited during the prosecution of the '455 Patent, all prior art cited during reexamination proceedings of the '455 Patent, all prior art as described in any future *inter partes* review proceedings of the '455 Patent,

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

and all prior art disclosed during previous litigation proceedings.

Defendants further identify and hereby incorporate by reference as if set forth fully herein the prior art references and invalidity contentions as described in any Other Omni Proceedings wherein invalidity contentions have been, or will be, provided regarding the '455 Patent, its foreign counterparts, or any parent or child patent of the '455 Patent. Defendants reserve the right to use any and all portions of the publication, related publications, commercial embodiments of the publication, and other evidence that is discovered in these lawsuits to demonstrate and/or evidence the components, functionality, and capabilities of the devices and systems disclosed in the references charted.

Where Defendants identify a particular figure in a prior art reference, the identification should be understood to encompass the caption and description of the figure, as well as any text relating to the figure in addition to the figure itself. Similarly, where an identified portion of text refers to a figure, embodiment, or other material, the identification should be understood to include the referenced figure, embodiment, or other material as well. Consistent with P.R. 3-3(c), Defendants' citations to specific statements, figures, or disclosures in a prior art reference are sufficient to put Plaintiff on notice where each element of each asserted claim is found in the prior art. However, it should be recognized that a person of ordinary skill in the art would generally read a prior art reference as a whole and in the context of other publications, literature, and general knowledge in the field. To understand and interpret any specific statement or disclosure in a prior art reference, a person of ordinary skill in the art would rely upon other information including other publications and general scientific or engineering knowledge. Defendants therefore reserve the right to rely upon other unidentified portions of the prior art references and on other publications and expert testimony to provide context and to aid understanding and interpretation of the

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

identified portions.

Defendants also reserve the right to rely upon other portions of the prior art references, other publications, and the testimony of experts to establish that the alleged inventions would have been obvious to a person of ordinary skill in the art, including the basis of modifying or combining certain cited references. To the extent any limitation is deemed not to be exactly met by an item of prior art, then any purported differences are such that the claimed subject matter as a whole would have been obvious to one skilled in the art at the time of the alleged invention, in view of the state of the art and knowledge of those skilled in the art. To the extent that an element of an Asserted Claim is not anticipated, the claim is rendered obvious by combination with one or more other prior art references identified in Appendix E.

6. U.S. Patent No. 12,193,790

The Asserted Claims of the ’790 Patent are anticipated and/or rendered obvious by prior art. Pursuant to P.R. 3-3(a), Defendants identify the prior art references that anticipate or render obvious the ’790 Patent Asserted Claims in the claim charts of Exhibits F1 through F14 (collectively “Appendix F”) which are hereby incorporated by reference as if fully set forth herein. The claim charts of Appendix F show how these prior art references teach or suggest each and every element of the ’790 Patent Asserted Claims. For each reference or combination of references suggested by each chart and/or herein, Defendants indicate whether the prior art renders the claim anticipated and/or obvious pursuant to P.R. 3-3(b).

In addition to contending that the ’790 Patent Asserted Claims are invalid in view of the prior art references cited in the claim charts of Appendix F, Defendants further contend that the ’790 Patent Asserted Claims are invalid as anticipated and/or obvious under U.S.C. §§ 102(a), 102(b), and/or 103 in view of public knowledge and uses and/or offers for sale of products and services related to the subject matter of the cited references. As discovery is ongoing, Defendants

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

continue to investigate these items and to reserve the right to amend or supplement these contentions to include additional information or documents regarding such products and/or systems. In addition to contending that the '790 Patent Asserted Claims are invalid in view of the explicit disclosures of the prior art references cited in the claim charts of Appendix F, Defendants further contend that the knowledge of skill evidenced by those references render those claims invalid. Defendants further contend that, even if a prior art reference does not expressly disclose all limitations as arranged or combined in the same manner as an asserted claim, a skilled artisan reading the reference would at once envisage the claimed arrangement or combination. *See, e.g.*, *Kennametal Inc. v. Ingersoll Cutting Tool Co.*, 780 F.3d 1376 (Fed. Cir. 2015).

Defendants' reference to particular components, circuits, software programs, devices, or products in the claim charts of Appendix F should be interpreted alternatively as both as a reference to the product itself and to any corresponding patents, publications, or product literature cited in Appendix F that relates to the cited component, circuit, software program, device, or product. In addition, Defendants may rely on other documents or things that have not yet been located to support its contentions regarding such prior art component(s), circuit(s), software program(s), device(s) or product(s) that are referenced in the charts.

Defendants incorporate by reference, as if set forth fully herein, all prior art cited during the prosecution of the '790 Patent, all prior art cited during reexamination proceedings of the '790 Patent, all prior art as described in any future *inter partes* review proceedings of the '790 Patent, and all prior art disclosed during previous litigation proceedings.

Defendants further identify and hereby incorporate by reference as if set forth fully herein the prior art references and invalidity contentions as described in any Other Omni Proceedings wherein invalidity contentions have been, or will be, provided regarding the '790 Patent, its foreign

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

counterparts, or any parent or child patent of the ’790 Patent. Defendants reserve the right to use any and all portions of the publication, related publications, commercial embodiments of the publication, and other evidence that is discovered in these lawsuits to demonstrate and/or evidence the components, functionality, and capabilities of the devices and systems disclosed in the references charted.

Where Defendants identify a particular figure in a prior art reference, the identification should be understood to encompass the caption and description of the figure, as well as any text relating to the figure in addition to the figure itself. Similarly, where an identified portion of text refers to a figure, embodiment, or other material, the identification should be understood to include the referenced figure, embodiment, or other material as well. Consistent with P.R. 3-3(c), Defendants’ citations to specific statements, figures, or disclosures in a prior art reference are sufficient to put Plaintiff on notice where each element of each asserted claim is found in the prior art. However, it should be recognized that a person of ordinary skill in the art would generally read a prior art reference as a whole and in the context of other publications, literature, and general knowledge in the field. To understand and interpret any specific statement or disclosure in a prior art reference, a person of ordinary skill in the art would rely upon other information including other publications and general scientific or engineering knowledge. Defendants therefore reserve the right to rely upon other unidentified portions of the prior art references and on other publications and expert testimony to provide context and to aid understanding and interpretation of the identified portions.

Defendants also reserve the right to rely upon other portions of the prior art references, other publications, and the testimony of experts to establish that the alleged inventions would have been obvious to a person of ordinary skill in the art, including the basis of modifying or combining

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

certain cited references. To the extent any limitation is deemed not to be exactly met by an item of prior art, then any purported differences are such that the claimed subject matter as a whole would have been obvious to one skilled in the art at the time of the alleged invention, in view of the state of the art and knowledge of those skilled in the art. To the extent that an element of an Asserted Claim is not anticipated, the claim is rendered obvious by combination with one or more other prior art references identified in Appendix F.

B. Obviousness

As stated above, Defendants incorporate by reference all other invalidity contentions related to the Asserted Patents served on or otherwise provided to Plaintiff, whether past or in the future. In addition to certain claims being anticipated at least under Plaintiff's apparent claim constructions as indicated above, the Asserted Claims are also invalid as obvious over the same teachings identified for anticipation. Further, the Asserted Claims are obvious over various combinations of the references shown in the claim charts accompanying or incorporated by reference into this disclosure. No Asserted Claim goes beyond combining known elements to achieve predictable results or does more than choose between clear alternatives known to those of skill in the art. Thus, to the extent that an Asserted Claim is not anticipated, it is nevertheless invalid as obvious. Specifically, Defendants assert that any charted or incorporated reference in combination with one or more other charted or incorporated references renders the Asserted Claims obvious.

In *KSR International Co. v. Teleflex, Inc.*, the United States Supreme Court held that, among other things, "[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." 550 U.S. 398, 416 (2007); *see also id.* at 417 ("[A] court must ask whether the improvement is more than the predictable use of

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

prior art elements according to their established functions."). A patent is obvious where "the content of the prior art, the scope of the patent claim, and the level of ordinary skill are not in material dispute, and the obviousness of the claim is apparent in light of these factors." *Id.* at 427. The Supreme Court found that "if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill." *Id.* at 417.

Moreover, the Supreme Court recognizes that market pressures will motivate a person of ordinary skill to survey known art for solutions to problems. *Id.* at 421 ("When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill in the art has good reason to pursue the known options within his or her technical grasp."). When a person of ordinary skill uses an identified, predictable solution to solve a problem, "it is likely the product not of innovation but of ordinary skill and common sense." *Id.* In addition, when a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. *Id.* at 417. If a person of ordinary skill can implement a predictable variation, U.S.C. § 103 bars its patentability. *Id.*

"'[A]ny need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed.'" *Intel Corp. v. PACT XPP Schweiz AG,* 61 F.4th 1373, 1379 (Fed. Cir. 2023) (quoting *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 420 (2007)). "Additionally, 'universal' motivations known in a particular field to improve technology provide 'a motivation to combine prior art references ***even absent any hint of suggestion*** in the references themselves.'" *Id.* (quoting *Intel Corp. v. Qualcomm Inc.*, 21 F.4th 784, 797-99 (Fed. Cir. 2021)) (original emphasis). Thus, motivations to

combine, as well as the general state of the art, may be found in a variety of places including, but not limited to, in the references defined above, and the specification of the Asserted Patents. For example, each piece of prior art relates to systems and methods for physiological monitoring devices / systems. A person of ordinary skill in the art at the time of the alleged invention would have been motivated to combine any one piece of identified prior art with any other identified piece of prior art. For at least this reason, it would have been obvious to a person of skill in the art at the time of the alleged invention of the Asserted Claims to combine the various references cited herein so as to practice the Asserted Claims and there is a motivation in the art to make such a combination. Further reasons to combine the references identified in these charts include the nature of the problem being solved, the express, implied, and/or inherent teachings of the prior art, the knowledge of persons of ordinary skill in the art, the fact that the prior art is generally directed towards methods and systems for physiological monitoring, that such combinations would have yielded predictable results, and that such combinations would have represented known alternatives to a person of ordinary skill in the art.

The law does not require evidence of a specific motivation to combine prior art where the combiation would yield expected results and at most simply represents a known alternative or design choice to one of skill in the art. *See Apple Inc. v. Samsung Elecs. Co*., 839 F.3d 1034, 1058 (Fed. Cir. 2016); *Intercontinental Great Brands LLC v. Kellogg N. Am. Co*., 869 F.3d 1336, 1344 (Fed. Cir. 2017); *KSR Int'l Co. v. Teleflex, Inc*., 127 S. Ct. 1727, 1739-40 (2007) (rejecting the Federal Circuit's "rigid" application of the teaching, suggestion, or motivation to combine test, and instead applying an "expansive and flexible" approach). Indeed, the Supreme Court held that a POSITA is "a person of ordinary creativity, not an automaton" and "in many cases a person of ordinary skill in the art will be able to fit the teachings of multiple patents together like pieces of

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

a puzzle." *KSR*, 550 U.S. at 420-21.

Nevertheless, in addition to the information contained immediately above and elsewhere in these contentions, Defendants identify additional motivations and reasons to combine. For example, in addition to the specific motivations identified herein, motivation to modify a particular reference or to combine any two or more of the identified references comes from (a) the nature of the problem being solved, (b) the teachings of the prior art, (c) the knowledge of persons of ordinary skill in the art, (d) the fact that all of the references teach systems, apparatuses, and methods related to the subject matter and address the same technical issues described in the Asserted Patents, and (e) one would be motivated by considerations of efficiency, effectiveness, convenience, cost-savings, and accessibility, to combine the various teachings of the references. Additionally, one would be motivated to address the alleged problems or achieve the purported objectives identified in the Background sections of the Asserted Patents, of the references cited on the face of the Asserted Patents, and of the other references cited herein.

In sum, motivations to modify or combine the identified references including the references listed above can be found via, for example, discussions in the cited references, the state of the art discussed in the references, and the knowledge of one of ordinary skill in the art. One of ordinary skill in the art would have been motivated to combine these references, because these references relate to common objectives and subject matter. The references share commonalities in terms of their general subject matter as well as the types of equipment, products, systems, and/or methods used. Further, certain prior art references explicitly or implicitly reference other prior art references, share common authors or inventors, were published in the same journals, were compiled by a common author of a compilation or reference book, were presented at the same conferences, and/or were developed at common companies, schools, or organizations, which

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

would motivate one of ordinary skill in the art to combine them. These references are within the field of the Asserted Patents and are directed to similar subject matter within the field. Additionally, the references, and any products, devices, or processes described in the references, existed and/or were invented in the same time period providing further motivation for combination. These disclosures were provided without prejudice to any arguments or objections concerning the relevance of motivation to combine in connection with any invalidity contentions.

Defendants reserve the right to further specify the motivations to combine the prior art in response to positions that Plaintiff may take later in this case and as discovery, including third party discovery, proceeds. Defendants may rely on any and all portions of the prior art, other documents, and expert testimony to establish that a person of ordinary skill in the art would have been motivated to modify or combine the prior art so as to render the claims invalid as obvious. Moreover, Defendants reserve the right to rely on later identified sources of information, including but not limited to witness testimony and other discovery, to establish the state of the art in the relevant time frame pertaining to the Asserted Patents.

Additionally, Defendants note that Plaintiff has neither provided any contention that secondary considerations of non-obviousness exist for any Asserted Patent nor provided any evidence of such secondary considerations. Defendants are not aware of any evidence supporting the existence of any such secondary considerations. This lack of evidence further renders the Asserted Claims obvious. Proving any such secondary considerations is Omni's burden. *See, e.g.*, *ZUP, LLC v. Nach Mfg., Inc.*, 896 F.3d 1365, 1373 (Fed. Cir. 2018) ("[A] patentee bears the burden of production with respect to evidence of secondary considerations of nonobviousness."). To the extent Omni is permitted to introduce contentions and/or evidence concerning secondary considerations in the future, Defendants reserve all rights to rebut those contentions if and when

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Omni identifies them. In the meantime, Defendants note the complete lack of any such evidence in the record. Moreover, Defendants further contend that, in any event, the evidence of obviousness for each asserted claim is so overwhelming that secondary considerations are necessarily insufficient to rebut Defendants' showing. *See, e.g.*, *Ohio Willow Wood Co. v. Alps South, LLC*, 735 F.3d 1333, 1344 (Fed. Cir. 2013) ("[W]here a claimed invention represents no more than the predictable use of prior art elements according to established functions, as here, evidence of secondary indicia are frequently deemed inadequate to establish non-obviousness.").

While Defendants reserve the right to rely on any combination of the references reflected in their charts or incorporated herein by reference, Defendants provide the following exemplary and non-exhaustive references and/or combinations evidencing invalidity of the claims of the Asserted Patents. The combinations of prior art listed below render obvious the Asserted Claims under the proper construction of the claims and/or under Plaintiff's apparent interpretation of the claims as set forth by Plaintiff in its Complaint and Infringement Contentions.

1. U.S. Patent No. 9,055,868

Pursuant to P.R. 3-3(a) and (b), Defendants identify in Appendix A the prior art references that render obvious the Asserted Claims of the '868 Patent and include below exemplary combinations showing the obviousness of the '868 Patent Asserted Claims in view of the prior art. To the extent Plaintiff contends that an element is not disclosed in any one of the anticipatory references described in Appendix A, the limitation would have been obvious in light of the disclosures within the reference and the knowledge of one of ordinary skill in the art at the time of the '868 Patent. Moreover, to the extent Plaintiff contends that an element is not disclosed in any one of the anticipatory references described in Appendix A, such reference may be combined with any other references listed in Appendix A for such element, thereby rendering the claims invalid for obviousness. To the extent a finder of fact determines that a limitation of any of the '868 Patent

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Asserted Claims is not disclosed by one of the references identified above pursuant to P.R. 3-3(a), the claim is nevertheless unpatentable as obvious because they contain nothing that constitutes a patentable innovation. To the extent a finder of fact determines that a limitation of the '868 Patent Asserted Claims is not anticipated, it does not go beyond combining familiar elements according to known methods to achieve predictable results or does more than choose between clear alternatives known to those of ordinary skill in the art.

a. Obviousness Rationale and Motivations to Combine

Obviousness: For at least the reasons described in these contentions, it would have been obvious to one of ordinary skill in the art to combine any of a number of prior art references, including any combination of those prior art references identified in Appendix A along with the knowledge of one of ordinary skill in the art to meet the limitations of the '868 Patent Asserted Claims. As a result, the references identified herein render one or more Asserted Claims of the '868 Patent obvious when the references are read in combination with each other, and/or when read in view of the state of the art and knowledge of those skilled in the art. Each and every reference identified is also relevant to the state of the art at the time of the alleged invention. Any of the references disclosed above may be combined with one another to render obvious (and therefore invalid) each of Omni's Asserted Claims. Defendants may rely upon a subset of the identified references or all of the references identified herein, including all references in Appendix A, for purposes of obviousness depending on the Court's claim construction, positions taken by Omni during this litigation, and further investigation and discovery.

Reservation of Rights: Moreover, as mentioned above, Defendants have not yet completed their search or discovery concerning additional prior art. As such, Defendants' inclusion of exemplary combinations does not preclude them from identifying other invalidating

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

combinations as appropriate, and Defendants reserve the right to identify additional specific combinations as well as to detail and explain such combinations.

No More Than Ordinary Variations of Prior Art; No Unexpected Results: To the extent not anticipated, the '868 Patent Asserted Claims represent no more than the result of ordinary variations of the prior art. Defendants further believe that no showing of a specific motivation to combine prior art is required to combine the references disclosed above and in the attached charts, as each combination of art would have no unexpected results, and at most would simply represent a known alternative to one of ordinary skill in the art. *See KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 415-16 (2007) (rejecting the Federal Circuit's "rigid" application of the teaching, suggestion, or motivation to combine test, instead espousing an "expansive and flexible" approach); *Apple Inc. v. Samsung Elecs. Co.*, 839 F.3d 1034, 1058 (Fed. Cir. 2016); *Intercontinental Great Brands LLC v. Kellogg N. Am. Co.*, 869 F.3d 1336, 1344 (Fed. Cir. 2017). Indeed, the Supreme Court held that a person of ordinary skill in the art is "a person of ordinary creativity, not an automaton" and "in many cases a person of ordinary skill in the art will be able to fit the teachings of multiple patents together like pieces of a puzzle." *Id.* at 420-21. Nevertheless, in addition to the information contained elsewhere in these contentions, Defendants identify motivation and reason to combine the cited art.

Predictable Results; Obvious to Try: One or more combinations of the prior art references identified in Appendix A would have been obvious because these references would have been combined using: known methods to yield predictable results; known techniques in the same way; a simple substitution of one known, equivalent element for another to obtain predictable results; and/or a teaching, suggestion, or motivation in the prior art generally. In addition, it would have been obvious to try combining the prior art references identified above because there were

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

only a finite number of predictable solutions and/or because known work in one field of endeavor prompted variations based on predictable design incentives and/or market forces either in the same field or a different one. Further, the combinations of the prior art references identified in Appendix A would have been obvious because the combinations represent known potential options with a reasonable expectation of success.

Interrelated Teachings: Additional evidence that there would have been a motivation to combine the prior art references identified above includes the interrelated teachings of multiple prior art references; common authorship; the effects of demands known to the design community or present in the marketplace; the existence of a known problem for which there was an obvious solution encompassed by the '868 Patent Asserted Claims; the existence of a known need or problem in the field of the endeavor at the time of the alleged invention(s); and the background knowledge that would have been possessed by a person having ordinary skill in the art.

Summary of Motivations to Combine: Thus, the motivation to combine the teachings of the prior art references disclosed in Appendix A is found in the references themselves and also in: (1) the nature of the problem being solved; (2) the express, implied and inherent teachings of the prior art; (3) the knowledge of persons of ordinary skill in the art; (4) the predictable results obtained in combining the different elements of the prior art; (5) the predictable results obtained in simple substitution of one known element for another; (6) the use of a known technique to improve similar devices, methods, or products in the same way; (7) the predictable results obtained in applying a known technique to a known device, method, or product ready for improvement; (8) the finite number of identified predictable solutions that had a reasonable expectation of success; and (9) known work in various technological fields that could be applied to the same or different technological fields based on design incentives or other market forces.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Same Area of Technology: Additionally, it would be obvious to one of ordinary skill in the art to consult and/or combine any of the prior art listed in Appendix A because all of these references relate to the same area of technology and/or are from analogous art. The '868 Patent Asserted Claims are directed to a diagnostic system comprising a light source, a software application capable of operating on a control system, and a host. '868 Patent at Abstract. The '868 Patent Asserted Claims merely unite old elements, well known in the field, with no change in their respective function or result. Given the interrelated teachings of the prior art, the effects of demands known to the design community or present in the marketplace, and the background knowledge possessed by a person having ordinary skill in the art, it would have been obvious for one of ordinary skill in the art to combine these familiar elements, disclosed and/or embodied in the prior art listed above to practice the '868 Patent Asserted Claims.

Same Technical Issues: A person of ordinary skill would have been motivated to combine the above prior art based on his/her knowledge, the nature of the problem to be solved, and the teachings of the prior art. The identified prior art addresses the same or similar technical issues and suggests the same or similar solutions to those issues. Moreover, some of the prior art refer to or discuss other prior art, illustrating the close technical relationship among the prior art. For the '868 Patent, one of ordinary skill in the art would have been motivated to combine known prior art solutions described in these references relating to wirelessly collecting and processing physiological information using a light source and related features.

Demand and Market Forces: For example, market forces suggested a demand for wirelessly collecting and processing physiological information using a light source, and thus one of skill in the art would have thought to combine or modify references that described known methods that one of skill in the art would have recognized as offering improvements to solutions

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

of that time.

Known Elements; Obvious to Try: Moreover, many of the claim elements were already known as admitted by the applicant in the patent specification. These elements represented design choices available to a person of ordinary skill. When there is a design need or market pressure to solve a problem such as identified previously and/or described in the '868 Patent, and there are a finite number of identified, predictable solutions, a person of ordinary skill would be motivated to combine the known options that are within his or her technical grasp. For the '868 Patent, there are a finite number of approaches for wirelessly collecting and processing physiological information using a light source. For example, as of the priority date of the '868 Patent, a POSITA would have been very familiar with basic elements of the '868 Patent's claims such as devices using light passing through a user's body, including blood, to measure physiological information; semiconductor diodes; software; the wireless transmission of data, including via mobile phones and the internet; tracking location of a remote device; differing inputs to a computing system, including voice commands, touchscreens, keypads, etc. Such elements were within the knowledge of a POSITA, whether or not disclosed in any particular reference, and the inclusion of such elements in the '868 Patent's claims does not render them novel or non-obvious.

There are significant similarities in subject matter and objectives for each of many references used in these contentions for the '868 Patent.

Wireless Physiological Monitoring References: For example, charted reference Mault, as well as numerous other references such as Kumar, Nihtila, Brown, and Quy all include teachings related to wirelessly collecting and analyzing physiological data, including data known to be collected using spectroscopy. These references provide numerous methods for collecting physiological data, as well as different methods for wirelessly transmitting and processing the data.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

For example, Mault teaches "a system embodiment comprising an electronic device 10, a blood glucose sensor 12, a physical activity monitor 14, an insulin pump 16, a communications network 20, and a remote computer system 22." Mault at [0069]. Mault further teaches that "[e]lectronic device 10 can be carried by the person, for example a portable computer, personal digital assistant (PDA), wireless phone with computational functionality, visor-mounted device, or other device" and "[s]ensor 12 can be carried by the person and provides blood glucose measurements at intervals." Mault at [0069]-[0070]. Mault teaches that "using a non-invasive spectroscopic technique, the PDA/module combination may be placed against part of the body to obtain a blood glucose reading." Mault at [0073]. Kumar teaches "system architecture 100 for network-based monitoring of data from a patient-side physiological collecting device . . . includ[ing] one or more patient-side devices 102 for collecting data from a patient/client, one or more provider-side devices 104, and an engine implemented on a central server 106." Kumar at [0067]. Kumar further teaches that "[t]he system may be adapted to include web-enabled spirometers and oximeters, allowing healthcare practitioners to perform remote spirometry and oximetry tests." Kumar at [0072]. Kumar also teaches that "[t]he patient-side device may then be connected via a computing device 110, such as a computer, handheld devices such as personal digital assistants (PDAs) and pocket PCs . . . ." Kumar at [0072]. Nihtila teaches "a system for acquiring physiological data from a user and communicating the physiological data via a mobile terminal to a network server for integration into a virtual physiological model established for the user in accordance with an embodiment of the present invention." Nihtila at [0035]. Nihtila further teaches that "[t]he physiological data communicated from the mobile terminal 122 to the network 124 is routed to a server 126 which is configured to accept and process this data. . . . and executes processing software that, in general, operates on the physiological data received from each of a number of users." Nihtila at [0038].

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Brown teaches "blood glucose monitor 16 operates in conjunction with data management unit 10 and handheld microprocessor unit 12 to: (a) perform a test or calibration sequence in which tests are performed to confirm that the system is operating properly; and, (b) perform the blood glucose test sequence in which blood glucose meter 16 senses the user's blood glucose level. Brown at 20:28-67. Brown further teaches that "each apparatus may be placed in communication with server 2018 via wireless communication networks, cellular networks, telephone networks, or any other network which allows each apparatus to exchange data with server 2018." Brown at 25:12-25. Quy is titled "Method and Apparatus for Health and Disease Management Combining Patient Data Monitoring with Wireless Internet Connectivity." Quy at Title. Quy teaches "[t]he system includes a wireless health-monitoring apparatus ('WHMA') 10 . . . [which] is linked in a wireless fashion to a wireless connection point of presence ("POP") 19, the same including at least a base station antenna 15 coupled to a server 17." Quy at 6:29-32. Quy teaches "[s]erver 17 is in turn connected to the wired, or even a wireless (not shown) Internet 21, which may include the World Wide Web." Quy at 6:33-35.

A person of skill in the art would understand that the functionality taught in these references could be added to other methods and systems that collect and transmit physiological data. These methods are known to be effective in collecting and transmitting data. Moreover, to the extent that any of these references includes a feature not expressly disclosed in one or more other references, a POSITA would have naturally looked to, and been motivated to combine, any one of these references with one or more of the other references in order to better achieve their common goals of collecting and transmitting physiological data.

Physiological Monitoring Using Spectroscopy References: For example, charted

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

reference Mault, as well as numerous other references such as Jeng[8], Pologe, Shigeki, Kumar, Nihtila, Quy, Abreu, and Scharf. all include teachings related to physiological monitoring using spectroscopy. These references provide numerous methods for measuring physiological information, such as blood glucose levels and blood oxygenation, using measurements of light. For example, Mault teaches "sensor 12 may use spectroscopic detection of a glucose oxidase reaction . . . and may also use in-vivo spectroscopy techniques to measure blood glucose." Mault at [0073]. Jeng discloses "a method and apparatus for measuring the concentration of an analyte of interest, e.g. glucose, in blood non-invasively, i.e., without penetrating the skin or obtaining a biological sample from the body of a patient." Jeng at 4:28-39. Jeng further discloses that "[l]ight passing through the body part 'B' is transmitted through an aperture 49 and then through a lens system 50 to deliver light to a dispersive element 52." Jeng at 6:57-7:4. Pologe discloses "a system for performing photoplethysmographic measurements using wavelength division multiplexing." Pologe at 4:20-32. Pologe further discloses that "[t]he received light pulses may then be delivered back to the main test unit 12, via probe cable 16, where they are processed to determine the level of one or more blood analytes in the person's arterial blood." Pologe at 4:33-54. Shigeki discloses a "glucose sensor" that "measures the blood glucose concentration of blood flowing through the microvessels in the earlobe 4 of the human body." Shigeki at [0009]. Shigeki further discloses that "[t]he volume of blood flow is measured using the Doppler effect, so infrared light, which has good transmissibility through biological tissue, is used to minimize the attenuation of light reflected by hemoglobin." Shigeki at [0009]. Kumar discloses that "[t]he patient-side device is located with a patient and can be any device that gathers physiological data from the patient."

[8] Mault incorporates Jeng by reference (*see* Mault at [0011], [0073]), thus, references to Jeng should be understood to be references to Mault and/or Jeng.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Kumar at [0071]. Kumar further discloses that "[t]he system may be adapted to include web-enabled spirometers and oximeters, allowing healthcare practitioners to perform remote spirometry and oximetry tests." Kumar at [0203]. Nihtila discloses "systems and methods for using mobile communication techniques to enhance an understanding of the physiological state of an individual based on physiological information acquired from the individual in real-time." Nihtila at [0024]. Nihtila firther discloses that "a physiological data acquisition system of the present invention can include a blood sensing device 211 . . . [which] can be used to measure a number of blood related parameters," including "oxygen saturation, oxygen consumption, blood chemistry, and blood pressure, for example." Nihtila at [0054]. Quy teaches "while various types of medical devices have been mentioned, numerous other types may also be used in the embodiments of the invention, including pulse oximeters, syringe drivers, infusion pumps, spirometers, ventilators, anesthesia monitors, and so on." Quy at 12:51-13:22. Abreu teaches "FIG. 100(C) shows a schematic block diagram of one preferred far-infrared spectroscopy measuring apparatus of the present invention." Abreu at [1159]. Abreu further teaches "[b]esides near-infrared spectroscopy, the present invention provides superior results and higher signal to noise ratio when using any other form of electromagnetic radiation such as for example mid-infrared radiation, radio wave impedance, photoacoustic spectroscopy, Raman spectroscopy, visible spectroscopy, ultraviolet spectroscopy, fluorescent spectroscopy, scattering spectroscopy, and optical rotation of polarized light as well as other techniques such as fluorescent (including Maillard reaction, light induced fluorescence, and induction of glucose fluorescence by ultraviolet light), colorimetric, refractive index, light reflection, thermal gradient, Attenuated Total Internal Reflection, molecular imprinting, and the like. Abreu at [0276]. Scharf teaches "[a] reflectance pulse oximeter that determines oxygen saturation of hemoglobin using two sources of electromagnetic radiation in the green optical

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

region, which provides the maximum reflectance pulsation spectrum." Scharf at Abstract. Scharf further teaches "[t]he oximeter 10 of the present invention comprises two emitters of green light 12, 14 that illuminate a volume of intravascular blood 4." Scharf at 4:8-22.

A person of skill in the art would understand that the functionality taught in these references could be added to other methods and systems that measure physiological information, such as blood glucose levels and blood oxygenation, using measurements of light. These methods use light to measure physiological information. Moreover, to the extent that any of these references includes a feature not expressly disclosed in one or more other references, a POSITA would have naturally looked to, and been motivated to combine, any one of these references with one or more of the other references in order to better achieve their common goals of measuring physiological information, such as blood glucose levels and blood oxygenation, using measurements of light.

Physiological Monitoring with Lenses References: For example, charted reference Jeng, as well as numerous other references such as Pologe, Shigeki, and Scharf all include teachings related to using light with lens systems to collect physiological data. These references provide numerous methods for collecting physiological data using spectroscopy, including using systems with lenses. For example, Jeng teaches that "[t]he body part, e.g., a finger, earlobe, is positioned at the place where the beam from the source of light is focused. Light passing through the body part is transmitted through an aperture 24 and then through a lens system 25 to deliver light to the detector 20." Jeng at 6:31-44. Jeng further discloses that "Light passing through the body part 'B' is transmitted through an aperture 49 and then through a lens system 50 to deliver light to a dispersive element 52." Jeng at 6:57-7:4. Pologue discloses that "the WDM coupler can include any of a number of coupler types, such as those using lenses, prisms, interference filters, diffraction gratings, or butt coupling." Pologe at 3:43-55. Shigeki discloses that "[t]he wavelength of the light

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

outputted from the first semiconductor laser 1 is 1.55 μm, which is within the glucose absorption wavelength band." Shigeki at [0009]. Shigeki further discloses that the light "passes through the earlobe 4 and is received by the first photodetector 20." Shigeki at [0009]. Abreu teaches "[t]he light radiation 2302 can be directly emitted from a light source 2300 and directly collected by a photodetector 2318, or the light radiation 2302 can be delivered and collected using optic fiber cables." Abreu at [1086]. Abreu further teaches "[a]n interface lens system can be used to convert the rays to spatial parallel rays, such as from an incident divergent beam to a spatially parallel beam." Abreu at [1086]. Scharf teaches "[s]uitable optical filters include custom-made molded acrylic aspheric lens/filters having peak wavelengths of 560 nm and 580 nm, respectively, and which have bandwidths of less than 5 nm, which are available from Innovations In Optics, Inc., address 38 Montvale Avenue, Suite 215, Storeham, Mass. 02180, (716) 279-0806." Scharf at 4:22-37. Scharf further teaches "Although shown as flat surfaces, face pieces 16, 18, and 91 can alternatively be shaped to form discrete lenses (not shown) to focus the radiant energy from the LEDs 13a-13d and 15a-15d onto the skin 2 and into the blood 4 and from the skin 2 onto the photodiode 26, 62." Scharf at 8:59-65.

A person of skill in the art would understand that the functionality taught in these references could be added to other methods and systems that measure physiological information using light with a lens system. These methods use light with a lens system to measure physiological information. Moreover, to the extent that any of these references includes a feature not expressly disclosed in one or more other references, a POSITA would have naturally looked to, and been motivated to combine, any one of these references with one or more of the other references in order to better achieve their common goals of measuring physiological information using light with a lens system.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Wavelength Division Multiplexing References: For example, charted reference Pologe, as well as numerous other references such as Jeng, Abreu, and Scharf all include teachings related to using wavelength division multiplexing to measure physiological information. These references provide numerous methods for using wavelength division multiplexing to measure physiological information, particularly relating to blood measurements. For example, Pologe teaches "the present invention relates to a system for performing photoplethysmographic measurements using wavelength division multiplexing." Pologe at 4:20-32. Pologe further discloses "the WDM coupler is capable of producing a wavelength multiplexed pulse on the single light guide that includes the spectral contents of all of the multiple light pulses. In this regard, the WDM coupler can include any of a number of coupler types, such as those using lenses, prisms, interference filters, diffraction gratings, or butt coupling. In addition, active WDM couplers can also be used." Pologe at 3:43-55. Jeng discloses that "[t]he band-pass filter set 14 selects one desired wavelength at a time by rotating the set to place a given filter in the path of the beam." Jeng at 6:11-30. Jeng further discloses that "[a] lens system 47 is used to focus the light from the beam splitter onto the detector 48." Jeng at 6:45-56. Jeng discloses that "[l]ight passing through the body part 'B' is transmitted through an aperture 49 and then through a lens system 50 to deliver light to a dispersive element 52." Jeng at 6:57-7:4. Abreu teaches "[a] variety of radiation sources 2300 can be used in the present invention including LEDs with or without a spectral filter, a variety of lasers including diode lasers, halogen lights and white light sources having maximum output power in the near infrared region with or without a filter, and the like . . . ." Abreu at [1085]. Abreu further teaches "[t]he contact device filter system allowed passage of the glucose band which is used as a reference measuring point while simultaneously measuring thermal energy absorption outside the glucose band." Abreu at [1166]. Scharf teaches "[d]epending on the particular green light sources chosen, green optical

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

filters 16, 18 might be needed. For example, if the Toshiba Ltd. part nos. TLGA183P and TLPGA-183P are used as green LEDs 13, 15 then narrow-band optical filters 16, 18 need to be used." Scharf at 4:22-37.

A person of skill in the art would understand that the functionality taught in these references could be added to other methods and systems that use wavelength division multiplexing to measure physiological information. These methods use principles of wavelength division multiplexing to measure physiological information. Moreover, to the extent that any of these references includes a feature not expressly disclosed in one or more other references, a POSITA would have naturally looked to, and been motivated to combine, any one of these references with one or more of the other references in order to better achieve their common goals of using wavelength division multiplexing to measure physiological information.

Semiconductor Diode References: For example, charted reference Jeng, as well as numerous other references such as Pologe, Shigeki, Abreu, and Scharf all include teachings related to using semiconductor diodes to measure physiological information. These references provide numerous methods for using semiconductor diodes to measure physiological information, particularly information related to a subject's blood. For example, Jeng teaches that "[t]he light sources are either laser diodes or light emitting diodes." Jeng at 15:1-27. Pologe teaches that "[t]he plurality of separate emitters includes multiple separate light sources, such as light emitting diodes (LEDs) and laser diodes." Pologe at 3:1-17. Shigeki teaches that "[t]he wavelength of the light outputted from the first semiconductor laser 1 is 1.55 μm, which is within the glucose absorption wavelength band" Shigeki at [0009]. Abreu teaches "[a] variety of radiation sources 2300 can be used in the present invention including LEDs with or without a spectral filter, a variety of lasers including diode lasers, halogen lights and white light sources having maximum output power in

the near infrared region with or without a filter, and the like . . . ." Abreu at [1085]. Scharf teaches "The green light sources 12, 14 are shown schematically as including light emitting diodes (LEDs) 13, 15 in FIG. 1; however, other green light sources can be used, such as laser diodes, filtered white light sources, filtered broad-band LEDs, etc. Suitable LEDs 13, 15 include part. nos. TLGA-183P (peak wavelength 574 nm) and TLPGA-183P (peak wavelength 562 nm) from Toshiba Ltd. through various sources, such as Marktech International, 5 Hemlock Street, Latham, N.Y. 12110, (518) 786-6591." Scharf at 4:8-22.

A person of skill in the art would understand that the functionality taught in these references could be added to other methods and systems that use semiconductor diodes to measure physiological information. These methods use semiconductor diodes to measure physiological information. Moreover, to the extent that any of these references includes a feature not expressly disclosed in one or more other references, a POSITA would have naturally looked to, and been motivated to combine, any one of these references with one or more of the other references in order to better achieve their common goals of measuring physiological information.

Software Application References: For example, charted reference Mault, as well as numerous other references such as Jeng, Pologe, Shigeki, Kumar, Nihtila, Brown, Quy, Abreu, and Scharf all include teachings related to using software to analyze the collected physiological data. These references provide numerous methods for using software to analyze the collected physiological data, including generating a status of a user based on the physiological data. For example, Mault teaches that "FIG. 19 shows a flowchart representing a software program running on a computing device." Mault at [0187]. Mault further teaches that "Box 516 corresponds to performing a blood test at intervals, and providing the data to a glycemic response algorithm." Mault at [0187]. Mault teaches that "[t]he PDA has a software program, such as a calorie

management program, having a glycemic response algorithm for the subject." Mault at [0109]. Jeng teaches that "[t]he computer controls the software operation for collecting data and storing measurement readings as a data file." Jeng at 6:31-44. Pologe teaches that "The received light pulses may then be delivered back to the main test unit 12, via probe cable 16, where they are processed to determine the level of one or more blood analytes in the person's arterial blood." Pologe at 4:33-54. Pologe further teaches that "[p]rocessing methods to determine the blood analyte levels are known and, therefore, will not be discussed further." Pologe at 4:33-54. Shigeki teaches that "[i]n the arithmetic control circuit 8, calculations are performed to calculate the amount of glucose using the relationship between glucose concentration values previously written to the EEPROM and the photodetector output values, and the relationship between glucose solution temperatures and the photodetector output values." Shigeki at [0012]. Kumar teaches that "[t]he present invention may be implemented on a program or code that can be stored in a computer-readable (or electronically-readable) medium." Kumar at [0087]. Kumar further teaches that "[t]he data interpretation and analysis module 114 is used to interpret the data stream from the client-side device, perform mathematical analysis on the data using FFT, DFT, etc., and generate statistics." Kumar at [0075]. Nihtila teaches that "The processing software integrates currently or recently acquired physiological data into the user's virtual physiological model (i.e., avatar)." Nihtila at [0038]. Nihtila further teaches that "The processing software further computes fitness data (FD) of various types, including, textual, graphical, animation, audio, video, or other form of fitness data." Nihtila at [0040]. Brown teaches that "[w]hen inserted in the handheld microprocessor unit, the program cartridge provides the software necessary (program instructions) to program the handheld microprocessor unit for operation with the microprocessor-based data management unit." Brown at 6:18-45. Brown further teaches that "Remotely Programmable

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Patient Apparatus 320 comprises a Patient Interaction Unit 322, which is connected through a patient communication network 324 to a Patient Data Management Unit 326." Brown at 35:50-36:8. Quy teaches "[a]pplication 62 may include an algorithm 63 for analyzing data from the HMD, and either application 62 or algorithm 63 may optionally access data from an external data source 74 and may further consult an artificial intelligence system 76." Quy at 8:9-14. Quy further teaches "wireless application 70 may correspondingly send a large amount of health data to server application 62." Quy at 8:47-62. Abreu teaches "[s]uitable analyzers include modified Fourier Transform Infrared (FTIR) spectrometers with chemometric software packages. Those are available from the PerkinElmer Corporation (Wellesley, Mass.) and Thermo Nicolet Company (Madison, Wis.)." Abreu at [1103]. Abreu further teaches "[p]rocessor 2324 can contain or be connected to a memory unit 2326 which can store data related to calibration, patient's measurement data, reference data, suitable algorithms, and the like." Abreu at [1083]. Scharf teaches "[a] reflectance pulse oximeter that determines oxygen saturation of hemoglobin using two sources of electromagnetic radiation in the green optical region, which provides the maximum reflectance pulsation spectrum." Scharf at Abstract. Scharf further teaches "the processor 30 collects data in the form of a digitized signal, calculates a coefficient for the oxygen saturation value from the digitized signal, determines the final saturation value by reading the saturation value for the calculated coefficient from a look-up table stored in memory, and then causes the display(s) 38, 40 to display a visual image corresponding to the final saturation value or other oximetry data." Scharf at 11:5-14.

A person of skill in the art would understand that the functionality taught in these references could be added to other methods and systems that use software to analyze the collected physiological data. These methods use software to analyze the collected physiological data,

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

including generating a status of a user based on the physiological data. Moreover, to the extent that any of these references includes a feature not expressly disclosed in one or more other references, a POSITA would have naturally looked to, and been motivated to combine, any one of these references with one or more of the other references in order to better achieve their common goals of using software to analyze the collected physiological data.

Touch Screen, Voice, and Manual Inputs References: For example, charted reference Mault as well as numerous other references such as Pologe, Kumar, Nihtila, Brown, and Quy all include teachings related to receiving touch screen, voice, or manual input to the system for measuring physiological data. These references provide numerous methods for receiving various inputs to systems that measure physiological data. For example, Mault teaches that "Other data entry mechanisms can be used, such as a stylus, touch pad, tracker device, biofeedback system, roller-jog dial, voice recognition, and the like." Mault at [0109]. Mault also teaches that "[t]he computer [which can be a PDA] can have a display, a microprocessor, memory (in the form of RAM, ROM, and a data storage device), and data entry mechanisms such as a keyboard, buttons, stylus, voice entry, roller-jog dial, track ball, finger tracking device, and the like." Mault at [0121]. Pologe discloses that "[t]he main test unit 12 includes: . . . and an input device 34, such as a keypad or a touch screen, for allowing the user to input commands and other information to the processor unit 28." Pologe at 4:63, 5:9. Kumar teaches that "the system allows for the real-time streaming of raw, interpreted, and processed physiological data as well as textual/audio/video data from a patient/client to a health care provider." Kumar at [0010]. Nihtila teaches that "the user can input weight, height, age, gender, and other physical and personal information to the user's virtual physiological model via the mobile terminal's user interface 216." Nihtila at [0046]. Brown teaches that "the user input buttons may be replaced by switches, keys, a touch sensitive display screen, or

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

any other data input device." Brown at 26:1-8. Brown further teaches "the patient interaction unit is a palm-top computer, the display means being provided by a display screen of the palm top computer, and the patient interaction unit input device is a palm-top computer input device such as a touch screen." Brown at claim 2. Brown teaches "the user interface includes a speech synthesizer for audibly communicating the queries and a speech recognizer for receiving spoken responses to the queries." Brown at 9:47-52. Quy teaches "[t]he deployment of voice processing technology may be used to enable an even more convenient user interface: i.e., one to which patients can talk." Quy at 4:62-65. Quy further teaches "[t]hese applications may accept as inputs data from a sensor 24 as well as from a manual input 36." Quy at 7:61-8:8.

A person of skill in the art would understand that the functionality taught in these references could be added to other methods and systems that receiving touch screen, voice, or manual input to the system for measuring physiological data. These methods allow the systems to receive touch screen, voice, or manual input to the system. Moreover, to the extent that any of these references includes a feature not expressly disclosed in one or more other references, a POSITA would have naturally looked to, and been motivated to combine, any one of these references with one or more of the other references in order to better achieve their common goals of receiving touch screen, voice, or manual input to the system for measuring physiological data.

Remote Server with Storage References: For example, charted reference Mault as well as numerous other references such as Kumar, Nihtila, Brown, Quy, Abreu, and Scharf all include teachings related to using remote systems, such as servers, to store and/or process physiological information. These references provide numerous methods for using remote systems, such as servers, to store and/or process physiological information. For example, Mault teaches "[t]he portable computing device 30 is in linked to a communications network 52, allowing

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

communication a remote computer system 54, which may be located at the person's home, doctor's office, or other remote location." Mault at [0079]. Mault teaches that "[a] remote server system 56 is also accessible through the communications network 52, and can be used to store a database of physiological parameters, activity, and diet relating to the person, for medical, nutritional, or computer expert system analysis." Mault at [0079]. Mault teaches that "[a] global positioning system (GPS) may also be added to the PDA, to facilitate medical rescue in an emergency." Mault at [0077]. Kumar teaches "the system includes one or more patient-side devices 102 for collecting data from a patient/client, one or more provider-side devices 104, and an engine implemented on a central server 106." Kumar at [0067]. Kumar teaches "the data may be stored in a secured storage device at the central server for later access, replay, and/or analysis." Kumar at [0083]. Nihtila teaches that "there is illustrated a system for acquiring physiological data from a user and communicating the physiological data via a mobile terminal to a network server for integration into a virtual physiological model established for the user in accordance with an embodiment of the present invention." Nihtila at [0035]. Nihtila teaches "the mobile terminal 122 operates effectively as a modem to facilitated the transfer of acquired physiological data between the physiological sensor device, mobile terminal 122, network 124, and server 126 in real-time." Nihtila at [0044]. Brown teaches "[m]onitoring application 2048 is a controlling software application executed by server 2018 to perform the various functions described below." Brown at 27:11-14. Quy teaches "[s]erver 22 has a base server application 62 with which the same calculates or provides a response based at least in part on data from WHMA 10." Quy at 8:9-14. Quy further teaches "[i]t should also be noted that each of application 62, algorithm 63, external data source 74, or AI system 76, may physically reside on more than one server, e.g., on an array of servers for, e.g., storage or multiple processing purposes." Quy at 8:40-46. Abreu teaches "[t]he signal can

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

be communicated by wires or radio telemetered to an externally placed receiver. The signal can then be processed, analyzed and stored." Abreu at Abstract; *see also* Abreu at [0099]. Scharf teaches "[t]he processor 30 and the remote display 40 are placed in circuit communication via a transmitter 42 and receiver 44." Scharf at 7:48-67. Scharf further teaches "the processor 30 is also in circuit communication with a remote display 40 to display a second visual image corresponding to the oximetry data." Scharf at 7:38-47.

A person of skill in the art would understand that the functionality taught in these references could be added to other methods and systems that use remote systems, such as servers, to store and/or process physiological information. These methods use remote systems, such as servers, to store and/or process physiological information Moreover, to the extent that any of these references includes a feature not expressly disclosed in one or more other references, a POSITA would have naturally looked to, and been motivated to combine, any one of these references with one or more of the other references in order to better achieve their common goals of using remote systems, such as servers, to store and/or process physiological information.

b. Combinations

For at least the reasons described above, it would have been obvious to one of ordinary skill in the art to combine each prior art reference listed in Appendix A with any other reference or references listed in Appendix A along with the knowledge of one of ordinary skill in the art to arrive at the inventions claims in the '868 Patent.

For example, and without limitation, the Asserted Claims of the '868 Patent would have been obvious to one of ordinary skill in the art in view of the following combinations:

(i) <u>Mault Combined with Jeng, Pologe, Shigeki, Abreu and/or Scharf</u>

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

A POSITA would have had reason to combine Mault with any one of Jeng, Pologe, Shigeki, Abreu and/or Scharf all of which relate to systems and methods for obtaining physiological measurements of a user. Each of Mault, Jeng, Pologe, Shigeki, Abreu, and Scharf relate to obtaining physiological measurements of a user, including blood measurements obtained by using light. Indeed, such components and/or processes were conventional as of the time these references were known. Each of Jeng, Pologe, Shigeki, Abreu, and Scharf provide means—not necessarily expressly present in all other references—for measuring physiological data of a user using light. A POSITA would have understood that the systems and methods for Jeng, Pologe, Shigeki, Abreu, and Scharf were intended to be incorporated into wearable measurement devices. A POSITA would understand that systems and methods for Jeng, Pologe, Shigeki, Abreu, and Scharf provide improvements such as advances in measuring physiological data of a user using light. A POSITA would further understand that in order to implement a wearable measurement device, the systems and methods for measuring physiological data of a user using light would commonly be combined with a wireless, wearable system, and thus a POSITA would have been motivated to combine the teachings of these references. The combination would apply known techniques for measuring physiological data of a user using light, to wearable measurement devices that were ready for improvement, in order to yield predictable results. The combination would further be "obvious to try," because it would involve simple design choices from a finite number of identified, predictable solutions, with a reasonable expectation of success.

(ii) Kumar Combined with Jeng, Pologe, Shigeki, Abreu, and/or Scharf

A POSITA would have had reason to combine Kumar with any one of Jeng, Pologe, Shigeki, Abreu and/or Scharf all of which relate to systems and methods for obtaining

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

physiological measurements of a user. Each of Kumar, Jeng, Pologe, Shigeki, Abreu, and Scharf relate to obtaining physiological measurements of a user, including blood measurements obtained by using light. Indeed, such components and/or processes were conventional as of the time these references were known. Each of Jeng, Pologe, Shigeki, Abreu, and Scharf provide means—not necessarily expressly present in all other references—for measuring physiological data of a user using light. A POSITA would have understood that the systems and methods for Jeng, Pologe, Shigeki, Abreu, and Scharf were intended to be incorporated into wearable measurement devices. A POSITA would understand that systems and methods for Jeng, Pologe, Shigeki, Abreu, and Scharf provide improvements such as advances in measuring physiological data of a user using light. A POSITA would further understand that in order to implement a wearable measurement device, the systems and methods for measuring physiological data of a user using light would commonly be combined with a wireless, wearable system, and thus a POSITA would have been motivated to combine the teachings of these references. The combination would apply known techniques for measuring physiological data of a user using light, to wearable measurement devices that were ready for improvement, in order to yield predictable results. The combination would further be "obvious to try," because it would involve simple design choices from a finite number of identified, predictable solutions, with a reasonable expectation of success.

(iii) Nihtila Combined with Jeng, Pologe, Shigeki, Abreu, and/or Scharf

A POSITA would have had reason to combine Nihtila with any one of Jeng, Pologe, Shigeki, Abreu and/or Scharf all of which relate to systems and methods for obtaining physiological measurements of a user. Each of Nihtila, Jeng, Pologe, Shigeki, Abreu, and Scharf relate to obtaining physiological measurements of a user, including blood measurements

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

obtained by using light. Indeed, such components and/or processes were conventional as of the time these references were known. Each of Jeng, Pologe, Shigeki, Abreu, and Scharf provide means—not necessarily expressly present in all other references—for measuring physiological data of a user using light. A POSITA would have understood that the systems and methods for Jeng, Pologe, Shigeki, Abreu, and Scharf were intended to be incorporated into wearable measurement devices. A POSITA would understand that systems and methods for Jeng, Pologe, Shigeki, Abreu, and Scharf provide improvements such as advances in measuring physiological data of a user using light. A POSITA would further understand that in order to implement a wearable measurement device, the systems and methods for measuring physiological data of a user using light would commonly be combined with a wireless, wearable system, and thus a POSITA would have been motivated to combine the teachings of these references. The combination would apply known techniques for measuring physiological data of a user using light, to wearable measurement devices that were ready for improvement, in order to yield predictable results. The combination would further be "obvious to try," because it would involve simple design choices from a finite number of identified, predictable solutions, with a reasonable expectation of success.

(iv) Mault, Kumar, Nihtila, Brown, and/or Quy, Combined with any of the References Disclosing Remaining Features

A POSITA would have had reason to combine references Mault, Kumar, Nihtila, Brown, and/or Quy with any one of the references disclosing physiological monitoring using spectroscopy; physiological monitoring with lenses; wavelength division multiplexing; the use of semiconductor diodes; software applications; touch screen, voice, and manual inputs; and remote servers with storage (collectively, the "remaining features") all of which relate to systems and methods for obtaining physiological measurements of a user, including blood measurements.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Each of the references teaching the remaining features relate to obtaining physiological measurements of a user, including blood measurements, using light. Indeed, such components and/or processes were conventional as of the time these references were known. Each of the references teaching the remaining features provide means—not necessarily expressly present in all other references—for obtaining physiological measurements of a user, including blood measurements, using light. A POSITA would have understood that the systems and methods for the references teaching the remaining features were intended to be incorporated into wearable measurement devices. A POSITA would understand that systems and methods for the references teaching the remaining features provide improvements such as specific methods and systems for obtaining physiological measurements using light. A POSITA would further understand that in order to implement a wearable measurement device, the systems and methods for a wireless system for collecting and processing physiological data would commonly be combined with obtaining physiological measurements (for example, blood glucose levels and blood oxygenation) using light, and thus a POSITA would have been motivated to combine the teachings of these references. Two non-limiting examples of such combinations, which are provided for illustrative purposes only, include Brown in view of Jeng, Pologe, Shigeki, Abreu, and/or Scharf and Quy in view of Jeng, Pologe, Shigeki, Abreu, and/or Scharf. The combinations would apply known techniques for obtaining physiological measurements using light, to wearable measurement devices that were ready for improvement, in order to yield predictable results. The combinations would further be "obvious to try," because they would involve simple design choices from a finite number of identified, predictable solutions, with a reasonable expectation of success.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Furthermore, to the extent any limitation of an Asserted Claim is deemed not to be exactly disclosed by an item of prior art, then the claim is rendered obvious by combination of the prior art in Exhibits A1 through A10 standing alone, in combination with the reference(s) in any other claim chart, in combination with any system art identified in Table 2-A, in combination with Applicant's Admitted Prior Art, in view of the knowledge of a person of ordinary skill in the art, and/or in view of the wireless physiological monitoring references; the physiological monitoring using spectroscopy references; the physiological monitoring with lenses references; the wavelength division multiplexing references; the semiconductor diode references; the software application references; the touch screen, voice, and manual inputs references; the remote server with storage references, for the reasons discussed above.

2. U.S. Patent No. 9,651,533

Pursuant to P.R. 3-3(a) and (b), Defendants identify in Appendix B the prior art references that render obvious the Asserted Claims of the '533 Patent and include below exemplary combinations showing the obviousness of the '533 Patent Asserted Claims in view of the prior art. To the extent Plaintiff contends that an element is not disclosed in any one of the anticipatory references described in Appendix B, the limitation would have been obvious in light of the disclosures within the reference and the knowledge of one of ordinary skill in the art at the time of the '533 Patent. Moreover, to the extent Plaintiff contends that an element is not disclosed in any one of the anticipatory references described in Appendix B, such reference may be combined with any other references listed in Appendix B for such element, thereby rendering the claims invalid for obviousness. To the extent a finder of fact determines that a limitation of any of the '533 Patent Asserted Claims is not disclosed by one of the references identified above pursuant to P.R. 3-3(a), the claim is nevertheless unpatentable as obvious because they contain nothing that constitutes a patentable innovation. To the extent a finder of fact determines that a limitation of the '533 Patent

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Asserted Claims is not anticipated, it does not go beyond combining familiar elements according to known methods to achieve predictable results or does more than choose between clear alternatives known to those of ordinary skill in the art.

a. Obviousness Rationale and Motivations to Combine

Obviousness: For at least the reasons described in these contentions, it would have been obvious to one of ordinary skill in the art to combine any of a number of prior art references, including any combination of those prior art references identified in Appendix B along with the knowledge of one of ordinary skill in the art to meet the limitations of the '533 Patent Asserted Claims. As a result, the references identified herein render one or more Asserted Claims of the '533 Patent obvious when the references are read in combination with each other, and/or when read in view of the state of the art and knowledge of those skilled in the art. Each and every reference identified is also relevant to the state of the art at the time of the alleged invention. Any of the references disclosed above may be combined with one another to render obvious (and therefore invalid) each of Omni's Asserted Claims. Defendants may rely upon a subset of the identified references or all of the references identified herein, including all references in Appendix B, for purposes of obviousness depending on the Court's claim construction, positions taken by Omni during this litigation, and further investigation and discovery.

Reservation of Rights: Moreover, as mentioned above, Defendants have not yet completed their search or discovery concerning additional prior art. As such, Defendants' inclusion of exemplary combinations does not preclude them from identifying other invalidating combinations as appropriate, and Defendants reserve the right to identify additional specific combinations as well as to detail and explain such combinations.

No More Than Ordinary Variations of Prior Art; No Unexpected Results: To the

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

extent not anticipated, the ’533 Patent Asserted Claims represent no more than the result of ordinary variations of the prior art. Defendants further believe that no showing of a specific motivation to combine prior art is required to combine the references disclosed above and in the attached charts, as each combination of art would have no unexpected results, and at most would simply represent a known alternative to one of ordinary skill in the art. *See KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 415-16 (2007) (rejecting the Federal Circuit’s “rigid” application of the teaching, suggestion, or motivation to combine test, instead espousing an “expansive and flexible” approach); *Apple Inc. v. Samsung Elecs. Co*., 839 F.3d 1034, 1058 (Fed. Cir. 2016); *Intercontinental Great Brands LLC v. Kellogg N. Am. Co*., 869 F.3d 1336, 1344 (Fed. Cir. 2017). Indeed, the Supreme Court held that a person of ordinary skill in the art is “a person of ordinary creativity, not an automaton” and “in many cases a person of ordinary skill in the art will be able to fit the teachings of multiple patents together like pieces of a puzzle.” *Id.* at 420-21. Nevertheless, in addition to the information contained elsewhere in these contentions, Defendants identify motivation and reason to combine the cited art.

Predictable Results; Obvious to Try: One or more combinations of the prior art references identified in Appendix B would have been obvious because these references would have been combined using: known methods to yield predictable results; known techniques in the same way; a simple substitution of one known, equivalent element for another to obtain predictable results; and/or a teaching, suggestion, or motivation in the prior art generally. In addition, it would have been obvious to try combining the prior art references identified above because there were only a finite number of predictable solutions and/or because known work in one field of endeavor prompted variations based on predictable design incentives and/or market forces either in the same field or a different one. Further, the combinations of the prior art references identified in Appendix

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

B would have been obvious because the combinations represent known potential options with a reasonable expectation of success.

Interrelated Teachings: Additional evidence that there would have been a motivation to combine the prior art references identified above includes the interrelated teachings of multiple prior art references; common authorship; the effects of demands known to the design community or present in the marketplace; the existence of a known problem for which there was an obvious solution encompassed by the ’533 Patent Asserted Claims; the existence of a known need or problem in the field of the endeavor at the time of the alleged invention(s); and the background knowledge that would have been possessed by a person having ordinary skill in the art.

Summary of Motivations to Combine: Thus, the motivation to combine the teachings of the prior art references disclosed in Appendix B is found in the references themselves and also in: (1) the nature of the problem being solved; (2) the express, implied and inherent teachings of the prior art; (3) the knowledge of persons of ordinary skill in the art; (4) the predictable results obtained in combining the different elements of the prior art; (5) the predictable results obtained in simple substitution of one known element for another; (6) the use of a known technique to improve similar devices, methods, or products in the same way; (7) the predictable results obtained in applying a known technique to a known device, method, or product ready for improvement; (8) the finite number of identified predictable solutions that had a reasonable expectation of success; and (9) known work in various technological fields that could be applied to the same or different technological fields based on design incentives or other market forces.

Same Area of Technology: Additionally, it would be obvious to one of ordinary skill in the art to consult and/or combine any of the prior art listed in Appendix B because all of these references relate to the same area of technology and/or are from analogous art. The ’533 Patent

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Asserted Claims are directed to an optical measurement system with a personal device and a remote device. '533 Patent at Claim 5. The '533 Patent Asserted Claims merely unite old elements, well known in the field, with no change in their respective function or result. Given the interrelated teachings of the prior art, the effects of demands known to the design community or present in the marketplace, and the background knowledge possessed by a person having ordinary skill in the art, it would have been obvious for one of ordinary skill in the art to combine these familiar elements, disclosed and/or embodied in the prior art listed above to practice the '533 Patent Asserted Claims.

Same Technical Issues: A person of ordinary skill would have been motivated to combine the above prior art based on his/her knowledge, the nature of the problem to be solved, and the teachings of the prior art. The identified prior art addresses the same or similar technical issues and suggests the same or similar solutions to those issues. Moreover, some of the prior art refer to or discuss other prior art, illustrating the close technical relationship among the prior art. For the '533 Patent, one of ordinary skill in the art would have been motivated to combine known prior art solutions described in these references concerning features related to known techniques for increasing the signal-to-noise ratio and known components and functionalities of personal devices and remote devices.

Demand and Market Forces: For example, market forces suggested a demand for improving signal-to-noise ratio and wirelessly transmitting information from optical measurement systems to devices such as personal devices and remote devices, and thus one of skill in the art would have thought to combine or modify references that described known methods that one of skill in the art would have recognized as offering improvements to solutions of that time.

Known Elements; Obvious to Try: Moreover, many of the claim elements were already

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

known as admitted by the applicant in the patent specification. These elements represented design choices available to a person of ordinary skill. When there is a design need or market pressure to solve a problem such as identified previously and/or described in the ’533 Patent, and there are a finite number of identified, predictable solutions, a person of ordinary skill would be motivated to combine the known options that are within his or her technical grasp. For the ’533 Patent, there are a finite number of approaches for increasing signal-to-noise ratio and communicating information to other devices. For example, as of the priority date of the ’533 Patent, a POSITA would have been very familiar with basic elements of the ’533 Patent’s claims such as increasing a light intensity, increasing a pulse rate, using a plurality of lenses to direct an output optical beam, and communicating information with a personal device and a remote device. Such elements were within the knowledge of a POSITA, whether or not disclosed in any particular reference, and the inclusion of such elements in the ’533 Patent’s claims does not render them novel or non-obvious.

There are significant similarities in subject matter and objectives for each of many references used in these contentions for the ’533 Patent.

References disclosing techniques for increasing signal-to-noise ratio: For example, charted reference Basu, as well as numerous other references such as Lisogurski, Carlson, LeBoeuf, and Park all include teachings related to increasing the signal-to-noise ratio of optical measurement systems by increasing a light intensity and increasing a pulse rate of an LED. These references provide numerous methods for increasing a light intensity and increasing a pulse rate of an LED. For example, Basu teaches that “[t]o maximize the signal-to-noise ratio in photoplethysmography, the LED intensity should be made as large as possible without saturating the detector. In the OPS 10, the LED intensity and modulation frequencies are programmable through the serial interface. In the case of the Vishay VCNL4000, the intensity is programmable

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

from 10-200 mA in 10 mA increments." Basu at [0048]. Lisogurski teaches "that modulation of the light drive signal . . . may include modulation of parameters including drive current or light brightness, duty cycle, firing rate, modulation parameters, other suitable parameters, or any combination thereof" and that "[t]he system may increase the brightness of the light sources in response to the noise to improve the signal-to-noise ratio." Lisogurski at 27:44-55, 9:46-60. Carlson teaches that the "frequency is chosen in such a way that it is outside the frequency spectrum of sunlight and of ambient light which, according to FIG. 7 b, is in the range of above approximately 1000 Hz. Thus, the pulsoximeter signals are readily discriminated from electronic and parasitic contributions of environmental optical radiation outside the frequency fc+/−5 Hz increasing significantly the Signal-to-Noise and Signal-to-Background ratio." Carlson at [0069]. LeBoeuf teaches that "the intensity of the optical emitter 102 may be increased to increase the ratio of physiological optical scatter 111 from blood vessels with respect to unwanted sunlight" and that "it is important to consider the emitter pulsing frequency and sampling approach" because "choosing a frequency that is too low may result in unsatisfactory subtraction." LeBoeuf at [0123], [0139]. Park teaches that "the light source intensity may be increased to maintain the output signal from the light detector within a desired range of output values." Park at 16:8-20.

A person of skill in the art would understand that the functionality taught in these references could be added to other methods and systems that are concerned with improving signal-to-noise ratio in optical measurement systems. These methods are known to be effective in improving the signal-to-noise ratio for such systems, and merely modulate the functioning of the existing LEDs in each system. Moreover, to the extent that any of these references includes a feature not expressly disclosed in one or more other references, a POSITA would have naturally looked to, and been motivated to combine, any one of these references with one or more of the other

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

references in order to better achieve their common goals of improving signal-to-noise ratio.

References disclosing lenses: For example, charted reference Basu, as well as numerous other references such as Carlson, LeBoeuf, Park, and Sakai all include teachings related to using a plurality of lenses configured to receive a portion of the output optical beam and to deliver an analysis output beam to a sample. These references provide numerous methods for using lenses to direct an optical output beam. For example, Basu teaches that "[e]ach of the LEDs is separated from the photo detector by an optical barrier." Basu at [0087]. Carlson teaches "a beam-shaping element, such as e.g. diffractive or refractive lenses, to direct the emitted optical radiation of, e.g., the LED light source into the human or animal tissue and the photon detecting element in order to increase the optical signal power, detected by the pulsoximeter sensor, and thus increasing the Signal/Noise—and signal/Background ratio" Carlson at [0014]. LeBoeuf teaches that "the at least one sensor module include a lens positioned above at least one of the optical emitter and filter. The lens may include respective first and second portions configured to matingly engage respective first and second apertures in the light-opaque material." LeBoeuf at [0022]. Park teaches that "the transmissive structures may employ a material and/or optical design to facilitate low light loss (for example, a lens) thereby improving SNR of the photo detector and/or reducing power consumption of the light emitter(s) and/or light detector(s)." Park at 11:32-57. Sakai teaches that "[i]nfrared light or green light is emitted to the human body via a light transmitting plate 2029." Sakai at 28:01-32.

A person of skill in the art would understand that the functionality taught in these references could be added to other methods and systems that are concerned with using lenses to direct an optical output beam. These methods are known to be effective in directing an optical output beam using known lens structures. Moreover, to the extent that any of these references includes a feature

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

not expressly disclosed in one or more other references, a POSITA would have naturally looked to, and been motivated to combine, any one of these references with one or more of the other references in order to better achieve their common goals of directing an optical output beam.

References disclosing a personal device: For example, charted reference Basu, as well as numerous other references such as Addison, LeBoeuf, Park, and Kreger all include teachings related to a personal device. These references provide numerous methods for incorporating a personal device into an optical measurement system. For example, Basu teaches "a wireless ring which combines the sensor with a Bluetooth transmitter linked to an Android application running on the user's cell phone." Basu at [0057]. Addison teaches that "[o]utput 414 may be any suitable output device such as, for example, . . . one or more display devices (e.g., monitor, PDA, mobile phone, any other suitable display device, or any combination thereof), one or more audio devices, . . . or any combination thereof." Addison at [0069]. LeBoeuf teaches that "headsets configured to monitor an individual's physiology and/or environment may be wired to a device that stores and/or processes data or there may be a combination of wired and wireless communications." LeBoeuf at [0106]. Park teaches that a "secondary device may be equipped with a display to output data obtained by the secondary device or data transferred to it by the biometric monitoring device, the external service, or a combination of data from the biometric monitoring device, the secondary device, and/or the external service." Park at 9:17-40. Kreger teaches "sensor data and measurements may be transmitted to remote medical personnel, internet servers, and others using WiFi transceiver 68, Bluetooth transceiver 72 or other RF transmitter such as for a cellular phone network. As well, the signals and measurements on the mobile 12 may be transferred via a cable connected to USB connector 28 c or docking connector 28 b to another computer storage device, over a computer network, to a personal computer, and so forth." Kreger at 7:39-46.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

A person of skill in the art would understand that the functionality taught in these references could be added to other methods and systems that are concerned with incorporating a personal device into optical measurement systems. These methods are known to be effective in incorporating a personal device into such systems. Moreover, to the extent that any of these references includes a feature not expressly disclosed in one or more other references, a POSITA would have naturally looked to, and been motivated to combine, any one of these references with one or more of the other references in order to better achieve their common goals of communicating with a personal device.

References disclosing a remote device: For example, charted reference Basu, as well as numerous other references such as Addison, LeBoeuf, Park, and Kreger all include teachings related to a remote device. These references provide numerous methods for incorporating a remote device into an optical measurement system. For example, Basu teaches that "[a] 'cloud-based' RPM infrastructure can actively manage cardiovascular health (Fig. 1). Using OPS technology, cardiovascular parameters can be monitored on a 24-hour ambulatory basis using wearable biosensors, with wireless transmission of relevant data to the patient's electronic medical record." Basu at [0055]. Carlson teaches that "health problems could be detected and an alarm signal could be generated which can be transmitted to a respective person, to a medical doctor, to a hospital, etc. so that help can be organised." Carlson at [0078]. LeBoeuf teaches that "the processed energy response signal is transmitted to a remote device, for example wirelessly transmitted." LeBoeuf at [0035]. Park teaches that "the secondary device may communicate with an external service such as www.fitbit.com or server (e.g., personal computer). Communication may be achieved through wired (e.g., Ethernet, USB) or wireless (e.g., WLAN, Bluetooth, RFID, NFC, cellular) circuitry and protocols to transfer data to and/or from the secondary device." Park at 8:53-9:16. Kreger

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

teaches “sensor data and measurements may be transmitted to remote medical personnel, internet servers, and others using WiFi transceiver 68, Bluetooth transceiver 72 or other RF transmitter such as for a cellular phone network. As well, the signals and measurements on the mobile 12 may be transferred via a cable connected to USB connector 28 c or docking connector 28 b to another computer storage device, over a computer network, to a personal computer, and so forth.” Kreger at 7:39-46.

A person of skill in the art would understand that the functionality taught in these references could be added to other methods and systems that are concerned with incorporating a remote device into optical measurement systems. These methods are known to be effective in incorporating a remote device into such systems. Moreover, to the extent that any of these references includes a feature not expressly disclosed in one or more other references, a POSITA would have naturally looked to, and been motivated to combine, any one of these references with one or more of the other references in order to better achieve their common goals of communicating with a remote device.

b. Combinations

For at least the reasons described above, it would have been obvious to one of ordinary skill in the art to combine each prior art reference listed in Appendix B with any other reference or references listed in Appendix B along with the knowledge of one of ordinary skill in the art to arrive at the inventions claims in the ’533 Patent.

For example, and without limitation, the Asserted Claims of the ’533 Patent would have been obvious to one of ordinary skill in the art in view of the following combinations:

(i) Basu Combined with Lisogurski, Carlson, LeBoeuf, Park, Kreger, and/or Sakai

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

A POSITA would have had reason to combine Basu with any one of Lisogurski, Carlson, LeBoeuf, and Park all of which relate to systems and methods for optical measurement. Each of Lisogurski, Carlson, LeBoeuf, and Park relate to increasing signal-to-noise ratio in optical measurement systems. Indeed, such components and/or processes were conventional as of the time these references were known. Each of Lisogurski, Carlson, LeBoeuf, and Park provide means—not necessarily expressly present in all other references—for increasing signal-to-noise ratio. A POSITA would have understood that the systems and methods for increasing signal-to-noise ratio were intended to be incorporated into wearable measurement devices. A POSITA would understand that systems and methods for increasing intensity and pulse rate, and those using filters, provide improvements such as increasing signal-to-noise ratio. A POSITA would further understand that in order to implement a wearable measurement device, the systems and methods for increasing signal-to-noise ratio would commonly be combined with increasing intensity and pulse rate, and thus a POSITA would have been motivated to combine the teachings of these references. The combination would apply known techniques for increasing signal-to-noise ratio, to wearable measurement devices that were ready for improvement, in order to yield predictable results. The combination would further be "obvious to try," because it would involve simple design choices from a finite number of identified, predictable solutions, with a reasonable expectation of success.

(ii) Basu Combined with Addison and/or Kreger

A POSITA would have had reason to combine Basu with Addison, which relates to systems and methods for optical measurement. Addison and Kreger relate to incorporating personal and remote devices into systems for optical measurement. Indeed, such components and/or processes were conventional as of the time these references were known. Addison and Kreger provide means—not necessarily expressly present in all other references—for incorporating personal and

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

remote devices into systems for optical measurement. A POSITA would have understood that the systems and methods for incorporating personal and remote devices into systems for optical measurement were intended to be incorporated into wearable measurement devices. A POSITA would understand that systems and methods for incorporating personal and remote devices into systems for optical measurement provide improvements such as improved mobility and remote medical monitoring. A POSITA would further understand that in order to implement a wearable measurement device, the systems and methods for optical measurement would commonly be combined with personal and remote devices, and thus a POSITA would have been motivated to combine the teachings of these references. The combination would apply known techniques for incorporating personal and remote devices into systems for optical measurement, to wearable measurement devices that were ready for improvement, in order to yield predictable results. The combination would further be "obvious to try," because it would involve simple design choices from a finite number of identified, predictable solutions, with a reasonable expectation of success.

(iii) Addison, Carslon, LeBoeuf, Lisogurski, Park, Kreger, Sakai, Combined with any of the References Disclosing Remaining Features

A POSITA would have had reason to combine references Addison, Carslon, LeBoeuf, Lisogurski, Park, Kreger, or Sakai with any one of the references disclosing increasing signal-to-noise ratio, lenses, a personal device, a remote device (collectively, the "remaining features") all of which relate to systems and methods for obtaining and processing physiological measurements of a user. Each of the references teaching the remaining features relate to obtaining and processing physiological measurements of a user using light. Indeed, such components and/or processes were conventional as of the time these references were known. Each of the references teaching the remaining features provide means—not necessarily expressly present in all other references—for obtaining and processing physiological measurements of a user. A POSITA would have

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

understood that the systems and methods for the references teaching the remaining features were intended to be incorporated into wearable measurement devices. A POSITA would understand that systems and methods for the references teaching the remaining features provide improvements such as specific methods and systems for obtaining and processing physiological measurements using light. A POSITA would further understand that in order to implement a wearable measurement device, the systems and methods for a wireless system for collecting and processing physiological data would commonly be combined with obtaining physiological measurements (for example, blood glucose levels and blood oxygenation) using light, and thus a POSITA would have been motivated to combine the teachings of these references. The combinations would apply known techniques for obtaining physiological measurements using light, to wearable measurement devices that were ready for improvement, in order to yield predictable results. The combinations would further be "obvious to try," because they would involve simple design choices from a finite number of identified, predictable solutions, with a reasonable expectation of success.

Furthermore, to the extent any limitation of an Asserted Claim is deemed not to be exactly disclosed by an item of prior art, then the claim is rendered obvious by combination of the prior art in Exhibits B1 through B8 standing alone, in combination with the reference(s) in any other claim chart, in combination with any system art identified in Table 2-B, in combination with Applicant's Admitted Prior Art, in view of the knowledge of a person of ordinary skill in the art, and/or in view of the References disclosing techniques for increasing signal-to-noise ratio, References disclosing lenses, References disclosing a personal device, and References disclosing a remote device, for the reasons discussed above.

3. U.S. Patent No. 10,517,484

Pursuant to P.R. 3-3(a) and (b), Defendants identify in Appendix C the prior art references that render obvious the Asserted Claims of the '484 Patent and include below exemplary

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

combinations showing the obviousness of the ’484 Patent Asserted Claims in view of the prior art. To the extent Plaintiff contends that an element is not disclosed in any one of the anticipatory references described in Appendix C, the limitation would have been obvious in light of the disclosures within the reference and the knowledge of one of ordinary skill in the art at the time of the ’484 Patent. Moreover, to the extent Plaintiff contends that an element is not disclosed in any one of the anticipatory references described in Appendix C, such reference may be combined with any other references listed in Appendix C for such element, thereby rendering the claims invalid for obviousness. To the extent a finder of fact determines that a limitation of any of the ’484 Patent Asserted Claims is not disclosed by one of the references identified above pursuant to P.R. 3-3(a), the claim is nevertheless unpatentable as obvious because they contain nothing that constitutes a patentable innovation. To the extent a finder of fact determines that a limitation of the ’484 Patent Asserted Claims is not anticipated, it does not go beyond combining familiar elements according to known methods to achieve predictable results or does more than choose between clear alternatives known to those of ordinary skill in the art.

a. Obviousness Rationale and Motivations to Combine

Obviousness: For at least the reasons described in these contentions, it would have been obvious to one of ordinary skill in the art to combine any of a number of prior art references, including any combination of those prior art references identified in Appendix C along with the knowledge of one of ordinary skill in the art to meet the limitations of the ’484 Patent Asserted Claims. As a result, the references identified herein render one or more Asserted Claims of the ’484 Patent obvious when the references are read in combination with each other, and/or when read in view of the state of the art and knowledge of those skilled in the art. Each and every reference identified is also relevant to the state of the art at the time of the alleged invention. Any

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

of the references disclosed above may be combined with one another to render obvious (and therefore invalid) each of Omni's Asserted Claims. Defendants may rely upon a subset of the identified references or all of the references identified herein, including all references in Appendix C, for purposes of obviousness depending on the Court's claim construction, positions taken by Omni during this litigation, and further investigation and discovery.

Reservation of Rights: Moreover, as mentioned above, Defendants have not yet completed their search or discovery concerning additional prior art. As such, Defendants' inclusion of exemplary combinations does not preclude them from identifying other invalidating combinations as appropriate, and Defendants reserve the right to identify additional specific combinations as well as to detail and explain such combinations.

No More Than Ordinary Variations of Prior Art; No Unexpected Results: To the extent not anticipated, the '484 Patent Asserted Claims represent no more than the result of ordinary variations of the prior art. Defendants further believe that no showing of a specific motivation to combine prior art is required to combine the references disclosed above and in the attached charts, as each combination of art would have no unexpected results, and at most would simply represent a known alternative to one of ordinary skill in the art. *See KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 415-16 (2007) (rejecting the Federal Circuit's "rigid" application of the teaching, suggestion, or motivation to combine test, instead espousing an "expansive and flexible" approach); *Apple Inc. v. Samsung Elecs. Co.*, 839 F.3d 1034, 1058 (Fed. Cir. 2016); *Intercontinental Great Brands LLC v. Kellogg N. Am. Co.*, 869 F.3d 1336, 1344 (Fed. Cir. 2017). Indeed, the Supreme Court held that a person of ordinary skill in the art is "a person of ordinary creativity, not an automaton" and "in many cases a person of ordinary skill in the art will be able to fit the teachings of multiple patents together like pieces of a puzzle." *Id.* at 420-21.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Nevertheless, in addition to the information contained elsewhere in these contentions, Defendants identify motivation and reason to combine the cited art.

Predictable Results; Obvious to Try: One or more combinations of the prior art references identified in Appendix C would have been obvious because these references would have been combined using: known methods to yield predictable results; known techniques in the same way; a simple substitution of one known, equivalent element for another to obtain predictable results; and/or a teaching, suggestion, or motivation in the prior art generally. In addition, it would have been obvious to try combining the prior art references identified above because there were only a finite number of predictable solutions and/or because known work in one field of endeavor prompted variations based on predictable design incentives and/or market forces either in the same field or a different one. Further, the combinations of the prior art references identified in Appendix C would have been obvious because the combinations represent known potential options with a reasonable expectation of success.

Interrelated Teachings: Additional evidence that there would have been a motivation to combine the prior art references identified above includes the interrelated teachings of multiple prior art references; common authorship; the effects of demands known to the design community or present in the marketplace; the existence of a known problem for which there was an obvious solution encompassed by the '484 Patent Asserted Claims; the existence of a known need or problem in the field of the endeavor at the time of the alleged invention(s); and the background knowledge that would have been possessed by a person having ordinary skill in the art.

Summary of Motivations to Combine: Thus, the motivation to combine the teachings of the prior art references disclosed in Appendix C is found in the references themselves and also in: (1) the nature of the problem being solved; (2) the express, implied and inherent teachings of the

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

prior art; (3) the knowledge of persons of ordinary skill in the art; (4) the predictable results obtained in combining the different elements of the prior art; (5) the predictable results obtained in simple substitution of one known element for another; (6) the use of a known technique to improve similar devices, methods, or products in the same way; (7) the predictable results obtained in applying a known technique to a known device, method, or product ready for improvement; (8) the finite number of identified predictable solutions that had a reasonable expectation of success; and (9) known work in various technological fields that could be applied to the same or different technological fields based on design incentives or other market forces.

Same Area of Technology: Additionally, it would be obvious to one of ordinary skill in the art to consult and/or combine any of the prior art listed in Appendix C because all of these references relate to the same area of technology and/or are from analogous art. The '484 Patent Asserted Claims are directed to "A wearable device includes a measurement device to measure a physiological parameter adapted to be placed on a wrist or an ear of a user." '484 Patent at Abstract. The '484 Patent Asserted Claims merely unite old elements, well known in the field, with no change in their respective function or result. Given the interrelated teachings of the prior art, the effects of demands known to the design community or present in the marketplace, and the background knowledge possessed by a person having ordinary skill in the art, it would have been obvious for one of ordinary skill in the art to combine these familiar elements, disclosed and/or embodied in the prior art listed above to practice the '484 Patent Asserted Claims.

Same Technical Issues: A person of ordinary skill would have been motivated to combine the above prior art based on his/her knowledge, the nature of the problem to be solved, and the teachings of the prior art. The identified prior art addresses the same or similar technical issues and suggests the same or similar solutions to those issues. Moreover, some of the prior art refer

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

to or discuss other prior art, illustrating the close technical relationship among the prior art. For the ’484 Patent, one of ordinary skill in the art would have been motivated to combine known prior art solutions described in these references relating to wearable devices measuring physiological parameters.

Demand and Market Forces: For example, market forces suggested a demand for wearable devices for measuring physiological parameters, and thus one of skill in the art would have thought to combine or modify references that described known methods that one of skill in the art would have recognized as offering improvements to solutions of that time.

Known Elements; Obvious to Try: Moreover, many of the claim elements were already known as admitted by the applicant in the patent specification. These elements represented design choices available to a person of ordinary skill. When there is a design need or market pressure to solve a problem such as identified previously and/or described in the ’484 Patent, and there are a finite number of identified, predictable solutions, a person of ordinary skill would be motivated to combine the known options that are within his or her technical grasp. For the ’484 Patent, there are a finite number of approaches for providing a wearable device for measuring physiological parameters. For example, as of the priority date of the ’484 Patent, a POSITA would have been very familiar with basic elements of the ’484 Patent’s claims such as semiconductors, optical wavelengths, lenses, signal-to-noise ratio, detectors, analog to digital convertors, smart phones, tablets, cloud, and artificial intelligence. Such elements were within the knowledge of a POSITA, whether or not disclosed in any particular reference, and the inclusion of such elements in the ’484 Patent’s claims does not render them novel or non-obvious.

There are significant similarities in subject matter and objectives for each of many references used in these contentions for the ’484 Patent.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

References disclosing smart phone or tablet: For example, charted reference Basu, Rulkov, Goodman, Kassim, Poeze, Terumoto, Moon, Tran, and Kreger, as well as other references such as Mault, all include teachings related to incorporating a smart phone or tablet into an optical measurement system. For example, Rulkov discloses "a device such as a personal digital assistant, laptop computer, mobile telephone, exercise equipment, or the like for display and even processing of the user's real-time vital signs information." Rulkov at 5:48-64. Basu discloses that "[i]n smart phones, for example, OPS detect when a phone is placed in a pocket, triggering touch-screen locking." Basu at [0035]. Goodman discloses "FIG. 5 shows another possible configuration of system 10 wherein processing device 14 is a PDA (e.g. Palm Pilot™) having PPG sensor 12 interfaced therein." Goodman at 13:26-42. Kassim discloses "the feedback unit may be a portable device, such as a mobile phone, smartphone, personal digital assistant (PDA), tablet, netbook or laptop, although this list is not exhaustive by any means." Kassim at 12:12-19. Poeze discloses "the patient monitor may include a display device, a network interface communicating with any one or combination of a computer network, a handheld computing device, a mobile phone, the Internet, or the like." Poeze at 2:47-60. Terumoto discloses "the wireless communication circuit 33 transmits the measurement data acquired at the measurement unit 10 (i.e., the raw data provided from the amplifier circuit 14, the processed data various processes has performed provided from the processing circuit 15, or the stored data provided from the memory 32) to the external personal computer or a cell phone." Terumoto at [0130]. Moon discloses, "FIG. 14 indicates how the wrist-worn transceiver 72 can communicate wirelessly with either a networked computer 198 (e.g. a tablet computer located at a central nursing station) or a hand-held computer 199 (e.g. a cell phone or PDA, typically carried by the medical professional)." Moon at [0107]. Tran teaches that while a patient with a wearable device is outside a mesh network range, "the wearable appliance

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

communicates with the cell phone and provides information to the server 200 using the cellular connection." Tran, 34:4-30. Kreger discloses "In other embodiments, the mobile communications device can be any of a number of mobile phones such as an iPhone® or an Android® phone, a personal digital assistant (PDA) such as a Blackberry®, a portable audio playback device such as an MP3 player, a portable media playback device such as an iPod®, or a handheld tablet such as an iPad®." Kreger at 5:48-53. Mault teaches a blood glucose monitoring system including an electronic device that "can be a portable electronic device or system carried by the person, or a device or system combining multiple functionalities, such as:…a portable computer; any portable Internet access device; [or] a wireless phone…." Mault [0069]-[0070].

A person of skill in the art would understand that the functionality taught in these references could be added to other methods and systems that are concerned with incorporating a smart phone or tablet into optical measurement systems. These methods are known to be effective in incorporating a smart phone or tablet into such systems. Moreover, to the extent that any of these references includes a feature not expressly disclosed in one or more other references, a POSITA would have naturally looked to, and been motivated to combine, any one of these references with one or more of the other references in order to better achieve their common goals of communicating with a smart phone or tablet.

References disclosing lenses: For example, charted reference Carlson, Poeze, and Soller, as well as numerous other references such as LeBoeuf and Park, all include teachings related to using one or more lenses configured to receive a portion of at least one of the output optical lights and to direct a lens output light to tissue. These references provide numerous methods for using lenses to direct an optical output beam. For example, Carlson teaches "us[ing] a beam-shaping element, such as e.g. diffractive or refractive lenses, to direct the emitted optical radiation of, e.g.,

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

the LED light source into the human or animal tissue and the photon detecting element in order to increase the optical signal power, detected by the pulsoximeter sensor, and thus increasing the Signal/Noise—and signal/Background ratio. The increase of the S/B ratio is estimated e.g. to a factor 5." Carlson at [0014]. Poeze teaches "[using] a lens which collects attenuated light exiting the measurement site and focuses onto one or more detectors. The protrusion can advantageously include plastic, including a hard opaque plastic, such as a black or other colored plastic, helpful in reducing light noise." Poeze at 7:52-8:7. Soller teaches "a variety of different collimating elements 56 can be used in sensor 10. Exemplary collimating elements include fiber faceplates (e.g., fiber optic windows), collimating hole devices, gradient index (GRIN) lenses, fiber bundles, lens arrays, optical windows (including shaped optical windows), and other similar devices." Soller at 18:37-56.

A person of skill in the art would understand that the functionality taught in these references could be added to other methods and systems that are concerned with using lenses to direct an optical output beam. These methods are known to be effective in directing an optical output beam using known lens structures. Moreover, to the extent that any of these references includes a feature not expressly disclosed in one or more other references, a POSITA would have naturally looked to, and been motivated to combine, any one of these references with one or more of the other references in order to better achieve their common goals of directing an optical output beam.

References disclosing techniques for increasing signal-to-noise ratio: For example, charted reference Basu, Lisogurski, and Carlson, as well as numerous other references such as LeBoeuf and Park, all include teachings related to increasing the signal-to-noise ratio of optical measurement systems by increasing a light intensity and increasing a pulse rate of an LED. These references provide numerous methods for increasing a light intensity and increasing a pulse rate

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

of an LED. For example, Basu teaches that "[t]o maximize the signal-to-noise ratio in photoplethysmography, the LED intensity should be made as large as possible without saturating the detector. In the OPS 10, the LED intensity and modulation frequencies are programmable through the serial interface. In the case of the Vishay VCNL4000, the intensity is programmable from 10-200 mA in 10 mA increments." Basu at [0058]. Lisogurski teaches "that modulation of the light drive signal . . . may include modulation of parameters including drive current or light brightness, duty cycle, firing rate, modulation parameters, other suitable parameters, or any combination thereof" and that "[t]he system may increase the brightness of the light sources in response to the noise to improve the signal-to-noise ratio." Lisogurski at 27:44-55, 9:46-60. Carlson teaches that the "frequency is chosen in such a way that it is outside the frequency spectrum of sunlight and of ambient light which, according to FIG. 7b, is in the range of above approximately 1000 Hz. Thus, the pulsoximeter signals are readily discriminated from electronic and parasitic contributions of environmental optical radiation outside the frequency fc+/−5 Hz increasing significantly the Signal-to-Noise and Signal-to-Background ratio." Carlson at [0069]. LeBoeuf teaches that "the intensity of the optical emitter 102 may be increased to increase the ratio of physiological optical scatter 111 from blood vessels with respect to unwanted sunlight" and that "it is important to consider the emitter pulsing frequency and sampling approach" because "choosing a frequency that is too low may result in unsatisfactory subtraction." LeBoeuf at [0123], [0139]. Park teaches that "the light source intensity may be increased to maintain the output signal from the light detector within a desired range of output values." Park at 16:8-20.

A person of skill in the art would understand that the functionality taught in these references could be added to other methods and systems that are concerned with improving signal-to-noise ratio in optical measurement systems. These methods are known to be effective in improving the

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

signal-to-noise ratio for such systems, and merely modulate the functioning of the existing LEDs in each system. Moreover, to the extent that any of these references includes a feature not expressly disclosed in one or more other references, a POSITA would have naturally looked to, and been motivated to combine, any one of these references with one or more of the other references in order to better achieve their common goals of improving signal-to-noise ratio.

References disclosing an analog to digital converter: For example, charted reference Basu, Goodman, Lisogurski, Rulkov, Moon, Poeze, Chandrasekar, Kreger, and Sakai all include teachings related to an analog to digital converter. These references provide numerous methods for using an analog to digital converter coupled to a detector. For example, Basu discloses "a digital interface for communication with a microcontroller." Basu at [0007]. Goodman discloses "On board analog-to-digital converter A/D 44 (10 bit, 5 channel input) is used to convert the conditioned PPG signals at B and B′ into time sampled digital signals which are then provided to processing device 14. Goodman at 11:66-12:21. Lisogurski discloses a "[f]ront end processing circuitry 150 may perform various analog and digital processing of the detector signal." Lisogurski at 12:42-51. Rulkov discloses that "The microprocessor741 has a LED control715 connected to DAC702 for controlling the intensity of the LEDs737. The signal from the photodetector736 is transmitted to a high pass filter (HPF) 703 which sends it to an analog to digital converter704, and the signal from the photodetector737 is also sent directly to a second analog to digital converter704." Rulkov at 11:39-60. Moon discloses that "[a] filter removes any high-frequency noise (e.g. 60 Hz electrical noise) that is not related to the PPG waveform, and yields a preliminary waveform that is digitized with an analog-to-digital converter 176, and processed as described above to generate a DC portion of the PPG." Moon at [0091]. Poeze discloses "[f]ront-end interfaces 108 may be implemented using transimpedance amplifiers that are coupled to analog to

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

digital converters in a sigma delta converter." Poeze at 40:15-27. Chandrasekar discloses "In principle, PPGs are considered simple devices; however, in practice, implementation requires a careful design involving optics (multiple paths, alignments, leakage barriers) and mixed signal electronics (transimpedance amplifiers, analog digital conversion, drivers, modulators, filters)." Chandrasekar at 1. Kreger discloses "Biosensor signals may also be received by one or more RF receivers in the dock 246 (not shown) and communicated to the mobile 212 via wired electrical connector 246, for example, to allow the wireless sensor to utilize the features of the wired audio input's anti-alias filters and analog to digital converter as will be explained in detail below." Kreger at 10:14-28. Sakai discloses "A/D converter 2013 d which converts a voltage value of analog signal into 10-bit digital value."

A person of skill in the art would understand that the functionality taught in these references could be added to other methods and systems that are concerned with incorporating an analog to digital converter into optical measurement systems. These methods are known to be effective in incorporating an analog to digital converter into such systems. Moreover, to the extent that any of these references includes a feature not expressly disclosed in one or more other references, a POSITA would have naturally looked to, and been motivated to combine, any one of these references with one or more of the other references in order to better achieve their common goals of signal processing.

References disclosing a cloud: For example, charted references Basu and Kassim, as well as numerous other references such as Mault and US2011/0082711A1, include teachings related to using a cloud. These references provide numerous methods for communicating with a cloud. For example, Basu teaches that "a "cloud-based" RPM infrastructure can actively manage cardiovascular health. Using OPS technology, cardiovascular parameters can be monitored on a

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

24-hour ambulatory basis using wearable biosensors, with wireless transmission of relevant data to the patient's electronic medical record." Basu at [0064]. Kassim teaches that "[t]he computer platform may further be connected to network resources 2006 which connect to the Internet or other components of a local public or private network. The network resources 2006 may provide instructions and data to the computer platform from a remote location on a network 2007." Kassim, 33:34-34:19. Mault teaches "[t]he PDA can access the communications network, such as the Internet, using a wireless connection. Data can be transferred to the remote system over the communications network 20." Mault, [0077]. US 2011/0082711A1 teaches "the camera is paired with an optical character recognition module so that scanned medical forms can be converted into data that can be uploaded for synchronization at a server in a network (e.g. a cloud computing network) or stored on the personal health organizer device." At [0048].

A person of skill in the art would understand that the functionality taught in this reference could be added to other methods and systems for measuring physiological parameters. These methods provide communication with a cloud which allows for remote storage and computation on the cloud. Moreover, to the extent that any of these references includes a feature not expressly disclosed in one or more other references, a POSITA would have naturally looked to, and been motivated to combine, any one of these references with one or more of the other references in order to better achieve their common goals of measuring physiological parameters.

References disclosing artificial intelligence: For example, charted reference Tran, as well as other references such as Quy, include teachings related to using artificial inteligence. For example, Tran teaches "Various mathematical techniques and Artificial Intelligence (AI) analyzer can be applied. … AI approaches towards signal recognition include Artificial Neural Networks (ANN), dynamic recurrent neural networks (DRNN), fuzzy logic system, Genetic Algorithm (GA),

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

and Hidden Markov Model (HMM)." Tran at 94:49-65. Quy teaches "[a]pplication 62 may include an algorithm 63 for analyzing data from the HMD, and either application 62 or algorithm 63 may optionally access data from an external data source 74 and may further consult an artificial intelligence system 76." Quy at 8:9-14.

A person of skill in the art would understand that the functionality taught in these references could be added to other methods and systems for measuring physiological parameters. These methods provide using artificial intelligence. Moreover, to the extent that any of these references includes a feature not expressly disclosed in one or more other references, a POSITA would have naturally looked to, and been motivated to combine, any one of these references with one or more of the other references in order to better achieve their common goals of measuring physiological parameters.

References disclosing spatially separated detectors: For example, charted references Lisogurski, Poeze, Soller, Terumoto, and Tran, all include teachings related to using detectors that are spatially separated. These references provide numerous methods for using light detectors. For example, Lisogurski teaches that "[o]ne or more detector 318 may also be provided in sensor unit 312 for detecting the light that is reflected by or has traveled through the subject's tissue. Any suitable configuration of light source 316 and detector 318 may be used. In an embodiment, sensor unit 312 may include multiple light sources and detectors, which may be spaced apart." Lisogurski at 17:35-45. Poeze discloses that "multiple detectors are employed and arranged in a spatial geometry. This spatial geometry provides a diversity of path lengths among at least some of the detectors and allows for multiple bulk and pulsatile measurements that are robust." Poeze at 9:18-27. Soller discloses "a plurality of spectral detectors attached to the circuit board, each spectral detector being configured to analyze radiation derived from the radiation source" and depicts the

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

detectors as spatially separated. Soller at 3:16-27; Fig. 34. Terumoto discloses "[t]he light sensor portions 101-1 to 101-n are located equally spaced from one another and to go round the armlet type housing 107 same as the fourth to sixth implementations." Terumoto at [0152]. Tran discloses "[t]he electrode array sensor can be a geometric array of discrete electrodes having an equally-spaced geometry of multiple nodes that are capable of functioning as sense and reference electrodes. In a typical tomography application the electrodes are equally-spaced in a circular configuration. Alternatively, the electrodes can have non-equal spacing and/or can be in rectangular or other configurations in one circuit or multiple circuits." Tran at 50:61-51:8.

A person of skill in the art would understand that the functionality taught in these references could be added to other methods and systems that detect light. These methods provide using detectors that are spatially separated. Moreover, to the extent that any of these references includes a feature not expressly disclosed in one or more other references, a POSITA would have naturally looked to, and been motivated to combine, any one of these references with one or more of the other references in order to better achieve their common goals of measuring physiological parameters.

References disclosing detection system is synchronized to the light source: For example, charted reference Lisogurski, Carlson, Poeze, Kreger, and Sakai all include teachings related to detection system is synchronized to the light source. These references provide numerous methods for synchronizing detection system with the light source. For example, Lisogurski discloses "he front end processing circuitry 150 may use the timing control signals to operate synchronously with light drive circuitry 120. For example, front end processing circuitry 150 may synchronize the operation of an analog-to-digital converter and a demultiplexer with the light drive signal based on the timing control signals." Lisogurski at 11:33-49. Carlson discloses "[t]he basic

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

idea of using AC-Coupling or Lock-In Amplification (synchronous detection), is to temporarily modulate the optical radiation of the LED at the carrier frequency fc in order to shift the power spectrum of the pulsoximeter signals into a higher frequency range where environmental optical radiation is unlikely and electronic band pass filtering is technologically less stringent. AC-Coupling or Lock-In Amplification is well known out of the state of the art and is described in literature 3." Carlson at [0065]. Poeze teaches that "[a] control signal can be useful in order to synchronize, minimize, or reduce jitter in the timing of pulses emitted from the emitter 104. Accordingly, this control signal can be useful in order to cause optical radiation pulses emitted from the emitter 104 to follow a precise timing and consistent pattern." Poeze at 15:27-48. Kreger discloses "Thus, it is another object to provide compatible signals to the mobile's electrical connectors which may involve transforming the biosensor signals to match requisite impedance and signal levels, eliminate noise, cancel DC noise and drift, demultiplex or multiplex multiple measurements, provide electrical isolation, serialization, synchronization, and so forth." Kreger at 3:17-23. Sakai discloses "he A/D converter 14 operates in synchronization with the light emission timing of the driver 12, to thereby convert the pulse wave detection signal detected upon light emission from the green LED 11 a and the body motion detection signal detected upon light emission from the infrared LED 11 b into digital data, and provides these digital data, as biological information, to the information processor 20." Sakai at 5:66-6:9.

A person of skill in the art would understand that the functionality taught in these references could be added to other methods and systems that are concerned with measuring physiological parameters. These methods are known to be effective in incorporating synchronizing detection system with the light source. Moreover, to the extent that any of these references includes a feature not expressly disclosed in one or more other references, a POSITA would have naturally looked

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

to, and been motivated to combine, any one of these references with one or more of the other references in order to better achieve their common goals of signal processing.

b. Combinations

For at least the reasons described above, it would have been obvious to one of ordinary skill in the art to combine each prior art reference listed in Appendix C with any other reference or references listed in Appendix C along with the knowledge of one of ordinary skill in the art to arrive at the inventions claims in the ’484 Patent.

For example, and without limitation, the Asserted Claims of the ’484 Patent would have been obvious to one of ordinary skill in the art in view of the following combinations:

(i) Carlson, Lisgurski, Chandersekar, Soller, Tran, and Sakai combined with References disclosing smart phone or tablet

A POSITA would have had reason to combine references Carlson, Lisgurski, Moon, Soller, and Sakai with any one of References disclosing smart phone or tablet, all of which relate to systems and methods for incorporating a smart phone or tablet into an optical measurement system. Indeed, such components and/or processes were conventional as of the time these references were known. Each of References disclosing smart phone or tablet provide means—not necessarily expressly present in all other references—for incorporating a smart phone or tablet into an optical measurement system. A POSITA would have understood that the systems and methods for References disclosing smart phone or tablet were intended to be incorporated into wearable measurement devices. A POSITA would understand that systems and methods for using smart phone or tablet into an optical measurement system provide improvements such as the ability to coomunicate with smart phone or tablet and/or increased processing capabilities. A POSITA would further understand that in order to implement a wearable measurement device, the systems and methods for using smart phone or tablet would commonly be combined with

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

optical measurement system, and thus a POSITA would have been motivated to combine the teachings of these references. The combination would apply known techniques for using smart phone or tablet, to wearable measurement devices that were ready for improvement, in order to yield predictable results. The combination would further be "obvious to try," because it would involve simple design choices from a finite number of identified, predictable solutions, with a reasonable expectation of success.

(ii) Rulkov, Basu, Goodman, Chandersekar, Kassim, Lisogurski, Moon, Terumoto, Tran, Kreger, and Sakai combined with References disclosing lenses

A POSITA would have had reason to combine references Rulkov, Basu, Goodman, Kassim, Lisogurski, Moon, Terumoto, Tran, Kreger, and Sakai with any one of References disclosing lenses, all of which relate to systems and methods for using lenses to direct an optical output beam. Each of References disclosing lenses relate to using one or more lenses configured to receive a portion of at least one of the output optical lights and to direct a lens output light to tissue. Indeed, such components and/or processes were conventional as of the time these references were known. Each of References disclosing lenses provide means—not necessarily expressly present in all other references—for using lenses to direct an optical output beam. A POSITA would have understood that the systems and methods for References disclosing lenses were intended to be incorporated into wearable measurement devices. A POSITA would understand that systems and methods for using lenses provide improvements such as disrecting the light to tissue. A POSITA would further understand that in order to implement a wearable measurement device, the systems and methods for using lenses to direct an optical output beam would commonly be combined with optical measurement systems, and thus a POSITA would have been motivated to combine the teachings of these references. The combination would apply known techniques for using lenses to direct an optical output beam, to wearable

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

measurement devices that were ready for improvement, in order to yield predictable results. The combination would further be "obvious to try," because it would involve simple design choices from a finite number of identified, predictable solutions, with a reasonable expectation of success.

(iii) Kassim, Rulkov, Goodman, Moon, Chandersekar, Poeze, Soller, Terumoto, Tran, Kreger, and Sakai combined with References disclosing techniques for increasing signal-to-noise ratio

A POSITA would have had reason to combine Kassim, Rulkov, Goodman, Moon, Poeze, Soller, Terumoto, Tran, Kreger, and Sakai with any one of References disclosing techniques for increasing signal-to-noise ratio, all of which relate to systems and methods for increasing a light intensity and increasing a pulse rate of an LED. Each of References disclosing techniques for increasing signal-to-noise ratio relate to increasing the signal-to-noise ratio of optical measurement systems by increasing a light intensity and increasing a pulse rate of an LED. Indeed, such components and/or processes were conventional as of the time these references were known. Each of References disclosing techniques for increasing signal-to-noise ratio provide means—not necessarily expressly present in all other references—for increasing signal-to-noise ratio relate to increasing the signal-to-noise ratio of optical measurement systems by increasing a light intensity and increasing a pulse rate of an LED. A POSITA would have understood that the systems and methods for References disclosing techniques for increasing signal-to-noise ratio were intended to be incorporated into wearable measurement devices. A POSITA would understand that systems and methods for increasing a light intensity and increasing a pulse rate of an LED provide improvements such as increasing signal-to-noise ratio. A POSITA would further understand that in order to implement a wearable measurement device, the systems and methods for increasing signal-to-noise ratio would commonly be combined with

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

optical measurement systems, and thus a POSITA would have been motivated to combine the teachings of these references. The combination would apply known techniques for increasing signal-to-noise ratio, to wearable measurement devices that were ready for improvement, in order to yield predictable results. The combination would further be "obvious to try," because it would involve simple design choices from a finite number of identified, predictable solutions, with a reasonable expectation of success.

(iv) Carlson, Kassim, Soller, Chandersekar, Terumoto, and Tran combined with References disclosing an analog to digital converter

A POSITA would have had reason to combine references Carlson, Kassim, Soller, Terumoto, and Tran with any one of References disclosing an analog to digital converter, all of which relate to systems and methods for using an analog to digital converter coupled to a detector. Indeed, such components and/or processes were conventional as of the time these references were known. Each of References disclosing an analog to digital converter provide means—not necessarily expressly present in all other references—for using an analog to digital converter coupled to a detector. A POSITA would have understood that the systems and methods for References disclosing an analog to digital converter were intended to be incorporated into wearable measurement devices. A POSITA would understand that systems and methods for using an analog to digital converter provide improvements such as ability to process a signal digitally. A POSITA would further understand that in order to implement a wearable measurement device, the systems and methods for using an analog to digital converter would commonly be combined with optical measurement systems, and thus a POSITA would have been motivated to combine the teachings of these references. The combination would apply known techniques for using an analog to digital converter, to wearable measurement devices that were ready for improvement, in order to yield predictable results. The combination

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

would further be "obvious to try," because it would involve simple design choices from a finite number of identified, predictable solutions, with a reasonable expectation of success.

(v) Carlson, Rulkov, Chandersekar, Goodman, Kassim, Lisogurski, Moon, Poeze, Soller, Terumoto, Tran, Kreger, and Sakai combined with References disclosing a cloud

A POSITA would have had reason to combine references Carlson, Rulkov, Chandersekar, Goodman, Kassim, Lisogurski, Moon, Poeze, Soller, Terumoto, Tran, Kreger, and Sakai with any one of References disclosing a cloud, all of which relate to systems and methods for using a cloud. Indeed, such components and/or processes were conventional as of the time these references were known. Each of References disclosing a cloud provide means—not necessarily expressly present in all other references—for using a cloud. A POSITA would have understood that the systems and methods for using a cloud were intended to be incorporated into wearable measurement devices. A POSITA would understand that systems and methods for using a cloud provide improvements such as remote storage and computing. A POSITA would further understand that in order to implement a wearable measurement device, the systems and methods for measuring physiological parameters would commonly be combined with a cloud, and thus a POSITA would have been motivated to combine the teachings of these references. The combination would apply known techniques for using a cloud, to wearable measurement devices that were ready for improvement, in order to yield predictable results. The combination would further be "obvious to try," because it would involve simple design choices from a finite number of identified, predictable solutions, with a reasonable expectation of success.

(vi) Carlson, Rulkov, Chandersekar, Basu, Goodman, Kassim, Lisogurski, Moon, Poeze, Soller, Terumoto, Kreger, and Sakai combined with References disclosing artificial intelligence

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

A POSITA would have had reason to combine references Carlson, Rulkov, Chandersekar, Basu, Goodman, Kassim, Lisogurski, Moon, Poeze, Soller, Terumoto, Kreger, and Sakai with any one of References disclosing artificial intelligence, all of which relate to systems and methods for using artificial intelligence. Indeed, such components and/or processes were conventional as of the time these references were known. Each of References disclosing artificial intelligence provide means—not necessarily expressly present in all other references—for using artificial intelligence. A POSITA would have understood that the systems and methods for References disclosing artificial intelligence were intended to be incorporated into wearable measurement devices. A POSITA would understand that systems and methods for using artificial intelligence provide improvements such as automation and improved processing power. A POSITA would further understand that in order to implement a wearable measurement device, the systems and methods for measuring physiological parameters would commonly be combined with artificial intelligence, and thus a POSITA would have been motivated to combine the teachings of these references. The combination would apply known techniques for artificial intelligence, to wearable measurement devices that were ready for improvement, in order to yield predictable results. The combination would further be "obvious to try," because it would involve simple design choices from a finite number of identified, predictable solutions, with a reasonable expectation of success.

(vii) Carlson, Rulkov, Chandersekar, Basu, Goodman, Kassim, Moon, Kreger, and Sakai combined with References disclosing spatially separated detectors

A POSITA would have had reason to combine references Carlson, Rulkov, Chandersekar, Basu, Goodman, Kassim, Moon, Kreger, and Sakai with any one of References disclosing spatially separated detectors all of which relate to systems and methods for using spatially separated detectors. Indeed, such components and/or processes were conventional as of

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

the time these references were known. Each of References disclosing spatially separated detectors provide means—not necessarily expressly present in all other references—for using spatially separated detectors. A POSITA would have understood that the systems and methods for References disclosing spatially separated detectors were intended to be incorporated into wearable measurement devices. A POSITA would understand that systems and methods for spatially separated detectors provide improvements such as improved detection quality. A POSITA would further understand that in order to implement a wearable measurement device, the systems and methods for measuring physiological parameters would commonly be combined with spatially separated detectors, and thus a POSITA would have been motivated to combine the teachings of these references. The combination would apply known techniques for using spatially separated detectors, to wearable measurement devices that were ready for improvement, in order to yield predictable results. The combination would further be "obvious to try," because it would involve simple design choices from a finite number of identified, predictable solutions, with a reasonable expectation of success.

(viii) Rulkov, Chandersekar, Basu, Goodman, Kassim, Moon, Soller, Terumoto, and Tran combined with References disclosing detection system is synchronized to the light source

A POSITA would have had reason to combine references Rulkov, Chandersekar, Basu, Goodman, Kassim, Moon, Soller, Terumoto, and Tran with any one of References disclosing detection system is synchronized to the light source, all of which relate to systems and methods for synchronizing a detection system with a light source. Indeed, such components and/or processes were conventional as of the time these references were known. Each of References disclosing detection system is synchronized to the light source provide means—not necessarily expressly present in all other references—for synchronizing a detection system with a light

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

source. A POSITA would have understood that the systems and methods for References disclosing detection system is synchronized to the light source were intended to be incorporated into wearable measurement devices. A POSITA would understand that systems and methods for synchronizing a detection system with a light source provide improvements such as improved detection. A POSITA would further understand that in order to implement a wearable measurement device, the systems and methods for measuring physiological parameters would commonly be combined with techniques for synchronizing a detection system with a light source, and thus a POSITA would have been motivated to combine the teachings of these references. The combination would apply known techniques for synchronizing a detection system with a light source, to wearable measurement devices that were ready for improvement, in order to yield predictable results. The combination would further be "obvious to try," because it would involve simple design choices from a finite number of identified, predictable solutions, with a reasonable expectation of success.

Furthermore, to the extent any limitation of an Asserted Claim is deemed not to be exactly disclosed by an item of prior art, then the claim is rendered obvious by combination of the prior art in Exhibits C1 through C14 standing alone, in combination with the reference(s) in any other claim chart, in combination with any system art identified in Table 2-C, in combination with Applicant's Admitted Prior Art, in view of the knowledge of a person of ordinary skill in the art, and/or in view of the References disclosing smart phone or tablet, References disclosing lenses, References disclosing techniques for increasing signal-to-noise ratio, References disclosing an analog to digital converter, References disclosing a cloud, References disclosing artificial intelligence, References disclosing spatially separated detectors, References disclosing detection system is synchronized to the light source, for the reasons discussed above.

4. U.S. Patent No. 10,874,304

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Pursuant to P.R. 3-3(a) and (b), Defendants identify in Appendix D the prior art references that render obvious the Asserted Claims of the ’304 Patent and include below exemplary combinations showing the obviousness of the ’304 Patent Asserted Claims in view of the prior art. To the extent Plaintiff contends that an element is not disclosed in any one of the anticipatory references described in Appendix D, the limitation would have been obvious in light of the disclosures within the reference and the knowledge of one of ordinary skill in the art at the time of the ’304 Patent. Moreover, to the extent Plaintiff contends that an element is not disclosed in any one of the anticipatory references described in Appendix D, such reference may be combined with any other references listed in Appendix D for such element, thereby rendering the claims invalid for obviousness. To the extent a finder of fact determines that a limitation of any of the ’304 Patent Asserted Claims is not disclosed by one of the references identified above pursuant to P.R. 3-3(a), the claim is nevertheless unpatentable as obvious because they contain nothing that constitutes a patentable innovation. To the extent a finder of fact determines that a limitation of the ’304 Patent Asserted Claims is not anticipated, it does not go beyond combining familiar elements according to known methods to achieve predictable results or does more than choose between clear alternatives known to those of ordinary skill in the art.

a. Obviousness Rationale and Motivations to Combine

Obviousness: For at least the reasons described in these contentions, it would have been obvious to one of ordinary skill in the art to combine any of a number of prior art references, including any combination of those prior art references identified in Appendix D along with the knowledge of one of ordinary skill in the art to meet the limitations of the ’304 Patent Asserted Claims. As a result, the references identified herein render one or more Asserted Claims of the ’304 Patent obvious when the references are read in combination with each other, and/or when

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

read in view of the state of the art and knowledge of those skilled in the art. Each and every reference identified is also relevant to the state of the art at the time of the alleged invention. Any of the references disclosed above may be combined with one another to render obvious (and therefore invalid) each of Omni's Asserted Claims. Defendants may rely upon a subset of the identified references or all of the references identified herein, including all references in Appendix D, for purposes of obviousness depending on the Court's claim construction, positions taken by Omni during this litigation, and further investigation and discovery.

Reservation of Rights: Moreover, as mentioned above, Defendants have not yet completed their search or discovery concerning additional prior art, including prior art systems that may anticipate and/or render obvious the Asserted Claims (e.g., System Art).. As such, Defendants' inclusion of exemplary combinations does not preclude them from identifying other invalidating combinations as appropriate, and Defendants reserve the right to identify additional specific combinations as well as to detail and explain such combinations.

No More Than Ordinary Variations of Prior Art; No Unexpected Results: To the extent not anticipated, the '304 Patent Asserted Claims represent no more than the result of ordinary variations of the prior art. Defendants further believe that no showing of a specific motivation to combine prior art is required to combine the references disclosed above and in the attached charts, as each combination of art would have no unexpected results, and at most would simply represent a known alternative to one of ordinary skill in the art. *See KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 415-16 (2007) (rejecting the Federal Circuit's "rigid" application of the teaching, suggestion, or motivation to combine test, instead espousing an "expansive and flexible" approach); *Apple Inc. v. Samsung Elecs. Co.*, 839 F.3d 1034, 1058 (Fed. Cir. 2016); *Intercontinental Great Brands LLC v. Kellogg N. Am. Co.*, 869 F.3d 1336, 1344 (Fed. Cir. 2017).

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Indeed, the Supreme Court held that a person of ordinary skill in the art is "a person of ordinary creativity, not an automaton" and "in many cases a person of ordinary skill in the art will be able to fit the teachings of multiple patents together like pieces of a puzzle." *Id.* at 420-21. Nevertheless, in addition to the information contained elsewhere in these contentions, Defendants identify motivation and reason to combine the cited art.

Predictable Results; Obvious to Try: One or more combinations of the prior art references identified in Appendix D would have been obvious because these references would have been combined using: known methods to yield predictable results; known techniques in the same way; a simple substitution of one known, equivalent element for another to obtain predictable results; and/or a teaching, suggestion, or motivation in the prior art generally. In addition, it would have been obvious to try combining the prior art references identified above because there were only a finite number of predictable solutions and/or because known work in one field of endeavor prompted variations based on predictable design incentives and/or market forces either in the same field or a different one. Further, the combinations of the prior art references identified in Appendix D would have been obvious because the combinations represent known potential options with a reasonable expectation of success.

Interrelated Teachings: Additional evidence that there would have been a motivation to combine the prior art references identified above includes the interrelated teachings of multiple prior art references; common authorship; the effects of demands known to the design community or present in the marketplace; the existence of a known problem for which there was an obvious solution encompassed by the '304 Patent Asserted Claims; the existence of a known need or problem in the field of the endeavor at the time of the alleged invention(s); and the background knowledge that would have been possessed by a person having ordinary skill in the art.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Summary of Motivations to Combine: Thus, the motivation to combine the teachings of the prior art references disclosed in Appendix D is found in the references themselves and also in: (1) the nature of the problem being solved; (2) the express, implied and inherent teachings of the prior art; (3) the knowledge of persons of ordinary skill in the art; (4) the predictable results obtained in combining the different elements of the prior art; (5) the predictable results obtained in simple substitution of one known element for another; (6) the use of a known technique to improve similar devices, methods, or products in the same way; (7) the predictable results obtained in applying a known technique to a known device, method, or product ready for improvement; (8) the finite number of identified predictable solutions that had a reasonable expectation of success; and (9) known work in various technological fields that could be applied to the same or different technological fields based on design incentives or other market forces.

Same Area of Technology: Additionally, it would be obvious to one of ordinary skill in the art to consult and/or combine any of the prior art listed in Appendix D because all of these references relate to the same area of technology and/or are from analogous art. The ’304 Patent Asserted Claims are directed to a physiological measurement system. ’304 Patent at Abstract. The ’304 Patent Asserted Claims merely unite old elements, well known in the field, with no change in their respective function or result. Given the interrelated teachings of the prior art, the effects of demands known to the design community or present in the marketplace, and the background knowledge possessed by a person having ordinary skill in the art, it would have been obvious for one of ordinary skill in the art to combine these familiar elements, disclosed and/or embodied in the prior art listed above to practice the ’304 Patent Asserted Claims.

Same Technical Issues: A person of ordinary skill would have been motivated to combine the above prior art based on his/her knowledge, the nature of the problem to be solved, and the

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

teachings of the prior art. The identified prior art addresses the same or similar technical issues and suggests the same or similar solutions to those issues. Moreover, some of the prior art refer to or discuss other prior art, illustrating the close technical relationship among the prior art. For the '304 Patent, one of ordinary skill in the art would have been motivated to combine known prior art solutions described in these references relating to wearable devices measuring physiological parameters.

Demand and Market Forces: For example, market forces suggested a demand for wearable devices for measuring physiological parameters, and thus one of skill in the art would have thought to combine or modify references that described known methods that one of skill in the art would have recognized as offering improvements to solutions of that time.

Known Elements; Obvious to Try: Moreover, many of the claim elements were already known as admitted by the applicant in the patent specification. These elements represented design choices available to a person of ordinary skill. When there is a design need or market pressure to solve a problem such as identified previously and/or described in the '304 Patent, and there are a finite number of identified, predictable solutions, a person of ordinary skill would be motivated to combine the known options that are within his or her technical grasp. For the '304 Patent, there are a finite number of approaches for providing a wearable device for measuring physiological parameters. For example, as of the priority date of the '304 Patent, a POSITA would have been very familiar with basic elements of the '304 Patent's claims such as semiconductors, optical wavelengths, signal-to-noise ratio, detectors, analog to digital converters, smart phones/tablets, cloud, and their configurations and/or means for the same. Such elements were within the knowledge of a POSITA, whether or not disclosed in any particular reference, and the inclusion of such elements in the '304 Patent's claims does not render them novel or non-obvious.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

There are significant similarities in subject matter and objectives for each of many references used in these contentions for the ’304 Patent.

Reflective Surface References: For example, charted reference **LeBoeuf**, as well as numerous other references such as **Basu** and **Valencell** all include teachings related to physiological measurement systems. These references provide numerous methods for using a reflective surface in a sensor to direct the reflected light from a sample to a detector. For example, **LeBoeuf** teaches using a “cover 18” with a “cladding material 21 [which] may be reflective material” to “serve[] as a light guide that… collects light external to the earbud housing 16 and delivers the collected light to the optical detector 26”. LeBoeuf, [0103], [0107], [0115]. **Basu** teaches “[t]he battery 32 may additionally be arranged to provide a reflective surface for the light emitted by the LED 14 toward the photodiode 16.” Basu, [0088]. **Valencell** teaches “The light guiding region 2306 helps direct light to and/or from the sensor module …. In some embodiments, the light guiding region 2306 may be a reflector.” Valencell, [0152].

A person of skill in the art would understand that the functionality taught in these references could be added to other methods and systems for physiological measurements. These methods provide the benefit of improved delivery of the light reflected from tissue to the detectors in the sensor. Moreover, to the extent that any of these references includes a feature not expressly disclosed in one or more other references, a POSITA would have naturally looked to, and been motivated to combine, any one of these references with one or more of the other references in order to better achieve their common goals of more accurate and efficient physiological monitoring.

SNR Techniques: For example, charted reference **Kassim**, as well as numerous other references such as **Carlson, Basu, Lisogurski, Marbach**, and **LeBoeuf** all include teachings related to physiological measurement systems. These references provide numerous methods for

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

improving signal-to-noise ratio through various methods, including increasing light intensity, increasing pulse rate, differencing detected signals, and applying multivariate techniques. For example, **Kassim** teaches "a maximum of the true Red PPG signal (devoid of ambient noise) can simply be obtained by subtracting the obtained maximum value of the Red PPG signal, obtained when the Red LED is turned on, with the obtained maximum value of the ambient PPG signal." Kassim, 22:27-23:3. **Carlson** teaches that "shift[ing] [the] spectrum of signal" can result in "increasing significantly the Signal-to-Noise and Signal-to-Background ratio" when the "frequency is chosen in such a way that it is outside the frequency spectrum of sunlight and of ambient light." Carlson, [0069]. **Basu** teaches "[t]o maximize the signal-to-noise ratio in photoplethysmography, the LED intensity should be made as large as possible without saturating the detector." Basu, [0058]. **Lisogurski** teaches "dark subtractor 162 may subtract dark values from the Red and IR components to generate adjusted Red and IR signals. For example, dark subtractor 162 may determine a subtraction amount from the dark signal portion of the detection signal and subtract it from the peak portion of the detection signal in order to reduce the effect of the dark signal on the peak. Lisogurski, 13:60-67. **Marbach** teaches "The LEDs are preferably pulse-modulated with a pulse frequency on the order of several kHz. Low power, quasi-continuous operation is possible by measuring intermittently, e.g., one measurement lasting 10 seconds every 5 minutes. …depending on the sampling rate and SNR requirements," and performing "measurement algorithms" on "multivariate input data" of measurement signals in order to "better the measurement accuracy a.k.a. SNR." Marbach, 17:1-7, 12:19-27. **LeBoeuf** teaches "Channel A refers to inputs from sensors that collect physiological information plus noise information, and Channel B refers to inputs from sensors that collect primarily … noise information. … The filter 203 properties are updated to minimize the difference between Channel A and the post-processed

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Channel B, denoted as B. In this way, noise is removed from Channel A and Channel C contains predominantly physiological information." LeBoeuf, [0143].

A person of skill in the art would understand that the functionality taught in these references could be added to other methods and systems for physiological measurements. These methods and systems provide the benefit of increasing a signal-to-noise ratio of the measure signal. Moreover, to the extent that any of these references includes a feature not expressly disclosed in one or more other references, a POSITA would have naturally looked to, and been motivated to combine, any one of these references with one or more of the other references in order to better achieve their common goals of more accurate and efficient physiological monitoring.

Smartphone/Tablet References: For example, charted reference **Basu**, as well as numerous other references such as **Kassim**, **Kreger**, **Lisogurski**, **Tran**, all include teachings related to physiological measurement systems. These references provide numerous means for a physiological monitoring system to be configured for use with a smart phone or tablet. For example, **Basu** teaches "health ring 44 which can monitor heart rate on a 24 hour basis," and that "combines the sensor with a…wireless transmitter linked to an application running on the user's cell phone." Basu, [0065]-[0066]. For example, **Kassim** teaches "[t]he optical measurement device 300 further comprises a coupling member 316 that can provide coupling between the measurement device 300 to a personal mobile processing device/feedback unit (not shown) in a cableless configuration," and that "the feedback unit may be a portable device, such as a mobile phone, smartphone, personal digital assistant (PDA), tablet, netbook or laptop, although this list is not exhaustive by any means." Kassim, 12:5-14. For example, **Kreger** teaches a "biosensor interface apparatus for use with a mobile communication device 10," that "can be any of a number of mobile phones such as an iPhone® or an Android® phone, a personal digital assistant (PDA)

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

such as a Blackberry®, a portable audio playback device such as an MP3 player, a portable media playback device such as an iPod®, or a handheld tablet such as an iPad®." Kreger, 5:40-53; *see also* Kreger, 7:39-46. For example, **Lisogurski** teaches a "monitor [that] may be powered by a battery" with a "[u]ser interface [which] may include user input 182, display 184, and speaker 186. User input 182 may include any type of user input device such as a keyboard, a mouse, a touch screen, buttons, switches, a microphone, a joy stick, a touch pad, or any other suitable input device." Lisogurski, 15:19-23, 18:65-67. For example, **Mault** teaches a blood glucose monitoring system including an electronic device that "can be a portable electronic device or system carried by the person, or a device or system combining multiple functionalities, such as:…a portable computer; any portable Internet access device; [or] a wireless phone…." Mault [0069]-[0070]. For example, **Poeze** teaches "a personal health organizer software module 132 executed on a general purpose computing device 126, with the computing device 126 coupled with the health data collection device 112 via a communications link 128," where the "personal health organizer module 132 can be an executable program on an operating system of a device such as a mobile phone, a personal digital assistant, a portable music player, an electronic book reader, a netbook, a TV media center, and a laptop or desktop computer. For example, the personal health organizer module 132 can be an application that is executed on the operating system of a mobile phone such as the iPhone manufactured by Apple, Inc., a Blackberry device manufactured by Research In Motion, Inc., the Pre manufactured by Palm, Inc, or a mobile device manufactured by HTC, Nokia, or Motorola, etc." Poeze, [0034]; *see also* Poeze [0010]. **Tran** teaches that while a patient with a wearable device is outside a mesh network range, "the wearable appliance communicates with the cell phone," such as a "smart phone[]" and "provides information to the server 200 using the cellular connection." Tran, 34:4-30.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

A person of skill in the art would understand that the functionality taught in these references could be added to other methods and systems that concern physiological monitoring. These methods and systems provide the benefit of more processing power and more convenient means to flag emergency situations. Moreover, to the extent that any of these references includes a feature not expressly disclosed in one or more other references, a POSITA would have naturally looked to, and been motivated to combine, any one of these references with one or more of the other references in order to better achieve their common goals of more accurate and efficient physiological monitoring.

Cloud References: For example, charted reference **Kassim**, as well as numerous other references such as **Mault, Basu, Lisogurski**, and **Poeze** all include teachings related to physiological measurement systems. These references provide numerous means for a physiological monitoring system to be configured for use a with cloud. For example, **Kassim** teaches that "[t]he computer platform may further be connected to network resources 2006 which connect to the Internet or other components of a local public or private network. The network resources 2006 may provide instructions and data to the computer platform from a remote location on a network 2007." Kassim, 33:34-34:19. **Mault** teaches "[t]he PDA can access the communications network, such as the Internet, using a wireless connection. Data can be transferred to the remote system over the communications network 20." Mault, [0077]. **Basu** teaches "a cloud-based health monitoring and mentoring framework which integrates remote patient monitoring (RPM) with an online community involving medical caregivers and a social network of the patient's peers." Basu, [0081]. **Lisogurski** teaches "monitor 314 and/or multi-parameter physiological monitor 326 may be coupled to a network to enable the sharing of information with servers or other work-stations." Lisogurski, 18:62-65. **Poeze** teaches "the camera is paired with an

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

opti cal character recognition module so that scanned medical forms can be converted into data that can be uploaded for synchronization at a server in a network (e.g. a cloud computing network) or stored on the personal health organizer device." Poeze, [0048].

A person of skill in the art would understand that the functionality taught in these references could be added to other methods and systems for physiological measurements. These methods improving the analysis capabilities of measurement systems due to the increased processing and storage power of a cloud. Moreover, to the extent that any of these references includes a feature not expressly disclosed in one or more other references, a POSITA would have naturally looked to, and been motivated to combine, any one of these references with one or more of the other references in order to better achieve their common goals of more accurate and efficient physiological monitoring.

Optical Detection Techniques References: For example, charted reference **Keller**, as well as numerous other references such as **Mault**, **Carlson, Lisogurski, Basu**, **Jung**, and **Marbach** all include teachings related to physiological measurement systems. These references provide numerous means for effective optical detection through various methods, including synchronizing light sources and detectors and modulating the light source. For example, **Keller** teaches that "[t]he light source 102 may also be pulsed or flashed, in order, for example, to synchronize with the imaging devices 305, 504 (see, FIGS. 3 and 5, respectively) of the invention." Keller, [0088]. **Mault** teaches "electrical modulation of a single device may be used to obtain multiple wavelength emission" Mault, [0020]. **Carlson** teaches "us[ing] a light source modulation to temporarily modulate the optical radiation of the LED … in order to shift the power spectrum of the pulsometer signals into a higher frequency range." Carlson, [0063]-[0065]. **Lisogurski** teaches "front end processing circuitry 150 may use the timing control signals to operate

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

synchronously with light drive circuitry 120." Lisogurski, 11:41-43. **Basu** teaches "[t]he LED 14 is modulated at 1 KHz frequency or higher. The received PD signal oscillates at the same frequency." Basu, [0037]. **Jung** teaches "[t]he three monochrome sources, however, are turned on and off rapidly, synchronous with the spectral measurements being taken." Jung, 68:26-30. **Lamego** teaches a "digital-to-analog conversion circuit 338" that includes "a synchronizing latch 323" which "accepts the synchronizing pulses which maintain synchronization between the activation of emitters 302 and the analog to digital conversion circuit 332." Lamego, [0044]-[0045]. **Marbach** teaches "The LEDs are preferably pulse-modulated with a pulse frequency on the order of several kHz. Low power, quasi-continuous operation is possible by measuring intermittently, e.g., one measurement lasting 10 seconds every 5 minutes." Marbach, 17:1-5.

A person of skill in the art would understand that the functionality taught in these references could be added to other methods and systems for physiological measurements. These methods and systems provide increased accuracy for monitoring physiological parameters. Moreover, to the extent that any of these references includes a feature not expressly disclosed in one or more other references, a POSITA would have naturally looked to, and been motivated to combine, any one of these references with one or more of the other references in order to better achieve their common goals of more accurate and efficient physiological monitoring.

Artificial Intelligence / Multivariate Techniques References: For example, charted reference **Tran**, as well as numerous other references such as **Mault** and **Marbach** all include teachings related to physiological measurement systems. These references provide numerous means for using artificial intelligence and multivariate techniques to make decisions and improve signal-to-noise ratios. For example, **Tran** teaches that "feed forward artificial neural networks (NNs) are used to classify valve-related heart disorders." Tran, 74:45-62. **Mault** teaches that

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

"[f]eedback, generated by a specialist or computer expert system, may be transmitted to the PDA from the remote computer over the communications network." Mault, [0077]. **Marbach** teaches performing "measurement algorithms" on "multivariate input data" of measurement signals in order to "better the measurement accuracy a.k.a. SNR." Marbach, 12:19-27.

A person of skill in the art would understand that the functionality taught in these references could be added to other methods and systems for physiological measurements. These methods and systems provide increased decision-making capabilities and minimize noise interference. Moreover, to the extent that any of these references includes a feature not expressly disclosed in one or more other references, a POSITA would have naturally looked to, and been motivated to combine, any one of these references with one or more of the other references in order to better achieve their common goals of more accurate and efficient physiological monitoring.

Arc References: For example, charted reference **Isaacson**, as well as numerous other references such as **Jung**, and **LeBoeuf** all include teachings related to physiological measurement systems. These references provide numerous methods for utilizing a plurality of semiconductor sources and the plurality of spatially separated detectors are located on one or more arcs. For example, **Isaacson** teaches emitters 10, 20 and detectors 12, 22 disposed on an arc. Isaacson, 4:64-5:9, Fig. 1. For example, **Jung** teaches "a fiber optic arrangement presented at the forward end of probe tip 1" which "utilizes a single central light source fiber optic…and a plurality of perimeter light receiver fiber optics, denoted as light receivers R1, R2 and R3." Jung, 11:21-50, Fig. 2; *see also* Jung 24:39-48, 24:39-62, 32:66-33:9, 39:41-40:14, Figs. 9, 10A-B, 20, 28A-B. For example, **LeBoeuf** teaches optical emitters 24 and optical detectors 26 configured in an arc. LeBoeuf, [0123]-[1024], Fig. 8B

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

A person of skill in the art would understand that the functionality taught in these references could be added to other methods and systems that concern physiological monitoring. These methods provide the benefit of better acquisition of signals from the samples. Moreover, to the extent that any of these references includes a feature not expressly disclosed in one or more other references, a POSITA would have naturally looked to, and been motivated to combine, any one of these references with one or more of the other references in order to better achieve their common goals of more accurate and efficient physiological monitoring.

b. Combinations

For at least the reasons described above, it would have been obvious to one of ordinary skill in the art to combine each prior art reference listed in Appendix D with any other reference or references listed in Appendix D along with the knowledge of one of ordinary skill in the art to arrive at the inventions claims in the ’304 Patent.

For example, and without limitation, the Asserted Claims of the ’304 Patent would have been obvious to one of ordinary skill in the art in view of the following combinations:

(i) Lisogurski, Kassim, Chandrasekar2012, Valencell, Mault, and Basu Combined with Reflective Surface References

A POSITA would have had reason to combine references **Lisogurski**, **Kassim**, **Chandrasekar2012**, **Valencell**, **Mault**, or **Basu**, or any of the references in Appendix D, with any one of the Reflective Surface References all of which relate to systems and methods for physiological monitoring. Each of references **LeBoeuf, Basu** and **Valencell** relate to physiological monitoring systems which use a reflective surface to direct the reflected light from a sample to a detector. Indeed, such components and/or processes were conventional as of the time these references were known. Each of the Reflective Surface References provide means—

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

not necessarily expressly present in all other references—for using a reflective surface in a sensor to direct the reflected light from a sample to a detector. A POSITA would have understood that the systems and methods for the Reflective Surface References were intended to be incorporated into wearable measurement devices. A POSITA would understand that systems and methods for incorporating reflective surfaces into sensors to direct the reflected light from a sample to a detector provide improvements such as enhancing the efficiency of the delivery of the light reflected from or transmitted through the tissue to the detectors in the sensor, minimizing loss of light intensity due to scattering. *E.g.*, LeBoeuf, [0125] ("An advantage of this configuration is … this configuration may reduce unwanted optical signals from regions that may not be relevant to the physiological activity of interest.") A POSITA would further understand that in order to implement a wearable measurement device, the systems and methods for optical measurement systems would commonly be combined with reflective surfaces, and thus a POSITA would have been motivated to combine the teachings of these references. The combination would apply known techniques of including basic optical components, to wearable measurement devices that were ready for improvement, in order to yield predictable results. The combination would further be "obvious to try," because it would involve simple design choices from a finite number of identified, predictable solutions, with a reasonable expectation of success.

(ii) Lisogurski, Kassim, Chandrasekar2012, Valencell, Mault, and Basu Combined with SNR Techniques References

A POSITA would have had reason to combine references **Lisogurski**, **Kassim, Chandrasekar2012**, **Valencell**, **Mault**, or **Basu**, or any of the references in Appendix D, with any one of the SNR Techniques References all of which relate to systems and methods for physiological monitoring. Each of references **Kassim, Carlson, Basu, Lisogurski, Marbach**, and **LeBoeuf** relate to physiological monitoring systems which use various methods for improving

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

signal-to-noise ratio. Indeed, such components and/or processes were conventional as of the time these references were known. Each of the SNR Techniques References provide means—not necessarily expressly present in all other references—for various methods, including increasing light intensity, increasing pulse rate, and differencing detected signals to improve the SNR of a detected signal. A POSITA would have understood that the systems and methods for the SNR Techniques References were intended to be incorporated into wearable measurement devices. A POSITA would understand that systems and methods for incorporating the usage of various SNR techniques into physiological measurement systems provide improvements such as reducing the effects of background noise or ambient light on the measurement signal and improving the accuracy of the measurement. *E.g.*, Kassim, 22:28-22:30 ("The inventors have recognized that by identifying and utilizing only significant information for Sp02 calculation, an efficient and accurate calculation can be carried out"). A POSITA would further understand that in order to implement a wearable measurement device, the systems and methods for optical measurement systems would commonly be combined with SNR improvement techniques, and thus a POSITA would have been motivated to combine the teachings of these references. The combination would apply known techniques of using known noise reduction and signal enhancement methods, to wearable measurement devices that were ready for improvement, in order to yield predictable results. The combination would further be "obvious to try," because it would involve simple design choices from a finite number of identified, predictable solutions, with a reasonable expectation of success.

(iii) Lisogurski, Kassim, Chandrasekar2012, Valencell, Mault, and Basu Combined with Smartphone/Tablet References

A POSITA would have had reason to combine references **Lisogurski**, **Kassim**, **Chandrasekar2012**, **Valencell**, **Mault**, or **Basu**, or any of the references in Appendix E, with any

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

one of Smartphone/Tablet References all of which relate to systems and methods for physiological monitoring. Each of references **Basu**, **Kassim**, **Kreger**, **Lisogurski**, **Mault**, **Poeze**, and **Tran** relate to physiological monitoring systems for use with a smartphone or tablet. Indeed, such components and/or processes were conventional as of the time these references were known. Each of Smartphone/Tablet References provide means—not necessarily expressly present in all other references—for a physiological monitoring system to communicate with a smartphone or tablet. A POSITA would have understood that the systems and methods for Smartphone/Tablet References were intended to be incorporated into wearable measurement devices. A POSITA would understand that systems and methods for connectivity to smartphones or tablets provide improvements improving the analysis capabilities of measurement systems due to the increased processing power of smartphones and tablets and the additional resources provided by their ability to connect to wireless and cell networks. *E.g.*, Basu, [0066] (physiological monitoring system "combines the sensor with a…wireless transmitter linked to an application running on the user's cell phone."); Kreger, 13:1-3 ("Mobile device smart phone 444 may derive measurements, display plots, transmit medical records of biosensor data, and so forth."); Tran, 34:4-40 ("If the wearable appliance detects a cellphone that is mesh network compatible, the wearable appliance communicates with the cell phone," such as a "smart phone" and "provides information to the server 200 using the cellular connection."). A POSITA would further understand that in order to implement a wearable measurement device, the systems and methods for optical physiological measurement would commonly be combined with smartphone and personal computing technology and thus a POSITA would have been motivated to combine the teachings of these references. The combination would apply known techniques of providing for connectivity to smartphone or personal computing devices in wearable measurement devices that were ready for improvement,

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

in order to yield predictable results. The combination would further be "obvious to try," because it would involve simple design choices from a finite number of identified, predictable solutions, with a reasonable expectation of success.

(iv) Lisogurski, Kassim, Chandrasekar2012, Valencell, Mault, and Basu Combined with Cloud References

A POSITA would have had reason to combine references **Lisogurski**, **Kassim**, **Chandrasekar2012**, **Valencell**, **Mault**, or **Basu**, or any of the references in Appendix D, with any one of the Cloud References all of which relate to systems and methods for physiological monitoring. Each of references **Kassim**, **Mault, Basu, Lisogurski**, and **Poeze** relate to connecting the physiological monitoring system with a cloud. Indeed, such components and/or processes were conventional as of the time these references were known. Each of the Cloud References provide means—not necessarily expressly present in all other references—for a physiological monitoring system to communicate with a cloud. A POSITA would have understood that the systems and methods for the Cloud References were intended to be incorporated into wearable measurement devices. A POSITA would understand that systems and methods for connectivity to a cloud provide improvements improving the analysis capabilities of measurement systems due to the increased processing and storage power of a cloud and the additional resources provided by their ability to connect to the internet and other remote networks. *E.g.*, Kassim, 34:14-16 ("The network resources may include 15 storage devices for storing data and executable instructions at a location separate from the computer platform 2001"). *E.g.*, Mault, [0077] ("Data can be transferred to the remote system over the communications network 20, allowing examination by a dietician, physician, other specialist"). A POSITA would further understand that in order to implement a wearable measurement device, the systems and methods for optical physiological measurement would commonly be combined with cloud connectivity and thus a POSITA would have been

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

motivated to combine the teachings of these references. The combination would apply known techniques of providing for connectivity to smartphone or personal computing devices in wearable measurement devices that were ready for improvement, in order to yield predictable results. The combination would further be "obvious to try," because it would involve simple design choices from a finite number of identified, predictable solutions, with a reasonable expectation of success.

(v) Lisogurski, Kassim, Chandrasekar2012, Valencell, Mault, and Basu Combined with Optical Detection Techniques References

A POSITA would have had reason to combine references **Lisogurski**, **Kassim**, **Chandrasekar2012**, **Valencell**, **Mault**, or **Basu**, or any of the references in Appendix D, with any one of the Optical Detection Techniques References all of which relate to systems and methods for physiological monitoring. Each of references **Keller, Mault**, **Carlson, Lisogurski, Basu**, **Jung**, and **Marbach** relate to physiological monitoring systems which use various methods for effective optical detection. Indeed, such components and/or processes were conventional as of the time these references were known. Each of the Optical Detection References provide means—not necessarily expressly present in all other references—for various methods, including synchronizing light sources and detectors and modulating the light source for effective optical detection of a sample. A POSITA would have understood that the systems and methods for the Optical Detection References were intended to be incorporated into wearable measurement devices. A POSITA would understand that systems and methods for incorporating the usage of various optical detection techniques into physiological measurement systems provide improvements such as improving the system's ability to effectively detect and measure samples of interest. *E.g.*, Carlson , [0065] ("AC-Coupling or Lock-In Amplification (synchronous detection), is to temporarily modulate the optical radiation of the LED at the carrier frequency fc in order to shift the power spectrum of the pulsoximeter signals into a higher frequency range where

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

environmental optical radiation is unlikely and electronic band pass filtering is technologically less stringent."); Lamego, [0045] ("[D]river circuit," including "synchronizing latch 323 [that] accepts the synchronizing pulses which maintain synchronization between the activation of emitters 302 and the analog to digital conversion circuit 332" "is designed to minimize the noise from the emitters 302."). A POSITA would further understand that in order to implement a wearable measurement device, the systems and methods for optical measurement systems would commonly be combined with optical detection techniques, and thus a POSITA would have been motivated to combine the teachings of these references. The combination would apply known techniques of using known optical detection methods, to wearable measurement devices that were ready for improvement, in order to yield predictable results. The combination would further be "obvious to try," because it would involve simple design choices from a finite number of identified, predictable solutions, with a reasonable expectation of success.

(vi) Lisogurski, Kassim, Chandrasekar2012, Valencell, Mault, and Basu Combined with Artificial Intelligence / Multivariate Techniques References

A POSITA would have had reason to combine references **Lisogurski**, **Kassim**, **Chandrasekar2012**, **Valencell**, **Mault**, or **Basu**, or any of the references in Appendix D, with any one of the Artificial Intelligence / Multivariate Techniques References all of which relate to systems and methods for physiological monitoring. Each of references **Tran, Mault,** and **Marbach** relate to physiological monitoring systems which use artificial intelligence or multivariate techniques to improve their measurements. Indeed, such components and/or processes were conventional as of the time these references were known. Each of the Artificial Intelligence / Multivariate Techniques References provide means—not necessarily expressly present in all other references—for improving a system's decision-making and the SNR of a measured signal. A POSITA would have understood that the systems and methods for the

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Artificial Intelligence / Multivariate Techniques References were intended to be incorporated into wearable measurement devices. A POSITA would understand that systems and methods for incorporating the usage artificial intelligence and multivariate techniques into physiological measurement systems provide improvements such as improving the system's ability to effectively make decisions and make accurate measurements with minimal noise interference. *E.g.*, Tran, 5:57-65 ("For example, the system can perform patient behavior analysis such as eating/drinking/smoke habits and medication compliance, among others"). A POSITA would further understand that in order to implement a wearable measurement device, the systems and methods for optical measurement systems would commonly be combined with artificial intelligence and multivariate techniques, and thus a POSITA would have been motivated to combine the teachings of these references. The combination would apply known techniques of using known artificial intelligence models and multivariate calculation methods, to wearable measurement devices that were ready for improvement, in order to yield predictable results. The combination would further be "obvious to try," because it would involve simple design choices from a finite number of identified, predictable solutions, with a reasonable expectation of success.

(vii) Lisogurski, Kassim, Chandrasekar2012, Valencell, Mault, and Basu Combined with Arc References

A POSITA would have had reason to combine references **Lisogurski**, **Kassim**, **Chandrasekar2012**, **Valencell**, **Mault**, or **Basu**, or any of the references in Appendix D, with any one of Arc References all of which relate to systems and methods for physiological monitoring. Each of references **Isaacson**, **Jung**, and **LeBoeuf** relate to physiological monitoring systems with their light sources and/or detectors configured in an arc. Indeed, such components and/or processes were conventional as of the time these references were known. Each of Arc References provide means—not necessarily expressly present in all other references—for configuring the

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

detectors and/or emitters of a physiological measurement system in an arc formation. A POSITA would have understood that the systems and methods for Arc References were intended to be incorporated into wearable measurement devices. A POSITA would understand that systems and methods for configuring optical detectors and emitters in an arc formation would provide improvements such as increased measurement accuracy due to lessening the negative effects of light scattering and accounting for the contours of the tissue sample that is being measured. A POSITA would further understand that in order to implement a wearable measurement device, the systems and methods for optical measurement would commonly be combined detectors and emitters in an arc formation, and thus a POSITA would have been motivated to combine the teachings of these references. The combination would apply known techniques for varying the spatial configurations of emitters and detectors in wearable measurement devices that were ready for improvement, in order to yield predictable results. The combination would further be "obvious to try," because it would involve simple design choices from a finite number of identified, predictable solutions, with a reasonable expectation of success.

Furthermore, to the extent any limitation of an Asserted Claim is deemed not to be exactly disclosed by an item of prior art, then the claim is rendered obvious by combination of the prior art in Exhibits D1 through D19 standing alone, in combination with the reference(s) in any other claim chart, in combination with any system art identified in Table 2-D, in combination with Applicant's Admitted Prior Art, in view of the knowledge of a person of ordinary skill in the art, and/or in view of the Lens References, Light Intensity References, Three Wavelength References, Six LED References, Smartphone/Tablet References, Synchronize Light Source/Detector References, and/or Arc References for the reasons discussed above.

5. U.S. Patent No. 11,160,455

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Pursuant to P.R. 3-3(a) and (b), Defendants identify in Appendix E the prior art references that render obvious the Asserted Claims of the ’455 Patent and include below exemplary combinations showing the obviousness of the ’455 Patent Asserted Claims in view of the prior art. To the extent Plaintiff contends that an element is not disclosed in any one of the anticipatory references described in Appendix E, the limitation would have been obvious in light of the disclosures within the reference and the knowledge of one of ordinary skill in the art at the time of the ’455 Patent. Moreover, to the extent Plaintiff contends that an element is not disclosed in any one of the anticipatory references described in Appendix E, such reference may be combined with any other references listed in Appendix E for such element, thereby rendering the claims invalid for obviousness. To the extent a finder of fact determines that a limitation of any of the ’455 Patent Asserted Claims is not disclosed by one of the references identified above pursuant to P.R. 3-3(a), the claim is nevertheless unpatentable as obvious because they contain nothing that constitutes a patentable innovation. To the extent a finder of fact determines that a limitation of the ’455 Patent Asserted Claims is not anticipated, it does not go beyond combining familiar elements according to known methods to achieve predictable results or does more than choose between clear alternatives known to those of ordinary skill in the art.

a. Obviousness Rationale and Motivations to Combine

Obviousness: For at least the reasons described in these contentions, it would have been obvious to one of ordinary skill in the art to combine any of a number of prior art references, including any combination of those prior art references identified in Appendix E along with the knowledge of one of ordinary skill in the art to meet the limitations of the ’455 Patent Asserted Claims. As a result, the references identified herein render one or more Asserted Claims of the ’455 Patent obvious when the references are read in combination with each other, and/or when

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

read in view of the state of the art and knowledge of those skilled in the art. Each and every reference identified is also relevant to the state of the art at the time of the alleged invention. Any of the references disclosed above may be combined with one another to render obvious (and therefore invalid) each of Omni's Asserted Claims. Defendants may rely upon a subset of the identified references or all of the references identified herein, including all references in Appendix E, for purposes of obviousness depending on the Court's claim construction, positions taken by Omni during this litigation, and further investigation and discovery.

Reservation of Rights: Moreover, as mentioned above, Defendants have not yet completed their search or discovery concerning additional prior art, including prior art systems that may anticipate and/or render obvious the Asserted Claims (e.g., System Art). As such, Defendants' inclusion of exemplary combinations does not preclude them from identifying other invalidating combinations as appropriate, and Defendants reserve the right to identify additional specific combinations as well as to detail and explain such combinations.

No More Than Ordinary Variations of Prior Art; No Unexpected Results: To the extent not anticipated, the '455 Patent Asserted Claims represent no more than the result of ordinary variations of the prior art. Defendants further believe that no showing of a specific motivation to combine prior art is required to combine the references disclosed above and in the attached charts, as each combination of art would have no unexpected results, and at most would simply represent a known alternative to one of ordinary skill in the art. *See KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 415-16 (2007) (rejecting the Federal Circuit's "rigid" application of the teaching, suggestion, or motivation to combine test, instead espousing an "expansive and flexible" approach); *Apple Inc. v. Samsung Elecs. Co.*, 839 F.3d 1034, 1058 (Fed. Cir. 2016); *Intercontinental Great Brands LLC v. Kellogg N. Am. Co.*, 869 F.3d 1336, 1344 (Fed. Cir. 2017).

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Indeed, the Supreme Court held that a person of ordinary skill in the art is "a person of ordinary creativity, not an automaton" and "in many cases a person of ordinary skill in the art will be able to fit the teachings of multiple patents together like pieces of a puzzle." *Id.* at 420-21. Nevertheless, in addition to the information contained elsewhere in these contentions, Defendants identify motivation and reason to combine the cited art.

Predictable Results; Obvious to Try: One or more combinations of the prior art references identified in Appendix E would have been obvious because these references would have been combined using: known methods to yield predictable results; known techniques in the same way; a simple substitution of one known, equivalent element for another to obtain predictable results; and/or a teaching, suggestion, or motivation in the prior art generally. In addition, it would have been obvious to try combining the prior art references identified above because there were only a finite number of predictable solutions and/or because known work in one field of endeavor prompted variations based on predictable design incentives and/or market forces either in the same field or a different one. Further, the combinations of the prior art references identified in Appendix E would have been obvious because the combinations represent known potential options with a reasonable expectation of success.

Interrelated Teachings: Additional evidence that there would have been a motivation to combine the prior art references identified above includes the interrelated teachings of multiple prior art references; common authorship; the effects of demands known to the design community or present in the marketplace; the existence of a known problem for which there was an obvious solution encompassed by the '455 Patent Asserted Claims; the existence of a known need or problem in the field of the endeavor at the time of the alleged invention(s); and the background knowledge that would have been possessed by a person having ordinary skill in the art.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Summary of Motivations to Combine: Thus, the motivation to combine the teachings of the prior art references disclosed in Appendix E is found in the references themselves and also in: (1) the nature of the problem being solved; (2) the express, implied and inherent teachings of the prior art; (3) the knowledge of persons of ordinary skill in the art; (4) the predictable results obtained in combining the different elements of the prior art; (5) the predictable results obtained in simple substitution of one known element for another; (6) the use of a known technique to improve similar devices, methods, or products in the same way; (7) the predictable results obtained in applying a known technique to a known device, method, or product ready for improvement; (8) the finite number of identified predictable solutions that had a reasonable expectation of success; and (9) known work in various technological fields that could be applied to the same or different technological fields based on design incentives or other market forces.

Same Area of Technology: Additionally, it would be obvious to one of ordinary skill in the art to consult and/or combine any of the prior art listed in Appendix E because all of these references relate to the same area of technology and/or are from analogous art. The ’455 Patent Asserted Claims are directed to a physiological measurement system. ’455 Patent at Abstract. The ’455 Patent Asserted Claims merely unite old elements, well known in the field, with no change in their respective function or result. Given the interrelated teachings of the prior art, the effects of demands known to the design community or present in the marketplace, and the background knowledge possessed by a person having ordinary skill in the art, it would have been obvious for one of ordinary skill in the art to combine these familiar elements, disclosed and/or embodied in the prior art listed above to practice the ’455 Patent Asserted Claims.

Same Technical Issues: A person of ordinary skill would have been motivated to combine the above prior art based on his/her knowledge, the nature of the problem to be solved, and the

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

teachings of the prior art. The identified prior art addresses the same or similar technical issues and suggests the same or similar solutions to those issues. Moreover, some of the prior art refer to or discuss other prior art, illustrating the close technical relationship among the prior art. For the ’455 Patent, one of ordinary skill in the art would have been motivated to combine known prior art solutions described in these references relating to wearable devices measuring physiological parameters.

Demand and Market Forces: For example, market forces suggested a demand for wearable devices for measuring physiological parameters, and thus one of skill in the art would have thought to combine or modify references that described known methods that one of skill in the art would have recognized as offering improvements to solutions of that time.

Known Elements; Obvious to Try: Moreover, many of the claim elements were already known as admitted by the applicant in the patent specification. These elements represented design choices available to a person of ordinary skill. When there is a design need or market pressure to solve a problem such as identified previously and/or described in the ’455 Patent, and there are a finite number of identified, predictable solutions, a person of ordinary skill would be motivated to combine the known options that are within his or her technical grasp. For the ’455 Patent, there are a finite number of approaches for providing a wearable device for measuring physiological parameters. For example, as of the priority date of the ’455 Patent, a POSITA would have been very familiar with basic elements of the ’455 Patent’s claims such as semiconductors, optical wavelengths, lenses, signal-to-noise ratio, detectors, analog to digital converters, smart phones/tablets, cloud, and their configurations and/or means for the same. Such elements were within the knowledge of a POSITA, whether or not disclosed in any particular reference, and the inclusion of such elements in the ’455 Patent’s claims does not render them novel or non-obvious.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

There are significant similarities in subject matter and objectives for each of many references used in these contentions for the ’455 Patent.

Lens References: For example, charted reference **Carlson**, as well as numerous other references such as **LeBoeuf**, **Poeze**, **Pologe**, and **Valencell** all include teachings related to physiological measurement systems. These references provide numerous means and methods for using lenses to receive at least a portion of the output optical light and to deliver a lens output light to tissue, which were already well known in the art. For example, **Carlson** teaches using “a beam-shaping element, such as e.g. diffractive or refractive lenses, to direct the emitted optical radiation of, e.g., the LED light Source into the human or animal tissue and the photon detecting element in order to increase the optical signal power, detected by the pulsoximeter sensor, and thus increasing the Signal/Noise-and signal/Background ratio.” Carlson, [0014]; *see also* Carlson, [0024]; [0041], [0062], FIG. 6c. Fore example, **LeBoeuf** teaches “lenses 29L [] configured to focus inspection light 111 onto a particular region of the ear.” LeBoeuf, [0114]; *see also* LeBoeuf, [0011], [0019], [0031], [0036], [0097], [0114], [0116] [0117], [0135], [0138], [0161], [0168]. For example, **Poeze** teaches “the device 112 includes an optional tissue thickness adjuster or tissue shaper 522, which can include one or more…lenses….” Poeze, [0102]. **Pologe** further teaches a “wavelength division multiplexing (WDM) coupler[]” using a lens to combine light signals from emitters into a “single multiplexed light signal on output cable 24.” Pologe, 5:16-51. For example, **Valencell** teaches “optical lenses 715 [that] may be designed for the desired optical coupling between the skin/blood vessel region and the emitter 102 or detector 103.” Valencell, [0118]; *see also* Valencell, [0016]-[0017], [0022]-[0023], [0038], [0119], [0121], [0124]-[0125], [0128]-[0131].

A person of skill in the art would understand that the functionality taught in these references could be added to other methods and systems that concern physiological monitoring. These

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

methods provide the benefit of increasing the light intensity to increase signal-to-noise ratio, without increasing power usage. Moreover, to the extent that any of these references includes a feature not expressly disclosed in one or more other references, a POSITA would have naturally looked to, and been motivated to combine, any one of these references with one or more of the other references in order to better achieve their common goals of more accurate and efficient physiological monitoring.

Light Intensity References: For example, charted reference **Basu**, as well as numerous other references such as **Kassim**, **Lisogurski**, and **Valencell** all include teachings related physiological measurement systems. These references provide numerous methods for increasing the signal-to-noise ratio by increasing light intensity of at least one of the semiconductor sources from an initial light intensity. For example, **Basu** teaches "[t]o maximize the signal-to-noise ratio in photoplethysmography, the LED intensity should be made as large as possible without saturating the detector." Basu, [0058]. For example, **Kassim** teaches "the effects of ambient light signals 30 can be reduced as much as possible by tuning the intensities of the IR and Red LEDs to be maximized as long as the detection assembly has not reached saturation." Kassim, 16:27-35. For example, **Lisogurski** discloses the "system may increase the brightness of the light sources in response to the noise to improve the signal-to-noise ratio." Lisogurski, 9:46-60. For example, **Valencell** teaches "the intensity of the optical emitter 102 may be increased to increase the ratio of physiological optical scatter 111 from blood vessels with respect to unwanted sunlight." Valencell, [0123].

A person of skill in the art would understand that the functionality taught in these references could be added to other methods and systems that concern physiological monitoring. These methods and systems provide the benefit of increasing a signal-to-noise ratio of the measure signal.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Moreover, to the extent that any of these references includes a feature not expressly disclosed in one or more other references, a POSITA would have naturally looked to, and been motivated to combine, any one of these references with one or more of the other references in order to better achieve their common goals of more accurate and efficient physiological monitoring.

Three Wavelength References: For example, charted reference **Basu**, as well as numerous other references such as **Lisogurski**, **Lamego**, **LeBoeuf**, **Poeze**, and **Valencell** all include teachings related to physiological measurement systems. These references provide numerous methods for using three optical wavelengths for measuring at least a portion of the one or more of the physiological parameters and using one of said wavelengths to improve measurement of at least one of the one or more physiological parameters using the output signal corresponding to the other two optical wavelengths. For example, **Lisogurski** discloses that its light source "emit photonic signals having one or more wavelength of light" and "include any number of light sources with any suitable characteristics." Lisogurski, 10:48-60, 10:65-11:6, 17:17-39. For example, **Basu** teaches "three LEDs 14, 14′, and 15 may all emit different wavelengths. LEDs 15, and 14, for example, may emit light in the red and IR spectrum, respectively, while LED 14′ may emit light at a wavelength at which the presence of falsifying components can be detected." Basu, [0109]. For example, **Lamego** teaches a multiwavelength physiological monitor "utiliz[ing] at least three different wavelengths of light . . . to determine blood oxygen saturation," and that "adding wave lengths sensitive to additional significant absorbers can help the system compensate for the additional significant absorbers and enable more accurate calculation of the concentration of each absorber and the blood oxygen saturation." Lamego, [0033], [0035]; *see also* Lamego [0034], [0036]-[0037], [0041]. For example, **LeBoeuf** teaches"[t]he optical detectors 26 and emitters 24 may be of multiple wavelengths, with the goal

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

of providing specialized physiological information for each wavelength. Referring to FIG. 19, for example, violet or UV light may be used to measure motion-related aspects of the ear, as violet and UV light may not penetrate greatly through the skin of the ear. Green, red, and IR wavelengths may have deeper penetration and provide information on the blood vessels and blood analyte levels. Blue wavelengths may be particularly useful for gauging changes in the size of the blood vessels." LeBoeuf, [0153]; *see also* LeBouef, [0163]. For example, **Poeze** teaches "the emitter 504 of the data collection device 112 can emit, in certain embodiments, combinations of optical radiation in various bands of interest. For example, in some embodiments, for analytes like glucose, the emitter 504 can emit optical radiation at three (3) or more wavelengths between about 1600 nm to about 1700 nm. In particular, the emitter 504 can emit optical radiation at or about 1610 nm, about 1640 nm, and about 1665 nm. In some circumstances, the use of three wavelengths within about 1600 nm to about 1700 nm enable sufficient SNRs of about 100 dB, which can result in a measurement accuracy of about 20 mg/dL or better for analytes like glucose." Poeze, [0109]; *see also* Poeze, [0108], [0110]-[0116]. For example, **Valencell** teaches "collecting light at different wavelengths, and processing these signals collectively, can be used to generate assessments of blood gas levels, such as blood oxygen (SpO2) and carbon dioxide (SpCO2), blood hemoglobin types and levels, or other blood constituents and their respective concentration levels. Multiple wavelengths may be generated by a signal multiwavelength optical emitter, multiple optical emitters, optically filtered optical emitters, or the like. In such case, multiple optical emitters 102 may be located between the two optical filters 715." Valencell, [0130].

A person of skill in the art would understand that the functionality taught in these references could be added to other methods and systems that concern physiological monitoring. These methods and systems provide the benefit of increased accuracy in measuring physiological

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

parameters. Moreover, to the extent that any of these references includes a feature not expressly disclosed in one or more other references, a POSITA would have naturally looked to, and been motivated to combine, any one of these references with one or more of the other references in order to better achieve their common goals of more accurate and efficient physiological monitoring.

Six LED References: For example, charted reference **Lamego**, as well as numerous other references such as **LeBoeuf**, **Lisogurski**, and **Pologe** all include teachings related to physiological measurement systems. These references provide numerous means for utilizing a plurality of semiconductor sources comprising six light emitting diodes. For example, **Lamego** teaches a multiwavelength physiological monitor "includ[ing] . . . six . . . LEDs of different wavelengths," and that "adding wave lengths sensitive to additional significant absorbers can help the system compensate for the additional significant absorbers and enable more accurate calculation of the concentration of each absorber and the blood oxygen saturation." Lamego, [0041], [0035]; *see also* Lamego [0033]-[0034], [0036]-[0037]. For example, **LeBoeuf** teaches utilizing "multiple light emitters… of different wavelengths." LeBoeuf, [0163]. For example, **Lisogurski** teaches "that light source 130 may include any number of light sources with any suitable characteristics," and that light source 130 ma include LEDs. Lisogurski, 10:42-11:8. For example, **Pologe** teaches a "main test unit 12 includes: an emitter module 18 having a plurality of emitters 20," and that the "emitters 20 may include…light emitting diodes (LEDs)." Pologe, 4:63-65, 5:16-20.

A person of skill in the art would understand that the functionality taught in these references could be added to other methods and systems that concern physiological monitoring. These methods and systems provide the benefit of increased accuracy in measuring physiological parameters. Moreover, to the extent that any of these references includes a feature not expressly disclosed in one or more other references, a POSITA would have naturally looked to, and been

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

motivated to combine, any one of these references with one or more of the other references in order to better achieve their common goals of more accurate and efficient physiological monitoring.

Smartphone/Tablet References: For example, charted reference **Basu**, as well as numerous other references such as **Kassim**, **Kreger**, **Lisogurski**, **Tran**, all include teachings related to physiological measurement systems. These references provide numerous means for a physiological monitoring system to be configured for use with a smart phone or tablet. For example, **Basu** teaches "health ring 44 which can monitor heart rate on a 24 hour basis," and that "combines the sensor with a…wireless transmitter linked to an application running on the user's cell phone." Basu, [0065]-[0066]. For example, **Kassim** teaches "[t]he optical measurement device 300 further comprises a coupling member 316 that can provide coupling between the measurement device 300 to a personal mobile processing device/feedback unit (not shown) in a cableless configuration," and that "the feedback unit may be a portable device, such as a mobile phone, smartphone, personal digital assistant (PDA), tablet, netbook or laptop, although this list is not exhaustive by any means." Kassim, 12:5-14. For example, **Kreger** teaches a "biosensor interface apparatus for use with a mobile communication device 10," that "can be any of a number of mobile phones such as an iPhone® or an Android® phone, a personal digital assistant (PDA) such as a Blackberry®, a portable audio playback device such as an MP3 player, a portable media playback device such as an iPod®, or a handheld tablet such as an iPad®." Kreger, 5:40-53; *see also* Kreger, 7:39-46. For example, **Lisogurski** teaches a "monitor [that] may be powered by a battery" with a "[u]ser interface [which] may include user input 182, display 184, and speaker 186. User input 182 may include any type of user input device such as a keyboard, a mouse, a touch screen, buttons, switches, a microphone, a joy stick, a touch pad, or any other suitable input device." Lisogurski, 15:19-23, 18:65-67. For example, **Mault** teaches a blood glucose monitoring

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

system including an electronic device that "can be a portable electronic device or system carried by the person, or a device or system combining multiple functionalities, such as:…a portable computer; any portable Internet access device; [or] a wireless phone…." Mault [0069]-[0070]. For example, **Poeze** teaches "a personal health organizer software module 132 executed on a general purpose computing device 126, with the computing device 126 coupled with the health data collection device 112 via a communications link 128," where the "personal health organizer module 132 can be an executable program on an operating system of a device such as a mobile phone, a personal digital assistant, a portable music player, an electronic book reader, a netbook, a TV media center, and a laptop or desktop computer. For example, the personal health organizer module 132 can be an application that is executed on the operating system of a mobile phone such as the iPhone manufactured by Apple, Inc., a Blackberry device manufactured by Research In Motion, Inc., the Pre manufactured by Palm, Inc, or a mobile device manufactured by HTC, Nokia, or Motorola, etc." Poeze, [0034]; *see also* Poeze [0010]. **Tran** teaches that while a patient with a wearable device is outside a mesh network range, "the wearable appliance communicates with the cell phone and provides information to the server 200 using the cellular connection." Tran, 34:4-30.

A person of skill in the art would understand that the functionality taught in these references could be added to other methods and systems that concern physiological monitoring. These methods and systems provide the benefit of more processing power and more convenient means to flag emergency situations. Moreover, to the extent that any of these references includes a feature not expressly disclosed in one or more other references, a POSITA would have naturally looked to, and been motivated to combine, any one of these references with one or more of the other

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

references in order to better achieve their common goals of more accurate and efficient physiological monitoring.

Synchronize Light Source/Detector References: For example, charted reference **Carlson**, as well as numerous other references such as **Jung**, **Lamego**, **Lisogurski**, and **Poeze** all include teachings related to physiological measurement systems. These references provide numerous methods for utilizing a detection system that is configured to be synchronized to the light source. For example, **Carlson** teaches using "AC-Coupling or Lock-In Amplification (synchronous detection), is to temporarily modulate the optical radiation of the LED at the carrier frequency fc in order to shift the power spectrum of the pulsoximeter signals into a higher frequency range where environmental optical radiation is unlikely and electronic band pass filtering is technologically less stringent." Carlson, [0064]-[0065]; *see also* Carlson, [0011]-[0020], [0018]-[0020], [0027]. For example, **Jung** discloses a spectrometer system were "three monochrome sources, however, are turned on and off rapidly, synchronous with the spectral measurements being taken at, for example, a rate of 1000 Hz." Jung, 68:13-33. For example, **Lamego** teaches a "digital-to-analog conversion circuit 338" that includes "a synchronizing latch 323" which "accepts the synchronizing pulses which maintain synchronization between the activation of emitters 302 and the analog to digital conversion circuit 332." Lamego, [0044]-[0045]; *see also* Lamego [0050]-[0051], [0069]. For example, **Lisogurski** teaches "light drive circuitry 120 may generate a light drive signal, which may be used to turn on and off the light source 130, based on the timing control signals. The front end processing circuitry 150 may use the timing control signals to operate synchronously with light drive circuitry 120." Lisogurski, 11:41-12:9; *see also* Lisogurski, 12:52-13:6 9 ("The peaks of detector current waveform 214 may be synchronous with light 'on' periods driving one or more emitters of a light source, such as light

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Source 130 of FIG. 1."). For example, **Poeze** teaches a "data collection device 112" including "a driver 520 that drives the emitter 504," wherein "[t]he driver 520 can be synchronized with other parts of the sensor 116 and can minimize or reduce jitter in the timing of pulses of optical radiation emitted from the emitter 504." Poeze, [0116]-[0117].

A person of skill in the art would understand that the functionality taught in these references could be added to other methods and systems that concern physiological monitoring. These methods and systems provide increased accuracy for monitoring physiological parameters. Moreover, to the extent that any of these references includes a feature not expressly disclosed in one or more other references, a POSITA would have naturally looked to, and been motivated to combine, any one of these references with one or more of the other references in order to better achieve their common goals of more accurate and efficient physiological monitoring.

Arc References: For example, charted reference **Isaacson**, as well as numerous other references such as **Jung**, and **LeBoeuf** all include teachings related to physiological measurement systems. These references provide numerous methods for utilizing a plurality of semiconductor sources and the plurality of spatially separated detectors are located on one or more arcs. For example, **Isaacson** teaches emitters 10, 20 and detectors 12, 22 disposed on an arc. Isaacson, 4:64-5:9, Fig. 1. For example, **Jung** teaches "a fiber optic arrangement presented at the forward end of probe tip 1" which "utilizes a single central light source fiber optic…and a plurality of perimeter light receiver fiber optics, denoted as light receivers R1, R2 and R3." Jung, 11:21-50, Fig. 2; *see also* Jung 24:39-48, 24:39-62, 32:66-33:9, 39:41-40:14, Figs. 9, 10A-B, 20, 28A-B. For example, **LeBoeuf** teaches optical emitters 24 and optical detectors 26 configured in an arc. LeBoeuf, [0123]-[1024], Fig. 8B

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

A person of skill in the art would understand that the functionality taught in these references could be added to other methods and systems that concern physiological monitoring. These methods provide the benefit of better acquisition of signals from the samples. Moreover, to the extent that any of these references includes a feature not expressly disclosed in one or more other references, a POSITA would have naturally looked to, and been motivated to combine, any one of these references with one or more of the other references in order to better achieve their common goals of more accurate and efficient physiological monitoring.

b. Combinations

For at least the reasons described above, it would have been obvious to one of ordinary skill in the art to combine each prior art reference listed in Appendix E with any other reference or references listed in Appendix E along with the knowledge of one of ordinary skill in the art to arrive at the inventions claims in the ’455 Patent.

For example, and without limitation, the Asserted Claims of the ’455 Patent would have been obvious to one of ordinary skill in the art in view of the following combinations:

(i) Lisogurski, Kassim, Chandrasekar2012, Valencell, Mault, and Basu Combined with Lens References

A POSITA would have had reason to combine references **Lisogurski**, **Kassim**, **Chandrasekar2012**, **Valencell**, **Mault**, or **Basu**, or any of the references in Appendix E, with any one of Lens References all of which relate to systems and methods for physiological monitoring. Each of references **Carlson**, **LeBoeuf**, **Poeze**, **Pologe**, and **Valencell** relate to physiological monitoring systems utilizing lenses. Indeed, such components and/or processes were conventional as of the time these references were known. Each of Lens References provide means—not necessarily expressly present in all other references—for a wearable device comprising one or more lenses configured to receive at least a portion of the output optical light and to deliver a lens

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

output light to tissue. A POSITA would have understood that the systems and methods for Lens References were intended to be incorporated into wearable measurement devices. A POSITA would understand that systems and methods for wearable device comprising one or more lenses configured to receive at least a portion of the output optical light and to deliver a lens output light to tissue provide improvements such as focusing output optical light to increase the intensity of the light transmitted to the wearer's tissue thereby reducing the light source's power consumption, reducing the detrimental effects of ambient light, reducing the loss of energy due to scattered light, and increasing signal-to-noise ratio. *E.g.*, Carlson, [0014] (lens system "increase[s] the optical signal power, detected by the pulsoximeter sensor, and thus increase[s] the Signal/Noise-and signal/Background ratio."); LeBoeuf, [0114] ("Lenses 29L are configured to focus inspection light 111 onto a particular region of the ear."). Valencell, [0017] ("The first lens focuses light emitted by the optical emitter…."). A POSITA would further understand that in order to implement a wearable measurement device, the systems and methods for optical measurement systems would commonly be combined with lens systems, and thus a POSITA would have been motivated to combine the teachings of these references. The combination would apply known techniques of including basic optical components, to wearable measurement devices that were ready for improvement, in order to yield predictable results. The combination would further be "obvious to try," because it would involve simple design choices from a finite number of identified, predictable solutions, with a reasonable expectation of success.

(ii) Lisogurski, Kassim, Chandrasekar2012, Valencell, Mault, and Basu Combined with Light Intensity References

A POSITA would have had reason to combine references **Lisogurski**, **Kassim**, **Chandrasekar2012**, **Valencell**, **Mault**, or **Basu**, or any of the references in Appendix E, with any one of Light Intensity References all of which relate to systems and methods for physiological

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

monitoring. Each of references **Basu, Kassim**, **Lisogurski**, and **Valencell** relate to physiological monitoring systems that utilize increased light intensity of their emitters to increase signal-to-noise ratio of their detection signal. Indeed, such components and/or processes were conventional as of the time these references were known. Each of Light Intensity References provide means—not necessarily expressly present in all other references—for improving signal-to-noise ratio by increasing the intensity of light sources. A POSITA would have understood that the systems and methods for Light Intensity References were intended to be incorporated into wearable measurement devices. A POSITA would understand that systems and methods for improving signal-to-noise ratio by increasing the intensity of light sources provide improvements such as increasing the accuracy of measured physiological parameters. *E.g.*, Basu, [0058] ("To maximize the signal-to-noise ratio in photoplethysmography, the LED intensity should be made as large as possible without saturating the detector."); Kassim, 16:27-35 ("[T]he effects of ambient light signals 30 can be reduced as much as possible by tuning the intensities of the IR and Red LEDs to be maximized as long as the detection assembly has not reached saturation."), Lisogurski 9:46-60 ("[S]ystem may increase the brightness of the light sources in response to the noise to improve the signal-to-noise ratio."); Valencell, [0123] ("[T]he intensity of the optical emitter 102 may be increased to increase the ratio of physiological optical scatter 111 from blood vessels with respect to unwanted sunlight."). A POSITA would further understand that in order to implement a wearable measurement device, the systems and methods for optical measurements systems would commonly be combined with circuity coupled to light sources that allow for the control of the light source's parameters, such as light intensity, and thus a POSITA would have been motivated to combine the teachings of these references. The combination would apply known techniques of allowing for the variability of light source parameters to wearable measurement devices that were

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

ready for improvement, in order to yield predictable results. The combination would further be "obvious to try," because it would involve simple design choices from a finite number of identified, predictable solutions, with a reasonable expectation of success.

(iii) Lisogurski, Kassim, Chandrasekar2012, Valencell, Mault, and Basu Combined with Three Wavelength References

A POSITA would have had reason to combine references **Lisogurski**, **Kassim**, **Chandrasekar2012**, **Valencell**, **Mault**, or **Basu**, or any of the references in Appendix E, with any one of Three Wavelength References all of which relate to systems and methods for physiological monitoring. Each of references **Basu**, **Lamego**, **LeBoeuf**, **Poeze**, and **Valencell** relate to physiological monitoring systems utilizing three wavelengths and using one of said wavelengths to improve measurement of at least one of the one or more physiological parameters using the output signal corresponding to the other two optical wavelengths. Indeed, such components and/or processes were conventional as of the time these references were known. Each of Three Wavelength References provide means—not necessarily expressly present in all other references—for using three optical wavelengths for measuring at least a portion of the one or more of the physiological parameters or using one of said wavelengths to improve measurement of at least one of the one or more physiological parameters using the output signal corresponding to the other two optical wavelengths. A POSITA would have understood that the systems and methods for Three Wavelength References were intended to be incorporated into wearable measurement devices. A POSITA would understand that systems and methods for utilizing three optical wavelengths provide improvements such as the ability to target different physiological absorbers according to their wavelength sensitivity and therefore providing for more accurate measurements. *E.g.*, Basu, [0109] ("It is known that certain factors may render pulse oximetry unreliable because the presence of other components (e.g. methemoglobin or carboxyhemoglobin) in the blood may

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

mimic the absorption of oxyhemoglobin at the IR LED frequency so that the reading is falsified. Such errors can be minimized by adding a third LED emitting light of a wavelength at which the component shows a different behavior than oxyhemoglobin and reduced hemoglobin."); Lamego, [0035] ("[A]dding wave lengths sensitive to additional significant absorbers can help the system compensate for the additional significant absorbers and enable more accurate calculation of the concentration of each absorber and the blood oxygen saturation."); Poeze, [0109] ("[T]he use of three wavelengths within about 1600 nm to about 1700 nm enable sufficient SNRs of about 100 dB, which can result in a measurement accuracy of about 20 mg/dL or better for analytes like glucose."). A POSITA would further understand that in order to implement a wearable measurement device, the systems and methods for multiwavelength emitters would commonly be combined with optical measurement systems, and thus a POSITA would have been motivated to combine the teachings of these references. The combination would apply known techniques of the variability of light source parameters, to wearable measurement devices that were ready for improvement, in order to yield predictable results. The combination would further be "obvious to try," because it would involve simple design choices from a finite number of identified, predictable solutions, with a reasonable expectation of success.

(iv) Lisogurski, Kassim, Chandrasekar2012, Valencell, Mault, and Basu Combined with Six LED References

A POSITA would have had reason to combine references **Lisogurski**, **Kassim**, **Chandrasekar2012**, **Valencell**, **Mault**, or **Basu**, or any of the references in Appendix E, with any one of Six LED References all of which relate to systems and methods for physiological monitoring. Each of references **Lamego**, **LeBoeuf**, **Lisogurski**, and **Pologe** relate to physiological monitoring systems using multiple LEDs as emitters. Indeed, such components and/or processes were conventional as of the time these references were known. Each of Six LED References

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

provide means—not necessarily expressly present in all other references—for utilizing six LED optical emitters in a light source. A POSITA would have understood that the systems and methods for Six LED References were intended to be incorporated into wearable measurement devices. A POSITA would understand that systems and methods for utilizing six LEDs provide improvements such as the ability to target different physiological absorbers according to their wavelength sensitivity and therefore providing for more accurate measurements, increasing intensity of optical output light, and reducing the detrimental effects on ambient light. *E.g.*, Lamego, [0035] ("[A]dding wave lengths sensitive to additional significant absorbers can help the system compensate for the additional significant absorbers and enable more accurate calculation of the concentration of each absorber and the blood oxygen saturation."). A POSITA would further understand that in order to implement a wearable measurement device, the systems and methods for optical physiological measurement would commonly be combined with multiple LED emitters and thus a POSITA would have been motivated to combine the teachings of these references. The combination would apply known techniques for increasing the number of optical emitters in a light to wearable measurement devices that were ready for improvement, in order to yield predictable results. The combination would further be "obvious to try," because it would involve simple design choices from a finite number of identified, predictable solutions, with a reasonable expectation of success.

(v) Lisogurski, Kassim, Chandrasekar2012, Valencell, Mault, and Basu Combined with Smartphone/Tablet References

A POSITA would have had reason to combine references **Lisogurski**, **Kassim**, **Chandrasekar2012**, **Valencell**, **Mault**, or **Basu**, or any of the references in Appendix E, with any one of Smartphone/Tablet References all of which relate to systems and methods for physiological monitoring. Each of references **Basu**, **Kassim**, **Kreger**, **Lisogurski**, **Mault**, **Poeze**, and **Tran**

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

relate to physiological monitoring systems for use with a smartphone or tablet. Indeed, such components and/or processes were conventional as of the time these references were known. Each of Smartphone/Tablet References provide means—not necessarily expressly present in all other references—for a physiological monitoring system to communicate with a smartphone or tablet. A POSITA would have understood that the systems and methods for Smartphone/Tablet References were intended to be incorporated into wearable measurement devices. A POSITA would understand that systems and methods for connectivity to smartphones or tablets provide improvements improving the analysis capabilities of measurement systems due to the increased processing power of smartphones and tablets and the additional resources provided by their ability to connect to wireless and cell networks. *E.g.*, Basu, [0066] (physiological monitoring system "combines the sensor with a…wireless transmitter linked to an application running on the user's cell phone."); Kreger, 13:1-3 ("Mobile device smart phone 444 may derive measurements, display plots, transmit medical records of biosensor data, and so forth."); Tran, 34:4-40 ("If the wearable appliance detects a cellphone that is mesh network compatible, the wearable appliance communicates with the cell phone and provides information to the server 200 using the cellular connection."). A POSITA would further understand that in order to implement a wearable measurement device, the systems and methods for optical physiological measurement would commonly be combined with smartphone and personal computing technology and thus a POSITA would have been motivated to combine the teachings of these references. The combination would apply known techniques of providing for connectivity to smartphone or personal computing devices in wearable measurement devices that were ready for improvement, in order to yield predictable results. The combination would further be "obvious to try," because it would involve

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

simple design choices from a finite number of identified, predictable solutions, with a reasonable expectation of success.

References Lisogurski and Basu Combined with Synchronize Light Source/Detector References

A POSITA would have had reason to combine references **Lisogurski** or **Basu**, or any of the references in Appendix E, with any one of Synchronize Light Source/Detector References all of which relate to systems and methods for physiological monitoring. Each of references **Carlson**, **Jung**, **Lamego**, **Lisogurski**, and **Poeze** relate to physiological monitoring systems that synchronize their detection systems to the their light sources. Indeed, such components and/or processes were conventional as of the time these references were known. Each of Synchronize Light Source/Detector References provide means—not necessarily expressly present in all other references—for synchronizing the sampling of a detector to the output of a light source. A POSITA would have understood that the systems and methods for Synchronize Light Source/Detector References were intended to be incorporated into wearable measurement devices. A POSITA would understand that systems and methods for synchronizing the sampling of a detector to the output of a light source provide improvements such as increased measurement accuracy. *E.g.*, Carlson, [0065] ("AC-Coupling or Lock-In Amplification (synchronous detection), is to temporarily modulate the optical radiation of the LED at the carrier frequency fc in order to shift the power spectrum of the pulsoximeter signals into a higher frequency range where environmental optical radiation is unlikely and electronic band pass filtering is technologically less stringent."); Lamego, [0045] ("[D]river circuit," including "synchronizing latch 323 [that] accepts the synchronizing pulses which maintain synchronization between the activation of emitters 302 and the analog to digital conversion circuit 332" "is designed to minimize the noise from the emitters 302."); Poeze, [0117] ("The driver 520 can be synchronized with other parts of the sensor 116 and can minimize or reduce jitter in the timing of pulses of

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

optical radiation emitted from the emitter 504."). A POSITA would further understand that in order to implement a wearable measurement device, the systems and methods for optical measurement would commonly be combined with detector and light source synchronization, and thus a POSITA would have been motivated to combine the teachings of these references. The combination would apply known techniques for varying the collection parameters of a detection system and the output parameters of light source in wearable measurement devices that were ready for improvement, in order to yield predictable results. The combination would further be "obvious to try," because it would involve simple design choices from a finite number of identified, predictable solutions, with a reasonable expectation of success.

(vi) Lisogurski, Kassim, Chandrasekar2012, Valencell, Mault, and Basu Combined with Arc References

A POSITA would have had reason to combine references **Lisogurski**, **Kassim**, **Chandrasekar2012**, **Valencell**, **Mault**, or **Basu**, or any of the references in Appendix E, with any one of Arc References all of which relate to systems and methods for physiological monitoring. Each of references **Isaacson**, **Jung**, and **LeBoeuf** relate to physiological monitoring systems with their light sources and/or detectors configured in an arc. Indeed, such components and/or processes were conventional as of the time these references were known. Each of Arc References provide means—not necessarily expressly present in all other references—for configuring the detectors and/or emitters of a physiological measurement system in an arc formation. A POSITA would have understood that the systems and methods for Arc References were intended to be incorporated into wearable measurement devices. A POSITA would understand that systems and methods for configuring optical detectors and emitters in an arc formation would provide improvements such as increased measurement accuracy due to lessening the negative effects of light scattering and accounting for the contours of the tissue sample that is being measured. A

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

POSITA would further understand that in order to implement a wearable measurement device, the systems and methods for optical measurement would commonly be combined detectors and emitters in an arc formation, and thus a POSITA would have been motivated to combine the teachings of these references. The combination would apply known techniques for varying the spatial configurations of emitters and detectors in wearable measurement devices that were ready for improvement, in order to yield predictable results. The combination would further be "obvious to try," because it would involve simple design choices from a finite number of identified, predictable solutions, with a reasonable expectation of success.

Furthermore, to the extent any limitation of an Asserted Claim is deemed not to be exactly disclosed by an item of prior art, then the claim is rendered obvious by combination of the prior art in Exhibits E1 through E18 standing alone, in combination with the reference(s) in any other claim chart, in combination with any system art identified in Table 2-E, in combination with Applicant's Admitted Prior Art, in view of the knowledge of a person of ordinary skill in the art, and/or in view of the Lens References, Light Intensity References, Three Wavelength References, Six LED References, Smartphone/Tablet References, Synchronize Light Source/Detector References, and/or Arc References for the reasons discussed above.

6. U.S. Patent No. 12,193,790

Pursuant to P.R. 3-3(a) and (b), Defendants identify in Appendix F the prior art references that render obvious the Asserted Claims of the '790 Patent and include below exemplary combinations showing the obviousness of the '790 Patent Asserted Claims in view of the prior art. To the extent Plaintiff contends that an element is not disclosed in any one of the anticipatory references described in Appendix F, the limitation would have been obvious in light of the disclosures within the reference and the knowledge of one of ordinary skill in the art at the time of the '790 Patent. Moreover, to the extent Plaintiff contends that an element is not disclosed in any

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

one of the anticipatory references described in Appendix F, such reference may be combined with any other references listed in Appendix F for such element, thereby rendering the claims invalid for obviousness. To the extent a finder of fact determines that a limitation of any of the '790 Patent Asserted Claims is not disclosed by one of the references identified above pursuant to P.R. 3-3(a), the claim is nevertheless unpatentable as obvious because they contain nothing that constitutes a patentable innovation. To the extent a finder of fact determines that a limitation of the '790 Patent Asserted Claims is not anticipated, it does not go beyond combining familiar elements according to known methods to achieve predictable results or does more than choose between clear alternatives known to those of ordinary skill in the art.

a. Obviousness Rationale and Motivations to Combine

Obviousness: For at least the reasons described in these contentions, it would have been obvious to one of ordinary skill in the art to combine any of a number of prior art references, including any combination of those prior art references identified in Appendix F along with the knowledge of one of ordinary skill in the art to meet the limitations of the '790 Patent Asserted Claims. As a result, the references identified herein render one or more Asserted Claims of the '790 Patent obvious when the references are read in combination with each other, and/or when read in view of the state of the art and knowledge of those skilled in the art. Each and every reference identified is also relevant to the state of the art at the time of the alleged invention. Any of the references disclosed above may be combined with one another to render obvious (and therefore invalid) each of Omni's Asserted Claims. Defendants may rely upon a subset of the identified references or all of the references identified herein, including all references in Appendix F, for purposes of obviousness depending on the Court's claim construction, positions taken by Omni during this litigation, and further investigation and discovery.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Reservation of Rights: Moreover, as mentioned above, Defendants have not yet completed their search or discovery concerning additional prior art. As such, Defendants' inclusion of exemplary combinations does not preclude them from identifying other invalidating combinations as appropriate, and Defendants reserve the right to identify additional specific combinations as well as to detail and explain such combinations.

No More Than Ordinary Variations of Prior Art; No Unexpected Results: To the extent not anticipated, the '790 Patent Asserted Claims represent no more than the result of ordinary variations of the prior art. Defendants further believe that no showing of a specific motivation to combine prior art is required to combine the references disclosed above and in the attached charts, as each combination of art would have no unexpected results, and at most would simply represent a known alternative to one of ordinary skill in the art. *See KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 415-16 (2007) (rejecting the Federal Circuit's "rigid" application of the teaching, suggestion, or motivation to combine test, instead espousing an "expansive and flexible" approach); *Apple Inc. v. Samsung Elecs. Co.*, 839 F.3d 1034, 1058 (Fed. Cir. 2016); *Intercontinental Great Brands LLC v. Kellogg N. Am. Co.*, 869 F.3d 1336, 1344 (Fed. Cir. 2017). Indeed, the Supreme Court held that a person of ordinary skill in the art is "a person of ordinary creativity, not an automaton" and "in many cases a person of ordinary skill in the art will be able to fit the teachings of multiple patents together like pieces of a puzzle." *Id.* at 420-21. Nevertheless, in addition to the information contained elsewhere in these contentions, Defendants identify motivation and reason to combine the cited art.

Predictable Results; Obvious to Try: One or more combinations of the prior art references identified in Appendix F would have been obvious because these references would have been combined using: known methods to yield predictable results; known techniques in the same

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

way; a simple substitution of one known, equivalent element for another to obtain predictable results; and/or a teaching, suggestion, or motivation in the prior art generally. In addition, it would have been obvious to try combining the prior art references identified above because there were only a finite number of predictable solutions and/or because known work in one field of endeavor prompted variations based on predictable design incentives and/or market forces either in the same field or a different one. Further, the combinations of the prior art references identified in Appendix F would have been obvious because the combinations represent known potential options with a reasonable expectation of success.

Interrelated Teachings: Additional evidence that there would have been a motivation to combine the prior art references identified above includes the interrelated teachings of multiple prior art references; common authorship; the effects of demands known to the design community or present in the marketplace; the existence of a known problem for which there was an obvious solution encompassed by the '790 Patent Asserted Claims; the existence of a known need or problem in the field of the endeavor at the time of the alleged invention(s); and the background knowledge that would have been possessed by a person having ordinary skill in the art.

Summary of Motivations to Combine: Thus, the motivation to combine the teachings of the prior art references disclosed in Appendix F is found in the references themselves and also in: (1) the nature of the problem being solved; (2) the express, implied and inherent teachings of the prior art; (3) the knowledge of persons of ordinary skill in the art; (4) the predictable results obtained in combining the different elements of the prior art; (5) the predictable results obtained in simple substitution of one known element for another; (6) the use of a known technique to improve similar devices, methods, or products in the same way; (7) the predictable results obtained in applying a known technique to a known device, method, or product ready for improvement; (8)

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

the finite number of identified predictable solutions that had a reasonable expectation of success; and (9) known work in various technological fields that could be applied to the same or different technological fields based on design incentives or other market forces.

Same Area of Technology: Additionally, it would be obvious to one of ordinary skill in the art to consult and/or combine any of the prior art listed in Appendix F because all of these references relate to the same area of technology and/or are from analogous art. The '790 Patent Asserted Claims are directed to "An optical system comprises a wearable device for measuring one or more physiological parameters." '790 Patent at Abstract. The '790 Patent Asserted Claims merely unite old elements, well known in the field, with no change in their respective function or result. Given the interrelated teachings of the prior art, the effects of demands known to the design community or present in the marketplace, and the background knowledge possessed by a person having ordinary skill in the art, it would have been obvious for one of ordinary skill in the art to combine these familiar elements, disclosed and/or embodied in the prior art listed above to practice the '790 Patent Asserted Claims.

Same Technical Issues: A person of ordinary skill would have been motivated to combine the above prior art based on his/her knowledge, the nature of the problem to be solved, and the teachings of the prior art. The identified prior art addresses the same or similar technical issues and suggests the same or similar solutions to those issues. Moreover, some of the prior art refer to or discuss other prior art, illustrating the close technical relationship among the prior art. For the '790 Patent, one of ordinary skill in the art would have been motivated to combine known prior art solutions described in these references relating to wearable devices measuring physiological parameters.

Demand and Market Forces: For example, market forces suggested a demand for

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

wearable devices measuring physiological parameters, and thus one of skill in the art would have thought to combine or modify references that described known methods that one of skill in the art would have recognized as offering improvements to solutions of that time.

Known Elements; Obvious to Try: Moreover, many of the claim elements were already known as admitted by the applicant in the patent specification. These elements represented design choices available to a person of ordinary skill. When there is a design need or market pressure to solve a problem such as identified previously and/or described in the '790 Patent, and there are a finite number of identified, predictable solutions, a person of ordinary skill would be motivated to combine the known options that are within his or her technical grasp. For the '790 Patent, there are a finite number of approaches for providing a wearable device for measuring physiological parameters. For example, as of the priority date of the '790 Patent, a POSITA would have been very familiar with basic elements of the '790 Patent's claims such as semiconductors diodes, optical wavelengths, lenses, signal-to-noise ratio, detectors, and analog to digital convertors. Such elements were within the knowledge of a POSITA, whether or not disclosed in any particular reference, and the inclusion of such elements in the '790 Patent's claims does not render them novel or non-obvious.

There are significant similarities in subject matter and objectives for each of many references used in these contentions for the '790 Patent.

References disclosing lenses: For example, charted reference Carlson, Poeze, and Soller, as well as numerous other references such as LeBoeuf and Park, all include teachings related to using one or more lenses configured to receive a portion of at least one of the output optical lights and to direct a lens output light to tissue. These references provide numerous methods for using lenses to direct an optical output beam. For example, Carlson teaches "us[ing] a beam-shaping

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

element, such as e.g. diffractive or refractive lenses, to direct the emitted optical radiation of, e.g., the LED light source into the human or animal tissue and the photon detecting element in order to increase the optical signal power, detected by the pulsoximeter sensor, and thus increasing the Signal/Noise—and signal/Background ratio. The increase of the S/B ratio is estimated e.g. to a factor 5." Carlson at [0014]. Poeze teaches "[using] a lens which collects attenuated light exiting the measurement site and focuses onto one or more detectors. The protrusion can advantageously include plastic, including a hard opaque plastic, such as a black or other colored plastic, helpful in reducing light noise." Poeze at 7:52-8:7. Soller teaches "a variety of different collimating elements 56 can be used in sensor 10. Exemplary collimating elements include fiber faceplates (e.g., fiber optic windows), collimating hole devices, gradient index (GRIN) lenses, fiber bundles, lens arrays, optical windows (including shaped optical windows), and other similar devices." Soller at 18:37-56.

A person of skill in the art would understand that the functionality taught in these references could be added to other methods and systems that are concerned with using lenses to direct an optical output beam. These methods are known to be effective in directing an optical output beam using known lens structures. Moreover, to the extent that any of these references includes a feature not expressly disclosed in one or more other references, a POSITA would have naturally looked to, and been motivated to combine, any one of these references with one or more of the other references in order to better achieve their common goals of directing an optical output beam.

References disclosing techniques for increasing signal-to-noise ratio: For example, charted reference Basu, Lisogurski, and Carlson, as well as numerous other references such as LeBoeuf and Park, all include teachings related to increasing the signal-to-noise ratio of optical measurement systems by increasing a light intensity and increasing a pulse rate of an LED. These

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

references provide numerous methods for increasing a light intensity and increasing a pulse rate of an LED. For example, Basu teaches that "[t]o maximize the signal-to-noise ratio in photoplethysmography, the LED intensity should be made as large as possible without saturating the detector. In the OPS 10, the LED intensity and modulation frequencies are programmable through the serial interface. In the case of the Vishay VCNL4000, the intensity is programmable from 10-200 mA in 10 mA increments." Basu at [0058]. Lisogurski teaches "that modulation of the light drive signal . . . may include modulation of parameters including drive current or light brightness, duty cycle, firing rate, modulation parameters, other suitable parameters, or any combination thereof" and that "[t]he system may increase the brightness of the light sources in response to the noise to improve the signal-to-noise ratio." Lisogurski at 27:44-55, 9:46-60. Carlson teaches that the "frequency is chosen in such a way that it is outside the frequency spectrum of sunlight and of ambient light which, according to FIG. 7b, is in the range of above approximately 1000 Hz. Thus, the pulsoximeter signals are readily discriminated from electronic and parasitic contributions of environmental optical radiation outside the frequency fc+/−5 Hz increasing significantly the Signal-to-Noise and Signal-to-Background ratio." Carlson at [0069]. LeBoeuf teaches that "the intensity of the optical emitter 102 may be increased to increase the ratio of physiological optical scatter 111 from blood vessels with respect to unwanted sunlight" and that "it is important to consider the emitter pulsing frequency and sampling approach" because "choosing a frequency that is too low may result in unsatisfactory subtraction." LeBoeuf at [0123], [0139]. Park teaches that "the light source intensity may be increased to maintain the output signal from the light detector within a desired range of output values." Park at 16:8-20.

A person of skill in the art would understand that the functionality taught in these references could be added to other methods and systems that are concerned with improving signal-to-noise

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

ratio in optical measurement systems. These methods are known to be effective in improving the signal-to-noise ratio for such systems, and merely modulate the functioning of the existing LEDs in each system. Moreover, to the extent that any of these references includes a feature not expressly disclosed in one or more other references, a POSITA would have naturally looked to, and been motivated to combine, any one of these references with one or more of the other references in order to better achieve their common goals of improving signal-to-noise ratio.

References disclosing an analog to digital converter: For example, charted reference Basu, Goodman, Lisogurski, Rulkov, Moon, Poeze, Chandrasekar, Al-Ali, Kreger, and Sakai all include teachings related to an analog to digital converter. These references provide numerous methods for using an analog to digital converter coupled to a detector. For example, Basu discloses "a digital interface for communication with a microcontroller." Basu at [0007]. Goodman discloses "On board analog-to-digital converter A/D 44 (10 bit, 5 channel input) is used to convert the conditioned PPG signals at B and B′ into time sampled digital signals which are then provided to processing device 14. Goodman at 11:66-12:21. Lisogurski discloses a "[f]ront end processing circuitry 150 may perform various analog and digital processing of the detector signal." Lisogurski at 12:42-51. Rulkov discloses that "The microprocessor741 has a LED control715 connected to DAC702 for controlling the intensity of the LEDs737. The signal from the photodetector736 is transmitted to a high pass filter (HPF) 703 which sends it to an analog to digital converter704, and the signal from the photodetector737 is also sent directly to a second analog to digital converter704." Rulkov at 11:39-60. Moon discloses that "[a] filter removes any high-frequency noise (e.g. 60 Hz electrical noise) that is not related to the PPG waveform, and yields a preliminary waveform that is digitized with an analog-to-digital converter 176, and processed as described above to generate a DC portion of the PPG." Moon at [0091]. Poeze discloses "[f]ront-end

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

interfaces 108 may be implemented using transimpedance amplifiers that are coupled to analog to digital converters in a sigma delta converter." Poeze at 40:15-27. Chandrasekar discloses "In principle, PPGs are considered simple devices; however, in practice, implementation requires a careful design involving optics (multiple paths, alignments, leakage barriers) and mixed signal electronics (transimpedance amplifiers, analog digital conversion, drivers, modulators, filters)." Chandrasekar at 1. Kreger discloses "Biosensor signals may also be received by one or more RF receivers in the dock 246 (not shown) and communicated to the mobile 212 via wired electrical connector 246, for example, to allow the wireless sensor to utilize the features of the wired audio input's anti-alias filters and analog to digital converter as will be explained in detail below." Kreger at 10:14-28. Sakai discloses "A/D converter 2013 d which converts a voltage value of analog signal into 10-bit digital value." Al-Ali discloses "As shown in FIG. 2, the processor board 250 includes a front end signal conditioner 252, an analog-to-digital (A/D) converter 253, a digital signal processor (DSP) 258, a memory reader 256, emitter drivers 254 and digital-to-analog (D/A) converters 255." Al-Ai at [0045].

A person of skill in the art would understand that the functionality taught in these references could be added to other methods and systems that are concerned with incorporating an analog to digital converter into optical measurement systems. These methods are known to be effective in incorporating an analog to digital converter into such systems. Moreover, to the extent that any of these references includes a feature not expressly disclosed in one or more other references, a POSITA would have naturally looked to, and been motivated to combine, any one of these references with one or more of the other references in order to better achieve their common goals of signal processing.

References disclosing spatially separated detectors: For example, charted references

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Lisogurski, Poeze, Soller, and Terumoto, all include teachings related to using detectors that are spatially separated. These references provide numerous methods for using light detectors. For example, Lisogurski teaches that "[o]ne or more detector 318 may also be provided in sensor unit 312 for detecting the light that is reflected by or has traveled through the subject's tissue. Any suitable configuration of light source 316 and detector 318 may be used. In an embodiment, sensor unit 312 may include multiple light sources and detectors, which may be spaced apart." Lisogurski at 17:35-45. Poeze discloses that "multiple detectors are employed and arranged in a spatial geometry. This spatial geometry provides a diversity of path lengths among at least some of the detectors and allows for multiple bulk and pulsatile measurements that are robust." Poeze at 9:18-27. Soller discloses "a plurality of spectral detectors attached to the circuit board, each spectral detector being configured to analyze radiation derived from the radiation source" and depicts the detectors as spatially separated. Soller at 3:16-27; Fig. 34. Terumoto discloses "[t]he light sensor portions 101-1 to 101-n are located equally spaced from one another and to go round the armlet type housing 107 same as the fourth to sixth implementations." Terumoto at [0152].

A person of skill in the art would understand that the functionality taught in these references could be added to other methods and systems that detect light. These methods provide using detectors that are spatially separated. Moreover, to the extent that any of these references includes a feature not expressly disclosed in one or more other references, a POSITA would have naturally looked to, and been motivated to combine, any one of these references with one or more of the other references in order to better achieve their common goals of measuring physiological parameters.

References disclosing detection system is synchronized to the light source: For example, charted reference Lisogurski, Carlson, Poeze, Kreger, and Sakai all include teachings

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

related to detection system is synchronized to the light source. These references provide numerous methods for synchronizing detection system with the light source. For example, Lisogurski discloses "he front end processing circuitry 150 may use the timing control signals to operate synchronously with light drive circuitry 120. For example, front end processing circuitry 150 may synchronize the operation of an analog-to-digital converter and a demultiplexer with the light drive signal based on the timing control signals." Lisogurski at 11:33-49. Carlson discloses "[t]he basic idea of using AC-Coupling or Lock-In Amplification (synchronous detection), is to temporarily modulate the optical radiation of the LED at the carrier frequency fc in order to shift the power spectrum of the pulsoximeter signals into a higher frequency range where environmental optical radiation is unlikely and electronic band pass filtering is technologically less stringent. AC-Coupling or Lock-In Amplification is well known out of the state of the art and is described in literature 3." Carlson at [0065]. Poeze teaches that "[a] control signal can be useful in order to synchronize, minimize, or reduce jitter in the timing of pulses emitted from the emitter 104. Accordingly, this control signal can be useful in order to cause optical radiation pulses emitted from the emitter 104 to follow a precise timing and consistent pattern." Poeze at 15:27-48. Kreger discloses "Thus, it is another object to provide compatible signals to the mobile's electrical connectors which may involve transforming the biosensor signals to match requisite impedance and signal levels, eliminate noise, cancel DC noise and drift, demultiplex or multiplex multiple measurements, provide electrical isolation, serialization, synchronization, and so forth." Kreger at 3:17-23. Sakai discloses "he A/D converter 14 operates in synchronization with the light emission timing of the driver 12, to thereby convert the pulse wave detection signal detected upon light emission from the green LED 11 a and the body motion detection signal detected upon light emission from the infrared LED 11 b into digital data, and provides these digital data, as biological

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

information, to the information processor 20." Sakai at 5:66-6:9.

A person of skill in the art would understand that the functionality taught in these references could be added to other methods and systems that are concerned with measuring physiological parameters. These methods are known to be effective in incorporating synchronizing detection system with the light source. Moreover, to the extent that any of these references includes a feature not expressly disclosed in one or more other references, a POSITA would have naturally looked to, and been motivated to combine, any one of these references with one or more of the other references in order to better achieve their common goals of signal processing.

b. Combinations

For at least the reasons described above, it would have been obvious to one of ordinary skill in the art to combine each prior art reference listed in Appendix C with any other reference or references listed in Appendix C along with the knowledge of one of ordinary skill in the art to arrive at the inventions claims in the '790 Patent.

For example, and without limitation, the Asserted Claims of the '790 Patent would have been obvious to one of ordinary skill in the art in view of the following combinations:

(i) Rulkov, Basu, Goodman, Chandersekar, Kassim, Lisogurski, Moon, Terumoto, Al-Ali, Kreger, and Sakai combined with References disclosing lenses

A POSITA would have had reason to combine references Rulkov, Basu, Goodman, Kassim, Lisogurski, Moon, Terumoto, Al-Ali, Kreger, and Sakai with any one of References disclosing lenses, all of which relate to systems and methods for using lenses to direct an optical output beam. Each of References disclosing lenses relate to using one or more lenses configured to receive a portion of at least one of the output optical lights and to direct a lens output light to tissue. Indeed, such components and/or processes were conventional as of the time these references were known. Each of References disclosing lenses provide means—not necessarily

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

expressly present in all other references—for using lenses to direct an optical output beam. A POSITA would have understood that the systems and methods for References disclosing lenses were intended to be incorporated into wearable measurement devices. A POSITA would understand that systems and methods for using lenses provide improvements such as disrecting the light to tissue. A POSITA would further understand that in order to implement a wearable measurement device, the systems and methods for using lenses to direct an optical output beam would commonly be combined with optical measurement systems, and thus a POSITA would have been motivated to combine the teachings of these references. The combination would apply known techniques for using lenses to direct an optical output beam, to wearable measurement devices that were ready for improvement, in order to yield predictable results. The combination would further be "obvious to try," because it would involve simple design choices from a finite number of identified, predictable solutions, with a reasonable expectation of success.

(ii) Kassim, Rulkov, Goodman, Moon, Chandersekar, Poeze, Soller, Terumoto, Al-Ali, Kreger, and Sakai combined with References disclosing techniques for increasing signal-to-noise ratio

A POSITA would have had reason to combine Kassim, Rulkov, Goodman, Moon, Poeze, Soller, Terumoto, Al-Ali, Kreger, and Sakai with any one of References disclosing techniques for increasing signal-to-noise ratio, all of which relate to systems and methods for increasing a light intensity and increasing a pulse rate of an LED. Each of References disclosing techniques for increasing signal-to-noise ratio relate to increasing the signal-to-noise ratio of optical measurement systems by increasing a light intensity and increasing a pulse rate of an LED. Indeed, such components and/or processes were conventional as of the time these references were known. Each of References disclosing techniques for increasing signal-to-noise ratio

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

provide means—not necessarily expressly present in all other references—for increasing signal-to-noise ratio relate to increasing the signal-to-noise ratio of optical measurement systems by increasing a light intensity and increasing a pulse rate of an LED. A POSITA would have understood that the systems and methods for References disclosing techniques for increasing signal-to-noise ratio were intended to be incorporated into wearable measurement devices. A POSITA would understand that systems and methods for increasing a light intensity and increasing a pulse rate of an LED provide improvements such as increasing signal-to-noise ratio. A POSITA would further understand that in order to implement a wearable measurement device, the systems and methods for increasing signal-to-noise ratio would commonly be combined with optical measurement systems, and thus a POSITA would have been motivated to combine the teachings of these references. The combination would apply known techniques for increasing signal-to-noise ratio, to wearable measurement devices that were ready for improvement, in order to yield predictable results. The combination would further be "obvious to try," because it would involve simple design choices from a finite number of identified, predictable solutions, with a reasonable expectation of success.

(iii) Carlson, Kassim, Soller, Chandersekar, and Terumoto combined with References disclosing an analog to digital converter

A POSITA would have had reason to combine references Carlson, Kassim, Soller, and Terumoto with any one of References disclosing an analog to digital converter, all of which relate to systems and methods for using an analog to digital converter coupled to a detector. Indeed, such components and/or processes were conventional as of the time these references were known. Each of References disclosing an analog to digital converter provide means—not necessarily expressly present in all other references—for using an analog to digital converter coupled to a detector. A POSITA would have understood that the systems and methods for

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

References disclosing an analog to digital converter were intended to be incorporated into wearable measurement devices. A POSITA would understand that systems and methods for using an analog to digital converter provide improvements such as ability to process a signal digitally. A POSITA would further understand that in order to implement a wearable measurement device, the systems and methods for using an analog to digital converter would commonly be combined with optical measurement systems, and thus a POSITA would have been motivated to combine the teachings of these references. The combination would apply known techniques for using an analog to digital converter, to wearable measurement devices that were ready for improvement, in order to yield predictable results. The combination would further be "obvious to try," because it would involve simple design choices from a finite number of identified, predictable solutions, with a reasonable expectation of success.

(iv) Carlson, Rulkov, Chandersekar, Basu, Goodman, Kassim, Moon, Al-Ali, Kreger, and Sakai combined with References disclosing spatially separated detectors

A POSITA would have had reason to combine references Carlson, Rulkov, Chandersekar, Basu, Goodman, Kassim, Moon, Al-Ali, Kreger, and Sakai with any one of References disclosing spatially separated detectors all of which relate to systems and methods for using spatially separated detectors. Indeed, such components and/or processes were conventional as of the time these references were known. Each of References disclosing spatially separated detectors provide means—not necessarily expressly present in all other references—for using spatially separated detectors. A POSITA would have understood that the systems and methods for References disclosing spatially separated detectors were intended to be incorporated into wearable measurement devices. A POSITA would understand that systems and methods for spatially separated detectors provide improvements such as improved detection quality. A POSITA would further understand that in order to implement a wearable measurement device, the systems and

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

methods for measuring physiological parameters would commonly be combined with spatially separated detectors, and thus a POSITA would have been motivated to combine the teachings of these references. The combination would apply known techniques for using spatially separated detectors, to wearable measurement devices that were ready for improvement, in order to yield predictable results. The combination would further be "obvious to try," because it would involve simple design choices from a finite number of identified, predictable solutions, with a reasonable expectation of success.

(v) Rulkov, Chandersekar, Basu, Goodman, Kassim, Moon, Soller, Terumoto, and Al-Ali combined with References disclosing detection system is synchronized to the light source

A POSITA would have had reason to combine references Rulkov, Chandersekar, Basu, Goodman, Kassim, Moon, Soller, Terumoto, and Al-Ali with any one of References disclosing detection system is synchronized to the light source, all of which relate to systems and methods for synchronizing a detection system with a light source. Indeed, such components and/or processes were conventional as of the time these references were known. Each of References disclosing detection system is synchronized to the light source provide means—not necessarily expressly present in all other references—for synchronizing a detection system with a light source. A POSITA would have understood that the systems and methods for References disclosing detection system is synchronized to the light source were intended to be incorporated into wearable measurement devices. A POSITA would understand that systems and methods for synchronizing a detection system with a light source provide improvements such as improved detection. A POSITA would further understand that in order to implement a wearable measurement device, the systems and methods for measuring physiological parameters would commonly be combined with techniques for synchronizing a detection system with a light

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

source, and thus a POSITA would have been motivated to combine the teachings of these references. The combination would apply known techniques for synchronizing a detection system with a light source, to wearable measurement devices that were ready for improvement, in order to yield predictable results. The combination would further be "obvious to try," because it would involve simple design choices from a finite number of identified, predictable solutions, with a reasonable expectation of success.

Furthermore, to the extent any limitation of an Asserted Claim is deemed not to be exactly disclosed by an item of prior art, then the claim is rendered obvious by combination of the prior art in Exhibits F1 through F14 standing alone, in combination with the reference(s) in any other claim chart, in combination with any system art identified in Table 2-F, in combination with Applicant's Admitted Prior Art, in view of the knowledge of a person of ordinary skill in the art, and/or in view of the References disclosing lenses, References disclosing techniques for increasing signal-to-noise ratio, References disclosing an analog to digital converter, References disclosing spatially separated detectors, References disclosing detection system is synchronized to the light source, for the reasons discussed above.

V. P.R. 3-3(c) – Claim Charts

Pursuant to Rule 3-3(c), Defendants identify invalidity claim charts identifying disclosures in the references identified in Sections III-IV supra as to the Asserted Claims of the Asserted Patents are provided in attached Appendix A ('868 Patent), Appendix B ('533 Patent), Appendix C ('484 Patent), Appendix D ('304 Patent), Appendix E ('455 Patent), and Appendix F ('790 Patent).

Defendants have identified relevant portions and/or features of the prior art. However, the identified prior art may contain additional descriptions of or alternative support for the claim

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

limitations. Defendants may rely on uncited portions or features of the identified prior art, other documents, and expert testimony, to provide context or to aid in understanding the identified prior art and the state of the art. Citations to a particular figure in a reference include the caption and description of the figure and any text relating to the figure. Similarly, citations to particular text referring to a figure include the figure and caption as well. Portions relevant to dependent claims incorporate by reference the citations to the chain of claims from which that dependent claim derives. Likewise, portions related to subsequent limitations that refer to claim elements identified, described, and/or cited to in earlier limitations may rely on the citations related to those portions of the claim chart that identify and/or describe these elements.

Throughout the invalidity claim charts in Appendices A-F, Defendants provide exemplary citations showing where references disclose subject matter recited in preambles of the Asserted Claims, regardless of whether the preambles limit the claims. Defendants reserve the right to argue that the preambles are or are not limitations. Further, where an entry in a claim chart corresponding to a given limitation refers back to the discussion of another claim, the entry incorporates all evidence cited for the other claim.

As noted above, the asserted claims have not yet been construed. Additional portions of the references may become relevant after claim construction. Further, to the extent that any claim term is governed by 35 U.S.C. § 112 ¶ 6, the claim charts identify, by the citations provided, the structure(s), act(s), or material(s) in each reference performing the claimed function for each limitation of the asserted claims. Plaintiffs' claim construction positions, expert analysis and testimony, and additional discovery could all inform which portions of the references disclose a limitation, including under 35 U.S.C. § 112 ¶ 6, and whether any particular limitation is governed by 35 U.S.C. § 112 ¶ 6. Defendants' contentions are based on the information presently available,

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

and Defendants reserve all rights to provide their claim construction positions in accordance with the Docket Control Order in this case.

VI. P. R. 3-3(d) – Other Grounds for Invalidity

A. U.S. Patent No. 9,055,868

Pursuant to Rule 3-3(d), Defendants hereby identify grounds of invalidity for the '868 Patent based on lack of written description under 35 U.S.C. § 112, first paragraph; lack of enablement under 35 U.S.C. § 112, first paragraph; indefiniteness under 35 U.S.C. § 112, second paragraph; and indefiniteness under 35 U.S.C. § 112, sixth paragraph. These contentions shall not be construed as an admission that any claim construction advanced by Defendants in this case is in any way inconsistent, flawed, or erroneous. Nor should these contentions prevent Defendants from advancing claim construction and/or non-infringement positions in lieu of, or in addition to, invalidity positions. Further, these contentions shall not be construed as an admission of or acquiescence to Plaintiff's purported construction of the claim language or of other positions advanced by Plaintiff during the course of this litigation. Defendants' invalidity contentions under 35 U.S.C. § 112 may depend, in part, on the Court's claim construction, as well as Plaintiff's alleged scope of the '868 Patent Asserted Claims. Consequently, Defendants only identify the issues under 35 U.S.C. § 112 of which they are presently aware.

1. Lack of Written Description and/or Enablement Under 35 U.S.C. § 112, ¶ 1

The '868 Patent does not provide sufficient written description to establish that the inventors were in possession of the alleged inventions recited in the '868 Patent Asserted Claims at the time the '868 Patent was filed, at least as plaintiff appears to be asserting those limitations. *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010). In other words, the applicants did not describe their purported inventions in a manner that "reasonably conveys to

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date." *Id.* One of ordinary skill in the art would not have understood that the inventors were in possession of the full scope of the claimed apparatus and methods, at least as plaintiff appears to be asserting the claims. For example, the claims of the '868 Patent do not provide sufficient written description of the limitations listed below.

The specification of the '868 Patent also does not enable one of ordinary skill in the art to make and/or use certain recited elements of the '868 Patent Asserted Claims without undue experimentation, at least as plaintiff appears to be asserting those limitations. For example, the claims of the '868 Patent fail to sufficiently enable the limtiations listed below.

To the extent the following limitations are definite (under 35 U.S.C. § 112, ¶ 2), the application that became the '868 Patent fails to sufficiently describe or enable them as required by 35 U.S.C. § 112, ¶ 1:[9]

Term	Relevant Claim(s)
"a software application capable of generating data"	7
"a status of the user"	7
"at least a portion of the status or associated information"	7
"a multiplexer capable of combining the plurality of semiconductor diodes"	8

2. Invalidity Under 35 U.S.C. § 112, ¶ 2

"[T]he second paragraph of § 112 contains two requirements: first, the claim must set forth what the applicant regards as his invention, and second, it must do so with sufficient particularity and distinctness, *i.e.*, the claim must be sufficiently definite." *Allen Eng'g Corp. v. Bartell Indus., Inc.*, 299 F.3d 1336, 1348 (Fed. Cir. 2002) (internal quotation marks and alteration omitted).

[9] Listed claims also include all Asserted Claims dependent thereon, even if those claims are not individually listed.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

"Where it would be apparent to one of skill in the art, based on the specification, that the invention set forth in a claim is not what the patentee regarded as his invention," the claim is "invalid under § 112, paragraph 2." *Id.* at 1349. Several of the '868 Patent Asserted Claims are invalid because it would be apparent to one of skill in the art, based on the specification, that the invention set forth in these claims are not what the patentee regarded as his invention, at least as the claims are being asserted by the Plaintiff. *Id.* These claims are invalid under the "applicant regards" prong of § 112 at least because they contain elements that differ from and/or conflict with the '868 Patent's written description of the invention, at least as the claim elements are being asserted by Plaintiff, or because they omit elements that one of skill in the art would understand as part of the '868 Patent's invention based on the specification.

Independently, under § 112, ¶ 2, "a patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention." *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014). Several of the '868 Patent Asserted Claims are also invalid as indefinite under § 112, ¶ 2 because they fail to inform those skilled in the art about the scope of the invention with reasonable certainty and are indefinite.

The following limitations recited in the '868 Patent Asserted Claims are indefinite in whole, in part or in combination:[10]

Term	Relevant Claim(s)
"a part of a user's body comprising blood"	7
"physiological information associated with the user"	7
"wireless data"	7
"voice input signals and manually entered input signals"	7
"at least a portion of the status or associated information"	7

[10] Listed claims also include all Asserted Claims dependent thereon, even if those claims are not individually listed.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Term	Relevant Claim(s)
"a multiplexer capable of combining the plurality of semiconductor diodes"	8
"generating the input light beam comprising one or more wavelengths"	8
"adapted for use in a diagnostics"	9
"a plurality of associated wavelengths transmitted or reflected from the blood"	9

B. U.S. Patent No. 9,651,533

Pursuant to Rule 3-3(d), Defendants hereby identify grounds of invalidity for the '533 Patent based on lack of written description under 35 U.S.C. § 112, first paragraph; lack of enablement under 35 U.S.C. § 112, first paragraph; indefiniteness under 35 U.S.C. § 112, second paragraph; and indefiniteness under 35 U.S.C. § 112, sixth paragraph. These contentions shall not be construed as an admission that any claim construction advanced by Defendants in this case is in any way inconsistent, flawed, or erroneous. Nor should these contentions prevent Defendants from advancing claim construction and/or non-infringement positions in lieu of, or in addition to, invalidity positions. Further, these contentions shall not be construed as an admission of or acquiescence to Plaintiff's purported construction of the claim language or of other positions advanced by Plaintiff during the course of this litigation. Defendants' invalidity contentions under 35 U.S.C. § 112 may depend, in part, on the Court's claim construction, as well as Plaintiff's alleged scope of the '533 Patent Asserted Claims. Consequently, Defendants only identify the issues under 35 U.S.C. § 112 of which they are presently aware.

1. Lack of Written Description and/or Enablement Under 35 U.S.C. § 112, ¶ 1

The '533 Patent does not provide sufficient written description to establish that the inventors were in possession of the alleged inventions recited in the '533 Patent Asserted Claims at the time the '533 Patent was filed, at least as plaintiff appears to be asserting those limitations.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Ariad Pharms., Inc. v. Eli Lilly & Co., 598 F.3d 1336, 1351 (Fed. Cir. 2010). In other words, the applicants did not describe their purported inventions in a manner that "reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date." *Id.* One of ordinary skill in the art would not have understood that the inventors were in possession of the full scope of the claimed apparatus and methods, at least as plaintiff appears to be asserting the claims. For example, the claims of the '533 Patent do not provide sufficient written description of the limitations listed below.

The specification of the '533 Patent also does not enable one of ordinary skill in the art to make and/or use certain recited elements of the '533 Patent Asserted Claims without undue experimentation, at least as plaintiff appears to be asserting those limitations. For example, the claims of the '533 Patent fail to sufficiently enable the limtiations listed below.

To the extent the following limitations are definite (under 35 U.S.C. § 112, ¶ 2), the application that became the '533 Patent fails to sufficiently describe or enable them as required by 35 U.S.C. § 112, ¶ 1:[11]

Term	Relevant Claim(s)
"the light emitting diodes configured to generate an output optical beam with one or more optical wavelengths"	5
"the processed output signal"	5
"one of more detectors"	11
"to select a fraction of the one or more optical wavelengths"	11

2. Invalidity Under 35 U.S.C. § 112, ¶ 2

"[T]he second paragraph of § 112 contains two requirements: first, the claim must set forth what the applicant regards as his invention, and second, it must do so with sufficient particularity and distinctness, *i.e.*, the claim must be sufficiently definite." *Allen Eng'g Corp. v. Bartell Indus.,*

[11] Listed claims also include all Asserted Claims dependent thereon, even if those claims are not individually listed.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Inc., 299 F.3d 1336, 1348 (Fed. Cir. 2002) (internal quotation marks and alteration omitted). "Where it would be apparent to one of skill in the art, based on the specification, that the invention set forth in a claim is not what the patentee regarded as his invention," the claim is "invalid under § 112, paragraph 2." *Id.* at 1349. Several of the '533 Patent Asserted Claims are invalid because it would be apparent to one of skill in the art, based on the specification, that the invention set forth in these claims are not what the patentee regarded as his invention, at least as the claims are being asserted by the Plaintiff. *Id.* These claims are invalid under the "applicant regards" prong of § 112 at least because they contain elements that differ from and/or conflict with the '533 Patent's written description of the invention, at least as the claim elements are being asserted by Plaintiff, or because they omit elements that one of skill in the art would understand as part of the '533 Patent's invention based on the specification.

Independently, under § 112, ¶ 2, "a patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention." *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014). Several of the '533 Patent Asserted Claims are also invalid as indefinite under § 112, ¶ 2 because they fail to inform those skilled in the art about the scope of the invention with reasonable certainty and are indefinite.

The following limitations recited in the '533 Patent Asserted Claims are indefinite in whole, in part or in combination:[12]

Term	Relevant Claim(s)
"the light emitting diodes configured to generate an output optical beam with one or more optical wavelengths"	5
"the processed output signal"	5
"one of more detectors"	11

[12] Listed claims also include all Asserted Claims dependent thereon, even if those claims are not individually listed.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Term	Relevant Claim(s)
"to select a fraction of the one or more optical wavelengths"	11

C. U.S. Patent No. 10,517,484

Pursuant to Rule 3-3(d), Defendants hereby identify grounds of invalidity for the '484 Patent based on lack of written description under 35 U.S.C. § 112, first paragraph; lack of enablement under 35 U.S.C. § 112, first paragraph; indefiniteness under 35 U.S.C. § 112, second paragraph; and indefiniteness under 35 U.S.C. § 112, sixth paragraph. These contentions shall not be construed as an admission that any claim construction advanced by Defendants in this case is in any way inconsistent, flawed, or erroneous. Nor should these contentions prevent Defendants from advancing claim construction and/or non-infringement positions in lieu of, or in addition to, invalidity positions. Further, these contentions shall not be construed as an admission of or acquiescence to Plaintiff's purported construction of the claim language or of other positions advanced by Plaintiff during the course of this litigation. Defendants' invalidity contentions under 35 U.S.C. § 112 may depend, in part, on the Court's claim construction, as well as Plaintiff's alleged scope of the '484 Patent Asserted Claims. Consequently, Defendants only identify the issues under 35 U.S.C. § 112 of which they are presently aware.

1. Lack of Written Description and/or Enablement Under 35 U.S.C. § 112, ¶ 1

The '484 Patent does not provide sufficient written description to establish that the inventors were in possession of the alleged inventions recited in the '484 Patent Asserted Claims at the time the '484 Patent was filed, at least as plaintiff appears to be asserting those limitations. *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010). In other words, the applicants did not describe their purported inventions in a manner that "reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

date." *Id.* One of ordinary skill in the art would not have understood that the inventors were in possession of the full scope of the claimed apparatus and methods, at least as plaintiff appears to be asserting the claims. For example, the claims of the '484 Patent do not provide sufficient written description of the limitations listed below.

The specification of the '484 Patent also does not enable one of ordinary skill in the art to make and/or use certain recited elements of the '484 Patent Asserted Claims without undue experimentation, at least as plaintiff appears to be asserting those limitations. For example, the claims of the '484 Patent fail to sufficiently enable the limtiations listed below.

To the extent the following limitations are definite (under 35 U.S.C. § 112, ¶ 2), the application that became the '484 Patent fails to sufficiently describe or enable them as required by 35 U.S.C. § 112, ¶ 1:[13]

Term	Relevant Claim(s)
"wherein the output signal is indicative of one or more of the physiological parameters"	7-10
"increase the signal-to-noise ratio by comparing the first signal and the second signal"	7-10
"a property of at least some of the output signal is compared by at least one of the wearable device, the smart phone or tablet to a threshold"	8-10
"wherein the wearable device is at least in part configured to identify an object"	8-10
"wherein the wearable device is configured to use artificial intelligence to process at least a portion of the output signal"	10

2. Invalidity Under 35 U.S.C. § 112, ¶ 2

"[T]he second paragraph of § 112 contains two requirements: first, the claim must set forth what the applicant regards as his invention, and second, it must do so with sufficient particularity and distinctness, *i.e.*, the claim must be sufficiently definite." *Allen Eng'g Corp. v. Bartell Indus.,*

[13] Listed claims also include all Asserted Claims dependent thereon, even if those claims are not individually listed.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Inc., 299 F.3d 1336, 1348 (Fed. Cir. 2002) (internal quotation marks and alteration omitted). "Where it would be apparent to one of skill in the art, based on the specification, that the invention set forth in a claim is not what the patentee regarded as his invention," the claim is "invalid under § 112, paragraph 2." *Id.* at 1349. Several of the '484 Patent Asserted Claims are invalid because it would be apparent to one of skill in the art, based on the specification, that the invention set forth in these claims are not what the patentee regarded as his invention, at least as the claims are being asserted by the Plaintiff. *Id.* These claims are invalid under the "applicant regards" prong of § 112 at least because they contain elements that differ from and/or conflict with the '484 Patent's written description of the invention, at least as the claim elements are being asserted by Plaintiff, or because they omit elements that one of skill in the art would understand as part of the '484 Patent's invention based on the specification.

Independently, under § 112, ¶ 2, "a patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention." *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014). Several of the '484 Patent Asserted Claims are also invalid as indefinite under § 112, ¶ 2 because they fail to inform those skilled in the art about the scope of the invention with reasonable certainty and are indefinite.

The following limitations recited in the '484 Patent Asserted Claims are indefinite in whole, in part or in combination:[14]

Term	Relevant Claim(s)
"spatially separated detectors"	7-10
"increase the signal-to-noise ratio by comparing the first signal and the second signal"	7-10

[14] Listed claims also include all Asserted Claims dependent thereon, even if those claims are not individually listed.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Term	Relevant Claim(s)
"wherein the detection system is configured to be synchronized to the light source"	7-10
"a cloud configured to receive over the wireless transmission link an output status"	7-10
"wherein the wearable device is at least in part configured to identify an object"	8-10
"gain configured to improve detection sensitivity"	9-10
"wherein the wearable device is configured to use artificial intelligence"	10

D. U.S. Patent No. 10,874,304

Pursuant to Rule 3-3(d), Defendants hereby identify grounds of invalidity for the '304 Patent based on lack of written description under 35 U.S.C. § 112, first paragraph; lack of enablement under 35 U.S.C. § 112, first paragraph; indefiniteness under 35 U.S.C. § 112, second paragraph; and indefiniteness under 35 U.S.C. § 112, sixth paragraph. These contentions shall not be construed as an admission that any claim construction advanced by Defendants in this case is in any way inconsistent, flawed, or erroneous. Nor should these contentions prevent Defendants from advancing claim construction and/or non-infringement positions in lieu of, or in addition to, invalidity positions. Further, these contentions shall not be construed as an admission of or acquiescence to Plaintiff's purported construction of the claim language or of other positions advanced by Plaintiff during the course of this litigation. Defendants' invalidity contentions under 35 U.S.C. § 112 may depend, in part, on the Court's claim construction, as well as Plaintiff's alleged scope of the '304 Patent Asserted Claims. Consequently, Defendants only identify the issues under 35 U.S.C. § 112 of which they are presently aware.

1. Lack of Written Description and/or Enablement Under 35 U.S.C. § 112, ¶ 1

The '304 Patent does not provide sufficient written description to establish that the inventors were in possession of the alleged inventions recited in the '304 Patent Asserted Claims

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

at the time the '304 Patent was filed, at least as plaintiff appears to be asserting those limitations. *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010). In other words, the applicants did not describe their purported inventions in a manner that "reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date." *Id.* One of ordinary skill in the art would not have understood that the inventors were in possession of the full scope of the claimed apparatus and methods, at least as plaintiff appears to be asserting the claims. For example, the claims of the '304 Patent do not provide sufficient written description of the limitations listed below.

The specification of the '304 Patent also does not enable one of ordinary skill in the art to make and/or use certain recited elements of the '304 Patent Asserted Claims without undue experimentation, at least as plaintiff appears to be asserting those limitations. For example, the claims of the '304 Patent fail to sufficiently enable the limitations listed below.

To the extent the following limitations are definite (under 35 U.S.C. § 112, ¶ 2), the application that became the '304 Patent fails to sufficiently describe or enable them as required by 35 U.S.C. § 112, ¶ 1:[15]

Term	Relevant Claim(s)
a cloud configured to receive over the wireless transmission link an output status comprising the at least a portion of the processed output signal, to process the received output status to generate processed data and to store the processed data, and wherein the cloud is capable of storing a history of at least a portion of the received output status over a specified period of time.	11
the light source configured to increase signal-to-noise ratio by increasing a light intensity relative to an initial light intensity from at least one of the plurality of semiconductor sources	11
wherein the measurement system is further configured to improve the signal-to-noise ratio by differencing the first signal and the second signal	11

[15] Listed claims also include all Asserted Claims dependent thereon, even if those claims are not individually listed.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Term	Relevant Claim(s)
wherein the light source is configured to further increase the signal-to-noise ratio by increasing a pulse rate of at least one of the plurality of semiconductor sources from an initial non-zero pulse rate	13
the receiver comprises a plurality of detectors arranged along a first arc, and wherein the plurality of semiconductor sources are arranged along a second arc that is offset from the first arc.	15, 21
wherein the first arc and the second arc are concentric	16, 22
the measurement device further configured to improve a signal-to-noise ratio of the input optical beam reflected from the tissue by: differencing the first signal and the second signal, and increasing the light intensity relative to the initial light intensity from at least one of the semiconductor sources	19
a measurement device including a light source comprising a plurality of semiconductor sources for measuring one or more physiological parameters	19
wherein the light source is configured to further improve the signal-to-noise ratio of the input optical beam reflected from the tissue by increasing a pulse rate of at least one of the plurality of semiconductor sources from an initial non-zero pulse rate	20

2. Invalidity Under 35 U.S.C. § 112, ¶ 2

"[T]he second paragraph of § 112 contains two requirements: first, the claim must set forth what the applicant regards as his invention, and second, it must do so with sufficient particularity and distinctness, *i.e.*, the claim must be sufficiently definite." *Allen Eng'g Corp. v. Bartell Indus., Inc.*, 299 F.3d 1336, 1348 (Fed. Cir. 2002) (internal quotation marks and alteration omitted). "Where it would be apparent to one of skill in the art, based on the specification, that the invention set forth in a claim is not what the patentee regarded as his invention," the claim is "invalid under § 112, paragraph 2." *Id.* at 1349. Several of the '304 Patent Asserted Claims are invalid because it would be apparent to one of skill in the art, based on the specification, that the invention set forth in these claims are not what the patentee regarded as his invention, at least as the claims are being asserted by the Plaintiff. *Id.* These claims are invalid under the "applicant regards" prong of § 112 at least because they contain elements that differ from and/or conflict with the '304 Patent's written description of the invention, at least as the claim elements are being asserted by Plaintiff, or

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

because they omit elements that one of skill in the art would understand as part of the '304 Patent's invention based on the specification.

Independently, under § 112, ¶ 2, "a patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention." *Nautilus, Inc. v. Biosig Instruments, Inc*., 572 U.S. 898, 901 (2014). Several of the '304 Patent Asserted Claims are also invalid as indefinite under § 112, ¶ 2 because they fail to inform those skilled in the art about the scope of the invention with reasonable certainty and are indefinite.

The following limitations recited in the '304 Patent Asserted Claims are indefinite in whole, in part or in combination:[16]

Term	Relevant Claim(s)
a receiver configured to: … synchronize to the light source	11
the light source configured to increase signal-to-noise ratio by increasing a light intensity relative to an initial light intensity from at least one of the plurality of semiconductor sources	11
wherein the measurement system is at least in part configured for selection or identification of an object	12
wherein the measurement system is configured to use artificial intelligence in making decisions	12
wherein the light source is configured to further increase the signal-to-noise ratio by increasing a pulse rate of at least one of the plurality of semiconductor sources from an initial non-zero pulse rate	13
the receiver comprises a plurality of detectors arranged along a first arc, and wherein the plurality of semiconductor sources are arranged along a second arc that is offset from the first arc.	15, 21
wherein the first arc and the second arc are concentric	16, 22
a receiver configured to: … synchronize to the modulation of the at least one of the semiconductor sources	19
the measurement device further configured to improve a signal-to-noise ratio of the input optical beam reflected from the tissue by:	19

[16] Listed claims also include all Asserted Claims dependent thereon, even if those claims are not individually listed.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Term	Relevant Claim(s)
differencing the first signal and the second signal, and increasing the light intensity relative to the initial light intensity from at least one of the semiconductor sources	
wherein the light source is configured to further improve the signal-to-noise ratio of the input optical beam reflected from the tissue by increasing a pulse rate of at least one of the plurality of semiconductor sources from an initial non-zero pulse rate	20

E. U.S. Patent No. 11,160,455

Pursuant to Rule 3-3(d), Defendants hereby identify grounds of invalidity for the '455 Patent based on lack of written description under 35 U.S.C. § 112, first paragraph; lack of enablement under 35 U.S.C. § 112, first paragraph; indefiniteness under 35 U.S.C. § 112, second paragraph; and indefiniteness under 35 U.S.C. § 112, sixth paragraph. These contentions shall not be construed as an admission that any claim construction advanced by Defendants in this case is in any way inconsistent, flawed, or erroneous. Nor should these contentions prevent Defendants from advancing claim construction and/or non-infringement positions in lieu of, or in addition to, invalidity positions. Further, these contentions shall not be construed as an admission of or acquiescence to Plaintiff's purported construction of the claim language or of other positions advanced by Plaintiff during the course of this litigation. Defendants' invalidity contentions under 35 U.S.C. § 112 may depend, in part, on the Court's claim construction, as well as Plaintiff's alleged scope of the '455 Patent Asserted Claims. Consequently, Defendants only identify the issues under 35 U.S.C. § 112 of which they are presently aware.

1. Lack of Written Description and/or Enablement Under 35 U.S.C. § 112, ¶ 1

The '455 Patent does not provide sufficient written description to establish that the inventors were in possession of the alleged inventions recited in the '455 Patent Asserted Claims at the time the '455 Patent was filed, at least as plaintiff appears to be asserting those limitations.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Ariad Pharms., Inc. v. Eli Lilly & Co., 598 F.3d 1336, 1351 (Fed. Cir. 2010). In other words, the applicants did not describe their purported inventions in a manner that "reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date." *Id.* One of ordinary skill in the art would not have understood that the inventors were in possession of the full scope of the claimed apparatus and methods, at least as plaintiff appears to be asserting the claims. For example, the claims of the '455 Patent do not provide sufficient written description of the limitations listed below.

The specification of the '455 Patent also does not enable one of ordinary skill in the art to make and/or use certain recited elements of the '455 Patent Asserted Claims without undue experimentation, at least as plaintiff appears to be asserting those limitations. For example, the claims of the '455 Patent fail to sufficiently enable the limtiations listed below.

To the extent the following limitations are definite (under 35 U.S.C. § 112, ¶ 2), the application that became the '455 Patent fails to sufficiently describe or enable them as required by 35 U.S.C. § 112, ¶ 1:[17]

Term	Relevant Claim(s)
A system for measuring one or more physiological parameters	1, 8, 15
the processed output signal	1, 8, 15
wherein the output signal is indicative of one or more of the physiological parameters	1, 8, 15
the wearable device configured to increase the signal-to-noise ratio by increasing light intensity of at least one of the [plurality of] semiconductor sources from an initial light intensity	1, 8, 15
increase the signal-to-noise ratio by comparing the first signal and the second signal	1, 8, 15
at least a portion of the one or more of the physiological parameters	1, 10
the plurality of semiconductor sources configured to generate an output optical light having a plurality of optical wavelengths	1

[17] Listed claims also include all Asserted Claims dependent thereon, even if those claims are not individually listed.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Term	Relevant Claim(s)
the plurality of semiconductor sources and the plurality of spatially separated detectors are located on one or more arcs	2, 9, 15
the light emitting diodes configured to generate an output optical light having one or more optical wavelengths	8, 15

2. Invalidity Under 35 U.S.C. § 112, ¶ 2

"[T]he second paragraph of § 112 contains two requirements: first, the claim must set forth what the applicant regards as his invention, and second, it must do so with sufficient particularity and distinctness, *i.e.*, the claim must be sufficiently definite." *Allen Eng'g Corp. v. Bartell Indus., Inc.*, 299 F.3d 1336, 1348 (Fed. Cir. 2002) (internal quotation marks and alteration omitted). "Where it would be apparent to one of skill in the art, based on the specification, that the invention set forth in a claim is not what the patentee regarded as his invention," the claim is "invalid under § 112, paragraph 2." *Id.* at 1349. Several of the '455 Patent Asserted Claims are invalid because it would be apparent to one of skill in the art, based on the specification, that the invention set forth in these claims are not what the patentee regarded as his invention, at least as the claims are being asserted by the Plaintiff. *Id.* These claims are invalid under the "applicant regards" prong of § 112 at least because they contain elements that differ from and/or conflict with the '455 Patent's written description of the invention, at least as the claim elements are being asserted by Plaintiff, or because they omit elements that one of skill in the art would understand as part of the '455 Patent's invention based on the specification.

Independently, under § 112, ¶ 2, "a patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention." *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014). Several of the '455 Patent Asserted Claims are also invalid as indefinite under § 112, ¶ 2 because they fail to inform those skilled in the art

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

about the scope of the invention with reasonable certainty and are indefinite.

The following limitations recited in the '455 Patent Asserted Claims are indefinite in whole, in part or in combination:[18]

Term	Relevant Claim(s)
spatially separated detectors	1, 2, 8, 9, 15
a plurality of detectors that are spatially separated from each other	1, 8, 15
wherein the detection system is configured to be synchronized to the light source	1, 8, 15
increase the signal-to-noise ratio by comparing the first signal and the second signal	1, 8, 15
the plurality of semiconductor sources configured to generate an output optical light having a plurality of optical wavelengths	1
the wearable device configured to increase the signal-to-noise ratio by increasing light intensity of at least one of the semiconductor sources from an initial light intensity	1
the plurality of semiconductor sources and the plurality of spatially separated detectors are located on one or more arcs	2, 9, 15
the light emitting diodes configured to generate an output optical light having one or more optical wavelengths	8, 15

F. U.S. Patent No. 12,193,790

Pursuant to Rule 3-3(d), Defendants hereby identify grounds of invalidity for the '790 Patent based on lack of written description under 35 U.S.C. § 112, first paragraph; lack of enablement under 35 U.S.C. § 112, first paragraph; indefiniteness under 35 U.S.C. § 112, second paragraph; and indefiniteness under 35 U.S.C. § 112, sixth paragraph. These contentions shall not be construed as an admission that any claim construction advanced by Defendants in this case is in any way inconsistent, flawed, or erroneous. Nor should these contentions prevent Defendants from advancing claim construction and/or non-infringement positions in lieu of, or in addition to, invalidity positions. Further, these contentions shall not be construed as an admission of or

[18] Listed claims also include all Asserted Claims dependent thereon, even if those claims are not individually listed.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

acquiescence to Plaintiff's purported construction of the claim language or of other positions advanced by Plaintiff during the course of this litigation. Defendants' invalidity contentions under 35 U.S.C. § 112 may depend, in part, on the Court's claim construction, as well as Plaintiff's alleged scope of the '790 Patent Asserted Claims. Consequently, Defendants only identify the issues under 35 U.S.C. § 112 of which they are presently aware.

1. Lack of Written Description and/or Enablement Under 35 U.S.C. § 112, ¶ 1

The '790 Patent does not provide sufficient written description to establish that the inventors were in possession of the alleged inventions recited in the '790 Patent Asserted Claims at the time the '790 Patent was filed, at least as plaintiff appears to be asserting those limitations. *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010). In other words, the applicants did not describe their purported inventions in a manner that "reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date." *Id.* One of ordinary skill in the art would not have understood that the inventors were in possession of the full scope of the claimed apparatus and methods, at least as plaintiff appears to be asserting the claims. For example, the claims of the '790 Patent do not provide sufficient written description of the limitations listed below.

The specification of the '790 Patent also does not enable one of ordinary skill in the art to make and/or use certain recited elements of the '790 Patent Asserted Claims without undue experimentation, at least as plaintiff appears to be asserting those limitations. For example, the claims of the '790 Patent fail to sufficiently enable the limtiations listed below.

To the extent the following limitations are definite (under 35 U.S.C. § 112, ¶ 2), the application that became the '790 Patent fails to sufficiently describe or enable them as required by

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

35 U.S.C. § 112, ¶ 1:[19]

Term	Relevant Claim(s)
"a wearable device for measuring one or more physiological parameters"	7
"signal is indicative of one or more of the physiological parameters"	7
"wherein the wearable device is at least in part configured to identify an object"	7

2. Invalidity Under 35 U.S.C. § 112, ¶ 2

"[T]he second paragraph of § 112 contains two requirements: first, the claim must set forth what the applicant regards as his invention, and second, it must do so with sufficient particularity and distinctness, *i.e.*, the claim must be sufficiently definite." *Allen Eng'g Corp. v. Bartell Indus., Inc.*, 299 F.3d 1336, 1348 (Fed. Cir. 2002) (internal quotation marks and alteration omitted). "Where it would be apparent to one of skill in the art, based on the specification, that the invention set forth in a claim is not what the patentee regarded as his invention," the claim is "invalid under § 112, paragraph 2." *Id.* at 1349. Several of the '790 Patent Asserted Claims are invalid because it would be apparent to one of skill in the art, based on the specification, that the invention set forth in these claims are not what the patentee regarded as his invention, at least as the claims are being asserted by the Plaintiff. *Id.* These claims are invalid under the "applicant regards" prong of § 112 at least because they contain elements that differ from and/or conflict with the '790 Patent's written description of the invention, at least as the claim elements are being asserted by Plaintiff, or because they omit elements that one of skill in the art would understand as part of the '790 Patent's invention based on the specification.

Independently, under § 112, ¶ 2, "a patent is invalid for indefiniteness if its claims, read in

[19] Listed claims also include all Asserted Claims dependent thereon, even if those claims are not individually listed.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention." *Nautilus, Inc. v. Biosig Instruments, Inc*., 572 U.S. 898, 901 (2014). Several of the '790 Patent Asserted Claims are also invalid as indefinite under § 112, ¶ 2 because they fail to inform those skilled in the art about the scope of the invention with reasonable certainty and are indefinite.

The following limitations recited in the '790 Patent Asserted Claims are indefinite in whole, in part or in combination:[20]

Term	Relevant Claim(s)
"a plurality of detectors that are spatially separated from each other"	7
"increase the signal-to-noise ratio by comparing the first signal and the second signal"	7
"wherein the wearable device is at least in part configured to identify an object"	7
"wherein the detection system is configured to be synchronized to the light source"	7

VII. Subject Matter Eligibility

Pursuant to the court's Standing Order Regarding Subject Matter Eligibility Contentions Applicable to All Patent Infringement Cases Assigned to Chief District Judge Rodney Gilstrap ("Order Regarding Eligibility"), Samsung provides the following Eligibility Contentions.

As described below, in Appendices A-F, and in Exhibits A101, B101, C101, D101, E101, and F101 (collectively "Appendix 101"), which are hereby incorporated by reference as if fully set forth herein, Defendants contend that the Asserted Claims of the Asserted Patents are drawn to subject matter that is not patentable under 35 U.S.C. § 101. Pursuant to section (a)(1) of the Order Regarding Eligibility, Appendix 101 contains a chart for each Asserted Patent identifying each

[20] Listed claims also include all Asserted Claims dependent thereon, even if those claims are not individually listed.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

exception to eligibility to which each Challenged Claim is directed and the factual and legal basis therefor. Pursuant to section (a)(2)(A) of the Order Regarding Eligibility the charts of Appendix 101, read in conjunction with the discussion herein and in Appendices A-F, and together with the material described, referenced, or cited in the charts, further provide a description of the indsutry, at the relevant time, in which the Challenged Claims are alleged to be well understood, routine, and conventional, and the factual and legal basis therefor. Further, pursuant to sections (a)(2)(B) and (a)(3) of the Order Regarding Eligibility the charts of Appendix 101, read in conjunction with the discussion herein, and together with the material described, referenced, or cited in the charts, further provides: (i) a description of how each element of each Challenged Claim, both individually and in combination with the other elements of that claim, was well understood, routine, and/or conventional in the relevant industry at the relevant time and (ii) an identification of the factual or legal basis for how the Challenged Claims are otherwise ineligible for patent protection.

Additionally, pursuant to section (b) of the Order Regarding Eligibility, Defendants are concurrently producing or making available for inspection and copying the materials on which Defendants presently seek to rely for subject-matter eligibility purposes. These prior art references and other materials are cited herein or in Appendices 101, A-F. For the avoidance of doubt, Defendants may rely on the materials identified in Section III, above. Without concession that expert testimony is necessary to resolve the subject matter eligibility of the Asserted Claims, Defendants reserve the right to further rely on expert testimony to be disclosed in accordance with the Docket Control Order. Defendants' search for prior art references, additional documentation, and/or corroborating evidence concerning prior art systems and devices is ongoing. Accordingly, Defendants reserve the right to supplement their production as Defendants obtain additional prior art references, documentation, and/or corroborating evidence concerning subject matter eligibility

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

during the course of discovery.

Defendants reserve the right to supplement their document production pursuant to section (b) of the Order Regarding Eligibility as authorized by the Patent Local Rules, the Order Regarding Eligibility, or any other order of the Court.

A. U.S. Patent No. 9,055,868

Each of the Asserted Claims of the '868 Patent is drawn to subject matter that is not patentable under 35 U.S.C. § 101. The '868 Patent Asserted Claims are unpatentable for failure to recite patent eligible subject matter.

The '868 Patent Asserted Claims are directed to abstract ideas and therefore not eligible subject matter under 35 U.S.C. § 101. *E.g.*, *Alice Corp. Pty. Ltd. v. CLS Bank Intern.*, 573 U.S. 208, 216 (2014). By way of example, the Asserted Claims of the '868 Patent are generally directed to the abstract idea of collecting, processing, and storing light-based physiological data for diagnostics. Although the Asserted Claims recite concrete, tangible components, the specification provides no technical details but instead describes them—both individually and collectively—in generic and functional terms. *See, e.g.*, '868 Patent at Figs. 1, 2, 4, 5 (illustrating exemplary embodiments via generic technology and functional language). This confirms that the recited physical components merely provide a generic environment in which to carry out the abstract idea of collecting, processing, and storing light-based physiological data. Indeed, the patent does not purport to have invented or improved signal generation or processing; data transmission or remote storage; or any sort of diagnostic technique. Thus, under *Alice* Step 1, the Asserted Claims of the '868 Patent are directed to one or more ineligible concepts.

Under *Alice* Step 2, the '868 Patent does not add an inventive step to the general abstract idea. The claimed elements, individually and as an ordered combination, recite only a "handful of

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

generic computer components configured to implement" the abstract idea. *See Alice*, 573 U.S. at 226. Semiconductor diodes and the claimed lens system have long been used in optical sensing; touchscreens, location sensors, applications, and wireless transceivers are common in smartphones; and terms like "host," "digital file," and "control logic" represent generic computer components. Optical systems, phone applications, and remote storage are well-known, and their combination follows the general trend toward interconnectivity. *See Chamberlain Grp., Inc. v. Techtronic Indus. Co.*, 935 F.3d 1341, 1347–48 (Fed. Cir. 2019) (noting the ability to "transmit[] data wirelessly" is "not a technological improvement, but rather simply a feature of wireless communication"). The '868 Patent, moreover, does not recite any new or improved algorithm, measurement method, or hardware design. *See Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1354 (Fed. Cir. 2016) ("We have repeatedly held that such invocation of computers and networks that are not even arguably inventive are insufficient to pass the test of an inventive concept in the application of an abstract idea." (cleaned up)). Instead, the '868 Patent recites functional, result-oriented language that fails to transform the claimed abstract idea beyond routine and conventional tasks. *See, e.g., Intell. Ventures I LLC v. Cap. Fin. Corp.*, 850 F.3d 1332, 1342 (Fed. Cir. 2017). The law requires more.

Pursuant to section (a)(1) of the Order Regarding Eligibility, Exhibit A101 contains a chart identifying each exception to eligibility to which each Challenged Claim is directed and the factual and legal basis therefor. For avoidance of doubt, and as set forth above and in Exhibit A101 each Challenged Claim of the '868 Patent is directed to one or more abstract ideas and therefore is not directed to patent eligible subject matter. Exhibit A101 also identifies claim 7 as representative of the other Challenged Claims for purposes of the eligibility inquiry. Also, pursuant to section (a)(2)(B) and (a)(3) of the Order regarding Eligibility, Exhibit A101, read in conjunction with the

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

preceding paragraphs herein provides: (i) a description of how each element of each Challenged Claim, both individually and in combination with the other elements of that claim, was well understood, routine, and/or conventional in the relevant industry at the relevant time and (ii) an identification of the factual or legal basis for how the Challenged Claims are otherwise ineligible for patent protection.

Finally, pursuant to section (a)(2)(A) of the Order Regarding Eligibility, Defendants provide the following description of the relevant industry at the relevant time. As of the alleged priority date for the '868 Patent, the relevant industry was well-developed. All individual elements disclosed and recited in the '868 Patent were conventional, routine, and well known in the medical device and wearable health tech industries. *See generally* Appendix A. As shown in the accompanying claim charts, none of the claimed concepts were new or merely on the verge of development as of the alleged priority date of the '868 Patent. Instead, these concepts had been known for years and were the subject of many published articles and/or patents from around the world. The '868 Patent contributed nothing beyond what was already conventional, routine, well-known technology as of the relevant time period.

Further detail regarding Defendants' contentions that the Asserted Claims of the '868 Patent do not qualify as patent-eligible subject matter are contained in Exhibit A101.

B. U.S. Patent No. 9,651,533

Each of the Asserted Claims of the '533 Patent is drawn to subject matter that is not patentable under 35 U.S.C. § 101. The '533 Patent Asserted Claims are unpatentable for failure to recite patent eligible subject matter.

The '533 Patent Asserted Claims are directed to abstract ideas and therefore not eligible subject matter under 35 U.S.C. § 101. *E.g.*, *Alice*, 573 U.S. at 216. By way of example, the

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

Asserted Claims of the ’533 Patent are generally directed to the abstract idea of collecting, processing, and storing light-based data for analysis. Although the Asserted Claims recite concrete, tangible components, the specification provides no technical details but instead describes them—both individually and collectively—in generic and functional terms. *See, e.g.*, ’533 Patent at 9:34-38, 2:26-29, 26:49-27:2. This confirms that the recited physical components merely provide a generic environment in which to carry out the abstract idea of collecting, processing, and storing light-based data. Indeed, the patent does not purport to have invented or improved signal generation or processing; data transmission or remote storage; or any sort of measurement technique. Thus, under *Alice* Step 1, the Asserted Claims of the ’533 Patent are directed to one or more ineligible concepts.

Under *Alice* Step 2, the ’533 Patent does not add an inventive step to the general abstract idea. The claimed elements, individually and as an ordered combination, recite only a “handful of generic computer components configured to implement” the abstract idea. *See Alice*, 573 U.S. at 226. Semiconductor diodes, filters, and lenses have long been used in optical sensing; touchscreens, receivers, and transmitters are common in smartphones; and a “remote device” represents a conventional computer or storage unit. Optical systems, phone applications, and remote storage are well-known, and their combination follows the general trend toward interconnectivity. *See Chamberlain*, 935 F.3d at 1347–48. The ’533 Patent, moreover, does not recite any new or improved algorithm, measurement method, or hardware design. Instead, the ’533 Patent recites functional, result-oriented language that fails to transform the claimed abstract idea beyond routine and conventional tasks. *See, e.g., Intell. Ventures*, 850 F.3d at 1342. The law requires more.

Pursuant to section (a)(1) of the Order Regarding Eligibility, Exhibit B101 contains a chart

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

identifying each exception to eligibility to which each Challenged Claim is directed and the factual and legal basis therefor. For avoidance of doubt, and as set forth above and in Exhibit B101, each Challenged Claim of the ’533 Patent is directed to one or more abstract ideas and therefore is not directed to patent eligible subject matter. Exhibit B101 also identifies claim 11 as representative of the other Challenged Claims for purposes of the eligibility inquiry. Also, pursuant to section (a)(2)(B) and (a)(3) of the Order regarding Eligibility, Exhibit B101, read in conjunction with the preceding paragraphs herein provides: (i) a description of how each element of each Challenged Claim, both individually and in combination with the other elements of that claim, was well understood, routine, and/or conventional in the relevant industry at the relevant time and (ii) an identification of the factual or legal basis for how the Challenged Claims are otherwise ineligible for patent protection.

Finally, pursuant to section (a)(2)(A) of the Order Regarding Eligibility, Defendants provide the following description of the relevant industry at the relevant time. As of the alleged priority date for the ’533 Patent, the relevant industry was well-developed. All individual elements disclosed and recited in the ’533 Patent were conventional, routine, and well known in the optoelectronics and laboratory analytical instrumentation industries. *See generally* Appendix B. As shown in the accompanying claim charts, none of the claimed concepts were new or merely on the verge of development as of the alleged priority date of the ’533 Patent. Instead, these concepts had been known for years and were the subject of many published articles and/or patents from around the world. The ’533 Patent contributed nothing beyond what was already conventional, routine, well-known technology as of the relevant time period.

Further detail regarding Defendants’ contentions that the Asserted Claims of the ’533 Patent do not qualify as patent-eligible subject matter are contained in Exhibit B101.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

C. U.S. Patent No. 10,517,484

Each of the Asserted Claims of the ’484 Patent is drawn to subject matter that is not patentable under 35 U.S.C. § 101. The ’484 Patent Asserted Claims are unpatentable for failure to recite patent eligible subject matter.

The ’484 Patent Asserted Claims are directed to abstract ideas and therefore not eligible subject matter under 35 U.S.C. § 101. *E.g.*, *Alice*, 573 U.S. at 216. By way of example, the Asserted Claims of the ’484 Patent are generally directed to the abstract ideas of collecting, processing, and storing light-based physiological data for analysis. Although the Asserted Claims recite concrete, tangible components, the specification provides no technical details but instead describes them—both individually and collectively—in generic and functional terms. *See, e.g.*, ’484 Patent at 11:3-6, 32:45-65. This confirms that the recited physical components merely provide a generic environment in which to carry out the abstract idea of collecting, processing, and storing light-based data. Indeed, the patent does not purport to have invented or improved signal generation or processing; data transmission or remote storage; or any sort of measurement technique. Thus, under *Alice* Step 1, the Asserted Claims of the ’484 Patent are directed to one or more ineligible concepts.

Under *Alice* Step 2, the ’484 Patent does not add an inventive step to the general abstract idea. The claimed elements, individually and as an ordered combination, recite only a “handful of generic computer components configured to implement” the abstract idea. *See Alice*, 573 U.S. at 226. Semiconductor diodes, detectors, and lenses have long been used in optical sensing; touchscreens, receivers, and transmitters are common in smartphones; and the cloud is ubiquitous with modern computing. Optical systems, phone applications, and remote storage are well-known, and their combination follows the general trend toward interconnectivity. *See Chamberlain*, 935

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

F.3d at 1347–48. The ’484 Patent, moreover, does not recite any new or improved algorithm, measurement method, or hardware design. Instead, the ’484 Patent recites functional, result-oriented language that fails to transform the claimed abstract idea beyond routine and conventional tasks. *See, e.g.*, *Intell. Ventures*, 850 F.3d at 1342. The law requires more.

Pursuant to section (a)(1) of the Order Regarding Eligibility, Exhibit C101 contains a chart identifying each exception to eligibility to which each Challenged Claim is directed and the factual and legal basis therefor. For avoidance of doubt, and as set forth above and in Exhibit C101, each Challenged Claim of the ’484 Patent is directed to one or more abstract ideas and therefore is not directed to patent eligible subject matter. Exhibit C101 also identifies claim 8 as representative of the other Challenged Claims for purposes of the eligibility inquiry. Also, pursuant to section (a)(2)(B) and (a)(3) of the Order regarding Eligibility, Exhibit C101, read in conjunction with the preceding paragraphs herein provides: (i) a description of how each element of each Challenged Claim, both individually and in combination with the other elements of that claim, was well understood, routine, and/or conventional in the relevant industry at the relevant time and (ii) an identification of the factual or legal basis for how the Challenged Claims are otherwise ineligible for patent protection.

Finally, pursuant to section (a)(2)(A) of the Order Regarding Eligibility, Defendants provide the following description of the relevant industry at the relevant time. As of the alleged priority date for the ’484 Patent, the relevant industry was well-developed. All individual elements disclosed and recited in the ’484 Patent were conventional, routine, and well known in the medical device and wearable health tech industries. *See generally* Appendix C. As shown in the accompanying claim charts, none of the claimed concepts were new or merely on the verge of development as of the alleged priority date of the ’484 Patent. Instead, these concepts had been

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

known for years and were the subject of many published articles and/or patents from around the world. The ’484 Patent contributed nothing beyond what was already conventional, routine, well-known technology as of the relevant time period.

Further detail regarding Defendants’ contentions that the Asserted Claims of the ’484 Patent do not qualify as patent-eligible subject matter are contained in Exhibit C101.

D. U.S. Patent No. 10,874,304

Each of the Asserted Claims of the ’304 Patent is drawn to subject matter that is not patentable under 35 U.S.C. § 101. The ’304 Patent Asserted Claims are unpatentable for failure to recite patent eligible subject matter.

The ’304 Patent Asserted Claims are directed to abstract ideas and therefore not eligible subject matter under 35 U.S.C. § 101. *E.g.*, *Alice*, 573 U.S. at 216. By way of example, the Asserted Claims of the ’304 Patent are generally directed to the abstract ideas of collecting, processing, and storing light-based physiological data for analysis. Although the Asserted Claims recite concrete, tangible components, the specification provides no technical details but instead describes them—both individually and collectively—in generic and functional terms. *See, e.g.*, ’304 Patent at 13:21-25, 33:45-64. This confirms that the recited physical components merely provide a generic environment in which to carry out the abstract idea of collecting, processing, and storing light-based physiological data. Indeed, the patent does not purport to have invented or improved signal generation or processing; data transmission or remote storage; or any sort of measurement technique. Thus, under *Alice* Step 1, the Asserted Claims of the ’304 Patent are directed to one or more ineligible concepts.

Under *Alice* Step 2, the ’304 Patent does not add an inventive step to the general abstract idea. The claimed elements, individually and as an ordered combination, recite only a “handful of

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

generic computer components configured to implement" the abstract idea. *See Alice*, 573 U.S. at 226. Semiconductor diodes and receivers have long been used in optical sensing; touchscreens, receivers, and transmitters are common in smartphones; and the cloud is ubiquitous with modern computing. Optical systems, phone applications, and remote storage are well-known, and their combination follows the general trend toward interconnectivity. *See Chamberlain*, 935 F.3d at 1347–48. The '304 Patent, moreover, does not recite any new or improved algorithm, measurement method, or hardware design. Instead, the '484 Patent recites functional, result-oriented language that fails to transform the claimed abstract idea beyond routine and conventional tasks. *See, e.g., Intell. Ventures*, 850 F.3d at 1342. The law requires more.

Pursuant to section (a)(1) of the Order Regarding Eligibility, Exhibit D101 contains a chart identifying each exception to eligibility to which each Challenged Claim is directed and the factual and legal basis therefor. For avoidance of doubt, and as set forth above and in Exhibit D101 each Challenged Claim of the '304 Patent is directed to one or more abstract ideas and therefore is not directed to patent eligible subject matter. Exhibit D101 also identifies claim 11 as representative of the other Challenged Claims for purposes of the eligibility inquiry. Also, pursuant to section (a)(2)(B) and (a)(3) of the Order regarding Eligibility, Exhibit D101, read in conjunction with the preceding paragraphs herein provides: (i) a description of how each element of each Challenged Claim, both individually and in combination with the other elements of that claim, was well understood, routine, and/or conventional in the relevant industry at the relevant time and (ii) an identification of the factual or legal basis for how the Challenged Claims are otherwise ineligible for patent protection.

Finally, pursuant to section (a)(2)(A) of the Order Regarding Eligibility, Defendants provide the following description of the relevant industry at the relevant time. As of the alleged

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

priority date for the ’304 Patent, the relevant industry was well-developed. All individual elements disclosed and recited in the ’304 Patent were conventional, routine, and well known in the medical device and wearable health tech industries. *See generally* Appendix D. As shown in the accompanying claim charts, none of the claimed concepts were new or merely on the verge of development as of the alleged priority date of the ’304 Patent. Instead, these concepts had been known for years and were the subject of many published articles and/or patents from around the world. The ’304 Patent contributed nothing beyond what was already conventional, routine, well-known technology as of the relevant time period.

Further detail regarding Defendants’ contentions that the Asserted Claims of the ’304 Patent do not qualify as patent-eligible subject matter are contained in Exhibit D101.

E. U.S. Patent No. 11,160,455

Each of the Asserted Claims of the ’455 Patent is drawn to subject matter that is not patentable under 35 U.S.C. § 101. The ’455 Patent Asserted Claims are unpatentable for failure to recite patent eligible subject matter.

The ’455 Patent Asserted Claims are directed to abstract ideas and therefore not eligible subject matter under 35 U.S.C. § 101. *E.g.*, *Alice*, 573 U.S. at 216. By way of example, the Asserted Claims of the ’455 Patent are generally directed to the abstract ideas of collecting, processing, and storing light-based physiological data for analysis. Although the Asserted Claims recite concrete, tangible components, the specification provides no technical details but instead describes them—both individually and collectively—in generic and functional terms. *See, e.g.*, ’455 Patent at 16:66-17:3, 45:43-62. This confirms that the recited physical components merely provide a generic environment in which to carry out the abstract idea of collecting, processing, and storing light-based physiological data. Indeed, the patent does not purport to have invented or

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

improved signal generation or processing; data transmission or remote storage; or any sort of measurement technique. Thus, under *Alice* Step 1, the Asserted Claims of the '455 Patent are directed to one or more ineligible concepts.

Under *Alice* Step 2, the '455 Patent does not add an inventive step to the general abstract idea. The claimed elements, individually and as an ordered combination, recite only a "handful of generic computer components configured to implement" the abstract idea. *See Alice*, 573 U.S. at 226. Semiconductor sources, lenses, and detectors have long been used in optical sensing; touchscreens, receivers, and transmitters are common in smartphones; and the combination of optical systems and smartphones follows the general trend toward interconnectivity. *See Chamberlain*, 935 F.3d at 1347–48. The '455 Patent, moreover, does not recite any new or improved algorithm, measurement method, or hardware design. Instead, the '455 Patent recites functional, result-oriented language that fails to transform the claimed abstract idea beyond routine and conventional tasks. *See, e.g.*, *Intell. Ventures*, 850 F.3d at 1342. The law requires more.

Pursuant to section (a)(1) of the Order Regarding Eligibility, Exhibit E101 contains a chart identifying each exception to eligibility to which each Challenged Claim is directed and the factual and legal basis therefor. For avoidance of doubt, and as set forth above and in Exhibit E101 each Challenged Claim of the '455 Patent is directed to one or more abstract ideas and therefore is not directed to patent eligible subject matter. Exhibit E101 also identifies claim 1 as representative of the other Challenged Claims for purposes of the eligibility inquiry. Also, pursuant to section (a)(2)(B) and (a)(3) of the Order regarding Eligibility, Exhibit E101, read in conjunction with the preceding paragraphs herein provides: (i) a description of how each element of each Challenged Claim, both individually and in combination with the other elements of that claim, was well understood, routine, and/or conventional in the relevant industry at the relevant time and (ii) an

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

identification of the factual or legal basis for how the Challenged Claims are otherwise ineligible for patent protection.

Finally, pursuant to section (a)(2)(A) of the Order Regarding Eligibility, Defendants provide the following description of the relevant industry at the relevant time. As of the alleged priority date for the '455 Patent, the relevant industry was well-developed. All individual elements disclosed and recited in the '455 Patent were conventional, routine, and well known in the medical device and wearable health tech industries. *See generally* Appendix E. As shown in the accompanying claim charts, none of the claimed concepts were new or merely on the verge of development as of the alleged priority date of the '455 Patent. Instead, these concepts had been known for years and were the subject of many published articles and/or patents from around the world. The '455 Patent contributed nothing beyond what was already conventional, routine, well-known technology as of the relevant time period.

Further detail regarding Defendants' contentions that the Asserted Claims of the '455 Patent do not qualify as patent-eligible subject matter are contained in Exhibit E101.

F. U.S. Patent No. 12,193,790

The Asserted Claim of the '790 Patent is drawn to subject matter that is not patentable under 35 U.S.C. § 101. The '790 Patent Asserted Claim is unpatentable for failure to recite patent eligible subject matter.

The '790 Patent Asserted Claim is directed to abstract ideas and therefore not eligible subject matter under 35 U.S.C. § 101. *E.g.*, *Alice*, 573 U.S. at 216. By way of example, the Asserted Claim of the '790 Patent is generally directed to the abstract idea of collecting and processing light-based data to determine physiological parameters. Although the Asserted Claim recites concrete, tangible components, the specification provides no technical details but instead

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

describes them—both individually and collectively—in generic and functional terms. *See, e.g.*, '790 Patent at 7:50-55, 84:63-67, 32:28-67. This confirms that the recited physical components merely provide a generic environment in which to carry out the abstract idea of collecting and processing natural phenomena. Indeed, the patent does not purport to have invented or improved signal generation or processing; data transmission or remote storage; or any sort of measurement technique. Thus, under *Alice* Step 1, the Asserted Claim of the '790 Patent is directed to one or more ineligible concepts.

Under *Alice* Step 2, the '790 Patent does not add an inventive step to the general abstract idea. The claimed elements, individually and as an ordered combination, recite only a "handful of generic computer components configured to implement" the abstract idea. *See Alice*, 573 U.S. at 226. The claimed light source (e.g., LEDs), semiconductor diodes, lenses, detection system, detectors, and analog-to-digital converters are conventional and perform their ordinary, expected functions. The claimed enhancement of signal-to-noise ratio by increasing light intensity or by subtracting background signal is a well-known technique in signal processing and does not constitute an unconventional arrangement or improvement in technology. The '790 Patent, moreover, does not recite any new or improved algorithm, measurement method, or hardware design. Instead, the '790 Patent recites functional, result-oriented language that fails to transform the claimed abstract idea beyond routine and conventional tasks. *See, e.g.*, *Intell. Ventures*, 850 F.3d at 1342. The law requires more.

Pursuant to section (a)(1) of the Order Regarding Eligibility, Exhibit F101 contains a chart identifying each exception to eligibility to which each Challenged Claim is directed and the factual and legal basis therefor. For avoidance of doubt, and as set forth above and in Exhibit F101 each Challenged Claim of the '790 Patent is directed to one or more abstract ideas and therefore is not

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

directed to patent eligible subject matter. Also, pursuant to section (a)(2)(B) and (a)(3) of the Order regarding Eligibility, Exhibit F101, read in conjunction with the preceding paragraphs herein provides: (i) a description of how each element of each Challenged Claim, both individually and in combination with the other elements of that claim, was well understood, routine, and/or conventional in the relevant industry at the relevant time and (ii) an identification of the factual or legal basis for how the Challenged Claims are otherwise ineligible for patent protection.

Finally, pursuant to section (a)(2)(A) of the Order Regarding Eligibility, Defendants provide the following description of the relevant industry at the relevant time. As of the alleged priority date for the '790 Patent, the relevant industry was well-developed. All individual elements disclosed and recited in the '790 Patent were conventional, routine, and well known in the medical device and wearable health tech industries. *See generally* Appendix F. As shown in the accompanying claim charts, none of the claimed concepts were new or merely on the verge of development as of the alleged priority date of the '790 Patent. Instead, these concepts had been known for years and were the subject of many published articles and/or patents from around the world. The '790 Patent contributed nothing beyond what was already conventional, routine, well-known technology as of the relevant time period.

Further detail regarding Defendants' contentions that the Asserted Claims of the '790 Patent do not qualify as patent-eligible subject matter are contained in Exhibit F101.

VIII. P. R. 3-4 – Productions

Pursuant to P.R. 3-4(a), each Defendant is concurrently producing and/or making available for inspection documents and other materials sufficient to show the operation of any aspects or elements of the Accused Products identified by Plaintiff in its P.R. 3-1(c) charts.

Additionally, and pursuant to P.R. 3-4(b), Defendants are concurrently producing a copy

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

of each item of prior art identified herein. These prior art references and corroborating evidence are cited in attached invalidity claim charts in Appendices 101, A-F. Defendants will also make available for inspection any prior art systems or devices upon request to the extent Defendants acquire such systems or devices. References that were cited during prosecution of the Asserted Patents may not be contained in Defendants' production as they are not required to be under the local patent rules. Defendants' search for prior art references, additional documentation, and/or corroborating evidence concerning prior art systems and devices is ongoing. Accordingly, Defendants reserve the right to supplement their production as Defendants obtain additional prior art references, documentation, and/or corroborating evidence concerning invalidity during the course of discovery.

Defendants reserve the right to supplement their P. R. 3-4 document production pursuant to the Patent Local Rules and the orders of the Court.

Dated: June 3, 2025 Respectfully Submitted,

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

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Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

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Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

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Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

EXHIBIT A101

Preliminary Eligibility Contentions for U.S. Patent No. 9,055,868

Based on Omni's apparent positions, as best they can be deciphered, as to the scope of asserted claims of U.S. Patent No. 9,055,868, the chart below provides Defendants' current contentions regarding the patent ineligibility of each asserted claim.

This disclosure is not an admission that Defendants concede any claim construction implied or suggested by Omni's apparent positions as to the scope of the patent's claims, nor is it an admission by Defendants that any of their products are covered by or infringe the patent's claims, particularly when they are properly construed and applied. Defendants are not taking any claim construction positions through this disclosure, including whether the preamble is a limitation.

Defendants reserve the right to rely on additional citations or sources of evidence that also may be applicable, or that may become applicable in light of claim construction, changes in Omni's infringement contentions, and/or information obtained during discovery as the case progresses. Defendants further reserve the right to amend or supplement this claim chart at a later date as more fully set forth in the Invalidity and Subject Matter Eligibility Contentions.

The asserted claims, claims 7–9, are drawn to patent-ineligible subject matter under 35 U.S.C. § 101. The claims are generally directed to the abstract idea of collecting, processing, and storing light-based physiological data for diagnostics. And none of the claims contain an "'inventive concept' . . . sufficient to ensure that the patent in practice amounts to *significantly more* than a patent upon the ineligible concept itself." *See Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 573 U.S. 208, 217–18 (2014) (emphasis added).

Claim 7 of the '868 patent is representative.

Claim 7 may be treated as representative for purposes of § 101 because the asserted claims are "substantially similar and linked to the same abstract idea." *See Content Extraction & Transmission LLC v. Wells Fargo Bank, Nat'l Ass'n*, 776 F.3d 1343, 1348–49 (Fed. Cir. 2014). Claim 7 essentially recites a data-flow system—collecting, processing, transmitting, and storing light-based physiological data—implemented using generic sensing, computing, and communication technology.

Claims 8 and 9 depend on Claim 7 and fail to add any meaningful limitations. For example, Claim 8 specifies that Claim 7's "light source" includes "a plurality of semiconductor diodes" coupled to a "multiplexer" capable of generating light with "one or more wavelengths." '868 patent at cl. 8. This is a conventional configuration in optical systems that fails to meaningfully separate Claim 8 from Claim 7 in terms of patent-eligibility. *See* Ex. A1-A10; *Content Extraction*, 776 F.3d at 1348–49 (explaining that "well-known, routine, and conventional" features are not meaningful limitations because they cannot provide an "inventive concept"). Next, Claim 9 requires that Claim 7's "input light beam" be adapted for blood diagnostics via "a spectroscopic procedure" based on a "comparison of

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

amplitudes." '868 patent at cl. 9. Because spectroscopy is a longstanding, conventional diagnostic technique, this limitation, like Claim 8, merely narrows the field of use without altering Claim 7's focus or making it any less abstract. *See, e.g.*, Ex. A1-A10; *Cleveland Clinic Found. v. True Health Diagnostics LLC*, 859 F.3d 1352, 1360 (Fed. Cir. 2017) (holding that the recitation of "known methods of detecting" physiological parameters does not provide an inventive concept); *Clear with Computers, LLC v. Dick's Sporting Goods, Inc.*, 21 F. Supp. 3d 758, 763 (E.D. Tex. 2014) ("Nor is a claim meaningfully limited if it contains only insignificant or token pre- or post-solution activity—such as identifying a relevant audience, a category of use, field of use, or technological environment." (cleaned up)). Because dependent claims 8 and 9 merely recite field-specific or conventional limitations that do not affect the eligibility analysis, they do not require separate evaluation under *Alice*.

Accordingly, Claim 7 may be treated as representative for purposes of § 101. *See PPS Data, LLC v. Jack Henry & Assocs., Inc.*, 404 F. Supp. 3d 1021, 1031–32 (E.D. Tex. 2019) (explaining that a defendant can make out a "prima facie case demonstrating representativeness" through "an analysis tethered to the claim language" showing "that there are no legally relevant distinctions between the claim identified as representative and the remaining asserted claims").

***Alice* Step One: The asserted claims are generally directed to the abstract idea of collecting, processing, and storing light-based physiological data for diagnostics.**

The *Alice* test requires the Court to look at the "focus of the claimed advance over the prior art to determine if the claim's character as a whole is directed to excluded subject matter." *Affinity Labs of Tex., LLC v. DIRECTV, LLC*, 838 F.3d 1253, 1257 (Fed. Cir. 2016) (cleaned up). Although the '868 patent does not explicitly recognize unmet needs in the art, it contemplates diagnostic systems that generate, transmit, and store physiological data based on light measurements. '868 patent at 1:33–3:2.

Claim 7 is thus generally directed to the abstract idea of collecting, processing, and storing light-based physiological data for diagnostics. The claimed system is adapted to first measure a property of the patient's blood by observing its relationship to light—specifically, it measures the correlation between two naturally occurring phenomena, which is an abstract natural law. *See, e.g.*, *id.* at cl. 7, 3:21–28; *Cleveland Clinic*, 859 F.3d at 1361 (holding claims directed to measuring the relationship between naturally occurring phenomena are directed to an abstract natural law); *Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 788 F.3d 1371, 1376 (Fed. Cir. 2015) (holding that claims "generally directed to detecting the presence of a naturally occurring thing" are abstract). The system is adapted to then process the light-based data via a software application on a control system and send the result (physiological information) to a remote host that stores the information and transmits it to remote displays. *See* '868 patent at cl. 7.

Claim 7 amounts to nothing more than a compilation of abstract ideas. Indeed, the patent does not purport to have invented or improved signal generation or processing; data transmission or remote storage; or any sort of diagnostic technique. The "use of a

mathematical calculation, even one that yields different or better results, does not render patent eligible subject matter." *In re Bd. of Trs. of Leland Stanford Junior Univ.*, 991 F.3d 1245, 1251 (Fed. Cir. 2021). Nor does "[a]dding one abstract idea (math) to another abstract idea" (e.g., measuring natural phenomena). *See RecogniCorp, LLC v. Nintendo Co., Ltd.*, 855 F.3d 1322, 1327 (Fed. Cir. 2017). And collecting, processing, storing, and transmitting information have long been held abstract. *See, e.g.*, *Elec. Power Grp., LLC v. Alstom S.A*., 830 F.3d 1350, 1353–54 (Fed. Cir. 2016) (collecting cases); *Content Extraction*, 776 F.3d at 1347 ("The concept of data collection, recognition, and storage is undisputedly well-known.").

Although Claim 7 requires concrete, tangible components such as a "light source," "semiconductor diodes," a "lens system," a "software application," a "control system," a "host," and a "memory storage device," "the specification makes clear that the recited physical components merely provide a generic environment in which to carry out the abstract idea" of collecting, processing, and storing data. *See In re TLI Commc'ns LLC Pat. Litig.*, 823 F.3d 607, 611–12 (Fed. Cir. 2016) (finding claims "directed to the use of conventional or generic technology in a nascent but well-known environment" to be abstract). In fact, the specification provides no technical details for the tangible components, but instead describes them—both individually and collectively—in generic and functional terms. *See infra*, *Alice* Step Two. So instead of providing any new or useful system, Claim 7 recites the abstract idea of collecting, processing, and storing light-based physiological data through conventional technology and result-oriented steps. *See In re Gopalan*, 809 F. App'x 942, 945–46 (Fed. Cir. 2020).

***Alice* Step Two: The asserted claims do not contain a transformative inventive concept.**

Claim 7 likewise contains no inventive concept that transforms the abstract idea into patent-eligible subject matter.

The claimed elements, individually and as an ordered combination, recite only a "handful of generic computer components configured to implement" the abstract idea. *See Alice*, 573 U.S. at 226. Semiconductor diodes and the claimed lens system have long been used in optical sensing; touchscreens, location sensors, applications, and wireless transceivers are common in smartphones; and terms like "host," "digital file," and "control logic" represent generic computer components. Optical systems, phone applications, and remote storage are well-known, and their combination follows the general trend toward interconnectivity. *See* Ex. A1-A10; Cover Pleading at § III.G; *Chamberlain Grp., Inc. v. Techtronic Indus. Co.*, 935 F.3d 1341, 1347–48 (Fed. Cir. 2019) (noting the ability to "transmit[] data wirelessly" is "not a technological improvement, but rather simply a feature of wireless communication").

Claim 7, moreover, does not recite any new or improved algorithm, measurement method, or hardware design. *See Elec. Power Grp.*, 830 F.3d at 1354 ("We have repeatedly held that such invocation of computers and networks that are not even arguably inventive are insufficient to pass the test of an inventive concept in the application of an abstract idea." (cleaned up)). Instead, Claim 7 recites functional, result-oriented language that fails to transform the claimed abstract idea beyond routine and conventional tasks. *See, e.g.,*

Intell. Ventures I LLC v. Cap. Fin. Corp., 850 F.3d 1332, 1342 (Fed. Cir. 2017) ("[T]he claim language here provides only a result-oriented solution, with insufficient detail for how a computer accomplishes it. Our law demands more."). In other words, the claim does not offer any specific technological solution to improve the functioning of the sensors, hardware, or anything else, but instead describes an interconnected system of conventional components that mirrors existing telemedicine and wearable diagnostic paradigms.

Finally, Claim 7 follows a generic data-processing pipeline, describing a system that: (1) collects light-based data, (2) generates physiological information based on that data using software, (3) stores that information, and (4) transmits it to remote displays. This is a classic data-processing and transmission sequence—the kind the Federal Circuit has consistently held to be ineligible when implemented using generic computing equipment. *See, e.g.*, *Two-Way Media Ltd. v. Comcast Cable Commc'ns, LLC*, 874 F.3d 1329, 1339 (Fed. Cir. 2017) (holding that a "conventional ordering of steps . . . with conventional technology to achieve its desired result" is insufficient to provide an inventive concept). And the specification confirms that each of the result-oriented claim elements can be carried out by generic hardware operating in a conventional fashion. *See* '868 patent at Figs. 1, 2, 4, 5 (illustrating exemplary embodiments via generic technology and functional language). At bottom, Claim 7, whether considered limitation-by-limitation or as a whole, does not sufficiently transform the abstract idea of collecting, processing, and storing physiological data into a patentable invention.

'868 Patent – Claim 7	**Subject Matter Eligibility Contentions**
[7pre] A diagnostic system comprising:	Claim 7 of the '868 is directed to an abstract idea. And it contains no inventive concept sufficient to ensure that the claim amounts to significantly more than the patent-ineligible concept itself. Claim 7 is generally directed to the abstract idea of collecting, processing, and storing light-based physiological data for diagnostics. *See, e.g.*, *AI Visualize, Inc. v. Nuance Commc'ns, Inc.*, 97 F.4th 1371, 1378–79 (Fed. Cir. 2024); *In re TLI Commc'ns LLC Patent Litig.*, 823 F.3d 607, 611–13 (Fed. Cir. 2016); *Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1353–54 (Fed. Cir. 2016); *Intell. Ventures I LLC v. Cap. Fin. Corp.*, 850 F.3d 1332, 1340–41 (Fed. Cir. 2017); *Univ. of Fla. Rsch. Found., Inc. v. Gen. Elec. Co.*, 916 F.3d 1363, 1367–68 (Fed. Cir. 2019); *CardioNet, LLC v. InfoBionic, Inc.*, 816 F.

	App'x 471, 475–77 (Fed. Cir. 2020); *In re Bd. of Trs. Of Leland Stanford Junior Univ.*, 991 F.3d 1245, 1250–51 (Fed. Cir. 2021); *Audio Evolution Diagnostics, Inc. v. United States*, 160 Fed. Cl. 513, 526–27 (2022), *aff'd*, No. 2023-1096, 2024 WL 2143376 (Fed. Cir. May 14, 2024); *Braemar Mfg., LLC v. ScottCare Corp.*, 816 F. App'x 465, 470 (Fed. Cir. 2020); *Philips N. Am. LLC v. Fitbit LLC*, 626 F. Supp. 3d 292, 306–09 (D. Mass. 2022); *Two-Way Media Ltd. v. Comcast Cable Commc'ns, LLC*, 874 F.3d 1329, 1337–39 (Fed. Cir. 2017); *In re Gopalan*, 809 F. App'x 942, 945–46 (Fed. Cir. 2020); *Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 788 F.3d 1371, 1376 (Fed. Cir. 2015); *Cleveland Clinic Found. v. True Health Diagnostics LLC*, 859 F.3d 1352, 1361 (Fed. Cir. 2017); *RecogniCorp, LLC v. Nintendo Co., Ltd.*, 855 F.3d 1322, 1327 (Fed. Cir. 2017); *Chamberlain Grp., Inc. v. Techtronic Indus. Co.*, 935 F.3d 1341, 1346–48 (Fed. Cir. 2019); *Content Extraction & Transmission LLC v. Wells Fargo Bank, Nat'l Ass'n*, 776 F.3d 1343, 1347 (Fed. Cir. 2014). Claim 7 also contains no inventive concept. At the time of the alleged invention, the elements of Claim 7 were well-understood, routine, and/or conventional. Claim 7 employs well-known components or functionality, as shown for example in Defendants' invalidity contentions, which is not enough to impart patent eligibility. *See, e.g.*, Ex. A1-A10 at all disclosures for [7pre]; Cover Pleading at § III.G.
[7a] a light source comprising:	As explained above, Claim 7 is generally directed to the abstract idea of collecting, processing, and storing light-based physiological data for diagnostics.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

	At the time of the alleged invention, this element was well-understood, routine, and/or conventional. *See, e.g.*, Ex. A1-A10 at all disclosures for [7a]; Cover Pleading at § III.G.
[7b] one or more semiconductor diodes generating an input light beam; and	As explained above, Claim 7 is generally directed to the abstract idea of collecting, processing, and storing light-based physiological data for diagnostics. At the time of the alleged invention, this element was well-understood, routine, and/or conventional. *See, e.g.*, Ex. A1-A10 at all disclosures for [7b]; Cover Pleading at § III.G.
[7c] a lens system configured to receive at least a portion of the input light beam and to communicate at least the portion of the input light beam onto a part of a user's body comprising blood	As explained above, Claim 7 is generally directed to the abstract idea of collecting, processing, and storing light-based physiological data for diagnostics. At the time of the alleged invention, this element was well-understood, routine, and/or conventional. *See, e.g.*, Ex. A1-A10 at all disclosures for [7c]; Cover Pleading at § III.G.
[7d] wherein at least the portion of the input light beam is used in a measurement on a user;	As explained above, Claim 7 is generally directed to the abstract idea of collecting, processing, and storing light-based physiological data for diagnostics. At the time of the alleged invention, this element was well-understood, routine, and/or conventional. *See, e.g.*, Ex. A1-A10 at all disclosures for [7d]; Cover Pleading at § III.G.
[7e] a software application capable of generating data based at least in part on the measurement on the user,	As explained above, Claim 7 is generally directed to the abstract idea of collecting, processing, and storing light-based physiological data for diagnostics. At the time of the alleged invention, this element was well-understood, routine, and/or conventional. *See, e.g.*, Ex. A1-A10 at all disclosures for [7e]; Cover Pleading at § III.G.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

[7f] wherein the data represents at least in part physiological information associated with the user;	As explained above, Claim 7 is generally directed to the abstract idea of collecting, processing, and storing light-based physiological data for diagnostics. At the time of the alleged invention, this element was well-understood, routine, and/or conventional. *See, e.g.*, Ex. A1-A10 at all disclosures for [7f]; Cover Pleading at § III.G.
[7g] the software application capable of operating on a control system adapted to receive, store and process at least a portion of the physiological information,	As explained above, Claim 7 is generally directed to the abstract idea of collecting, processing, and storing light-based physiological data for diagnostics. At the time of the alleged invention, this element was well-understood, routine, and/or conventional. *See, e.g.*, Ex. A1-A10 at all disclosures for [7g]; Cover Pleading at § III.G.
[7h] the control system having a touch-screen, circuitry for obtaining position information from a location sensor, and	As explained above, Claim 7 is generally directed to the abstract idea of collecting, processing, and storing light-based physiological data for diagnostics. At the time of the alleged invention, this element was well-understood, routine, and/or conventional. *See, e.g.*, Ex. A1-A10 at all disclosures for [7h]; Cover Pleading at § III.G.
[7i] a wireless transceiver to transmit wireless data over a wireless link,	As explained above, Claim 7 is generally directed to the abstract idea of collecting, processing, and storing light-based physiological data for diagnostics. At the time of the alleged invention, this element was well-understood, routine, and/or conventional. *See, e.g.*, Ex. A1-A10 at all disclosures for [7i]; Cover Pleading at § III.G.
[7j] the wireless data comprising at least a part of the physiological information,	As explained above, Claim 7 is generally directed to the abstract idea of collecting, processing, and storing light-based physiological data for diagnostics.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

	At the time of the alleged invention, this element was well-understood, routine, and/or conventional. *See, e.g.*, Ex. A1-A10 at all disclosures for [7j]; Cover Pleading at § III.G.
[7k] wherein the control system is further capable of receiving voice input signals and manually entered input signals; and	As explained above, Claim 7 is generally directed to the abstract idea of collecting, processing, and storing light-based physiological data for diagnostics. At the time of the alleged invention, this element was well-understood, routine, and/or conventional. *See, e.g.*, Ex. A1-A10 at all disclosures for [7k]; Cover Pleading at § III.G.
[7l] a host comprising:	As explained above, Claim 7 is generally directed to the abstract idea of collecting, processing, and storing light-based physiological data for diagnostics. At the time of the alleged invention, this element was well-understood, routine, and/or conventional. *See, e.g.*, Ex. A1-A10 at all disclosures for [7l]; Cover Pleading at § III.G.
[7m] a digital file for receiving and storing at least a portion of the wireless data;	As explained above, Claim 7 is generally directed to the abstract idea of collecting, processing, and storing light-based physiological data for diagnostics. At the time of the alleged invention, this element was well-understood, routine, and/or conventional. *See, e.g.*, Ex. A1-A10 at all disclosures for [7m]; Cover Pleading at § III.G.
[7n] control logic at the host to process at least the portion of the wireless data to generate a status of the user;	As explained above, Claim 7 of the ’868 patent is generally directed to the abstract idea of collecting, processing, and storing light-based physiological data for diagnostics. At the time of the alleged invention, this element was well-understood, routine, and/or conventional. *See, e.g.*, Ex. A1-A10 at all disclosures for [7n]; Cover Pleading at § III.G.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

[7o] a memory storage device for recording the status; and	As explained above, Claim 7 is generally directed to the abstract idea of collecting, processing, and storing light-based physiological data for diagnostics. At the time of the alleged invention, this element was well-understood, routine, and/or conventional. *See, e.g.*, Ex. A1-A10 at all disclosures for [7o]; Cover Pleading at § III.G.
[7p] an output for communicating at least a portion of the status or associated information over a communication link to one or more display output devices,	As explained above, Claim 7 is generally directed to the abstract idea of collecting, processing, and storing light-based physiological data for diagnostics. At the time of the alleged invention, this element was well-understood, routine, and/or conventional. *See, e.g.*, Ex. A1-A10 at all disclosures for [7p]; Cover Pleading at § III.G.
[7q] wherein the one or more display output devices are located remotely from the host.	As explained above, Claim 7 is generally directed to the abstract idea of collecting, processing, and storing light-based physiological data for diagnostics. At the time of the alleged invention, this element was well-understood, routine, and/or conventional. *See, e.g.*, Ex. A1-A10 at all disclosures for [7q]; Cover Pleading at § III.G.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

EXHIBIT A1

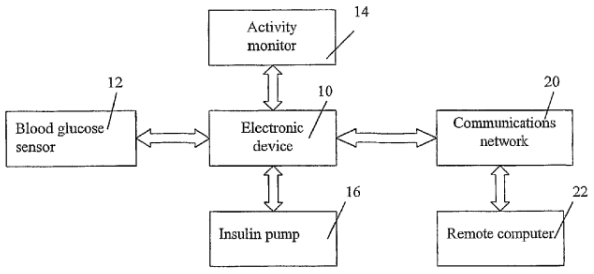
U.S. Pat. No. 9,055,868 in view of U.S. Patent Publication No. 2003/0208113 to James Mault ("Mault")

As described in detail below, Mault (individually or collectively) anticipates and/or renders obvious claim 7-9 ("Asserted Claims") of U.S. Patent No. 9,055,868 B2 (the "'868 Patent") under 35 U.S.C. §102 and/or §103, either alone in combination with the knowledge of a person of ordinary skill, and/or additional prior art references discussed in discussed in Exhibits A1-A10, the contents of which are hereby incorporated by reference into this chart. One of ordinary skill in the art, as of the priority date of the '868 Patent, would have known to combine the prior art elements disclosed by the foregoing references using known methods, and to use these elements according to their established functions in order to achieve a known and predictable result. This invalidity claim chart is based on Defendants' present understanding of the Asserted Claims and Plaintiff's apparent construction of the Asserted Claims in its Preliminary Infringement Contentions ("Infringement Contentions").

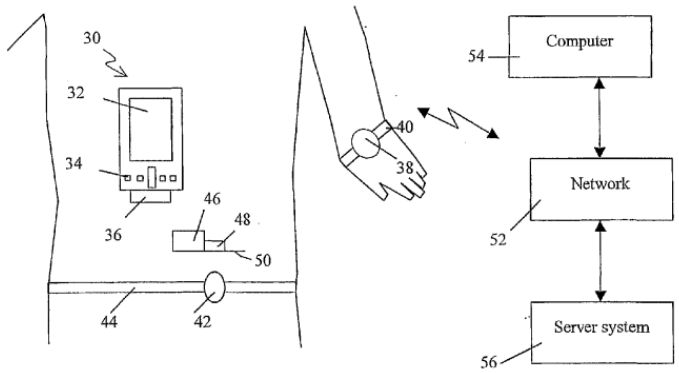
The following invalidity chart includes references to the structure, function, operation, and/or features of the technology described in Mault. The cited portions of Mault are merely illustrative, and Defendants reserve the right to rely on alternative or additional evidence, including uncited portions of Mault. Where a particular figure is cited, the citation should be understood to encompass the caption and description of the figure as well as any text relating to or describing the figure. Conversely, where particular text referring to a figure is cited, the citation should be understood to include the figure as well. Although the documentation collectively evidences prior knowledge, use, or sale, Defendants reserve the right to rely upon individual documents as printed publications. Where the chart below states that Mault "describes" or "provides for" a limitation, such disclosure may be express, inherent, or implicit. To the extent it is found Mault does not expressly disclose certain limitations in the asserted claim, such limitations are inherent. Defendants reserve the right to present direct evidence of the structure, function, operation, and/or features of the technology described in Mault (including product samples, source code, and/or witness testimony) and/or its prior art status, and to present alternative or additional documents concerning the same as evidence that the technology described in Mault anticipates and/or renders obvious the Asserted Claims of the '868 Patent.

This chart is subject to all reservations, objections, and disclaimers in Defendants' Invalidity Contentions and any amendment, supplement, or modification thereof, which are incorporated herein by reference in their entirety. Nothing stated herein shall be treated as an admission or suggestion that Defendants agree with Plaintiff regarding the scope of the Asserted Claims, Plainitff's apparent claim constructions, or the accuracy of any particular claim construction. Defendants reserve all rights to challenge any of the claim terms herein under 35 U.S.C. § 112, including by arguing that they are indefinite, are not supported by the written description, and/or are not enabled. Defendants further reserve all rights to amend this invalidity claim chart without leave of court pursuant to the Court's Docket Control Order, or upon a showing of good cause.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Mault
Claim 7	
7[pre]. A diagnostic system comprising:	By providing this disclosure, Defendants do not take a position on whether the preamble is limiting. Mault discloses or renders obvious a diagnostic system. A system for assisting a person to maintain a blood glucose level between predetermined limits comprises: an electronic device, comprising a display, a clock, a memory, and a processor; and a software program executable by the processor of the electronic device, adapted to receive nutritional data of food consumed by the person, adapted to calculate the blood glucose level for the person using the nutritional data and a glycemic response model for the person, and further adapted to present the blood glucose level to the person on the display of the electronic device. Mault at Abstract Embodiments of **the present invention provide methods of blood glucose management systems that allow a person to view projected future levels of blood glucose, so as to assist the person to keep blood glucose levels within a predetermined range, such as a medically advisable healthy range. Systems are provided by which a person can view future projections of blood glucose levels in based on actions or planned actions, receive advance warnings of possible excursions of blood glucose from the predetermined range**, and receive advice on diet, exercise, behavior modification, or medical treatments that can help the person prevent the blood glucose level excursions into unhealthy ranges. Mault at [0013]  Figure 1 Mault at Fig. 1

’868 Patent	Mault
	FIG. 1 shows a schematic of a system embodiment comprising an electronic device 10, a blood glucose sensor 12, a physical activity monitor 14, an insulin pump 16, **a communications network 20, and a remote computer system 22**. Mault at [0069] Electronic device **10** can be carried by the person, for example a portable computer, personal digital assistant (PDA), wireless phone with computational functionality, visor-mounted device, or other device. The electronic device **10** can be a PDA such as a Palm Pilot. The electronic device can be a portable electronic device or system carried by the person, or a device or system combining multiple functionalities, such as: a personal digital assistant (PDA); an electronic book (e-book); a portable computer; any portable Internet access device; a wireless phone; a wristwatch, adapted to record data, for example to monitor physiological properties, or act as a diet log (it may also act as a wireless internet access device, or be otherwise adapted); a headset, providing for example visual and audio communication to the person, and recording audio and/or visual information; a body mounted activity monitor (for example pedometer) adapted to record data; any portable electronic device with data logging capabilities, for example an electronic organizer; or some combination of the above or other devices. Mault at [0070] Sensor **12** can be carried by the person and provides blood glucose measurements at intervals. For example, sensor **12** can uses ion flow to draw glucose molecules out of the blood into a gel disk containing the enzyme glucose oxidase, generating hydrogen peroxide, which is detected and a numerical value displayed. This technique is used by GlucoWatch developed by Cygnus (Redwood City, Calif.). The sensor can then transmit the numerical value of blood glucose to the PDA **10**, for example using a wireless method. Alternatively, sensor **12** may use spectroscopic detection of a glucose oxidase reaction. Sensor **12** may also use in-vivo spectroscopy techniques to measure blood glucose, for example as described in U.S. Pat. Nos. 6,067,463 (Jeng), 6,049,727 (Crothal), 5,660,163 (Schulman), and others. For example, IR absorption or reflection properties of skin or tissues may be determined, for example using a finger, toe, wrist, skin membrane, earlobe, nose, cheek, retina, or other body part. A blood analysis sensor may be built in to a module which plugs in to the PDA. For example, using a non-invasive spectroscopic technique, the PDA/module combination may be placed against part

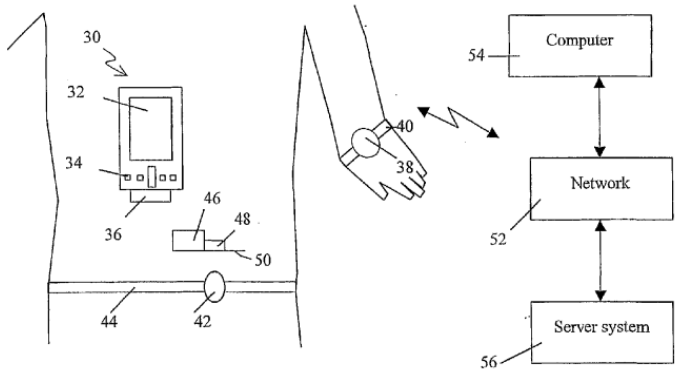
’868 Patent	Mault
	of the body to obtain a blood glucose reading. The sensor may also be placed under the skin, with wireless communication, such as using the Bluetooth protocol, to the PDA. The sensor may be powered by internal batteries, by light using a photoelectric effect, by temperature gradients using a thermoelectric effect, by radiation (e.g. from AM radio stations, electric mains, or radiated by the PDA or other portable device), and may be either continuously powered or only powered at times a reading is required. The sensor may record data to a memory card which plugs into the PDA. Mault at [0073]  Figure 2 Mault at Fig.2 FIG. 2 shows a system embodiment, comprising portable computing device **30** having a display **32**, data entry mechanism **34**, and wireless transceiver **36**; a wrist-mounted glucose sensor **38** having a strap **40**; activity monitor **42** supported by the person's body using belt **44**; insulin storage and dispensing device **46** comprising a subcutaneous needle **50** and delivery system **48** such as a pump. The portable computing device **30** is in linked to a communications network **52**, allowing communication a remote computer system **54**, which may be located at the person's home, doctor's office, or other remote location. A remote server system **56** is also accessible through the communications network **52**, and can be used to store a database of physiological parameters, activity, and diet relating to the person, for medical, nutritional, or computer expert system analysis. The wrist mounted sensor **40** and activity monitor **42** can transmit data to the portable computing

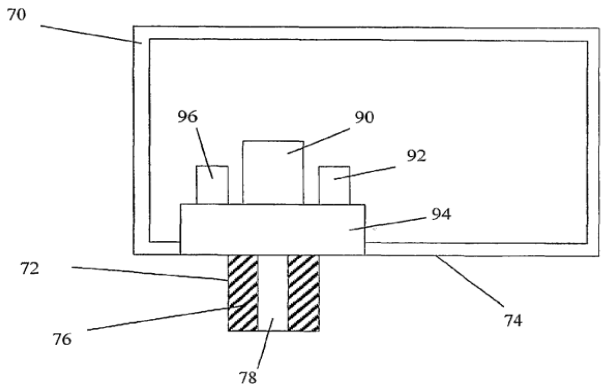
’868 Patent	Mault
	device **30** through a wireless method. The device **30** can be carried in a pocket of the person's clothes, or on a belt clip, or other convenient method. Mault at [0079] FIG. 7B shows a schematic of a possible embodiment of a system blood glucose monitoring system, an analysis module **164** comprising a blood glucose sensor **140** providing an electrical glucose signal correlated with blood glucose levels, an analog-to-digital converter **142** providing a digital representation of the glucose signal, and a wireless transmitter **144** transmitting the digital representation of the glucose signal to other devices in communication with the analysis module. A portable computing device **166** which can communicate with the analysis module comprises a wireless receiver **146**, a data buffer **148**, a processor **150**, a memory **152**, a memory module (e.g. memory card) interface **154**, a clock **156**, a display **158**, and a bus **162**. Mault at [0093] In one embodiment, interstitial fluid is drawn out of the dermis of the skin into an analysis means. Fluid can be drawn out of the skin through one or more inlet microneedles, and returned to the dermis through one or more outlet microneedles, so as to provide a flow of interstitial fluid through the module. The fluid can flow through an array of microspheres, such as silica or polymer microspheres, the surfaces of which have a molecular species which fluoresces in the presence of glucose. Alternatively, the fluid may flow through a capillary or microcapillary having an inside surface lined with a fluorescence film sensitive to the concentration of glucose in the fluid. The fluorescence is detected as a measure of glucose concentration, using a detector and excitation radiation source (which can be located within the housing) possibly in comparison with a reference region not exposed to interstitial fluid flow. IR radiation may also be waveguided along capillaries, or scattered by microspheres, so as to spectroscopically detect glucose. In other embodiments, the analysis module uses the detection methods developed by Cygnus for the GlucoWatch, as discussed above. The module may alternatively draw blood or lymph fluid into the housing for analysis, for example using a micromechanical pump. The analysis module may alternatively perform non-invasive analysis of blood glucose, for example by clipping to an ear lobe or other skin flap and transmitting near-IR radiation through the skin flap. An analysis module with a fluorescence sensing region may be optically accessed by an external device having an excitation radiation source and a fluorescence detector, for example a fluorescence sensor can be contained within a transparent housing and embedded in the skin.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Mault
	Mault at [0094] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Mault, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Mault, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[a]. a light source comprising:	Mault discloses or renders obvious a diagnostic system comprises a light source. **The person carries a portable computing device, such as a PDA, which receives blood glucose levels from a blood glucose sensor. The blood glucose sensor may be a device clipped on to the earlobe of the person, using at least one semiconductor laser or light emitting diode to emit wavelengths in the near-IR.** These wavelengths are transmitted through or reflected by blood-containing tissue, and then detected by a near-IR detector. A number of emissive devices may be used, or electrical modulation of a single device may be used to obtain multiple wavelength emission. For example, two wavelengths may be chosen, one absorbed and one not absorbed by blood glucose, the absorption ratio then being used to compute the blood glucose level of the person. Other blood glucose sensors are known in the art, and improved sensor systems are discussed below. The blood glucose data can be transmitted from the sensor to the PDA using the Bluetooth wireless protocol. Mault at [0020] Sensor **12** can be carried by the person and provides blood glucose measurements at intervals. For example, sensor **12** can uses ion flow to draw glucose molecules out of the blood into a gel disk containing the enzyme glucose oxidase, generating hydrogen peroxide, which is detected and a numerical value displayed. This technique is used by GlucoWatch developed by Cygnus (Redwood City, Calif.). The sensor can then transmit the numerical value of blood glucose to the PDA **10**, for example using a wireless method. **Alternatively, sensor 12 may use spectroscopic detection of a glucose oxidase reaction. Sensor 12 may also use in-vivo spectroscopy techniques to measure blood glucose, for example as described in U.S. Pat. Nos. 6,067,463 (Jeng), 6,049,727 (Crothal), 5,660,163 (Schulman), and others. For example, IR absorption or reflection properties of skin or tissues may be determined, for example using a finger, toe, wrist, skin membrane, earlobe, nose,**

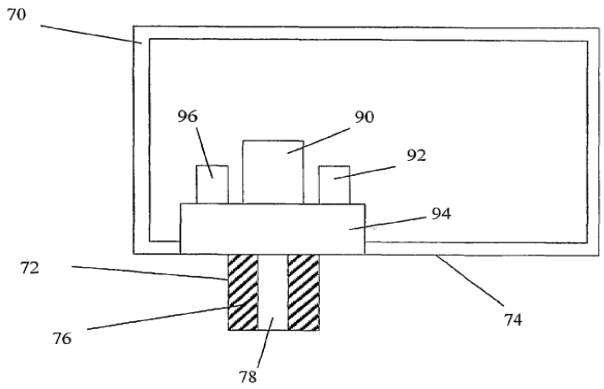
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Mault
	cheek, retina, or other body part. A blood analysis sensor may be built in to a module which plugs in to the PDA. **For example, using a non-invasive spectroscopic technique, the PDA/module combination may be placed against part of the body to obtain a blood glucose reading.** The sensor may also be placed under the skin, with wireless communication, such as using the Bluetooth protocol, to the PDA. The sensor may be powered by internal batteries, by light using a photoelectric effect, by temperature gradients using a thermoelectric effect, by radiation (e.g. from AM radio stations, electric mains, or radiated by the PDA or other portable device), and may be either continuously powered or only powered at times a reading is required. The sensor may record data to a memory card which plugs into the PDA. Mault at [0073]  Figure 2 Mault at Fig.2 FIG. 2 shows **a system embodiment, comprising portable computing device 30** having a display 32, data entry mechanism 34, and wireless transceiver 36; a wrist-mounted glucose sensor 38 having a strap 40; activity monitor 42 supported by the person's body using belt 44; insulin storage and dispensing device 46 comprising a subcutaneous needle 50 and delivery system 48 such as a pump. The portable computing device 30 is in linked to a communications network 52, allowing communication a remote computer system 54, which may be located at the person's home, doctor's office, or other remote location. A remote server system 56 is also accessible through the communications network 52, and can be used to store a database of physiological parameters, activity, and diet relating to the person, for

’868 Patent	Mault
	medical, nutritional, or computer expert system analysis. The wrist mounted sensor 40 and activity monitor 42 can transmit data to the portable computing device 30 through a wireless method. The device 30 can be carried in a pocket of the person's clothes, or on a belt clip, or other convenient method. Mault at [0079]  Figure 5 Mault at Fig. 5 FIG. 5 shows a microneedle 72 with a hollow center 78 in fluid communication with fluorescent matrix 94. Matrix 94, for example **a fluorophore doped polymer or sol-gel, is excited by light emitting diode 90**. **Photodetector 96 detects fluorescent radiation from a sensing region of the matrix, which is affected by the presence of analyte in the interstitial fluid drawn from the skin**. Mault at [0085] Analytical techniques which may be used to measure glucose concentrations in blood, interstitial fluid, urine, or other body fluids and tissues include: techniques based on the glucose oxidase reaction; other enzymatic reactions; IR (particularly near-IR), Raman, and optical-UV spectroscopy; fluorescence; colorimetry; attenuated total reflection, for example from a surface adapted to bind glucose; micromechanical methods such as detecting changes in resonance frequencies on analyte absorption, or having surfaces adapted to bind glucose with other detection methods; optical rotation and ORD; refractometry; fiber sensing; laser absorption; enzymatic methods such as using the glucose oxidase

’868 Patent	Mault
	reaction; biochemical effect detection; or other appropriate techniques. Fluid samples may be removed from the body, or analyzed within the body. Mault at [0090] Jeng (U.S. Pat. No. 6,067,463) Mault incorporates Jeng by reference. Mault at [0011] (“The contents of U.S. Patents and published Patent Applications mentioned herein, are incorporated herein by reference.”), [0073] (Sensor 12 may also use in-vivo spectroscopy techniques to measure blood glucose, for example as described in U.S. Pat. Nos. 6,067,463 (Jeng) . . . .”). Jeng discloses or renders obvious a diagnostic system comprises a light source as shown in Exhibit A2, which is incorporated by reference as if fully stated herein. One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Mault, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Mault, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[b]. one or more semiconductor diodes generating an input light beam; and	Mault discloses or renders obvious the light source comprises one or more semiconductor diodes generating an input light beam. **The person carries a portable computing device, such as a PDA, which receives blood glucose levels from a blood glucose sensor. The blood glucose sensor may be a device clipped on to the earlobe of the person, using at least one semiconductor laser or light emitting diode to emit wavelengths in the near-IR.** These wavelengths are transmitted through or reflected by blood-containing tissue, and then detected by a near-IR detector. A number of emissive devices may be used, or electrical modulation of a single device may be used to obtain multiple wavelength emission. For example, two wavelengths may be chosen, one absorbed and one not absorbed by blood glucose, the absorption ratio then being used to compute the blood glucose level of the person. Other blood glucose sensors are known in the art, and improved sensor systems are discussed below. The blood glucose data can be transmitted from the sensor to the PDA using the Bluetooth wireless protocol.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

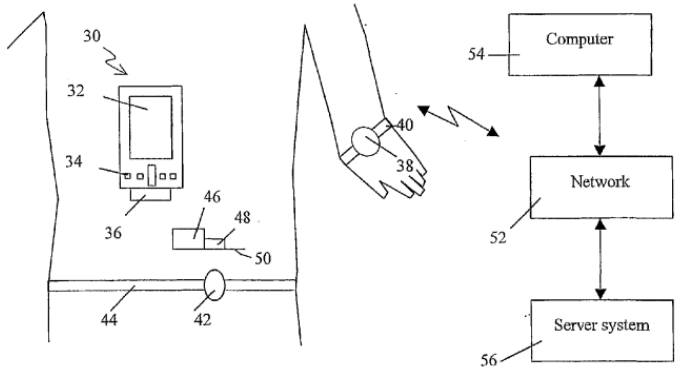
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	Mault at [0020]  Figure 5 Mault at Fig. 5 Sensor **12** can be carried by the person and provides blood glucose measurements at intervals. For example, sensor **12** can uses ion flow to draw glucose molecules out of the blood into a gel disk containing the enzyme glucose oxidase, generating hydrogen peroxide, which is detected and a numerical value displayed. This technique is used by GlucoWatch developed by Cygnus (Redwood City, Calif.). The sensor can then transmit the numerical value of blood glucose to the PDA **10**, for example using a wireless method. **Alternatively, sensor 12 may use spectroscopic detection of a glucose oxidase reaction. Sensor 12 may also use in-vivo spectroscopy techniques to measure blood glucose, for example as described in U.S. Pat. Nos. 6,067,463 (Jeng), 6,049,727 (Crothal), 5,660,163 (Schulman), and others. For example, IR absorption or reflection properties of skin or tissues may be determined, for example using a finger, toe, wrist, skin membrane, earlobe, nose, cheek, retina, or other body part.** A blood analysis sensor may be built in to a module which plugs in to the PDA. **For example, using a non-invasive spectroscopic technique, the PDA/module combination may be placed against part of the body to obtain a blood glucose reading.** The sensor may also be placed under the skin, with wireless communication, such as using the Bluetooth protocol, to the PDA. The sensor may be powered by internal batteries, by light using a photoelectric effect, by temperature gradients using a thermoelectric effect, by radiation (e.g. from AM radio stations, electric mains, or radiated by the PDA or other portable device), and may be either continuously powered or

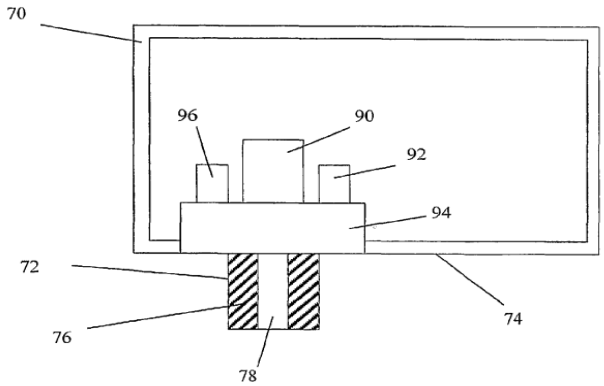
’868 Patent	Mault
	only powered at times a reading is required. The sensor may record data to a memory card which plugs into the PDA. Mault at [0073] **FIG. 5 shows a microneedle 72 with a hollow center 78 in fluid communication with fluorescent matrix 94. Matrix 94, for example a fluorophore doped polymer or sol-gel, is excited by light emitting diode 90.** Photodetector 96 detects fluorescent radiation from a sensing region of the matrix, which is affected by the presence of analyte in the interstitial fluid drawn from the skin. A reference photodiode 92 is used to provide a reference signal from an reference region of fluorescent matrix, into which the analyte does not enter. For example, a semi-permeable membrane can be used to prevent glucose molecules from entering reference regions of the matrix. A number of microneedles such as 72 can pass fluid to a fluorescent matrix. The sensor housing contains at least one fluorescent matrix. In other embodiments, a plurality of separate analyte and reference matrix regions can be used. Mault at [0085] **Excitation radiation, for example from a light emitting diode, may be passed along the hollow center of a microneedle.** A fluorescent matrix may be supported by the end of the microneedle, or line the wall surface of a microneedle, so as to be in contact with interstitial fluid, allowing fluorescent detection of analytes in the fluid. Mault at [0087] Analytical techniques which may be used to measure glucose concentrations in blood, interstitial fluid, urine, or other body fluids and tissues include: techniques based on the glucose oxidase reaction; other enzymatic reactions; IR (particularly near-IR), Raman, and optical-UV spectroscopy; fluorescence; colorimetry; attenuated total reflection, for example from a surface adapted to bind glucose; micromechanical methods such as detecting changes in resonance frequencies on analyte absorption, or having surfaces adapted to bind glucose with other detection methods; optical rotation and ORD; refractometry; fiber sensing; laser absorption; enzymatic methods such as using the glucose oxidase reaction; biochemical effect detection; or other appropriate techniques. Fluid samples may be removed from the body, or analyzed within the body.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Mault
	Mault at [0090] Jeng (U.S. Pat. No. 6,067,463) Mault incorporates Jeng by reference. Mault at [0011] (“The contents of U.S. Patents and published Patent Applications mentioned herein, are incorporated herein by reference.”), [0073] (Sensor 12 may also use in-vivo spectroscopy techniques to measure blood glucose, for example as described in U.S. Pat. Nos. 6,067,463 (Jeng) . . . .”). Jeng discloses or renders obvious a diagnostic system comprises a light source as shown in Exhibit A2, which is incorporated by reference as if fully stated herein. One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Mault, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Mault, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[c]. a lens system configured to receive at least a portion of the input light beam and to communicate at least the portion of the input light beam onto a part of a user's body comprising blood	Mault discloses or renders obvious the light source comprises a lens system configured to receive at least a portion of the input light beam and to communicate at least the portion of the input light beam onto a part of a user's body comprising blood. The person carries **a portable computing device, such as a PDA, which receives blood glucose levels from a blood glucose sensor. The blood glucose sensor may be a device clipped on to the earlobe of the person, using at least one semiconductor laser or light emitting diode to emit wavelengths in the near-IR. These wavelengths are transmitted through or reflected by blood-containing tissue**, and then detected by a near-IR detector. A number of emissive devices may be used, or electrical modulation of a single device may be used to obtain multiple wavelength emission. For example, two wavelengths may be chosen, one absorbed and one not absorbed by blood glucose, the absorption ratio then being used to compute the blood glucose level of the person. Other blood glucose sensors are known in the art, and improved sensor systems are discussed below. The blood glucose data can be transmitted from the sensor to the PDA using the Bluetooth wireless protocol. Mault at [0020]

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Mault
	 Figure 2 Mault at Fig.2 FIG. 2 shows **a system embodiment, comprising portable computing device 30** having a display 32, data entry mechanism 34, and wireless transceiver 36; a wrist-mounted glucose sensor 38 having a strap 40; activity monitor 42 supported by the person's body using belt 44; insulin storage and dispensing device 46 comprising a subcutaneous needle 50 and delivery system 48 such as a pump. The portable computing device 30 is in linked to a communications network 52, allowing communication a remote computer system 54, which may be located at the person's home, doctor's office, or other remote location. A remote server system 56 is also accessible through the communications network 52, and can be used to store a database of physiological parameters, activity, and diet relating to the person, for medical, nutritional, or computer expert system analysis. The wrist mounted sensor 40 and activity monitor 42 can transmit data to the portable computing device 30 through a wireless method. The device 30 can be carried in a pocket of the person's clothes, or on a belt clip, or other convenient method. Mault at [0079]

’868 Patent	Mault
	 Figure 5 Mault at Fig. 5 **FIG. 5 shows a microneedle 72 with a hollow center 78 in fluid communication with fluorescent matrix 94. Matrix 94, for example a fluorophore doped polymer or sol-gel, is excited by light emitting diode 90.** Photodetector 96 detects fluorescent radiation from a sensing region of the matrix, which is affected by the presence of analyte in the interstitial fluid drawn from the skin. A reference photodiode 92 is used to provide a reference signal from an reference region of fluorescent matrix, into which the analyte does not enter. For example, a semi-permeable membrane can be used to prevent glucose molecules from entering reference regions of the matrix. A number of microneedles such as 72 can pass fluid to a fluorescent matrix. The sensor housing contains at least one fluorescent matrix. In other embodiments, a plurality of separate analyte and reference matrix regions can be used. Mault at [0085] **Excitation radiation, for example from a light emitting diode, may be passed along the hollow center of a microneedle.** A fluorescent matrix may be supported by the end of the microneedle, or line the wall surface of a microneedle, so as to be in contact with interstitial fluid, allowing fluorescent detection of analytes in the fluid. Mault at [0087]

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Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

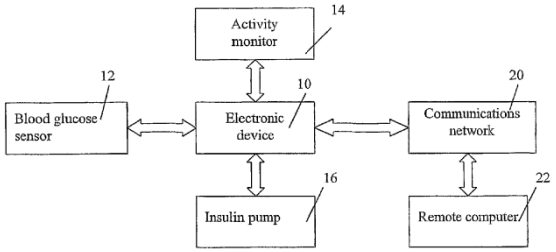
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	In one embodiment, the interstitial fluid is drawn into a gel layer, where it is analyzed for blood glucose using the conventional glucose oxidase reaction, or another analytical technique**. Infrared and Raman spectroscopy can also be used for noninvasive analysis of blood glucose levels**. **A module may be placed against the skin to detect the IR signature of glucose of fluid beneath the skin**, or a spectroscopic mechanism can be included into the analysis module described above so as to detect levels of glucose within the interstitial fluid extracted from the skin. Mault at [0089] **Analytical techniques which may be used to measure glucose concentrations in blood**, interstitial fluid, urine, or **other body fluids and tissues include: techniques based on the glucose oxidase reaction; other enzymatic reactions; IR (particularly near-IR), Raman, and optical-UV spectroscopy; fluorescence; colorimetry; attenuated total reflection, for example from a surface adapted to bind glucose; micromechanical methods such as detecting changes in resonance frequencies on analyte absorption, or having surfaces adapted to bind glucose with other detection methods; optical rotation and ORD; refractometry; fiber sensing; laser absorption**; enzymatic methods such as using the glucose oxidase reaction; biochemical effect detection; or other appropriate techniques. Fluid samples may be removed from the body, or analyzed within the body. Mault at [0090] In one embodiment, interstitial fluid is drawn out of the dermis of the skin into an analysis means. Fluid can be drawn out of the skin through one or more inlet microneedles, and returned to the dermis through one or more outlet microneedles, so as to provide a flow of interstitial fluid through the module. The fluid can flow through an array of microspheres, such as silica or polymer microspheres, the surfaces of which have a molecular species which fluoresces in the presence of glucose. Alternatively, **the fluid may flow through a capillary or microcapillary having an inside surface lined with a fluorescence film sensitive to the concentration of glucose in the fluid. The fluorescence is detected as a measure of glucose concentration, using a detector and excitation radiation source (which can be located within the housing) possibly in comparison with a reference region not exposed to interstitial fluid flow. IR radiation may also be waveguided along capillaries, or scattered by microspheres, so as to spectroscopically detect glucose**. In other embodiments, the analysis module uses the detection methods developed by Cygnus for the GlucoWatch, as discussed above. The module may alternatively draw blood or lymph fluid into the housing for analysis, for example using a micromechanical pump.

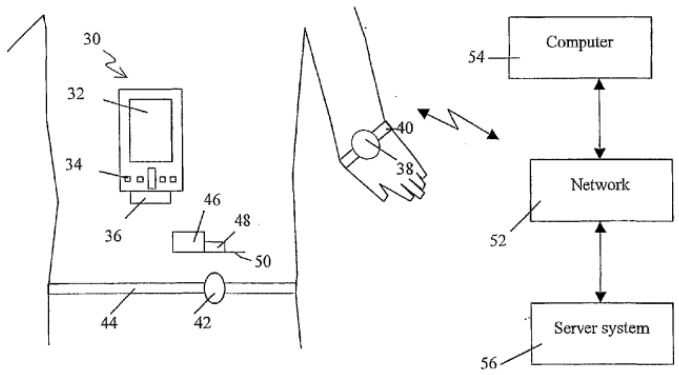
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Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

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	The analysis module may alternatively perform non-invasive analysis of blood glucose, for example by clipping to an ear lobe or other skin flap and transmitting near-IR radiation through the skin flap. **An analysis module with a fluorescence sensing region may be optically accessed by an external device having an excitation radiation source and a fluorescence detector, for example a fluorescence sensor can be contained within a transparent housing and embedded in the skin**. Mault at [0094] Analytical techniques which may be used to measure glucose concentrations in blood, interstitial fluid, urine, or other body fluids and tissues include: techniques based on the glucose oxidase reaction; other enzymatic reactions; IR (particularly near-IR), Raman, and optical-UV spectroscopy; fluorescence; colorimetry; attenuated total reflection, for example from a surface adapted to bind glucose; micromechanical methods such as detecting changes in resonance frequencies on analyte absorption, or having surfaces adapted to bind glucose with other detection methods; optical rotation and ORD; refractometry; fiber sensing; laser absorption; enzymatic methods such as using the glucose oxidase reaction; biochemical effect detection; or other appropriate techniques. Fluid samples may be removed from the body, or analyzed within the body. Mault at [0090] <u>Jeng (U.S. Pat. No. 6,067,463)</u> Mault incorporates Jeng by reference. Mault at [0011] (“The contents of U.S. Patents and published Patent Applications mentioned herein, are incorporated herein by reference.”), [0073] (Sensor 12 may also use in-vivo spectroscopy techniques to measure blood glucose, for example as described in U.S. Pat. Nos. 6,067,463 (Jeng) . . . .”). Jeng discloses or renders obvious a diagnostic system comprises a light source as shown in Exhibit A2, which is incorporated by reference as if fully stated herein. One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Mault, it would

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	have been obvious to one of ordinary skill in the art to combine, with the teachings of Mault, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[d]. wherein at least the portion of the input light beam is used in a measurement on a user;	Mault discloses or renders obvious the portion of the input light beam is used in a measurement on a user. The person carries **a portable computing device, such as a PDA, which receives blood glucose levels from a blood glucose sensor. The blood glucose sensor may be a device clipped on to the earlobe of the person, using at least one semiconductor laser or light emitting diode to emit wavelengths in the near-IR. These wavelengths are transmitted through or reflected by blood-containing tissue, and then detected by a near-IR detector**. **A number of emissive devices may be used, or electrical modulation of a single device may be used to obtain multiple wavelength emission. For example, two wavelengths may be chosen, one absorbed and one not absorbed by blood glucose, the absorption ratio then being used to compute the blood glucose level of the person**. Other blood glucose sensors are known in the art, and improved sensor systems are discussed below. The blood glucose data can be transmitted from the sensor to the PDA using the Bluetooth wireless protocol. Mault at [0020] Embodiments of this invention provide a person with improved control over their blood glucose levels. This improved control is important in diabetes management, and can also be combined with a weight control program by providing a software program combining glycemic response modeling with diet logging functionalities. **A glycemic response model for a person, which is used to predict changes in blood glucose level based on the recording of foods consumed, or foods planned to be consumed, can be modified for improved accuracy by comparison with actual measurements of blood glucose.** Further, **the glycemic response model for a person can be determined by relating blood glucose measurements** with diet log records, in terms of food consumed and time of meals, in a closed loop system by which the model can be constantly improved based on new comparisons of projected and actual blood glucose levels. Mault at [0066]

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Mault
	 Figure 1 Mault at Fig.1 **FIG. 1 shows a schematic of a system embodiment comprising an electronic device 10, a blood glucose sensor 12, a physical activity monitor 14**, an insulin pump 16, **a communications network 20, and a remote computer system 22**. Mault at [0069] Electronic device **10** can be carried by the person, for example a portable computer, personal digital assistant (PDA), wireless phone with computational functionality, visor-mounted device, or other device. The electronic device **10** can be a PDA such as a Palm Pilot. The electronic device can be a portable electronic device or system carried by the person, or a device or system combining multiple functionalities, such as: a personal digital assistant (PDA); an electronic book (e-book); a portable computer; any portable Internet access device; a wireless phone; a wristwatch, adapted to record data, for example to monitor physiological properties, or act as a diet log (it may also act as a wireless internet access device, or be otherwise adapted); a headset, providing for example visual and audio communication to the person, and recording audio and/or visual information; a body mounted activity monitor (for example pedometer) adapted to record data; any portable electronic device with data logging capabilities, for example an electronic organizer; or some combination of the above or other devices. Mault at [0070] Sensor 12 can be carried by the person and provides blood glucose measurements at intervals. For example, sensor 12 can uses ion flow to draw glucose molecules out of the blood into a gel disk

’868 Patent	Mault
	containing the enzyme glucose oxidase, generating hydrogen peroxide, which is detected and a numerical value displayed. This technique is used by GlucoWatch developed by Cygnus (Redwood City, Calif.). The sensor can then transmit the numerical value of blood glucose to the PDA 10, for example using a wireless method. Alternatively, sensor 12 may use spectroscopic detection of a glucose oxidase reaction. **Sensor 12 may also use in-vivo spectroscopy techniques to measure blood glucose, for example as described in U.S. Pat. Nos. 6,067,463 (Jeng), 6,049,727 (Crothal), 5,660,163 (Schulman), and others. For example, IR absorption or reflection properties of skin or tissues may be determined, for example using a finger, toe, wrist, skin membrane, earlobe, nose, cheek, retina, or other body part.** A blood analysis sensor may be built in to a module which plugs in to the PDA. For example, using a non-invasive spectroscopic technique, the PDA/module combination may be placed against part of the body to obtain a blood glucose reading. The sensor may also be placed under the skin, with wireless communication, such as using the Bluetooth protocol, to the PDA. The sensor may be powered by internal batteries, by light using a photoelectric effect, by temperature gradients using a thermoelectric effect, by radiation (e.g. from AM radio stations, electric mains, or radiated by the PDA or other portable device), and may be either continuously powered or only powered at times a reading is required. The sensor may record data to a memory card which plugs into the PDA. Mault at [0073]  Figure 2 Mault at Fig.2

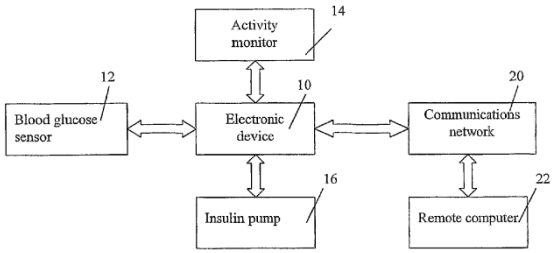
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	FIG. 2 shows a system embodiment, comprising portable computing device **30** having a display **32**, data entry mechanism **34**, and wireless transceiver **36**; a wrist-mounted glucose sensor **38** having a strap **40**; activity monitor **42** supported by the person's body using belt **44**; insulin storage and dispensing device **46** comprising a subcutaneous needle **50** and delivery system **48** such as a pump. The portable computing device **30** is in linked to a communications network **52**, allowing communication a remote computer system **54**, which may be located at the person's home, doctor's office, or other remote location. A remote server system **56** is also accessible through the communications network **52**, and can be used to store a database of physiological parameters, activity, and diet relating to the person, for medical, nutritional, or computer expert system analysis. The wrist mounted sensor **40** and activity monitor **42** can transmit data to the portable computing device **30** through a wireless method. The device **30** can be carried in a pocket of the person's clothes, or on a belt clip, or other convenient method. Mault at [0079] **Analytical techniques which may be used to measure glucose concentrations in blood**, interstitial fluid, urine, or **other body fluids and tissues include: techniques based on the glucose oxidase reaction; other enzymatic reactions; IR (particularly near-IR), Raman, and optical-UV spectroscopy; fluorescence; colorimetry; attenuated total reflection, for example from a surface adapted to bind glucose; micromechanical methods such as detecting changes in resonance frequencies on analyte absorption, or having surfaces adapted to bind glucose with other detection methods; optical rotation and ORD; refractometry; fiber sensing; laser absorption**; enzymatic methods such as using the glucose oxidase reaction; biochemical effect detection; or other appropriate techniques. Fluid samples may be removed from the body, or analyzed within the body. Mault at [0090] FIG. 7B shows a schematic of a possible embodiment of a system blood glucose monitoring system, an analysis module **164** comprising a blood glucose sensor **140** providing an electrical glucose signal correlated with blood glucose levels, an analog-to-digital converter **142** providing a digital representation of the glucose signal, and a wireless transmitter **144** transmitting the digital representation of the glucose signal to other devices in communication with the analysis module. A portable computing device **166** which can communicate with the analysis module comprises

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

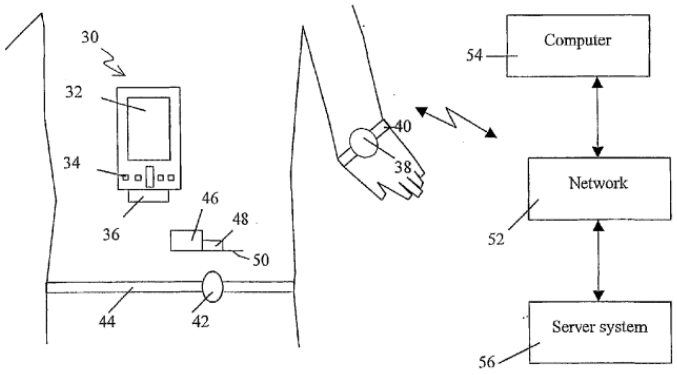
’868 Patent	Mault
	a wireless receiver **146**, a data buffer **148**, a processor **150**, a memory **152**, a memory module (e.g. memory card) interface **154**, a clock **156**, a display **158**, and a bus **162**. Mault at [0093] In one embodiment, interstitial fluid is drawn out of the dermis of the skin into an analysis means. Fluid can be drawn out of the skin through one or more inlet microneedles, and returned to the dermis through one or more outlet microneedles, so as to provide a flow of interstitial fluid through the module. The fluid can flow through an array of microspheres, such as silica or polymer microspheres, the surfaces of which have a molecular species which fluoresces in the presence of glucose. Alternatively, **the fluid may flow through a capillary or microcapillary having an inside surface lined with a fluorescence film sensitive to the concentration of glucose in the fluid. The fluorescence is detected as a measure of glucose concentration, using a detector and excitation radiation source (which can be located within the housing) possibly in comparison with a reference region not exposed to interstitial fluid flow. IR radiation may also be waveguided along capillaries, or scattered by microspheres, so as to spectroscopically detect glucose**. In other embodiments, the analysis module uses the detection methods developed by Cygnus for the GlucoWatch, as discussed above. The module may alternatively draw blood or lymph fluid into the housing for analysis, for example using a micromechanical pump. **The analysis module may alternatively perform non-invasive analysis of blood glucose, for example by clipping to an ear lobe or other skin flap and transmitting near-IR radiation through the skin flap**. **An analysis module with a fluorescence sensing region may be optically accessed by an external device having an excitation radiation source and a fluorescence detector, for example a fluorescence sensor can be contained within a transparent housing and embedded in the skin**. Mault at [0094] <u>Jeng (U.S. Pat. No. 6,067,463)</u> Mault incorporates Jeng by reference. Mault at [0011] (“The contents of U.S. Patents and published Patent Applications mentioned herein, are incorporated herein by reference.”), [0073] (Sensor 12 may also use in-vivo spectroscopy techniques to measure blood glucose, for example as described in U.S. Pat. Nos. 6,067,463 (Jeng) . . . .”). Jeng discloses or renders obvious a diagnostic system comprises a light source as shown in Exhibit A2, which is incorporated by reference as if fully stated herein.

’868 Patent	Mault
	One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Mault, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Mault, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[e]. a software application capable of generating data based at least in part on the measurement on the user,	Mault discloses or renders obvious a software application capable of generating data based at least in part on the measurement on the user. A system for assisting a person to maintain a blood glucose level between predetermined limits comprises: an electronic device, comprising a display, a clock, a memory, and a processor; and a software program executable by the processor of the electronic device, adapted to receive nutritional data of food consumed by the person, adapted to calculate the blood glucose level for the person using the nutritional data and a glycemic response model for the person, and further adapted to present the blood glucose level to the person on the display of the electronic device. Mault at Abstract A method by which a person can control their blood glucose comprises: entering food consumption data into a software program, **the software program running on a computing device, the software program adapted to record food consumed and to calculate a glycemic response; viewing the calculated glycemic response on a display of the computing device; and performing an action in response to the calculated glycemic response, so as to maintain blood glucose within predetermined levels.** The action may comprise the administration of insulin, the administration of glucagon; the performing of exercise, eating, or contacting a medical professional. Mault at [0038] A system for assisting a person to maintain a blood glucose level between predetermined limits comprises an electronic device, for example a portable computing device such as a PDA, comprising a display, a clock, a memory, and a processor; and **a software program executable by the processor of the electronic device, adapted to receive nutritional data of food consumed by the person, to calculate the blood glucose level for the person using the nutritional data and a glycemic response**

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Mault
	model for the person, and further adapted to present the blood glucose level to the person on the display of the electronic device. The program can receive diet log data from the person, for example food identities, then correlate the food identities with nutritional data using a database. The software program can be further adapted to receive time data related to the time of consumption of food (including beverages, nutraceuticals, and other consumables) by the person, and to receive data relating to planned consumption of food. **Blood glucose levels can be calculated for a plurality of times, and presented as a table or graph.** Mault at [0042] Embodiments of this invention provide a person with improved control over their blood glucose levels. This improved control is important in diabetes management, and can also be combined with a weight control program by providing a software program combining glycemic response modeling with diet logging functionalities. **A glycemic response model for a person, which is used to predict changes in blood glucose level based on the recording of foods consumed, or foods planned to be consumed, can be modified for improved accuracy by comparison with actual measurements of blood glucose.** Further, **the glycemic response model for a person can be determined by relating blood glucose measurements** with diet log records, in terms of food consumed and time of meals, in a closed loop system by which the model can be constantly improved based on new comparisons of projected and actual blood glucose levels. Mault at [0066]  Figure 1 Mault at Fig.1

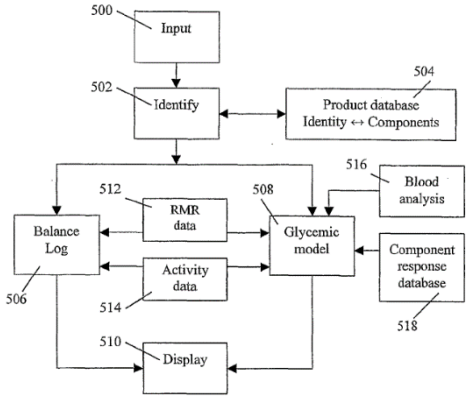
’868 Patent	Mault
	FIG. 1 shows a schematic of a system embodiment comprising an electronic device 10, a blood glucose sensor 12, a physical activity monitor 14, an insulin pump 16, **a communications network 20, and a remote computer system 22**. Mault at [0069] Electronic device **10** can be carried by the person, for example a portable computer, personal digital assistant (PDA), wireless phone with computational functionality, visor-mounted device, or other device. The electronic device **10** can be a PDA such as a Palm Pilot. The electronic device can be a portable electronic device or system carried by the person, or a device or system combining multiple functionalities, such as: a personal digital assistant (PDA); an electronic book (e-book); a portable computer; any portable Internet access device; a wireless phone; a wristwatch, adapted to record data, for example to monitor physiological properties, or act as a diet log (it may also act as a wireless internet access device, or be otherwise adapted); a headset, providing for example visual and audio communication to the person, and recording audio and/or visual information; a body mounted activity monitor (for example pedometer) adapted to record data; any portable electronic device with data logging capabilities, for example an electronic organizer; or some combination of the above or other devices. Mault at [0070] Sensor 12 can be carried by the person and provides blood glucose measurements at intervals. For example, sensor 12 can uses ion flow to draw glucose molecules out of the blood into a gel disk containing the enzyme glucose oxidase, generating hydrogen peroxide, which is detected and a numerical value displayed. This technique is used by GlucoWatch developed by Cygnus (Redwood City, Calif.). The sensor can then transmit the numerical value of blood glucose to the PDA 10, for example using a wireless method. Alternatively, sensor 12 may use spectroscopic detection of a glucose oxidase reaction. **Sensor 12 may also use in-vivo spectroscopy techniques to measure blood glucose, for example as described in U.S. Pat. Nos. 6,067,463 (Jeng), 6,049,727 (Crothal), 5,660,163 (Schulman), and others. For example, IR absorption or reflection properties of skin or tissues may be determined, for example using a finger, toe, wrist, skin membrane, earlobe, nose, cheek, retina, or other body part.** A blood analysis sensor may be built in to a module which plugs in to the PDA. For example, using a non-invasive spectroscopic technique, the PDA/module combination may be placed against part of the body to obtain a blood glucose reading. The sensor may also be placed

’868 Patent	Mault
	under the skin, with wireless communication, such as using the Bluetooth protocol, to the PDA. The sensor may be powered by internal batteries, by light using a photoelectric effect, by temperature gradients using a thermoelectric effect, by radiation (e.g. from AM radio stations, electric mains, or radiated by the PDA or other portable device), and may be either continuously powered or only powered at times a reading is required. The sensor may record data to a memory card which plugs into the PDA. Mault at [0073]  Figure 2 Mault at Fig.2 FIG. 2 shows a system embodiment, comprising portable computing device **30** having a display **32**, data entry mechanism **34**, and wireless transceiver **36**; a wrist-mounted glucose sensor **38** having a strap **40**; activity monitor **42** supported by the person's body using belt **44**; insulin storage and dispensing device **46** comprising a subcutaneous needle **50** and delivery system **48** such as a pump. The portable computing device **30** is in linked to a communications network **52**, allowing communication a remote computer system **54**, which may be located at the person's home, doctor's office, or other remote location. A remote server system **56** is also accessible through the communications network **52**, and can be used to store a database of physiological parameters, activity, and diet relating to the person, for medical, nutritional, or computer expert system analysis. The wrist mounted sensor **40** and activity monitor **42** can transmit data to the portable computing device **30** through a wireless method. The device **30** can be carried in a pocket of the person's clothes, or on a belt clip, or other convenient method.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Mault
	Mault at [0079] **Analytical techniques which may be used to measure glucose concentrations in blood**, interstitial fluid, urine, or **other body fluids and tissues include: techniques based on the glucose oxidase reaction; other enzymatic reactions; IR (particularly near-IR), Raman, and optical-UV spectroscopy; fluorescence; colorimetry; attenuated total reflection, for example from a surface adapted to bind glucose; micromechanical methods such as detecting changes in resonance frequencies on analyte absorption, or having surfaces adapted to bind glucose with other detection methods; optical rotation and ORD; refractometry; fiber sensing; laser absorption**; enzymatic methods such as using the glucose oxidase reaction; biochemical effect detection; or other appropriate techniques. Fluid samples may be removed from the body, or analyzed within the body. Mault at [0090] FIG. 7B shows a schematic of a possible embodiment of a system blood glucose monitoring system, an analysis module **164** comprising a blood glucose sensor **140** providing an electrical glucose signal correlated with blood glucose levels, an analog-to-digital converter **142** providing a digital representation of the glucose signal, and a wireless transmitter **144** transmitting the digital representation of the glucose signal to other devices in communication with the analysis module. A portable computing device **166** which can communicate with the analysis module comprises a wireless receiver **146**, a data buffer **148**, a processor **150**, a memory **152**, a memory module (e.g. memory card) interface **154**, a clock **156**, a display **158**, and a bus **162**. Mault at [0093] In one embodiment, interstitial fluid is drawn out of the dermis of the skin into an analysis means. Fluid can be drawn out of the skin through one or more inlet microneedles, and returned to the dermis through one or more outlet microneedles, so as to provide a flow of interstitial fluid through the module. The fluid can flow through an array of microspheres, such as silica or polymer microspheres, the surfaces of which have a molecular species which fluoresces in the presence of glucose. Alternatively, **the fluid may flow through a capillary or microcapillary having an inside surface lined with a fluorescence film sensitive to the concentration of glucose in the fluid. The fluorescence is detected as a measure of glucose concentration, using a detector and excitation radiation source (which can be located within the housing) possibly in comparison with a reference region not exposed to interstitial fluid**

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

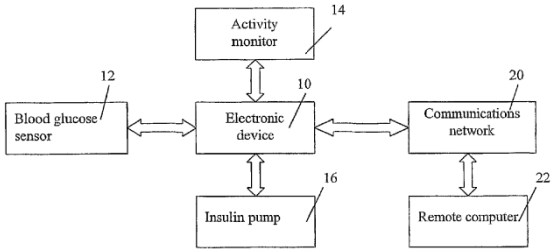
’868 Patent	Mault
	flow. IR radiation may also be waveguided along capillaries, or scattered by microspheres, so as to spectroscopically detect glucose. In other embodiments, the analysis module uses the detection methods developed by Cygnus for the GlucoWatch, as discussed above. The module may alternatively draw blood or lymph fluid into the housing for analysis, for example using a micromechanical pump. **The analysis module may alternatively perform non-invasive analysis of blood glucose, for example by clipping to an ear lobe or other skin flap and transmitting near-IR radiation through the skin flap**. **An analysis module with a fluorescence sensing region may be optically accessed by an external device having an excitation radiation source and a fluorescence detector, for example a fluorescence sensor can be contained within a transparent housing and embedded in the skin**. Mault at [0094]  Figure 19 Mault at Fig. 19 FIG. 19 shows a flowchart representing **a software program running on a computing device.** Box 500 represents the person entering food consumed, using any appropriate method. Box 502 represents the software program providing a food identification, for example by correlating an entered code with food identification and data. Box 504 corresponds to food identification being provided to a database 504, with corresponding nutritional data being extracted from the database. Box 506 corresponds to some part of the nutritional data, for example caloric data, being passed to a balance log calculator which calculates the calorie balance of the person from food consumed, activity levels, and metabolic

’868 Patent	Mault
	rate. Box 512 corresponds to providing RMR data, for example as determined using an indirect calorimeter. Box 514 corresponds to providing activity data, for example from an activity monitor. Box 510 corresponds to displaying calorie balance and projected blood glucose levels on display 510. **Box 508 corresponds to determining blood glucose levels for the person, using nutritional data, activity levels, metabolic rate, blood analysis data, and blood glucose response parameters corresponding to nutritional data provided by a component response database. Box 518 corresponds to providing blood glucose response parameters from a database, corresponding to nutritional data received. Box 516 corresponds to performing a blood test at intervals, and providing the data to a glycemic response algorithm.** Mault at [0187] <u>Jeng (U.S. Pat. No. 6,067,463)</u> Mault incorporates Jeng by reference. Mault at [0011] (“The contents of U.S. Patents and published Patent Applications mentioned herein, are incorporated herein by reference.”), [0073] (Sensor 12 may also use in-vivo spectroscopy techniques to measure blood glucose, for example as described in U.S. Pat. Nos. 6,067,463 (Jeng) . . . .”). Jeng discloses or renders obvious a diagnostic system comprises a light source as shown in Exhibit A2, which is incorporated by reference as if fully stated herein. One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Mault, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Mault, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[f]. wherein the data represents at least in part physiological information associated with the user;	Mault discloses or renders obvious the data represents at least in part physiological information associated with the user. A system for assisting a person to maintain a blood glucose level between predetermined limits comprises: an electronic device, comprising a display, a clock, a memory, and a processor; and a software program executable by the processor of the electronic device, adapted to receive nutritional data of food consumed by the person, adapted to calculate the blood glucose level for the person using

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

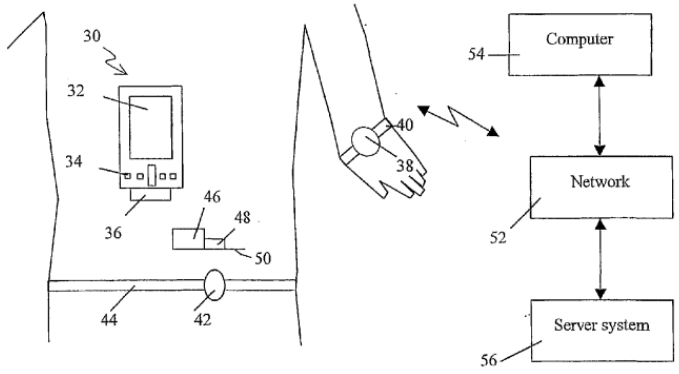
’868 Patent	Mault
	the nutritional data and a glycemic response model for the person, and further adapted to present the blood glucose level to the person on the display of the electronic device. Mault at Abstract A method by which a person can control their blood glucose comprises: entering food consumption data into a software program, **the software program running on a computing device, the software program adapted to record food consumed and to calculate a glycemic response; viewing the calculated glycemic response on a display of the computing device; and performing an action in response to the calculated glycemic response, so as to maintain blood glucose within predetermined levels.** The action may comprise the administration of insulin, the administration of glucagon; the performing of exercise, eating, or contacting a medical professional. Mault at [0038] A system for assisting a person to maintain a blood glucose level between predetermined limits comprises an electronic device, for example a portable computing device such as a PDA, comprising a display, a clock, a memory, and a processor; and **a software program executable by the processor of the electronic device, adapted to receive nutritional data of food consumed by the person, to calculate the blood glucose level for the person using the nutritional data and a glycemic response model for the person, and further adapted to present the blood glucose level to the person on the display of the electronic device.** The program can receive diet log data from the person, for example food identities, then correlate the food identities with nutritional data using a database. The software program can be further adapted to receive time data related to the time of consumption of food (including beverages, nutraceuticals, and other consumables) by the person, and to receive data relating to planned consumption of food. **Blood glucose levels can be calculated for a plurality of times, and presented as a table or graph.** Mault at [0042] Embodiments of this invention provide a person with improved control over their blood glucose levels. This improved control is important in diabetes management, and can also be combined with a weight control program by providing a software program combining glycemic response modeling with diet logging functionalities. **A glycemic response model for a person, which is used to predict changes**

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Mault
	in blood glucose level based on the recording of foods consumed, or foods planned to be consumed, can be modified for improved accuracy by comparison with actual measurements of blood glucose. Further, **the glycemic response model for a person can be determined by relating blood glucose measurements** with diet log records, in terms of food consumed and time of meals, in a closed loop system by which the model can be constantly improved based on new comparisons of projected and actual blood glucose levels. Mault at [0066]  Figure 1 Mault at Fig.1 **FIG. 1 shows a schematic of a system embodiment comprising an electronic device 10, a blood glucose sensor 12, a physical activity monitor 14**, an insulin pump 16, **a communications network 20, and a remote computer system 22**. Mault at [0069] Electronic device **10** can be carried by the person, for example a portable computer, personal digital assistant (PDA), wireless phone with computational functionality, visor-mounted device, or other device. The electronic device **10** can be a PDA such as a Palm Pilot. The electronic device can be a portable electronic device or system carried by the person, or a device or system combining multiple functionalities, such as: a personal digital assistant (PDA); an electronic book (e-book); a portable computer; any portable Internet access device; a wireless phone; a wristwatch, adapted to record data, for example to monitor physiological properties, or act as a diet log (it may also act as a wireless internet access device, or be otherwise adapted); a headset, providing for example visual and audio communication to the person, and recording audio and/or visual information; a body mounted activity

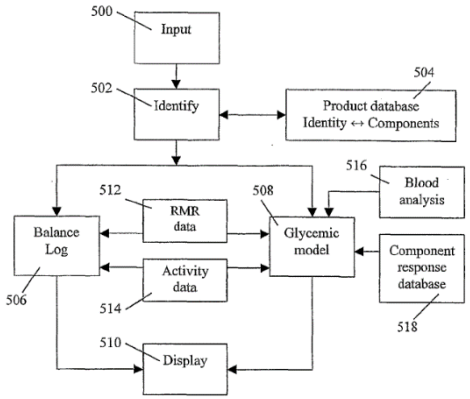
’868 Patent	Mault
	monitor (for example pedometer) adapted to record data; any portable electronic device with data logging capabilities, for example an electronic organizer; or some combination of the above or other devices. Mault at [0070] Sensor 12 can be carried by the person and provides blood glucose measurements at intervals. For example, sensor 12 can uses ion flow to draw glucose molecules out of the blood into a gel disk containing the enzyme glucose oxidase, generating hydrogen peroxide, which is detected and a numerical value displayed. This technique is used by GlucoWatch developed by Cygnus (Redwood City, Calif.). The sensor can then transmit the numerical value of blood glucose to the PDA 10, for example using a wireless method. Alternatively, sensor 12 may use spectroscopic detection of a glucose oxidase reaction. **Sensor 12 may also use in-vivo spectroscopy techniques to measure blood glucose, for example as described in U.S. Pat. Nos. 6,067,463 (Jeng), 6,049,727 (Crothal), 5,660,163 (Schulman), and others. For example, IR absorption or reflection properties of skin or tissues may be determined, for example using a finger, toe, wrist, skin membrane, earlobe, nose, cheek, retina, or other body part.** A blood analysis sensor may be built in to a module which plugs in to the PDA. For example, using a non-invasive spectroscopic technique, the PDA/module combination may be placed against part of the body to obtain a blood glucose reading. The sensor may also be placed under the skin, with wireless communication, such as using the Bluetooth protocol, to the PDA. The sensor may be powered by internal batteries, by light using a photoelectric effect, by temperature gradients using a thermoelectric effect, by radiation (e.g. from AM radio stations, electric mains, or radiated by the PDA or other portable device), and may be either continuously powered or only powered at times a reading is required. The sensor may record data to a memory card which plugs into the PDA. Mault at [0073]

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Mault
	 Figure 2 Mault at Fig.2 FIG. 2 shows a system embodiment, comprising portable computing device **30** having a display **32**, data entry mechanism **34**, and wireless transceiver **36**; a wrist-mounted glucose sensor **38** having a strap **40**; activity monitor **42** supported by the person's body using belt **44**; insulin storage and dispensing device **46** comprising a subcutaneous needle **50** and delivery system **48** such as a pump. The portable computing device **30** is in linked to a communications network **52**, allowing communication a remote computer system **54**, which may be located at the person's home, doctor's office, or other remote location. A remote server system **56** is also accessible through the communications network **52**, and can be used to store a database of physiological parameters, activity, and diet relating to the person, for medical, nutritional, or computer expert system analysis. The wrist mounted sensor **40** and activity monitor **42** can transmit data to the portable computing device **30** through a wireless method. The device **30** can be carried in a pocket of the person's clothes, or on a belt clip, or other convenient method. Mault at [0079] **Analytical techniques which may be used to measure glucose concentrations in blood**, interstitial fluid, urine, or **other body fluids and tissues include: techniques based on the glucose oxidase reaction; other enzymatic reactions; IR (particularly near-IR), Raman, and optical-UV spectroscopy; fluorescence; colorimetry; attenuated total reflection, for example from a surface adapted to bind glucose; micromechanical methods such as detecting changes in resonance frequencies on analyte absorption, or having surfaces adapted to bind glucose with other**

’868 Patent	Mault
	detection methods; optical rotation and ORD; refractometry; fiber sensing; laser absorption; enzymatic methods such as using the glucose oxidase reaction; biochemical effect detection; or other appropriate techniques. Fluid samples may be removed from the body, or analyzed within the body. Mault at [0090] FIG. 7B shows a schematic of a possible embodiment of a system blood glucose monitoring system, an analysis module **164** comprising a blood glucose sensor **140** providing an electrical glucose signal correlated with blood glucose levels, an analog-to-digital converter **142** providing a digital representation of the glucose signal, and a wireless transmitter **144** transmitting the digital representation of the glucose signal to other devices in communication with the analysis module. A portable computing device **166** which can communicate with the analysis module comprises a wireless receiver **146**, a data buffer **148**, a processor **150**, a memory **152**, a memory module (e.g. memory card) interface **154**, a clock **156**, a display **158**, and a bus **162**. Mault at [0093] In one embodiment, interstitial fluid is drawn out of the dermis of the skin into an analysis means. Fluid can be drawn out of the skin through one or more inlet microneedles, and returned to the dermis through one or more outlet microneedles, so as to provide a flow of interstitial fluid through the module. The fluid can flow through an array of microspheres, such as silica or polymer microspheres, the surfaces of which have a molecular species which fluoresces in the presence of glucose. Alternatively, **the fluid may flow through a capillary or microcapillary having an inside surface lined with a fluorescence film sensitive to the concentration of glucose in the fluid. The fluorescence is detected as a measure of glucose concentration, using a detector and excitation radiation source (which can be located within the housing) possibly in comparison with a reference region not exposed to interstitial fluid flow. IR radiation may also be waveguided along capillaries, or scattered by microspheres, so as to spectroscopically detect glucose**. In other embodiments, the analysis module uses the detection methods developed by Cygnus for the GlucoWatch, as discussed above. The module may alternatively draw blood or lymph fluid into the housing for analysis, for example using a micromechanical pump. **The analysis module may alternatively perform non-invasive analysis of blood glucose, for example by clipping to an ear lobe or other skin flap and transmitting near-IR radiation through the skin flap**. **An analysis module with a fluorescence sensing region may be optically accessed by**

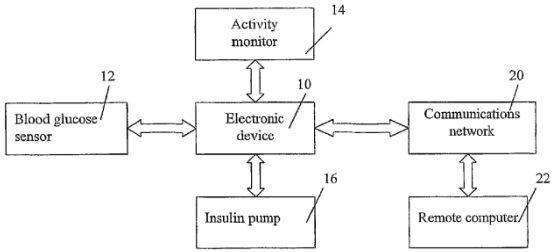
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

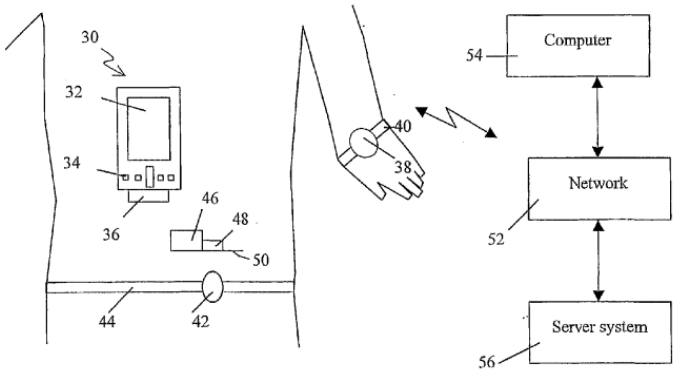
’868 Patent	Mault
	an external device having an excitation radiation source and a fluorescence detector, for example a fluorescence sensor can be contained within a transparent housing and embedded in the skin. Mault at [0094]  Figure 19 Mault at Fig. 19 FIG. 19 shows a flowchart representing **a software program running on a computing device.** Box 500 represents the person entering food consumed, using any appropriate method. Box 502 represents the software program providing a food identification, for example by correlating an entered code with food identification and data. Box 504 corresponds to food identification being provided to a database 504, with corresponding nutritional data being extracted from the database. Box 506 corresponds to some part of the nutritional data, for example caloric data, being passed to a balance log calculator which calculates the calorie balance of the person from food consumed, activity levels, and metabolic rate. Box 512 corresponds to providing RMR data, for example as determined using an indirect calorimeter. Box 514 corresponds to providing activity data, for example from an activity monitor. Box 510 corresponds to displaying calorie balance and projected blood glucose levels on display 510. **Box 508 corresponds to determining blood glucose levels for the person, using nutritional data, activity levels, metabolic rate, blood analysis data, and blood glucose response parameters corresponding to nutritional data provided by a component response database. Box 518 corresponds to providing blood glucose response parameters from a database, corresponding to nutritional data**

’868 Patent	Mault
	received. Box 516 corresponds to performing a blood test at intervals, and providing the data to a glycemic response algorithm. Mault at [0187] <u>Jeng (U.S. Pat. No. 6,067,463)</u> Mault incorporates Jeng by reference. Mault at [0011] (“The contents of U.S. Patents and published Patent Applications mentioned herein, are incorporated herein by reference.”), [0073] (Sensor 12 may also use in-vivo spectroscopy techniques to measure blood glucose, for example as described in U.S. Pat. Nos. 6,067,463 (Jeng) . . . .”). Jeng discloses or renders obvious a diagnostic system comprises a light source as shown in Exhibit A2, which is incorporated by reference as if fully stated herein. One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Mault, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Mault, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[g]. the software application capable of operating on a control system adapted to receive, store and process at least a portion of the physiological information,	Mault discloses or renders obvious the software application capable of operating on a control system adapted to receive, store and process at least a portion of the physiological information. A system for assisting a person to maintain a blood glucose level between predetermined limits comprises: an electronic device, comprising a display, a clock, a memory, and a processor; and a software program executable by the processor of the electronic device, adapted to receive nutritional data of food consumed by the person, adapted to calculate the blood glucose level for the person using the nutritional data and a glycemic response model for the person, and further adapted to present the blood glucose level to the person on the display of the electronic device. Mault at Abstract A method by which a person can control their blood glucose comprises: entering food consumption data into a software program, **the software program running on a computing device, the software**

’868 Patent	Mault
	program adapted to record food consumed and to calculate a glycemic response; viewing the calculated glycemic response on a display of the computing device; and performing an action in response to the calculated glycemic response, so as to maintain blood glucose within predetermined levels. The action may comprise the administration of insulin, the administration of glucagon; the performing of exercise, eating, or contacting a medical professional. Mault at [0038] A system for assisting a person to maintain a blood glucose level between predetermined limits comprises an electronic device, for example a portable computing device such as a PDA, comprising a display, a clock, a memory, and a processor; and **a software program executable by the processor of the electronic device, adapted to receive nutritional data of food consumed by the person, to calculate the blood glucose level for the person using the nutritional data and a glycemic response model for the person, and further adapted to present the blood glucose level to the person on the display of the electronic device.** The program can receive diet log data from the person, for example food identities, then correlate the food identities with nutritional data using a database. The software program can be further adapted to receive time data related to the time of consumption of food (including beverages, nutraceuticals, and other consumables) by the person, and to receive data relating to planned consumption of food. **Blood glucose levels can be calculated for a plurality of times, and presented as a table or graph.** Mault at [0042] Embodiments of this invention provide a person with improved control over their blood glucose levels. This improved control is important in diabetes management, and can also be combined with a weight control program by providing a software program combining glycemic response modeling with diet logging functionalities. **A glycemic response model for a person, which is used to predict changes in blood glucose level based on the recording of foods consumed, or foods planned to be consumed, can be modified for improved accuracy by comparison with actual measurements of blood glucose.** Further, **the glycemic response model for a person can be determined by relating blood glucose measurements** with diet log records, in terms of food consumed and time of meals, in a closed loop system by which the model can be constantly improved based on new comparisons of projected and actual blood glucose levels.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Mault
	Mault at [0066]  Figure 1 Mault at Fig.1 **FIG. 1 shows a schematic of a system embodiment comprising an electronic device 10, a blood glucose sensor 12, a physical activity monitor 14**, an insulin pump 16, **a communications network 20, and a remote computer system 22**. Mault at [0069] Electronic device **10** can be carried by the person, for example a portable computer, personal digital assistant (PDA), wireless phone with computational functionality, visor-mounted device, or other device. The electronic device **10** can be a PDA such as a Palm Pilot. The electronic device can be a portable electronic device or system carried by the person, or a device or system combining multiple functionalities, such as: a personal digital assistant (PDA); an electronic book (e-book); a portable computer; any portable Internet access device; a wireless phone; a wristwatch, adapted to record data, for example to monitor physiological properties, or act as a diet log (it may also act as a wireless internet access device, or be otherwise adapted); a headset, providing for example visual and audio communication to the person, and recording audio and/or visual information; a body mounted activity monitor (for example pedometer) adapted to record data; any portable electronic device with data logging capabilities, for example an electronic organizer; or some combination of the above or other devices. Mault at [0070]

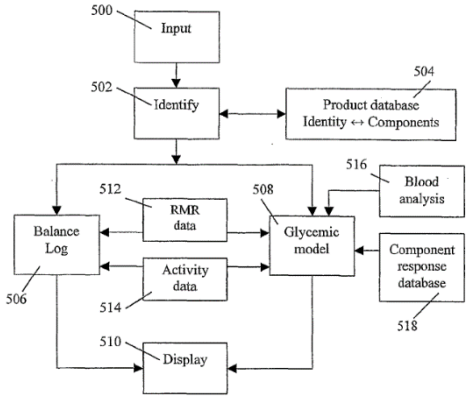
’868 Patent	Mault
	Sensor 12 can be carried by the person and provides blood glucose measurements at intervals. For example, sensor 12 can uses ion flow to draw glucose molecules out of the blood into a gel disk containing the enzyme glucose oxidase, generating hydrogen peroxide, which is detected and a numerical value displayed. This technique is used by GlucoWatch developed by Cygnus (Redwood City, Calif.). The sensor can then transmit the numerical value of blood glucose to the PDA 10, for example using a wireless method. Alternatively, sensor 12 may use spectroscopic detection of a glucose oxidase reaction. **Sensor 12 may also use in-vivo spectroscopy techniques to measure blood glucose, for example as described in U.S. Pat. Nos. 6,067,463 (Jeng), 6,049,727 (Crothal), 5,660,163 (Schulman), and others. For example, IR absorption or reflection properties of skin or tissues may be determined, for example using a finger, toe, wrist, skin membrane, earlobe, nose, cheek, retina, or other body part.** A blood analysis sensor may be built in to a module which plugs in to the PDA. For example, using a non-invasive spectroscopic technique, the PDA/module combination may be placed against part of the body to obtain a blood glucose reading. The sensor may also be placed under the skin, with wireless communication, such as using the Bluetooth protocol, to the PDA. The sensor may be powered by internal batteries, by light using a photoelectric effect, by temperature gradients using a thermoelectric effect, by radiation (e.g. from AM radio stations, electric mains, or radiated by the PDA or other portable device), and may be either continuously powered or only powered at times a reading is required. The sensor may record data to a memory card which plugs into the PDA. Mault at [0073]  Figure 2 Mault at Fig.2

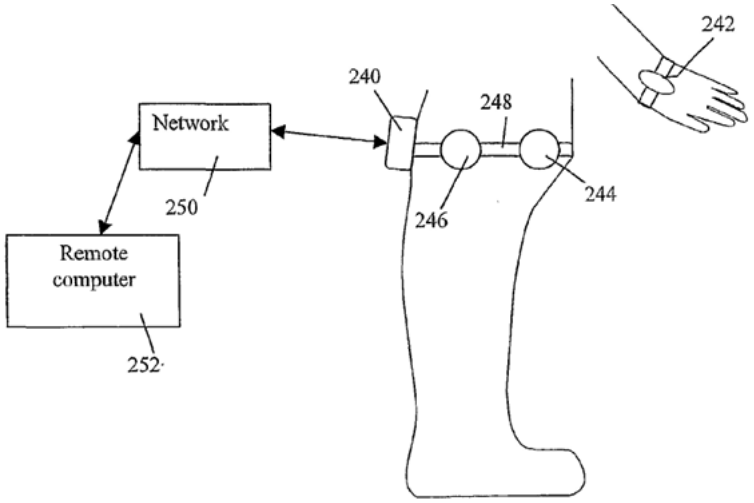
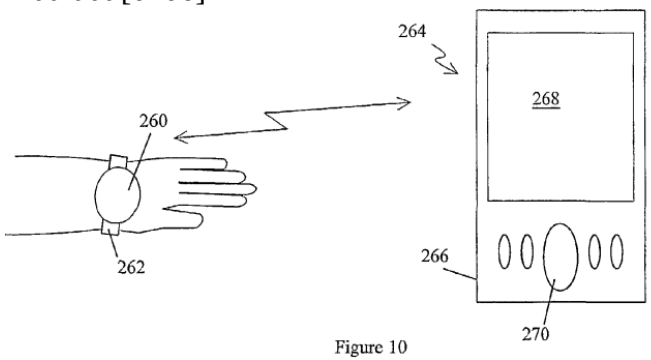
’868 Patent	Mault
	FIG. 2 shows a system embodiment, comprising portable computing device **30** having a display **32**, data entry mechanism **34**, and wireless transceiver **36**; a wrist-mounted glucose sensor **38** having a strap **40**; activity monitor **42** supported by the person's body using belt **44**; insulin storage and dispensing device **46** comprising a subcutaneous needle **50** and delivery system **48** such as a pump. The portable computing device **30** is in linked to a communications network **52**, allowing communication a remote computer system **54**, which may be located at the person's home, doctor's office, or other remote location. A remote server system **56** is also accessible through the communications network **52**, and can be used to store a database of physiological parameters, activity, and diet relating to the person, for medical, nutritional, or computer expert system analysis. The wrist mounted sensor **40** and activity monitor **42** can transmit data to the portable computing device **30** through a wireless method. The device **30** can be carried in a pocket of the person's clothes, or on a belt clip, or other convenient method. Mault at [0079] **Analytical techniques which may be used to measure glucose concentrations in blood**, interstitial fluid, urine, or **other body fluids and tissues include: techniques based on the glucose oxidase reaction; other enzymatic reactions; IR (particularly near-IR), Raman, and optical-UV spectroscopy; fluorescence; colorimetry; attenuated total reflection, for example from a surface adapted to bind glucose; micromechanical methods such as detecting changes in resonance frequencies on analyte absorption, or having surfaces adapted to bind glucose with other detection methods; optical rotation and ORD; refractometry; fiber sensing; laser absorption**; enzymatic methods such as using the glucose oxidase reaction; biochemical effect detection; or other appropriate techniques. Fluid samples may be removed from the body, or analyzed within the body. Mault at [0090] FIG. 7B shows a schematic of a possible embodiment of a system blood glucose monitoring system, an analysis module **164** comprising a blood glucose sensor **140** providing an electrical glucose signal correlated with blood glucose levels, an analog-to-digital converter **142** providing a digital representation of the glucose signal, and a wireless transmitter **144** transmitting the digital representation of the glucose signal to other devices in communication with the analysis module. A portable computing device **166** which can communicate with the analysis module comprises

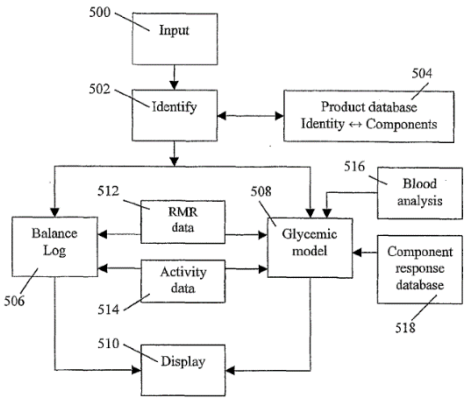
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Mault
	a wireless receiver **146**, a data buffer **148**, a processor **150**, a memory **152**, a memory module (e.g. memory card) interface **154**, a clock **156**, a display **158**, and a bus **162**. Mault at [0093] In one embodiment, interstitial fluid is drawn out of the dermis of the skin into an analysis means. Fluid can be drawn out of the skin through one or more inlet microneedles, and returned to the dermis through one or more outlet microneedles, so as to provide a flow of interstitial fluid through the module. The fluid can flow through an array of microspheres, such as silica or polymer microspheres, the surfaces of which have a molecular species which fluoresces in the presence of glucose. Alternatively, **the fluid may flow through a capillary or microcapillary having an inside surface lined with a fluorescence film sensitive to the concentration of glucose in the fluid. The fluorescence is detected as a measure of glucose concentration, using a detector and excitation radiation source (which can be located within the housing) possibly in comparison with a reference region not exposed to interstitial fluid flow. IR radiation may also be waveguided along capillaries, or scattered by microspheres, so as to spectroscopically detect glucose**. In other embodiments, the analysis module uses the detection methods developed by Cygnus for the GlucoWatch, as discussed above. The module may alternatively draw blood or lymph fluid into the housing for analysis, for example using a micromechanical pump. **The analysis module may alternatively perform non-invasive analysis of blood glucose, for example by clipping to an ear lobe or other skin flap and transmitting near-IR radiation through the skin flap**. **An analysis module with a fluorescence sensing region may be optically accessed by an external device having an excitation radiation source and a fluorescence detector, for example a fluorescence sensor can be contained within a transparent housing and embedded in the skin**. Mault at [0094]

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Mault
	 Figure 19 Mault at Fig. 19 FIG. 19 shows a flowchart representing **a software program running on a computing device.** Box 500 represents the person entering food consumed, using any appropriate method. Box 502 represents the software program providing a food identification, for example by correlating an entered code with food identification and data. Box 504 corresponds to food identification being provided to a database 504, with corresponding nutritional data being extracted from the database. Box 506 corresponds to some part of the nutritional data, for example caloric data, being passed to a balance log calculator which calculates the calorie balance of the person from food consumed, activity levels, and metabolic rate. Box 512 corresponds to providing RMR data, for example as determined using an indirect calorimeter. Box 514 corresponds to providing activity data, for example from an activity monitor. Box 510 corresponds to displaying calorie balance and projected blood glucose levels on display 510. **Box 508 corresponds to determining blood glucose levels for the person, using nutritional data, activity levels, metabolic rate, blood analysis data, and blood glucose response parameters corresponding to nutritional data provided by a component response database. Box 518 corresponds to providing blood glucose response parameters from a database, corresponding to nutritional data received. Box 516 corresponds to performing a blood test at intervals, and providing the data to a glycemic response algorithm.** Mault at [0187]

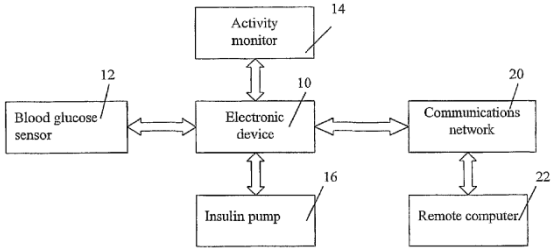
’868 Patent	Mault
	 Figure 9 Mault at Fig 9. **The electronic device 240 is used as a diet log and to store blood glucose readings**. The device provides dietary feedback to the mother based on a measured and modeled (or estimated) glycemic response. **The device also collects data from physiological sensors monitoring the health of the baby and/or mother**. An audible alert can sound if projected or actual blood glucose levels deviate from a predetermined range. Mault at [0106]  Figure 10

’868 Patent	Mault
	Mault at Fig. 10 **FIG. 10 shows a blood glucose monitoring system 260, in the form of a watch, supported on a monitored subject using a strap 262, providing data to a PDA 264 in possession of the caregiver. The PDA 264 has housing 266, display 268, and data entry means in the form of a keypad 270. Other data entry mechanisms can be used, such as** a stylus, **touch pad**, tracker device, biofeedback system, roller-jog dial, voice recognition, and the like. **Wireless data transmission can be used, such as Bluetooth (Ericsson) or IR transmission. Electrical connections may be used at intervals, or data read off a display of the wrist-mounted device. The PDA has a software program, such as a calorie management program, having a glycemic response algorithm for the subject. The software program can be adapted for diet logging and glycemic response modeling for a plurality of subjects. Monitoring device 260 can further be any wearable, portable, or implanted analysis device.** The caregiver records meals consumed by the subject, estimates activity levels (or receives data from a physical activity monitor worn by the subject), and is alerted to possible or actual blood glucose excursions from a safe range. The caregiver can control diet, exercise, insulin administration, or other subject treatment or condition so as to maintain a healthy status of the subject. Mault at [0109]  Figure 19 Mault at Fig. 19

’868 Patent	Mault
	FIG. 19 shows a flowchart representing **a software program running on a computing device.** Box 500 represents the person entering food consumed, using any appropriate method. Box 502 represents the software program providing a food identification, for example by correlating an entered code with food identification and data. Box 504 corresponds to food identification being provided to a database 504, with corresponding nutritional data being extracted from the database. Box 506 corresponds to some part of the nutritional data, for example caloric data, being passed to a balance log calculator which calculates the calorie balance of the person from food consumed, activity levels, and metabolic rate. Box 512 corresponds to providing RMR data, for example as determined using an indirect calorimeter. Box 514 corresponds to providing activity data, for example from an activity monitor. Box 510 corresponds to displaying calorie balance and projected blood glucose levels on display 510. **Box 508 corresponds to determining blood glucose levels for the person, using nutritional data, activity levels, metabolic rate, blood analysis data, and blood glucose response parameters corresponding to nutritional data provided by a component response database. Box 518 corresponds to providing blood glucose response parameters from a database, corresponding to nutritional data received. Box 516 corresponds to performing a blood test at intervals, and providing the data to a glycemic response algorithm.** Mault at [0187] **A single database can be used, in which food components are correlated with food identity, and at least one glycemic response parameter. The database can contain glycemic response curves parameterized for various foods, which may be established using a glucose tolerance test, and refined using a closed loop system in which measurements refine the prediction based on the database contents.** Different response curves may be determined for simple sugars, complex carbohydrates, fiber-rich foods, food or otherwise treated to reduce the glycemic response peak, and other food types. Mault at [0188] <u>Jeng (U.S. Pat. No. 6,067,463)</u> Mault incorporates Jeng by reference. Mault at [0011] (“The contents of U.S. Patents and published Patent Applications mentioned herein, are incorporated herein by reference.”), [0073] (Sensor 12 may

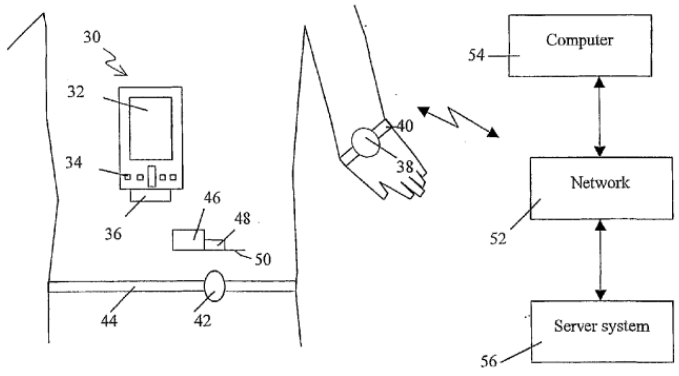
’868 Patent	Mault
	also use in-vivo spectroscopy techniques to measure blood glucose, for example as described in U.S. Pat. Nos. 6,067,463 (Jeng) . . . .”). Jeng discloses or renders obvious a diagnostic system comprises a light source as shown in Exhibit A2, which is incorporated by reference as if fully stated herein. One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Mault, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Mault, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[h]. the control system having a touch-screen, circuitry for obtaining position information from a location sensor, and	Mault discloses or renders obvious the control system having a touch-screen, circuitry for obtaining position information from a location sensor. A system for assisting a person to maintain a blood glucose level between predetermined limits comprises: an electronic device, comprising a display, a clock, a memory, and a processor; and a software program executable by the processor of the electronic device, adapted to receive nutritional data of food consumed by the person, adapted to calculate the blood glucose level for the person using the nutritional data and a glycemic response model for the person, and further adapted to present the blood glucose level to the person on the display of the electronic device. Mault at Abstract A method by which a person can control their blood glucose comprises: entering food consumption data into a software program, **the software program running on a computing device, the software program adapted to record food consumed and to calculate a glycemic response; viewing the calculated glycemic response on a display of the computing device; and performing an action in response to the calculated glycemic response, so as to maintain blood glucose within predetermined levels.** The action may comprise the administration of insulin, the administration of glucagon; the performing of exercise, eating, or contacting a medical professional. Mault at [0038]

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Mault
	A system for assisting a person to maintain a blood glucose level between predetermined limits comprises an electronic device, for example a portable computing device such as a PDA, comprising a display, a clock, a memory, and a processor; and a software program executable by the processor of the electronic device, adapted to receive nutritional data of food consumed by the person, to calculate the blood glucose level for the person using the nutritional data and a glycemic response model for the person, and further adapted to present the blood glucose level to the person on the display of the electronic device. The program can receive diet log data from the person, for example food identities, then correlate the food identities with nutritional data using a database. The software program can be further adapted to receive time data related to the time of consumption of food (including beverages, nutraceuticals, and other consumables) by the person, and to receive data relating to planned consumption of food. **Blood glucose levels can be calculated for a plurality of times, and presented as a table or graph.** Mault at [0042]  Figure 1 Mault at Fig.1 **FIG. 1 shows a schematic of a system embodiment comprising an electronic device 10, a blood glucose sensor 12, a physical activity monitor 14**, an insulin pump 16, **a communications network 20, and a remote computer system 22**. Mault at [0069] **Electronic device 10 can be carried by the person, for example a portable computer, personal digital assistant (PDA), wireless phone with computational functionality, visor-mounted device,**

’868 Patent	Mault
	or other device. The electronic device 10 can be a PDA such as a Palm Pilot. The electronic device can be a portable electronic device or system carried by the person, or a device or system combining multiple functionalities, such as: a personal digital assistant (PDA); an electronic book (e-book); a portable computer; any portable Internet access device; a wireless phone; a wristwatch, adapted to record data, for example to monitor physiological properties, or act as a diet log (it may also act as a wireless internet access device, or be otherwise adapted); a headset, providing for example visual and audio communication to the person, and recording audio and/or visual information; a body mounted activity monitor (for example pedometer) adapted to record data; any portable electronic device with data logging capabilities, for example an electronic organizer; or some combination of the above or other devices. Mault at [0070] Sensor 12 can be carried by the person and provides blood glucose measurements at intervals. For example, sensor 12 can uses ion flow to draw glucose molecules out of the blood into a gel disk containing the enzyme glucose oxidase, generating hydrogen peroxide, which is detected and a numerical value displayed. This technique is used by GlucoWatch developed by Cygnus (Redwood City, Calif.). **The sensor can then transmit the numerical value of blood glucose to the PDA 10, for example using a wireless method. Alternatively, sensor 12 may use spectroscopic detection of a glucose oxidase reaction.** Sensor 12 may also use in-vivo spectroscopy techniques to measure blood glucose, for example as described in U.S. Pat. Nos. 6,067,463 (Jeng), 6,049,727 (Crothal), 5,660,163 (Schulman), and others. For example, IR absorption or reflection properties of skin or tissues may be determined, for example using a finger, toe, wrist, skin membrane, earlobe, nose, cheek, retina, or other body part. **A blood analysis sensor may be built in to a module which plugs in to the PDA. For example, using a non-invasive spectroscopic technique, the PDA/module combination may be placed against part of the body to obtain a blood glucose reading. The sensor may also be placed under the skin, with wireless communication, such as using the Bluetooth protocol, to the PDA**. The sensor may be powered by internal batteries, by light using a photoelectric effect, by temperature gradients using a thermoelectric effect, by radiation (e.g. from AM radio stations, electric mains, or radiated by the PDA or other portable device), and may be either continuously powered or only powered at times a reading is required. The sensor may record data to a memory card which plugs into the PDA. Mault at [0073]

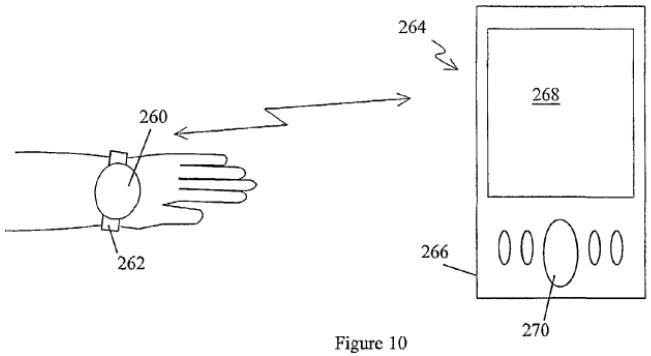
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Mault
	In one embodiment, the glucose sensor transmits the blood glucose level data to the PDA using a wireless communication protocol such as Bluetooth (Ericsson Components AB). Communication methods between sensor **12** and PDA **10** might include Bluetooth, IR transmission, IEEE 802.11(b), wireless Ethernet, optical methods, acoustic methods, or other wireless methods, or using a cable connection, electrical interface, or manual **entry of data into the PDA using any input mechanism, such as keys, a stylus, voice recognition, and the like. The PDA may request a blood glucose reading from the sensor.** Mault at [0074]  Figure 2 Mault at Fig.2 FIG. 2 shows a system embodiment, comprising portable computing device **30** having a display **32**, data entry mechanism **34**, and wireless transceiver **36**; a wrist-mounted glucose sensor **38** having a strap **40**; activity monitor **42** supported by the person's body using belt **44**; insulin storage and dispensing device **46** comprising a subcutaneous needle **50** and delivery system **48** such as a pump. The portable computing device **30** is in linked to a communications network **52**, allowing communication a remote computer system **54**, which may be located at the person's home, doctor's office, or other remote location. A remote server system **56** is also accessible through the communications network **52**, and can be used to store a database of physiological parameters, activity, and diet relating to the person, for medical, nutritional, or computer expert system analysis. The wrist mounted sensor **40** and activity monitor **42** can transmit data to the portable computing

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Mault
	device **30** through a wireless method. The device **30** can be carried in a pocket of the person's clothes, or on a belt clip, or other convenient method. Mault at [0079] **Analytical techniques which may be used to measure glucose concentrations in blood**, interstitial fluid, urine, or **other body fluids and tissues include: techniques based on the glucose oxidase reaction; other enzymatic reactions; IR (particularly near-IR), Raman, and optical-UV spectroscopy; fluorescence; colorimetry; attenuated total reflection, for example from a surface adapted to bind glucose; micromechanical methods such as detecting changes in resonance frequencies on analyte absorption, or having surfaces adapted to bind glucose with other detection methods; optical rotation and ORD; refractometry; fiber sensing; laser absorption**; enzymatic methods such as using the glucose oxidase reaction; biochemical effect detection; or other appropriate techniques. Fluid samples may be removed from the body, or analyzed within the body. Mault at [0090] FIG. 7B shows a schematic of a possible embodiment of a system blood glucose monitoring system, an analysis module **164** comprising a blood glucose sensor **140** providing an electrical glucose signal correlated with blood glucose levels, an analog-to-digital converter **142** providing a digital representation of the glucose signal, and a wireless transmitter **144** transmitting the digital representation of the glucose signal to other devices in communication with the analysis module. A portable computing device **166** which can communicate with the analysis module comprises a wireless receiver **146**, a data buffer **148**, a processor **150**, a memory **152**, a memory module (e.g. memory card) interface **154**, a clock **156**, a display **158**, and a bus **162**. Mault at [0093] In one embodiment, interstitial fluid is drawn out of the dermis of the skin into an analysis means. Fluid can be drawn out of the skin through one or more inlet microneedles, and returned to the dermis through one or more outlet microneedles, so as to provide a flow of interstitial fluid through the module. The fluid can flow through an array of microspheres, such as silica or polymer microspheres, the surfaces of which have a molecular species which fluoresces in the presence of glucose. Alternatively, **the fluid may flow through a capillary or microcapillary having an inside surface lined with a fluorescence**

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Mault
	film sensitive to the concentration of glucose in the fluid. The fluorescence is detected as a measure of glucose concentration, using a detector and excitation radiation source (which can be located within the housing) possibly in comparison with a reference region not exposed to interstitial fluid flow. IR radiation may also be waveguided along capillaries, or scattered by microspheres, so as to spectroscopically detect glucose. In other embodiments, the analysis module uses the detection methods developed by Cygnus for the GlucoWatch, as discussed above. The module may alternatively draw blood or lymph fluid into the housing for analysis, for example using a micromechanical pump. **The analysis module may alternatively perform non-invasive analysis of blood glucose, for example by clipping to an ear lobe or other skin flap and transmitting near-IR radiation through the skin flap**. **An analysis module with a fluorescence sensing region may be optically accessed by an external device having an excitation radiation source and a fluorescence detector, for example a fluorescence sensor can be contained within a transparent housing and embedded in the skin**. Mault at [0094]  Figure 10 Mault at Fig. 10 **FIG. 10 shows a blood glucose monitoring system 260**, in the form of a watch, supported on a monitored subject using a strap 262, **providing data to a PDA 264** in possession of the caregiver. The PDA 264 has housing 266, display 268, and data entry means in the form of a keypad 270. **Other data entry mechanisms can be used, such as** a stylus, **touch pad**, **tracker device**, biofeedback system, roller-jog dial, voice recognition, and the like. Wireless data transmission can be used, such as Bluetooth (Ericsson) or IR transmission. Electrical connections may be used at intervals, or data read off a display of the wrist-mounted device. The PDA has a software program, such as a calorie management program,

’868 Patent	Mault
	having a glycemic response algorithm for the subject. The software program can be adapted for diet logging and glycemic response modeling for a plurality of subjects. Monitoring device 260 can further be any wearable, portable, or implanted analysis device. The caregiver records meals consumed by the subject, estimates activity levels (or receives data from a physical activity monitor worn by the subject), and is alerted to possible or actual blood glucose excursions from a safe range. The caregiver can control diet, exercise, insulin administration, or other subject treatment or condition so as to maintain a healthy status of the subject. Mault at [0109] In use, the person records food consumed using a software program running on a PDA, having a diet log function, for example as described in U.S. Provisional App. 60/240,185 (filed Oct. 13, 2000). Data entry can be made using any convenient method, such as stylus entry, keyboard entry, menu selection methods, entering product codes, barcode scanning, imaging, optical character recognition, entering user defined codes representing common meals, making voice records, voice recognition software, using a roller jog entry (as used on Sony devices), or using any convenient method. Meal data can be entered as food consumed, food about to be consumed, or food planned to be consumed in the future. At intervals, the person can enter a blood glucose level determined using any convenient technique. These techniques will be described in more detail later. The software program, working from previously entered blood glucose levels, and any previous diet log information, calculates a projected curve of blood glucose levels from the food items recorded. This curve is shown on the display of the PDA, or using the display capabilities of any device in communication with the PDA. If the projected curve goes outside a predetermined healthy range, actions can be recommended to the person, these include changing planned meals, not eating the whole meal, replacing high glycemic index foods with low glycemic index foods such as complex carbohydrates, administering an insulin injection (which may be done automatically by a device in communication with the PDA), eating a snack at a later time (the time can be suggested by the software program, and the PDA may be used to alert the person to eat the snack), performing exercise (an optimum time, duration, nature, and intensity of exercise may be recommended), cancellation of exercise, future meal suggestions, performing medical emergency procedures, infusion of medications, dialysis with blood glucose or other blood component removal, or other actions which are performed so as to maintain blood glucose levels within a healthy range. The organizer capability of the PDA can be used to plan meals, activities, administration of medication, appointments, and other actions. The PDA can synchronize data with a personal computer, so that the

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Mault
	enhanced display and data entry capabilities of the PC can be used to enter and review displayed information. Mault at [0118] A health management business may provide diet log software so as to run on a computer belonging to the person. Alternatively, the business may provide a computer, for example a portable computing device such as a PDA, on which the software program is installed. The computer can have a display, a microprocessor, memory (in the form of RAM, ROM, and a data storage device), and data entry mechanisms such as a keyboard, buttons, stylus, voice entry, roller-jog dial, track ball, finger tracking device, and the like. Mault at [0121] FIG. 13 illustrates a possible display **362** on an electronic device **360** (such as a PDA) during entry of a planned meal into the device. The display comprises a menu display **366** and data entry method options **364**. A menu-type entry scheme can be convenient, particularly if the range of foods consumed is not that great. Menus can be divided into breakfast, lunch, dinner, and snack sub-menus, and other sub-menus. Data entry methods can include keystroke entry, voice entry (using voice recognition software), stylus entry, optical character recognition applied to packaging/nutrition information, barcode scanning (from the package, menu, etc.), wireless transponder methods (for example from transponder chips mounted on packaging), and the like. A PDA would have a software program allowing diet logging running on it, or can be used to interact with a software program over a communications network. Mault at [0133] Food consumed can be entered into the PDA using a menu entry system, for example using key presses, stylus entry, voice entry, eye motion detection, hand motion (gesticulation) detection, etc.—for voice entry, a restricted voice recognition capability may be adopted for computational simplicity, for example one which recognizes only numbers or letters associated with menu choices, such as disclosed in co-pending provisional application serial No. 60/212,319 filed Jun. 16, 2000, to James R. Mault. The name, code number, other identifier, time of consumption, nutritional data, portion size, or other information concerning food consumed can be entered into the PDA, for example using key presses;

’868 Patent	Mault
	stylus entry such as handwriting recognition systems); voice entry; optical character recognition (OCR), for example by placing an item such as a food package, receipt for a food item, a menu, and the like near an OCR-adapted PDA (the PDA may have in-built imaging and OCR capabilities, or be in communication with an accessory device, such as a pen-like device which can be scanned over text, or an imaging device used to image and recognize text); bar-code scanning of an item (for example a food package, receipt, menu, etc.) to obtain identification of food consumed and hence nutrition information, or imaging of a bar code for similar purposes; receiving data transmission from the package, such as from a wireless transponder embedded in a food package under interrogation from the PDA; reading of data from magnetic strips on a food package, menu, receipt, etc.; reading data from patterns on the surface of the food or package, for example microstructures, holograms, etc.; entering data from menu listings, for example using key press entry, stylus entry, optical character recognition, barcode entry, etc. including portion size, food identification, or full or partial nutrition information; receiving data transmissions for example wireless, IR, optical, memory storage media, etc., from food vendors (for example grocery stores, restaurants, etc.), with the data stored for future use if the food is not to be consumed at the time of purchase; receiving data over a communications network, for example the Internet, for example receiving nutrition information on items purchased; recording voice records of food consumed. Mault at [0193] **The PDA can be used for monitoring the physical activity of the person.** The PDA is used to receive and store activity-related data, for example, **the PDA may be used for: receiving signals from a body mounted accelerometer, a pedometer, a posture sensor, or a similar device (or devices) which provides a signal (or signals) related to the activity level of the person**; receiving signals from an array of body mounted accelerometers; receiving data from an exercise machine, during or after exercise by the person, relating to the energy expended by the person; receiving data from a personal trainer (either human, robot, or computer) related to energy expended in an exercise program; **receiving positional and/or altitude data, using a global positioning system (GPS),** triangulation method, **or other positioning scheme, to obtain data such as speed, distance traveled, distance climbed, and hence energy expended in walking, running, cycling, swimming, etc; receiving data** from an altimeter to estimate the effect of altitude on metabolism; receiving data from physiological monitors which obtain information related to physical activity, such as pulse rate, respiration frequency, body temperature, respiration volume, respiration frequency, etc; estimating physical activity of the person from the responses of the person to questions, for example quizzes given by the PDA; receiving data

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Mault
	from an indirect calorimeter to obtain metabolic rate in the resting state, and possibly also in the active state, for estimation or direct determination of total energy expenditure; receiving data from any sensor providing a signal related to physical activity which has been calibrated using an indirect calorimeter; receiving data from muscle contraction sensors; and receiving data from posture sensors related to physical activity, such as from skin-mounted ultrasonic transducers. Mault at [0198] Data may be received by the PDA using any convenient method, for example wireless communication (for example Bluetooth), IR beams, wires, cables, electrical interfaces, data storage media transfer, voice entry, manual entry (for example using keys or stylus), etc. Sensors may be part of the PDA, in which case signals would be received by connections contained within the housing of the PDA. Data may be received in continuously, in real time, or at periodic intervals. The PDA may prompt a sensor to send data. Mault at [0199] **The PDA may be used to monitor environmental conditions**, such as those in the following list. **Appropriate sensors may be part of the PDA**, carried with the person by some other method, or otherwise be **appropriately located for transmission of useful information to the PDA**. The following methods may be useful, either individually or in combination: recording ambient temperature; monitoring radiation levels; monitoring smoke or particulate levels; monitoring atmospheric pollution levels for example ozone, nitrogen oxides, chemical solvents; monitoring noise levels; recording body cooling rates, wind-chill, etc. for example from skin temperature; monitoring light levels; monitoring UV levels; **determining location (from GPS or other positioning method);** cosmic ray levels (for example for aviation employees); monitoring odor levels; monitoring water pollution; receiving data over a communications network such as the Internet concerning environmental conditions (for example air pollution, pollen count, etc.); manual entry of data from diverse sources, for example readings from sensors, data from publications (newspapers, web-sites, etc.); and monitoring altitude. Mault at [0208] Jeng (U.S. Pat. No. 6,067,463)

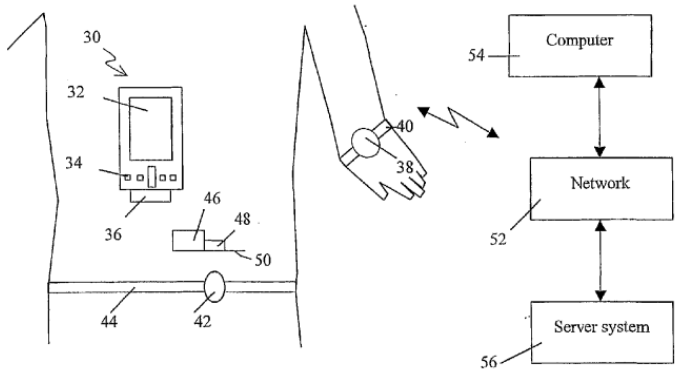
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Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

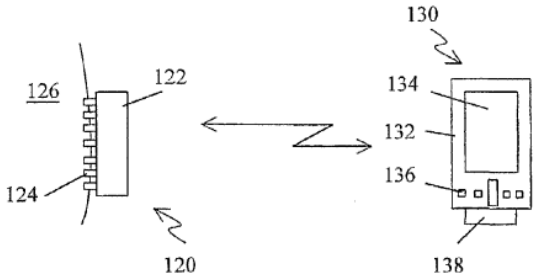
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	Mault incorporates Jeng by reference. Mault at [0011] (“The contents of U.S. Patents and published Patent Applications mentioned herein, are incorporated herein by reference.”), [0073] (Sensor 12 may also use in-vivo spectroscopy techniques to measure blood glucose, for example as described in U.S. Pat. Nos. 6,067,463 (Jeng) . . . .”). Jeng discloses or renders obvious a diagnostic system comprises a light source as shown in Exhibit A2, which is incorporated by reference as if fully stated herein. One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Mault, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Mault, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[i]. a wireless transceiver to transmit wireless data over a wireless link,	Mault discloses or renders obvious a wireless transceiver to transmit wireless data over a wireless link. **The person carries a portable computing device, such as a PDA, which receives blood glucose levels from a blood glucose sensor. The blood glucose sensor may be a device clipped on to the earlobe of the person, using at least one semiconductor laser or light emitting diode to emit wavelengths in the near-IR.** These wavelengths are transmitted through or reflected by blood-containing tissue, and then detected by a near-IR detector. A number of emissive devices may be used, or electrical modulation of a single device may be used to obtain multiple wavelength emission. For example, two wavelengths may be chosen, one absorbed and one not absorbed by blood glucose, the absorption ratio then being used to compute the blood glucose level of the person. Other blood glucose sensors are known in the art, and improved sensor systems are discussed below. **The blood glucose data can be transmitted from the sensor to the PDA using the Bluetooth wireless protocol.** Mault at [0020] Electronic device **10** can be carried by the person, for example a portable computer, personal digital assistant (PDA), wireless phone with computational functionality, visor-mounted device, or other device. The electronic device **10** can be a PDA such as a Palm Pilot. The electronic device can be a portable electronic device or system carried by the person, or a device or system combining multiple functionalities, such as: a personal digital assistant (PDA); an electronic book (e-book); a portable computer; any portable Internet access device; a wireless phone; a wristwatch, adapted to record data,

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Mault
	for example to monitor physiological properties, or act as a diet log (it may also act as a wireless internet access device, or be otherwise adapted); a headset, providing for example visual and audio communication to the person, and recording audio and/or visual information; a body mounted activity monitor (for example pedometer) adapted to record data; any portable electronic device with data logging capabilities, for example an electronic organizer; or some combination of the above or other devices. Mault at [0070] The portable electronic device receives data, and provides feedback to the person. For convenience, the device will be referred to as a PDA, though it may contain a number of functionalities in addition to those of a conventional PDA, such as the Palm V (Palm Computing). The portable device can be in communication with a communications network, for example through a wireless Internet connection or similar. The PDA may be a single device, or may be a system of separate components, for example (for non-limiting illustrative purposes only) a collar-mounted microphone transmitting to a device carried in the pocket, which itself transmits images to a projection unit mounted on a visor, and audio to a hidden earpiece. The system configuration of the PDA is not critical to this invention. Mault at [0071] Sensor **12** can be carried by the person and provides blood glucose measurements at intervals. For example, sensor **12** can uses ion flow to draw glucose molecules out of the blood into a gel disk containing the enzyme glucose oxidase, generating hydrogen peroxide, which is detected and a numerical value displayed. This technique is used by GlucoWatch developed by Cygnus (Redwood City, Calif.). The sensor can then transmit the numerical value of blood glucose to the PDA **10**, for example using a wireless method. Alternatively, sensor **12** may use spectroscopic detection of a glucose oxidase reaction. Sensor **12** may also use in-vivo spectroscopy techniques to measure blood glucose, for example as described in U.S. Pat. Nos. 6,067,463 (Jeng), 6,049,727 (Crothal), 5,660,163 (Schulman), and others. For example, IR absorption or reflection properties of skin or tissues may be determined, for example using a finger, toe, wrist, skin membrane, earlobe, nose, cheek, retina, or other body part. A blood analysis sensor may be built in to a module which plugs in to the PDA. For example, using a non-invasive spectroscopic technique, the PDA/module combination may be placed against part of the body to obtain a blood glucose reading. The sensor may also be placed under the skin, with wireless communication, such as using the Bluetooth protocol, to the PDA. The sensor may be powered

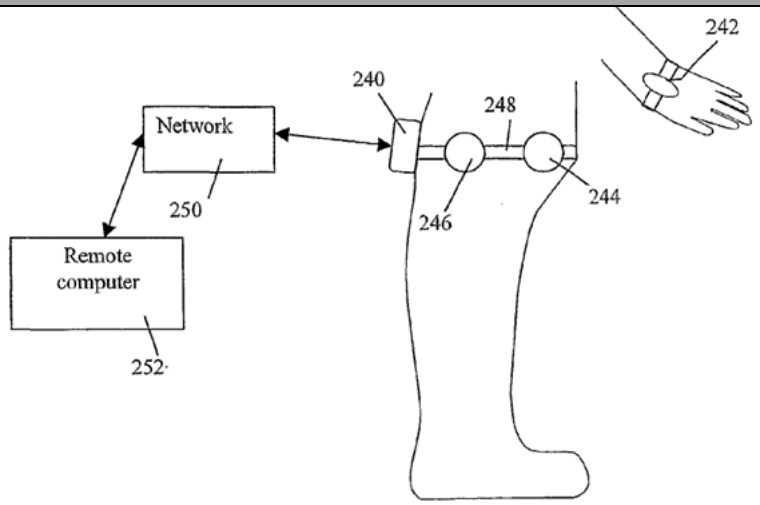
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Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

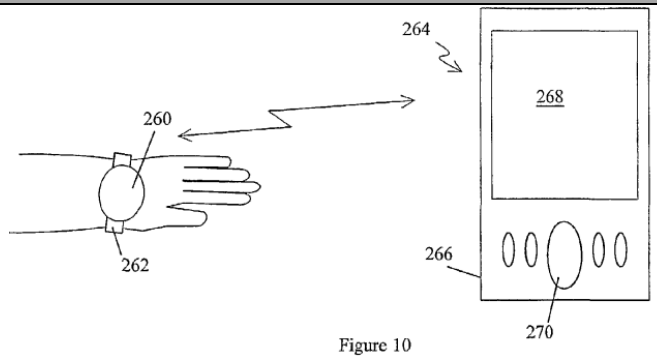
’868 Patent	Mault
	by internal batteries, by light using a photoelectric effect, by temperature gradients using a thermoelectric effect, by radiation (e.g. from AM radio stations, electric mains, or radiated by the PDA or other portable device), and may be either continuously powered or only powered at times a reading is required. The sensor may record data to a memory card which plugs into the PDA. Mault at [0073] **In one embodiment, the glucose sensor transmits the blood glucose level data to the PDA using a wireless communication protocol such as Bluetooth (Ericsson Components AB). Communication methods between sensor 12 and PDA 10 might include Bluetooth, IR transmission, IEEE 802.11(b), wireless Ethernet, optical methods, acoustic methods, or other wireless methods, or using a cable connection, electrical interface**, or manual entry of data into the PDA using any input mechanism, such as keys, a stylus, voice recognition, and the like. The PDA may request a blood glucose reading from the sensor. Mault at [0074]  Figure 2 Mault at Fig.2 FIG. 2 shows a system embodiment, comprising portable computing device **30** having a display **32**, data entry mechanism **34**, and wireless transceiver **36**; a wrist-mounted glucose

’868 Patent	Mault
	sensor **38** having a strap **40**; activity monitor **42** supported by the person's body using belt **44**; insulin storage and dispensing device **46** comprising a subcutaneous needle **50** and delivery system **48** such as a pump. The portable computing device **30** is in linked to a communications network **52**, allowing communication a remote computer system **54**, which may be located at the person's home, doctor's office, or other remote location. A remote server system **56** is also accessible through the communications network **52**, and can be used to store a database of physiological parameters, activity, and diet relating to the person, for medical, nutritional, or computer expert system analysis. The wrist mounted sensor **40** and activity monitor **42** can transmit data to the portable computing device **30** through a wireless method. The device **30** can be carried in a pocket of the person's clothes, or on a belt clip, or other convenient method. Mault at [0079]  Figure 7A Mault at Fig. 7a FIG. 7A shows a blood glucose analysis module having **a microneedle array placed against the skin of a person and in wireless communication with a PDA.** The analysis module, shown generally at 120, has a housing 122 having a microneedle array 124 on one surface. The array is placed against the skin 126 of a person. The PDA 130 has housing 132, display 134, data entry mechanism 136, and **an accessory communication module 138 used to communicate with the analysis module 120. Communication may use a cable link, or a wireless communication such as the Bluetooth protocol developed by Ericsson and other companies. The communications module may be contained within the housing of the PDA.** The **analysis module 120 may be powered by radiation generated by the**

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Mault
	PDA or other electronic device, for example by inductive coupling, capacitive coupling, thermoelectric, photoelectric, or piezoelectric effects. In other embodiments, a direct electrical interface may be formed between the PDA and the microneedle analysis module 120. Suction, heat, pressure, radiation, chemicals, or other external factors may be advantageously applied to the skin to enhance interstitial fluid production. Mault at [0091] The **module 120 contains a wireless transceiver for transmitting data to another device, such as the PDA 130. The measurements of blood glucose are received by the PDA,** and provided to the software program used for diet logging and glycemic response prediction. The measurements can be used to update and refine a glycemic response model. Mault at [0092] FIG. 7B shows a schematic of a possible embodiment of a system blood glucose monitoring system, an analysis module 164 comprising a blood glucose sensor 140 providing an electrical glucose signal correlated with blood glucose levels, an analog-to-digital converter 142 providing a digital representation of the glucose signal, and a wireless transmitter 144 transmitting the digital representation of the glucose signal to other devices in communication with the analysis module. A portable computing device 166 which can communicate with the analysis module comprises a wireless receiver 146, a data buffer 148, a processor 150, a memory 152, a memory module (e.g. memory card) interface 154, a clock 156, a display 158, and a bus 162. Mault at [0093]

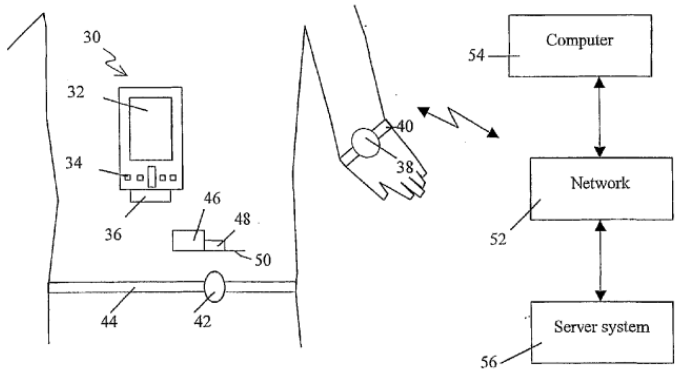
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	 Figure 9 Mault at Fig 9. **The electronic device 240 is used as a diet log and to store blood glucose readings**. The device provides dietary feedback to the mother based on a measured and modeled (or estimated) glycemic response. **The device also collects data from physiological sensors monitoring the health of the baby and/or mother**. An audible alert can sound if projected or actual blood glucose levels deviate from a predetermined range. Mault at [0106]

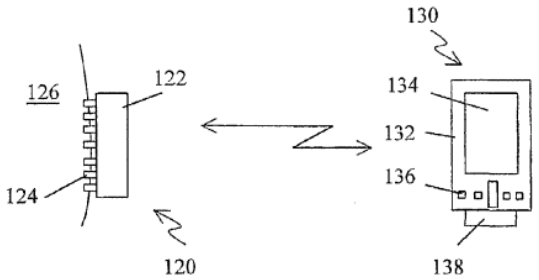
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	 Figure 10 Mault at Fig. 10 **FIG. 10 shows a blood glucose monitoring system 260**, **in the form of a watch, supported on a monitored subject using a strap 262**, **providing data to a PDA 264 in possession of the caregiver**. **The PDA 264 has housing 266, display 268, and data entry means in the form of a keypad 270**. **Other data entry mechanisms can be used, such as** a stylus, **touch pad**, tracker device, biofeedback system, roller-jog dial, voice recognition, and the like. **Wireless data transmission can be used, such as Bluetooth (Ericsson) or IR transmission. Electrical connections may be used at intervals, or data read off a display of the wrist-mounted device. The PDA has a software program, such as a calorie management program, having a glycemic response algorithm for the subject. The software program can be adapted for diet logging and glycemic response modeling for a plurality of subjects. Monitoring device 260 can further be any wearable, portable, or implanted analysis device.** The caregiver records meals consumed by the subject, estimates activity levels (or receives data from a physical activity monitor worn by the subject), and is alerted to possible or actual blood glucose excursions from a safe range. The caregiver can control diet, exercise, insulin administration, or other subject treatment or condition so as to maintain a healthy status of the subject. Mault at [0109] <u>Jeng (U.S. Pat. No. 6,067,463)</u> Mault incorporates Jeng by reference. Mault at [0011] (“The contents of U.S. Patents and published Patent Applications mentioned herein, are incorporated herein by reference.”), [0073] (Sensor 12 may also use in-vivo spectroscopy techniques to measure blood glucose, for example as described in U.S.

’868 Patent	Mault
	Pat. Nos. 6,067,463 (Jeng) . . . .”). Jeng discloses or renders obvious a diagnostic system comprises a light source as shown in Exhibit A2, which is incorporated by reference as if fully stated herein. One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Mault, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Mault, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[j]. the wireless data comprising at least a part of the physiological information,	Mault discloses or renders obvious the wireless data comprising at least a part of the physiological information. **The person carries a portable computing device, such as a PDA, which receives blood glucose levels from a blood glucose sensor. The blood glucose sensor may be a device clipped on to the earlobe of the person, using at least one semiconductor laser or light emitting diode to emit wavelengths in the near-IR.** These wavelengths are transmitted through or reflected by blood-containing tissue, and then detected by a near-IR detector. A number of emissive devices may be used, or electrical modulation of a single device may be used to obtain multiple wavelength emission. For example, two wavelengths may be chosen, one absorbed and one not absorbed by blood glucose, the absorption ratio then being used to compute the blood glucose level of the person. Other blood glucose sensors are known in the art, and improved sensor systems are discussed below. **The blood glucose data can be transmitted from the sensor to the PDA using the Bluetooth wireless protocol.** Mault at [0020] Electronic device **10** can be carried by the person, for example a portable computer, personal digital assistant (PDA), wireless phone with computational functionality, visor-mounted device, or other device. The electronic device **10** can be a PDA such as a Palm Pilot. The electronic device can be a portable electronic device or system carried by the person, or a device or system combining multiple functionalities, such as: a personal digital assistant (PDA); an electronic book (e-book); a portable computer; any portable Internet access device; a wireless phone; a wristwatch, adapted to record data, for example to monitor physiological properties, or act as a diet log (it may also act as a wireless internet access device, or be otherwise adapted); a headset, providing for example visual and audio

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Mault
	communication to the person, and recording audio and/or visual information; a body mounted activity monitor (for example pedometer) adapted to record data; any portable electronic device with data logging capabilities, for example an electronic organizer; or some combination of the above or other devices. Mault at [0070] The portable electronic device receives data, and provides feedback to the person. For convenience, the device will be referred to as a PDA, though it may contain a number of functionalities in addition to those of a conventional PDA, such as the Palm V (Palm Computing). The portable device can be in communication with a communications network, for example through a wireless Internet connection or similar. The PDA may be a single device, or may be a system of separate components, for example (for non-limiting illustrative purposes only) a collar-mounted microphone transmitting to a device carried in the pocket, which itself transmits images to a projection unit mounted on a visor, and audio to a hidden earpiece. The system configuration of the PDA is not critical to this invention. Mault at [0071] Sensor **12** can be carried by the person and provides blood glucose measurements at intervals. For example, sensor **12** can uses ion flow to draw glucose molecules out of the blood into a gel disk containing the enzyme glucose oxidase, generating hydrogen peroxide, which is detected and a numerical value displayed. This technique is used by GlucoWatch developed by Cygnus (Redwood City, Calif.). The sensor can then transmit the numerical value of blood glucose to the PDA **10**, for example using a wireless method. Alternatively, sensor **12** may use spectroscopic detection of a glucose oxidase reaction. Sensor **12** may also use in-vivo spectroscopy techniques to measure blood glucose, for example as described in U.S. Pat. Nos. 6,067,463 (Jeng), 6,049,727 (Crothal), 5,660,163 (Schulman), and others. For example, IR absorption or reflection properties of skin or tissues may be determined, for example using a finger, toe, wrist, skin membrane, earlobe, nose, cheek, retina, or other body part. A blood analysis sensor may be built in to a module which plugs in to the PDA. For example, using a non-invasive spectroscopic technique, the PDA/module combination may be placed against part of the body to obtain a blood glucose reading. The sensor may also be placed under the skin, with wireless communication, such as using the Bluetooth protocol, to the PDA. The sensor may be powered by internal batteries, by light using a photoelectric effect, by temperature gradients using a thermoelectric effect, by radiation (e.g. from AM radio stations, electric mains, or radiated by the PDA

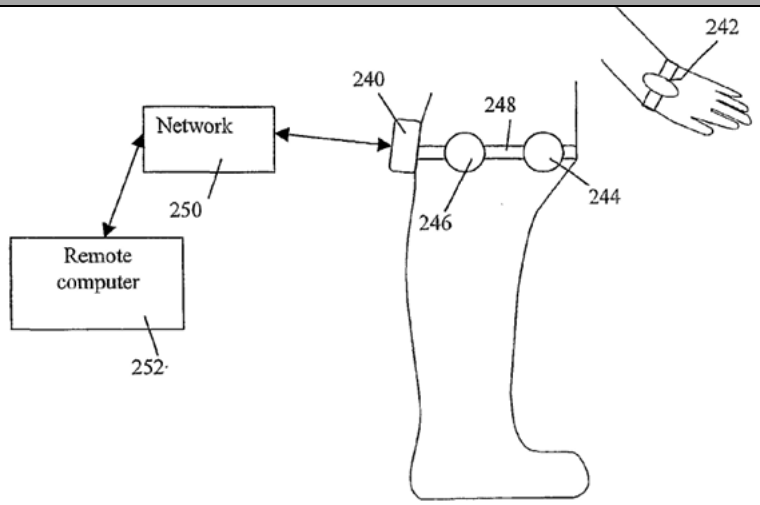
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	or other portable device), and may be either continuously powered or only powered at times a reading is required. The sensor may record data to a memory card which plugs into the PDA. Mault at [0073] **In one embodiment, the glucose sensor transmits the blood glucose level data to the PDA using a wireless communication protocol such as Bluetooth (Ericsson Components AB). Communication methods between sensor 12 and PDA 10 might include Bluetooth, IR transmission, IEEE 802.11(b), wireless Ethernet, optical methods, acoustic methods, or other wireless methods, or using a cable connection, electrical interface**, or manual entry of data into the PDA using any input mechanism, such as keys, a stylus, voice recognition, and the like. The PDA may request a blood glucose reading from the sensor. Mault at [0074]  Figure 2 Mault at Fig.2 FIG. 2 shows a system embodiment, comprising portable computing device **30** having a display **32**, data entry mechanism **34**, and wireless transceiver **36**; a wrist-mounted glucose sensor **38** having a strap **40**; activity monitor **42** supported by the person's body using belt **44**; insulin storage and dispensing device **46** comprising a subcutaneous needle **50** and delivery system **48** such as

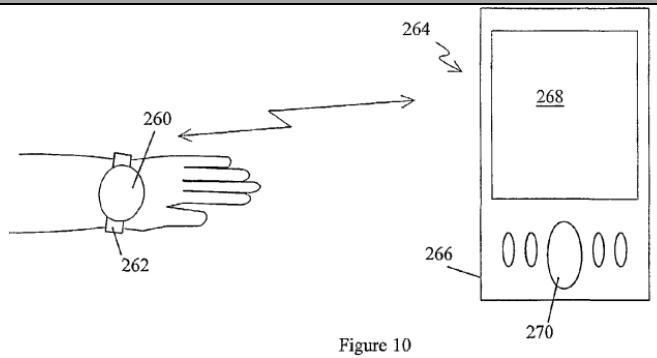
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	a pump. The portable computing device **30** is in linked to a communications network **52**, allowing communication a remote computer system **54**, which may be located at the person's home, doctor's office, or other remote location. A remote server system **56** is also accessible through the communications network **52**, and can be used to store a database of physiological parameters, activity, and diet relating to the person, for medical, nutritional, or computer expert system analysis. The wrist mounted sensor **40** and activity monitor **42** can transmit data to the portable computing device **30** through a wireless method. The device **30** can be carried in a pocket of the person's clothes, or on a belt clip, or other convenient method. Mault at [0079]  Figure 7A Mault at Fig. 7a FIG. 7A shows a blood glucose analysis module having **a microneedle array placed against the skin of a person and in wireless communication with a PDA.** The analysis module, shown generally at 120, has a housing 122 having a microneedle array 124 on one surface. The array is placed against the skin 126 of a person. The PDA 130 has housing 132, display 134, data entry mechanism 136, and **an accessory communication module 138 used to communicate with the analysis module 120. Communication may use a cable link, or a wireless communication such as the Bluetooth protocol developed by Ericsson and other companies. The communications module may be contained within the housing of the PDA.** The **analysis module 120 may be powered by radiation generated by the PDA or other electronic device**, for example by inductive coupling, capacitive coupling, thermoelectric, photoelectric, or piezoelectric effects. In other embodiments, a direct electrical interface may be formed

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Mault
	between the PDA and the microneedle analysis module 120. Suction, heat, pressure, radiation, chemicals, or other external factors may be advantageously applied to the skin to enhance interstitial fluid production. Mault at [0091] The **module 120 contains a wireless transceiver for transmitting data to another device, such as the PDA 130. The measurements of blood glucose are received by the PDA,** and provided to the software program used for diet logging and glycemic response prediction. The measurements can be used to update and refine a glycemic response model. Mault at [0092] FIG. 7B shows a schematic of a possible embodiment of a system blood glucose monitoring system, an analysis module 164 comprising a blood glucose sensor 140 providing an electrical glucose signal correlated with blood glucose levels, an analog-to-digital converter 142 providing a digital representation of the glucose signal, and a wireless transmitter 144 transmitting the digital representation of the glucose signal to other devices in communication with the analysis module. A portable computing device 166 which can communicate with the analysis module comprises a wireless receiver 146, a data buffer 148, a processor 150, a memory 152, a memory module (e.g. memory card) interface 154, a clock 156, a display 158, and a bus 162. Mault at [0093]

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Mault
	 Figure 9 Mault at Fig 9. **The electronic device 240 is used as a diet log and to store blood glucose readings**. The device provides dietary feedback to the mother based on a measured and modeled (or estimated) glycemic response. **The device also collects data from physiological sensors monitoring the health of the baby and/or mother**. An audible alert can sound if projected or actual blood glucose levels deviate from a predetermined range. Mault at [0106]

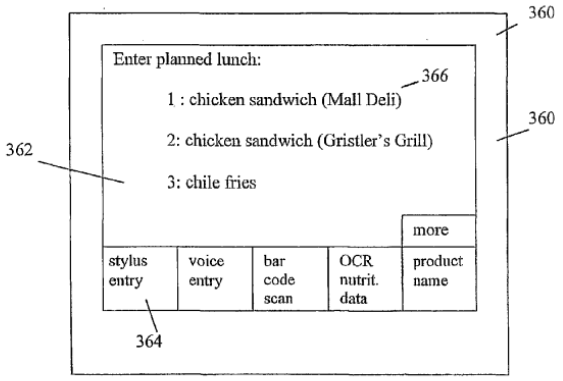
’868 Patent	Mault
	 Figure 10 Mault at Fig. 10 **FIG. 10 shows a blood glucose monitoring system 260**, **in the form of a watch, supported on a monitored subject using a strap 262**, **providing data to a PDA 264 in possession of the caregiver**. **The PDA 264 has housing 266, display 268, and data entry means in the form of a keypad 270**. **Other data entry mechanisms can be used, such as** a stylus, **touch pad**, tracker device, biofeedback system, roller-jog dial, voice recognition, and the like. **Wireless data transmission can be used, such as Bluetooth (Ericsson) or IR transmission. Electrical connections may be used at intervals, or data read off a display of the wrist-mounted device. The PDA has a software program, such as a calorie management program, having a glycemic response algorithm for the subject. The software program can be adapted for diet logging and glycemic response modeling for a plurality of subjects. Monitoring device 260 can further be any wearable, portable, or implanted analysis device.** The caregiver records meals consumed by the subject, estimates activity levels (or receives data from a physical activity monitor worn by the subject), and is alerted to possible or actual blood glucose excursions from a safe range. The caregiver can control diet, exercise, insulin administration, or other subject treatment or condition so as to maintain a healthy status of the subject. Mault at [0109] <u>Jeng (U.S. Pat. No. 6,067,463)</u> Mault incorporates Jeng by reference. Mault at [0011] (“The contents of U.S. Patents and published Patent Applications mentioned herein, are incorporated herein by reference.”), [0073] (Sensor 12 may also use in-vivo spectroscopy techniques to measure blood glucose, for example as described in U.S.

’868 Patent	Mault
	Pat. Nos. 6,067,463 (Jeng) . . . .”). Jeng discloses or renders obvious a diagnostic system comprises a light source as shown in Exhibit A2, which is incorporated by reference as if fully stated herein. One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Mault, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Mault, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[k]. wherein the control system is further capable of receiving voice input signals and manually entered input signals; and	Mault discloses or renders obvious the control system is further capable of receiving voice input signals and manually entered input signals. The glucose sensor 12 may be a monitoring kit as used in a doctor's office or the person's home, conventionally involving the drawing of blood and an analysis of blood glucose levels. **Data from such tests may then be manually entered into the PDA**. However, repeated use of such kits is inconvenient. Mault at [0072] In one embodiment, the glucose sensor transmits the blood glucose level data to the PDA using a wireless communication protocol such as Bluetooth (Ericsson Components AB). Communication methods between sensor 12 and PDA 10 might include Bluetooth, IR transmission, IEEE 802.11(b), wireless Ethernet, optical methods, acoustic methods, or other wireless methods, or using a cable connection, electrical interface, or **manual entry of data into the PDA using any input mechanism, such as keys, a stylus, voice recognition, and the like.** The PDA may request a blood glucose reading from the sensor. Mault at [0074] The wrist-mounted device may have one or more of the following functionalities: glucose measurement; barcode scanner; a memory containing nutritional data, correlated with food identity data such as names, numeric codes, UPC barcode data, and the like; **voice recognition capability for data input**; a display, such as an electronic display or a laser projection display for large scale information projection against a surface; an IR port, for communication with other devices; a wireless transceiver such as Bluetooth enabled transceiver; a camera, for recording food images; a connection to a communications network,

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

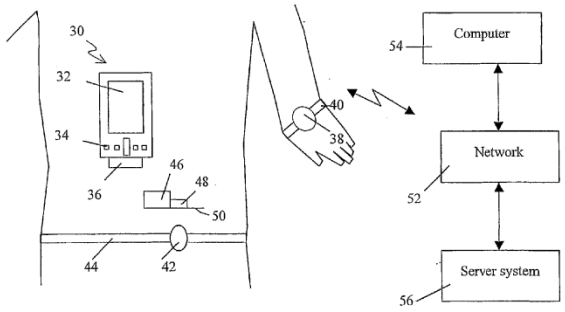
’868 Patent	Mault
	such as a wireless Internet connection, for sending and receiving data which may include nutritional information associated with non-recognized UPC codes or other data; a memory module port for transfer of data; an electrical connector, for communicating with another electronic device; a processor for running a software program having diet log, activity log, and glycemic response model functionalities; a wireless phone functionality; activity recorder, for example using pulse, or activity time flagging. Other functionalities, such as the alert systems described by Olsen in U.S. Pat. No. 6,188,648, herein incorporated by reference, can also be included. Mault at [0100] FIG. 10 shows a blood glucose monitoring system **260**, in the form of a watch, supported on a monitored subject using a strap **262**, providing data to a PDA **264** in possession of the caregiver. **The PDA 264 has housing 266, display 268, and data entry means in the form of a keypad 270. Other data entry mechanisms can be used, such as a stylus, touch pad, tracker device, biofeedback system, roller-jog dial, voice recognition, and the like**. Wireless data transmission can be used, such as Bluetooth (Ericsson) or IR transmission. Electrical connections may be used at intervals, or data read off a display of the wrist-mounted device. The PDA has a software program, such as a calorie management program, having a glycemic response algorithm for the subject. The software program can be adapted for diet logging and glycemic response modeling for a plurality of subjects. Monitoring device **260** can further be any wearable, portable, or implanted analysis device. The caregiver records meals consumed by the subject, estimates activity levels (or receives data from a physical activity monitor worn by the subject), and is alerted to possible or actual blood glucose excursions from a safe range. The caregiver can control diet, exercise, insulin administration, or other subject treatment or condition so as to maintain a healthy status of the subject. Mault at [0109]

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Mault
	 Figure 13 Mault at Fig. 13 FIG. 13 illustrates a possible display 362 on an electronic device 360 (such as a PDA) during entry of a planned meal into the device. The display comprises a menu display 366 and data entry method options 364. A menu-type entry scheme can be convenient, particularly if the range of foods consumed is not that great. Menus can be divided into breakfast, lunch, dinner, and snack sub-menus, and other sub-menus. **Data entry methods can include keystroke entry, voice entry (using voice recognition software)**, stylus entry, optical character recognition applied to packaging/nutrition information, barcode scanning (from the package, menu, etc.), wireless transponder methods (for example from transponder chips mounted on packaging), and the like. A PDA would have a software program allowing diet logging running on it, or can be used to interact with a software program over a communications network. Mault at [0133] **Food consumed can be entered into the PDA using a menu entry system, for example using key presses, stylus entry, voice entry, eye motion detection, hand motion (gesticulation) detection, etc.—for voice entry, a restricted voice recognition capability may be adopted for computational simplicity**, for example one which recognizes only numbers or letters associated with menu choices, such as disclosed in co-pending provisional application serial No. 60/212,319 filed Jun. 16, 2000, to James R. Mault. The name, code number, other identifier, time of consumption, nutritional data, portion size, or other information concerning food consumed can be entered into the PDA, for example using key presses; stylus entry such as handwriting recognition systems); voice entry; optical character

’868 Patent	Mault
	recognition (OCR), for example by placing an item such as a food package, receipt for a food item, a menu, and the like near an OCR-adapted PDA (the PDA may have in-built imaging and OCR capabilities, or be in communication with an accessory device, such as a pen-like device which can be scanned over text, or an imaging device used to image and recognize text); bar-code scanning of an item (for example a food package, receipt, menu, etc.) to obtain identification of food consumed and hence nutrition information, or imaging of a bar code for similar purposes; receiving data transmission from the package, such as from a wireless transponder embedded in a food package under interrogation from the PDA; reading of data from magnetic strips on a food package, menu, receipt, etc.; reading data from patterns on the surface of the food or package, for example microstructures, holograms, etc.; entering data from menu listings, for example using key press entry, stylus entry, optical character recognition, barcode entry, etc. including portion size, food identification, or full or partial nutrition information; receiving data transmissions for example wireless, IR, optical, memory storage media, etc., from food vendors (for example grocery stores, restaurants, etc.), with the data stored for future use if the food is not to be consumed at the time of purchase; receiving data over a communications network, for example the Internet, for example receiving nutrition information on items purchased; recording voice records of food consumed. Mault at [0193] *See also* Mault at [0111], [0118], [0121], [0199], [0203] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Mault, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Mault, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[l]. a host comprising:	Mault discloses or renders obvious the diagnostic system comprises a host. Remote computer system **22** may be a remote server, physicians computer, home computer, or other computer system accessible over the communications network **20**. The PDA can access the communications network, such as the Internet, using a wireless connection. Data can be transferred to the remote system over the communications network **20**, allowing examination by a dietician,

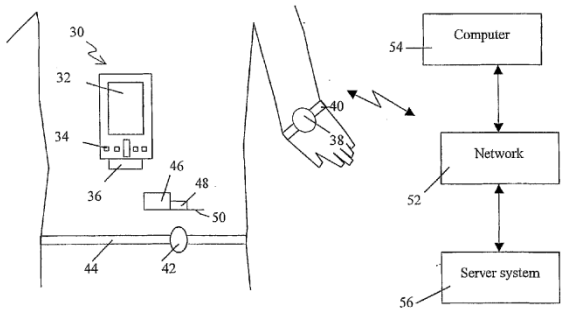
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Mault
	physician, other specialist, or by the person themselves using the PDA or any computer. Feedback, generated by a specialist or computer expert system, may be transmitted to the PDA from the remote computer over the communications network. In an emergency situation, the PDA may send out a request for medical assistance. A global positioning system (GPS) may also be added to the PDA, to facilitate medical rescue in an emergency. Mault at [0077]  Figure 2 Mault at Fig. 2 FIG. 2 shows a system embodiment, comprising portable computing device 30 having a display 32, data entry mechanism 34, and wireless transceiver 36; a wrist-mounted glucose sensor 38 having a strap 40; activity monitor 42 supported by the person's body using belt 44; insulin storage and dispensing device 46 comprising a subcutaneous needle 50 and delivery system 48 such as a pump. **The portable computing device 30 is in linked to a communications network 52, allowing communication a remote computer system 54, which may be located at the person's home, doctor's office, or other remote location.** A remote server system 56 is also accessible through the communications network 52, and can be used to store a database of physiological parameters, activity, and diet relating to the person, for medical, nutritional, or computer expert system analysis. The wrist mounted sensor 40 and activity monitor 42 can transmit data to the portable computing device 30 through a wireless method. The device 30 can be carried in a pocket of the person's clothes, or on a belt clip, or other convenient method. Mault at [0079]

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Mault
	FIG. 11 shows a general schematic of a system embodiment of the present invention. PDA **300** is carried by the person. The PDA **300** contains, or receives data from, a diet log **302** (for example software on the PDA, a voice recorder, a notepad, a digital camera, or other methods as described elsewhere in this specification), a physiological sensor **304** (for example a pulse rate sensor, or other physiological sensor as described elsewhere in this specification), an environmental log **306** (for example, ambient temperature measurement or as described elsewhere in this specification), a physical activity monitor **308**, and a medical log **310**. Various monitoring, recording, or sensing systems can be used in creating the various logs. The system can include the diet log and activity monitor; the other sensors or loggers can be omitted. Data collected is transmitted via a communications network **312** to a computer system **314**. Feedback to the person may be provided by the PDA **300**, an interactive television **316**, or other electronic device. Data collected from the PDA (and possibly from other sources) is stored in a database **318**. Data provided by the PDA **300** or database **318** may be used to determine the content viewed on the interactive television **316**. The content is provided by a content provider **40**, for example a broadcaster, cable service, or server. A physician may view collected data via the physician's computer **42**. A software program having diet log, activity log, glycemic response model, or hunger index model (to be described later) may reside on the PDA **300** or on the computer system **314** so as to be accessed using the communications network, for example using a PDA, computer, web appliance, interactive TV, or other device which can communicate with the communications network. Mault at [0111] The PDA may communicate with a remote computer system, for example for sending data to a database or web-site, for examination by authorized persons or systems. For example, a physician may monitor the condition of a patient remotely. Mault at [0115] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Mault, it would

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Mault
	have been obvious to one of ordinary skill in the art to combine, with the teachings of Mault, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[m]. a digital file for receiving and storing at least a portion of the wireless data;	Mault discloses or renders obvious the host comprises a digital file for receiving and storing at least a portion of the wireless data. **Remote computer system 22 may be a remote server, physicians computer, home computer, or other computer system accessible over the communications network 20.** The PDA can access the communications network, such as the Internet, using a wireless connection. **Data can be transferred to the remote system over the communications network 20,** allowing examination by a dietician, physician, other specialist, or by the person themselves using the PDA or any computer. Feedback, generated by a specialist or computer expert system, may be transmitted to the PDA from the remote computer over the communications network. In an emergency situation, the PDA may send out a request for medical assistance. A global positioning system (GPS) may also be added to the PDA, to facilitate medical rescue in an emergency. Mault at [0077]  Figure 2 Mault at Fig. 2 FIG. 2 shows a system embodiment, comprising portable computing device 30 having a display 32, data entry mechanism 34, and wireless transceiver 36; a wrist-mounted glucose sensor 38 having a strap 40; activity monitor 42 supported by the person's body using belt 44; insulin storage and dispensing device 46 comprising a subcutaneous needle 50 and delivery system 48 such as a pump. **The portable computing device 30 is in linked to a communications network 52, allowing communication a**

’868 Patent	Mault
	remote computer system 54, which may be located at the person's home, doctor's office, or other remote location. A remote server system 56 is also accessible through the communications network 52, and can be used to store a database of physiological parameters, activity, and diet relating to the person, for medical, nutritional, or computer expert system analysis. The wrist mounted sensor 40 and activity monitor 42 can transmit data to the portable computing device 30 through a wireless method. The device 30 can be carried in a pocket of the person's clothes, or on a belt clip, or other convenient method. Mault at [0079] FIG. 11 shows a general schematic of a system embodiment of the present invention. PDA **300** is carried by the person. The PDA **300** contains, or receives data from, a diet log **302** (for example software on the PDA, a voice recorder, a notepad, a digital camera, or other methods as described elsewhere in this specification), a physiological sensor **304** (for example a pulse rate sensor, or other physiological sensor as described elsewhere in this specification), an environmental log **306** (for example, ambient temperature measurement or as described elsewhere in this specification), a physical activity monitor **308**, and a medical log **310**. Various monitoring, recording, or sensing systems can be used in creating the various logs. The system can include the diet log and activity monitor; the other sensors or loggers can be omitted. Data collected is transmitted via a communications network **312** to a computer system **314**. Feedback to the person may be provided by the PDA **300**, an interactive television **316**, or other electronic device. Data collected from the PDA (and possibly from other sources) is stored in a database **318**. Data provided by the PDA **300** or database **318** may be used to determine the content viewed on the interactive television **316**. The content is provided by a content provider **40**, for example a broadcaster, cable service, or server. A physician may view collected data via the physician's computer **42**. A software program having diet log, activity log, glycemic response model, or hunger index model (to be described later) may reside on the PDA **300** or on the computer system **314** so as to be accessed using the communications network, for example using a PDA, computer, web appliance, interactive TV, or other device which can communicate with the communications network. Mault at [0111]

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

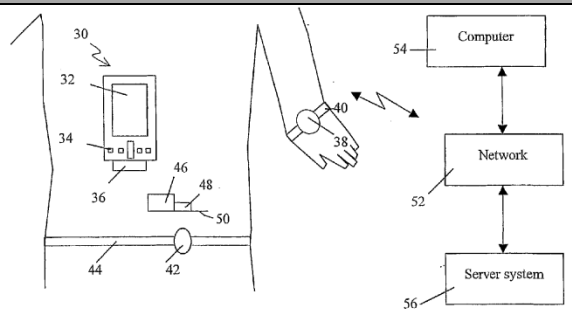
’868 Patent	Mault
	The PDA may communicate with a remote computer system, for example for sending data to a database or web-site, for examination by authorized persons or systems. For example, a physician may monitor the condition of a patient remotely. Mault at [0115] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Mault, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Mault, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[n]. control logic at the host to process at least the portion of the wireless data to generate a status of the user;	Mault discloses or renders obvious the host comprises control logic at the host to process at least the portion of the wireless data to generate a status of the user. In one embodiment, **the system comprises a portable computing device such as a personal digital assistant (PDA), having a software program (such as a calorie management program or other health maintenance program) having a glycemic modeling capability, such as a glycemic response algorithm. The term PDA will be used for convenience to refer to a portable computing device. The software program can be adapted to receive blood glucose measurements of the person. Blood glucose levels can be determined by any convenient technique for comparison with the glycemic response predictions of the software program**. Mault at [0014] The person carries a portable computing device, such as a PDA, which receives blood glucose levels from a blood glucose sensor. The blood glucose sensor may be a device clipped on to the earlobe of the person, using at least one semiconductor laser or light emitting diode to emit wavelengths in the near-IR. These wavelengths are transmitted through or reflected by blood-containing tissue, and then detected by a near-IR detector. A number of emissive devices may be used, or electrical modulation of a single device may be used to obtain multiple wavelength emission. For example, two wavelengths may be chosen, one absorbed and one not absorbed by blood glucose, the absorption ratio then being used to compute the blood glucose level of the person. Other blood glucose sensors are known in the

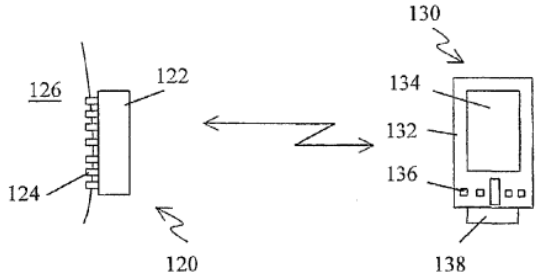
’868 Patent	Mault
	art, and improved sensor systems are discussed below. The blood glucose data can be transmitted from the sensor to the PDA using the Bluetooth wireless protocol. Mault at [0020] Electronic device **10** can be carried by the person, for example a portable computer, personal digital assistant (PDA), wireless phone with computational functionality, visor-mounted device, or other device. The electronic device **10** can be a PDA such as a Palm Pilot. The electronic device can be a portable electronic device or system carried by the person, or a device or system combining multiple functionalities, such as: a personal digital assistant (PDA); an electronic book (e-book); a portable computer; any portable Internet access device; a wireless phone; a wristwatch, adapted to record data, for example to monitor physiological properties, or act as a diet log (it may also act as a wireless internet access device, or be otherwise adapted); a headset, providing for example visual and audio communication to the person, and recording audio and/or visual information; a body mounted activity monitor (for example pedometer) adapted to record data; any portable electronic device with data logging capabilities, for example an electronic organizer; or some combination of the above or other devices. Mault at [0070] The portable electronic device receives data, and provides feedback to the person. For convenience, the device will be referred to as a PDA, though it may contain a number of functionalities in addition to those of a conventional PDA, such as the Palm V (Palm Computing). The portable device can be in communication with a communications network, for example through a wireless Internet connection or similar. The PDA may be a single device, or may be a system of separate components, for example (for non-limiting illustrative purposes only) a collar-mounted microphone transmitting to a device carried in the pocket, which itself transmits images to a projection unit mounted on a visor, and audio to a hidden earpiece. The system configuration of the PDA is not critical to this invention. Mault at [0071] Sensor **12** can be carried by the person and provides blood glucose measurements at intervals. For example, sensor **12** can uses ion flow to draw glucose molecules out of the blood into a gel disk containing the enzyme glucose oxidase, generating hydrogen peroxide, which is detected and a

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

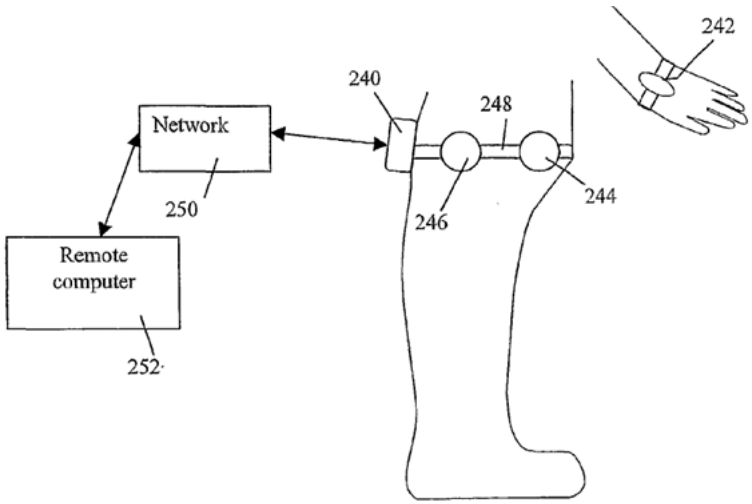
’868 Patent	Mault
	numerical value displayed. This technique is used by GlucoWatch developed by Cygnus (Redwood City, Calif.). The sensor can then transmit the numerical value of blood glucose to the PDA **10**, for example using a wireless method. Alternatively, sensor **12** may use spectroscopic detection of a glucose oxidase reaction. Sensor **12** may also use in-vivo spectroscopy techniques to measure blood glucose, for example as described in U.S. Pat. Nos. 6,067,463 (Jeng), 6,049,727 (Crothal), 5,660,163 (Schulman), and others. For example, IR absorption or reflection properties of skin or tissues may be determined, for example using a finger, toe, wrist, skin membrane, earlobe, nose, cheek, retina, or other body part. A blood analysis sensor may be built in to a module which plugs in to the PDA. For example, using a non-invasive spectroscopic technique, the PDA/module combination may be placed against part of the body to obtain a blood glucose reading. The sensor may also be placed under the skin, with wireless communication, such as using the Bluetooth protocol, to the PDA. The sensor may be powered by internal batteries, by light using a photoelectric effect, by temperature gradients using a thermoelectric effect, by radiation (e.g. from AM radio stations, electric mains, or radiated by the PDA or other portable device), and may be either continuously powered or only powered at times a reading is required. The sensor may record data to a memory card which plugs into the PDA. Mault at [0073] **In one embodiment, the glucose sensor transmits the blood glucose level data to the PDA using a wireless communication protocol such as Bluetooth (Ericsson Components AB). Communication methods between sensor 12 and PDA 10 might include Bluetooth, IR transmission, IEEE 802.11(b), wireless Ethernet, optical methods, acoustic methods, or other wireless methods, or using a cable connection, electrical interface**, or manual entry of data into the PDA using any input mechanism, such as keys, a stylus, voice recognition, and the like. The PDA may request a blood glucose reading from the sensor. Mault at [0074]

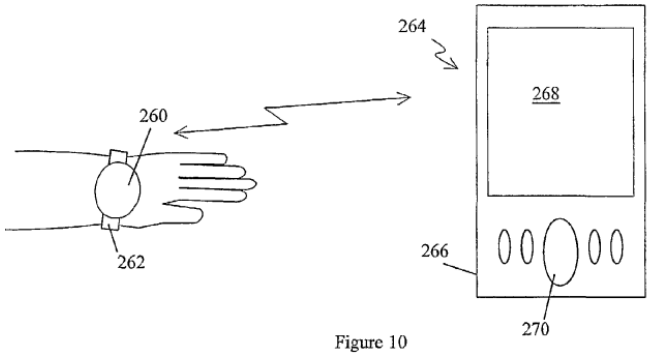
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Mault
	 Figure 2 Mault at Fig. 2 **FIG. 2 shows a system embodiment, comprising portable computing device 30** having a display 32, data entry mechanism 34, and wireless transceiver 36; a wrist-mounted glucose sensor 38 having a strap 40; activity monitor 42 supported by the person's body using belt 44; insulin storage and dispensing device 46 comprising a subcutaneous needle 50 and delivery system 48 such as a pump. **The portable computing device 30 is in linked to a communications network 52, allowing communication a remote computer system 54, which may be located at the person's home, doctor's office, or other remote location. A remote server system 56 is also accessible through the communications network 52, and can be used to store a database of physiological parameters, activity, and diet relating to the person, for medical, nutritional, or computer expert system analysis**. The wrist mounted sensor 40 and activity monitor 42 can transmit data to the portable computing device 30 through a wireless method. The device 30 can be carried in a pocket of the person's clothes, or on a belt clip, or other convenient method. Mault at [0079]

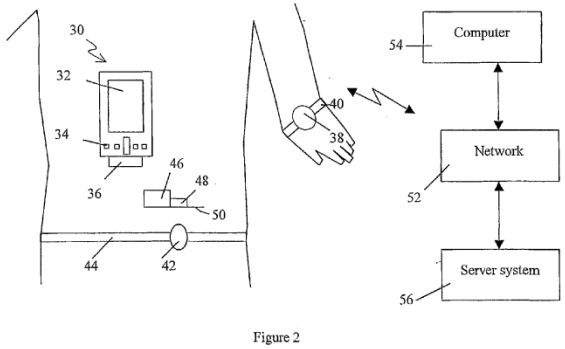
’868 Patent	Mault
	 Figure 7A Mault at Fig. 7a FIG. 7A shows a blood glucose analysis module having **a microneedle array placed against the skin of a person and in wireless communication with a PDA.** The analysis module, shown generally at 120, has a housing 122 having a microneedle array 124 on one surface. The array is placed against the skin 126 of a person. The PDA 130 has housing 132, display 134, data entry mechanism 136, and **an accessory communication module 138 used to communicate with the analysis module 120. Communication may use a cable link, or a wireless communication such as the Bluetooth protocol developed by Ericsson and other companies. The communications module may be contained within the housing of the PDA.** The **analysis module 120 may be powered by radiation generated by the PDA or other electronic device**, for example by inductive coupling, capacitive coupling, thermoelectric, photoelectric, or piezoelectric effects. In other embodiments, a direct electrical interface may be formed between the PDA and the microneedle analysis module 120. Suction, heat, pressure, radiation, chemicals, or other external factors may be advantageously applied to the skin to enhance interstitial fluid production. Mault at [0091] The **module 120 contains a wireless transceiver for transmitting data to another device, such as the PDA 130. The measurements of blood glucose are received by the PDA,** and provided to the software program used for diet logging and glycemic response prediction. The measurements can be used to update and refine a glycemic response model. Mault at [0092]

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Mault
	FIG. 7B shows a schematic of a possible embodiment of a system blood glucose monitoring system, an analysis module 164 comprising a blood glucose sensor 140 providing an electrical glucose signal correlated with blood glucose levels, an analog-to-digital converter 142 providing a digital representation of the glucose signal, and a wireless transmitter 144 transmitting the digital representation of the glucose signal to other devices in communication with the analysis module. A portable computing device 166 which can communicate with the analysis module comprises a wireless receiver 146, a data buffer 148, a processor 150, a memory 152, a memory module (e.g. memory card) interface 154, a clock 156, a display 158, and a bus 162. Mault at [0093]  Figure 9 Mault at Fig 9. The electronic device 240 is used as a diet log and to store blood glucose readings. The device provides dietary feedback to the mother based on a measured and modeled (or estimated) glycemic response. The device also collects data from physiological sensors monitoring the health of the baby and/or mother. An audible alert can sound if projected or actual blood glucose levels deviate from a predetermined range.

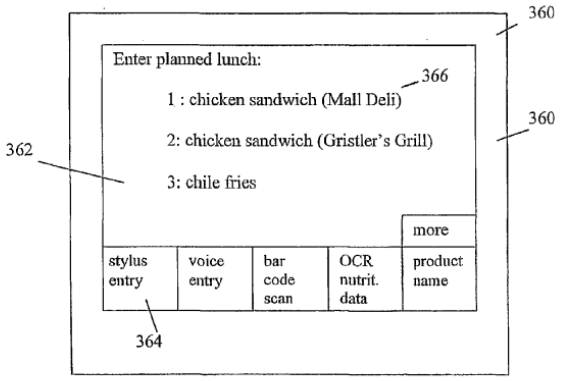
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	Mault at [0106]  Figure 10 Mault at Fig. 10 FIG. 10 shows a blood glucose monitoring system 260, in the form of a watch, supported on a monitored subject using a strap 262, providing data to a PDA 264 in possession of the caregiver. The PDA 264 has housing 266, display 268, and data entry means in the form of a keypad 270. Other data entry mechanisms can be used, such as a stylus, touch pad, tracker device, biofeedback system, roller-jog dial, voice recognition, and the like. Wireless data transmission can be used, such as Bluetooth (Ericsson) or IR transmission. Electrical connections may be used at intervals, or data read off a display of the wrist-mounted device. The PDA has a software program, such as a calorie management program, having a glycemic response algorithm for the subject. The software program can be adapted for diet logging and glycemic response modeling for a plurality of subjects. Monitoring device 260 can further be any wearable, portable, or implanted analysis device. The caregiver records meals consumed by the subject, estimates activity levels (or receives data from a physical activity monitor worn by the subject), and is alerted to possible or actual blood glucose excursions from a safe range. The caregiver can control diet, exercise, insulin administration, or other subject treatment or condition so as to maintain a healthy status of the subject. Mault at [0109]

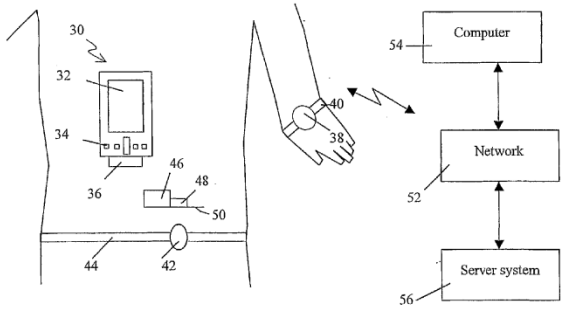
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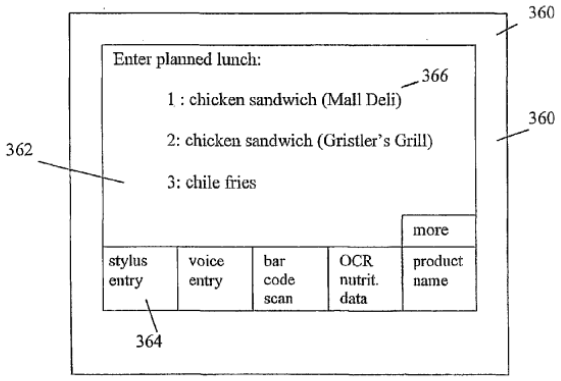
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	One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Mault, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Mault, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[o]. a memory storage device for recording the status; and	Mault discloses or renders obvious the host comprises a memory storage device for recording the status.  Figure 2 Mault at Fig. 2 **FIG. 2 shows a system embodiment, comprising portable computing device 30** having a display 32, data entry mechanism 34, and wireless transceiver 36; a wrist-mounted glucose sensor 38 having a strap 40; activity monitor 42 supported by the person's body using belt 44; insulin storage and dispensing device 46 comprising a subcutaneous needle 50 and delivery system 48 such as a pump. **The portable computing device 30 is in linked to a communications network 52, allowing communication a remote computer system 54, which may be located at the person's home, doctor's office, or other remote location. A remote server system 56 is also accessible through the communications network 52, and can be used to store a database of physiological parameters, activity, and diet relating to the person, for medical, nutritional, or computer expert system analysis**. The wrist mounted sensor 40 and activity monitor 42 can transmit data to the portable computing device 30 through a wireless method. The device 30 can be carried in a pocket of the person's clothes, or on a belt clip, or other convenient method.

’868 Patent	Mault
	Mault at [0079] A health management business may provide diet log software so as to run on a computer belonging to the person. **Alternatively, the business may provide a computer, for example a portable computing device such as a PDA, on which the software program is installed**. **The computer can have a display, a microprocessor, memory (in the form of RAM, ROM, and a data storage device), and data entry mechanisms such as a keyboard, buttons, stylus, voice entry, roller-jog dial, track ball, finger tracking device, and the like.** Mault at [0112] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Mault, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Mault, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[p]. an output for communicating at least a portion of the status or associated information over a communication link to one or more display output devices,	Mault discloses or renders obvious the host comprises an output for communicating at least a portion of the status or associated information over a communication link to one or more display output devices, wherein the one or more display output devices are located remotely from the host. A system for assisting a person to maintain a blood glucose level between predetermined limits comprises an electronic device, for example **a portable computing device such as a PDA, comprising a display**, a clock, a memory, and a processor; and a software program executable by the processor of the electronic device, adapted to receive nutritional data of food consumed by the person, to calculate the blood glucose level for the person using the nutritional data and a glycemic response model for the person, and further adapted **to present the blood glucose level to the person on the display of the electronic device**. Mault at [0042]

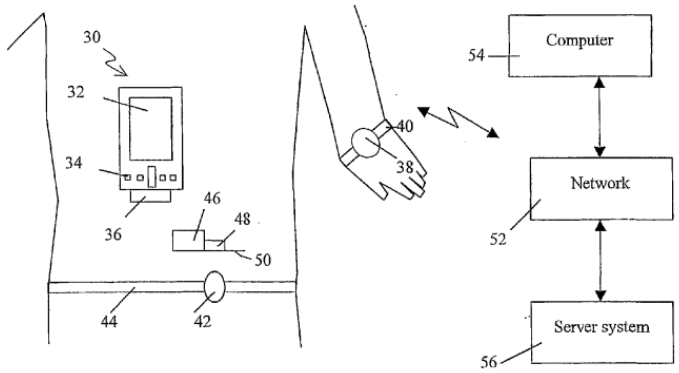
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Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

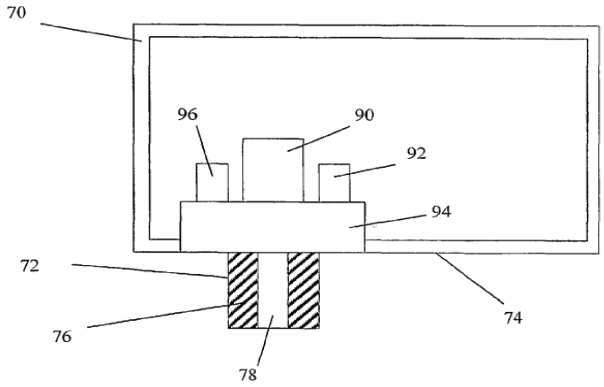
’868 Patent	Mault
	 Figure 13 Mault at Fig. 13 FIG. 13 illustrates **a possible display 362 on an electronic device 360 (such as a PDA) during entry of a planned meal into the device. The display comprises a menu display 366** and data entry method options 364. **A menu-type entry scheme can be convenient, particularly if the range of foods consumed is not that great. Menus can be divided into breakfast, lunch, dinner, and snack sub-menus, and other sub-menus.** Data entry methods can include keystroke entry, voice entry (using voice recognition software), stylus entry, optical character recognition applied to packaging/nutrition information, barcode scanning (from the package, menu, etc.), wireless transponder methods (for example from transponder chips mounted on packaging), and the like. A PDA would have a software program allowing diet logging running on it, or can be used to interact with a software program over a communications network. Mault at [0133] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Mault, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Mault, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.

’868 Patent	Mault
7[q]. wherein the one or more display output devices are located remotely from the host.	Mault discloses or renders obvious the one or more display output devices are located remotely from the host.  Figure 2 Mault at Fig. 2 FIG. 2 shows a system embodiment, comprising portable computing device 30 having a display 32, data entry mechanism 34, and wireless transceiver 36; a wrist-mounted glucose sensor 38 having a strap 40; activity monitor 42 supported by the person's body using belt 44; insulin storage and dispensing device 46 comprising a subcutaneous needle 50 and delivery system 48 such as a pump. **The portable computing device 30 is in linked to a communications network 52, allowing communication a remote computer system 54, which may be located at the person's home, doctor's office, or other remote location.** A remote server system 56 is also accessible through the communications network 52, and can be used to store a database of physiological parameters, activity, and diet relating to the person, for medical, nutritional, or computer expert system analysis. The wrist mounted sensor 40 and activity monitor 42 can transmit data to the portable computing device 30 through a wireless method. The device 30 can be carried in a pocket of the person's clothes, or on a belt clip, or other convenient method. Mault at [0079]

’868 Patent	Mault
	 Figure 13 Mault at Fig. 13 FIG. 13 illustrates **a possible display 362 on an electronic device 360 (such as a PDA) during entry of a planned meal into the device. The display comprises a menu display 366** and data entry method options 364. **A menu-type entry scheme can be convenient, particularly if the range of foods consumed is not that great. Menus can be divided into breakfast, lunch, dinner, and snack sub-menus, and other sub-menus.** Data entry methods can include keystroke entry, voice entry (using voice recognition software), stylus entry, optical character recognition applied to packaging/nutrition information, barcode scanning (from the package, menu, etc.), wireless transponder methods (for example from transponder chips mounted on packaging), and the like. A PDA would have a software program allowing diet logging running on it, or can be used to interact with a software program over a communications network. Mault at [0133] 28. The method according to claim 15, wherein said **nutritional data is entered and said generated glycemic response curve is displayed, in a portable computer unit carried by the person, and wherein said data is processed in a remotely-located data processor which communicates with and serves a plurality of said portable computer units.** Mault at [Claim 28]

’868 Patent	Mault
	One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Mault, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Mault, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
Claim 8	
8. The diagnostic system of claim 7, wherein the light source comprises a plurality of semiconductor diodes that are further coupled to a multiplexer capable of combining the plurality of semiconductor diodes and generating the input light beam comprising one or more wavelengths.	*See* claim 7 above. Mault discloses or renders obvious the light source comprises a plurality of semiconductor diodes that are further coupled to a multiplexer capable of combining the plurality of semiconductor diodes and generating the input light beam comprising one or more wavelengths. **The person carries a portable computing device, such as a PDA, which receives blood glucose levels from a blood glucose sensor. The blood glucose sensor may be a device clipped on to the earlobe of the person, using at least one semiconductor laser or light emitting diode to emit wavelengths in the near-IR.** These wavelengths are transmitted through or reflected by blood-containing tissue, and then detected by a near-IR detector. A number of emissive devices may be used, or electrical modulation of a single device may be used to obtain multiple wavelength emission. For example, two wavelengths may be chosen, one absorbed and one not absorbed by blood glucose, the absorption ratio then being used to compute the blood glucose level of the person. Other blood glucose sensors are known in the art, and improved sensor systems are discussed below. The blood glucose data can be transmitted from the sensor to the PDA using the Bluetooth wireless protocol. Mault at [0020] Sensor **12** can be carried by the person and provides blood glucose measurements at intervals. For example, sensor **12** can uses ion flow to draw glucose molecules out of the blood into a gel disk containing the enzyme glucose oxidase, generating hydrogen peroxide, which is detected and a numerical value displayed. This technique is used by GlucoWatch developed by Cygnus (Redwood City, Calif.). The sensor can then transmit the numerical value of blood glucose to the PDA **10**, for example using a wireless method. **Alternatively, sensor 12 may use spectroscopic detection of a**

’868 Patent	Mault
	glucose oxidase reaction. Sensor 12 may also use in-vivo spectroscopy techniques to measure blood glucose, for example as described in U.S. Pat. Nos. 6,067,463 (Jeng), 6,049,727 (Crothal), 5,660,163 (Schulman), and others. For example, IR absorption or reflection properties of skin or tissues may be determined, for example using a finger, toe, wrist, skin membrane, earlobe, nose, cheek, retina, or other body part. A blood analysis sensor may be built in to a module which plugs in to the PDA. **For example, using a non-invasive spectroscopic technique, the PDA/module combination may be placed against part of the body to obtain a blood glucose reading.** The sensor may also be placed under the skin, with wireless communication, such as using the Bluetooth protocol, to the PDA. The sensor may be powered by internal batteries, by light using a photoelectric effect, by temperature gradients using a thermoelectric effect, by radiation (e.g. from AM radio stations, electric mains, or radiated by the PDA or other portable device), and may be either continuously powered or only powered at times a reading is required. The sensor may record data to a memory card which plugs into the PDA. Mault at [0073]  Figure 2 Mault at Fig.2 FIG. 2 shows **a system embodiment, comprising portable computing device 30** having a display 32, data entry mechanism 34, and wireless transceiver 36; a wrist-mounted glucose sensor 38 having a strap 40; activity monitor 42 supported by the person's body using belt 44; insulin storage and dispensing device 46 comprising a subcutaneous needle 50 and delivery system 48 such as a pump. The portable

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	computing device 30 is in linked to a communications network 52, allowing communication a remote computer system 54, which may be located at the person's home, doctor's office, or other remote location. A remote server system 56 is also accessible through the communications network 52, and can be used to store a database of physiological parameters, activity, and diet relating to the person, for medical, nutritional, or computer expert system analysis. The wrist mounted sensor 40 and activity monitor 42 can transmit data to the portable computing device 30 through a wireless method. The device 30 can be carried in a pocket of the person's clothes, or on a belt clip, or other convenient method. Mault at [0079]  Figure 5 Mault at Fig. 5 FIG. 5 shows a microneedle 72 with a hollow center 78 in fluid communication with fluorescent matrix 94. Matrix 94, for example **a fluorophore doped polymer or sol-gel, is excited by light emitting diode 90**. **Photodetector 96 detects fluorescent radiation from a sensing region of the matrix, which is affected by the presence of analyte in the interstitial fluid drawn from the skin**. Mault at [0085] Excitation radiation, for example from a light emitting diode, may be passed along the hollow center of a microneedle. A fluorescent matrix may be supported by the end of the microneedle, or line the wall

’868 Patent	Mault
	surface of a microneedle, so as to be in contact with interstitial fluid, allowing fluorescent detection of analytes in the fluid. Mault at [0087] Analytical techniques which may be used to measure glucose concentrations in blood, interstitial fluid, urine, or other body fluids and tissues include: techniques based on the glucose oxidase reaction; other enzymatic reactions; IR (particularly near-IR), Raman, and optical-UV spectroscopy; fluorescence; colorimetry; attenuated total reflection, for example from a surface adapted to bind glucose; micromechanical methods such as detecting changes in resonance frequencies on analyte absorption, or having surfaces adapted to bind glucose with other detection methods; optical rotation and ORD; refractometry; fiber sensing; laser absorption; enzymatic methods such as using the glucose oxidase reaction; biochemical effect detection; or other appropriate techniques. Fluid samples may be removed from the body, or analyzed within the body. Mault at [0090] <u>Jeng (U.S. Pat. No. 6,067,463)</u> Mault incorporates Jeng by reference. Mault at [0011] (“The contents of U.S. Patents and published Patent Applications mentioned herein, are incorporated herein by reference.”), [0073] (Sensor 12 may also use in-vivo spectroscopy techniques to measure blood glucose, for example as described in U.S. Pat. Nos. 6,067,463 (Jeng) . . . .”). Jeng discloses or renders obvious a diagnostic system comprises a light source as shown in Exhibit A2, which is incorporated by reference as if fully stated herein. One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Mault, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Mault, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
Claim 9	

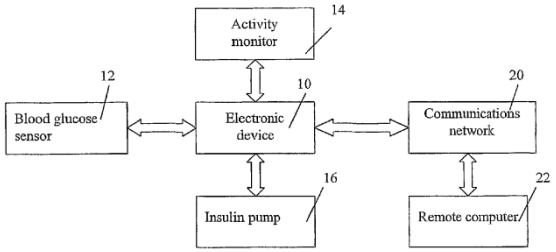
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

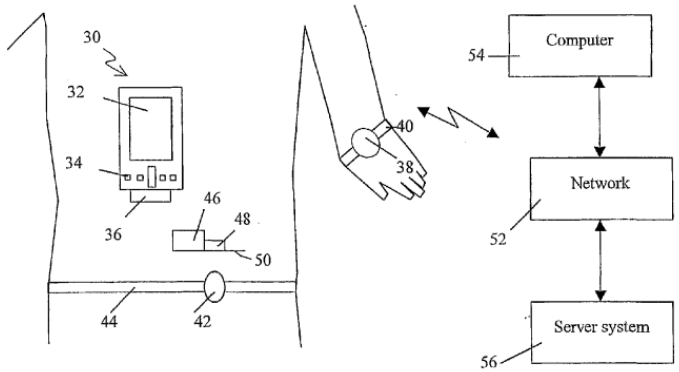
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9. The diagnostic system of claim 7, wherein at least the portion of the input light beam is adapted for use in a diagnostics to measure a property of the blood, wherein the diagnostics comprise a spectroscopic procedure, wherein the spectroscopic procedure is based at least in part on a comparison of amplitudes at a plurality of associated wavelengths transmitted or reflected from the blood.	*See* claim 7 above. Mault discloses or renders obvious the portion of the input light beam is adapted for use in a diagnostics to measure a property of the blood, wherein the diagnostics comprise a spectroscopic procedure, wherein the spectroscopic procedure is based at least in part on a comparison of amplitudes at a plurality of associated wavelengths transmitted or reflected from the blood. A system for assisting a person to maintain a blood glucose level between predetermined limits comprises: an electronic device, comprising a display, a clock, a memory, and a processor; and a software program executable by the processor of the electronic device, adapted to receive nutritional data of food consumed by the person, adapted to calculate the blood glucose level for the person using the nutritional data and a glycemic response model for the person, and further adapted to present the blood glucose level to the person on the display of the electronic device. Mault at Abstract The person carries a portable computing device, such as a PDA, which receives blood glucose levels from a blood glucose sensor. **The blood glucose sensor may be a device clipped on to the earlobe of the person, using at least one semiconductor laser or light emitting diode to emit wavelengths in the near-IR. These wavelengths are transmitted through or reflected by blood-containing tissue, and then detected by a near-IR detector. A number of emissive devices may be used, or electrical modulation of a single device may be used to obtain multiple wavelength emission**. For example, **two wavelengths may be chosen, one absorbed and one not absorbed by blood glucose, the absorption ratio then being used to compute the blood glucose level of the person.** Other blood glucose sensors are known in the art, and improved sensor systems are discussed below. The blood glucose data can be transmitted from the sensor to the PDA using the Bluetooth wireless protocol. Mault at [0020] A method by which a person can control their blood glucose comprises: entering food consumption data into a software program, **the software program running on a computing device, the software program adapted to record food consumed and to calculate a glycemic response; viewing the calculated glycemic response on a display of the computing device; and performing an action in response to the calculated glycemic response, so as to maintain blood glucose within**

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Mault
	predetermined levels. The action may comprise the administration of insulin, the administration of glucagon; the performing of exercise, eating, or contacting a medical professional. Mault at [0038] A system for assisting a person to maintain a blood glucose level between predetermined limits comprises an electronic device, for example a portable computing device such as a PDA, comprising a display, a clock, a memory, and a processor; and **a software program executable by the processor of the electronic device, adapted to receive nutritional data of food consumed by the person, to calculate the blood glucose level for the person using the nutritional data and a glycemic response model for the person, and further adapted to present the blood glucose level to the person on the display of the electronic device.** The program can receive diet log data from the person, for example food identities, then correlate the food identities with nutritional data using a database. The software program can be further adapted to receive time data related to the time of consumption of food (including beverages, nutraceuticals, and other consumables) by the person, and to receive data relating to planned consumption of food. **Blood glucose levels can be calculated for a plurality of times, and presented as a table or graph.** Mault at [0042] Embodiments of this invention provide a person with improved control over their blood glucose levels. This improved control is important in diabetes management, and can also be combined with a weight control program by providing a software program combining glycemic response modeling with diet logging functionalities. **A glycemic response model for a person, which is used to predict changes in blood glucose level based on the recording of foods consumed, or foods planned to be consumed, can be modified for improved accuracy by comparison with actual measurements of blood glucose.** Further, **the glycemic response model for a person can be determined by relating blood glucose measurements** with diet log records, in terms of food consumed and time of meals, in a closed loop system by which the model can be constantly improved based on new comparisons of projected and actual blood glucose levels. Mault at [0066]

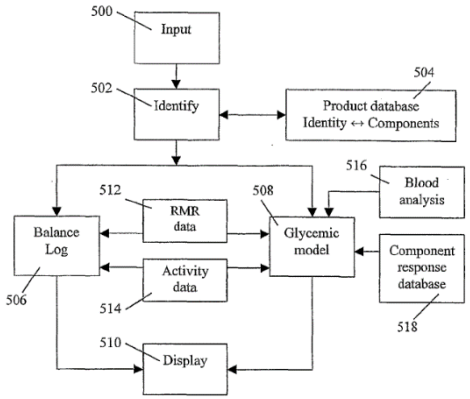
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’868 Patent	Mault
	 Figure 1 Mault at Fig.1 **FIG. 1 shows a schematic of a system embodiment comprising an electronic device 10, a blood glucose sensor 12, a physical activity monitor 14**, an insulin pump 16, **a communications network 20, and a remote computer system 22**. Mault at [0069] Electronic device **10** can be carried by the person, for example a portable computer, personal digital assistant (PDA), wireless phone with computational functionality, visor-mounted device, or other device. The electronic device **10** can be a PDA such as a Palm Pilot. The electronic device can be a portable electronic device or system carried by the person, or a device or system combining multiple functionalities, such as: a personal digital assistant (PDA); an electronic book (e-book); a portable computer; any portable Internet access device; a wireless phone; a wristwatch, adapted to record data, for example to monitor physiological properties, or act as a diet log (it may also act as a wireless internet access device, or be otherwise adapted); a headset, providing for example visual and audio communication to the person, and recording audio and/or visual information; a body mounted activity monitor (for example pedometer) adapted to record data; any portable electronic device with data logging capabilities, for example an electronic organizer; or some combination of the above or other devices. Mault at [0070] Sensor 12 can be carried by the person and provides blood glucose measurements at intervals. For example, sensor 12 can uses ion flow to draw glucose molecules out of the blood into a gel disk containing the enzyme glucose oxidase, generating hydrogen peroxide, which is detected and a

’868 Patent	Mault
	numerical value displayed. This technique is used by GlucoWatch developed by Cygnus (Redwood City, Calif.). The sensor can then transmit the numerical value of blood glucose to the PDA 10, for example using a wireless method. Alternatively, sensor 12 may use spectroscopic detection of a glucose oxidase reaction. **Sensor 12 may also use in-vivo spectroscopy techniques to measure blood glucose, for example as described in U.S. Pat. Nos. 6,067,463 (Jeng), 6,049,727 (Crothal), 5,660,163 (Schulman), and others. For example, IR absorption or reflection properties of skin or tissues may be determined, for example using a finger, toe, wrist, skin membrane, earlobe, nose, cheek, retina, or other body part.** A blood analysis sensor may be built in to a module which plugs in to the PDA. For example, using a non-invasive spectroscopic technique, the PDA/module combination may be placed against part of the body to obtain a blood glucose reading. The sensor may also be placed under the skin, with wireless communication, such as using the Bluetooth protocol, to the PDA. The sensor may be powered by internal batteries, by light using a photoelectric effect, by temperature gradients using a thermoelectric effect, by radiation (e.g. from AM radio stations, electric mains, or radiated by the PDA or other portable device), and may be either continuously powered or only powered at times a reading is required. The sensor may record data to a memory card which plugs into the PDA. Mault at [0073]  Figure 2 Mault at Fig.2 FIG. 2 shows a system embodiment, comprising portable computing device **30** having a display **32**, data entry mechanism **34**, and wireless transceiver **36**; a wrist-mounted glucose sensor **38** having a strap **40**; activity monitor **42** supported by the person's body using belt **44**; insulin

’868 Patent	Mault
	storage and dispensing device **46** comprising a subcutaneous needle **50** and delivery system **48** such as a pump. The portable computing device **30** is in linked to a communications network **52**, allowing communication a remote computer system **54**, which may be located at the person's home, doctor's office, or other remote location. A remote server system **56** is also accessible through the communications network **52**, and can be used to store a database of physiological parameters, activity, and diet relating to the person, for medical, nutritional, or computer expert system analysis. The wrist mounted sensor **40** and activity monitor **42** can transmit data to the portable computing device **30** through a wireless method. The device **30** can be carried in a pocket of the person's clothes, or on a belt clip, or other convenient method. Mault at [0079] **Analytical techniques which may be used to measure glucose concentrations in blood**, interstitial fluid, urine, or **other body fluids and tissues include: techniques based on the glucose oxidase reaction; other enzymatic reactions; IR (particularly near-IR), Raman, and optical-UV spectroscopy; fluorescence; colorimetry; attenuated total reflection, for example from a surface adapted to bind glucose; micromechanical methods such as detecting changes in resonance frequencies on analyte absorption, or having surfaces adapted to bind glucose with other detection methods; optical rotation and ORD; refractometry; fiber sensing; laser absorption**; enzymatic methods such as using the glucose oxidase reaction; biochemical effect detection; or other appropriate techniques. Fluid samples may be removed from the body, or analyzed within the body. Mault at [0090] FIG. 7B shows a schematic of a possible embodiment of a system blood glucose monitoring system, an analysis module **164** comprising a blood glucose sensor **140** providing an electrical glucose signal correlated with blood glucose levels, an analog-to-digital converter **142** providing a digital representation of the glucose signal, and a wireless transmitter **144** transmitting the digital representation of the glucose signal to other devices in communication with the analysis module. A portable computing device **166** which can communicate with the analysis module comprises a wireless receiver **146**, a data buffer **148**, a processor **150**, a memory **152**, a memory module (e.g. memory card) interface **154**, a clock **156**, a display **158**, and a bus **162**. Mault at [0093]

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Mault
	In one embodiment, interstitial fluid is drawn out of the dermis of the skin into an analysis means. Fluid can be drawn out of the skin through one or more inlet microneedles, and returned to the dermis through one or more outlet microneedles, so as to provide a flow of interstitial fluid through the module. The fluid can flow through an array of microspheres, such as silica or polymer microspheres, the surfaces of which have a molecular species which fluoresces in the presence of glucose. Alternatively, **the fluid may flow through a capillary or microcapillary having an inside surface lined with a fluorescence film sensitive to the concentration of glucose in the fluid. The fluorescence is detected as a measure of glucose concentration, using a detector and excitation radiation source (which can be located within the housing) possibly in comparison with a reference region not exposed to interstitial fluid flow. IR radiation may also be waveguided along capillaries, or scattered by microspheres, so as to spectroscopically detect glucose**. In other embodiments, the analysis module uses the detection methods developed by Cygnus for the GlucoWatch, as discussed above. The module may alternatively draw blood or lymph fluid into the housing for analysis, for example using a micromechanical pump. **The analysis module may alternatively perform non-invasive analysis of blood glucose, for example by clipping to an ear lobe or other skin flap and transmitting near-IR radiation through the skin flap**. **An analysis module with a fluorescence sensing region may be optically accessed by an external device having an excitation radiation source and a fluorescence detector, for example a fluorescence sensor can be contained within a transparent housing and embedded in the skin**. Mault at [0094]  Figure 19

’868 Patent	Mault
	Mault at Fig. 19 FIG. 19 shows a flowchart representing **a software program running on a computing device.** Box 500 represents the person entering food consumed, using any appropriate method. Box 502 represents the software program providing a food identification, for example by correlating an entered code with food identification and data. Box 504 corresponds to food identification being provided to a database 504, with corresponding nutritional data being extracted from the database. Box 506 corresponds to some part of the nutritional data, for example caloric data, being passed to a balance log calculator which calculates the calorie balance of the person from food consumed, activity levels, and metabolic rate. Box 512 corresponds to providing RMR data, for example as determined using an indirect calorimeter. Box 514 corresponds to providing activity data, for example from an activity monitor. Box 510 corresponds to displaying calorie balance and projected blood glucose levels on display 510. **Box 508 corresponds to determining blood glucose levels for the person, using nutritional data, activity levels, metabolic rate, blood analysis data, and blood glucose response parameters corresponding to nutritional data provided by a component response database. Box 518 corresponds to providing blood glucose response parameters from a database, corresponding to nutritional data received. Box 516 corresponds to performing a blood test at intervals, and providing the data to a glycemic response algorithm.** Mault at [0187] Further, **foods and food components can be identified by other techniques, such as: spectroscopy or spectroscopic imaging (for example imaging over IR-visible-UV spectral ranges), which may also assist image recognition software to identify foods (foods may contain spectroscopic markers to aid identification);** using electronic nose technology, using for example olfactory sensors in the PDA; using the physiological response to food, for example by monitoring the change in blood glucose, triglycerides, or other blood components, or using other physiological responses to eating; and combustion or vaporization (for example laser vaporization) of food samples, followed by vapor, condensate, or residue analysis; calorimetry of food for example using a microchamber. Mault at [0195] Jeng (U.S. Pat. No. 6,067,463)

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Mault
	Mault incorporates Jeng by reference. Mault at [0011] (“The contents of U.S. Patents and published Patent Applications mentioned herein, are incorporated herein by reference.”), [0073] (Sensor 12 may also use in-vivo spectroscopy techniques to measure blood glucose, for example as described in U.S. Pat. Nos. 6,067,463 (Jeng) . . . .”). Jeng discloses or renders obvious a diagnostic system comprises a light source as shown in Exhibit A2, which is incorporated by reference as if fully stated herein. One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Mault, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Mault, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

EXHIBIT A2

U.S. Pat. No. 9,055,868 in view of U.S. Patent No. 6,067,463 to Tzyy-Wen Jeng ("Jeng")

As described in detail below, Jeng (individually or collectively) anticipates and/or renders obvious claim 7-9 ("Asserted Claims") of U.S. Patent No. 9,055,868 B2 (the "'868 Patent") under 35 U.S.C. §102 and/or §103, either alone in combination with the knowledge of a person of ordinary skill, and/or additional prior art references discussed in discussed in Exhibits A1-A10, the contents of which are hereby incorporated by reference into this chart. One of ordinary skill in the art, as of the priority date of the '868 Patent, would have known to combine the prior art elements disclosed by the foregoing references using known methods, and to use these elements according to their established functions in order to achieve a known and predictable result. This invalidity claim chart is based on Defendants' present understanding of the Asserted Claims and Plaintiff's apparent construction of the Asserted Claims in its Preliminary Infringement Contentions ("Infringement Contentions").

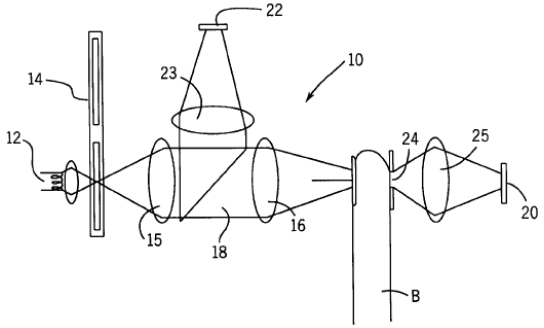
The following invalidity chart includes references to the structure, function, operation, and/or features of the technology described in Jeng. The cited portions of Jeng are merely illustrative, and Defendants reserve the right to rely on alternative or additional evidence, including uncited portions of Jeng. Where a particular figure is cited, the citation should be understood to encompass the caption and description of the figure as well as any text relating to or describing the figure. Conversely, where particular text referring to a figure is cited, the citation should be understood to include the figure as well. Although the documentation collectively evidences prior knowledge, use, or sale, Defendants reserve the right to rely upon individual documents as printed publications. Where the chart below states that Jeng "describes" or "provides for" a limitation, such disclosure may be express, inherent, or implicit. To the extent it is found Jeng does not expressly disclose certain limitations in the asserted claim, such limitations are inherent. Defendants reserve the right to present direct evidence of the structure, function, operation, and/or features of the technology described in Jeng (including product samples, source code, and/or witness testimony) and/or its prior art status, and to present alternative or additional documents concerning the same as evidence that the technology described in Jeng anticipates and/or renders obvious the Asserted Claims of the '868 Patent.

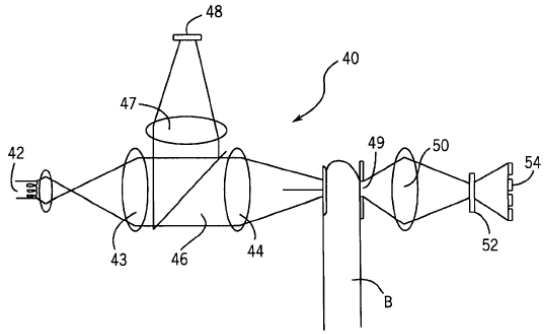
This chart is subject to all reservations, objections, and disclaimers in Defendants' Invalidity Contentions and any amendment, supplement, or modification thereof, which are incorporated herein by reference in their entirety. Nothing stated herein shall be treated as an admission or suggestion that Defendants agree with Plaintiff regarding the scope of the Asserted Claims, Plainitff's apparent claim constructions, or the accuracy of any particular claim construction. Defendants reserve all rights to challenge any of the claim terms herein under 35 U.S.C. § 112, including by arguing that they are indefinite, are not supported by the written description, and/or are not enabled. Defendants further reserve all rights to amend this invalidity claim chart without leave of court pursuant to the Court's Docket Control Order, or upon a showing of good cause.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

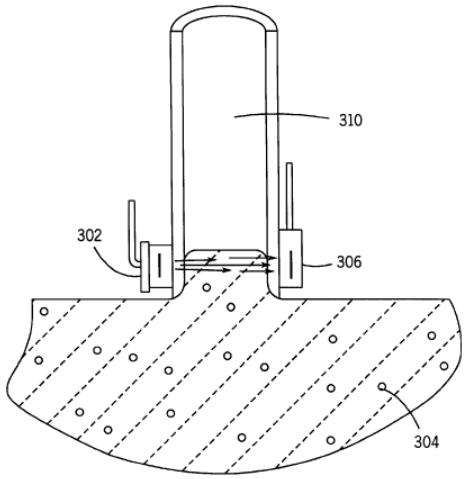
’868 Patent	Jeng
Claim 7	
7[pre]. A diagnostic system comprising:	By providing this disclosure, Defendants do not take a position on whether the preamble is limiting. Jeng discloses or renders obvious a diagnostic system. A method and apparatus for measuring the concentration of an analyte of interest, e.g. glucose, in blood non-invasively, i.e., without penetrating the skin or obtaining a biological sample from the body of a patient. Jeng at Abstract **This invention provides a method and apparatus for measuring the concentration of an analyte of interest, e.g. glucose, in blood non-invasively, i.e., without penetrating the skin or obtaining a biological sample from the body of a patient**. The method and apparatus uses a plurality of measurement channels with appropriate wavelengths of interest to control variations of signal and to separate the contribution of the analyte of interest from those of interfering compounds. The method and apparatus of this invention can also be adapted to allow a portion of a body part to be engorged with blood to bring about greater accuracy in optical measurements. Jeng at 4:28-39 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Jeng, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Jeng, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[a]. a light source comprising:	Jeng discloses or renders obvious a diagnostic system comprises a light source. Referring now to FIG. 1, a filter photometer unit 10 includes a source of light 12 having a band-pass filter set 14 and a lens system 15 for collimating light from the filter set 14 and a lens system 16 for focusing light onto a body part "B". The band-pass filter set 14 selects one desired wavelength at a time by rotating the set to place a given filter in the path of the beam. The rate of rotation should be sufficiently high (e.g., greater than 500 Hz) to achieve the concurrency requirement, i.e., observing with substantially the same optical arrangement at substantially the same time on substantially the same observation area

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Jeng
	of the body part. Before light reaches the body part, a beam splitter 18 separates the beam into two portions. The major portion is directed toward the body part and ultimately reaches a detector 20. The minor portion is directed toward a detector 22. The channel associated with this detector 22 can be used to monitor the stability of the source of light 12 and can be used to correct for light source drift if lamp intensity drift occurs. A lens system 23 is used to focus the light from the beam splitter onto the detector 22. Jeng at 6:11-30 The body part, e.g., a finger, earlobe, is positioned at the place where the beam from the source of light is focused. Light passing through the body part is transmitted through an aperture 24 and then through a lens system 25 to deliver light to the detector 20. The detector 20 is connected to a data amplification unit having a pre-amplifier (not shown) and an amplifier (not shown). Amplified readings are transferred through connecting cables to a computer. The computer controls the software operation for collecting data and storing measurement readings as a data file. The data amplification unit, the cable connecting the amplification unit to the control computer, the control computer itself, and the display device are not shown in this figure for the sake of clarity. Jeng at 6:31-44 FIG. 1  Jeng at Fig. 1 Another embodiment is shown in FIG. 2. Referring now to FIG. 2, a filter photometer unit 40 includes a source of light 42 and a lens system 43 for collimating light from the source of light 42 and a lens system 44 for focusing light onto a body part. Before light reaches the body part, a beam splitter 46, from whence that portion is transmitted to a detector 48, separates a portion of the source beam. The channel

’868 Patent	Jeng
	encompassed by this detector 48 can be used to monitor the stability of the source of light 42 and can be used to correct for light source drift if lamp intensity drift occurs. A lens system 47 is used to focus the light from the beam splitter onto the detector 48. Jeng at 6:45-56 The body part, e.g., a finger, earlobe, is positioned at the place where the beam from the source of light is focused. Light passing through the body part "B" is transmitted through an aperture 49 and then through a lens system 50 to deliver light to a dispersive element 52. A segment of the spectrum is delivered to a detection element of an array detector 54. The dispersive element, which separates broad band light into segments of different wavelengths, could be either a prism or a diffraction grating. Detector 48 and detector 54 are connected to a data amplification unit having a pre-amplifier (not shown) and an amplifier (not shown). Amplified readings are transferred through connecting cables to a computer. The computer controls the software operation for collecting data and storing measurement readings as a data file. Jeng at 6:57-7:4 FIG. 2  Jeng at Fig. 2 FIGS. 5A, 5B, and 5C illustrate a photometer unit 300 that has the capability of increasing the local supply of blood to a body part. This photometer unit is small enough to be held in the hand of a person. The photometer unit 300 includes a plurality of light sources 302 of selected wavelengths. The light sources are either laser diodes or light emitting diodes. The light sources emit light of discrete wavelengths sequentially to impinge on a body part 304. The rate of the emitting sequence should be

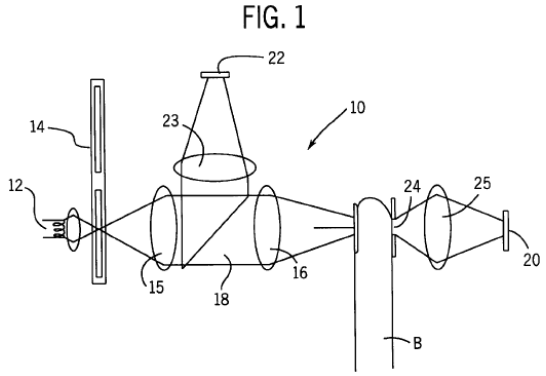
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Jeng
	sufficiently high (e.g., greater than 500 Hz) to achieve the concurrency requirement, i.e., observing with substantially the same optical arrangement at substantially the same time on substantially the same position on the body part. The light reaches the detector 306 at the side of the body part opposite to that of the light source. A vacuum pump 308 generates and maintains a low vacuum on the body part to draw blood-engorged skin and tissue into an observation area defined by hollow tubing 310. A lever 312 driven by motor 314 is used to adjust the distance between the light source and the detector, i.e. path-length, for optimal reading on the detector. The power source 316, the controlling electronic 318, and the processor units 320 are shown as an example of one of the many possible ways of implementing the electronics. The results after the data is processed are shown in the display 322 for blood glucose concentration. The switch 324 is used for switching the instrument on and off. The optical arrangement can be of the type illustrated in FIG. 1 and FIG. 2. Jeng at 15:1-27  FIG. 5C Jeng at Fig. 5C One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are

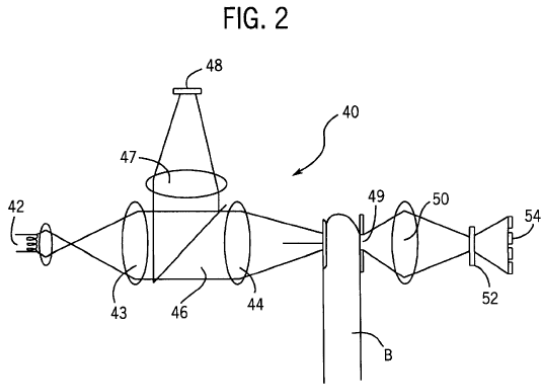
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Jeng
	incorporated by reference into this chart. To the extent this limitation is not disclosed by Jeng, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Jeng, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[b]. one or more semiconductor diodes generating an input light beam; and	Jeng discloses or renders obvious the light source comprises one or more semiconductor diodes generating an input light beam. Referring now to FIG. 1, a filter photometer unit 10 includes a source of light 12 having a band-pass filter set 14 and a lens system 15 for collimating light from the filter set 14 and a lens system 16 for focusing light onto a body part "B". The band-pass filter set 14 selects one desired wavelength at a time by rotating the set to place a given filter in the path of the beam. The rate of rotation should be sufficiently high (e.g., greater than 500 Hz) to achieve the concurrency requirement, i.e., observing with substantially the same optical arrangement at substantially the same time on substantially the same observation area of the body part. Before light reaches the body part, a beam splitter 18 separates the beam into two portions. The major portion is directed toward the body part and ultimately reaches a detector 20. The minor portion is directed toward a detector 22. The channel associated with this detector 22 can be used to monitor the stability of the source of light 12 and can be used to correct for light source drift if lamp intensity drift occurs. A lens system 23 is used to focus the light from the beam splitter onto the detector 22. Jeng at 6:11-30 The body part, e.g., a finger, earlobe, is positioned at the place where the beam from the source of light is focused. Light passing through the body part is transmitted through an aperture 24 and then through a lens system 25 to deliver light to the detector 20. The detector 20 is connected to a data amplification unit having a pre-amplifier (not shown) and an amplifier (not shown). Amplified readings are transferred through connecting cables to a computer. The computer controls the software operation for collecting data and storing measurement readings as a data file. The data amplification unit, the cable connecting the amplification unit to the control computer, the control computer itself, and the display device are not shown in this figure for the sake of clarity. Jeng at 6:31-44

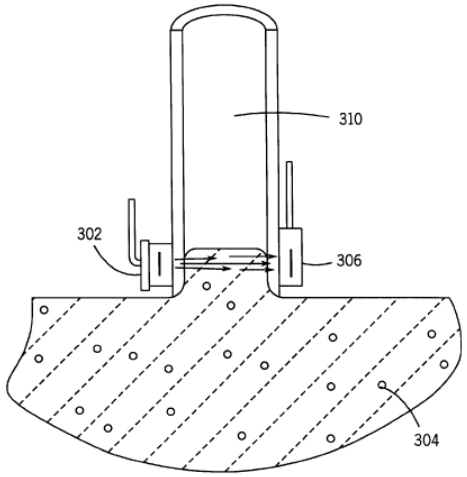
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Jeng
	 Jeng at Fig. 1 Another embodiment is shown in FIG. 2. Referring now to FIG. 2, a filter photometer unit 40 includes a source of light 42 and a lens system 43 for collimating light from the source of light 42 and a lens system 44 for focusing light onto a body part. Before light reaches the body part, a beam splitter 46, from whence that portion is transmitted to a detector 48, separates a portion of the source beam. The channel encompassed by this detector 48 can be used to monitor the stability of the source of light 42 and can be used to correct for light source drift if lamp intensity drift occurs. A lens system 47 is used to focus the light from the beam splitter onto the detector 48. Jeng at 6:45-56 The body part, e.g., a finger, earlobe, is positioned at the place where the beam from the source of light is focused. Light passing through the body part "B" is transmitted through an aperture 49 and then through a lens system 50 to deliver light to a dispersive element 52. A segment of the spectrum is delivered to a detection element of an array detector 54. The dispersive element, which separates broad band light into segments of different wavelengths, could be either a prism or a diffraction grating. Detector 48 and detector 54 are connected to a data amplification unit having a pre-amplifier (not shown) and an amplifier (not shown). Amplified readings are transferred through connecting cables to a computer. The computer controls the software operation for collecting data and storing measurement readings as a data file. Jeng at 6:57-7:4

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Jeng
	 Jeng at Fig. 2 FIGS. 5A, 5B, and 5C illustrate a photometer unit 300 that has the capability of increasing the local supply of blood to a body part. This photometer unit is small enough to be held in the hand of a person. The photometer unit 300 includes a plurality of light sources 302 of selected wavelengths. The light sources are either laser diodes or light emitting diodes. The light sources emit light of discrete wavelengths sequentially to impinge on a body part 304. The rate of the emitting sequence should be sufficiently high (e.g., greater than 500 Hz) to achieve the concurrency requirement, i.e., observing with substantially the same optical arrangement at substantially the same time on substantially the same position on the body part. The light reaches the detector 306 at the side of the body part opposite to that of the light source. A vacuum pump 308 generates and maintains a low vacuum on the body part to draw blood-engorged skin and tissue into an observation area defined by hollow tubing 310. A lever 312 driven by motor 314 is used to adjust the distance between the light source and the detector, i.e. path-length, for optimal reading on the detector. The power source 316, the controlling electronic 318, and the processor units 320 are shown as an example of one of the many possible ways of implementing the electronics. The results after the data is processed are shown in the display 322 for blood glucose concentration. The switch 324 is used for switching the instrument on and off. The optical arrangement can be of the type illustrated in FIG. 1 and FIG. 2. Jeng at 15:1-27

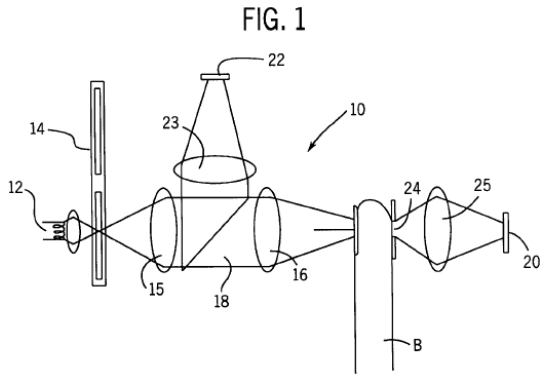
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Jeng
	 FIG. 5C Jeng at Fig. 5C One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Jeng, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Jeng, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[c]. a lens system configured to receive at least a portion of the input light beam and to communicate at least the portion of the input light beam onto a part of a user's body comprising blood	Jeng discloses or renders obvious the light source comprises a lens system configured to receive at least a portion of the input light beam and to communicate at least the portion of the input light beam onto a part of a user's body comprising blood. **A method and apparatus for measuring the concentration of an analyte of interest, e.g. glucose, in blood non-invasively**, i.e., without penetrating the skin or obtaining a biological sample from the body of a patient. Jeng at Abstract

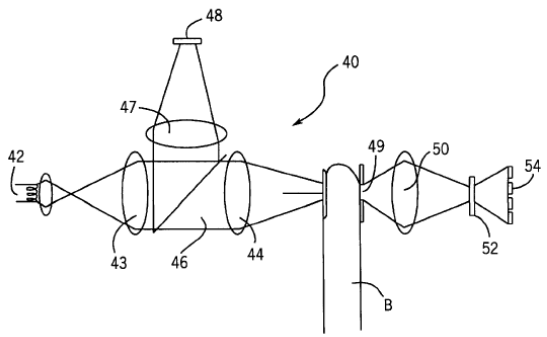
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Jeng
	This invention provides a method and apparatus for measuring the concentration of an analyte of interest, e.g. glucose, in blood non-invasively, i.e., without penetrating the skin or obtaining a biological sample from the body of a patient. The method and apparatus uses a plurality of measurement channels with appropriate wavelengths of interest to control variations of signal and to separate the contribution of the analyte of interest from those of interfering compounds. The method and apparatus of this invention can also be adapted to allow a portion of a body part to be engorged with blood to bring about greater accuracy in optical measurements. Jeng at 4:28-39 Referring now to FIG. 1, a filter photometer unit 10 includes a source of light 12 having a band-pass filter set 14 and a lens system 15 for collimating light from the filter set 14 and a lens system 16 for focusing light onto a body part "B". The band-pass filter set 14 selects one desired wavelength at a time by rotating the set to place a given filter in the path of the beam. The rate of rotation should be sufficiently high (e.g., greater than 500 Hz) to achieve the concurrency requirement, i.e., observing with substantially the same optical arrangement at substantially the same time on substantially the same observation area of the body part. Before light reaches the body part, a beam splitter 18 separates the beam into two portions. The major portion is directed toward the body part and ultimately reaches a detector 20. The minor portion is directed toward a detector 22. The channel associated with this detector 22 can be used to monitor the stability of the source of light 12 and can be used to correct for light source drift if lamp intensity drift occurs. A lens system 23 is used to focus the light from the beam splitter onto the detector 22. Jeng at 6:11-30 The body part, e.g., a finger, earlobe, is positioned at the place where the beam from the source of light is focused. Light passing through the body part is transmitted through an aperture 24 and then through a lens system 25 to deliver light to the detector 20. The detector 20 is connected to a data amplification unit having a pre-amplifier (not shown) and an amplifier (not shown). Amplified readings are transferred through connecting cables to a computer. The computer controls the software operation for collecting data and storing measurement readings as a data file. The data amplification unit, the cable connecting the amplification unit to the control computer, the control computer itself, and the display device are not shown in this figure for the sake of clarity. Jeng at 6:31-44

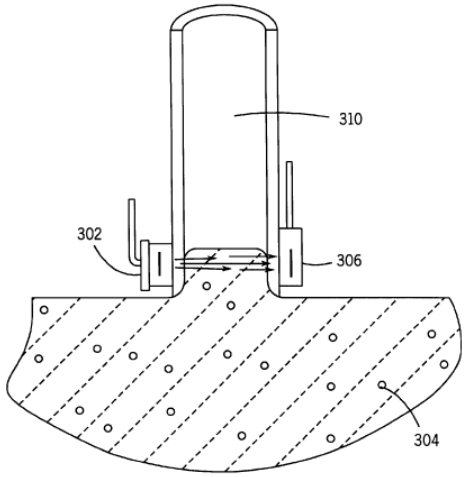
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Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

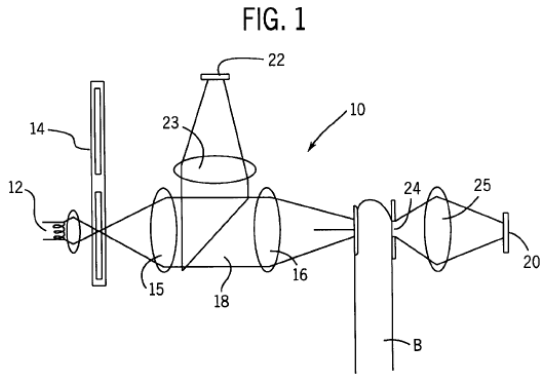
’868 Patent	Jeng
	 Jeng at Fig. 1 Another embodiment is shown in FIG. 2. Referring now to FIG. 2, a filter photometer unit 40 includes a source of light 42 and a lens system 43 for collimating light from the source of light 42 and a lens system 44 for focusing light onto a body part. Before light reaches the body part, a beam splitter 46, from whence that portion is transmitted to a detector 48, separates a portion of the source beam. The channel encompassed by this detector 48 can be used to monitor the stability of the source of light 42 and can be used to correct for light source drift if lamp intensity drift occurs. A lens system 47 is used to focus the light from the beam splitter onto the detector 48. Jeng at 6:45-56 The body part, e.g., a finger, earlobe, is positioned at the place where the beam from the source of light is focused. Light passing through the body part "B" is transmitted through an aperture 49 and then through a lens system 50 to deliver light to a dispersive element 52. A segment of the spectrum is delivered to a detection element of an array detector 54. The dispersive element, which separates broad band light into segments of different wavelengths, could be either a prism or a diffraction grating. Detector 48 and detector 54 are connected to a data amplification unit having a pre-amplifier (not shown) and an amplifier (not shown). Amplified readings are transferred through connecting cables to a computer. The computer controls the software operation for collecting data and storing measurement readings as a data file. Jeng at 6:57-7:4

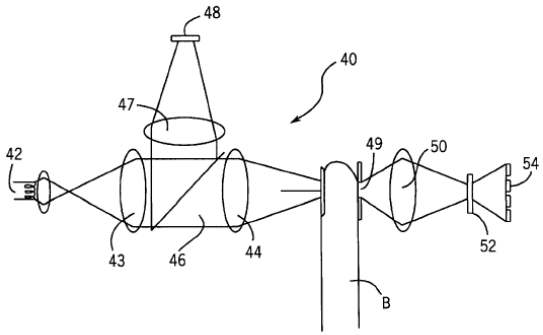
Omni MedSci Ex. 2002
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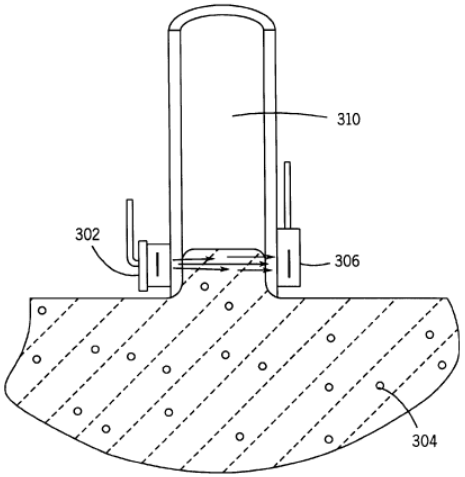
’868 Patent	Jeng
	FIG. 2  Jeng at Fig. 2 FIGS. 5A, 5B, and 5C illustrate a photometer unit 300 that has the capability of increasing the local supply of blood to a body part. This photometer unit is small enough to be held in the hand of a person. The photometer unit 300 includes a plurality of light sources 302 of selected wavelengths. The light sources are either laser diodes or light emitting diodes. The light sources emit light of discrete wavelengths sequentially to impinge on a body part 304. The rate of the emitting sequence should be sufficiently high (e.g., greater than 500 Hz) to achieve the concurrency requirement, i.e., observing with substantially the same optical arrangement at substantially the same time on substantially the same position on the body part. The light reaches the detector 306 at the side of the body part opposite to that of the light source. A vacuum pump 308 generates and maintains a low vacuum on the body part to draw blood-engorged skin and tissue into an observation area defined by hollow tubing 310. A lever 312 driven by motor 314 is used to adjust the distance between the light source and the detector, i.e. path-length, for optimal reading on the detector. The power source 316, the controlling electronic 318, and the processor units 320 are shown as an example of one of the many possible ways of implementing the electronics. The results after the data is processed are shown in the display 322 for blood glucose concentration. The switch 324 is used for switching the instrument on and off. The optical arrangement can be of the type illustrated in FIG. 1 and FIG. 2. Jeng at 15:1-27

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Jeng
	 FIG. 5C Jeng at Fig. 5C One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Jeng, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Jeng, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[d]. wherein at least the portion of the input light beam is used in a measurement on a user;	Jeng discloses or renders obvious the portion of the input light beam is used in a measurement on a user. Referring now to FIG. 1, a filter photometer unit 10 includes a source of light 12 having a band-pass filter set 14 and a lens system 15 for collimating light from the filter set 14 and a lens system 16 for focusing light onto a body part "B". The band-pass filter set 14 selects one desired wavelength at a time by rotating the set to place a given filter in the path of the beam. The rate of rotation should be sufficiently high (e.g., greater than 500 Hz) to achieve the concurrency requirement, i.e., observing with substantially the same optical arrangement at substantially the same time on substantially the same observation area of the body part. Before light reaches the body part, a beam splitter 18

’868 Patent	Jeng
	separates the beam into two portions. The major portion is directed toward the body part and ultimately reaches a detector 20. The minor portion is directed toward a detector 22. The channel associated with this detector 22 can be used to monitor the stability of the source of light 12 and can be used to correct for light source drift if lamp intensity drift occurs. A lens system 23 is used to focus the light from the beam splitter onto the detector 22. Jeng at 6:11-30 The body part, e.g., a finger, earlobe, is positioned at the place where the beam from the source of light is focused. Light passing through the body part is transmitted through an aperture 24 and then through a lens system 25 to deliver light to the detector 20. The detector 20 is connected to a data amplification unit having a pre-amplifier (not shown) and an amplifier (not shown). Amplified readings are transferred through connecting cables to a computer. The computer controls the software operation for collecting data and storing measurement readings as a data file. The data amplification unit, the cable connecting the amplification unit to the control computer, the control computer itself, and the display device are not shown in this figure for the sake of clarity. Jeng at 6:31-44  Jeng at Fig. 1 Another embodiment is shown in FIG. 2. Referring now to FIG. 2, a filter photometer unit 40 includes a source of light 42 and a lens system 43 for collimating light from the source of light 42 and a lens

’868 Patent	Jeng
	system 44 for focusing light onto a body part. Before light reaches the body part, a beam splitter 46, from whence that portion is transmitted to a detector 48, separates a portion of the source beam. The channel encompassed by this detector 48 can be used to monitor the stability of the source of light 42 and can be used to correct for light source drift if lamp intensity drift occurs. A lens system 47 is used to focus the light from the beam splitter onto the detector 48. Jeng at 6:45-56 The body part, e.g., a finger, earlobe, is positioned at the place where the beam from the source of light is focused. Light passing through the body part "B" is transmitted through an aperture 49 and then through a lens system 50 to deliver light to a dispersive element 52. A segment of the spectrum is delivered to a detection element of an array detector 54. The dispersive element, which separates broad band light into segments of different wavelengths, could be either a prism or a diffraction grating. Detector 48 and detector 54 are connected to a data amplification unit having a pre-amplifier (not shown) and an amplifier (not shown). Amplified readings are transferred through connecting cables to a computer. The computer controls the software operation for collecting data and storing measurement readings as a data file. Jeng at 6:57-7:4 FIG. 2  Jeng at Fig. 2

’868 Patent	Jeng
	FIGS. 5A, 5B, and 5C illustrate a photometer unit 300 that has the capability of increasing the local supply of blood to a body part. This photometer unit is small enough to be held in the hand of a person. The photometer unit 300 includes a plurality of light sources 302 of selected wavelengths. The light sources are either laser diodes or light emitting diodes. The light sources emit light of discrete wavelengths sequentially to impinge on a body part 304. The rate of the emitting sequence should be sufficiently high (e.g., greater than 500 Hz) to achieve the concurrency requirement, i.e., observing with substantially the same optical arrangement at substantially the same time on substantially the same position on the body part. The light reaches the detector 306 at the side of the body part opposite to that of the light source. A vacuum pump 308 generates and maintains a low vacuum on the body part to draw blood-engorged skin and tissue into an observation area defined by hollow tubing 310. A lever 312 driven by motor 314 is used to adjust the distance between the light source and the detector, i.e. path-length, for optimal reading on the detector. The power source 316, the controlling electronic 318, and the processor units 320 are shown as an example of one of the many possible ways of implementing the electronics. The results after the data is processed are shown in the display 322 for blood glucose concentration. The switch 324 is used for switching the instrument on and off. The optical arrangement can be of the type illustrated in FIG. 1 and FIG. 2. Jeng at 15:1-27  FIG. 5C

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Jeng
	Jeng at Fig. 5C One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Jeng, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Jeng, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[e]. a software application capable of generating data based at least in part on the measurement on the user,	Jeng discloses or renders obvious a software application capable of generating data based at least in part on the measurement on the user. The body part, e.g., a finger, earlobe, is positioned at the place where the beam from the source of light is focused. Light passing through the body part is transmitted through an aperture 24 and then through a lens system 25 to deliver light to the detector 20. **The detector 20 is connected to a data amplification unit having a pre-amplifier (not shown) and an amplifier (not shown). Amplified readings are transferred through connecting cables to a computer. The computer controls the software operation for collecting data and storing measurement readings as a data file. The data amplification unit, the cable connecting the amplification unit to the control computer, the control computer itself, and the display device are not shown in this figure for the sake of clarity**. Jeng at 6:31-44 The body part, e.g., a finger, earlobe, is positioned at the place where the beam from the source of light is focused. Light passing through the body part "B" is transmitted through an aperture 49 and then through a lens system 50 to deliver light to a dispersive element 52. A segment of the spectrum is delivered to a detection element of an array detector 54. The dispersive element, which separates broad band light into segments of different wavelengths, could be either a prism or a diffraction grating. Detector 48 and detector 54 are connected to a data amplification unit having a pre-amplifier (not shown) and an amplifier (not shown). **Amplified readings are transferred through connecting**

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Jeng
	cables to a computer. The computer controls the software operation for collecting data and storing measurement readings as a data file. Jeng at 6:57-7:4 This invention, which is characterized by a plurality of channels, reduces the variation in data, thereby improving the reproducibility of data. Variations arising from bodily changes and body-instrument interface changes are shared in a plurality of channels substantially simultaneously. Due to the concurrency of this optical system, the measurements made in each of the channels are related to those made in the other channels with respect to using substantially the same optical system to observed substantially the same body part at substantially the same time. The wavelength of any given channel should not be overlapping with the wavelength of any other channel to allow maximum differentiation to ensure greater specificity. By designating an appropriate channel as a reference channel and then calculating the ratio of the output of each measurement channel to the output of the reference channel, the changes that are common in the measurement channels can be reduced or minimized. For example, in a simplified situation, it can be assumed that two channels, channel A and channel B, are present. It can be further assumed that the measurement made in channel A has the mean value X_a and that the measurement made in channel B has the mean value X_b. The standard deviation of the measurements in channel A is S_a and the standard deviation of the measurements in channel B is S_b. Accordingly, the coefficient of variation (CV) in channel A, i.e., CV_a, is equal to $S_a /X_a \times 100\%$ and the coefficient of variation in channel B, i.e., CV_b, is equal to $S_b /X_b \times 100\%$. These values of CV, CV_a for channel A and CV_b for channel B, could be very high on account of such factors as motion, heartbeats, or re-insertion variations of the body part. When the data is processed by using channel A as the measurement channel and channel B as the reference channel, the mean value of this ratio can be expressed as R, and it is equal to X_a /X_b. The standard deviation of R, which may be designated $S_{R'}$ would be much smaller than either Sa or S_b. The CV of R, i.e., $CV_R = S_R /R \times 100\%$, would be significantly smaller than either CV_a or CV_b. The statement that CV_R would be significantly smaller than either CV_a or CV_b is true when the variation of channel A and the variation of channel B are related to and are synchronous with each other. In other words, the features of variation in the two channels must be common. This condition can be met by requiring concurrent observation. For further clarification of this concept, a simulation is shown below. In this simulation, three scenarios (Scenario A, Scenario B, and Scenario C) are compared. Jeng at 7:9-8:8

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Jeng

TABLE 4

Pulse Averaged Value of the Optical Readings through a Finger

Observation	Finger insertion	Recording channel A	B	C	D	Lamp
1	1	249332.0	297674.5	179992.9	63968.4	99788.7
2	1	254884.5	304380.4	184059.0	66280.7	99806.4
3	1	253015.0	302852.2	184231.8	66378.7	99786.7
4	1	251775.6	301806.9	184365.3	66464.8	99774.8
5	1	256746.9	307128.8	186115.0	67137.7	99739.3
6	2	243203.1	291577.4	178469.7	64418.9	99738.7
7	2	258072.2	307704.1	184807.2	66877.3	99743.4
8	2	259386.5	309326.0	185843.0	67143.1	99735.2
9	2	250008.5	300153.1	184048.9	66802.5	99740.0
10	2	258274.6	308784.6	186755.5	67676.0	99762.1
11	3	211443.6	257860.0	164925.6	58446.0	99778.2
12	3	232463.6	280862.1	173806.4	62056.2	99772.3
13	3	238666.1	287844.5	176992.2	63379.7	99775.0
14	3	238204.6	287763.0	177622.8	63756.4	99774.4
15	3	237188.0	287047.2	177996.5	63978.9	99791.6
16	4	254804.8	304355.9	183746.7	66995.0	99791.4
17	4	255761.3	305898.7	185436.6	67657.8	99779.0
18	4	256038.8	306509.7	186256.1	67957.7	99779.4
19	4	256477.3	307067.4	186652.0	67869.1	99739.3
20	4	254511.2	305374.8	186610.0	68009.9	99747.4
21	5	245816.3	295877.5	182217.7	66475.6	99746.1
22	5	263369.1	314706.8	189139.2	68992.0	99794.5
23	5	252842.5	304128.3	187037.9	68296.9	99773.4
24	5	255437.8	307065.6	188436.6	68853.4	99787.8
25	5	241834.6	293398.3	185406.8	67994.0	99782.4

Jeng at Table 4

The first technique for processing these data involved identifying the peak (high value) and valley (low value) of the recording for each complete pulse segment and then averaging all the measured values between the limit of these two points. This averaged value is a number representing the mean value of a pulse segment for the measurement. Because there are five complete pulses in the measurement shown in FIG. 3, the mean values of these five pulses were further averaged to yield a number herein designated as "Pulse Averaged Value." This Pulse Averaged Value for a given channel for a given run is shown in Table 4. The statistical analysis of the 25 such Pulse Averaged Values is shown in Table 5. All four channels showed lower standard deviation for within run statistics (effect of one finger insertion for each of the five runs) than that for between run statistics (effect of five finger insertions in the 25 runs). These results are consistent with conventional state-of-the arts studies. These results indicate that a major contribution to total variation was attributable to reinsertion of the finger into the instrument. The success of this invention can be seen when these variations can be reduced significantly by using the device and method of this invention. Within the

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Jeng
	course of the study, the lamp was sufficiently stable that the total CV of the lamp was about 0.02%, and therefore contributed little to the variation of in vivo measurements. Jeng at 16:26-50 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Jeng, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Jeng, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[f]. wherein the data represents at least in part physiological information associated with the user;	Jeng discloses or renders obvious the data represents at least in part physiological information associated with the user. **A method and apparatus for measuring the concentration of an analyte of interest, e.g. glucose, in blood non-invasively**, i.e., without penetrating the skin or obtaining a biological sample from the body of a patient. Jeng at Abstract **This invention provides a method and apparatus for measuring the concentration of an analyte of interest, e.g. glucose, in blood non-invasively, i.e., without penetrating the skin or obtaining a biological sample from the body of a patient**. **The method and apparatus uses a plurality of measurement channels with appropriate wavelengths of interest to control variations of signal and to separate the contribution of the analyte of interest from those of interfering compounds.** The method and apparatus of this invention can also be adapted to allow a portion of a body part to be engorged with blood to bring about greater accuracy in optical measurements. Jeng at 4:28-39 The body part, e.g., a finger, earlobe, is positioned at the place where the beam from the source of light is focused. Light passing through the body part is transmitted through an aperture 24 and then

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Jeng
	through a lens system 25 to deliver light to the detector 20. **The detector 20 is connected to a data amplification unit having a pre-amplifier (not shown) and an amplifier (not shown). Amplified readings are transferred through connecting cables to a computer. The computer controls the software operation for collecting data and storing measurement readings as a data file. The data amplification unit, the cable connecting the amplification unit to the control computer, the control computer itself, and the display device are not shown in this figure for the sake of clarity**. Jeng at 6:31-44 The body part, e.g., a finger, earlobe, is positioned at the place where the beam from the source of light is focused. Light passing through the body part "B" is transmitted through an aperture 49 and then through a lens system 50 to deliver light to a dispersive element 52. **A segment of the spectrum is delivered to a detection element of an array detector 54.** The dispersive element, which separates broad band light into segments of different wavelengths, could be either a prism or a diffraction grating. Detector 48 and detector 54 are connected to a data amplification unit having a pre-amplifier (not shown) and an amplifier (not shown). **Amplified readings are transferred through connecting cables to a computer. The computer controls the software operation for collecting data and storing measurement readings as a data file**. Jeng at 6:57-7:4 This invention, which is characterized by a plurality of channels, reduces the variation in data, thereby improving the reproducibility of data. Variations arising from bodily changes and body-instrument interface changes are shared in a plurality of channels substantially simultaneously. Due to the concurrency of this optical system, the measurements made in each of the channels are related to those made in the other channels with respect to using substantially the same optical system to observed substantially the same body part at substantially the same time. The wavelength of any given channel should not be overlapping with the wavelength of any other channel to allow maximum differentiation to ensure greater specificity. By designating an appropriate channel as a reference channel and then calculating the ratio of the output of each measurement channel to the output of the reference channel, the changes that are common in the measurement channels can be reduced or minimized. For example, in a simplified situation, it can be assumed that two channels, channel A and channel B, are present. It can be further assumed that the measurement made in channel A has the mean value X_a and that the

Omni MedSci Ex. 2002
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	measurement made in channel B has the mean value X_b. The standard deviation of the measurements in channel A is S_a and the standard deviation of the measurements in channel B is S_b. Accordingly, the coefficient of variation (CV) in channel A, i.e., CV_a, is equal to $S_a / X_a \times 100\%$ and the coefficient of variation in channel B, i.e., CV_b, is equal to $S_b / X_b \times 100\%$. These values of CV, CV_a for channel A and CV_b for channel B, could be very high on account of such factors as motion, heartbeats, or re-insertion variations of the body part. When the data is processed by using channel A as the measurement channel and channel B as the reference channel, the mean value of this ratio can be expressed as R, and it is equal to X_a / X_b. The standard deviation of R, which may be designated $S_{R'}$ would be much smaller than either Sa or S_b. The CV of R, i.e., $CV_R = S_R / R \times 100\%$, would be significantly smaller than either CV_a or CV_b. The statement that CV_R would be significantly smaller than either CV_a or CV_b is true when the variation of channel A and the variation of channel B are related to and are synchronous with each other. In other words, the features of variation in the two channels must be common. This condition can be met by requiring concurrent observation. For further clarification of this concept, a simulation is shown below. In this simulation, three scenarios (Scenario A, Scenario B, and Scenario C) are compared. Jeng at 7:9-8:8 TABLE 4 Pulse Averaged Value of the Optical Readings through a Finger | Observation	Finger insertion	Recording channel A	B	C	D	Lamp
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	Jeng at Table 4 The first technique for processing these data involved identifying the peak (high value) and valley (low value) of the recording for each complete pulse segment and then averaging all the measured values between the limit of these two points. This averaged value is a number representing the mean value of a pulse segment for the measurement. Because there are five complete pulses in the measurement shown in FIG. 3, the mean values of these five pulses were further averaged to yield a number herein designated as "Pulse Averaged Value." This Pulse Averaged Value for a given channel for a given run is shown in Table 4. The statistical analysis of the 25 such Pulse Averaged Values is shown in Table 5. All four channels showed lower standard deviation for within run statistics (effect of one finger insertion for each of the five runs) than that for between run statistics (effect of five finger insertions in the 25 runs). These results are consistent with conventional state-of-the arts studies. These results indicate that a major contribution to total variation was attributable to reinsertion of the finger into the instrument. The success of this invention can be seen when these variations can be reduced significantly by using the device and method of this invention. Within the course of the study, the lamp was sufficiently stable that the total CV of the lamp was about 0.02%, and therefore contributed little to the variation of in vivo measurements. Jeng at 16:26-50 1. An apparatus for **determining the concentration of an analyte of interest within the body of a mammal comprising;** (a) at least one source of light, said at least one source of light capable of generating electromagnetic radiation at a plurality of wavelengths; (b) means for transmitting said radiation into a body part, said transmitting means comprising at least one measurement channel and at least one reference channel; **(c) means for concurrently measuring radiation that has emerged from said body part;** (d) means for normalizing the measurement of radiation from said at least one measurement channel to said at least one reference channel so that noise common to said at least one measurement channel and said at least one reference channel is removed; and **(e) means for processing data to convert said normalized measurement to the concentration of said analyte.**

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Jeng
	Jeng at claim 1 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Jeng, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Jeng, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[g]. the software application capable of operating on a control system adapted to receive, store and process at least a portion of the physiological information,	Jeng discloses or renders obvious the software application capable of operating on a control system adapted to receive, store and process at least a portion of the physiological information. The body part, e.g., a finger, earlobe, is positioned at the place where the beam from the source of light is focused. Light passing through the body part is transmitted through an aperture 24 and then through a lens system 25 to deliver light to the detector 20. **The detector 20 is connected to a data amplification unit having a pre-amplifier (not shown) and an amplifier (not shown). Amplified readings are transferred through connecting cables to a computer.** The computer controls the software operation for collecting data and storing measurement readings as a data file. The data amplification unit, the cable connecting the amplification unit to the control computer, the control computer itself, and the display device are not shown in this figure for the sake of clarity. Jeng at 6:31-44 The body part, e.g., a finger, earlobe, is positioned at the place where the beam from the source of light is focused. Light passing through the body part "B" is transmitted through an aperture 49 and then through a lens system 50 to deliver light to a dispersive element 52. A segment of the spectrum is delivered to a detection element of an array detector 54. The dispersive element, which separates broad band light into segments of different wavelengths, could be either a prism or a diffraction grating. Detector 48 and detector 54 are connected to a data amplification unit having a pre-amplifier (not shown) and an amplifier (not shown). **Amplified readings are transferred through connecting cables to a computer. The computer controls the software operation for collecting data and storing measurement readings as a data file**. Jeng at 6:57-7:4

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Jeng
	FIGS. 5A, 5B, and 5C illustrate a photometer unit 300 that has the capability of increasing the local supply of blood to a body part. This photometer unit is small enough to be held in the hand of a person. The photometer unit 300 includes a plurality of light sources 302 of selected wavelengths. The light sources are either laser diodes or light emitting diodes. The light sources emit light of discrete wavelengths sequentially to impinge on a body part 304. The rate of the emitting sequence should be sufficiently high (e.g., greater than 500 Hz) to achieve the concurrency requirement, i.e., observing with substantially the same optical arrangement at substantially the same time on substantially the same position on the body part. The light reaches the detector 306 at the side of the body part opposite to that of the light source. A vacuum pump 308 generates and maintains a low vacuum on the body part to draw blood-engorged skin and tissue into an observation area defined by hollow tubing 310. A lever 312 driven by motor 314 is used to adjust the distance between the light source and the detector, i.e. path-length, for optimal reading on the detector. The power source 316, the controlling electronic 318, and the processor units 320 are shown as an example of one of the many possible ways of implementing the electronics. The results after the data is processed are shown in the display 322 for blood glucose concentration. The switch 324 is used for switching the instrument on and off. The optical arrangement can be of the type illustrated in FIG. 1 and FIG. 2. Jeng at 15:1-27 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Jeng, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Jeng, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[h]. the control system having a touch-screen, circuitry for obtaining position information from a location sensor, and	Jeng discloses or renders obvious the control system having a touch-screen, circuitry for obtaining position information from a location sensor. The body part, e.g., a finger, earlobe, is positioned at the place where the beam from the source of light is focused. Light passing through the body part is transmitted through an aperture 24 and then through a lens system 25 to deliver light to the detector 20. The detector 20 is connected to a data amplification unit having a pre-amplifier (not shown) and an amplifier (not shown). Amplified readings are transferred through connecting cables to a computer. The computer controls the software

’868 Patent	Jeng
	operation for collecting data and storing measurement readings as a data file. The data amplification unit, the cable connecting the amplification unit to the control computer, the control computer itself, and the display device are not shown in this figure for the sake of clarity. Jeng at 6:31-44 The body part, e.g., a finger, earlobe, is positioned at the place where the beam from the source of light is focused. Light passing through the body part "B" is transmitted through an aperture 49 and then through a lens system 50 to deliver light to a dispersive element 52. A segment of the spectrum is delivered to a detection element of an array detector 54. The dispersive element, which separates broad band light into segments of different wavelengths, could be either a prism or a diffraction grating. Detector 48 and detector 54 are connected to a data amplification unit having a pre-amplifier (not shown) and an amplifier (not shown). Amplified readings are transferred through connecting cables to a computer. The computer controls the software operation for collecting data and storing measurement readings as a data file. Jeng at 6:57-7:4 FIGS. 5A, 5B, and 5C illustrate a photometer unit 300 that has the capability of increasing the local supply of blood to a body part. This photometer unit is small enough to be held in the hand of a person. The photometer unit 300 includes a plurality of light sources 302 of selected wavelengths. The light sources are either laser diodes or light emitting diodes. The light sources emit light of discrete wavelengths sequentially to impinge on a body part 304. The rate of the emitting sequence should be sufficiently high (e.g., greater than 500 Hz) to achieve the concurrency requirement, i.e., observing with substantially the same optical arrangement at substantially the same time on substantially the same position on the body part. The light reaches the detector 306 at the side of the body part opposite to that of the light source. A vacuum pump 308 generates and maintains a low vacuum on the body part to draw blood-engorged skin and tissue into an observation area defined by hollow tubing 310. A lever 312 driven by motor 314 is used to adjust the distance between the light source and the detector, i.e. path-length, for optimal reading on the detector. The power source 316, the controlling electronic 318, and the processor units 320 are shown as an example of one of the many possible ways of implementing the electronics. The results after the data is processed are shown in the display 322 for blood glucose concentration. The switch 324 is used for switching the instrument on and off. The optical arrangement can be of the type illustrated in FIG. 1 and FIG. 2.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Jeng
	Jeng at 15:1-27 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Jeng, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Jeng, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[i]. a wireless transceiver to transmit wireless data over a wireless link,	Jeng discloses or renders obvious a wireless transceiver to transmit wireless data over a wireless link. The body part, e.g., a finger, earlobe, is positioned at the place where the beam from the source of light is focused. Light passing through the body part is transmitted through an aperture 24 and then through a lens system 25 to deliver light to the detector 20. The detector 20 is connected to a data amplification unit having a pre-amplifier (not shown) and an amplifier (not shown). Amplified readings are transferred through connecting cables to a computer. The computer controls the software operation for collecting data and storing measurement readings as a data file. The data amplification unit, the cable connecting the amplification unit to the control computer, the control computer itself, and the display device are not shown in this figure for the sake of clarity. Jeng at 6:31-44 The body part, e.g., a finger, earlobe, is positioned at the place where the beam from the source of light is focused. Light passing through the body part "B" is transmitted through an aperture 49 and then through a lens system 50 to deliver light to a dispersive element 52. A segment of the spectrum is delivered to a detection element of an array detector 54. The dispersive element, which separates broad band light into segments of different wavelengths, could be either a prism or a diffraction grating. Detector 48 and detector 54 are connected to a data amplification unit having a pre-amplifier (not shown) and an amplifier (not shown). Amplified readings are transferred through connecting cables to a computer. The computer controls the software operation for collecting data and storing measurement readings as a data file. Jeng at 6:57-7:4

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Jeng
	FIGS. 5A, 5B, and 5C illustrate a photometer unit 300 that has the capability of increasing the local supply of blood to a body part. This photometer unit is small enough to be held in the hand of a person. The photometer unit 300 includes a plurality of light sources 302 of selected wavelengths. The light sources are either laser diodes or light emitting diodes. The light sources emit light of discrete wavelengths sequentially to impinge on a body part 304. The rate of the emitting sequence should be sufficiently high (e.g., greater than 500 Hz) to achieve the concurrency requirement, i.e., observing with substantially the same optical arrangement at substantially the same time on substantially the same position on the body part. The light reaches the detector 306 at the side of the body part opposite to that of the light source. A vacuum pump 308 generates and maintains a low vacuum on the body part to draw blood-engorged skin and tissue into an observation area defined by hollow tubing 310. A lever 312 driven by motor 314 is used to adjust the distance between the light source and the detector, i.e. path-length, for optimal reading on the detector. The power source 316, the controlling electronic 318, and the processor units 320 are shown as an example of one of the many possible ways of implementing the electronics. The results after the data is processed are shown in the display 322 for blood glucose concentration. The switch 324 is used for switching the instrument on and off. The optical arrangement can be of the type illustrated in FIG. 1 and FIG. 2. Jeng at 15:1-27 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Jeng, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Jeng, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[j]. the wireless data comprising at least a part of the physiological information,	Jeng discloses or renders obvious the wireless data comprising at least a part of the physiological information. The body part, e.g., a finger, earlobe, is positioned at the place where the beam from the source of light is focused. Light passing through the body part is transmitted through an aperture 24 and then through a lens system 25 to deliver light to the detector 20. The detector 20 is connected to a data amplification unit having a pre-amplifier (not shown) and an amplifier (not shown). Amplified

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Jeng
	readings are transferred through connecting cables to a computer. The computer controls the software operation for collecting data and storing measurement readings as a data file. The data amplification unit, the cable connecting the amplification unit to the control computer, the control computer itself, and the display device are not shown in this figure for the sake of clarity. Jeng at 6:31-44 The body part, e.g., a finger, earlobe, is positioned at the place where the beam from the source of light is focused. Light passing through the body part "B" is transmitted through an aperture 49 and then through a lens system 50 to deliver light to a dispersive element 52. A segment of the spectrum is delivered to a detection element of an array detector 54. The dispersive element, which separates broad band light into segments of different wavelengths, could be either a prism or a diffraction grating. Detector 48 and detector 54 are connected to a data amplification unit having a pre-amplifier (not shown) and an amplifier (not shown). Amplified readings are transferred through connecting cables to a computer. The computer controls the software operation for collecting data and storing measurement readings as a data file. Jeng at 6:57-7:4 FIGS. 5A, 5B, and 5C illustrate a photometer unit 300 that has the capability of increasing the local supply of blood to a body part. This photometer unit is small enough to be held in the hand of a person. The photometer unit 300 includes a plurality of light sources 302 of selected wavelengths. The light sources are either laser diodes or light emitting diodes. The light sources emit light of discrete wavelengths sequentially to impinge on a body part 304. The rate of the emitting sequence should be sufficiently high (e.g., greater than 500 Hz) to achieve the concurrency requirement, i.e., observing with substantially the same optical arrangement at substantially the same time on substantially the same position on the body part. The light reaches the detector 306 at the side of the body part opposite to that of the light source. A vacuum pump 308 generates and maintains a low vacuum on the body part to draw blood-engorged skin and tissue into an observation area defined by hollow tubing 310. A lever 312 driven by motor 314 is used to adjust the distance between the light source and the detector, i.e. path-length, for optimal reading on the detector. The power source 316, the controlling electronic 318, and the processor units 320 are shown as an example of one of the many possible ways of implementing the electronics. The results after the data is processed are shown in the display 322 for

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Jeng
	blood glucose concentration. The switch 324 is used for switching the instrument on and off. The optical arrangement can be of the type illustrated in FIG. 1 and FIG. 2. Jeng at 15:1-27 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Jeng, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Jeng, those elements, as known to them or as disclosed by other prior art identified in the cover pleading
7[k]. wherein the control system is further capable of receiving voice input signals and manually entered input signals; and	Jeng discloses or renders obvious the control system is further capable of receiving voice input signals and manually entered input signals. The body part, e.g., a finger, earlobe, is positioned at the place where the beam from the source of light is focused. Light passing through the body part is transmitted through an aperture 24 and then through a lens system 25 to deliver light to the detector 20. The detector 20 is connected to a data amplification unit having a pre-amplifier (not shown) and an amplifier (not shown). Amplified readings are transferred through connecting cables to a computer. The computer controls the software operation for collecting data and storing measurement readings as a data file. The data amplification unit, the cable connecting the amplification unit to the control computer, the control computer itself, and the display device are not shown in this figure for the sake of clarity. Jeng at 6:31-44 The body part, e.g., a finger, earlobe, is positioned at the place where the beam from the source of light is focused. Light passing through the body part "B" is transmitted through an aperture 49 and then through a lens system 50 to deliver light to a dispersive element 52. A segment of the spectrum is delivered to a detection element of an array detector 54. The dispersive element, which separates broad band light into segments of different wavelengths, could be either a prism or a diffraction grating. Detector 48 and detector 54 are connected to a data amplification unit having a pre-amplifier (not shown) and an amplifier (not shown). Amplified readings are transferred through connecting

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Jeng
	cables to a computer. The computer controls the software operation for collecting data and storing measurement readings as a data file. Jeng at 6:57-7:4 FIGS. 5A, 5B, and 5C illustrate a photometer unit 300 that has the capability of increasing the local supply of blood to a body part. This photometer unit is small enough to be held in the hand of a person. The photometer unit 300 includes a plurality of light sources 302 of selected wavelengths. The light sources are either laser diodes or light emitting diodes. The light sources emit light of discrete wavelengths sequentially to impinge on a body part 304. The rate of the emitting sequence should be sufficiently high (e.g., greater than 500 Hz) to achieve the concurrency requirement, i.e., observing with substantially the same optical arrangement at substantially the same time on substantially the same position on the body part. The light reaches the detector 306 at the side of the body part opposite to that of the light source. A vacuum pump 308 generates and maintains a low vacuum on the body part to draw blood-engorged skin and tissue into an observation area defined by hollow tubing 310. A lever 312 driven by motor 314 is used to adjust the distance between the light source and the detector, i.e. path-length, for optimal reading on the detector. The power source 316, the controlling electronic 318, and the processor units 320 are shown as an example of one of the many possible ways of implementing the electronics. The results after the data is processed are shown in the display 322 for blood glucose concentration. The switch 324 is used for switching the instrument on and off. The optical arrangement can be of the type illustrated in FIG. 1 and FIG. 2. Jeng at 15:1-27 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Jeng, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Jeng, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[l]. a host comprising:	Jeng discloses or renders obvious the diagnostic system comprises a host.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Jeng
	The body part, e.g., a finger, earlobe, is positioned at the place where the beam from the source of light is focused. Light passing through the body part is transmitted through an aperture 24 and then through a lens system 25 to deliver light to the detector 20. The detector 20 is connected to a data amplification unit having a pre-amplifier (not shown) and an amplifier (not shown). Amplified readings are transferred through connecting cables to a computer. The computer controls the software operation for collecting data and storing measurement readings as a data file. The data amplification unit, the cable connecting the amplification unit to the control computer, the control computer itself, and the display device are not shown in this figure for the sake of clarity. Jeng at 6:31-44 The body part, e.g., a finger, earlobe, is positioned at the place where the beam from the source of light is focused. Light passing through the body part "B" is transmitted through an aperture 49 and then through a lens system 50 to deliver light to a dispersive element 52. A segment of the spectrum is delivered to a detection element of an array detector 54. The dispersive element, which separates broad band light into segments of different wavelengths, could be either a prism or a diffraction grating. Detector 48 and detector 54 are connected to a data amplification unit having a pre-amplifier (not shown) and an amplifier (not shown). Amplified readings are transferred through connecting cables to a computer. The computer controls the software operation for collecting data and storing measurement readings as a data file. Jeng at 6:57-7:4 FIGS. 5A, 5B, and 5C illustrate a photometer unit 300 that has the capability of increasing the local supply of blood to a body part. This photometer unit is small enough to be held in the hand of a person. The photometer unit 300 includes a plurality of light sources 302 of selected wavelengths. The light sources are either laser diodes or light emitting diodes. The light sources emit light of discrete wavelengths sequentially to impinge on a body part 304. The rate of the emitting sequence should be sufficiently high (e.g., greater than 500 Hz) to achieve the concurrency requirement, i.e., observing with substantially the same optical arrangement at substantially the same time on substantially the same position on the body part. The light reaches the detector 306 at the side of the body part opposite to that of the light source. A vacuum pump 308 generates and maintains a low vacuum on the body part to draw blood-engorged skin and tissue into an observation area defined by hollow tubing 310. A lever 312 driven by motor 314 is used to adjust the distance between the light source and the detector,

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Jeng
	i.e. path-length, for optimal reading on the detector. The power source 316, the controlling electronic 318, and the processor units 320 are shown as an example of one of the many possible ways of implementing the electronics. The results after the data is processed are shown in the display 322 for blood glucose concentration. The switch 324 is used for switching the instrument on and off. The optical arrangement can be of the type illustrated in FIG. 1 and FIG. 2. Jeng at 15:1-27 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Jeng, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Jeng, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[m]. a digital file for receiving and storing at least a portion of the wireless data;	Jeng discloses or renders obvious the host comprises a digital file for receiving and storing at least a portion of the wireless data. The body part, e.g., a finger, earlobe, is positioned at the place where the beam from the source of light is focused. Light passing through the body part is transmitted through an aperture 24 and then through a lens system 25 to deliver light to the detector 20. The detector 20 is connected to a data amplification unit having a pre-amplifier (not shown) and an amplifier (not shown). Amplified readings are transferred through connecting cables to a computer. The computer controls the software operation for collecting data and storing measurement readings as a data file. The data amplification unit, the cable connecting the amplification unit to the control computer, the control computer itself, and the display device are not shown in this figure for the sake of clarity. Jeng at 6:31-44 The body part, e.g., a finger, earlobe, is positioned at the place where the beam from the source of light is focused. Light passing through the body part "B" is transmitted through an aperture 49 and then through a lens system 50 to deliver light to a dispersive element 52. A segment of the spectrum is delivered to a detection element of an array detector 54. The dispersive element, which separates broad band light into segments of different wavelengths, could be either a prism or a diffraction

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Jeng
	grating. Detector 48 and detector 54 are connected to a data amplification unit having a pre-amplifier (not shown) and an amplifier (not shown). Amplified readings are transferred through connecting cables to a computer. The computer controls the software operation for collecting data and storing measurement readings as a data file. Jeng at 6:57-7:4 FIGS. 5A, 5B, and 5C illustrate a photometer unit 300 that has the capability of increasing the local supply of blood to a body part. This photometer unit is small enough to be held in the hand of a person. The photometer unit 300 includes a plurality of light sources 302 of selected wavelengths. The light sources are either laser diodes or light emitting diodes. The light sources emit light of discrete wavelengths sequentially to impinge on a body part 304. The rate of the emitting sequence should be sufficiently high (e.g., greater than 500 Hz) to achieve the concurrency requirement, i.e., observing with substantially the same optical arrangement at substantially the same time on substantially the same position on the body part. The light reaches the detector 306 at the side of the body part opposite to that of the light source. A vacuum pump 308 generates and maintains a low vacuum on the body part to draw blood-engorged skin and tissue into an observation area defined by hollow tubing 310. A lever 312 driven by motor 314 is used to adjust the distance between the light source and the detector, i.e. path-length, for optimal reading on the detector. The power source 316, the controlling electronic 318, and the processor units 320 are shown as an example of one of the many possible ways of implementing the electronics. The results after the data is processed are shown in the display 322 for blood glucose concentration. The switch 324 is used for switching the instrument on and off. The optical arrangement can be of the type illustrated in FIG. 1 and FIG. 2. Jeng at 15:1-27 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Jeng, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Jeng, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Jeng
7[n]. control logic at the host to process at least the portion of the wireless data to generate a status of the user;	Jeng discloses or renders obvious the host comprises control logic at the host to process at least the portion of the wireless data to generate a status of the user. The body part, e.g., a finger, earlobe, is positioned at the place where the beam from the source of light is focused. Light passing through the body part is transmitted through an aperture 24 and then through a lens system 25 to deliver light to the detector 20. The detector 20 is connected to a data amplification unit having a pre-amplifier (not shown) and an amplifier (not shown). Amplified readings are transferred through connecting cables to a computer. The computer controls the software operation for collecting data and storing measurement readings as a data file. The data amplification unit, the cable connecting the amplification unit to the control computer, the control computer itself, and the display device are not shown in this figure for the sake of clarity. Jeng at 6:31-44 The body part, e.g., a finger, earlobe, is positioned at the place where the beam from the source of light is focused. Light passing through the body part "B" is transmitted through an aperture 49 and then through a lens system 50 to deliver light to a dispersive element 52. A segment of the spectrum is delivered to a detection element of an array detector 54. The dispersive element, which separates broad band light into segments of different wavelengths, could be either a prism or a diffraction grating. Detector 48 and detector 54 are connected to a data amplification unit having a pre-amplifier (not shown) and an amplifier (not shown). Amplified readings are transferred through connecting cables to a computer. The computer controls the software operation for collecting data and storing measurement readings as a data file. Jeng at 6:57-7:4 FIGS. 5A, 5B, and 5C illustrate a photometer unit 300 that has the capability of increasing the local supply of blood to a body part. This photometer unit is small enough to be held in the hand of a person. The photometer unit 300 includes a plurality of light sources 302 of selected wavelengths. The light sources are either laser diodes or light emitting diodes. The light sources emit light of discrete wavelengths sequentially to impinge on a body part 304. The rate of the emitting sequence should be sufficiently high (e.g., greater than 500 Hz) to achieve the concurrency requirement, i.e., observing with substantially the same optical arrangement at substantially the same time on substantially the same position on the body part. The light reaches the detector 306 at the side of the body part opposite to that

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Jeng
	of the light source. A vacuum pump 308 generates and maintains a low vacuum on the body part to draw blood-engorged skin and tissue into an observation area defined by hollow tubing 310. A lever 312 driven by motor 314 is used to adjust the distance between the light source and the detector, i.e. path-length, for optimal reading on the detector. The power source 316, the controlling electronic 318, and the processor units 320 are shown as an example of one of the many possible ways of implementing the electronics. The results after the data is processed are shown in the display 322 for blood glucose concentration. The switch 324 is used for switching the instrument on and off. The optical arrangement can be of the type illustrated in FIG. 1 and FIG. 2. Jeng at 15:1-27 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Jeng, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Jeng, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[o]. a memory storage device for recording the status; and	Jeng discloses or renders obvious the host comprises a memory storage device for recording the status. The body part, e.g., a finger, earlobe, is positioned at the place where the beam from the source of light is focused. Light passing through the body part is transmitted through an aperture 24 and then through a lens system 25 to deliver light to the detector 20. The detector 20 is connected to a data amplification unit having a pre-amplifier (not shown) and an amplifier (not shown). Amplified readings are transferred through connecting cables to a computer. The computer controls the software operation for collecting data and storing measurement readings as a data file. The data amplification unit, the cable connecting the amplification unit to the control computer, the control computer itself, and the display device are not shown in this figure for the sake of clarity. Jeng at 6:31-44 The body part, e.g., a finger, earlobe, is positioned at the place where the beam from the source of light is focused. Light passing through the body part "B" is transmitted through an aperture 49 and then through a lens system 50 to deliver light to a dispersive element 52. A segment of the spectrum is

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Jeng
	delivered to a detection element of an array detector 54. The dispersive element, which separates broad band light into segments of different wavelengths, could be either a prism or a diffraction grating. Detector 48 and detector 54 are connected to a data amplification unit having a pre-amplifier (not shown) and an amplifier (not shown). Amplified readings are transferred through connecting cables to a computer. The computer controls the software operation for collecting data and storing measurement readings as a data file. Jeng at 6:57-7:4 FIGS. 5A, 5B, and 5C illustrate a photometer unit 300 that has the capability of increasing the local supply of blood to a body part. This photometer unit is small enough to be held in the hand of a person. The photometer unit 300 includes a plurality of light sources 302 of selected wavelengths. The light sources are either laser diodes or light emitting diodes. The light sources emit light of discrete wavelengths sequentially to impinge on a body part 304. The rate of the emitting sequence should be sufficiently high (e.g., greater than 500 Hz) to achieve the concurrency requirement, i.e., observing with substantially the same optical arrangement at substantially the same time on substantially the same position on the body part. The light reaches the detector 306 at the side of the body part opposite to that of the light source. A vacuum pump 308 generates and maintains a low vacuum on the body part to draw blood-engorged skin and tissue into an observation area defined by hollow tubing 310. A lever 312 driven by motor 314 is used to adjust the distance between the light source and the detector, i.e. path-length, for optimal reading on the detector. The power source 316, the controlling electronic 318, and the processor units 320 are shown as an example of one of the many possible ways of implementing the electronics. The results after the data is processed are shown in the display 322 for blood glucose concentration. The switch 324 is used for switching the instrument on and off. The optical arrangement can be of the type illustrated in FIG. 1 and FIG. 2. Jeng at 15:1-27 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Jeng, it would

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Jeng
	have been obvious to one of ordinary skill in the art to combine, with the teachings of Jeng, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[p]. an output for communicating at least a portion of the status or associated information over a communication link to one or more display output devices,	Jeng discloses or renders obvious the host comprises an output for communicating at least a portion of the status or associated information over a communication link to one or more display output devices, wherein the one or more display output devices are located remotely from the host. The body part, e.g., a finger, earlobe, is positioned at the place where the beam from the source of light is focused. Light passing through the body part is transmitted through an aperture 24 and then through a lens system 25 to deliver light to the detector 20. The detector 20 is connected to a data amplification unit having a pre-amplifier (not shown) and an amplifier (not shown). Amplified readings are transferred through connecting cables to a computer. The computer controls the software operation for collecting data and storing measurement readings as a data file. The data amplification unit, the cable connecting the amplification unit to the control computer, the control computer itself, and the display device are not shown in this figure for the sake of clarity. Jeng at 6:31-44 The body part, e.g., a finger, earlobe, is positioned at the place where the beam from the source of light is focused. Light passing through the body part "B" is transmitted through an aperture 49 and then through a lens system 50 to deliver light to a dispersive element 52. A segment of the spectrum is delivered to a detection element of an array detector 54. The dispersive element, which separates broad band light into segments of different wavelengths, could be either a prism or a diffraction grating. Detector 48 and detector 54 are connected to a data amplification unit having a pre-amplifier (not shown) and an amplifier (not shown). Amplified readings are transferred through connecting cables to a computer. The computer controls the software operation for collecting data and storing measurement readings as a data file. Jeng at 6:57-7:4 The data amplification unit, the cable connecting the amplification unit to the control computer, the control computer itself, and the display device are not shown in this figure for the sake of clarity. Jeng at 7:5-8

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Jeng
	A method has been developed to determine concurrency. Measurements through a fingertip were collected with a four-channel recording instrument as shown in FIG. 1. The time offset of each channel is 2 ms; thus, the total time lapse is 8 ms for the sequence of the four channels. For clarity in the figure, the recorded data was processed by subtracting the value corresponding to the first data point in a given channel from the values corresponding to the remaining data points of that channel. Offset values were added to the differences so obtained so that results could be displayed in FIG. 3 without masking each other. The offset values were 0.5, 0.3, 0.2, and 0.1 for channels A, B, C, and D, respectively. In this figure, the peak value and valley value of each pulse for each channel appears at about the same data point number, thereby suggesting a high degree of concurrency. For further verification of concurrency, a correlation function was evaluated. In this evaluation method, the first pulse in channel A was selected as a reference segment. This pulse included data points starting from the first minimum and ending at the second minimum of the data curve of channel A. Then, starting from the first data point of channel A, a segment of data having the same number of data points as that of the reference segment was used as a test segment. The correlation coefficient for the test segment and the reference segment was calculated, and its value was assigned to the first data point of the correlation function. This process was repeated many times in a moving window fashion; in each repetition, one data point in the test segment was shifted along the data string of channel A. The last data point of the correlation was reached when the test segment included the last data point of the measurement in channel A. This process produced a correlation function with highest value located at the beginning of the reference segment, i.e., the first minimum. By means of the same process, that same reference segment in channel A was used to calculate the correlation coefficients for the other three channels. The portion of the correlation function calculated around the first pulse of data is shown in FIG. 4. By displaying only a portion of the entire function, higher resolution and minute variations can be visualized in FIG. 4. In FIG. 4, it can be seen that all four channels showed the same peak and valley positions. This observation suggests that the rate of collecting data was fast enough to allow common features in the measurement to appear at or near the same data point number for all four channels. Thus, concurrency among the four channels is indicated. The similar high values of correlation coefficient (1.00, 1.00, 0.99 and 0.98 for channels A, B, C, and D, respectively) are also indicative of a high degree of concurrency. When the time offset was increased to 4 ms per channel in another test, the correlation coefficients obtained were 1.00, 0.99, 0.98, 0.97 for channels A, B, C, and D, respectively. A correlation coefficient of greater than 0.9 is indicative of a high degree of concurrency while a correlation coefficient of greater than 0.5 indicates a sufficient degree of concurrency. Jeng at 12:28-13:15

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Jeng
	FIGS. 5A, 5B, and 5C illustrate a photometer unit 300 that has the capability of increasing the local supply of blood to a body part. This photometer unit is small enough to be held in the hand of a person. The photometer unit 300 includes a plurality of light sources 302 of selected wavelengths. The light sources are either laser diodes or light emitting diodes. The light sources emit light of discrete wavelengths sequentially to impinge on a body part 304. The rate of the emitting sequence should be sufficiently high (e.g., greater than 500 Hz) to achieve the concurrency requirement, i.e., observing with substantially the same optical arrangement at substantially the same time on substantially the same position on the body part. The light reaches the detector 306 at the side of the body part opposite to that of the light source. A vacuum pump 308 generates and maintains a low vacuum on the body part to draw blood-engorged skin and tissue into an observation area defined by hollow tubing 310. A lever 312 driven by motor 314 is used to adjust the distance between the light source and the detector, i.e. path-length, for optimal reading on the detector. The power source 316, the controlling electronic 318, and the processor units 320 are shown as an example of one of the many possible ways of implementing the electronics. The results after the data is processed are shown in the display 322 for blood glucose concentration. The switch 324 is used for switching the instrument on and off. The optical arrangement can be of the type illustrated in FIG. 1 and FIG. 2. Jeng at 15:1-27 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Jeng, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Jeng, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[q]. wherein the one or more display output devices are located remotely from the host.	Jeng discloses or renders obvious the one or more display output devices are located remotely from the host. The body part, e.g., a finger, earlobe, is positioned at the place where the beam from the source of light is focused. Light passing through the body part is transmitted through an aperture 24 and then through a lens system 25 to deliver light to the detector 20. The detector 20 is connected to a data amplification unit having a pre-amplifier (not shown) and an amplifier (not shown). Amplified

’868 Patent	Jeng
	readings are transferred through connecting cables to a computer. The computer controls the software operation for collecting data and storing measurement readings as a data file. The data amplification unit, the cable connecting the amplification unit to the control computer, the control computer itself, and the display device are not shown in this figure for the sake of clarity. Jeng at 6:31-44 The body part, e.g., a finger, earlobe, is positioned at the place where the beam from the source of light is focused. Light passing through the body part "B" is transmitted through an aperture 49 and then through a lens system 50 to deliver light to a dispersive element 52. A segment of the spectrum is delivered to a detection element of an array detector 54. The dispersive element, which separates broad band light into segments of different wavelengths, could be either a prism or a diffraction grating. Detector 48 and detector 54 are connected to a data amplification unit having a pre-amplifier (not shown) and an amplifier (not shown). Amplified readings are transferred through connecting cables to a computer. The computer controls the software operation for collecting data and storing measurement readings as a data file. Jeng at 6:57-7:4 The data amplification unit, the cable connecting the amplification unit to the control computer, the control computer itself, and the display device are not shown in this figure for the sake of clarity. Jeng at 7:5-8 A method has been developed to determine concurrency. Measurements through a fingertip were collected with a four-channel recording instrument as shown in FIG. 1. The time offset of each channel is 2 ms; thus, the total time lapse is 8 ms for the sequence of the four channels. For clarity in the figure, the recorded data was processed by subtracting the value corresponding to the first data point in a given channel from the values corresponding to the remaining data points of that channel. Offset values were added to the differences so obtained so that results could be displayed in FIG. 3 without masking each other. The offset values were 0.5, 0.3, 0.2, and 0.1 for channels A, B, C, and D, respectively. In this figure, the peak value and valley value of each pulse for each channel appears at about the same data point number, thereby suggesting a high degree of concurrency. For further verification of concurrency, a correlation function was evaluated. In this evaluation method, the first pulse in channel A was selected

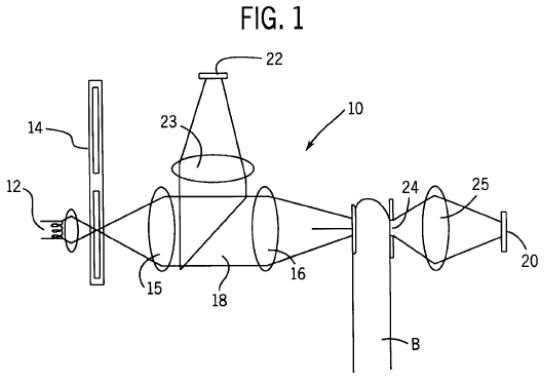
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Jeng
	as a reference segment. This pulse included data points starting from the first minimum and ending at the second minimum of the data curve of channel A. Then, starting from the first data point of channel A, a segment of data having the same number of data points as that of the reference segment was used as a test segment. The correlation coefficient for the test segment and the reference segment was calculated, and its value was assigned to the first data point of the correlation function. This process was repeated many times in a moving window fashion; in each repetition, one data point in the test segment was shifted along the data string of channel A. The last data point of the correlation was reached when the test segment included the last data point of the measurement in channel A. This process produced a correlation function with highest value located at the beginning of the reference segment, i.e., the first minimum. By means of the same process, that same reference segment in channel A was used to calculate the correlation coefficients for the other three channels. The portion of the correlation function calculated around the first pulse of data is shown in FIG. 4. By displaying only a portion of the entire function, higher resolution and minute variations can be visualized in FIG. 4. In FIG. 4, it can be seen that all four channels showed the same peak and valley positions. This observation suggests that the rate of collecting data was fast enough to allow common features in the measurement to appear at or near the same data point number for all four channels. Thus, concurrency among the four channels is indicated. The similar high values of correlation coefficient (1.00, 1.00, 0.99 and 0.98 for channels A, B, C, and D, respectively) are also indicative of a high degree of concurrency. When the time offset was increased to 4 ms per channel in another test, the correlation coefficients obtained were 1.00, 0.99, 0.98, 0.97 for channels A, B, C, and D, respectively. A correlation coefficient of greater than 0.9 is indicative of a high degree of concurrency while a correlation coefficient of greater than 0.5 indicates a sufficient degree of concurrency. Jeng at 12:28-13:15 FIGS. 5A, 5B, and 5C illustrate a photometer unit 300 that has the capability of increasing the local supply of blood to a body part. This photometer unit is small enough to be held in the hand of a person. The photometer unit 300 includes a plurality of light sources 302 of selected wavelengths. The light sources are either laser diodes or light emitting diodes. The light sources emit light of discrete wavelengths sequentially to impinge on a body part 304. The rate of the emitting sequence should be sufficiently high (e.g., greater than 500 Hz) to achieve the concurrency requirement, i.e., observing with substantially the same optical arrangement at substantially the same time on substantially the same position on the body part. The light reaches the detector 306 at the side of the body part opposite to that of the light source. A vacuum pump 308 generates and maintains a low vacuum on the body part to

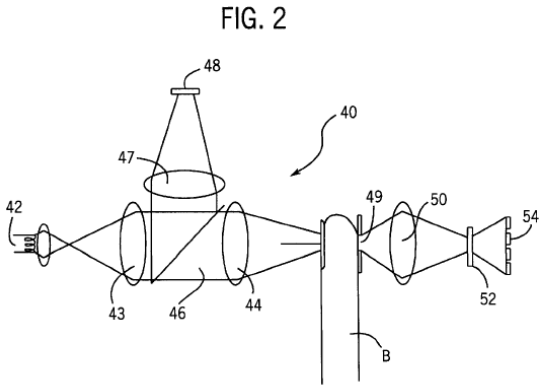
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

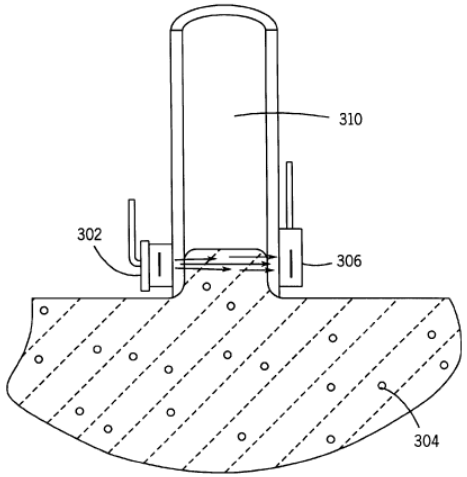
’868 Patent	Jeng
	draw blood-engorged skin and tissue into an observation area defined by hollow tubing 310. A lever 312 driven by motor 314 is used to adjust the distance between the light source and the detector, i.e. path-length, for optimal reading on the detector. The power source 316, the controlling electronic 318, and the processor units 320 are shown as an example of one of the many possible ways of implementing the electronics. The results after the data is processed are shown in the display 322 for blood glucose concentration. The switch 324 is used for switching the instrument on and off. The optical arrangement can be of the type illustrated in FIG. 1 and FIG. 2. Jeng at 15:1-27 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Jeng, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Jeng, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
Claim 8	
8. The diagnostic system of claim 7, wherein the light source comprises a plurality of semiconductor diodes that are further coupled to a multiplexer capable of combining the plurality of semiconductor diodes and generating the input light beam comprising one or more wavelengths.	Jeng discloses or renders obvious the light source comprises a plurality of semiconductor diodes that are further coupled to a multiplexer capable of combining the plurality of semiconductor diodes and generating the input light beam comprising one or more wavelengths. Referring now to FIG. 1, a filter photometer unit 10 includes a source of light 12 having a band-pass filter set 14 and a lens system 15 for collimating light from the filter set 14 and a lens system 16 for focusing light onto a body part "B". The band-pass filter set 14 selects one desired wavelength at a time by rotating the set to place a given filter in the path of the beam. The rate of rotation should be sufficiently high (e.g., greater than 500 Hz) to achieve the concurrency requirement, i.e., observing with substantially the same optical arrangement at substantially the same time on substantially the same observation area of the body part. Before light reaches the body part, a beam splitter 18 separates the beam into two portions. The major portion is directed toward the body part and ultimately reaches a detector 20. The minor portion is directed toward a detector 22. The channel associated with this detector 22 can be used to monitor the stability of the source of light 12 and can be used to correct for light source drift if lamp intensity drift occurs. A lens system 23 is used to focus the light from the beam splitter onto the detector 22.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Jeng
	Jeng at 6:11-30 The body part, e.g., a finger, earlobe, is positioned at the place where the beam from the source of light is focused. Light passing through the body part is transmitted through an aperture 24 and then through a lens system 25 to deliver light to the detector 20. The detector 20 is connected to a data amplification unit having a pre-amplifier (not shown) and an amplifier (not shown). Amplified readings are transferred through connecting cables to a computer. The computer controls the software operation for collecting data and storing measurement readings as a data file. The data amplification unit, the cable connecting the amplification unit to the control computer, the control computer itself, and the display device are not shown in this figure for the sake of clarity. Jeng at 6:31-44  Jeng at Fig. 1 Another embodiment is shown in FIG. 2. Referring now to FIG. 2, a filter photometer unit 40 includes a source of light 42 and a lens system 43 for collimating light from the source of light 42 and a lens system 44 for focusing light onto a body part. Before light reaches the body part, a beam splitter 46, from whence that portion is transmitted to a detector 48, separates a portion of the source beam. The channel encompassed by this detector 48 can be used to monitor the stability of the source of light 42 and can be used to correct for light source drift if lamp intensity drift occurs. A lens system 47 is used to focus the light from the beam splitter onto the detector 48.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Jeng
	Jeng at 6:45-56 The body part, e.g., a finger, earlobe, is positioned at the place where the beam from the source of light is focused. Light passing through the body part "B" is transmitted through an aperture 49 and then through a lens system 50 to deliver light to a dispersive element 52. A segment of the spectrum is delivered to a detection element of an array detector 54. The dispersive element, which separates broad band light into segments of different wavelengths, could be either a prism or a diffraction grating. Detector 48 and detector 54 are connected to a data amplification unit having a pre-amplifier (not shown) and an amplifier (not shown). Amplified readings are transferred through connecting cables to a computer. The computer controls the software operation for collecting data and storing measurement readings as a data file. Jeng at 6:57-7:4  Jeng at Fig. 2 FIGS. 5A, 5B, and 5C illustrate a photometer unit 300 that has the capability of increasing the local supply of blood to a body part. This photometer unit is small enough to be held in the hand of a person. The photometer unit 300 includes a plurality of light sources 302 of selected wavelengths. The light sources are either laser diodes or light emitting diodes. The light sources emit light of discrete wavelengths sequentially to impinge on a body part 304. The rate of the emitting sequence should be sufficiently high (e.g., greater than 500 Hz) to achieve the concurrency requirement, i.e., observing with substantially the same optical arrangement at substantially the same time on substantially the same

’868 Patent	Jeng
	position on the body part. The light reaches the detector 306 at the side of the body part opposite to that of the light source. A vacuum pump 308 generates and maintains a low vacuum on the body part to draw blood-engorged skin and tissue into an observation area defined by hollow tubing 310. A lever 312 driven by motor 314 is used to adjust the distance between the light source and the detector, i.e. path-length, for optimal reading on the detector. The power source 316, the controlling electronic 318, and the processor units 320 are shown as an example of one of the many possible ways of implementing the electronics. The results after the data is processed are shown in the display 322 for blood glucose concentration. The switch 324 is used for switching the instrument on and off. The optical arrangement can be of the type illustrated in FIG. 1 and FIG. 2. Jeng at 15:1-27  FIG. 5C Jeng at Fig. 5C *See* claim 7 above. One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references

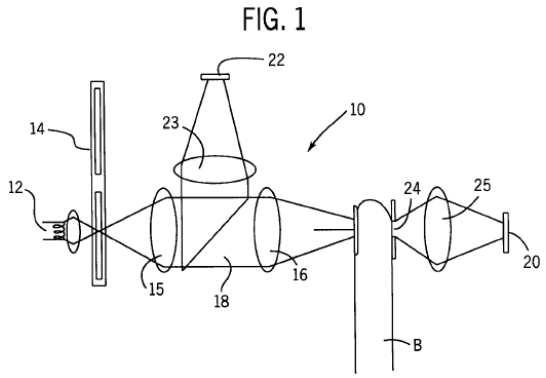
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Jeng
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Claim 9	
9. The diagnostic system of claim 7, wherein at least the portion of the input light beam is adapted for use in a diagnostics to measure a property of the blood, wherein the diagnostics comprise a spectroscopic procedure, wherein the spectroscopic procedure is based at least in part on a comparison of amplitudes at a plurality of associated wavelengths transmitted or reflected from the blood.	Jeng discloses or renders obvious the portion of the input light beam is adapted for use in a diagnostics to measure a property of the blood, wherein the diagnostics comprise a spectroscopic procedure, wherein the spectroscopic procedure is based at least in part on a comparison of amplitudes at a plurality of associated wavelengths transmitted or reflected from the blood. This invention provides a method and apparatus for measuring the concentration of an analyte of interest, e.g. glucose, in blood non-invasively, i.e., without penetrating the skin or obtaining a biological sample from the body of a patient. The method and apparatus uses a plurality of measurement channels with appropriate wavelengths of interest to control variations of signal and to separate the contribution of the analyte of interest from those of interfering compounds. The method and apparatus of this invention can also be adapted to allow a portion of a body part to be engorged with blood to bring about greater accuracy in optical measurements. In the method of this invention, at least two similar, but not identical, measurements are made concurrently. For example, at least two measurements can be made with similar, but not identical, wavelengths of electromagnetic radiation. The two wavelengths should not be overlapping to allow maximum non-identity. Each one of the optical measurements is carried out in a given channel. For each channel, a source of light, a body-instrument interface, a body part as measurement site, and a detector are required. Concurrent measurements in each channel are essential. As used herein, concurrent measurements refer to making at least two measurements of electromagnetic radiation at substantially the same time on substantially the same body part with substantially the same optical arrangement. By making measurements concurrently, each channel in the system experiences variations as they occur substantially simultaneously in all channels. These variations, which are designated "common noise", could include variations in measurement hardware, such as power source fluctuation or lamp drift; ambient temperature change; and other variations, such as change in body-instrument interface or change in body part. By selecting one of the channels as a reference channel and by normalizing the optical measurements of the other channels to this reference channel, the variations common to all channels are eliminated. Removing these common variations from the optical measurements by normalization, such as by calculating ratios of the measurement of each of the

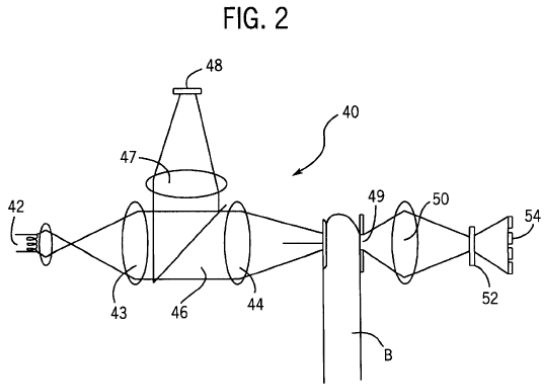
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Jeng
	measuring channels to that of the reference channel, will allow the actual changes of the signal for a specific analyte of interest to be measured. Because of the simplicity in normalizing measurements, the measurement operation can be carried out very fast. With high-speed electronics under control of a microprocessor, the in vivo non-invasive determination of blood glucose or other analyte of interest can be made almost instantly. Jeng at 4:28-5:7 Referring now to FIG. 1, a filter photometer unit 10 includes a source of light 12 having a band-pass filter set 14 and a lens system 15 for collimating light from the filter set 14 and a lens system 16 for focusing light onto a body part "B". The band-pass filter set 14 selects one desired wavelength at a time by rotating the set to place a given filter in the path of the beam. The rate of rotation should be sufficiently high (e.g., greater than 500 Hz) to achieve the concurrency requirement, i.e., observing with substantially the same optical arrangement at substantially the same time on substantially the same observation area of the body part. Before light reaches the body part, a beam splitter 18 separates the beam into two portions. The major portion is directed toward the body part and ultimately reaches a detector 20. The minor portion is directed toward a detector 22. The channel associated with this detector 22 can be used to monitor the stability of the source of light 12 and can be used to correct for light source drift if lamp intensity drift occurs. A lens system 23 is used to focus the light from the beam splitter onto the detector 22. Jeng at 6:11-30 The body part, e.g., a finger, earlobe, is positioned at the place where the beam from the source of light is focused. Light passing through the body part is transmitted through an aperture 24 and then through a lens system 25 to deliver light to the detector 20. The detector 20 is connected to a data amplification unit having a pre-amplifier (not shown) and an amplifier (not shown). Amplified readings are transferred through connecting cables to a computer. The computer controls the software operation for collecting data and storing measurement readings as a data file. The data amplification unit, the cable connecting the amplification unit to the control computer, the control computer itself, and the display device are not shown in this figure for the sake of clarity. Jeng at 6:31-44

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

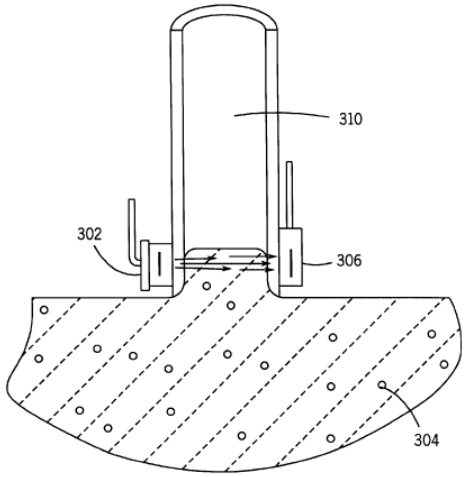
’868 Patent	Jeng
	 Jeng at Fig. 1 Another embodiment is shown in FIG. 2. Referring now to FIG. 2, a filter photometer unit 40 includes a source of light 42 and a lens system 43 for collimating light from the source of light 42 and a lens system 44 for focusing light onto a body part. Before light reaches the body part, a beam splitter 46, from whence that portion is transmitted to a detector 48, separates a portion of the source beam. The channel encompassed by this detector 48 can be used to monitor the stability of the source of light 42 and can be used to correct for light source drift if lamp intensity drift occurs. A lens system 47 is used to focus the light from the beam splitter onto the detector 48. Jeng at 6:45-56 The body part, e.g., a finger, earlobe, is positioned at the place where the beam from the source of light is focused. Light passing through the body part "B" is transmitted through an aperture 49 and then through a lens system 50 to deliver light to a dispersive element 52. A segment of the spectrum is delivered to a detection element of an array detector 54. The dispersive element, which separates broad band light into segments of different wavelengths, could be either a prism or a diffraction grating. Detector 48 and detector 54 are connected to a data amplification unit having a pre-amplifier (not shown) and an amplifier (not shown). Amplified readings are transferred through connecting cables to a computer. The computer controls the software operation for collecting data and storing measurement readings as a data file. Jeng at 6:57-7:4

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Jeng
	 Jeng at Fig. 2 This invention, which is characterized by a plurality of channels, reduces the variation in data, thereby improving the reproducibility of data. Variations arising from bodily changes and body-instrument interface changes are shared in a plurality of channels substantially simultaneously. Due to the concurrency of this optical system, the measurements made in each of the channels are related to those made in the other channels with respect to using substantially the same optical system to observed substantially the same body part at substantially the same time. The wavelength of any given channel should not be overlapping with the wavelength of any other channel to allow maximum differentiation to ensure greater specificity. By designating an appropriate channel as a reference channel and then calculating the ratio of the output of each measurement channel to the output of the reference channel, the changes that are common in the measurement channels can be reduced or minimized. For example, in a simplified situation, it can be assumed that two channels, channel A and channel B, are present. It can be further assumed that the measurement made in channel A has the mean value X_a and that the measurement made in channel B has the mean value X_b. The standard deviation of the measurements in channel A is S_a and the standard deviation of the measurements in channel B is S_b. Accordingly, the coefficient of variation (CV) in channel A, i.e., CV_a, is equal to $S_a /X_a \times 100\%$ and the coefficient of variation in channel B, i.e., CV_b, is equal to $S_b /X_b \times 100\%$. These values of CV, CV_a for channel A and CV_b for channel B, could be very high on account of such factors as motion, heartbeats, or re-insertion variations of the body part. When the data is processed by using channel A as the measurement channel and channel B as the reference channel, the mean value of this ratio can be expressed as R, and it is equal to X_a /X_b. The standard deviation of R, which may be designated $S_{R'}$ would be much smaller than either Sa or S_b. The CV of R, i.e., $CV_R = S_R /R \times 100\%$, would be significantly smaller than either CV_a or

’868 Patent	Jeng
	CV_b. The statement that CV_R would be significantly smaller than either CV_a or CV_b is true when the variation of channel A and the variation of channel B are related to and are synchronous with each other. In other words, the features of variation in the two channels must be common. This condition can be met by requiring concurrent observation. For further clarification of this concept, a simulation is shown below. In this simulation, three scenarios (Scenario A, Scenario B, and Scenario C) are compared. Jeng at 7:9-8:8 FIGS. 5A, 5B, and 5C illustrate a photometer unit 300 that has the capability of increasing the local supply of blood to a body part. This photometer unit is small enough to be held in the hand of a person. The photometer unit 300 includes a plurality of light sources 302 of selected wavelengths. The light sources are either laser diodes or light emitting diodes. The light sources emit light of discrete wavelengths sequentially to impinge on a body part 304. The rate of the emitting sequence should be sufficiently high (e.g., greater than 500 Hz) to achieve the concurrency requirement, i.e., observing with substantially the same optical arrangement at substantially the same time on substantially the same position on the body part. The light reaches the detector 306 at the side of the body part opposite to that of the light source. A vacuum pump 308 generates and maintains a low vacuum on the body part to draw blood-engorged skin and tissue into an observation area defined by hollow tubing 310. A lever 312 driven by motor 314 is used to adjust the distance between the light source and the detector, i.e. path-length, for optimal reading on the detector. The power source 316, the controlling electronic 318, and the processor units 320 are shown as an example of one of the many possible ways of implementing the electronics. The results after the data is processed are shown in the display 322 for blood glucose concentration. The switch 324 is used for switching the instrument on and off. The optical arrangement can be of the type illustrated in FIG. 1 and FIG. 2. Jeng at 15:1-27

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Jeng
	 FIG. 5C Jeng at Fig. 5C *See* claim 7 above. One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Jeng, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Jeng, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

EXHIBIT A3

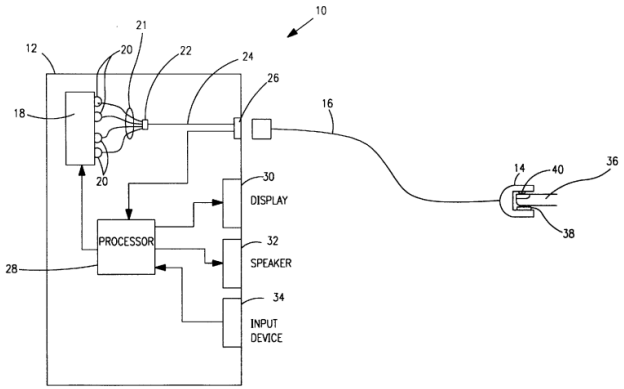
U.S. Pat. No. 9,055,868 in view of U.S. Patent No. 5,891,022 A to Jonas A. Pologe ("Pologe")

As described in detail below, Pologe (individually or collectively) anticipates and/or renders obvious claim 7-9 ("Asserted Claims") of U.S. Patent No. 9,055,868 B2 (the "' 868 Patent") under 35 U.S.C. §102 and/or §103, either alone in combination with the knowledge of a person of ordinary skill, and/or additional prior art references discussed in discussed in Exhibits A1-A10, the contents of which are hereby incorporated by reference into this chart. One of ordinary skill in the art, as of the priority date of the '868 Patent, would have known to combine the prior art elements disclosed by the foregoing references using known methods, and to use these elements according to their established functions in order to achieve a known and predictable result. This invalidity claim chart is based on Defendants' present understanding of the Asserted Claims and Plaintiff's apparent construction of the Asserted Claims in its Preliminary Infringement Contentions ("Infringement Contentions").

The following invalidity chart includes references to the structure, function, operation, and/or features of the technology described in Pologe. The cited portions of Pologe are merely illustrative, and Defendants reserve the right to rely on alternative or additional evidence, including uncited portions of Pologe. Where a particular figure is cited, the citation should be understood to encompass the caption and description of the figure as well as any text relating to or describing the figure. Conversely, where particular text referring to a figure is cited, the citation should be understood to include the figure as well. Although the documentation collectively evidences prior knowledge, use, or sale, Defendants reserve the right to rely upon individual documents as printed publications. Where the chart below states that Pologe "describes" or "provides for" a limitation, such disclosure may be express, inherent, or implicit. To the extent it is found Pologe does not expressly disclose certain limitations in the asserted claim, such limitations are inherent. Defendants reserve the right to present direct evidence of the structure, function, operation, and/or features of the technology described in Pologe (including product samples, source code, and/or witness testimony) and/or its prior art status, and to present alternative or additional documents concerning the same as evidence that the technology described in Pologe anticipates and/or renders obvious the Asserted Claims of the '868 Patent.

This chart is subject to all reservations, objections, and disclaimers in Defendants' Invalidity Contentions and any amendment, supplement, or modification thereof, which are incorporated herein by reference in their entirety. Nothing stated herein shall be treated as an admission or suggestion that Defendants agree with Plaintiff regarding the scope of the Asserted Claims, Plainitff's apparent claim constructions, or the accuracy of any particular claim construction. Defendants reserve all rights to challenge any of the claim terms herein under 35 U.S.C. § 112, including by arguing that they are indefinite, are not supported by the written description, and/or are not enabled. Defendants further reserve all rights to amend this invalidity claim chart without leave of court pursuant to the Court's Docket Control Order, or upon a showing of good cause.

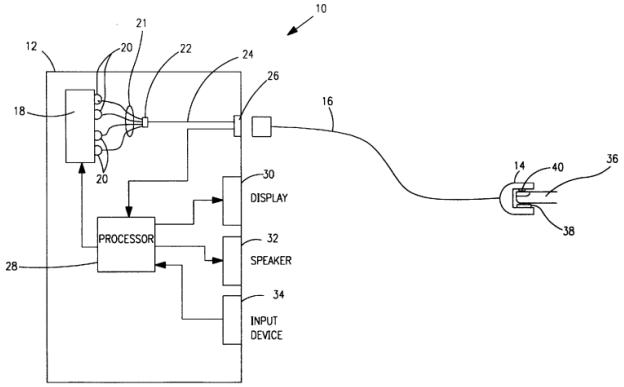
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Pologe
Claim 7	
7[pre]. A diagnostic system comprising:	By providing this disclosure, Defendants do not take a position on whether the preamble is limiting. Pologe discloses or renders obvious a diagnostic system. The present invention relates to **a system for performing photoplethysmographic measurements using wavelength division multiplexing. The system is relatively inexpensive to produce and is capable of efficiently and accurately performing photoplethysmographic measurements. The system uses wavelength division multiplexing (WDM) to combine the light signals from multiple light sources in a main test unit into a single multiplexed signal before the signal is delivered to the probe**. The multiplexed signal may then be delivered to the probe over a single optical line, such as a single fiber optic cable, a single fiber bundle, or any other single light guide. Pologe at 4:20-32  FIG. 1 Pologe at Fig. 1 In one embodiment, as illustrated in FIG. 1, **the invention is implemented in a pulse oximetry system 10. The system 10 comprises: a main test unit 12, a probe 14, and a probe cable 16.** During a measurement, **the probe 14 is first attached to an appropriate appendage of a person being tested, such as finger 36 illustrated in FIG. 1. Light pulses are then delivered from the main test unit 12 to the probe 14 via a single optical transmission line in the probe cable 16. The light pulses are then directed into the finger 36, travel through the finger 36, and emerge on the other side of the finger**

’868 Patent	Pologe
	36 where they are received by a light pick up device 38. The received light pulses may then be delivered back to the main test unit 12, via probe cable 16, where they are processed to determine the level of one or more blood analytes in the person's arterial blood. Processing methods to determine the blood analyte levels are known and, therefore, will not be discussed further. It should be understood, however, that the benefits of the present invention are independent of the precise method used to measure the analyte levels and, therefore, the invention may be used with virtually any processing method, whether currently known or developed in the future. Pologe at 4:33-54 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Pologe, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Pologe, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[a]. a light source comprising:	Pologe discloses or renders obvious a diagnostic system comprises a light source. **The present invention relates to a system for performing photoplethysmographic measurements using wavelength division multiplexing**. The system is relatively inexpensive to produce and is capable of efficiently and accurately performing photoplethysmographic measurements. **The system uses wavelength division multiplexing (WDM) to combine the light signals from multiple light sources in a main test unit into a single multiplexed signal before the signal is delivered to the probe.** The multiplexed signal may then be delivered to the probe over a single optical line, such as a single fiber optic cable, a single fiber bundle, or any other single light guide. Pologe at 4:20-32 **Light pulses are then delivered from the main test unit 12 to the probe 14 via a single optical transmission line in the probe cable 16. The light pulses are then directed into the finger 36, travel through the finger 36, and emerge on the other side of the finger 36 where they are received by a light pick up device 38. The received light pulses may then be delivered back to the main test unit 12, via probe cable 16, where they are processed to determine the level of one or more blood analytes in the person's arterial blood**. Processing methods to determine the blood analyte levels are

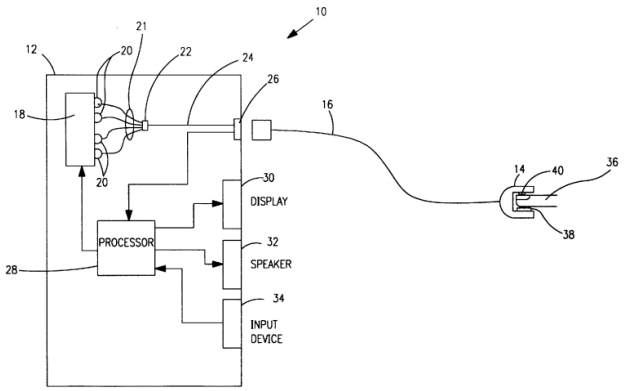
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

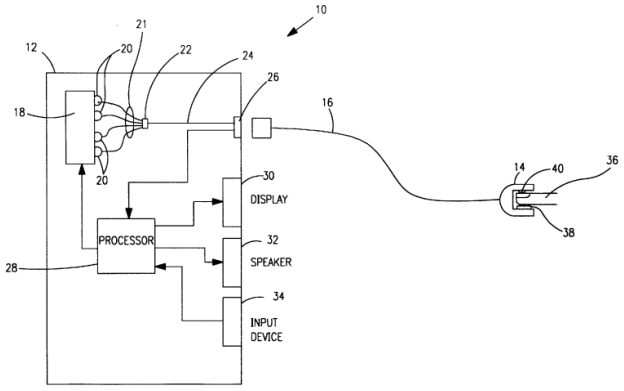
’868 Patent	Pologe
	known and, therefore, will not be discussed further. It should be understood, however, that the benefits of the present invention are independent of the precise method used to measure the analyte levels and, therefore, the invention may be used with virtually any processing method, whether currently known or developed in the future. Pologe at 4:38-54 **To perform photoplethysmographic measurements, light sources must be used that are each capable of producing relatively narrow band light having a unique spectral content**. As described above, **some light sources capable of performing this function are, for example, light emitting diodes and laser diodes.** It is also possible to use a single broadband light source in combination with a number of narrow band filters, although this technique has a number of distinct disadvantages which make it a suboptimal solution. Pologe at 5:36-44 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Pologe, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Pologe, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[b]. one or more semiconductor diodes generating an input light beam; and	Pologe discloses or renders obvious the light source comprises one or more semiconductor diodes generating an input light beam. **The plurality of separate emitters includes multiple separate light sources, such as light emitting diodes (LEDs) and laser diodes**. In general, the signal delivery means includes a single input/single output light guide such as a single optical fiber, a single fiber bundle, or other type of light guiding means. The single input/single output light guide delivers light to a probe head which couples the light into the tissue under test. The probe head can also include detection means for converting the light signal transmitted through the tissue under test into an electrical signal. In one embodiment, the plurality of emitters and the combining unit are included in a housing, such as a bench top test unit or a handheld unit. The housing may also include means for communicating measurement results to users and means

’868 Patent	Pologe
	for receiving commands from users. The probe head is physically separated from the housing with the single input/single output light guide connecting them. Pologe at 3:1-17  FIG. 1 Pologe at Fig. 1 To perform an oxygen saturation measurement, **the processor unit 28 sends a signal to the emitter unit 18 causing the emitters 20 to produce their corresponding light signals**. **The emitters 20 may include, for example, laser diodes or light emitting diodes (LEDs). In addition, in one embodiment of the invention, the plurality of emitters includes one or more broadband light sources and appropriate filtering means**. As used herein, **the term "light emitting diode" includes both infrared emitting diodes and ultraviolet emitting diodes. The light signals are combined in the optical coupler 22 into a single multiplexed light signal on output cable 24. Output cable 24 delivers the multiplexed signal to front panel connector 26 from which it is launched onto a single optical light guide within probe cable 16. Probe cable 16 delivers the multiplexed light signal to the probe 14, from which it is directed into the test subject's finger 36**. After the multiplexed light signal has been transmitted through the finger 36, it is returned to the main test unit 12 via probe cable 16 in either optical or electrical form. Pologe at 5:16-34

’868 Patent	Pologe
	One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Pologe, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Pologe, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[c]. a lens system configured to receive at least a portion of the input light beam and to communicate at least the portion of the input light beam onto a part of a user's body comprising blood	Pologe discloses or renders obvious the light source comprises a lens system configured to receive at least a portion of the input light beam and to communicate at least the portion of the input light beam onto a part of a user's body comprising blood. It is a further object of the present invention to achieve the above described objects in a **photoplethysmographic measurement system for determining a variety of arterial blood analytes.** Pologe at 2:25-28 The **WDM coupler is capable of simultaneously coupling multiple light pulses** having different spectral contents onto a single light guide. That is, the WDM coupler is capable of producing a wavelength multiplexed pulse on the single light guide that includes the spectral contents of all of the multiple light pulses. In this regard, **the WDM coupler can include any of a number of coupler types, such as those using lenses**, **prisms**, interference filters, diffraction gratings, or butt coupling. In addition, active WDM couplers can also be used. Pologe at 3:43-55 **To perform photoplethysmographic measurements, light sources must be used that are each capable of producing relatively narrow band light having a unique spectral content**. As described above, **some light sources capable of performing this function are, for example, light emitting diodes and laser diodes.** It is also possible to use a single broadband light source in combination with a number of narrow band filters, although this technique has a number of distinct disadvantages which make it a suboptimal solution. Pologe at 5:36-44

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

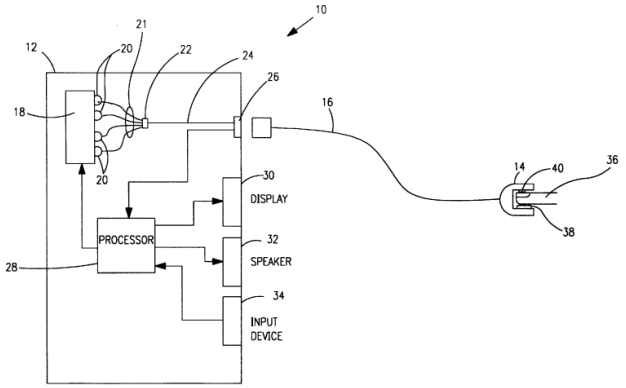
’868 Patent	Pologe
	 FIG. 1 Pologe at Fig. 1 **To perform an oxygen saturation measurement, the processor unit 28 sends a signal to the emitter unit 18 causing the emitters 20 to produce their corresponding light signals**. **The emitters 20 may include, for example, laser diodes or light emitting diodes (LEDs). In addition, in one embodiment of the invention, the plurality of emitters includes one or more broadband light sources and appropriate filtering means.** As used herein, **the term "light emitting diode" includes both infrared emitting diodes and ultraviolet emitting diodes. The light signals are combined in the optical coupler 22 into a single multiplexed light signal on output cable 24. Output cable 24 delivers the multiplexed signal to front panel connector 26 from which it is launched onto a single optical light guide within probe cable 16. Probe cable 16 delivers the multiplexed light signal to the probe 14, from which it is directed into the test subject's finger 36**. After the multiplexed light signal has been transmitted through the finger 36, it is returned to the main test unit 12 via probe cable 16 in either optical or electrical form. Pologe at 5:16-34 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references

’868 Patent	Pologe
	identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Pologe, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Pologe, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[d]. wherein at least the portion of the input light beam is used in a measurement on a user;	Pologe discloses or renders obvious the portion of the input light beam is used in a measurement on a user. It is a further object of the present invention to achieve the above described objects in a **photoplethysmographic measurement system for determining a variety of arterial blood analytes.** Pologe at 2:25-28  FIG. 1 Pologe at Fig. 1 **To perform an oxygen saturation measurement, the processor unit 28 sends a signal to the emitter unit 18 causing the emitters 20 to produce their corresponding light signals. The emitters 20 may include, for example, laser diodes or light emitting diodes (LEDs).** In addition, in one embodiment of the invention, the plurality of emitters includes one or more broadband light sources and appropriate filtering means. As used herein, **the term "light emitting diode" includes both infrared emitting diodes and ultraviolet emitting diodes.** The light signals are combined in the optical coupler 22 into a single multiplexed light signal on output cable 24. **Output cable 24 delivers the multiplexed signal**

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

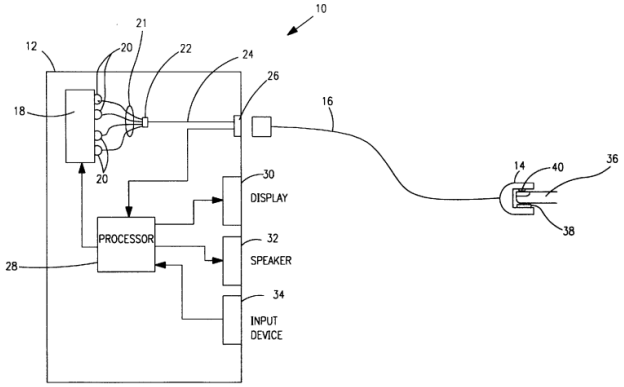
’868 Patent	Pologe
	to front panel connector 26 from which it is launched onto a single optical light guide within probe cable 16. **Probe cable 16 delivers the multiplexed light signal to the probe 14, from which it is directed into the test subject's finger 36. After the multiplexed light signal has been transmitted through the finger 36, it is returned to the main test unit 12 via probe cable 16 in either optical or electrical form**. Pologe at 5:16-34 **To perform photoplethysmographic measurements, light sources must be used that are each capable of producing relatively narrow band light having a unique spectral content**. As described above, **some light sources capable of performing this function are, for example, light emitting diodes and laser diodes.** It is also possible to use a single broadband light source in combination with a number of narrow band filters, although this technique has a number of distinct disadvantages which make it a suboptimal solution. Pologe at 5:36-44 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Pologe, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Pologe, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[e]. a software application capable of generating data based at least in part on the measurement on the user,	Pologe discloses or renders obvious a software application capable of generating data based at least in part on the measurement on the user. It is a further object of the present invention to achieve the above described objects in a **photoplethysmographic measurement system for determining a variety of arterial blood analytes.** Pologe at 2:25-28

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Pologe
	 FIG. 1 Pologe at Fig. 1 **The main test unit 12 includes: an emitter module 18 having a plurality of emitters 20, each capable of producing a light signal having a unique spectral content; a plurality of optical cables 21 each coupled to a single emitter source for carrying the corresponding light signal; an optical coupler 22 for coupling light signals from each of the plurality of cables 21 to a single output cable 24; a front panel connector 26** for use in coupling the probe cable 16 to the main test unit 12; a **processor unit 28 for performing processing and control functions; a display unit 30 for displaying measurement values to a user; a speaker 32 for providing audible tones to the user; and an input device 34, such as a keypad or a touch screen, for allowing the user to input commands and other information to the processor unit 28**. Pologe at 4:63-5:9 **To perform an oxygen saturation measurement, the processor unit 28 sends a signal to the emitter unit 18 causing the emitters 20 to produce their corresponding light signals. The emitters 20 may include, for example, laser diodes or light emitting diodes (LEDs).** In addition, in one embodiment of the invention, the plurality of emitters includes one or more broadband light sources and appropriate filtering means. As used herein, **the term "light emitting diode" includes both infrared emitting diodes and ultraviolet emitting diodes. The light signals are combined in the optical coupler 22 into a single multiplexed light signal on output cable 24**. **Output cable 24 delivers the multiplexed signal to front panel connector 26 from which it is launched onto a single optical light guide within**

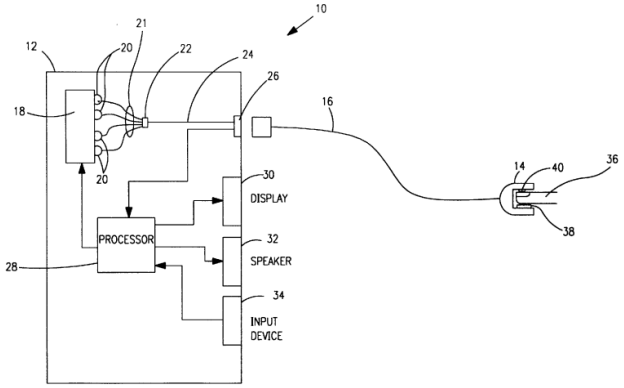
’868 Patent	Pologe
	probe cable 16. Probe cable 16 delivers the multiplexed light signal to the probe 14, from which it is directed into the test subject's finger 36. After the multiplexed light signal has been transmitted through the finger 36, it is returned to the main test unit 12 via probe cable 16 in either optical or electrical form. Pologe at 5:16-34 **To perform photoplethysmographic measurements, light sources must be used** that are each capable of producing relatively narrow band light having a unique spectral content. As described above, **some light sources capable of performing this function are, for example, light emitting diodes and laser diodes.** It is also possible to use a single broadband light source in combination with a number of narrow band filters, although this technique has a number of distinct disadvantages which make it a suboptimal solution. Pologe at 5:36-44 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Pologe, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Pologe, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[f]. wherein the data represents at least in part physiological information associated with the user;	Pologe discloses or renders obvious the data represents at least in part physiological information associated with the user. **A photoplethysmographic measurement device that utilizes wavelength division multiplexing is provided. Signals from multiple light emitters are combined into a single multiplexed light signal in a test unit before being delivered to a physically separated probe head attached to a test subject**. **The probe then causes the single multiplexed signal to be transmitted through a tissue under test on the test subject, after which it is processed to determine a blood analyte level of the test subject**. By combining the light signals into a single multiplexed signal before delivering the signals to the probe, a single light guide, such as a single optical fiber, can be used to deliver the signals to the probe, thereby reducing system implementation cost and increasing the flexibility of the probe cable. In addition, the

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

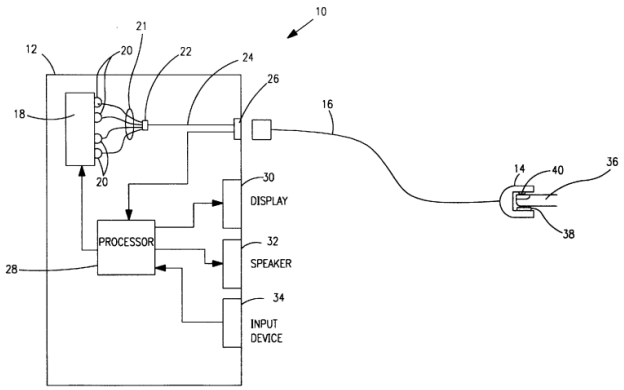
’868 Patent	Pologe
	invention allows the signals from the light emitters to be directed into the test subject from a single point source, which can significantly increase measurement accuracy. Pologe at Abstract  FIG. 1 Pologe at Fig. 1 It is a further object of **the present invention to achieve the above described objects in a photoplethysmographic measurement system for determining a variety of arterial blood analytes.** Pologe at 2:25-28 **To perform an oxygen saturation measurement, the processor unit 28 sends a signal to the emitter unit 18 causing the emitters 20 to produce their corresponding light signals. The emitters 20 may include, for example, laser diodes or light emitting diodes (LEDs).** In addition, in one embodiment of the invention, the plurality of emitters includes one or more broadband light sources and appropriate filtering means. As used herein, **the term "light emitting diode" includes both infrared emitting diodes and ultraviolet emitting diodes. The light signals are combined in the optical coupler 22 into a single multiplexed light signal on output cable 24. Output cable 24 delivers the multiplexed signal to front panel connector 26 from which it is launched onto a single optical light guide within probe cable 16. Probe cable 16 delivers the multiplexed light signal to the probe 14, from which it is directed into the test subject's finger 36. After the multiplexed light signal has been**

’868 Patent	Pologe
	transmitted through the finger 36, it is returned to the main test unit 12 via probe cable 16 in either optical or electrical form. Pologe at 5:16-34 **To perform photoplethysmographic measurements, light sources must be used** that are each **capable of producing relatively narrow band light having a unique spectral content**. As described above, **some light sources capable of performing this function are, for example, light emitting diodes and laser diodes.** It is also possible to use a single broadband light source in combination with a number of narrow band filters, although this technique has a number of distinct disadvantages which make it a suboptimal solution. Pologe at 5:36-44 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Pologe, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Pologe, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[g]. the software application capable of operating on a control system adapted to receive, store and process at least a portion of the physiological information,	Pologe discloses or renders obvious the software application capable of operating on a control system adapted to receive, store and process at least a portion of the physiological information. **A photoplethysmographic measurement device that utilizes wavelength division multiplexing is provided. Signals from multiple light emitters are combined into a single multiplexed light signal in a test unit before being delivered to a physically separated probe head attached to a test subject**. **The probe then causes the single multiplexed signal to be transmitted through a tissue under test on the test subject, after which it is processed to determine a blood analyte level of the test subject.** By combining the light signals into a single multiplexed signal before delivering the signals to the probe, a single light guide, such as a single optical fiber, can be used to deliver the signals to the probe, thereby reducing system implementation cost and increasing the flexibility of the probe cable. In addition, the invention allows the signals from the light emitters to be directed into the test subject from a single point source, which can significantly increase measurement accuracy.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

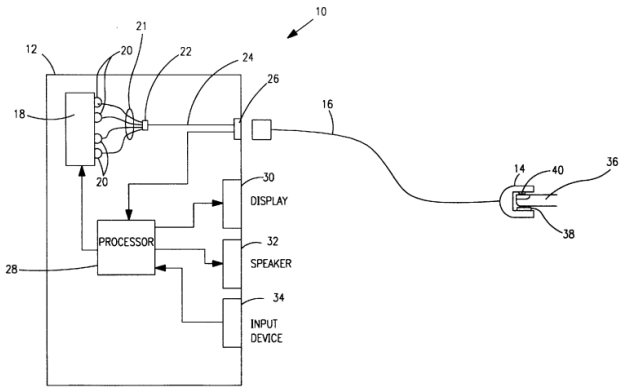
’868 Patent	Pologe
	Pologe at Abstract  FIG. 1 Pologe at Fig. 1 **In one embodiment, as illustrated in FIG. 1, the invention is implemented in a pulse oximetry system 10. The system 10 comprises: a main test unit 12, a probe 14, and a probe cable 16. During a measurement, the probe 14 is first attached to an appropriate appendage of a person being tested, such as finger 36 illustrated in FIG. 1. Light pulses are then delivered from the main test unit 12 to the probe 14 via a single optical transmission line in the probe cable 16. The light pulses are then directed into the finger 36, travel through the finger 36**, and emerge on the other side of the finger 36 where they are received by a light pick up device 38. **The received light pulses may then be delivered back to the main test unit 12, via probe cable 16, where they are processed to determine the level of one or more blood analytes in the person's arterial blood. Processing methods to determine the blood analyte levels are known** and, therefore, will not be discussed further. It should be understood, however, that the benefits of the present invention are independent of the precise method used to measure the analyte levels and, therefore, the invention may be used with virtually any processing method, whether currently known or developed in the future. Pologe at 4:33-54

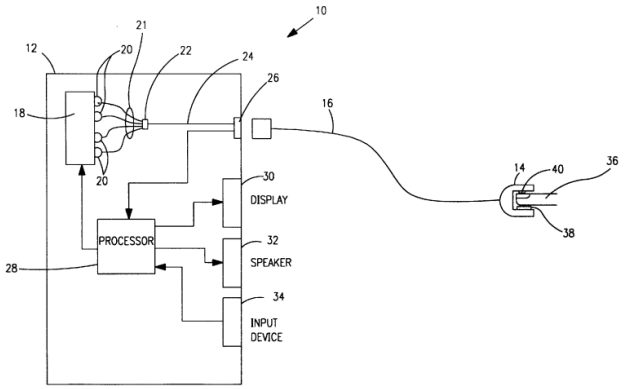
’868 Patent	Pologe
	The main test unit 12 includes: an emitter module 18 having a plurality of emitters 20, each capable of producing a light signal having a unique spectral content; a plurality of optical cables 21 each coupled to a single emitter source for carrying the corresponding light signal; an optical coupler 22 for coupling light signals from each of the plurality of cables 21 to a single output cable 24; a front panel connector 26 for use in coupling the probe cable 16 to the main test unit 12; a **processor unit 28 for performing processing and control functions; a display unit 30 for displaying measurement values to a user; a speaker 32 for providing audible tones to the user; and an input device 34, such as a keypad or a touch screen, for allowing the user to input commands and other information to the processor unit 28**. During operation, **the processor unit 28 receives user commands from the input device 34. The processor unit 28 then carries out the commands by controlling the other components in the system 10.** For example, the processor unit 28 may receive a command from a user to set alarm limits or to silence an alarm. **To perform an oxygen saturation measurement, the processor unit 28 sends a signal to the emitter unit 18 causing the emitters 20 to produce their corresponding light signals. The emitters 20 may include, for example, laser diodes or light emitting diodes (LEDs).** In addition, in one embodiment of the invention, the plurality of emitters includes one or more broadband light sources and appropriate filtering means. Pologe at 4:63-5:22 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Pologe, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Pologe, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[h]. the control system having a touch-screen, circuitry for obtaining	Pologe discloses or renders obvious the control system having a touch-screen, circuitry for obtaining position information from a location sensor.

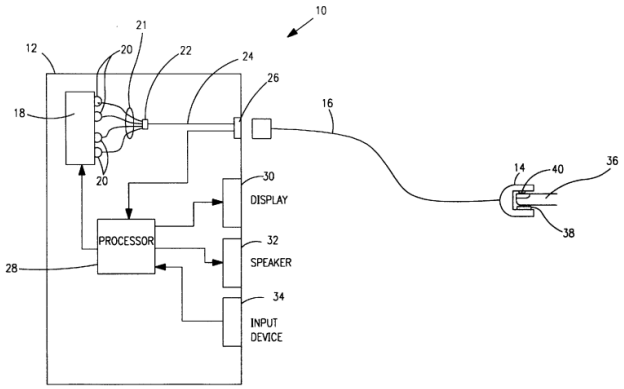
’868 Patent	Pologe
position information from a location sensor, and	 FIG. 1 Pologe at Fig. 1 The main test unit 12 includes: an emitter module 18 having a plurality of emitters 20, each capable of producing a light signal having a unique spectral content; a plurality of optical cables 21 each coupled to a single emitter source for carrying the corresponding light signal; an optical coupler 22 for coupling light signals from each of the plurality of cables 21 to a single output cable 24; a front panel connector 26 for use in coupling the probe cable 16 to the main test unit 12; **a processor unit 28 for performing processing and control functions**; a display unit 30 for displaying measurement values to a user; a speaker 32 for providing audible tones to the user; and **an input device 34, such as a keypad or a touch screen**, **for allowing the user to input commands** and other information to the processor unit 28. Pologe at 4:63-5:9 In another aspect of the present invention, a method is provided for **photoplethysmographically measuring one or more arterial blood analytes.** The method includes: providing a plurality of separate light signals, each light signal including a spectral content having a unique center frequency; combining the plurality of separate light signals into a single light signal; **delivering, after the step of combining, the single light signal to the tissue so that the single light signal is directed into the tissue; detecting a transmitted light signal from the tissue; and processing the transmitted light signal to determine a blood analyte level for the tissue.** Pologe at 3:18-28

’868 Patent	Pologe
	One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Pologe, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Pologe, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[i]. a wireless transceiver to transmit wireless data over a wireless link,	Pologe discloses or renders obvious a wireless transceiver to transmit wireless data over a wireless link. In yet another aspect of the present invention, **a photoplethysmographic measurement apparatus for measuring a blood analyte level in a tissue** under test is provided. The apparatus includes: a plurality of emitters, wherein each device produces a light signal having a unique spectral content; a wavelength division multiplexing (WDM) coupler for combining the light signals from the plurality of emitters into a single light signal, wherein the WDM coupler is capable of simultaneously receiving multiple light pulses having unique spectral contents and simultaneously coupling the multiple light pulses onto a single light guide resulting in a single light pulse on the light guide that contains the spectral contents of all of the multiple light pulses; means for delivering the single light signal to the tissue so that the single light signal is directed into the tissue; means for **receiving a transmitted light signal from the tissue, the transmitted light signal resulting from the transmission of the single light signal through the tissue; and means for processing the transmitted light signal to determine a blood analyte level in the tissue.** Pologe at 3:36-56

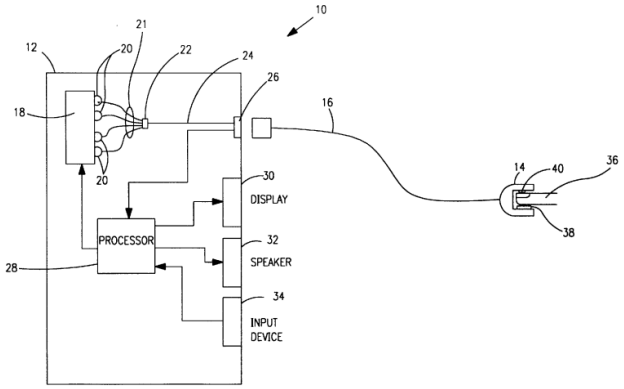
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Pologe
	 FIG. 1 Pologe at Fig. 1 In addition to the optical light guide that carries the light pulses to the probe 14, the probe cable 16 must also provide a path for the transmitted light pulses to travel back to the main test unit 12, for processing by the processor unit 28. As described above, **the transmitted light pulses may be delivered back optically or electrically. If electrical transmission is used, the probe cable 16 includes conductive means, such as thin wires, for carrying the electrical signal. If optical transmission is used, the probe cable 16 may include a second optical light guide for transferring the transmitted pulses.** Pologe at 7:1-11 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Pologe, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Pologe, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[j]. the wireless data comprising at least a part of the physiological information,	Pologe discloses or renders obvious the wireless data comprising at least a part of the physiological information.

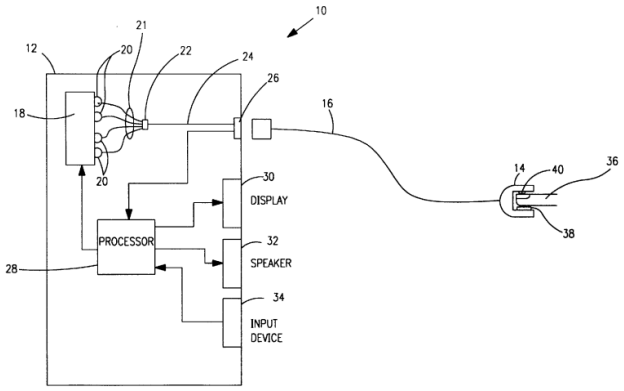
’868 Patent	Pologe
	In yet another aspect of the present invention, **a photoplethysmographic measurement apparatus for measuring a blood analyte level in a tissue** under test is provided. The apparatus includes: a plurality of emitters, wherein each device produces a light signal having a unique spectral content; a wavelength division multiplexing (WDM) coupler for combining the light signals from the plurality of emitters into a single light signal, wherein the WDM coupler is capable of simultaneously receiving multiple light pulses having unique spectral contents and simultaneously coupling the multiple light pulses onto a single light guide resulting in a single light pulse on the light guide that contains the spectral contents of all of the multiple light pulses; means for delivering the single light signal to the tissue so that the single light signal is directed into the tissue; means for **receiving a transmitted light signal from the tissue, the transmitted light signal resulting from the transmission of the single light signal through the tissue; and means for processing the transmitted light signal to determine a blood analyte level in the tissue.** Pologe at 3:36-56  FIG. 1 Pologe at Fig. 1 In one embodiment, as illustrated in FIG. 1, the invention is implemented in a pulse oximetry system 10. The system 10 comprises: a main test unit 12, a probe 14, and a probe cable 16. During a measurement, the probe 14 is first attached to an appropriate appendage of a person being tested, such as finger 36 illustrated in FIG. 1. **Light pulses are then delivered from the main test unit 12 to the probe 14 via a single optical transmission line in the probe cable 16. The light pulses are then directed into the**

’868 Patent	Pologe
	finger 36, travel through the finger 36, and emerge on the other side of the finger 36 where they are received by a light pick up device 38. The received light pulses may then be delivered back to the main test unit 12, via probe cable 16, where they are processed to determine the level of one or more blood analytes in the person's arterial blood. Processing methods to determine the blood analyte levels are known and, therefore, will not be discussed further. It should be understood, however, that the benefits of the present invention are independent of the precise method used to measure the analyte levels and, therefore, the invention may be used with virtually any processing method, whether currently known or developed in the future. Pologe at 4:33-54 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Pologe, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Pologe, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[k]. wherein the control system is further capable of receiving voice input signals and manually entered input signals; and	Pologe discloses or renders obvious the control system is further capable of receiving voice input signals and manually entered input signals.  FIG. 1 Pologe at Fig. 1

’868 Patent	Pologe
	In one embodiment, as illustrated in FIG. 1, the invention is implemented in a pulse oximetry system 10. The system 10 comprises: a main test unit 12, a probe 14, and a probe cable 16. During a measurement, the probe 14 is first attached to an appropriate appendage of a person being tested, such as finger 36 illustrated in FIG. 1. **Light pulses are then delivered from the main test unit 12 to the probe 14 via a single optical transmission line in the probe cable 16. The light pulses are then directed into the finger 36, travel through the finger 36, and emerge on the other side of the finger 36 where they are received by a light pick up device 38. The received light pulses may then be delivered back to the main test unit 12, via probe cable 16, where they are processed to determine the level of one or more blood analytes in the person's arterial blood.** Processing methods to determine the blood analyte levels are known and, therefore, will not be discussed further. It should be understood, however, that the benefits of the present invention are independent of the precise method used to measure the analyte levels and, therefore, the invention may be used with virtually any processing method, whether currently known or developed in the future. Pologe at 4:33-54 The main test unit 12 includes: an emitter module 18 having a plurality of emitters 20, each capable of producing a light signal having a unique spectral content; a plurality of optical cables 21 each coupled to a single emitter source for carrying the corresponding light signal; an optical coupler 22 for coupling light signals from each of the plurality of cables 21 to a single output cable 24; a front panel connector 26 for use in coupling the probe cable 16 to the main test unit 12; **a processor unit 28 for performing processing and control functions**; a display unit 30 for displaying measurement values to a user; **a speaker 32 for providing audible tones to the user; and an input device 34, such as a keypad or a touch screen**, **for allowing the user to input commands** and other information to the processor unit 28. Pologe at 4:63, 5:9 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Pologe, it would

’868 Patent	Pologe
	have been obvious to one of ordinary skill in the art to combine, with the teachings of Pologe, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[l]. a host comprising:	Pologe discloses or renders obvious the diagnostic system comprises a host.  FIG. 1 Pologe at Fig. 1 **In one embodiment, as illustrated in FIG. 1, the invention is implemented in a pulse oximetry system 10. The system 10 comprises: a main test unit 12**, a probe 14, and a probe cable 16. During a measurement, the probe 14 is first attached to an appropriate appendage of a person being tested, such as finger 36 illustrated in FIG. 1. **Light pulses are then delivered from the main test unit 12 to the probe 14 via a single optical transmission line in the probe cable 16. The light pulses are then directed into the finger 36, travel through the finger 36, and emerge on the other side of the finger 36 where they are received by a light pick up device 38. The received light pulses may then be delivered back to the main test unit 12, via probe cable 16, where they are processed to determine the level of one or more blood analytes in the person's arterial blood.** Processing methods to determine the blood analyte levels are known and, therefore, will not be discussed further. It should be understood, however, that the benefits of the present invention are independent of the precise method used to measure the analyte levels and, therefore, the invention may be used with virtually any processing method, whether currently known or developed in the future. Pologe at 4:33-54

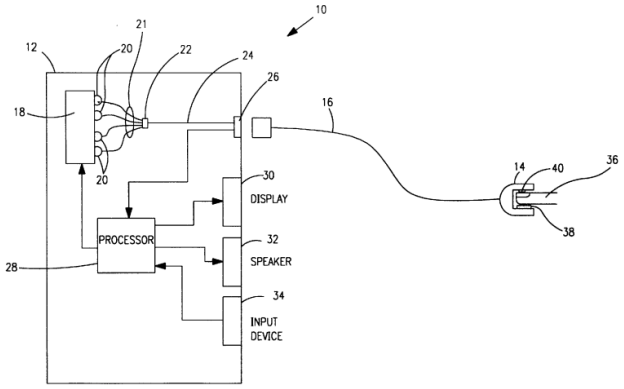
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Pologe
	The main test unit 12 includes: an emitter module 18 having a plurality of emitters 20, each capable of producing a light signal having a unique spectral content; a plurality of optical cables 21 each coupled to a single emitter source for carrying the corresponding light signal; an optical coupler 22 for coupling light signals from each of the plurality of cables 21 to a single output cable 24; a front panel connector 26 for use in coupling the probe cable 16 to the main test unit 12; **a processor unit 28 for performing processing and control functions; a display unit 30 for displaying measurement values to a user; a speaker 32 for providing audible tones to the user; and an input device 34, such as a keypad or a touch screen, for allowing the user to input commands and other information to the processor unit 28.** Pologe at 4:63-5:9 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Pologe, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Pologe, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[m]. a digital file for receiving and storing at least a portion of the wireless data;	Pologe discloses or renders obvious the host comprises a digital file for receiving and storing at least a portion of the wireless data.  FIG. 1

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

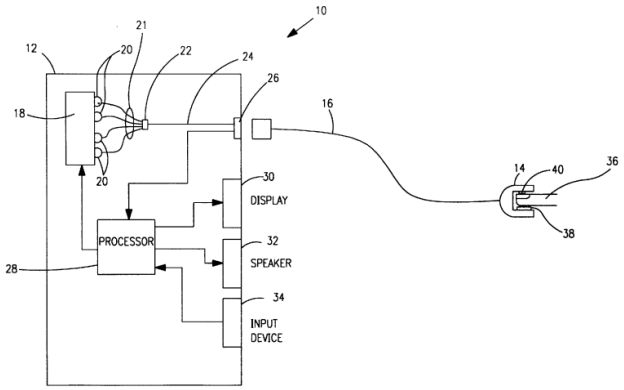
’868 Patent	Pologe
	Pologe at Fig. 1 The main test unit 12 includes: an emitter module 18 having a plurality of emitters 20, each capable of producing a light signal having a unique spectral content; a plurality of optical cables 21 each coupled to a single emitter source for carrying the corresponding light signal; an optical coupler 22 for coupling light signals from each of the plurality of cables 21 to a single output cable 24; a front panel connector 26 for use in coupling the probe cable 16 to the main test unit 12; **a processor unit 28 for performing processing and control functions; a display unit 30 for displaying measurement values to a user; a speaker 32 for providing audible tones to the user; and an input device 34, such as a keypad or a touch screen, for allowing the user to input commands and other information to the processor unit 28.** Pologe at 4:63, 5:9 During operation, **the processor unit 28 receives user commands from the input device 34. The processor unit 28 then carries out the commands by controlling the other components in the system 10.** For example, the processor unit 28 may receive a command from a user to set alarm limits or to silence an alarm. Pologe at 5:10-15 To perform an oxygen saturation measurement, **the processor unit 28 sends a signal to the emitter unit 18 causing the emitters 20 to produce their corresponding light signals.** The emitters 20 may include, for example, laser diodes or light emitting diodes (LEDs). In addition, in one embodiment of the invention, the plurality of emitters includes one or more broadband light sources and appropriate filtering means. As used herein, the term "light emitting diode" includes both infrared emitting diodes and ultraviolet emitting diodes. The light signals are combined in the optical coupler 22 into a single multiplexed light signal on output cable 24. Output cable 24 delivers the multiplexed signal to front panel connector 26 from which it is launched onto a single optical light guide within probe cable 16. Probe cable 16 delivers the multiplexed light signal to the probe 14, from which it is directed into the test subject's finger 36. After the multiplexed light signal has been transmitted through the finger 36, it is returned to the main test unit 12 via probe cable 16 in either optical or electrical form. Pologe at 5:16-34

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

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7[n]. control logic at the host to process at least the portion of the wireless data to generate a status of the user;	Pologe discloses or renders obvious the host comprises control logic at the host to process at least the portion of the wireless data to generate a status of the user.  FIG. 1 Pologe at Fig. 1 **The main test unit 12 includes: an emitter module 18 having a plurality of emitters 20, each capable of producing a light signal having a unique spectral content; a plurality of optical cables 21 each coupled to a single emitter source for carrying the corresponding light signal; an optical coupler 22 for coupling light signals from each of the plurality of cables 21 to a single output cable 24; a front panel connector 26 for use in coupling the probe cable 16 to the main test unit 12; a processor unit 28 for performing processing and control functions; a display unit 30 for displaying measurement values to a user; a speaker 32 for providing audible tones to the user; and an input device 34, such as a keypad or a touch screen, for allowing the user to input commands and other information to the processor unit 28.**

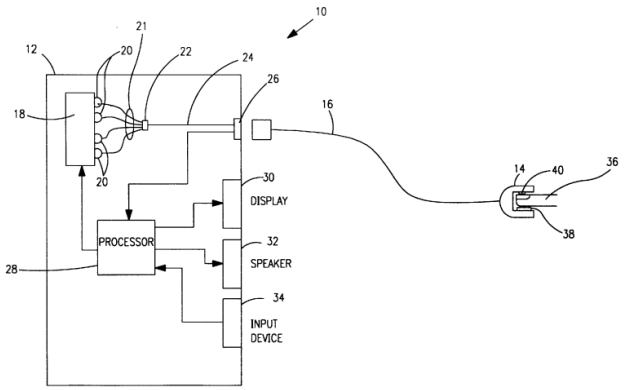
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	Pologe at 4:63, 5:9 During operation, **the processor unit 28 receives user commands from the input device 34. The processor unit 28 then carries out the commands by controlling the other components in the system 10.** For example, the processor unit 28 may receive a command from a user to set alarm limits or to silence an alarm. Pologe at 5:10-15 **To perform an oxygen saturation measurement, the processor unit 28 sends a signal to the emitter unit 18 causing the emitters 20 to produce their corresponding light signals.** The emitters 20 may include, for example, laser diodes or light emitting diodes (LEDs). In addition, in one embodiment of the invention, the plurality of emitters includes one or more broadband light sources and appropriate filtering means. As used herein, the term "light emitting diode" includes both infrared emitting diodes and ultraviolet emitting diodes. The light signals are combined in the optical coupler 22 into a single multiplexed light signal on output cable 24. Output cable 24 delivers the multiplexed signal to front panel connector 26 from which it is launched onto a single optical light guide within probe cable 16. Probe cable 16 delivers the multiplexed light signal to the probe 14, from which it is directed into the test subject's finger 36. After the multiplexed light signal has been transmitted through the finger 36, it is returned to the main test unit 12 via probe cable 16 in either optical or electrical form. Pologe at 5:16-34 In addition to the **optical light guide that carries the light pulses to the probe 14, the probe cable 16 must also provide a path for the transmitted light pulses to travel back to the main test unit 12, for processing by the processor unit 28.** As described above, the transmitted light pulses may be delivered back optically or electrically. If electrical transmission is used, the probe cable 16 includes conductive means, such as thin wires, for carrying the electrical signal. If optical transmission is used, the probe cable 16 may include a second optical light guide for transferring the transmitted pulses. Pologe at 7:1-11

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

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7[o]. a memory storage device for recording the status; and	Pologe discloses or renders obvious the host comprises a memory storage device for recording the status.  FIG. 1 Pologe at Fig. 1 The main test unit 12 includes: an emitter module 18 having a plurality of emitters 20, each capable of producing a light signal having a unique spectral content; a plurality of optical cables 21 each coupled to a single emitter source for carrying the corresponding light signal; an optical coupler 22 for coupling light signals from each of the plurality of cables 21 to a single output cable 24; a front panel connector 26 for use in coupling the probe cable 16 to the main test unit 12; **a processor unit 28 for performing processing and control functions;** a display unit 30 for displaying measurement values to a user; a speaker 32 for providing audible tones to the user; and an input device 34, such as a keypad or a touch screen, **for allowing the user to input commands and other information to the processor unit 28.** Pologe at 4:63, 5:9

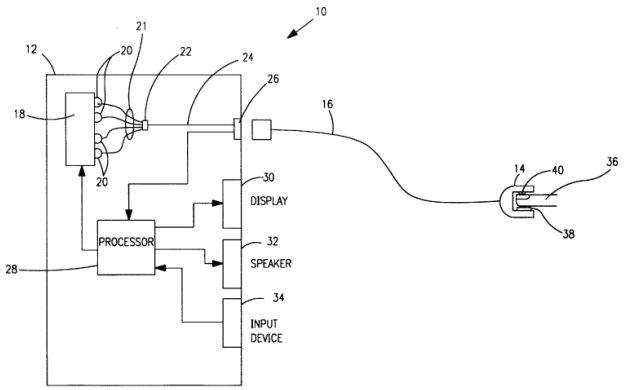
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	During operation, **the processor unit 28 receives user commands from the input device 34. The processor unit 28 then carries out the commands by controlling the other components in the system 10. For example, the processor unit 28 may receive a command from a user to set alarm limits or to silence an alarm.** Pologe at 5:10-15 **To perform an oxygen saturation measurement, the processor unit 28 sends a signal to the emitter unit 18 causing the emitters 20 to produce their corresponding light signals.** The emitters 20 may include, for example, laser diodes or light emitting diodes (LEDs). In addition, in one embodiment of the invention, the plurality of emitters includes one or more broadband light sources and appropriate filtering means. As used herein, the term "light emitting diode" includes both infrared emitting diodes and ultraviolet emitting diodes. The light signals are combined in the optical coupler 22 into a single multiplexed light signal on output cable 24. Output cable 24 delivers the multiplexed signal to front panel connector 26 from which it is launched onto a single optical light guide within probe cable 16. **Probe cable 16 delivers the multiplexed light signal to the probe 14, from which it is directed into the test subject's finger 36. After the multiplexed light signal has been transmitted through the finger 36, it is returned to the main test unit 12 via probe cable 16 in either optical or electrical form.** Pologe at 5:16-34 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Pologe, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Pologe, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[p]. an output for communicating at least a portion of the status or associated information over a communication link to one	Pologe discloses or renders obvious the host comprises an output for communicating at least a portion of the status or associated information over a communication link to one or more display output devices, wherein the one or more display output devices are located remotely from the host.

’868 Patent	Pologe
or more display output devices,	 FIG. 1 Pologe at Fig. 1 In one embodiment, as illustrated in FIG. 1, the invention is implemented in a pulse oximetry system 10. The system 10 comprises: a main test unit 12, a probe 14, and a probe cable 16. During a measurement, the probe 14 is first attached to an appropriate appendage of a person being tested, such as finger 36 illustrated in FIG. 1. **Light pulses are then delivered from the main test unit 12 to the probe 14 via a single optical transmission line in the probe cable 16. The light pulses are then directed into the finger 36, travel through the finger 36, and emerge on the other side of the finger 36 where they are received by a light pick up device 38. The received light pulses may then be delivered back to the main test unit 12, via probe cable 16, where they are processed to determine the level of one or more blood analytes in the person's arterial blood.** Processing methods to determine the blood analyte levels are known and, therefore, will not be discussed further. It should be understood, however, that the benefits of the present invention are independent of the precise method used to measure the analyte levels and, therefore, the invention may be used with virtually any processing method, whether currently known or developed in the future. Pologe at 4:33-54 The main test unit 12 includes: an emitter module 18 having a plurality of emitters 20, each capable of producing a light signal having a unique spectral content; a plurality of optical cables 21 each coupled to a single emitter source for carrying the corresponding light signal; an optical coupler 22 for coupling light signals from each of the plurality of cables 21 to a single output cable 24; **a front panel connector**

’868 Patent	Pologe
	26 for use in coupling the probe cable 16 to the main test unit 12; a processor unit 28 for performing processing and control functions; a display unit 30 for displaying measurement values to a user; a speaker 32 for providing audible tones to the user; and an input device 34, such as a keypad or a touch screen, for allowing the user to input commands and other information to the processor unit 28. Pologe at 4:63-5:9 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Pologe, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Pologe, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[q]. wherein the one or more display output devices are located remotely from the host.	Pologe discloses or renders obvious the one or more display output devices are located remotely from the host. In one embodiment, as illustrated in FIG. 1, the invention is implemented in a pulse Oximetry System 10. The system 10 comprises: a main test unit 12, a probe 14, and a probe cable 16. During a measurement, the probe 14 is first attached to an appropriate appendage of a person being tested, such as finger 36 illustrated in FIG. 1. Light pulses are then delivered from the main test unit 12 to the probe 14 via a Single optical transmission line in the probe cable 16. The light pulses are then directed into the finger 36, travel through the finger 36, and emerge on the other side of the finger 36 where they are received by a light pick up device 38. The received light pulses may then be delivered back to the main test unit 12, via probe cable 16, where they are processed to determine the level of one or more blood analytes in the person's arterial blood. Processing methods to determine the blood analyte levels are known and, therefore, will not be discussed further. It should be understood, however, that the benefits of the present inven tion are independent of the precise method used to measure the analyte levels and, therefore, the invention may be used with virtually any processing method, whether currently known or developed in the future. **Before the light pulses are processed, it is generally required that they be converted to electrical form. This conversion may be performed in the probe, in which case the probe cable includes a thin electrical conductor for carrying the electrical signal back to the main test unit**, or it may be

’868 Patent	Pologe
	performed in the main test unit 12, in which case the light signals are delivered back over the same or a different light transmission line in the probe cable. Pologe at 4:33-62 The main test unit 12 includes: an emitter module 18 having a plurality of emitters 20, each capable of producing a light signal having a unique spectral content; a plurality of optical cables 21 each coupled to a single emitter source for carrying the corresponding light signal; an optical coupler 22 for coupling light signals from each of the plurality of cables 21 to a single output cable 24; **a front panel connector 26 for use in coupling the probe cable 16 to the main test unit 12; a processor unit 28 for performing processing and control functions; a display unit 30 for displaying measurement values to a user**; a speaker 32 for providing audible tones to the user; and an input device 34, such as a keypad or a touch screen, for allowing the user to input commands and other information to the processor unit 28. Pologe at 4:63-5:9 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Pologe, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Pologe, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
Claim 8	
8. The diagnostic system of claim 7, wherein the light source comprises a plurality of semiconductor diodes that are further coupled to a multiplexer capable of combining the plurality of semiconductor diodes and generating the input light	*See* claim 7 above. Pologe discloses or renders obvious the light source comprises a plurality of semiconductor diodes that are further coupled to a multiplexer capable of combining the plurality of semiconductor diodes and generating the input light beam comprising one or more wavelengths.

’868 Patent	Pologe
beam comprising one or more wavelengths.	 FIG. 1 Pologe at Fig. 1 In yet another aspect of the present invention, **a photoplethysmographic measurement apparatus for measuring a blood analyte level in a tissue under test is provided.** The apparatus includes: a plurality of emitters, wherein each device produces a light signal having a unique spectral content; **a wavelength division multiplexing (WDM) coupler for combining the light signals from the plurality of emitters into a single light signal, wherein the WDM coupler is capable of simultaneously receiving multiple light pulses having unique spectral contents and simultaneously coupling the multiple light pulses onto a single light guide resulting in a single light pulse on the light guide that contains the spectral contents of all of the multiple light pulses; means for delivering the single light signal to the tissue so that the single light signal is directed into the tissue; means for receiving a transmitted light signal from the tissue, the transmitted light signal resulting from the transmission of the single light signal through the tissue; and means for processing the transmitted light signal to determine a blood analyte level in the tissue.** Pologe at 3:36-56 To perform an oxygen saturation measurement, **the processor unit 28 sends a signal to the emitter unit 18 causing the emitters 20 to produce their corresponding light signals**. **The emitters 20 may include, for example, laser diodes or light emitting diodes (LEDs).** In addition, in one embodiment of the invention, the plurality of emitters includes one or more broadband light sources and appropriate filtering means. As used herein, **the term "light emitting diode" includes both infrared emitting**

’868 Patent	Pologe
	diodes and ultraviolet emitting diodes. The light signals are combined in the optical coupler 22 into a single multiplexed light signal on output cable 24. Output cable 24 delivers the multiplexed signal to front panel connector 26 from which it is launched onto a single optical light guide within probe cable 16. Probe cable 16 delivers the multiplexed light signal to the probe 14, from which it is directed into the test subject's finger 36. After the multiplexed light signal has been transmitted through the finger 36, it is returned to the main test unit 12 via probe cable 16 in either optical or electrical form. Pologe at 5:16-34 **To perform photoplethysmographic measurements, light sources must be used that are each capable of producing relatively narrow band light** having a unique spectral content. As described above, **some light sources capable of performing this function are, for example, light emitting diodes and laser diodes.** It is also possible to use a single broadband light source in combination with a number of narrow band filters, although this technique has a number of distinct disadvantages which make it a suboptimal solution. Pologe at 5:36-44 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Pologe, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Pologe, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
Claim 9	
9. The diagnostic system of claim 7, wherein at least the portion of the input light beam is adapted for use in a diagnostics to measure a property of the blood, wherein the diagnostics	*See* claim 7 above. Pologe discloses or renders obvious the portion of the input light beam is adapted for use in a diagnostics to measure a property of the blood, wherein the diagnostics comprise a spectroscopic procedure, wherein the spectroscopic procedure is based at least in part on a comparison of amplitudes at a plurality of associated wavelengths transmitted or reflected from the blood.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Pologe
comprise a spectroscopic procedure, wherein the spectroscopic procedure is based at least in part on a comparison of amplitudes at a plurality of associated wavelengths transmitted or reflected from the blood.	The WDM coupler is capable of simultaneously coupling multiple light pulses having different spectral contents onto a single light guide. That is, **the WDM coupler is capable of producing a wavelength multiplexed pulse on the single light guide that includes the spectral contents of all of the multiple light pulses.** In this regard, **the WDM coupler can include any of a number of coupler types, such as those using lenses**, prisms, interference filters, diffraction gratings, or butt coupling. In addition, active WDM couplers can also be used. Pologe at 3:63-4:5 In one embodiment, as illustrated in FIG. 1, the invention is implemented in a pulse oximetry system 10. The system 10 comprises: a main test unit 12, a probe 14, and a probe cable 16. During a measurement, the probe 14 is first attached to an appropriate appendage of a person being tested, such as finger 36 illustrated in FIG. 1. **Light pulses are then delivered from the main test unit 12 to the probe 14 via a single optical transmission line in the probe cable 16. The light pulses are then directed into the finger 36, travel through the finger 36, and emerge on the other side of the finger 36 where they are received by a light pick up device 38. The received light pulses may then be delivered back to the main test unit 12, via probe cable 16, where they are processed to determine the level of one or more blood analytes in the person's arterial blood. Processing methods to determine the blood analyte levels are known** and, therefore, will not be discussed further. It should be understood, however, that the benefits of the present invention are independent of the precise method used to measure the analyte levels and, therefore, the invention may be used with virtually any processing method, whether currently known or developed in the future. Pologe at 4:33-54 **To perform photoplethysmographic measurements, light sources must be used that are each capable of producing relatively narrow band light having a unique spectral content.** As described above, **some light sources capable of performing this function are, for example, light emitting diodes and laser diodes. It is also possible to use a single broadband light source in combination with a number of narrow band filters,** although this technique has a number of distinct disadvantages which make it a suboptimal solution. Pologe at 5:36-44

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

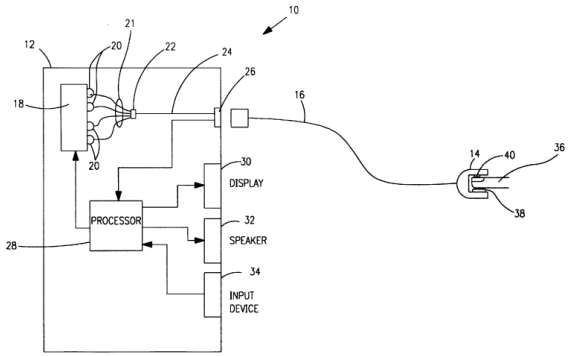
’868 Patent	Pologe
	 FIG. 1 Pologe at Fig. 1 **The optical coupler 22 may comprise any type of device capable of receiving individual light signals from multiple sources and combining them into a single multiplexed signal**. In this regard, any of a number of **different types of wavelength division multiplexing (WDM) couplers** may be used, such as WDM couplers using lenses, prisms, interference filters, diffraction gratings, or butt coupling. Also, **active WDM couplers can be used, such as those including cascaded or parallel emitters on a single substrate**. **Wavelength division multiplexing refers to any method whereby multiple light signals having unique and substantially non-overlapping spectral contents are coupled onto a common light guide. The individual components of the multiplexed signal can then be separated back out by any of a number of methods.** Pologe at 5:45-59 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Pologe, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Pologe, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.

EXHIBIT A4

U.S. Pat. No. 9,055,868 in view of U.S. Patent Publication No. 2002/0198473 to Kishore Kumar ("Kumar")

As described in detail below, Kumar (individually or collectively) anticipates and/or renders obvious claim 7-9 ("Asserted Claims") of U.S. Patent No. 9,055,868 (the "' 868 Patent") under 35 U.S.C. §102 and/or §103, either alone in combination with the knowledge of a person of ordinary skill, and/or additional prior art references discussed in discussed in Exhibits A1-A10, the contents of which are hereby incorporated by reference into this chart. One of ordinary skill in the art, as of the priority date of the '868 Patent, would have known to combine the prior art elements disclosed by the foregoing references using known methods, and to use these elements according to their established functions in order to achieve a known and predictable result. This invalidity claim chart is based on Defendants' present understanding of the Asserted Claims and Plaintiff's apparent construction of the Asserted Claims in its Preliminary Infringement Contentions ("Infringement Contentions").

The following invalidity chart includes references to the structure, function, operation, and/or features of the technology described in Kumar. The cited portions of Kumar are merely illustrative, and Defendants reserve the right to rely on alternative or additional evidence, including uncited portions of Kumar. Where a particular figure is cited, the citation should be understood to encompass the caption and description of the figure as well as any text relating to or describing the figure. Conversely, where particular text referring to a figure is cited, the citation should be understood to include the figure as well. Although the documentation collectively evidences prior knowledge, use, or sale, Defendants reserve the right to rely upon individual documents as printed publications. Where the chart below states that Kumar "describes" or "provides for" a limitation, such disclosure may be express, inherent, or implicit. To the extent it is found Kumar does not expressly disclose certain limitations in the asserted claim, such limitations are inherent. Defendants reserve the right to present direct evidence of the structure, function, operation, and/or features of the technology described in Kumar (including product samples, source code, and/or witness testimony) and/or its prior art status, and to present alternative or additional documents concerning the same as evidence that the technology described in Kumar anticipates and/or renders obvious the Asserted Claims of the '868 Patent.

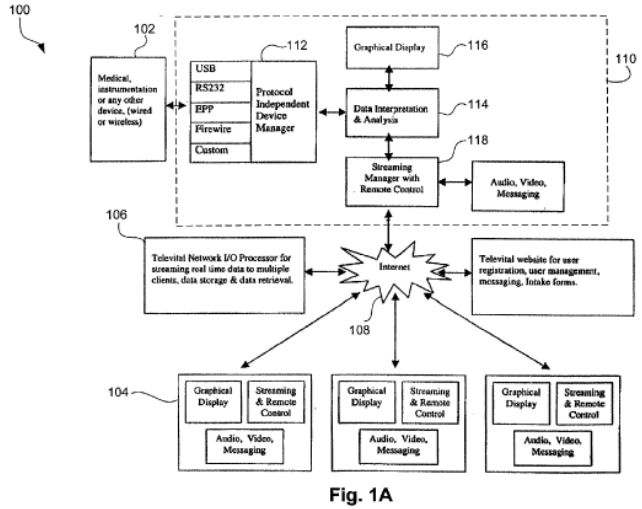
This chart is subject to all reservations, objections, and disclaimers in Defendants' Invalidity Contentions and any amendment, supplement, or modification thereof, which are incorporated herein by reference in their entirety. Nothing stated herein shall be treated as an admission or suggestion that Defendants agree with Plaintiff regarding the scope of the Asserted Claims, Plainitff's apparent claim constructions, or the accuracy of any particular claim construction. Defendants reserve all rights to challenge any of the claim terms herein under 35 U.S.C. § 112, including by arguing that they are indefinite, are not supported by the written description, and/or are not enabled. Defendants further reserve all rights to amend this invalidity claim chart without leave of court pursuant to the Court's Docket Control Order, or upon a showing of good cause.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

EXHIBIT A4

’868 Patent	Kumar
Claim 7	
7[pre]. A diagnostic system comprising:	By providing this disclosure, the Defendants does not take a position on whether the preamble is limiting. Kumar discloses or renders obvious a diagnostic system. A system and method are provided for network-based monitoring of physiological data. At least one patient-side device collects physiological data from a patient. A provider-side device receives the data from at least one patient-side device via a wide area network. An engine communicates with at least one patient-side device and the provider-side device. The engine manages transmission of the data from the patient-side device to the provider-side device. Kumar at Abstract For simplicity, the discussion will proceed with description of a system having a single patient-side and provider-side device. The patient-side device is located with the patient/client and gathers physiological data from the patient/client. The patient-side device can include, for example, a medical and/or biofeedback device that communicates through a serial, parallel, wireless, or customized interface. The patient-side device may then be connected via a computing device, such as a computer, personal digital assistant (PDA), etc., to the WAN. Alternatively, the patient-side device may have a built-in computing device for communication over the WAN. Optionally, the provider-side device can be any type of computing device, such as a computer, PDA, etc. Kumar at [0013]

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Kumar
	 Fig. 1A Kumar at Fig. 1A FIG. 1A is a diagram of an exemplary **system architecture 100 for network-based monitoring of data from a patient-side physiological collecting device according to one illustrative embodiment. As shown, the system includes one or more patient-side devices 102 for collecting data from a patient/client, one or more provider-side devices 104, and an engine implemented on a central server 106.** The devices and engine are connected to a wide area network (WAN) 108 such as the Internet, intranet, or extranet. The system allows for the real-time streaming of raw, interpreted, and/or processed physiological data as well as textual/audio/video data from a patient to a health care provider. However, other embodiments may contemplate non-medical/non-biofeedback devices and non-human monitoring. Kumar at [0067] **The patient-side device is located with a patient and can be any device that gathers physiological data from the patient. Illustrative patient-side devices include, but are not limited to, telemetary EKG, EMG and EEG monitors; continuous blood pressure and blood glucose watches; cellular transmission holter monitors; wireless plethysmograph rings; automated IBS and depression multimedia protocols; T-shirts wired with sensors that monitor and record physical and emotional indicators derived from heart activity, breathing patterns and blood pressure; bracelets, earrings**

’868 Patent	Kumar
	and necklaces that monitor physiological activity; implanted devices that capture and transmits a person's vital body-function data, such as body temperature or pulse, to an internet-intergraged ground station while providing global positioning information. Kumar at [0071] The patient-side device may then be connected via a computing device **110**, such as a computer, handheld devices such as personal digital assistants (PDAs) and pocket PCs such as IPAQ with Windows CE operating System and Palm devices based on Palm OS), wireless telephone, or any other computing device, to the WAN. Optionally, the patient-side device may have a built-in computing device for communication over the WAN. A protocol independent device manager **112** running on the computing device establishes a two-way communication with a vast array of client-side devices, including but not limited to medical and/or biofeedback devices, holter monitors, telemetry units, data acquisition units, etc. Each patient-side device can be wired or wireless, and communicates through a serial (RS232, USB, IEEE 1394, etc.), parallel, fire-wire, wireless, or customized interface/protocol. Similarly, the provider-side device can be any type of computing device, such as a computer, PDA, wireless telephone, etc. In one embodiment, the provider's computing device (such as a PDA or telephone) has a wireless connection to the WAN so that, even though the doctor is not at a hospital or in his office, he may still be consulted remotely without the need to rush to the hospital. FIG. 1B illustrates browser-based real-time **3** lead and spirometry transmitting, viewing and receiving on a wireless Internet connection using a pocket PC **150**. Kumar at [0072] The system may be adapted to include web-enabled spirometers and oximeters, allowing healthcare practitioners to perform remote spirometry and oximetry tests. FIG. 24A shows a screen **2400** displaying a patient's blood oxygen saturation and pulse rate. FIG. 24B depicts another screen **2420** displaying historical blood oxygen saturation and pulse rate data. FIG. 24C shows a screen **2440** displaying both historical and numerical oximetry data. FIG. 25 depicts a screen **2500** displaying a comprehensive report of a pulse oximetry testing session. FIG. 26 depicts a screen **2600** displaying a spirometry graph, numerical results, and predictors. Kumar at [0203]

’868 Patent	Kumar
	Web-enabled spirometry allows for real-time remote testing, retrieval, and analysis of a patient's pulmonary function tests from any Internet-enabled computer. Such remote spirometry greatly improves the management and prevention of pulmonary problems in various healthcare segments, including pharmaceutical research, HMO's, educational institutions, and from isolated areas such as on aircrafts and ships. Kumar at [0204] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendants’ Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Kumar , it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Kumar , those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[a]. a light source comprising:	Kumar discloses or renders obvious a diagnostic system comprises a light source. **The patient-side device is located with a patient and can be any device that gathers physiological data from the patient. Illustrative patient-side devices include, but are not limited to**, telemetary EKG, EMG and EEG monitors; continuous blood pressure and **blood glucose watches**; cellular transmission holter monitors; wireless plethysmograph rings; automated IBS and depression multimedia protocols; T-shirts wired with sensors that monitor and record physical and emotional indicators derived from heart activity, breathing patterns and blood pressure**; bracelets, earrings and necklaces that monitor physiological activity**; implanted devices that capture and transmits a person's vital body-function data, such as body temperature or pulse, to an internet-intergraged ground station while providing global positioning information. Kumar at [0071] The system may be adapted to include web-enabled spirometers and **oximeters**, allowing healthcare practitioners to perform remote spirometry and oximetry tests. FIG. 24A shows a screen 2400 displaying a patient's blood oxygen saturation and pulse rate. FIG. 24B depicts another screen 2420 displaying historical blood oxygen saturation and pulse rate data. FIG. 24C shows a screen 2440 displaying both historical and numerical oximetry data. FIG. 25 depicts a screen 2500 displaying a

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Kumar
	comprehensive report of a pulse oximetry testing session. FIG. 26 depicts a screen 2600 displaying a spirometry graph, numerical results, and predictors. Kumar at [0203] *See also* Kumar at Figs. 24A, 24B, 24C, 25 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendants’ Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Kumar , it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Kumar , those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[b]. one or more semiconductor diodes generating an input light beam; and	Kumar discloses or renders obvious the light source comprises one or more semiconductor diodes generating an input light beam. **The patient-side device is located with a patient and can be any device that gathers physiological data from the patient. Illustrative patient-side devices include, but are not limited to**, telemetary EKG, EMG and EEG monitors; continuous blood pressure and **blood glucose watches**; cellular transmission holter monitors; wireless plethysmograph rings; automated IBS and depression multimedia protocols; T-shirts wired with sensors that monitor and record physical and emotional indicators derived from heart activity, breathing patterns and blood pressure**; bracelets, earrings and necklaces that monitor physiological activity**; implanted devices that capture and transmits a person's vital body-function data, such as body temperature or pulse, to an internet-intergraged ground station while providing global positioning information. Kumar at [0071] The system may be adapted to include web-enabled spirometers and **oximeters**, allowing healthcare practitioners to perform remote spirometry and oximetry tests. FIG. 24A shows a screen 2400 displaying a patient's blood oxygen saturation and pulse rate. FIG. 24B depicts another screen 2420 displaying historical blood oxygen saturation and pulse rate data. FIG. 24C shows a screen 2440

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

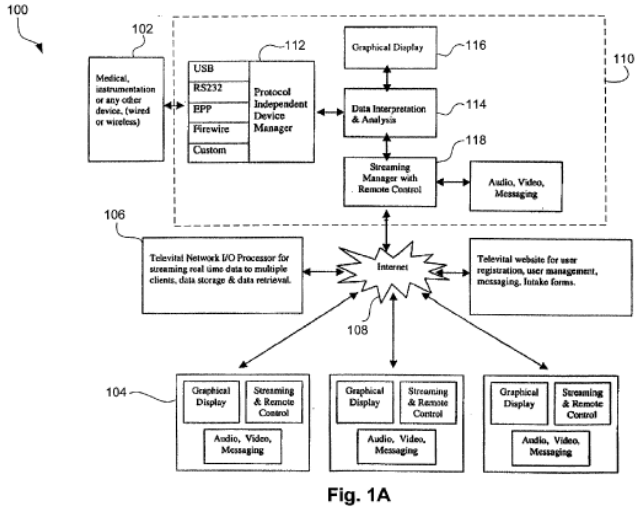
’868 Patent	Kumar
	displaying both historical and numerical oximetry data. FIG. 25 depicts a screen 2500 displaying a comprehensive report of a pulse oximetry testing session. FIG. 26 depicts a screen 2600 displaying a spirometry graph, numerical results, and predictors. Kumar at [0203] *See also* Kumar at Figs. 24A, 24B, 24C, 25 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendants’ Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Kumar , it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Kumar , those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[c]. a lens system configured to receive at least a portion of the input light beam and to communicate at least the portion of the input light beam onto a part of a user's body comprising blood	Kumar discloses or renders obvious the light source comprises a lens system configured to receive at least a portion of the input light beam and to communicate at least the portion of the input light beam onto a part of a user's body comprising blood. **The patient-side device is located with a patient and can be any device that gathers physiological data from the patient. Illustrative patient-side devices include, but are not limited to**, telemetary EKG, EMG and EEG monitors; continuous blood pressure and **blood glucose watches**; cellular transmission holter monitors; wireless plethysmograph rings; automated IBS and depression multimedia protocols; T-shirts wired with sensors that monitor and record physical and emotional indicators derived from heart activity, breathing patterns and blood pressure**; bracelets, earrings and necklaces that monitor physiological activity**; implanted devices that capture and transmits a person's vital body-function data, such as body temperature or pulse, to an internet-intergraged ground station while providing global positioning information. Kumar at [0071] The system may be adapted to include web-enabled spirometers and **oximeters**, allowing healthcare practitioners to perform remote spirometry and oximetry tests. FIG. 24A shows a screen 2400 displaying a patient's blood oxygen saturation and pulse rate. FIG. 24B depicts another screen 2420

’868 Patent	Kumar
	displaying historical blood oxygen saturation and pulse rate data. FIG. 24C shows a screen 2440 displaying both historical and numerical oximetry data. FIG. 25 depicts a screen 2500 displaying a comprehensive report of a pulse oximetry testing session. FIG. 26 depicts a screen 2600 displaying a spirometry graph, numerical results, and predictors. Kumar at [0203] *See also* Kumar at Figs. 24A, 24B, 24C, 25 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendants’ Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Kumar , it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Kumar , those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[d]. wherein at least the portion of the input light beam is used in a measurement on a user;	Kumar discloses or renders obvious the portion of the input light beam is used in a measurement on a user. **The patient-side device is located with a patient and can be any device that gathers physiological data from the patient. Illustrative patient-side devices include, but are not limited to**, telemetary EKG, EMG and EEG monitors; continuous blood pressure and **blood glucose watches**; cellular transmission holter monitors; wireless plethysmograph rings; automated IBS and depression multimedia protocols; T-shirts wired with sensors that monitor and record physical and emotional indicators derived from heart activity, breathing patterns and blood pressure**; bracelets, earrings and necklaces that monitor physiological activity**; implanted devices that capture and transmits a person's vital body-function data, such as body temperature or pulse, to an internet-intergraged ground station while providing global positioning information. Kumar at [0071] The system may be adapted to include web-enabled spirometers and **oximeters**, allowing healthcare practitioners to perform remote spirometry and oximetry tests. FIG. 24A shows a screen 2400 displaying a patient's blood oxygen saturation and pulse rate. FIG. 24B depicts another screen 2420

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Kumar
	displaying historical blood oxygen saturation and pulse rate data. FIG. 24C shows a screen 2440 displaying both historical and numerical oximetry data. FIG. 25 depicts a screen 2500 displaying a comprehensive report of a pulse oximetry testing session. FIG. 26 depicts a screen 2600 displaying a spirometry graph, numerical results, and predictors. Kumar at [0203] *See also* Kumar at Figs. 24A, 24B, 24C, 25 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendants’ Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Kumar , it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Kumar , those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[e]. a software application capable of generating data based at least in part on the measurement on the user,	Kumar discloses or renders obvious a software application capable of generating data based at least in part on the measurement on the user. A system and method are provided for network-based monitoring of physiological data. At least one patient-side device collects physiological data from a patient. A provider-side device receives the data from at least one patient-side device via a wide area network. An engine communicates with at least one patient-side device and the provider-side device. The engine manages transmission of the data from the patient-side device to the provider-side device. Kumar at Abstract For simplicity, the discussion will proceed with description of a system having a single patient-side and provider-side device. The patient-side device is located with the patient/client and gathers physiological data from the patient/client. The patient-side device can include, for example, a medical and/or biofeedback device that communicates through a serial, parallel, wireless, or customized interface. The patient-side device may then be connected via a computing device, such as a computer, personal digital assistant (PDA), etc., to the WAN. Alternatively, the patient-side device may have a built-in computing

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Kumar
	device for communication over the WAN. Optionally, the provider-side device can be any type of computing device, such as a computer, PDA, etc. Kumar at [0013]  **Fig. 1A** Kumar at Fig. 1A FIG. 1A is a diagram of an exemplary **system architecture 100 for network-based monitoring of data from a patient-side physiological collecting device according to one illustrative embodiment. As shown, the system includes one or more patient-side devices 102 for collecting data from a patient/client, one or more provider-side devices 104, and an engine implemented on a central server 106.** The devices and engine are connected to a wide area network (WAN) 108 such as the Internet, intranet, or extranet. The system allows for the real-time streaming of raw, interpreted, and/or processed physiological data as well as textual/audio/video data from a patient to a health care provider. However, other embodiments may contemplate non-medical/non-biofeedback devices and non-human monitoring. Kumar at [0067]

’868 Patent	Kumar
	The patient-side device is located with a patient and can be any device that gathers physiological data from the patient. Illustrative patient-side devices include, but are not limited to, telemetary EKG, EMG and EEG monitors; continuous blood pressure and blood glucose watches; cellular transmission holter monitors; wireless plethysmograph rings; automated IBS and depression multimedia protocols; T-shirts wired with sensors that monitor and record physical and emotional indicators derived from heart activity, breathing patterns and blood pressure; bracelets, earrings and necklaces that monitor physiological activity; implanted devices that capture and transmits a person's vital body-function data, such as body temperature or pulse, to an internet-intergraged ground station while providing global positioning information. Kumar at [0071] The patient-side device may then be connected via a computing device 110, such as a computer, handheld devices such as personal digital assistants (PDAs) and pocket PCs such as IPAQ with Windows CE operating System and Palm devices based on Palm OS), wireless telephone, or any other computing device, to the WAN. Optionally, **the patient-side device may have a built-in computing device for communication over the WAN. A protocol independent device manager 112 running on the computing device establishes a two-way communication with a vast array of client-side devices**, including but not limited to medical and/or biofeedback devices, holter monitors, telemetry units, data acquisition units, etc. Each patient-side device can be wired or wireless, and communicates through a serial (RS232, USB, IEEE 1394, etc.), parallel, fire-wire, wireless, or customized interface/protocol. Similarly, the provider-side device can be any type of computing device, such as a computer, PDA, wireless telephone, etc. In one embodiment, the provider's computing device (such as a PDA or telephone) has a wireless connection to the WAN so that, even though the doctor is not at a hospital or in his office, he may still be consulted remotely without the need to rush to the hospital. FIG. 1B illustrates browser-based real-time 3 lead and spirometry transmitting, viewing and receiving on a wireless Internet connection using a pocket PC 150. Kumar at [0072] Depending on available bandwidth, the system may allow for the real-time streaming of raw, interpreted, and processed physiological data as well as textual/audio/video data from a patient to a health care provider. **For example, the devices on the patient and/or provider sides may allow for various forms of communication including, but not limited to instant messaging, an integrated e-**

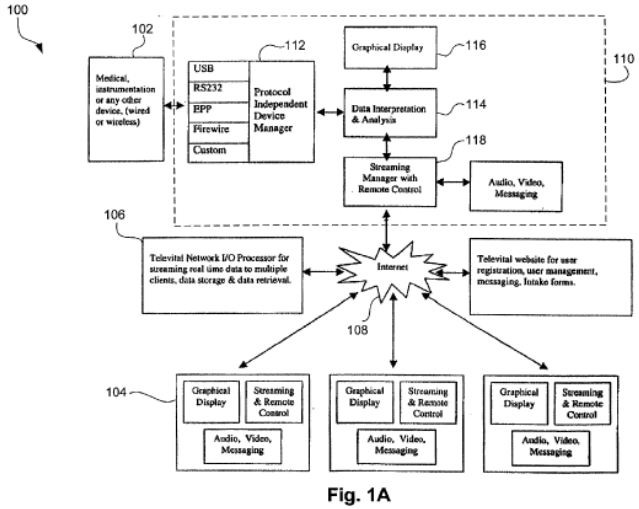
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Kumar
	mail system, real-time video, and real time audio. The audio and/or video can be synchronized with the biomedical signals to help correlate behavior with physiological activity. Preferably, the communications are provided via a browser-based interface. Using optional remote control features built in to the system, remote providers can control the software on the patient's end. **Thus, patients do not need to know how to operate the software**. Kumar at [0079]-[0080] A remote client module (not shown) allows remote hosts to view the data being streamed in real time. **The remote client module can also control the software being run on the patient's and/or provider's end.** Multiple remote client modules can run concurrently, allowing multiple remote providers to view data form one device. Kumar at [0085] Preferably, the entire system runs in the context of an Internet browser. Integration of the client-side device driver is performed in two steps. First, the appropriate device driver is incorporated into the system, preferably via a web page. A customized or standard GUI is incorporated or developed based on user and/or device manager specifications. **Thus, a user does not have to install any software, and updates to the software are done by simply running the latest software from a website.** Kumar at [0086] **The present invention may be implemented on a program or code that can be stored in a computer-readable (or electronically-readable) medium.** The system may be implemented using Apache web server, MySql on Linux, Oracle on Linux, Java servlets, Applets, HTML, JavaScript, Java, C#, Microsoft's .NET etc. Note also that the server may be implemented on the Internet, intranet, or an extranet. Kumar at [0087] **A further application includes monitoring patients on a mass scale. For example, such a using a screening protocol can include screening persons in third world countries on a large scale.**

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Kumar
	Kumar at [0272] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendants’ Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Kumar , it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Kumar , those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[f]. wherein the data represents at least in part physiological information associated with the user;	Kumar discloses or renders obvious the data represents at least in part physiological information associated with the user. **A system and method are provided for network-based monitoring of physiological data. At least one patient-side device collects physiological data from a patient. A provider-side device receives the data from at least one patient-side device via a wide area network. An engine communicates with at least one patient-side device and the provider-side device. The engine manages transmission of the data from the patient-side device to the provider-side device.** Kumar at Abstract For simplicity, the discussion will proceed with description of a system having a single patient-side and provider-side device. **The patient-side device is located with the patient/client and gathers physiological data from the patient/client. The patient-side device can include, for example, a medical and/or biofeedback device that communicates through a serial, parallel, wireless, or customized interface. The patient-side device may then be connected via a computing device, such as a computer, personal digital assistant (PDA), etc., to the WAN.** Alternatively, the patient-side device may have a built-in computing device for communication over the WAN. Optionally, the provider-side device can be any type of computing device, such as a computer, PDA, etc. Kumar at [0013]

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Kumar
	 Fig. 1A Kumar at Fig. 1A FIG. 1A is a diagram of an exemplary **system architecture 100 for network-based monitoring of data from a patient-side physiological collecting device according to one illustrative embodiment. As shown, the system includes one or more patient-side devices 102 for collecting data from a patient/client, one or more provider-side devices 104, and an engine implemented on a central server 106.** The devices and engine are connected to a wide area network (WAN) 108 such as the Internet, intranet, or extranet. **The system allows for the real-time streaming of raw, interpreted, and/or processed physiological data as well as textual/audio/video data from a patient to a health care provider.** However, other embodiments may contemplate non-medical/non-biofeedback devices and non-human monitoring. Kumar at [0067] **The patient-side device is located with a patient and can be any device that gathers physiological data from the patient. Illustrative patient-side devices include, but are not limited to, telemetary EKG, EMG and EEG monitors; continuous blood pressure and blood glucose watches; cellular transmission holter monitors; wireless plethysmograph rings; automated IBS and depression multimedia protocols; T-shirts wired with sensors that monitor and record physical and emotional indicators derived from heart activity, breathing patterns and blood pressure;**

’868 Patent	Kumar
	bracelets, earrings and necklaces that monitor physiological activity; implanted devices that capture and transmits a person's vital body-function data, such as body temperature or pulse, to an internet-intergraged ground station while providing global positioning information. Kumar at [0071] The patient-side device may then be connected via a computing device **110**, such as a computer, handheld devices such as personal digital assistants (PDAs) and pocket PCs such as IPAQ with Windows CE operating System and Palm devices based on Palm OS), wireless telephone, or any other computing device, to the WAN. Optionally, the patient-side device may have a built-in computing device for communication over the WAN. A protocol independent device manager **112** running on the computing device establishes a two-way communication with a vast array of client-side devices, including but not limited to medical and/or biofeedback devices, holter monitors, telemetry units, data acquisition units, etc. Each patient-side device can be wired or wireless, and communicates through a serial (RS232, USB, IEEE 1394, etc.), parallel, fire-wire, wireless, or customized interface/protocol. Similarly, the provider-side device can be any type of computing device, such as a computer, PDA, wireless telephone, etc. In one embodiment, the provider's computing device (such as a PDA or telephone) has a wireless connection to the WAN so that, even though the doctor is not at a hospital or in his office, he may still be consulted remotely without the need to rush to the hospital. FIG. 1B illustrates browser-based real-time **3** lead and spirometry transmitting, viewing and receiving on a wireless Internet connection using a pocket PC **150**. Kumar at [0072] **The system may be adapted to include web-enabled spirometers and oximeters, allowing healthcare practitioners to perform remote spirometry and oximetry tests.** FIG. 24A shows a screen 2400 displaying a patient's blood oxygen saturation and pulse rate. FIG. 24B depicts another screen 2420 displaying historical blood oxygen saturation and pulse rate data. FIG. 24C shows a screen 2440 displaying both historical and numerical oximetry data. FIG. 25 depicts a screen 2500 displaying a comprehensive report of a pulse oximetry testing session. FIG. 26 depicts a screen 2600 displaying a spirometry graph, numerical results, and predictors. Kumar at [0203]

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Kumar
	Web-enabled spirometry allows for real-time remote testing, retrieval, and analysis of a patient's pulmonary function tests from any Internet-enabled computer. Such remote spirometry greatly improves the management and prevention of pulmonary problems in various healthcare segments, including pharmaceutical research, HMO's, educational institutions, and from isolated areas such as on aircrafts and ships. Kumar at [0204] *See also* Kumar at Figs. 24A, 24B, 24C, 25 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendants’ Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Kumar , it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Kumar , those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[g]. the software application capable of operating on a control system adapted to receive, store and process at least a portion of the physiological information,	Kumar discloses or renders obvious the software application capable of operating on a control system adapted to receive, store and process at least a portion of the physiological information. System and method for real-time **monitoring, assessment, analysis, retrieval, and storage of physiological data** over a wide area network Kumar at Title The system of the exemplary embodiment preferably includes at least one patient-side device for collecting data from a patient/client, a provider-side device, and an engine, each coupled to the WAN. The engine manages transmission of the data from the patient-side device to the provider-side device. **This means that the engine may configure the devices to transfer the data directly from one device to the other; may receive the data from the patient-side device and transmit the raw or processed data to the provider-side device; may store the data for later transmission to the provider-side device, etc.** Kumar at [0011]

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Kumar
	Whether or not the provider is not currently accessing real-time streamed information, the data may be stored in a secured storage device for later access, replay, and/or analysis. The storage device may also be used to store all patient data or information. Thus, the exemplary embodiment may allow for simultaneous storage, retrieval, print, analysis, and play back from anywhere in the world with access to the storage device. Kumar at [0017] The patient-side device may then be connected via a computing device 110, such as a computer, handheld devices such as personal digital assistants (PDAs) and pocket PCs such as IPAQ with Windows CE operating System and Palm devices based on Palm OS), wireless telephone, or any other computing device, to the WAN. Optionally, **the patient-side device may have a built-in computing device for communication over the WAN. A protocol independent device manager 112 running on the computing device establishes a two-way communication with a vast array of client-side devices, including but not limited to medical and/or biofeedback devices, holter monitors, telemetry units, data acquisition units, etc. Each patient-side device can be wired or wireless, and communicates through a serial (RS232, USB, IEEE 1394, etc.), parallel, fire-wire, wireless, or customized interface/protocol. Similarly, the provider-side device can be any type of computing device, such as a computer, PDA, wireless telephone, etc.** In one embodiment, the provider's computing device (such as a PDA or telephone) has a wireless connection to the WAN so that, even though the doctor is not at a hospital or in his office, he may still be consulted remotely without the need to rush to the hospital. FIG. 1B illustrates browser-based real-time 3 lead and spirometry transmitting, viewing and receiving on a wireless Internet connection using a pocket PC 150. Kumar at [0072] **The real time streaming of ECG, EEG, EMG, blood-gas readings, respiration, and other medical wave-forms can be supported by threshold and alarm controls, real-time and/or post-session analysis, email, teleconference medias, and storage, retrieval and replay of raw or interpreted data from any WAN connection, including a dialup Internet connection.** Kumar at [0077]

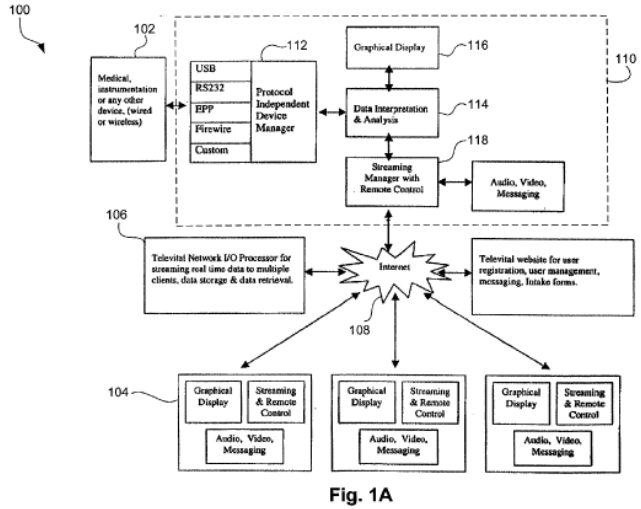
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Kumar
	Preferably, the engine manages transmission of the data from the patient-side device to the provider-side device. This means that the engine may configure the devices to transfer the data directly from one device to the other; may receive the data from the patient-side device and transmit the raw or processed data to the provider-side device; may store the data for later transmission to the provider-side device, etc. Kumar at [0081] Whether or not the provider is currently accessing real-time streamed information, **the data may be stored in a secured storage device at the central server for later access, replay, and/or analysis. The storage device may also be used to store all patient data or information, and integrate the data, whether as raw data, trended data, or summary data, into any electronic medical records system, for example. Thus, the exemplary embodiment may allow for simultaneous storage, retrieval, print, analysis, and play back from anywhere in the world with access to the storage device.** This beneficially allows a provider to seek expert consultation for clinically difficult cases, by sharing the patient history and medical test results online. Further, storage of the data allows for the creation of statistical databases, including development of a database of biomedical test results, for example. For example the results of routine medical tests may be stored from the biomedical device directly into the patient's electronic medical record. Further, personal health information can be stored in smart-cards that can be carried by a patient, and which may also carry other personal information such as credit card and bank account data. Kumar at [0083] *See also* Kumar at Tables 1-8 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendants’ Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Kumar , it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Kumar , those elements, as known to them or as disclosed by other prior art identified in the cover pleading.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Kumar
7[h]. the control system having a touch-screen, circuitry for obtaining position information from a location sensor, and	Kumar discloses or renders obvious the control system having a touch-screen, circuitry for obtaining position information from a location sensor. For simplicity, the discussion will proceed with description of a system having a single patient-side and provider-side device. The patient-side device is located with the patient/client and gathers physiological data from the patient/client. The patient-side device can include, for example, a medical and/or biofeedback device that communicates through a serial, parallel, wireless, or customized interface. **The patient-side device may then be connected via a computing device, such as a computer, personal digital assistant (PDA), etc.**, to the WAN. Alternatively, the patient-side device may have a built-in computing device for communication over the WAN. **Optionally, the provider-side device can be any type of computing device, such as a computer, PDA, etc.** Kumar at [0013] The patient-side device is located with a patient and can be any device that gathers physiological data from the patient. Illustrative patient-side devices include, but are not limited to, telemetary EKG, EMG and EEG monitors; continuous blood pressure and blood glucose watches; cellular transmission holter monitors; wireless plethysmograph rings; automated IBS and depression multimedia protocols; T-shirts wired with sensors that monitor and record physical and emotional indicators derived from heart activity, breathing patterns and blood pressure; bracelets, earrings and necklaces that monitor physiological activity; implanted devices that capture and transmits a person's vital body-function data, such as body temperature or pulse, **to an internet-intergraged ground station while providing global positioning information.** Kumar at [0071] **The patient-side device may then be connected via a computing device 110, such as a computer, handheld devices such as personal digital assistants (PDAs) and pocket PCs such as IPAQ with Windows CE operating System and Palm devices based on Palm OS), wireless telephone, or any other computing device, to the WAN.** Optionally, the patient-side device may have a built-in computing device for communication over the WAN. A protocol independent device manager **112** running on the computing device establishes a two-way communication with a vast array of client-side devices, including but not limited to medical and/or biofeedback devices, holter monitors, telemetry units, data acquisition units, etc. Each patient-side device can be wired or wireless, and

’868 Patent	Kumar
	communicates through a serial (RS232, USB, IEEE 1394, etc.), parallel, fire-wire, wireless, or customized interface/protocol. **Similarly, the provider-side device can be any type of computing device, such as a computer, PDA, wireless telephone, etc. In one embodiment, the provider's computing device (such as a PDA or telephone) has a wireless connection to the WAN so that, even though the doctor is not at a hospital or in his office, he may still be consulted remotely without the need to rush to the hospital.** FIG. 1B illustrates browser-based real-time **3** lead and spirometry transmitting, viewing and receiving on a wireless Internet connection using a pocket PC **150**. Kumar at [0072] The data interpretation and analysis module 114 is used to interpret the data stream from the client-side device, perform mathematical analysis on the data using FFT, DFT, etc., and generate statistics. **The data may be displayed graphically on the display module 116.** Kumar at [0075] **The system's web-enabled protocols support multiple devices, and offer bi-directional communication, while supporting multimedia features. Further, the system's customizable display screens,** summary reports, statistical calculations, history intake forms, and on-line educational segments can be tailored for a specific protocol. Kumar at [0205] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendants’ Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Kumar , it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Kumar , those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[i]. a wireless transceiver to transmit wireless data over a wireless link,	Kumar discloses or renders obvious a wireless transceiver to transmit wireless data over a wireless link.

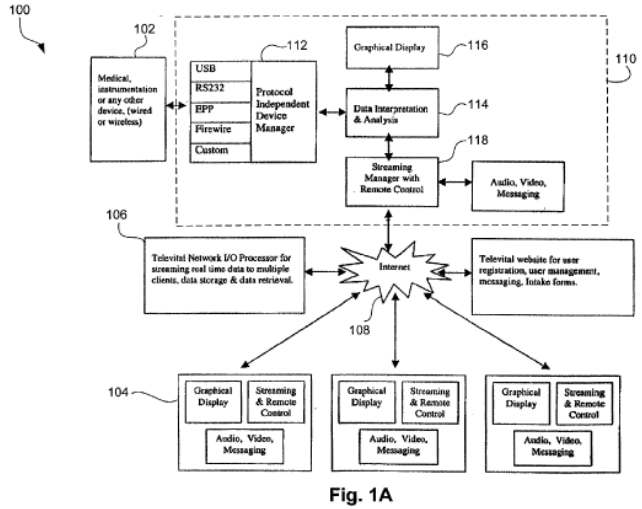
’868 Patent	Kumar
	 Fig. 1A Kumar at Fig. 1A FIG. 1A is a diagram of an exemplary **system architecture 100 for network-based monitoring of data from a patient-side physiological collecting device according to one illustrative embodiment. As shown, the system includes one or more patient-side devices 102 for collecting data from a patient/client, one or more provider-side devices 104, and an engine implemented on a central server 106.** The devices and engine are connected to a wide area network (WAN) 108 such as the Internet, intranet, or extranet. The system allows for the real-time streaming of raw, interpreted, and/or processed physiological data as well as textual/audio/video data from a patient to a health care provider. However, other embodiments may contemplate non-medical/non-biofeedback devices and non-human monitoring. Kumar at [0067] **The patient-side device may then be connected via a computing device 110, such as a computer, handheld devices such as personal digital assistants (PDAs) and pocket PCs such as IPAQ with Windows CE operating System and Palm devices based on Palm OS), wireless telephone, or any other computing device, to the WAN. Optionally, the patient-side device may have a built-in computing device for communication over the WAN**. A protocol independent device manager 112 running on the computing device establishes a two-way communication with a vast array of client-side

’868 Patent	Kumar
	devices, including but not limited to medical and/or biofeedback devices, holter monitors, telemetry units, data acquisition units, etc. **Each patient-side device can be wired or wireless, and communicates through a serial (RS232, USB, IEEE 1394, etc.), parallel, fire-wire, wireless, or customized interface/protocol. Similarly, the provider-side device can be any type of computing device, such as a computer, PDA, wireless telephone, etc. In one embodiment, the provider's computing device (such as a PDA or telephone) has a wireless connection to the WAN so that, even though the doctor is not at a hospital or in his office, he may still be consulted remotely without the need to rush to the hospital. FIG. 1B illustrates browser-based real-time 3 lead and spirometry transmitting, viewing and receiving on a wireless Internet connection using a pocket PC 150.** Kumar at [0072] Depending on available bandwidth, the system may allow for the real-time streaming of raw, interpreted, and processed physiological data as well as textual/audio/video data from a patient to a health care provider. **For example, the devices on the patient and/or provider sides may allow for various forms of communication including, but not limited to instant messaging, an integrated e-mail system, real-time video, and real time audio.** The audio and/or video can be synchronized with the biomedical signals to help correlate behavior with physiological activity. Preferably, the communications are provided via a browser-based interface. Using optional remote control features built in to the system, remote providers can control the software on the patient's end. **Thus, patients do not need to know how to operate the software**. Kumar at [0079]-[0080] A remote client module (not shown) allows remote hosts to view the data being streamed in real time. **The remote client module can also control the software being run on the patient's and/or provider's end.** Multiple remote client modules can run concurrently, allowing multiple remote providers to view data form one device. Kumar at [0085] Preferably, the entire system runs in the context of an Internet browser. Integration of the client-side device driver is performed in two steps. First, the appropriate device driver is incorporated into the

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Kumar
	system, preferably via a web page. A customized or standard GUI is incorporated or developed based on user and/or device manager specifications. **Thus, a user does not have to install any software, and updates to the software are done by simply running the latest software from a website.** Kumar at [0086] *See also* 7[h] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendants’ Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Kumar , it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Kumar , those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[j]. the wireless data comprising at least a part of the physiological information,	Kumar discloses or renders obvious the wireless data comprising at least a part of the physiological information. For simplicity, the discussion will proceed with description of a system having a single patient-side and provider-side device. **The patient-side device is located with the patient/client and gathers physiological data from the patient/client. The patient-side device can include, for example, a medical and/or biofeedback device that communicates through a serial, parallel, wireless, or customized interface. The patient-side device may then be connected via a computing device, such as a computer, personal digital assistant (PDA), etc., to the WAN.** Alternatively, the patient-side device may have a built-in computing device for communication over the WAN. Optionally, the provider-side device can be any type of computing device, such as a computer, PDA, etc. Kumar at [0013]

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Kumar
	 **Fig. 1A** Kumar at Fig. 1A FIG. 1A is a diagram of an exemplary **system architecture 100 for network-based monitoring of data from a patient-side physiological collecting device according to one illustrative embodiment. As shown, the system includes one or more patient-side devices 102 for collecting data from a patient/client, one or more provider-side devices 104, and an engine implemented on a central server 106.** The devices and engine are connected to a wide area network (WAN) 108 such as the Internet, intranet, or extranet. **The system allows for the real-time streaming of raw, interpreted, and/or processed physiological data as well as textual/audio/video data from a patient to a health care provider.** However, other embodiments may contemplate non-medical/non-biofeedback devices and non-human monitoring. Kumar at [0067] The patient-side device may then be connected via a computing device 110, such as a computer, handheld devices such as personal digital assistants (PDAs) and pocket PCs such as IPAQ with Windows CE operating System and Palm devices based on Palm OS), wireless telephone, or any other computing device, to the WAN. Optionally, the patient-side device may have a built-in computing device for communication over the WAN. **A protocol independent device manager 112 running on the computing device establishes a two-way communication with a vast array of client-side devices,**

’868 Patent	Kumar
	including but not limited to medical and/or biofeedback devices, holter monitors, telemetry units, data acquisition units, etc. Each patient-side device can be wired or wireless, and communicates through a serial (RS232, USB, IEEE 1394, etc.), parallel, fire-wire, wireless, or customized interface/protocol. Similarly, the provider-side device can be any type of computing device, such as a computer, PDA, wireless telephone, etc. In one embodiment, the provider's computing device (such as a PDA or telephone) has a wireless connection to the WAN so that, even though the doctor is not at a hospital or in his office, he may still be consulted remotely without the need to rush to the hospital. FIG. 1B illustrates browser-based real-time 3 lead and spirometry transmitting, viewing and receiving on a wireless Internet connection using a pocket PC 150. Kumar at [0072] **The real time streaming of ECG, EEG, EMG, blood-gas readings, respiration, and other medical wave-forms can be supported by threshold and alarm controls, real-time and/or post-session analysis, email, teleconference medias, and storage, retrieval and replay of raw or interpreted data from any WAN connection, including a dialup Internet connection.** Kumar at [0077] *See also* 7[f] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendants’ Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Kumar , it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Kumar , those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[k]. wherein the control system is further capable of receiving voice input signals and manually entered input signals; and	Kumar discloses or renders obvious the control system is further capable of receiving voice input signals and manually entered input signals. The present invention provides a system and method for remote monitoring of medical and/or biofeedback devices over a wide area network (WAN) such as the Internet. In a preferred embodiment, a browser-based engine supports real-time streaming of information over the WAN. **In an exemplary**

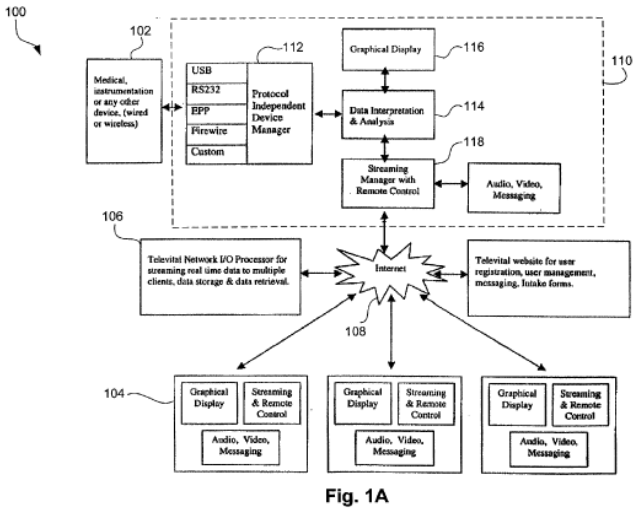
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Kumar
	embodiment, the system allows for the real-time streaming of raw, interpreted, and processed physiological data as well as textual/audio/video data from a patient/client to a health care provider. However, other embodiments may contemplate non-medical/non-biofeedback devices and non-human monitoring. Kumar at [0010] **The devices on the patient/client and/or provider sides may allow for various forms of bidirectional communication including, but not limited to instant messaging, an integrated e-mail system, real-time video, and real time audio**. Preferably, the communications are provided via a browser-based interface. Further, the provider may remotely control the client-side device. For example, when the patient is sleeping in his/her home with EKG and blood pressure devices connected, the provider can start these devices remotely to read the data periodically or whenever needed. Kumar at [0015] FIG. 1A is a diagram of an exemplary system architecture **100** for network-based monitoring of data from a patient-side physiological collecting device according to one illustrative embodiment. As shown, the system includes one or more patient-side devices **102** for collecting data from a patient/client, one or more provider-side devices **104**, and an engine implemented on a central server **106**. **The devices and engine are connected to a wide area network (WAN) 108 such as the Internet, intranet, or extranet. The system allows for the real-time streaming of raw, interpreted, and/or processed physiological data as well as textual/audio/video data from a patient to a health care provider**. However, other embodiments may contemplate non-medical/non-biofeedback devices and non-human monitoring. Kumar at [0067] Depending on available bandwidth, the system may allow for the real-time streaming of raw, interpreted, and processed physiological data as well as textual/audio/video data from a patient to a health care provider. For example, the devices on the patient and/or provider sides may allow for various forms of communication including, but not limited to instant messaging, an integrated e-mail system, real-time video, and real time audio. The audio and/or video can be synchronized with the biomedical

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Kumar
	signals to help correlate behavior with physiological activity. Preferably, the communications are provided via a browser-based interface. Kumar at [0079] **The network I/O processor running the engine preferably forms the core of the real time data streaming portion of the engine. The I/O processor is responsible for streaming device data, audio, video, messages, and remote control information between multiple clients and hosts. The processor may also handle data storage and retrieval of the streamed data.** Kumar at [0082] By joining the session, the healthcare provider can immediately view their patient's real-physiological data by selecting button 504. **The healthcare provider can remotely adjust the gain for optimal display, and both parties have the option to communicate with the built-in instant messaging feature, or an external or integrated audio or visual device.** At the end of a session, the healthcare provider can view a statistical summary report 600, shown in FIG. 6, and that includes a field for adding clinical notes. FIG. 7 shows a screen 700 of a graphical report that can also be displayed. Either can be displayed on both ends, and can even be remotely printed for the client. All sessions may be dated and stored for retrieval by either party at a later date. Kumar at [0092] **After verifying the signals, the healthcare provider can begin a session. Auditory and visual cues guide the client through the entire protocol, and the gain can be remotely adjusted for optimal display. Both parties can communicate with built-in instant messaging features, or an external audio or visual device**. Kumar at [0184] *See also* 7[h] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Kumar
	the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendants’ Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Kumar , it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Kumar , those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[I]. a host comprising:	Kumar discloses or renders obvious the diagnostic system comprises a host.  Fig. 1A Kumar at Fig. 1A FIG. 1A is a diagram of an exemplary **system architecture 100 for network-based monitoring of data from a patient-side physiological collecting device according to one illustrative embodiment. As shown, the system includes one or more patient-side devices 102 for collecting data from a patient/client, one or more provider-side devices 104, and an engine implemented on a central server 106.** The devices and engine are connected to a wide area network (WAN) 108 such as the Internet, intranet, or extranet. The system allows for the real-time streaming of raw, interpreted, and/or processed physiological data as well as textual/audio/video data from a patient to a health care provider. However, other embodiments may contemplate non-medical/non-biofeedback devices and non-human monitoring. Kumar at [0067]

’868 Patent	Kumar
	The embodiments presented herein contemplate connection of multiple patient-side devices, provider-side devices, and engines/central servers. Because a plurality of devices and engines may be in operation, the system may be capable of networking the numerous devices and/or engines into individual, group, clinic, hospital, or other electronic record systems. For simplicity, the discussion will proceed with description of a system having a single patient-side device, provider-side device, and engine/central server; it being understood that one skilled in the art would be able to use the system with multiple devices connected without undue experimentation. Kumar at [0069] **The network I/O processor running the engine preferably forms the core of the real time data streaming portion of the engine. The I/O processor is responsible for streaming device data, audio, video, messages, and remote control information between multiple clients and hosts. The processor may also handle data storage and retrieval of the streamed data.** Kumar at [0082] Whether or not the provider is currently accessing real-time streamed information, **the data may be stored in a secured storage device at the central server for later access, replay, and/or analysis. The storage device may also be used to store all patient data or information, and integrate the data, whether as raw data, trended data, or summary data, into any electronic medical records system, for example. Thus, the exemplary embodiment may allow for simultaneous storage, retrieval, print, analysis, and play back from anywhere in the world with access to the storage device.** This beneficially allows a provider to seek expert consultation for clinically difficult cases, by sharing the patient history and medical test results online. Further, storage of the data allows for the creation of statistical databases, including development of a database of biomedical test results, for example. For example the results of routine medical tests may be stored from the biomedical device directly into the patient's electronic medical record. Further, personal health information can be stored in smart-cards that can be carried by a patient, and which may also carry other personal information such as credit card and bank account data. Kumar at [0083]

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Kumar
	A remote client module (not shown) allows remote hosts to view the data being streamed in real time. The remote client module can also control the software being run on the patient's and/or provider's end. Multiple remote client modules can run concurrently, allowing multiple remote providers to view data form one device. Kumar at [0085] The present invention may be implemented on a program or code that can be stored in a computer-readable (or electronically-readable) medium. The system may be implemented using Apache web server, MySql on Linux, Oracle on Linux, Java servlets, Applets, HTML, JavaScript, Java, C#, Microsoft's .NET etc. Note also that the server may be implemented on the Internet, intranet, or an extranet. Kumar at [0087] FIG. 10 depicts a modular view of the system **1000** according to an exemplary embodiment. As shown, the five major modules include Registration **1002**, Client/Sponsored Client **1004**, Service Provider **1006**, Sponsor **1008** and Admin **1010**. Following is explanation for all the modules. Kumar at [0094] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendants’ Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Kumar , it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Kumar , those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[m]. a digital file for receiving and storing at least a portion of the wireless data;	Kumar discloses or renders obvious the host comprises a digital file for receiving and storing at least a portion of the wireless data. System and method for real-time **monitoring, assessment, analysis, retrieval, and storage of physiological data** over a wide area network

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Kumar
	Kumar at Title The system of the exemplary embodiment preferably includes at least one patient-side device for collecting data from a patient/client, a provider-side device, and an engine, each coupled to the WAN. The engine manages transmission of the data from the patient-side device to the provider-side device. **This means that the engine may configure the devices to transfer the data directly from one device to the other; may receive the data from the patient-side device and transmit the raw or processed data to the provider-side device; may store the data for later transmission to the provider-side device, etc.** Kumar at [0011] Whether or not the provider is not currently accessing real-time streamed information, the data may be stored in a secured storage device for later access, replay, and/or analysis. The storage device may also be used to store all patient data or information. Thus, the exemplary embodiment may allow for simultaneous storage, retrieval, print, analysis, and play back from anywhere in the world with access to the storage device. Kumar at [0017] The patient-side device may then be connected via a computing device 110, such as a computer, handheld devices such as personal digital assistants (PDAs) and pocket PCs such as IPAQ with Windows CE operating System and Palm devices based on Palm OS), wireless telephone, or any other computing device, to the WAN. Optionally, **the patient-side device may have a built-in computing device for communication over the WAN. A protocol independent device manager 112 running on the computing device establishes a two-way communication with a vast array of client-side devices, including but not limited to medical and/or biofeedback devices, holter monitors, telemetry units, data acquisition units, etc. Each patient-side device can be wired or wireless, and communicates through a serial (RS232, USB, IEEE 1394, etc.), parallel, fire-wire, wireless, or customized interface/protocol. Similarly, the provider-side device can be any type of computing device, such as a computer, PDA, wireless telephone, etc.** In one embodiment, the provider's computing device (such as a PDA or telephone) has a wireless connection to the WAN so that, even though the doctor is not at a hospital or in his office, he may still be consulted remotely without the

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Kumar
	need to rush to the hospital. FIG. 1B illustrates browser-based real-time 3 lead and spirometry transmitting, viewing and receiving on a wireless Internet connection using a pocket PC 150. Kumar at [0072] **The real time streaming of ECG, EEG, EMG, blood-gas readings, respiration, and other medical wave-forms can be supported by threshold and alarm controls, real-time and/or post-session analysis, email, teleconference medias, and storage, retrieval and replay of raw or interpreted data from any WAN connection, including a dialup Internet connection.** Kumar at [0077] Preferably, the engine manages transmission of the data from the patient-side device to the provider-side device. This means that the engine may configure the devices to transfer the data directly from one device to the other; may receive the data from the patient-side device and transmit the raw or processed data to the provider-side device; may store the data for later transmission to the provider-side device, etc. Kumar at [0081] Whether or not the provider is currently accessing real-time streamed information, **the data may be stored in a secured storage device at the central server for later access, replay, and/or analysis. The storage device may also be used to store all patient data or information, and integrate the data, whether as raw data, trended data, or summary data, into any electronic medical records system, for example. Thus, the exemplary embodiment may allow for simultaneous storage, retrieval, print, analysis, and play back from anywhere in the world with access to the storage device.** This beneficially allows a provider to seek expert consultation for clinically difficult cases, by sharing the patient history and medical test results online. Further, storage of the data allows for the creation of statistical databases, including development of a database of biomedical test results, for example. For example the results of routine medical tests may be stored from the biomedical device directly into the patient's electronic medical record. Further, personal health information can be stored in smart-cards that can be carried by a patient, and which may also carry other personal information such as credit card and bank account data.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Kumar
	Kumar at [0083] *See also* Kumar at Tables 1-8 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendants’ Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Kumar , it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Kumar , those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[n]. control logic at the host to process at least the portion of the wireless data to generate a status of the user;	Kumar discloses or renders obvious the host comprises control logic at the host to process at least the portion of the wireless data to generate a status of the user. The patient-side device may then be connected via a computing device 110, such as a computer, handheld devices such as personal digital assistants (PDAs) and pocket PCs such as IPAQ with Windows CE operating System and Palm devices based on Palm OS), wireless telephone, or any other computing device, to the WAN. Optionally, the patient-side device may have a built-in computing device for communication over the WAN. A protocol independent device manager 112 running on the computing device establishes a two-way communication with a vast array of client-side devices, including but not limited to medical and/or biofeedback devices, holter monitors, telemetry units, data acquisition units, etc. Each patient-side device can be wired or wireless, and communicates through a serial (RS232, USB, IEEE 1394, etc.), parallel, fire-wire, wireless, or customized interface/protocol. Similarly, the provider-side device can be any type of computing device, such as a computer, PDA, wireless telephone, etc. In one embodiment, the provider's computing device (such as a PDA or telephone) has a wireless connection to the WAN so that, **even though the doctor is not at a hospital or in his office, he may still be consulted remotely without the need to rush to the hospital.** FIG. 1B illustrates browser-based real-time 3 lead and spirometry transmitting, viewing and receiving on a wireless Internet connection using a pocket PC 150. Kumar at [0072] **The real time streaming of ECG, EEG, EMG, blood-gas readings, respiration, and other medical wave-forms can be supported by threshold and alarm controls, real-time and/or post-session**

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Kumar
	analysis, email, teleconference medias, and storage, retrieval and replay of raw or interpreted data from any WAN connection, including a dialup Internet connection. Kumar at [0077] **The network I/O processor running the engine preferably forms the core of the real time data streaming portion of the engine. The I/O processor is responsible for streaming device data, audio, video, messages, and remote control information between multiple clients and hosts. The processor may also handle data storage and retrieval of the streamed data.** Kumar at [0082] Whether or not the provider is currently accessing real-time streamed information, **the data may be stored in a secured storage device at the central server for later access, replay, and/or analysis. The storage device may also be used to store all patient data or information, and integrate the data, whether as raw data, trended data, or summary data, into any electronic medical records system, for example. Thus, the exemplary embodiment may allow for simultaneous storage, retrieval, print, analysis, and play back from anywhere in the world with access to the storage device.** This beneficially allows a provider to seek expert consultation for clinically difficult cases, by sharing the patient history and medical test results online. Further, storage of the data allows for the creation of statistical databases, including development of a database of biomedical test results, for example. **For example the results of routine medical tests may be stored from the biomedical device directly into the patient's electronic medical record**. Further, personal health information can be stored in smart-cards that can be carried by a patient, and which may also carry other personal information such as credit card and bank account data. Kumar at [0083] **A remote client module (not shown) allows remote hosts to view the data being streamed in real time. The remote client module can also control the software being run on the patient's and/or provider's end. Multiple remote client modules can run concurrently, allowing multiple remote providers to view data form one device.** Kumar at [0085]

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Kumar
	One modern type of treatment is to isolate, train and strengthen the pelvic floor without recruiting any other peripheral muscles. **The strength of muscular contractions is monitored using surface electromyography. This form of therapy provides immediate auditory or visual information to the person about the status of the pelvic muscle function, and has proven to be helpful in 8 out of 10 people.** By monitoring the electromyography, a provider can determine whether pelvic exercises are being done correctly. Kumar at [0178] The system may be adapted to include web-enabled spirometers and oximeters, allowing healthcare practitioners to perform remote spirometry and oximetry tests. FIG. 24A shows a screen 2400 displaying a patient's blood oxygen saturation and pulse rate. FIG. 24B depicts another screen 2420 displaying historical blood oxygen saturation and pulse rate data. FIG. 24C shows a screen 2440 displaying both historical and numerical oximetry data. **FIG. 25 depicts a screen 2500 displaying a comprehensive report of a pulse oximetry testing session. FIG. 26 depicts a screen 2600 displaying a spirometry graph, numerical results, and predictors.** Kumar at [0203] **Web-enabled spirometry allows for real-time remote testing, retrieval, and analysis of a patient's pulmonary function tests from any Internet-enabled computer.** Such remote spirometry greatly improves the management and prevention of pulmonary problems in various healthcare segments, including pharmaceutical research, HMO's, educational institutions, and from isolated areas such as on aircrafts and ships. Kumar at [0204] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendants’ Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Kumar , it would

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Kumar
	have been obvious to one of ordinary skill in the art to combine, with the teachings of Kumar , those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[o]. a memory storage device for recording the status; and	Kumar discloses or renders obvious the host comprises a memory storage device for recording the status. The patient-side device may then be connected via a computing device 110, such as a computer, handheld devices such as personal digital assistants (PDAs) and pocket PCs such as IPAQ with Windows CE operating System and Palm devices based on Palm OS), wireless telephone, or any other computing device, to the WAN. Optionally, the patient-side device may have a built-in computing device for communication over the WAN. A protocol independent device manager 112 running on the computing device establishes a two-way communication with a vast array of client-side devices, including but not limited to medical and/or biofeedback devices, holter monitors, telemetry units, data acquisition units, etc. Each patient-side device can be wired or wireless, and communicates through a serial (RS232, USB, IEEE 1394, etc.), parallel, fire-wire, wireless, or customized interface/protocol. Similarly, the provider-side device can be any type of computing device, such as a computer, PDA, wireless telephone, etc. In one embodiment, the provider's computing device (such as a PDA or telephone) has a wireless connection to the WAN so that, even though the doctor is not at a hospital or in his office, he may still be consulted remotely without the need to rush to the hospital. FIG. 1B illustrates browser-based real-time 3 lead and spirometry transmitting, viewing and receiving on a wireless Internet connection using a pocket PC 150. Kumar at [0072] **The real time streaming of ECG, EEG, EMG, blood-gas readings, respiration, and other medical wave-forms can be supported by threshold and alarm controls, real-time and/or post-session analysis, email, teleconference medias, and storage, retrieval and replay of raw or interpreted data from any WAN connection, including a dialup Internet connection.** Kumar at [0077] **The network I/O processor running the engine preferably forms the core of the real time data streaming portion of the engine. The I/O processor is responsible for streaming device data, audio, video, messages, and remote control information between multiple clients and hosts. The processor may also handle data storage and retrieval of the streamed data.**

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Kumar
	Kumar at [0082] Preferably, the engine manages transmission of the data from the patient-side device to the provider-side device. This means that the engine may configure the devices to transfer the data directly from one device to the other; may receive the data from the patient-side device and transmit the raw or processed data to the provider-side device; may store the data for later transmission to the provider-side device, etc. Kumar at [0081] Whether or not the provider is currently accessing real-time streamed information, **the data may be stored in a secured storage device at the central server for later access, replay, and/or analysis. The storage device may also be used to store all patient data or information, and integrate the data, whether as raw data, trended data, or summary data, into any electronic medical records system, for example. Thus, the exemplary embodiment may allow for simultaneous storage, retrieval, print, analysis, and play back from anywhere in the world with access to the storage device.** This beneficially allows a provider to seek expert consultation for clinically difficult cases, by sharing the patient history and medical test results online. Further, storage of the data allows for the creation of statistical databases, including development of a database of biomedical test results, for example. **For example the results of routine medical tests may be stored from the biomedical device directly into the patient's electronic medical record**. Further, personal health information can be stored in smart-cards that can be carried by a patient, and which may also carry other personal information such as credit card and bank account data. Kumar at [0083] **A remote client module (not shown) allows remote hosts to view the data being streamed in real time. The remote client module can also control the software being run on the patient's and/or provider's end. Multiple remote client modules can run concurrently, allowing multiple remote providers to view data form one device.** Kumar at [0085]

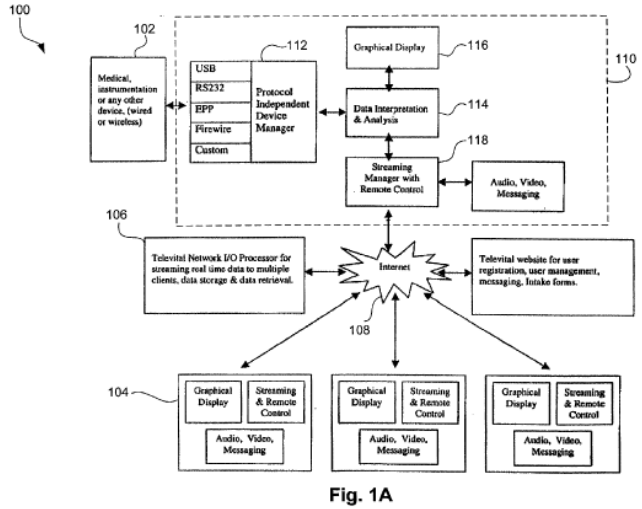
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Kumar
	The system can be adapted to compliment any existing incontinence program. The surface electromyography signal processing unit, such as J& J Engineering's 1330 C-2 and mini C2 series; and Thought Technology's Myotrac, Procomp+, and Procomp2, plugs into the computer's serial port. **Data collected by the unit is processed by the system to provide real-time medical monitoring, summary reports, statistical calculations, and visual displays, which can further be tailored for the healthcare provider's particular needs, and can each be tailored for a particular protocol.** This unique technology allows healthcare providers to remotely manage clients worldwide, while communicating with them, and simultaneously viewing their real-time physiological data. Kumar at [0179] One modern type of treatment is to isolate, train and strengthen the pelvic floor without recruiting any other peripheral muscles. **The strength of muscular contractions is monitored using surface electromyography. This form of therapy provides immediate auditory or visual information to the person about the status of the pelvic muscle function, and has proven to be helpful in 8 out of 10 people.** By monitoring the electromyography, a provider can determine whether pelvic exercises are being done correctly. Kumar at [0178] The system may be adapted to include web-enabled spirometers and oximeters, allowing healthcare practitioners to perform remote spirometry and oximetry tests. FIG. 24A shows a screen 2400 displaying a patient's blood oxygen saturation and pulse rate. FIG. 24B depicts another screen 2420 displaying historical blood oxygen saturation and pulse rate data. FIG. 24C shows a screen 2440 displaying both historical and numerical oximetry data. **FIG. 25 depicts a screen 2500 displaying a comprehensive report of a pulse oximetry testing session. FIG. 26 depicts a screen 2600 displaying a spirometry graph, numerical results, and predictors.** Kumar at [0203] **Web-enabled spirometry allows for real-time remote testing, retrieval, and analysis of a patient's pulmonary function tests from any Internet-enabled computer.** Such remote spirometry greatly improves the management and prevention of pulmonary problems in various healthcare segments,

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Kumar
	including pharmaceutical research, HMO's, educational institutions, and from isolated areas such as on aircrafts and ships. Kumar at [0204] *See also* Kumar at Tables 1-8 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendants’ Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Kumar , it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Kumar , those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[p]. an output for communicating at least a portion of the status or associated information over a communication link to one or more display output devices,	Kumar discloses or renders obvious the host comprises an output for communicating at least a portion of the status or associated information over a communication link to one or more display output devices, wherein the one or more display output devices are located remotely from the host. For simplicity, the discussion will proceed with description of a system having a single patient-side and provider-side device. The patient-side device is located with the patient/client and gathers physiological data from the patient/client. The patient-side device can include, for example, a medical and/or biofeedback device that communicates through a serial, parallel, wireless, or customized interface. **The patient-side device may then be connected via a computing device, such as a computer, personal digital assistant (PDA), etc.**, to the WAN. Alternatively, the patient-side device may have a built-in computing device for communication over the WAN. **Optionally, the provider-side device can be any type of computing device, such as a computer, PDA, etc.** Kumar at [0013]

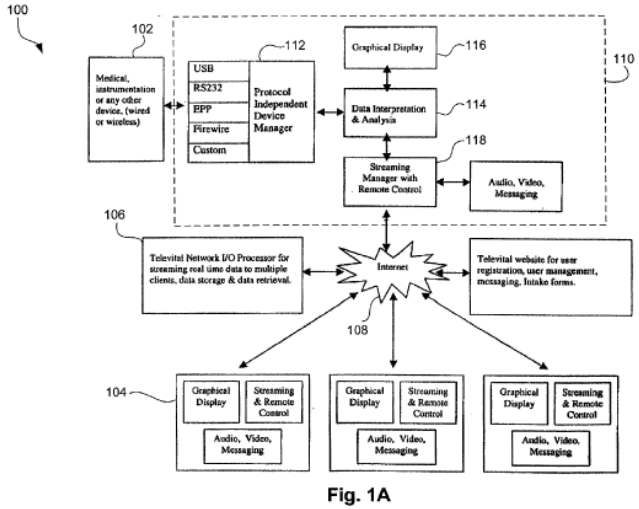
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Kumar
	 **Fig. 1A** Kumar at Fig. 1A FIG. 1A is a diagram of an exemplary system architecture 100 for network-based monitoring of data from a patient-side physiological collecting device according to one illustrative embodiment. As shown, the system includes one or more patient-side devices 102 for collecting data from a patient/client, one or more provider-side devices 104, and an engine implemented on a central server 106. The devices and engine are connected to a wide area network (WAN) 108 such as the Internet, intranet, or extranet. The system allows for the real-time streaming of raw, interpreted, and/or processed physiological data as well as textual/audio/video data from a patient to a health care provider. However, other embodiments may contemplate non-medical/non-biofeedback devices and non-human monitoring. Kumar at [0067] The patient-side device is located with a patient and can be any device that gathers physiological data from the patient. Illustrative patient-side devices include, but are not limited to, telemetary EKG, EMG and EEG monitors; continuous blood pressure and blood glucose watches; cellular transmission holter monitors; wireless plethysmograph rings; automated IBS and depression multimedia protocols; T-shirts wired with sensors that monitor and record physical and emotional indicators derived from heart activity, breathing patterns and blood pressure; bracelets, earrings and necklaces that monitor physiological activity; implanted devices that capture and transmits a person's vital body-function data,

’868 Patent	Kumar
	such as body temperature or pulse, **to an internet-intergraged ground station while providing global positioning information.** Kumar at [0071] **The patient-side device may then be connected via a computing device 110, such as a computer, handheld devices such as personal digital assistants (PDAs) and pocket PCs such as IPAQ with Windows CE operating System and Palm devices based on Palm OS), wireless telephone, or any other computing device, to the WAN.** Optionally, the patient-side device may have a built-in computing device for communication over the WAN. A protocol independent device manager **112** running on the computing device establishes a two-way communication with a vast array of client-side devices, including but not limited to medical and/or biofeedback devices, holter monitors, telemetry units, data acquisition units, etc. Each patient-side device can be wired or wireless, and communicates through a serial (RS232, USB, IEEE 1394, etc.), parallel, fire-wire, wireless, or customized interface/protocol. **Similarly, the provider-side device can be any type of computing device, such as a computer, PDA, wireless telephone, etc. In one embodiment, the provider's computing device (such as a PDA or telephone) has a wireless connection to the WAN so that, even though the doctor is not at a hospital or in his office, he may still be consulted remotely without the need to rush to the hospital.** FIG. 1B illustrates browser-based real-time **3** lead and spirometry transmitting, viewing and receiving on a wireless Internet connection using a pocket PC **150**. Kumar at [0072] The data interpretation and analysis module 114 is used to interpret the data stream from the client-side device, perform mathematical analysis on the data using FFT, DFT, etc., and generate statistics. **The data may be displayed graphically on the display module 116.** Kumar at [0075] The data may also be simultaneously streamed to multiple remote providers over the WAN so that the remote providers can view the data in real time. The streaming manager **118** is responsible for managing transmission of the data to the remote providers, including, optionally, encrypting and compressing the data.

’868 Patent	Kumar
	Kumar at [0076] The system can be adapted to compliment any existing incontinence program. The surface electromyography signal processing unit, such as J& J Engineering's 1330 C-2 and mini C2 series; and Thought Technology's Myotrac, Procomp+, and Procomp2, plugs into the computer's serial port. **Data collected by the unit is processed by the system to provide real-time medical monitoring, summary reports, statistical calculations, and visual displays, which can further be tailored for the healthcare provider's particular needs, and can each be tailored for a particular protocol. This unique technology allows healthcare providers to remotely manage clients worldwide, while communicating with them, and simultaneously viewing their real-time physiological data.** Kumar at [0179] **The system's web-enabled protocols support multiple devices, and offer bi-directional communication, while supporting multimedia features. Further, the system's customizable display screens,** summary reports, statistical calculations, history intake forms, and on-line educational segments can be tailored for a specific protocol. Kumar at [0205] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendants’ Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Kumar , it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Kumar , those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[q]. wherein the one or more display output devices are located remotely from the host.	Kumar discloses or renders obvious the one or more display output devices are located remotely from the host. For simplicity, the discussion will proceed with description of a system having a single patient-side and provider-side device. The patient-side device is located with the patient/client and gathers physiological data from the patient/client. The patient-side device can include, for example, a medical and/or

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Kumar
	biofeedback device that communicates through a serial, parallel, wireless, or customized interface. **The patient-side device may then be connected via a computing device, such as a computer, personal digital assistant (PDA), etc.**, to the WAN. Alternatively, the patient-side device may have a built-in computing device for communication over the WAN. **Optionally, the provider-side device can be any type of computing device, such as a computer, PDA, etc.** Kumar at [0013]  Fig. 1A Kumar at Fig. 1A FIG. 1A is a diagram of an exemplary system architecture 100 for network-based monitoring of data from a patient-side physiological collecting device according to one illustrative embodiment. As shown, the system includes one or more patient-side devices 102 for collecting data from a patient/client, one or more provider-side devices 104, and an engine implemented on a central server 106. The devices and engine are connected to a wide area network (WAN) 108 such as the Internet, intranet, or extranet. The system allows for the real-time streaming of raw, interpreted, and/or processed physiological data as well as textual/audio/video data from a patient to a health care provider. However, other embodiments may contemplate non-medical/non-biofeedback devices and non-human monitoring.

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Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Kumar
	The data interpretation and analysis module 114 is used to interpret the data stream from the client-side device, perform mathematical analysis on the data using FFT, DFT, etc., and generate statistics. **The data may be displayed graphically on the display module 116.** Kumar at [0075] The data may also be simultaneously streamed to multiple remote providers over the WAN so that the remote providers can view the data in real time. The streaming manager **118** is responsible for managing transmission of the data to the remote providers, including, optionally, encrypting and compressing the data. Kumar at [0076] The system can be adapted to compliment any existing incontinence program. The surface electromyography signal processing unit, such as J& J Engineering's 1330 C-2 and mini C2 series; and Thought Technology's Myotrac, Procomp+, and Procomp2, plugs into the computer's serial port. **Data collected by the unit is processed by the system to provide real-time medical monitoring, summary reports, statistical calculations, and visual displays, which can further be tailored for the healthcare provider's particular needs, and can each be tailored for a particular protocol. This unique technology allows healthcare providers to remotely manage clients worldwide, while communicating with them, and simultaneously viewing their real-time physiological data.** Kumar at [0179] **The system's web-enabled protocols support multiple devices, and offer bi-directional communication, while supporting multimedia features. Further, the system's customizable display screens,** summary reports, statistical calculations, history intake forms, and on-line educational segments can be tailored for a specific protocol. Kumar at [0205] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Kumar
	identified in Defendants’ Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Kumar , it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Kumar , those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
Claim 8	
8. The diagnostic system of claim 7, wherein the light source comprises a plurality of semiconductor diodes that are further coupled to a multiplexer capable of combining the plurality of semiconductor diodes and generating the input light beam comprising one or more wavelengths.	*See* claim 7 above. Kumar discloses or renders obvious the light source comprises a plurality of semiconductor diodes that are further coupled to a multiplexer capable of combining the plurality of semiconductor diodes and generating the input light beam comprising one or more wavelengths. One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendants’ Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Kumar , it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Kumar , those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
Claim 9	
9. The diagnostic system of claim 7, wherein at least the portion of the input light beam is adapted for use in a diagnostics to measure a property of the blood, wherein the diagnostics comprise a spectroscopic procedure, wherein the spectroscopic procedure is based at least in part on a comparison of amplitudes at a plurality of associated wavelengths transmitted or reflected from the blood.	*See* claim 7 above. Kumar discloses or renders obvious the portion of the input light beam is adapted for use in a diagnostics to measure a property of the blood, wherein the diagnostics comprise a spectroscopic procedure, wherein the spectroscopic procedure is based at least in part on a comparison of amplitudes at a plurality of associated wavelengths transmitted or reflected from the blood. One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendants’ Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Kumar , it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Kumar , those elements, as known to them or as disclosed by other prior art identified in the cover pleading.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

EXHIBIT A4

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

EXHIBIT A5

U.S. Pat. No. 9,055,868 in view of U.S. Patent Publication No. 2004/0002634 to Jukka Nihtila ("Nihtila")

As described in detail below, Nihtila (individually or collectively) anticipates and/or renders obvious claim 7-9 ("Asserted Claims") of U.S. Patent No. 9,055,868 (the "' 868 Patent") under 35 U.S.C. §102 and/or §103, either alone in combination with the knowledge of a person of ordinary skill, and/or additional prior art references discussed in discussed in Exhibits A1-A10, the contents of which are hereby incorporated by reference into this chart. One of ordinary skill in the art, as of the priority date of the '868 Patent, would have known to combine the prior art elements disclosed by the foregoing references using known methods, and to use these elements according to their established functions in order to achieve a known and predictable result. This invalidity claim chart is based on Defendants' present understanding of the Asserted Claims and Plaintiff's apparent construction of the Asserted Claims in its Preliminary Infringement Contentions ("Infringement Contentions").

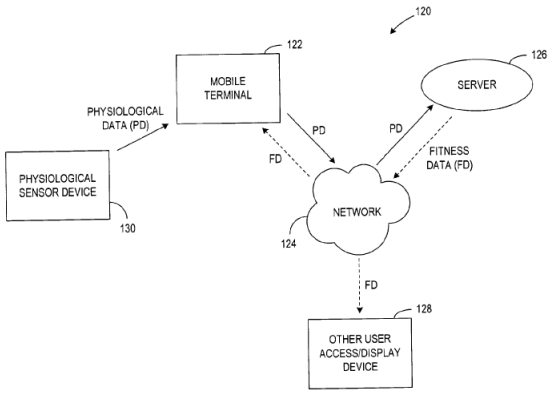
The following invalidity chart includes references to the structure, function, operation, and/or features of the technology described in Nihtila. The cited portions of Nihtila are merely illustrative, and Defendants' reserve the right to rely on alternative or additional evidence, including uncited portions of Nihtila . Where a particular figure is cited, the citation should be understood to encompass the caption and description of the figure as well as any text relating to or describing the figure. Conversely, where particular text referring to a figure is cited, the citation should be understood to include the figure as well. Although the documentation collectively evidences prior knowledge, use, or sale, Defendants' reserve the right to rely upon individual documents as printed publications. Where the chart below states that Nihtila "describes" or "provides for" a limitation, such disclosure may be express, inherent, or implicit. To the extent it is found Nihtila does not expressly disclose certain limitations in the asserted claim, such limitations are inherent. Defendants' reserve the right to present direct evidence of the structure, function, operation, and/or features of the technology described in Nihtila (including product samples, source code, and/or witness testimony) and/or its prior art status, and to present alternative or additional documents concerning the same as evidence that the technology described in Nihtila anticipates and/or renders obvious the Asserted Claims of the '868 Patent.

This chart is subject to all reservations, objections, and disclaimers in Defendants' Invalidity Contentions and any amendment, supplement, or modification thereof, which are incorporated herein by reference in their entirety. Nothing stated herein shall be treated as an admission or suggestion that Defendants' agree with Plaintiff regarding the scope of the Asserted Claims, Plainitff's apparent claim constructions, or the accuracy of any particular claim construction. Defendants' reserves all rights to challenge any of the claim terms herein under 35 U.S.C. § 112, including by arguing that they are indefinite, are not supported by the written description, and/or are not enabled. Defendants' further reserve all rights to amend this invalidity claim chart without leave of court pursuant to the Court's Docket Control Order, or upon a showing of good cause.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

EXHIBIT A5

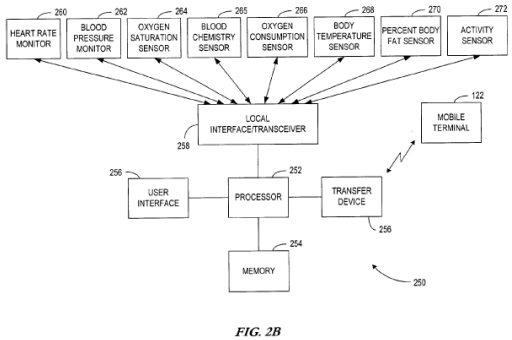
’868 Patent	Nihtila
Claim 7	
7[pre]. A diagnostic system comprising:	By providing this disclosure, Defendants’ do not take a position on whether the preamble is limiting. Nihtila discloses or renders obvious a diagnostic system. A system and method provide for interacting with a virtual physiological model of a user with use of a mobile communication device. Physiological data associated with the user is acquired from the user. The physiological data is transmitted to the mobile communication device, preferably with use of a wireless communication protocol. The methodology further involves using the mobile communication device to communicate the physiological data to a network server. The physiological data is integrated into the virtual physiological model of the user. The user can access data and depictions of the user developed from the physiological data. Nihtila at Abstract The present invention is directed to **systems and methods for using mobile communication techniques to enhance an understanding of the physiological state of an individual based on physiological information acquired from the individual in real-time. The principles of the present invention find particular applicability in the context of development, refinement, and monitoring of physical fitness regimens and training, and verification of the effectiveness of such regimens and training over time.** Nihtila at [0024] **Employment of a visual depiction or characterization of a user's real-time physiological state in accordance with the principles of the present invention provides a comprehensive visual physical fitness feedback methodology heretofore unavailable using conventional physiological monitoring techniques.** Nihtila at [0026] Physiological data is preferably acquired from the user through use of non-invasive techniques. Various types of physiological data can be acquired from the user, including, in particular, heart rate data. Blood pressure data can be acquired from time to time and incorporated into the virtual physiological model of the user. Body temperature, particularly when measured during extended periods of exertion, can

’868 Patent	Nihtila
	also be acquired. Oxygen saturation and oxygen consumption can also be measured and incorporated into the user's virtual physiological model. Further, percent body fat can be determined and incorporated into the user's virtual physiological model. Various other physiological parameters can be acquired or developed for incorporation into the user's avatar. Nihtila at [0029]  *FIG. 1* Nihtila at Fig. 1 Turning now to the drawings, and more particularly to FIG. 1, there is illustrated a system for acquiring physiological data from a user and communicating the physiological data via a mobile terminal to a network server for integration into a virtual physiological model established for the user in accordance with an embodiment of the present invention. FIG. 1 shows a physiological sensor device **130** communicatively coupled to a mobile terminal **122**. The physiological sensor device **130** is intended to represent one or more sensing devices that sense one or more physiological parameters of a user, such as heart rate, for example. The physiological sensor device **130** is communicatively coupled to mobile terminal **122** via a wireless link, such as wireless link that conforms to the Bluetooth wireless specification. In another configuration, the physiological sensor device **130** can be coupled to the mobile terminal **122** via a hard wired connection, although it is perceived that a wireless link is more desirable in most cases. Nihtila at [0035]

’868 Patent	Nihtila
	The physiological sensor device 130 acquires physiological data (PD) from the user and transmits this data to the mobile terminal 122. According to one approach, the mobile terminal 122 effectively functions as a modem by communicating the physiological data received from the physiological sensor device 130 to a radio network 124, such as a 2G or 3G network. It is noted that the network 124 shown in the figures can alternatively be representative of an IP or Mobil IP network, such as an IPv4, IPv6, or hybrid IPv4/IPv6 network for example. Nihtila at [0036] According to another approach, the mobile terminal 122 cooperates with the physiological sensor device 130 to buffer physiological data received from the physiological sensor device 130, noting that portions of the physiological data acquired by the physiological sensor device 130 in real-time can be stored/buffered in memory of one or both of the mobile terminal 122 and physiological sensor device 130. This cooperative use of distributed memory is of particular use when significant amounts of real-time physiological data obtained by several sensors are acquired, and in situations where a communication link between the mobile terminal 122 and network 124 cannot be established or is unstable/unreliable. Nihtila at [0037] The physiological data communicated from the mobile terminal 122 to the network 124 is routed to a server 126 which is configured to accept and process this data. The server 126 stores and executes processing software that, in general, operates on the physiological data received from each of a number of users. The processing software integrates currently or recently acquired physiological data into the user's virtual physiological model (i.e., avatar). The user can review the data associated with his or her avatar using the mobile terminal 122 or other user access/display device 128. Nihtila at [0038] A physiological data acquisition system of the present invention can employ one or more other types of portable or ambulatory physiological sensor devices 204. Such portable physiological sensor devices 204 are typically worn by the user using a wristband, belt, or other harness that provides for user comfort and high mobility. In the case of a heart rate monitor 202, for example, this physiological sensor device

’868 Patent	Nihtila
	is in continuous contact with the user's anatomy during use. In the case of other portable physiological sensor devices 204, such devices can be carried within the user's clothing, pouch or other carrying arrangement, and be brought into contact with the user's anatomy only when the physiological parameter of interest is to be measured. Nihtila at [0051] A physiological data acquisition system of the present invention can include various types of non-invasive physiological sensor devices 208. Such non-invasive physiological sensor devices 208 are typically portable, but need not be in all configurations. A physiological data acquisition system of the present invention can also include various types of table-top physiological sensor devices 206, which are generally not considered highly portable. Such table-top devices 206 can be situated at a location frequented by a user, such as the user's home. Nihtila at [0052] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendants’ Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Nihtila , it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Nihtila , those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[a]. a light source comprising:	Nihtila discloses or renders obvious a diagnostic system comprises a light source. Physiological data is preferably acquired from the user through use of non-invasive techniques. Various types of physiological data can be acquired from the user, including, in particular, heart rate data. Blood pressure data can be acquired from time to time and incorporated into the virtual physiological model of the user. Body temperature, particularly when measured during extended periods of exertion, can also be acquired. **Oxygen saturation and oxygen consumption can also be measured and incorporated into the user's virtual physiological model.** Further, percent body fat can be determined and incorporated into the user's virtual physiological model. Various other physiological parameters can be acquired or developed for incorporation into the user's avatar.

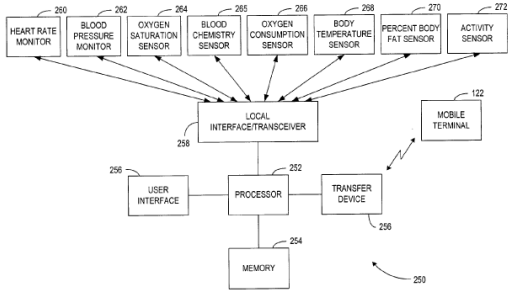
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Nihtila
	Nihtila at [0029] **In accordance with a more complex configuration, a physiological data acquisition system of the present invention can include a blood sensing device 211. The blood sensing device 211 is representative of one or more devices that can be used to measure a number of blood related parameters. Such blood related parameters can include oxygen saturation, oxygen consumption, blood chemistry, and blood pressure, for example.** Nihtila at [0054]  *FIG. 2B* Nihtila at Fig. 2B **FIG. 2B illustrates a number of different physiological sensor devices that can be employed in a physiological data acquisition system 250 of the present invention.** It is understood that the devices depicted in FIG. 2B do not represent an exhaustive listing of devices that can be employed. Moreover, it is understood that a physiological data acquisition system **250** of the present invention need not incorporate all of the devices shown in FIG. 2B, but can incorporate one or multiple devices. Nihtila at [0055] **In a more sophisticated implementation, a physiological data acquisition system 250 of the present invention can include an oxygen saturation sensor 264 which non-invasively measures oxygen saturation of the user's blood. A pulse oximeter, for example, can be used to measure and compute the arterial oxygen saturation level of the user's blood from signals received from the pulse oximeter.**

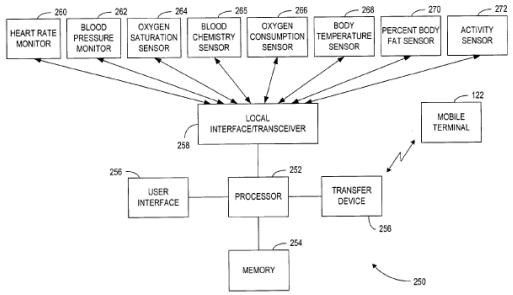
’868 Patent	Nihtila
	Nihtila at [0059] According to one configuration, **the physiological data acquisition system 250 is intended to represent a portable, and preferably wearable, unit that provides for local acquisition of physiological data from one or more physiological sensor devices.** The physiological sensor devices may be integral to or separate from the physiological data acquisition system 250. Each of the physiological sensor devices typically communicates with the physiological data acquisition system 250 via an on-board communication device, **such as a device that conforms to the Bluetooth wireless specification. The physiological data acquisition system 250 includes a local interface/transceiver 258 that also operates in conformance with the Bluetooth wireless specification. Depending on the type of physiological sensor device employed, a hardwire connection can be established between a given physiological sensor device and the physiological data acquisition system 250 via the local interface/transceiver 258. A user interface 256 and memory 254 are coupled to the processor 252. A transfer device 256, such as a communication device configured to operate in conformance with the Bluetooth wireless specification, is coupled to the processor 252 and provides for unidirectional or bidirectional communication with a mobile terminal 122.** Nihtila at [0056] According to a more sophisticated implementation, a physiological data acquisition system of the present invention can include a blood chemistry sensor device **265** which enables various non-invasive blood chemistry measurements. Such blood chemistry measurements can include measurement of hemacrit, which is a measure of the fractional level of red blood cells in the blood, hemoglobin, tissue perfusion, and oxygenation. According to one approach, noninvasive blood chemistry measurements are obtained using NIR (near infrared) spectroscopy techniques. Nihtila at [0062] By way of example, **a sensor of the blood chemistry sensor device 265 can employ photonic methods based on fluorescence. For example, the blood chemistry sensor device 265 contains a colored dye immobilized in a polymer film. A blue LED excites fluorescence while a photodiode monitors the resulting red emission. Oxygen interferes with the fluorescence. Greater**

’868 Patent	Nihtila
	concentrations of oxygen diminish the red fluorescence emission. A suitable non-invasive blood chemistry measurement device is commercially available from PhotoSense LLC. Nihtila at [0063] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendants’ Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Nihtila , it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Nihtila , those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[b]. one or more semiconductor diodes generating an input light beam; and	Nihtila discloses or renders obvious the light source comprises one or more semiconductor diodes generating an input light beam. Physiological data is preferably acquired from the user through use of non-invasive techniques. Various types of physiological data can be acquired from the user, including, in particular, heart rate data. Blood pressure data can be acquired from time to time and incorporated into the virtual physiological model of the user. Body temperature, particularly when measured during extended periods of exertion, can also be acquired. **Oxygen saturation and oxygen consumption can also be measured and incorporated into the user's virtual physiological model.** Further, percent body fat can be determined and incorporated into the user's virtual physiological model. Various other physiological parameters can be acquired or developed for incorporation into the user's avatar. Nihtila at [0029] **In accordance with a more complex configuration, a physiological data acquisition system of the present invention can include a blood sensing device 211. The blood sensing device 211 is representative of one or more devices that can be used to measure a number of blood related parameters. Such blood related parameters can include oxygen saturation, oxygen consumption, blood chemistry, and blood pressure, for example.** Nihtila at [0054]

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

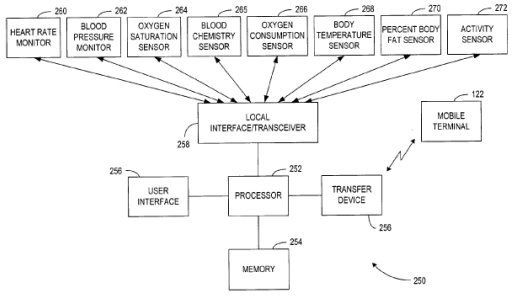
’868 Patent	Nihtila
	 *FIG. 2B* Nigtila at Fig. 2B **FIG. 2B illustrates a number of different physiological sensor devices that can be employed in a physiological data acquisition system 250 of the present invention.** It is understood that the devices depicted in FIG. 2B do not represent an exhaustive listing of devices that can be employed. Moreover, it is understood that a physiological data acquisition system **250** of the present invention need not incorporate all of the devices shown in FIG. 2B, but can incorporate one or multiple devices. Nihtila at [0055] According to one configuration, **the physiological data acquisition system 250 is intended to represent a portable, and preferably wearable, unit that provides for local acquisition of physiological data from one or more physiological sensor devices.** The physiological sensor devices may be integral to or separate from the physiological data acquisition system 250. Each of the physiological sensor devices typically communicates with the physiological data acquisition system 250 via an on-board communication device, such as a device that conforms to the Bluetooth wireless specification. The physiological data acquisition system 250 includes a local interface/transceiver 258 that also operates in conformance with the Bluetooth wireless specification. Depending on the type of physiological sensor device employed, a hardwire connection can be established between a given physiological sensor device and the physiological data acquisition system 250 via the local interface/transceiver 258. A user interface 256 and memory 254 are coupled to the processor 252. A transfer device 256, such as a communication device configured to operate in conformance with the Bluetooth wireless specification, is coupled to the processor 252 and provides for unidirectional or bidirectional communication with a mobile terminal 122.

’868 Patent	Nihtila
	Nihtila at [0056] **In a more sophisticated implementation, a physiological data acquisition system 250 of the present invention can include an oxygen saturation sensor 264 which non-invasively measures oxygen saturation of the user's blood. A pulse oximeter, for example, can be used to measure and compute the arterial oxygen saturation level of the user's blood from signals received from the pulse oximeter.** Nihtila at [0059] According to a more sophisticated implementation, a physiological data acquisition system of the present invention can include a blood chemistry sensor device **265** which enables various non-invasive blood chemistry measurements. Such blood chemistry measurements can include measurement of hemacrit, which is a measure of the fractional level of red blood cells in the blood, hemoglobin, tissue perfusion, and oxygenation. According to one approach, noninvasive blood chemistry measurements are obtained using NIR (near infrared) spectroscopy techniques. Nihtila at [0062] By way of example, **a sensor of the blood chemistry sensor device 265 can employ photonic methods based on fluorescence. For example, the blood chemistry sensor device 265 contains a colored dye immobilized in a polymer film. A blue LED excites fluorescence while a photodiode monitors the resulting red emission. Oxygen interferes with the fluorescence. Greater concentrations of oxygen diminish the red fluorescence emission.** A suitable non-invasive blood chemistry measurement device is commercially available from PhotoSense LLC. Nihtila at [0063] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendants’ Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Nihtila , it

’868 Patent	Nihtila
	would have been obvious to one of ordinary skill in the art to combine, with the teachings of Nihtila , those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[c]. a lens system configured to receive at least a portion of the input light beam and to communicate at least the portion of the input light beam onto a part of a user's body comprising blood	Nihtila discloses or renders obvious the light source comprises a lens system configured to receive at least a portion of the input light beam and to communicate at least the portion of the input light beam onto a part of a user's body comprising blood. Physiological data is preferably acquired from the user through use of non-invasive techniques. Various types of physiological data can be acquired from the user, including, in particular, heart rate data. Blood pressure data can be acquired from time to time and incorporated into the virtual physiological model of the user. Body temperature, particularly when measured during extended periods of exertion, can also be acquired. **Oxygen saturation and oxygen consumption can also be measured and incorporated into the user's virtual physiological model.** Further, percent body fat can be determined and incorporated into the user's virtual physiological model. Various other physiological parameters can be acquired or developed for incorporation into the user's avatar. Nihtila at [0029] **In accordance with a more complex configuration, a physiological data acquisition system of the present invention can include a blood sensing device 211. The blood sensing device 211 is representative of one or more devices that can be used to measure a number of blood related parameters. Such blood related parameters can include oxygen saturation, oxygen consumption, blood chemistry, and blood pressure, for example.** Nihtila at [0054]  *FIG. 2B*

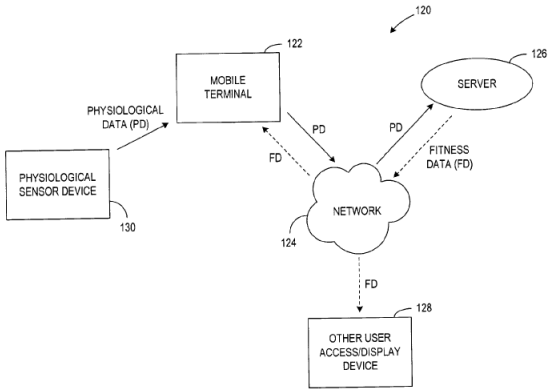
’868 Patent	Nihtila
	Nigtila at Fig. 2B **FIG. 2B illustrates a number of different physiological sensor devices that can be employed in a physiological data acquisition system 250 of the present invention.** It is understood that the devices depicted in FIG. 2B do not represent an exhaustive listing of devices that can be employed. Moreover, it is understood that a physiological data acquisition system **250** of the present invention need not incorporate all of the devices shown in FIG. 2B, but can incorporate one or multiple devices. Nihtila at [0055] According to one configuration, **the physiological data acquisition system 250 is intended to represent a portable, and preferably wearable, unit that provides for local acquisition of physiological data from one or more physiological sensor devices.** The physiological sensor devices may be integral to or separate from the physiological data acquisition system 250. Each of the physiological sensor devices typically communicates with the physiological data acquisition system 250 via an on-board communication device, such as a device that conforms to the Bluetooth wireless specification. The physiological data acquisition system 250 includes a local interface/transceiver 258 that also operates in conformance with the Bluetooth wireless specification. Depending on the type of physiological sensor device employed, a hardwire connection can be established between a given physiological sensor device and the physiological data acquisition system 250 via the local interface/transceiver 258. A user interface 256 and memory 254 are coupled to the processor 252. A transfer device 256, such as a communication device configured to operate in conformance with the Bluetooth wireless specification, is coupled to the processor 252 and provides for unidirectional or bidirectional communication with a mobile terminal 122. Nihtila at [0056] **In a more sophisticated implementation, a physiological data acquisition system 250 of the present invention can include an oxygen saturation sensor 264 which non-invasively measures oxygen saturation of the user's blood. A pulse oximeter, for example, can be used to measure and compute the arterial oxygen saturation level of the user's blood from signals received from the pulse oximeter.** Nihtila at [0059]

’868 Patent	Nihtila
	According to a more sophisticated implementation, a physiological data acquisition system of the present invention can include a blood chemistry sensor device **265** which enables various non-invasive blood chemistry measurements. Such blood chemistry measurements can include measurement of hemacrit, which is a measure of the fractional level of red blood cells in the blood, hemoglobin, tissue perfusion, and oxygenation. According to one approach, noninvasive blood chemistry measurements are obtained using NIR (near infrared) spectroscopy techniques. Nihtila at [0062] By way of example, **a sensor of the blood chemistry sensor device 265 can employ photonic methods based on fluorescence. For example, the blood chemistry sensor device 265 contains a colored dye immobilized in a polymer film. A blue LED excites fluorescence while a photodiode monitors the resulting red emission. Oxygen interferes with the fluorescence. Greater concentrations of oxygen diminish the red fluorescence emission.** A suitable non-invasive blood chemistry measurement device is commercially available from PhotoSense LLC. Nihtila at [0063] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendants’ Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Nihtila , it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Nihtila , those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[d]. wherein at least the portion of the input light beam is used in a measurement on a user;	Nihtila discloses or renders obvious the portion of the input light beam is used in a measurement on a user. Physiological data is preferably acquired from the user through use of non-invasive techniques. Various types of physiological data can be acquired from the user, including, in particular, heart rate data. Blood pressure data can be acquired from time to time and incorporated into the virtual physiological model of the user. Body temperature, particularly when measured during extended periods of exertion, can also be acquired. **Oxygen saturation and oxygen consumption can also be measured and**

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	incorporated into the user's virtual physiological model. Further, percent body fat can be determined and incorporated into the user's virtual physiological model. Various other physiological parameters can be acquired or developed for incorporation into the user's avatar. Nihtila at [0029] **In accordance with a more complex configuration, a physiological data acquisition system of the present invention can include a blood sensing device 211. The blood sensing device 211 is representative of one or more devices that can be used to measure a number of blood related parameters. Such blood related parameters can include oxygen saturation, oxygen consumption, blood chemistry, and blood pressure, for example.** Nihtila at [0054]  *FIG. 2B* Nigtila at Fig. 2B **FIG. 2B illustrates a number of different physiological sensor devices that can be employed in a physiological data acquisition system 250 of the present invention.** It is understood that the devices depicted in FIG. 2B do not represent an exhaustive listing of devices that can be employed. Moreover, it is understood that a physiological data acquisition system **250** of the present invention need not incorporate all of the devices shown in FIG. 2B, but can incorporate one or multiple devices. Nihtila at [0055]

’868 Patent	Nihtila
	According to one configuration, **the physiological data acquisition system 250 is intended to represent a portable, and preferably wearable, unit that provides for local acquisition of physiological data from one or more physiological sensor devices.** The physiological sensor devices may be integral to or separate from the physiological data acquisition system 250. Each of the physiological sensor devices typically communicates with the physiological data acquisition system 250 via an on-board communication device, such as a device that conforms to the Bluetooth wireless specification. The physiological data acquisition system 250 includes a local interface/transceiver 258 that also operates in conformance with the Bluetooth wireless specification. Depending on the type of physiological sensor device employed, a hardwire connection can be established between a given physiological sensor device and the physiological data acquisition system 250 via the local interface/transceiver 258. A user interface 256 and memory 254 are coupled to the processor 252. A transfer device 256, such as a communication device configured to operate in conformance with the Bluetooth wireless specification, is coupled to the processor 252 and provides for unidirectional or bidirectional communication with a mobile terminal 122. Nihtila at [0056] **In a more sophisticated implementation, a physiological data acquisition system 250 of the present invention can include an oxygen saturation sensor 264 which non-invasively measures oxygen saturation of the user's blood. A pulse oximeter, for example, can be used to measure and compute the arterial oxygen saturation level of the user's blood from signals received from the pulse oximeter.** Nihtila at [0059] According to a more sophisticated implementation, a physiological data acquisition system of the present invention can include a blood chemistry sensor device **265** which enables various non-invasive blood chemistry measurements. Such blood chemistry measurements can include measurement of hemacrit, which is a measure of the fractional level of red blood cells in the blood, hemoglobin, tissue perfusion, and oxygenation. According to one approach, noninvasive blood chemistry measurements are obtained using NIR (near infrared) spectroscopy techniques. Nihtila at [0062]

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Nihtila
	By way of example, **a sensor of the blood chemistry sensor device 265 can employ photonic methods based on fluorescence. For example, the blood chemistry sensor device 265 contains a colored dye immobilized in a polymer film. A blue LED excites fluorescence while a photodiode monitors the resulting red emission. Oxygen interferes with the fluorescence. Greater concentrations of oxygen diminish the red fluorescence emission.** A suitable non-invasive blood chemistry measurement device is commercially available from PhotoSense LLC. Nihtila at [0063] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendants’ Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Nihtila , it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Nihtila , those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[e]. a software application capable of generating data based at least in part on the measurement on the user,	Nihtila discloses or renders obvious a software application capable of generating data based at least in part on the measurement on the user.  *FIG. 1* Nihtila at Fig. 1

’868 Patent	Nihtila
	Turning now to the drawings, and more particularly to FIG. 1, there is illustrated a system for acquiring physiological data from a user and communicating the physiological data via a mobile terminal to a network server for integration into a virtual physiological model established for the user in accordance with an embodiment of the present invention. FIG. 1 shows a physiological sensor device **130** communicatively coupled to a mobile terminal **122**. The physiological sensor device **130** is intended to represent one or more sensing devices that sense one or more physiological parameters of a user, such as heart rate, for example. The physiological sensor device **130** is communicatively coupled to mobile terminal **122** via a wireless link, such as wireless link that conforms to the Bluetooth wireless specification. In another configuration, the physiological sensor device **130** can be coupled to the mobile terminal **122** via a hard wired connection, although it is perceived that a wireless link is more desirable in most cases. Nihtila at [0035] The physiological sensor device 130 acquires physiological data (PD) from the user and transmits this data to the mobile terminal 122. According to one approach, the mobile terminal 122 effectively functions as a modem by communicating the physiological data received from the physiological sensor device 130 to a radio network 124, such as a 2G or 3G network. It is noted that the network 124 shown in the figures can alternatively be representative of an IP or Mobil IP network, such as an IPv4, IPv6, or hybrid IPv4/IPv6 network for example. Nihtila at [0036] According to another approach, the mobile terminal 122 cooperates with the physiological sensor device 130 to buffer physiological data received from the physiological sensor device 130, noting that portions of the physiological data acquired by the physiological sensor device 130 in real-time can be stored/buffered in memory of one or both of the mobile terminal 122 and physiological sensor device 130. This cooperative use of distributed memory is of particular use when significant amounts of real-time physiological data obtained by several sensors are acquired, and in situations where a communication link between the mobile terminal 122 and network 124 cannot be established or is unstable/unreliable. Nihtila at [0037]

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

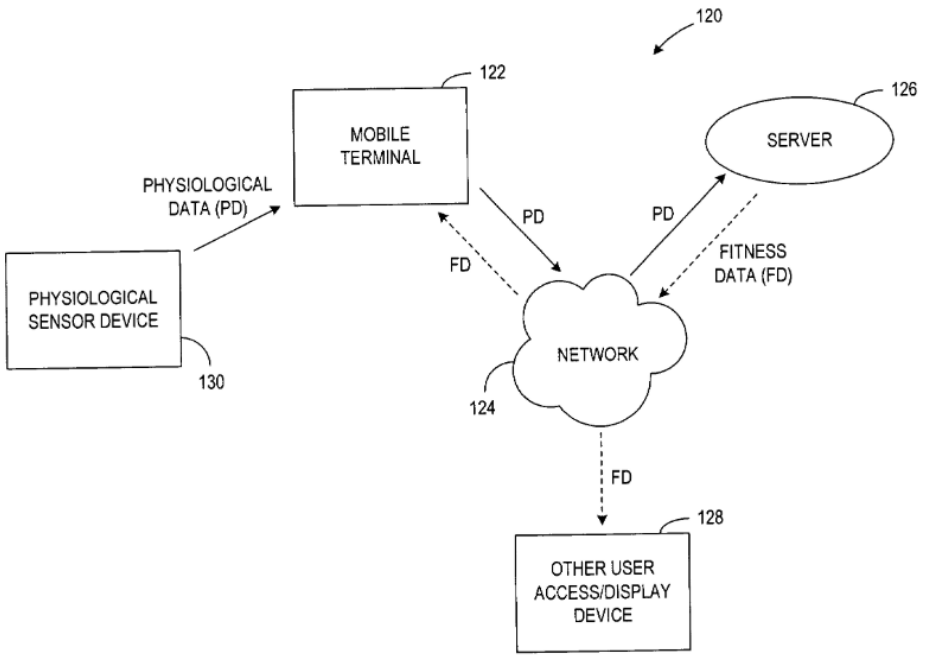
’868 Patent	Nihtila
	The physiological data communicated from the mobile terminal 122 to the network 124 is routed to a server 126 which is configured to accept and process this data. The server 126 stores and executes processing software that, in general, operates on the physiological data received from each of a number of users. The processing software integrates currently or recently acquired physiological data into the user's virtual physiological model (i.e., avatar). The user can review the data associated with his or her avatar using the mobile terminal 122 or other user access/display device 128. Nihtila at [0038] The processing software further computes fitness data (FD) of various types, including, textual, graphical, animation, audio, video, or other form of fitness data. As previously discussed, the fitness data can include various types of physiological parameters, changes to such parameters over time, training and diet recommendations, and various views of the user's avatar, among other forms of data. The fitness data is communicated from the server **126** to the user via the network **124**. The fitness data can be communicated to the mobile terminal **122** or some other user access/display device **128**. Nihtila at [0040] FIG. 2A is a depiction of a system for acquiring physiological data from a user and communicating the physiological data via a mobile terminal to a network server for integration into a virtual physiological model established for the user in accordance with another embodiment of the present invention. According to this embodiment, a number of different physiological sensor devices can be employed to acquire a variety of different physiological parameters from a user. As shown in the illustrative embodiment of FIG. 2A, a system of the present invention can include a variety of physiological sensor devices, including portable or ambulatory sensor devices, table-top or stationary sensor devices, and a combination of these devices. The physiological sensor devices are preferably non-invasive devices. It is understood that a system of the present invention can range in sophistication from simple configurations, in which one or perhaps two physiological sensor devices are employed, to complex configurations, in which several physiological sensor devices are employed. Nihtila at [0042] Each of the physiological sensor devices includes an integral transfer device 203 which facilitates the transmission of acquired physiological data to a mobile terminal 122. According to this embodiment,

’868 Patent	Nihtila
	the transfer device 203 includes a communication device configured to operate in conformance with the Bluetooth wireless specification. The mobile terminal 122 also has the capability to communicate with the transfer device 203 in conformance with the Bluetooth wireless specification. The transfer device 203 can be configured to provide for uni-directional or bi-directional communication with the mobile terminal 122. Nihtila at [0043] As discussed previously, physiological data, such as heart rate data, can be acquired and transmitted to the mobile terminal 122 via the transfer device 203 in real-time. Alternatively, physiological data can be buffered in memory of one or both of the physiological sensor device and mobile terminal 122. In a real-time mode of operation, the mobile terminal 122 operates effectively as a modem to facilitated the transfer of acquired physiological data between the physiological sensor device, mobile terminal 122, network 124, and server 126 in real-time. Nihtila at [0044] A fitness data engine 220 supported by the server 126 can receive the acquired physiological data in real-time, interact with the user's avatar, such as by integrating the acquired physiological data into the avatar, generate fitness data, including various processed data and avatar depictions, and transmit the fitness data to the mobile terminal 122 or other user access/display device in real-time. It is understood that these data can also be transmitted between the various communication elements on a non real-time basis. Nihtila at [0045] The mobile terminal 122 includes a display 212 and user interface 216, among other standard components. The user interface 216 of the mobile terminal 122 can be used to input various types of user related information needed to create, modify, or otherwise interact with the user's avatar residing on the server 126. For example, the user can input weight, height, age, gender, and other physical and personal information to the user's virtual physiological model via the mobile terminal's user interface 216. Alternative or in addition, this information can be input using a user interface of a given physiological sensor device that provides such an interface.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

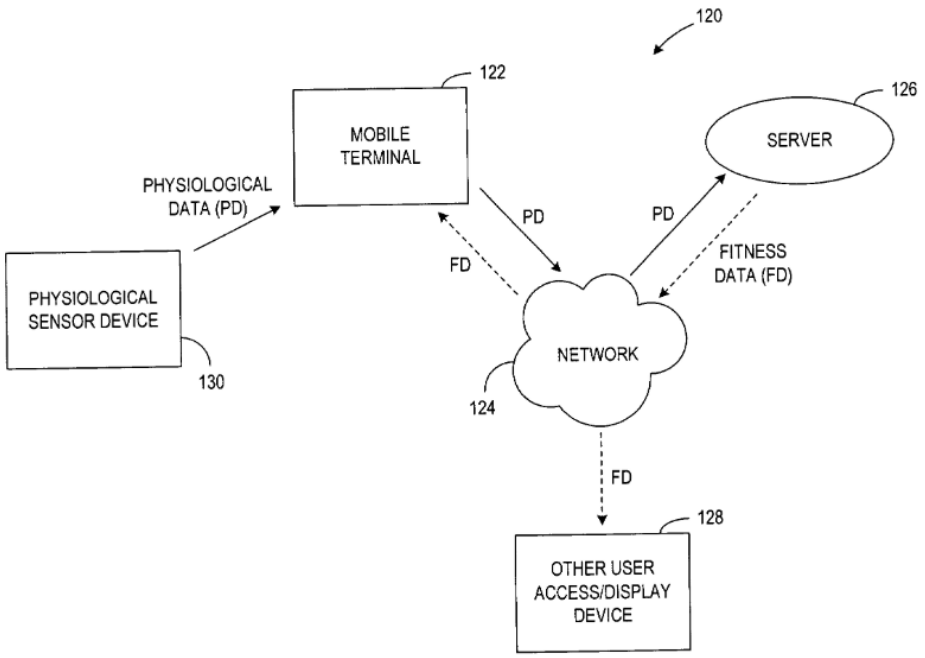
’868 Patent	Nihtila
	Nihtila at [0046] Various commands to access and interact with the user's virtual physiological model can be generated using the user interface 216 of the mobile terminal 122. Various types of textual, graphical, audio, motion video, and animation data received from the fitness data engine 220 and server 126 can be displayed on the display 212 of the mobile terminal 122, which also includes a speaker. In addition, these various data types can be transmitted from the server 126/fitness data engine 220 to a user by use of a WEB terminal device 222, television 224, or other access interface 226 that employs a display 228. Nihtila at [0047] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendants’ Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Nihtila , it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Nihtila , those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[f]. wherein the data represents at least in part physiological information associated with the user;	Nihtila discloses or renders obvious the data represents at least in part physiological information associated with the user.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Nihtila
	 *FIG. 1* Nihtila at Fig.1 **The physiological data communicated from the mobile terminal 122 to the network 124 is routed to a server 126 which is configured to accept and process this data. The server 126 stores and executes processing software that, in general, operates on the physiological data received from each of a number of users. The processing software integrates currently or recently acquired physiological data into the user's virtual physiological model (i.e., avatar). The user can review the data associated with his or her avatar using the mobile terminal 122 or other user access/display device 128**. Nihtila at [0038]

’868 Patent	Nihtila
	The processing software further computes fitness data (FD) of various types, including, textual, graphical, animation, audio, video, or other form of fitness data. As previously discussed, the fitness data can include various types of physiological parameters, changes to such parameters over time, training and diet recommendations, and various views of the user's avatar, among other forms of data. The fitness data is communicated from the server 126 to the user via the network 124. The fitness data can be communicated to the mobile terminal 122 or some other user access/display device 128. Nihtila at [0040] *See also* 7[e] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendants’ Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Nihtila , it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Nihtila , those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[g]. the software application capable of operating on a control system adapted to receive, store and process at least a portion of the physiological information,	Nihtila discloses or renders obvious the software application capable of operating on a control system adapted to receive, store and process at least a portion of the physiological information.

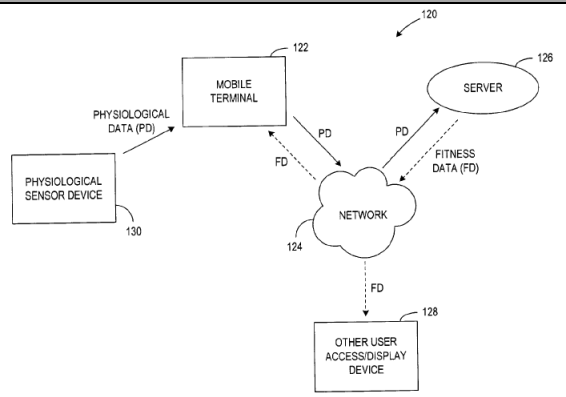
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Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Nihtila
	 *FIG. 1* Nihtila at Fig.1 According to another approach, **the mobile terminal 122 cooperates with the physiological sensor device 130 to buffer physiological data received from the physiological sensor device 130, noting that portions of the physiological data acquired by the physiological sensor device 130 in real-time can be stored/buffered in memory of one or both of the mobile terminal 122 and physiological sensor device 130.** This cooperative use of distributed memory is of particular use when significant amounts of real-time physiological data obtained by several sensors are acquired, and in situations where a communication link between the mobile terminal 122 and network 124 cannot be established or is unstable/unreliable. Nihtila at [0037]

'868 Patent	Nihtila
	The physiological data communicated from the mobile terminal 122 to the network 124 is routed to a server 126 which is configured to accept and process this data. The server 126 stores and executes processing software that, in general, operates on the physiological data received from each of a number of users. The processing software integrates currently or recently acquired physiological data into the user's virtual physiological model (i.e., avatar). The user can review the data associated with his or her avatar using the mobile terminal 122 or other user access/display device 128. Nihtila at [0038] **The processing software further computes fitness data (FD) of various types, including, textual, graphical, animation, audio, video, or other form of fitness data. As previously discussed, the fitness data can include various types of physiological parameters, changes to such parameters over time, training and diet recommendations, and various views of the user's avatar, among other forms of data. The fitness data is communicated from the server 126 to the user via the network 124. The fitness data can be communicated to the mobile terminal 122 or some other user access/display device 128.** Nihtila at [0040] *See also* 7[pre] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendants' Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Nihtila , it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Nihtila , those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[h]. the control system having a touch-screen, circuitry for obtaining position information from a location sensor, and	Nihtila discloses or renders obvious the control system having a touch-screen, circuitry for obtaining position information from a location sensor. **The processing software further computes fitness data (FD) of various types, including, textual, graphical, animation, audio, video, or other form of fitness data. As previously discussed, the**

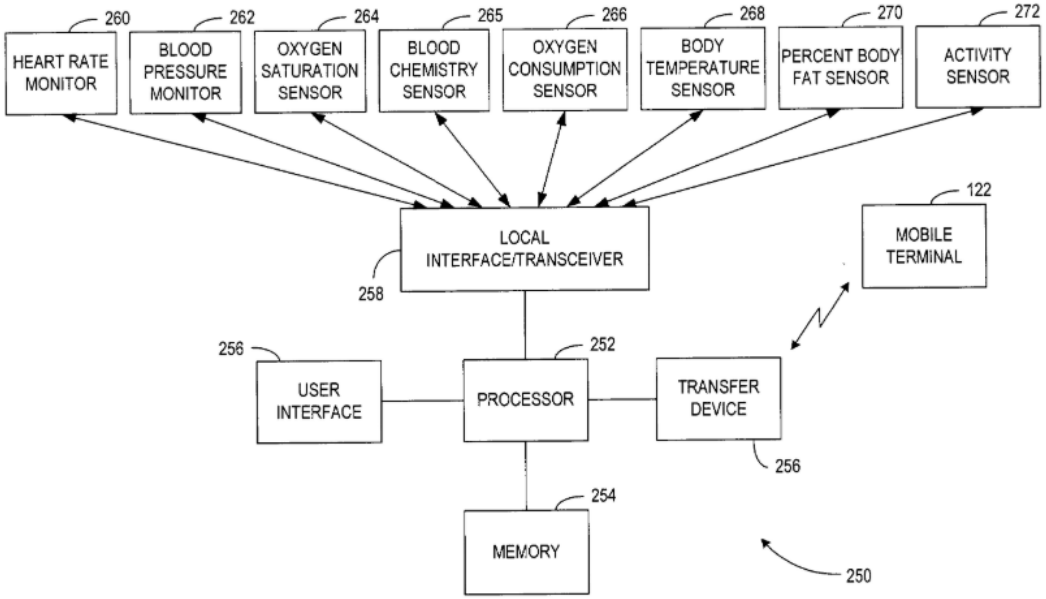
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Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Nihtila
	fitness data can include various types of physiological parameters, changes to such parameters over time, training and diet recommendations, and various views of the user's avatar, among other forms of data. The fitness data is communicated from the server 126 to the user via the network 124. The fitness data can be communicated to the mobile terminal 122 or some other user access/display device 128. Nihtila at [0040] **Various commands to access and interact with the user's virtual physiological model can be generated using the user interface 216 of the mobile terminal 122. Various types of textual, graphical, audio, motion video, and animation data received from the fitness data engine 220 and server 126 can be displayed on the display 212 of the mobile terminal 122**, which also includes a speaker. In addition, these various data types can be transmitted from the server 126/fitness data engine 220 to a user by use of a WEB terminal device 222, television 224, or other access interface 226 that employs a display 228. Nihtila at [0047] *See also* 7[pre] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendants’ Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Nihtila , it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Nihtila , those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[i]. a wireless transceiver to transmit wireless data over a wireless link,	Nihtila discloses or renders obvious a wireless transceiver to transmit wireless data over a wireless link.

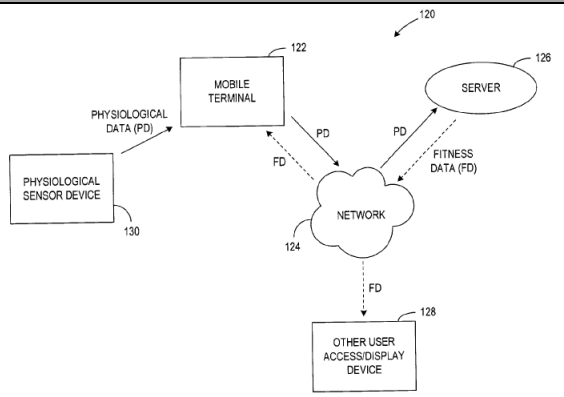
’868 Patent	Nihtila
	 *FIG. 1* Nihtila at Fig. 1 Turning now to the drawings, and more particularly to FIG. 1, there is illustrated a system for acquiring physiological data from a user and communicating the physiological data via a mobile terminal to a network server for integration into a virtual physiological model established for the user in accordance with an embodiment of the present invention. FIG. 1 shows a physiological sensor device **130** communicatively coupled to a mobile terminal **122**. The physiological sensor device **130** is intended to represent one or more sensing devices that sense one or more physiological parameters of a user, such as heart rate, for example. The physiological sensor device **130** is communicatively coupled to mobile terminal **122** via a wireless link, such as wireless link that conforms to the Bluetooth wireless specification. In another configuration, the physiological sensor device **130** can be coupled to the mobile terminal **122** via a hard wired connection, although it is perceived that a wireless link is more desirable in most cases. Nihtila at [0035] The physiological sensor device 130 acquires physiological data (PD) from the user and transmits this data to the mobile terminal 122. According to one approach, the mobile terminal 122 effectively functions as a modem by communicating the physiological data received from the physiological sensor device 130 to a radio network 124, such as a 2G or 3G network. It is noted that the network 124 shown in the figures can alternatively be representative of an IP or Mobil IP network, such as an IPv4, IPv6, or hybrid IPv4/IPv6 network for example.

’868 Patent	Nihtila
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Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

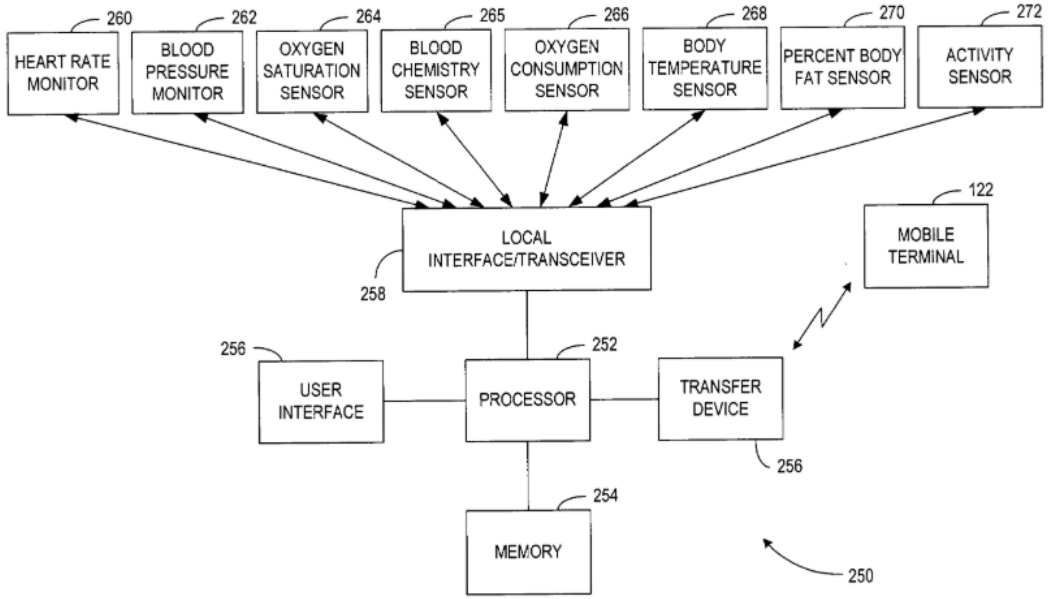
’868 Patent	Nihtila
	 *FIG. 2B* Nihtila at Fig. 2B According to one configuration, **the physiological data acquisition system 250 is intended to represent a portable, and preferably wearable, unit that provides for local acquisition of physiological data from one or more physiological sensor devices.** The physiological sensor devices may be integral to or separate from the physiological data acquisition system 250. Each of the physiological sensor devices typically communicates with the physiological data acquisition system 250 via an on-board communication device, such as a device that conforms to the Bluetooth wireless specification. **The physiological data acquisition system 250 includes a local interface/transceiver 258 that also operates in conformance with the Bluetooth wireless specification. Depending on the type of physiological sensor device employed, a hardwire connection can be established between a given physiological sensor device and the physiological data acquisition system 250 via the local interface/transceiver 258. A user interface 256 and memory 254 are coupled to the processor 252. A transfer device 256, such as a communication device configured to operate in conformance with**

’868 Patent	Nihtila
	the Bluetooth wireless specification, is coupled to the processor 252 and provides for unidirectional or bidirectional communication with a mobile terminal 122. Nihtila at [0056] In accordance with another configuration, the processor 252, user interface 256, and memory 254 represent standard components of a mobile terminal. **The transceiver device 256, in this configuration, represents standard communication circuitry that provides for communication with a radio network, such as a 2G or 3G network. In this particular case, block 122 would be representative of a network, rather than a mobile terminal as is shown in FIG. 2B. Each of the physiological sensor devices is communicatively coupled to the processor 252 of the mobile terminal via wireless or hardwired connections to the local interface/transceiver 258. Wireless communication between the local interface/transceiver 258 and one or more of the physiological sensor devices is preferably accomplished in accordance with the Bluetooth wireless specification.** Nihtila at [0057] *See also* 7[pre] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendants’ Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Nihtila , it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Nihtila , those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[j]. the wireless data comprising at least a part of the physiological information,	Nihtila discloses or renders obvious the wireless data comprising at least a part of the physiological information.

’868 Patent	Nihtila
	 *FIG. 1* Nihtila at Fig. 1 Turning now to the drawings, and more particularly to FIG. 1, there is illustrated a system for acquiring physiological data from a user and communicating the physiological data via a mobile terminal to a network server for integration into a virtual physiological model established for the user in accordance with an embodiment of the present invention. FIG. 1 shows a physiological sensor device **130** communicatively coupled to a mobile terminal **122**. The physiological sensor device **130** is intended to represent one or more sensing devices that sense one or more physiological parameters of a user, such as heart rate, for example. The physiological sensor device **130** is communicatively coupled to mobile terminal **122** via a wireless link, such as wireless link that conforms to the Bluetooth wireless specification. In another configuration, the physiological sensor device **130** can be coupled to the mobile terminal **122** via a hard wired connection, although it is perceived that a wireless link is more desirable in most cases. Nihtila at [0035] The physiological sensor device 130 acquires physiological data (PD) from the user and transmits this data to the mobile terminal 122. According to one approach, the mobile terminal 122 effectively functions as a modem by communicating the physiological data received from the physiological sensor device 130 to a radio network 124, such as a 2G or 3G network. It is noted that the network 124 shown in the figures can alternatively be representative of an IP or Mobil IP network, such as an IPv4, IPv6, or hybrid IPv4/IPv6 network for example.

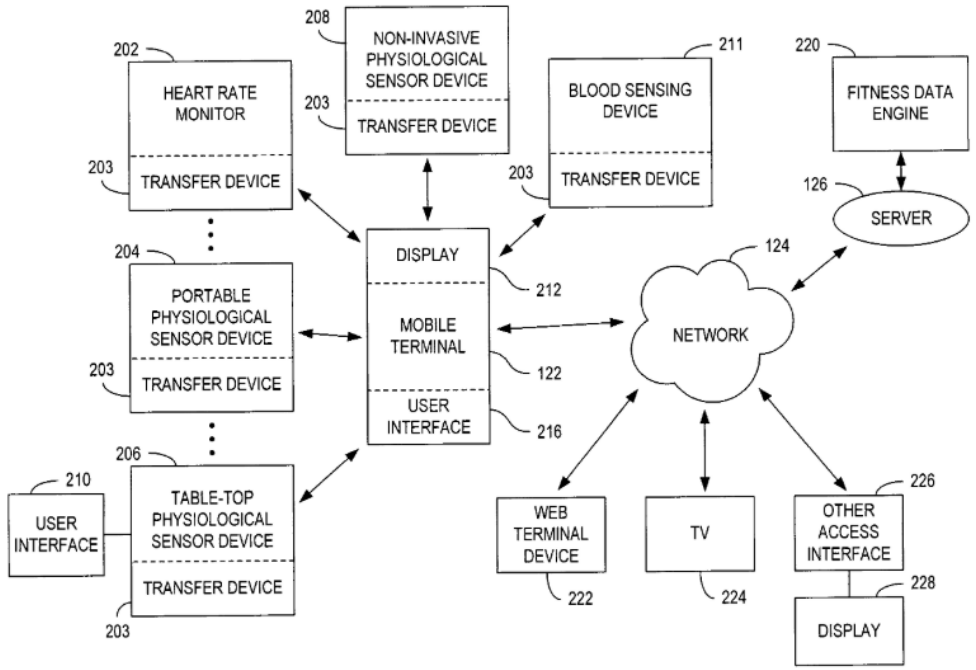
’868 Patent	Nihtila
	Nihtila at [0036] According to another approach, the mobile terminal 122 cooperates with the physiological sensor device 130 to buffer physiological data received from the physiological sensor device 130, noting that portions of the physiological data acquired by the physiological sensor device 130 in real-time can be stored/buffered in memory of one or both of the mobile terminal 122 and physiological sensor device 130. This cooperative use of distributed memory is of particular use when significant amounts of real-time physiological data obtained by several sensors are acquired, and in situations where a communication link between the mobile terminal 122 and network 124 cannot be established or is unstable/unreliable. Nihtila at [0037] The physiological data communicated from the mobile terminal 122 to the network 124 is routed to a server 126 which is configured to accept and process this data. The server 126 stores and executes processing software that, in general, operates on the physiological data received from each of a number of users. The processing software integrates currently or recently acquired physiological data into the user's virtual physiological model (i.e., avatar). The user can review the data associated with his or her avatar using the mobile terminal 122 or other user access/display device 128. Nihtila at [0038]

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Nihtila
	 *FIG. 2B* Nihtila at Fig. 2B According to one configuration, **the physiological data acquisition system 250 is intended to represent a portable, and preferably wearable, unit that provides for local acquisition of physiological data from one or more physiological sensor devices.** The physiological sensor devices may be integral to or separate from the physiological data acquisition system 250. Each of the physiological sensor devices typically communicates with the physiological data acquisition system 250 via an on-board communication device, such as a device that conforms to the Bluetooth wireless specification. **The physiological data acquisition system 250 includes a local interface/transceiver 258 that also operates in conformance with the Bluetooth wireless specification. Depending on the type of physiological sensor device employed, a hardwire connection can be established between a given physiological sensor device and the physiological data acquisition system 250 via the local interface/transceiver 258. A user interface 256 and memory 254 are coupled to the processor 252. A transfer device 256, such as a communication device configured to operate in conformance with**

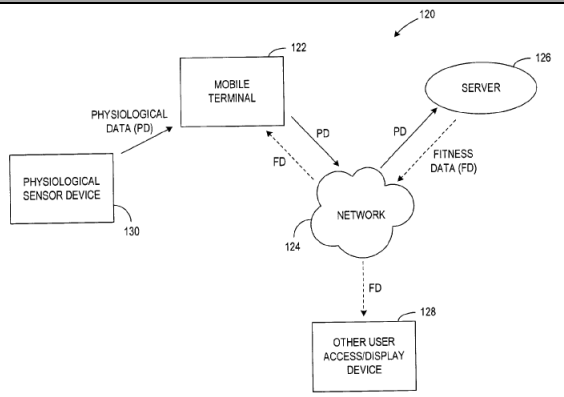
’868 Patent	Nihtila
	the Bluetooth wireless specification, is coupled to the processor 252 and provides for unidirectional or bidirectional communication with a mobile terminal 122. Nihtila at [0056] As was discussed previously, **the physiological data acquisition system 250 preferably includes a heart rate monitor 260 and may further include a blood pressure monitor 262. A body temperature sensor 268 can also be used to monitor changes in the user's body temperature over time**, and to develop body temperature profiles for the user during particular exercise regimens. For example, monitoring the body temperature of a marathon runner and developing temperature profiles therefrom can be useful in developing optimal training regimens for such long distance runners. Nihtila at [0058] *See also* 7[f] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendants’ Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Nihtila , it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Nihtila , those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[k]. wherein the control system is further capable of receiving voice input signals and manually entered input signals; and	Nihtila discloses or renders obvious the control system is further capable of receiving voice input signals and manually entered input signals. The processing software further computes fitness data (FD) of various types, including, textual, graphical, animation, audio, video, or other form of fitness data. As previously discussed, the fitness data can include various types of physiological parameters, changes to such parameters over time, training and diet recommendations, and various views of the user's avatar, among other forms of data. The fitness data is communicated from the server **126** to the user via the network **124**. The fitness data can be communicated to the mobile terminal **122** or some other user access/display device **128**. Nihtila at [0040]

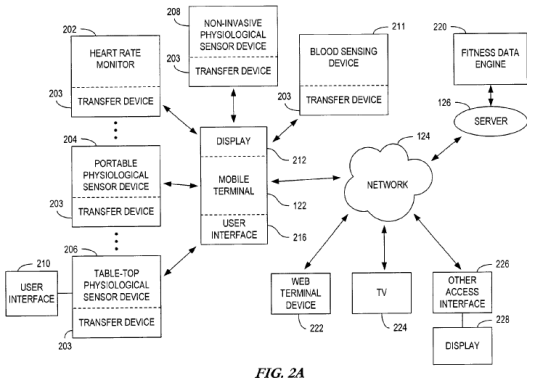
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Nihtila
	 *FIG. 2A* Nihtila at Fig. 2A The mobile terminal 122 includes a display 212 and user interface 216, among other standard components. **The user interface 216 of the mobile terminal 122 can be used to input various types of user related information needed to create, modify, or otherwise interact with the user's avatar residing on the server 126. For example, the user can input weight, height, age, gender, and other physical and personal information to the user's virtual physiological model via the mobile terminal's user interface 216. Alternative or in addition, this information can be input using a user interface of a given physiological sensor device that provides such an interface** Nihtila at [0046] **Various commands to access and interact with the user's virtual physiological model can be generated using the user interface 216 of the mobile terminal 122. Various types of textual,**

’868 Patent	Nihtila
	graphical, audio, motion video, and animation data received from the fitness data engine 220 and server 126 can be displayed on the display 212 of the mobile terminal 122, which also includes a speaker. In addition, these various data types can be transmitted from the server 126/fitness data engine 220 to a user by use of a WEB terminal device 222, television 224, or other access interface 226 that employs a display 228. Nihtila at [0047] A sphygmomanometer, for example, can be employed as a table-top physiological sensor device 206 that can be used frequently to provide accurate measurement of the user's blood pressure. **The table-top physiological sensor device 206, in certain configurations, can include a user interface 210, such as a user input device and display**, for example. **It is noted that the table-top physiological sensor device 206 or the portable physiological sensor device 204 can employ an invasive approach to sensing a particular physiological parameter of the user**. Nihtila at [0053] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendants’ Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Nihtila , it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Nihtila , those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[l]. a host comprising:	Nihtila discloses or renders obvious the diagnostic system comprises a host. A system and method provide for interacting with a virtual physiological model of a user with use of a mobile communication device. Physiological data associated with the user is acquired from the user. The physiological data is transmitted to the mobile communication device, preferably with use of a wireless communication protocol. The methodology further involves using the mobile communication device to communicate the physiological data to a network server. The physiological data is integrated into the virtual physiological model of the user. The user can access data and depictions of the user developed from the physiological data.

’868 Patent	Nihtila
	Nihtila at Abstract The present invention is directed to **systems and methods for using mobile communication techniques to enhance an understanding of the physiological state of an individual based on physiological information acquired from the individual in real-time. The principles of the present invention find particular applicability in the context of development, refinement, and monitoring of physical fitness regimens and training, and verification of the effectiveness of such regimens and training over time.** Nihtila at [0024] **Employment of a visual depiction or characterization of a user's real-time physiological state in accordance with the principles of the present invention provides a comprehensive visual physical fitness feedback methodology heretofore unavailable using conventional physiological monitoring techniques.** Nihtila at [0026] Physiological data is preferably acquired from the user through use of non-invasive techniques. Various types of physiological data can be acquired from the user, including, in particular, heart rate data. Blood pressure data can be acquired from time to time and incorporated into the virtual physiological model of the user. Body temperature, particularly when measured during extended periods of exertion, can also be acquired. Oxygen saturation and oxygen consumption can also be measured and incorporated into the user's virtual physiological model. Further, percent body fat can be determined and incorporated into the user's virtual physiological model. Various other physiological parameters can be acquired or developed for incorporation into the user's avatar. Nihtila at [0029]

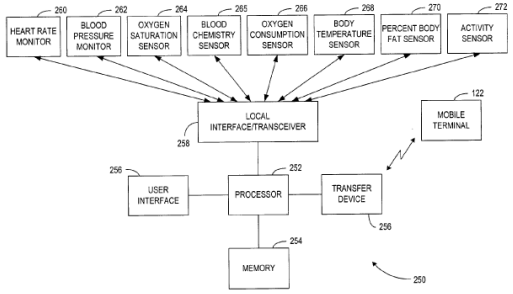
’868 Patent	Nihtila
	 *FIG. 1* Nihtila at Fig. 1 Turning now to the drawings, and more particularly to FIG. 1, there is illustrated a system for acquiring physiological data from a user and communicating the physiological data via a mobile terminal to a network server for integration into a virtual physiological model established for the user in accordance with an embodiment of the present invention. FIG. 1 shows a physiological sensor device **130** communicatively coupled to a mobile terminal **122**. The physiological sensor device **130** is intended to represent one or more sensing devices that sense one or more physiological parameters of a user, such as heart rate, for example. The physiological sensor device **130** is communicatively coupled to mobile terminal **122** via a wireless link, such as wireless link that conforms to the Bluetooth wireless specification. In another configuration, the physiological sensor device **130** can be coupled to the mobile terminal **122** via a hard wired connection, although it is perceived that a wireless link is more desirable in most cases. Nihtila at [0035] The physiological sensor device 130 acquires physiological data (PD) from the user and transmits this data to the mobile terminal 122. According to one approach, the mobile terminal 122 effectively functions as a modem by communicating the physiological data received from the physiological sensor device 130 to a radio network 124, such as a 2G or 3G network. It is noted that the network 124 shown in the figures can alternatively be representative of an IP or Mobil IP network, such as an IPv4, IPv6, or hybrid IPv4/IPv6 network for example.

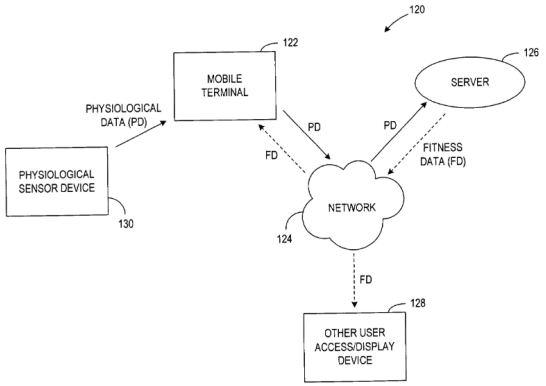
’868 Patent	Nihtila
	Nihtila at [0036] According to another approach, the mobile terminal 122 cooperates with the physiological sensor device 130 to buffer physiological data received from the physiological sensor device 130, noting that portions of the physiological data acquired by the physiological sensor device 130 in real-time can be stored/buffered in memory of one or both of the mobile terminal 122 and physiological sensor device 130. This cooperative use of distributed memory is of particular use when significant amounts of real-time physiological data obtained by several sensors are acquired, and in situations where a communication link between the mobile terminal 122 and network 124 cannot be established or is unstable/unreliable. Nihtila at [0037] The physiological data communicated from the mobile terminal 122 to the network 124 is routed to a server 126 which is configured to accept and process this data. The server 126 stores and executes processing software that, in general, operates on the physiological data received from each of a number of users. The processing software integrates currently or recently acquired physiological data into the user's virtual physiological model (i.e., avatar). The user can review the data associated with his or her avatar using the mobile terminal 122 or other user access/display device 128. Nihtila at [0038]  *FIG. 2A* Fig. 2A

’868 Patent	Nihtila
	FIG. 2A is a depiction of a system for acquiring physiological data from a user and communicating the physiological data via a mobile terminal to a network server for integration into a virtual physiological model established for the user in accordance with another embodiment of the present invention. According to this embodiment, a number of different physiological sensor devices can be employed to acquire a variety of different physiological parameters from a user. As shown in the illustrative embodiment of FIG. 2A, a system of the present invention can include a variety of physiological sensor devices, including portable or ambulatory sensor devices, table-top or stationary sensor devices, and a combination of these devices. The physiological sensor devices are preferably non-invasive devices. It is understood that a system of the present invention can range in sophistication from simple configurations, in which one or perhaps two physiological sensor devices are employed, to complex configurations, in which several physiological sensor devices are employed. Nihtila at [0042] Each of the physiological sensor devices includes an integral transfer device 203 which facilitates the transmission of acquired physiological data to a mobile terminal 122. According to this embodiment, the transfer device 203 includes a communication device configured to operate in conformance with the Bluetooth wireless specification. The mobile terminal 122 also has the capability to communicate with the transfer device 203 in conformance with the Bluetooth wireless specification. The transfer device 203 can be configured to provide for uni-directional or bi-directional communication with the mobile terminal 122. Nihtila at [0043] As discussed previously, physiological data, such as heart rate data, can be acquired and transmitted to the mobile terminal 122 via the transfer device 203 in real-time. Alternatively, physiological data can be buffered in memory of one or both of the physiological sensor device and mobile terminal 122. In a real-time mode of operation, the mobile terminal 122 operates effectively as a modem to facilitated the transfer of acquired physiological data between the physiological sensor device, mobile terminal 122, network 124, and server 126 in real-time. Nihtila at [0044]

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Nihtila
	A fitness data engine 220 supported by the server 126 can receive the acquired physiological data in real-time, interact with the user's avatar, such as by integrating the acquired physiological data into the avatar, generate fitness data, including various processed data and avatar depictions, and transmit the fitness data to the mobile terminal 122 or other user access/display device in real-time. It is understood that these data can also be transmitted between the various communication elements on a non real-time basis. Nihtila at [0045] The mobile terminal 122 includes a display 212 and user interface 216, among other standard components. The user interface 216 of the mobile terminal 122 can be used to input various types of user related information needed to create, modify, or otherwise interact with the user's avatar residing on the server 126. For example, the user can input weight, height, age, gender, and other physical and personal information to the user's virtual physiological model via the mobile terminal's user interface 216. Alternative or in addition, this information can be input using a user interface of a given physiological sensor device that provides such an interface. Nihtila at [0046] Various commands to access and interact with the user's virtual physiological model can be generated using the user interface 216 of the mobile terminal 122. Various types of textual, graphical, audio, motion video, and animation data received from the fitness data engine 220 and server 126 can be displayed on the display 212 of the mobile terminal 122, which also includes a speaker. In addition, these various data types can be transmitted from the server 126/fitness data engine 220 to a user by use of a WEB terminal device 222, television 224, or other access interface 226 that employs a display 228. Nihtila at [0047]

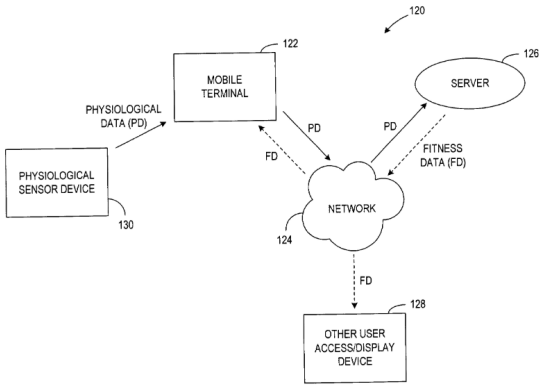
’868 Patent	Nihtila
	 *FIG. 2B* Nihtila at Fig. 2B **FIG. 2B illustrates a number of different physiological sensor devices that can be employed in a physiological data acquisition system 250 of the present invention.** It is understood that the devices depicted in FIG. 2B do not represent an exhaustive listing of devices that can be employed. Moreover, it is understood that a physiological data acquisition system **250** of the present invention need not incorporate all of the devices shown in FIG. 2B, but can incorporate one or multiple devices. Nihtila at [0055] Turning now to the drawings, and more particularly to FIG. 1**, there is illustrated a system for acquiring physiological data from a user and communicating the physiological data via a mobile terminal to a network server for integration into a virtual physiological model established for the user in accordance with an embodiment of the present invention. FIG. 1 shows a physiological sensor device 130 communicatively coupled to a mobile terminal 122. The physiological sensor device 130 is intended to represent one or more sensing devices that sense one or more physiological parameters of a user, such as heart rate, for example. The physiological sensor device 130 is communicatively coupled to mobile terminal 122 via a wireless link**, such as wireless link that conforms to the Bluetooth wireless specification. In another configuration, the physiological sensor device 130 can be coupled to the mobile terminal 122 via a hard wired connection, although it is perceived that a wireless link is more desirable in most cases. Nihtila at [0085] *See also* Nihtila at claims 1, 31, 39

’868 Patent	Nihtila
	One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendants’ Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Nihtila , it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Nihtila , those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[m]. a digital file for receiving and storing at least a portion of the wireless data;	Nihtila discloses or renders obvious the host comprises a digital file for receiving and storing at least a portion of the wireless data.  *FIG. 1* Nihtila at Fig.1 Turning now to the drawings, and more particularly to FIG. 1**, there is illustrated a system for acquiring physiological data from a user and communicating the physiological data via a mobile terminal to a network server for integration into a virtual physiological model established for the user in accordance with an embodiment of the present invention. FIG. 1 shows a physiological sensor device 130 communicatively coupled to a mobile terminal 122. The physiological sensor device 130 is intended to represent one or more sensing devices that sense one or more physiological parameters of a user, such as heart rate, for example. The physiological sensor device 130 is communicatively coupled to mobile terminal 122 via a wireless link**, such as wireless link that conforms to the Bluetooth wireless specification. In another configuration, the physiological

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	sensor device 130 can be coupled to the mobile terminal 122 via a hard wired connection, although it is perceived that a wireless link is more desirable in most cases. Nihtila at [0035] According to another approach, **the mobile terminal 122 cooperates with the physiological sensor device 130 to buffer physiological data received from the physiological sensor device 130, noting that portions of the physiological data acquired by the physiological sensor device 130 in real-time can be stored/buffered in memory of one or both of the mobile terminal 122 and physiological sensor device 130.** This cooperative use of distributed memory is of particular use when significant amounts of real-time physiological data obtained by several sensors are acquired, and in situations where a communication link between the mobile terminal 122 and network 124 cannot be established or is unstable/unreliable. Nihtila at [0037] FIG. 2A is a depiction of a system for acquiring physiological data from a user and communicating the physiological data via a mobile terminal to a network server for integration into a virtual physiological model established for the user in accordance with another embodiment of the present invention. According to this embodiment, a number of different physiological sensor devices can be employed to acquire a variety of different physiological parameters from a user. As shown in the illustrative embodiment of FIG. 2A, a system of the present invention can include a variety of physiological sensor devices, including portable or ambulatory sensor devices, table-top or stationary sensor devices, and a combination of these devices. The physiological sensor devices are preferably non-invasive devices. It is understood that a system of the present invention can range in sophistication from simple configurations, in which one or perhaps two physiological sensor devices are employed, to complex configurations, in which several physiological sensor devices are employed. Nihtila at [0042] Each of the physiological sensor devices includes an integral transfer device 203 which facilitates the transmission of acquired physiological data to a mobile terminal 122. According to this embodiment, the transfer device 203 includes a communication device configured to operate in conformance with the Bluetooth wireless specification. The mobile terminal 122 also has the capability to communicate

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	with the transfer device 203 in conformance with the Bluetooth wireless specification. The transfer device 203 can be configured to provide for uni-directional or bi-directional communication with the mobile terminal 122. Nihtila at [0043] As discussed previously, physiological data, such as heart rate data, can be acquired and transmitted to the mobile terminal 122 via the transfer device 203 in real-time. Alternatively, physiological data can be buffered in memory of one or both of the physiological sensor device and mobile terminal 122. In a real-time mode of operation, the mobile terminal 122 operates effectively as a modem to facilitated the transfer of acquired physiological data between the physiological sensor device, mobile terminal 122, network 124, and server 126 in real-time. Nihtila at [0044] A fitness data engine 220 supported by the server 126 can receive the acquired physiological data in real-time, interact with the user's avatar, such as by integrating the acquired physiological data into the avatar, generate fitness data, including various processed data and avatar depictions, and transmit the fitness data to the mobile terminal 122 or other user access/display device in real-time. It is understood that these data can also be transmitted between the various communication elements on a non real-time basis. Nihtila at [0045] *See also* 7[l] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendants’ Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Nihtila , it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Nihtila , those elements, as known to them or as disclosed by other prior art identified in the cover pleading.

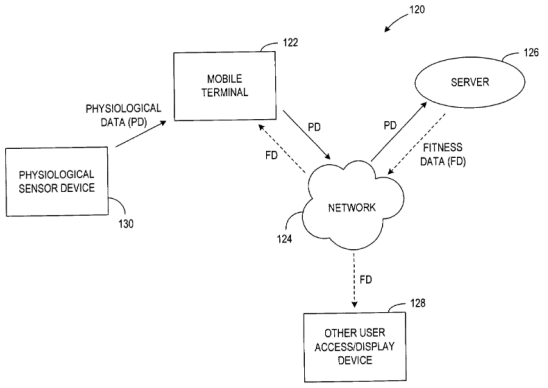
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Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Nihtila
7[n]. control logic at the host to process at least the portion of the wireless data to generate a status of the user;	Nihtila discloses or renders obvious the host comprises control logic at the host to process at least the portion of the wireless data to generate a status of the user.  *FIG. 1* Nihtila at Fig.1 Turning now to the drawings, and more particularly to FIG. 1**, there is illustrated a system for acquiring physiological data from a user and communicating the physiological data via a mobile terminal to a network server for integration into a virtual physiological model established for the user in accordance with an embodiment of the present invention. FIG. 1 shows a physiological sensor device 130 communicatively coupled to a mobile terminal 122. The physiological sensor device 130 is intended to represent one or more sensing devices that sense one or more physiological parameters of a user, such as heart rate, for example. The physiological sensor device 130 is communicatively coupled to mobile terminal 122 via a wireless link**, such as wireless link that conforms to the Bluetooth wireless specification. In another configuration, the physiological sensor device 130 can be coupled to the mobile terminal 122 via a hard wired connection, although it is perceived that a wireless link is more desirable in most cases. Nihtila at [0035] According to another approach, **the mobile terminal 122 cooperates with the physiological sensor device 130 to buffer physiological data received from the physiological sensor device 130, noting that portions of the physiological data acquired by the physiological sensor device 130 in real-time**

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	can be stored/buffered in memory of one or both of the mobile terminal 122 and physiological sensor device 130. This cooperative use of distributed memory is of particular use when significant amounts of real-time physiological data obtained by several sensors are acquired, and in situations where a communication link between the mobile terminal 122 and network 124 cannot be established or is unstable/unreliable. Nihtila at [0037] The processing software further computes fitness data (FD) of various types, including, textual, graphical, animation, audio, video, or other form of fitness data. As previously discussed, **the fitness data can include various types of physiological parameters, changes to such parameters over time, training and diet recommendations, and various views of the user's avatar, among other forms of data. The fitness data is communicated from the server 126 to the user via the network 124. The fitness data can be communicated to the mobile terminal 122 or some other user access/display device 128.** Nihtila at [0040] FIG. 2A is a depiction of a system for acquiring physiological data from a user and communicating the physiological data via a mobile terminal to a network server for integration into a virtual physiological model established for the user in accordance with another embodiment of the present invention. According to this embodiment, a number of different physiological sensor devices can be employed to acquire a variety of different physiological parameters from a user. As shown in the illustrative embodiment of FIG. 2A, a system of the present invention can include a variety of physiological sensor devices, including portable or ambulatory sensor devices, table-top or stationary sensor devices, and a combination of these devices. The physiological sensor devices are preferably non-invasive devices. It is understood that a system of the present invention can range in sophistication from simple configurations, in which one or perhaps two physiological sensor devices are employed, to complex configurations, in which several physiological sensor devices are employed. Nihtila at [0042] Each of the physiological sensor devices includes an integral transfer device 203 which facilitates the transmission of acquired physiological data to a mobile terminal 122. According to this embodiment,

’868 Patent	Nihtila
	the transfer device 203 includes a communication device configured to operate in conformance with the Bluetooth wireless specification. The mobile terminal 122 also has the capability to communicate with the transfer device 203 in conformance with the Bluetooth wireless specification. The transfer device 203 can be configured to provide for uni-directional or bi-directional communication with the mobile terminal 122. Nihtila at [0043] As discussed previously, physiological data, such as heart rate data, can be acquired and transmitted to the mobile terminal 122 via the transfer device 203 in real-time. Alternatively, physiological data can be buffered in memory of one or both of the physiological sensor device and mobile terminal 122. In a real-time mode of operation, the mobile terminal 122 operates effectively as a modem to facilitated the transfer of acquired physiological data between the physiological sensor device, mobile terminal 122, network 124, and server 126 in real-time. Nihtila at [0044] A fitness data engine 220 supported by the server 126 can receive the acquired physiological data in real-time, interact with the user's avatar, such as by integrating the acquired physiological data into the avatar, generate fitness data, including various processed data and avatar depictions, and transmit the fitness data to the mobile terminal 122 or other user access/display device in real-time. It is understood that these data can also be transmitted between the various communication elements on a non real-time basis. Nihtila at [0045] *See also* 7[l] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendants’ Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Nihtila , it would

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Nihtila
	have been obvious to one of ordinary skill in the art to combine, with the teachings of Nihtila , those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[o]. a memory storage device for recording the status; and	Nihtila discloses or renders obvious the host comprises a memory storage device for recording the status.  *FIG. 1* Nihtila at Fig.1 Turning now to the drawings, and more particularly to FIG. 1**, there is illustrated a system for acquiring physiological data from a user and communicating the physiological data via a mobile terminal to a network server for integration into a virtual physiological model established for the user in accordance with an embodiment of the present invention. FIG. 1 shows a physiological sensor device 130 communicatively coupled to a mobile terminal 122. The physiological sensor device 130 is intended to represent one or more sensing devices that sense one or more physiological parameters of a user, such as heart rate, for example. The physiological sensor device 130 is communicatively coupled to mobile terminal 122 via a wireless link**, such as wireless link that conforms to the Bluetooth wireless specification. In another configuration, the physiological sensor device 130 can be coupled to the mobile terminal 122 via a hard wired connection, although it is perceived that a wireless link is more desirable in most cases. Nihtila at [0035] According to another approach, **the mobile terminal 122 cooperates with the physiological sensor device 130 to buffer physiological data received from the physiological sensor device 130, noting**

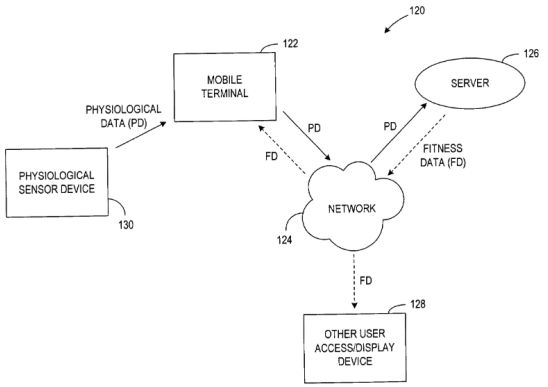
’868 Patent	Nihtila
	that portions of the physiological data acquired by the physiological sensor device 130 in real-time can be stored/buffered in memory of one or both of the mobile terminal 122 and physiological sensor device 130. This cooperative use of distributed memory is of particular use when significant amounts of real-time physiological data obtained by several sensors are acquired, and in situations where a communication link between the mobile terminal 122 and network 124 cannot be established or is unstable/unreliable. Nihtila at [0037] The physiological data communicated from the mobile terminal 122 to the network 124 is routed to a server 126 which is configured to accept and process this data. The server 126 stores and executes processing software that, in general, operates on the physiological data received from each of a number of users. The processing software integrates currently or recently acquired physiological data into the user's virtual physiological model (i.e., avatar). The user can review the data associated with his or her avatar using the mobile terminal 122 or other user access/display device 128. Nihtila at [0038] The processing software further computes fitness data (FD) of various types, including, textual, graphical, animation, audio, video, or other form of fitness data. As previously discussed, **the fitness data can include various types of physiological parameters, changes to such parameters over time, training and diet recommendations, and various views of the user's avatar, among other forms of data. The fitness data is communicated from the server 126 to the user via the network 124. The fitness data can be communicated to the mobile terminal 122 or some other user access/display device 128.** Nihtila at [0040] FIG. 2A is a depiction of a system for acquiring physiological data from a user and communicating the physiological data via a mobile terminal to a network server for integration into a virtual physiological model established for the user in accordance with another embodiment of the present invention. According to this embodiment, a number of different physiological sensor devices can be employed to acquire a variety of different physiological parameters from a user. As shown in the illustrative embodiment of FIG. 2A, a system of the present invention can include a variety of physiological sensor

’868 Patent	Nihtila
	devices, including portable or ambulatory sensor devices, table-top or stationary sensor devices, and a combination of these devices. The physiological sensor devices are preferably non-invasive devices. It is understood that a system of the present invention can range in sophistication from simple configurations, in which one or perhaps two physiological sensor devices are employed, to complex configurations, in which several physiological sensor devices are employed. Nihtila at [0042] Each of the physiological sensor devices includes an integral transfer device 203 which facilitates the transmission of acquired physiological data to a mobile terminal 122. According to this embodiment, the transfer device 203 includes a communication device configured to operate in conformance with the Bluetooth wireless specification. The mobile terminal 122 also has the capability to communicate with the transfer device 203 in conformance with the Bluetooth wireless specification. The transfer device 203 can be configured to provide for uni-directional or bi-directional communication with the mobile terminal 122. Nihtila at [0043] As discussed previously, physiological data, such as heart rate data, can be acquired and transmitted to the mobile terminal 122 via the transfer device 203 in real-time. Alternatively**, physiological data can be buffered in memory of one or both of the physiological sensor device and mobile terminal 122. In a real-time mode of operation, the mobile terminal 122 operates effectively as a modem to facilitated the transfer of acquired physiological data between the physiological sensor device, mobile terminal 122, network 124, and server 126 in real-time.** Nihtila at [0044] A fitness data engine 220 supported by the server 126 can receive the acquired physiological data in real-time, interact with the user's avatar, such as by integrating the acquired physiological data into the avatar, generate fitness data, including various processed data and avatar depictions, and transmit the fitness data to the mobile terminal 122 or other user access/display device in real-time. It is understood that these data can also be transmitted between the various communication elements on a non real-time basis.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Nihtila
	Nihtila at [0045] As is shown in the embodiment of FIG. 2A, a physiological data acquisition system of the present invention preferably includes at least a heart rate monitor **202**. The heart rate monitor **202** is preferably implemented as a personal non-invasive heart rate measuring device. The heart rate monitor **202**, for example, can be implemented as a two-part device comprising a belt-type heart rate transmitter containing EKG electrodes and a wristband-type receiver unit in telemetric inductive or optical connection with the transmitter. The receiver unit generally includes a microprocessor, memory, a display, and a user interface. Nihtila at [0048] According to one configuration, the physiological data acquisition system 250 is intended to represent a portable, and preferably wearable, unit that provides for local acquisition of physiological data from one or more physiological sensor devices. The physiological sensor devices may be integral to or separate from the physiological data acquisition system 250. Each of the physiological sensor devices typically communicates with the physiological data acquisition system 250 via an on-board communication device, such as a device that conforms to the Bluetooth wireless specification. The physiological data acquisition system 250 includes a local interface/transceiver 258 that also operates in conformance with the Bluetooth wireless specification. Depending on the type of physiological sensor device employed, a hardwire connection can be established between a given physiological sensor device and the physiological data acquisition system 250 via the local interface/transceiver 258. A user interface 256 and memory 254 are coupled to the processor 252. A transfer device 256, such as a communication device configured to operate in conformance with the Bluetooth wireless specification, is coupled to the processor 252 and provides for unidirectional or bidirectional communication with a mobile terminal 122. Nihtila at [0056] In accordance with another configuration, the processor 252, user interface 256, and memory 254 represent standard components of a mobile terminal. The transceiver device 256, in this configuration, represents standard communication circuitry that provides for communication with a radio network, such as a 2G or 3G network. In this particular case, block 122 would be representative of a network, rather than a mobile terminal as is shown in FIG. 2B. Each of the physiological sensor devices is

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Nihtila
	communicatively coupled to the processor 252 of the mobile terminal via wireless or hardwired connections to the local interface/transceiver 258. Wireless communication between the local interface/transceiver 258 and one or more of the physiological sensor devices is preferably accomplished in accordance with the Bluetooth wireless specification. Nihtila at [0057] *See also* 7[l] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendants’ Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Nihtila , it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Nihtila , those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[p]. an output for communicating at least a portion of the status or associated information over a communication link to one or more display output devices,	Nihtila discloses or renders obvious the host comprises an output for communicating at least a portion of the status or associated information over a communication link to one or more display output devices, wherein the one or more display output devices are located remotely from the host.  *FIG. 1* Nihtila at Fig.1

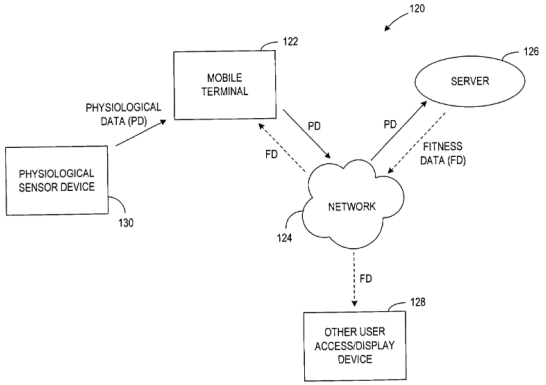
’868 Patent	Nihtila
	Turning now to the drawings, and more particularly to FIG. 1**, there is illustrated a system for acquiring physiological data from a user and communicating the physiological data via a mobile terminal to a network server for integration into a virtual physiological model established for the user in accordance with an embodiment of the present invention. FIG. 1 shows a physiological sensor device 130 communicatively coupled to a mobile terminal 122. The physiological sensor device 130 is intended to represent one or more sensing devices that sense one or more physiological parameters of a user, such as heart rate, for example. The physiological sensor device 130 is communicatively coupled to mobile terminal 122 via a wireless link**, such as wireless link that conforms to the Bluetooth wireless specification. In another configuration, the physiological sensor device 130 can be coupled to the mobile terminal 122 via a hard wired connection, although it is perceived that a wireless link is more desirable in most cases. Nihtila at [0035] According to another approach, **the mobile terminal 122 cooperates with the physiological sensor device 130 to buffer physiological data received from the physiological sensor device 130, noting that portions of the physiological data acquired by the physiological sensor device 130 in real-time can be stored/buffered in memory of one or both of the mobile terminal 122 and physiological sensor device 130.** This cooperative use of distributed memory is of particular use when significant amounts of real-time physiological data obtained by several sensors are acquired, and in situations where a communication link between the mobile terminal 122 and network 124 cannot be established or is unstable/unreliable. Nihtila at [0037] The physiological data communicated from the mobile terminal 122 to the network 124 is routed to a server 126 which is configured to accept and process this data. The server 126 stores and executes processing software that, in general, operates on the physiological data received from each of a number of users. The processing software integrates currently or recently acquired physiological data into the user's virtual physiological model (i.e., avatar). The user can review the data associated with his or her avatar using the mobile terminal 122 or other user access/display device 128. Nihtila at [0038]

’868 Patent	Nihtila
	The processing software further computes fitness data (FD) of various types, including, textual, graphical, animation, audio, video, or other form of fitness data. As previously discussed, **the fitness data can include various types of physiological parameters, changes to such parameters over time, training and diet recommendations, and various views of the user's avatar, among other forms of data. The fitness data is communicated from the server 126 to the user via the network 124. The fitness data can be communicated to the mobile terminal 122 or some other user access/display device 128.** Nihtila at [0040] FIG. 2A is a depiction of a system for acquiring physiological data from a user and communicating the physiological data via a mobile terminal to a network server for integration into a virtual physiological model established for the user in accordance with another embodiment of the present invention. According to this embodiment, a number of different physiological sensor devices can be employed to acquire a variety of different physiological parameters from a user. As shown in the illustrative embodiment of FIG. 2A, a system of the present invention can include a variety of physiological sensor devices, including portable or ambulatory sensor devices, table-top or stationary sensor devices, and a combination of these devices. The physiological sensor devices are preferably non-invasive devices. It is understood that a system of the present invention can range in sophistication from simple configurations, in which one or perhaps two physiological sensor devices are employed, to complex configurations, in which several physiological sensor devices are employed. Nihtila at [0042] Each of the physiological sensor devices includes an integral transfer device 203 which facilitates the transmission of acquired physiological data to a mobile terminal 122. According to this embodiment, the transfer device 203 includes a communication device configured to operate in conformance with the Bluetooth wireless specification. The mobile terminal 122 also has the capability to communicate with the transfer device 203 in conformance with the Bluetooth wireless specification. The transfer device 203 can be configured to provide for uni-directional or bi-directional communication with the mobile terminal 122. Nihtila at [0043]

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Nihtila
	As discussed previously, physiological data, such as heart rate data, can be acquired and transmitted to the mobile terminal 122 via the transfer device 203 in real-time. Alternatively**, physiological data can be buffered in memory of one or both of the physiological sensor device and mobile terminal 122. In a real-time mode of operation, the mobile terminal 122 operates effectively as a modem to facilitated the transfer of acquired physiological data between the physiological sensor device, mobile terminal 122, network 124, and server 126 in real-time.** Nihtila at [0044] A fitness data engine 220 supported by the server 126 can receive the acquired physiological data in real-time, interact with the user's avatar, such as by integrating the acquired physiological data into the avatar, generate fitness data, including various processed data and avatar depictions, and transmit the fitness data to the mobile terminal 122 or other user access/display device in real-time. It is understood that these data can also be transmitted between the various communication elements on a non real-time basis. Nihtila at [0045] As is shown in the embodiment of FIG. 2A, a physiological data acquisition system of the present invention preferably includes at least a heart rate monitor **202**. The heart rate monitor **202** is preferably implemented as a personal non-invasive heart rate measuring device. The heart rate monitor **202**, for example, can be implemented as a two-part device comprising a belt-type heart rate transmitter containing EKG electrodes and a wristband-type receiver unit in telemetric inductive or optical connection with the transmitter. The receiver unit generally includes a microprocessor, memory, a display, and a user interface. Nihtila at [0048] According to one configuration, the physiological data acquisition system 250 is intended to represent a portable, and preferably wearable, unit that provides for local acquisition of physiological data from one or more physiological sensor devices. The physiological sensor devices may be integral to or separate from the physiological data acquisition system 250. Each of the physiological sensor devices typically communicates with the physiological data acquisition system 250 via an on-board communication device, such as a device that conforms to the Bluetooth wireless specification. The

’868 Patent	Nihtila
	physiological data acquisition system 250 includes a local interface/transceiver 258 that also operates in conformance with the Bluetooth wireless specification. Depending on the type of physiological sensor device employed, a hardwire connection can be established between a given physiological sensor device and the physiological data acquisition system 250 via the local interface/transceiver 258. A user interface 256 and memory 254 are coupled to the processor 252. A transfer device 256, such as a communication device configured to operate in conformance with the Bluetooth wireless specification, is coupled to the processor 252 and provides for unidirectional or bidirectional communication with a mobile terminal 122. Nihtila at [0056] In accordance with another configuration, the processor 252, user interface 256, and memory 254 represent standard components of a mobile terminal. The transceiver device 256, in this configuration, represents standard communication circuitry that provides for communication with a radio network, such as a 2G or 3G network. In this particular case, block 122 would be representative of a network, rather than a mobile terminal as is shown in FIG. 2B. Each of the physiological sensor devices is communicatively coupled to the processor 252 of the mobile terminal via wireless or hardwired connections to the local interface/transceiver 258. Wireless communication between the local interface/transceiver 258 and one or more of the physiological sensor devices is preferably accomplished in accordance with the Bluetooth wireless specification. Nihtila at [0057] Turning now to FIG. 3, there is depicted a display **300** on which various types of fitness data within the context of the present invention are displayed. **The display 300 represents a display of a mobile terminal, a television, and WEB terminal device, or the display of another access device.** Various textual data can be presented, including the data types **304** acquired by the physiological data acquisition system and user input data, such as weight and age, for example. Current fitness data **306** generated by the fitness data engine can be presented on the display **300**. Historical fitness data **308** can also be presented on the display **300**. Predicted fitness data **310** generated by the fitness data engine can be presented. Nihtila at [0066]

’868 Patent	Nihtila
	See also 7[l] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendants’ Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Nihtila , it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Nihtila , those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[q]. wherein the one or more display output devices are located remotely from the host.	Nihtila discloses or renders obvious the one or more display output devices are located remotely from the host.  *FIG. 1* Nihtila at Fig.1 Turning now to the drawings, and more particularly to FIG. 1**, there is illustrated a system for acquiring physiological data from a user and communicating the physiological data via a mobile terminal to a network server for integration into a virtual physiological model established for the user in accordance with an embodiment of the present invention. FIG. 1 shows a physiological sensor device 130 communicatively coupled to a mobile terminal 122. The physiological sensor device 130 is intended to represent one or more sensing devices that sense one or more physiological parameters of a user, such as heart rate, for example. The physiological sensor device 130 is communicatively coupled to mobile terminal 122 via a wireless link**, such as wireless

’868 Patent	Nihtila
	link that conforms to the Bluetooth wireless specification. In another configuration, the physiological sensor device 130 can be coupled to the mobile terminal 122 via a hard wired connection, although it is perceived that a wireless link is more desirable in most cases. Nihtila at [0035] According to another approach, **the mobile terminal 122 cooperates with the physiological sensor device 130 to buffer physiological data received from the physiological sensor device 130, noting that portions of the physiological data acquired by the physiological sensor device 130 in real-time can be stored/buffered in memory of one or both of the mobile terminal 122 and physiological sensor device 130.** This cooperative use of distributed memory is of particular use when significant amounts of real-time physiological data obtained by several sensors are acquired, and in situations where a communication link between the mobile terminal 122 and network 124 cannot be established or is unstable/unreliable. Nihtila at [0037] The physiological data communicated from the mobile terminal 122 to the network 124 is routed to a server 126 which is configured to accept and process this data. The server 126 stores and executes processing software that, in general, operates on the physiological data received from each of a number of users. The processing software integrates currently or recently acquired physiological data into the user's virtual physiological model (i.e., avatar). The user can review the data associated with his or her avatar using the mobile terminal 122 or other user access/display device 128. Nihtila at [0038] The processing software further computes fitness data (FD) of various types, including, textual, graphical, animation, audio, video, or other form of fitness data. As previously discussed, **the fitness data can include various types of physiological parameters, changes to such parameters over time, training and diet recommendations, and various views of the user's avatar, among other forms of data. The fitness data is communicated from the server 126 to the user via the network 124. The fitness data can be communicated to the mobile terminal 122 or some other user access/display device 128.**

’868 Patent	Nihtila
	Nihtila at [0040] FIG. 2A is a depiction of a system for acquiring physiological data from a user and communicating the physiological data via a mobile terminal to a network server for integration into a virtual physiological model established for the user in accordance with another embodiment of the present invention. According to this embodiment, a number of different physiological sensor devices can be employed to acquire a variety of different physiological parameters from a user. As shown in the illustrative embodiment of FIG. 2A, a system of the present invention can include a variety of physiological sensor devices, including portable or ambulatory sensor devices, table-top or stationary sensor devices, and a combination of these devices. The physiological sensor devices are preferably non-invasive devices. It is understood that a system of the present invention can range in sophistication from simple configurations, in which one or perhaps two physiological sensor devices are employed, to complex configurations, in which several physiological sensor devices are employed. Nihtila at [0042] Each of the physiological sensor devices includes an integral transfer device 203 which facilitates the transmission of acquired physiological data to a mobile terminal 122. According to this embodiment, the transfer device 203 includes a communication device configured to operate in conformance with the Bluetooth wireless specification. The mobile terminal 122 also has the capability to communicate with the transfer device 203 in conformance with the Bluetooth wireless specification. The transfer device 203 can be configured to provide for uni-directional or bi-directional communication with the mobile terminal 122. Nihtila at [0043] As discussed previously, physiological data, such as heart rate data, can be acquired and transmitted to the mobile terminal 122 via the transfer device 203 in real-time. Alternatively**, physiological data can be buffered in memory of one or both of the physiological sensor device and mobile terminal 122. In a real-time mode of operation, the mobile terminal 122 operates effectively as a modem to facilitated the transfer of acquired physiological data between the physiological sensor device, mobile terminal 122, network 124, and server 126 in real-time.** Nihtila at [0044]

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

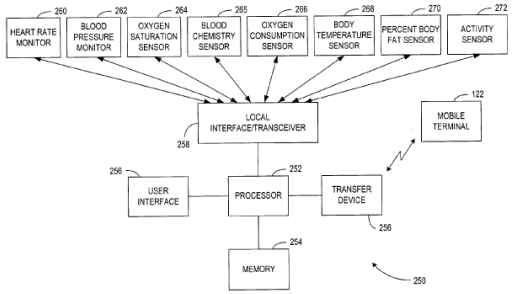
’868 Patent	Nihtila
	A fitness data engine 220 supported by the server 126 can receive the acquired physiological data in real-time, interact with the user's avatar, such as by integrating the acquired physiological data into the avatar, generate fitness data, including various processed data and avatar depictions, and transmit the fitness data to the mobile terminal 122 or other user access/display device in real-time. It is understood that these data can also be transmitted between the various communication elements on a non real-time basis. Nihtila at [0045] As is shown in the embodiment of FIG. 2A, a physiological data acquisition system of the present invention preferably includes at least a heart rate monitor **202**. The heart rate monitor **202** is preferably implemented as a personal non-invasive heart rate measuring device. The heart rate monitor **202**, for example, can be implemented as a two-part device comprising a belt-type heart rate transmitter containing EKG electrodes and a wristband-type receiver unit in telemetric inductive or optical connection with the transmitter. The receiver unit generally includes a microprocessor, memory, a display, and a user interface. Nihtila at [0048] According to one configuration, the physiological data acquisition system 250 is intended to represent a portable, and preferably wearable, unit that provides for local acquisition of physiological data from one or more physiological sensor devices. The physiological sensor devices may be integral to or separate from the physiological data acquisition system 250. Each of the physiological sensor devices typically communicates with the physiological data acquisition system 250 via an on-board communication device, such as a device that conforms to the Bluetooth wireless specification. The physiological data acquisition system 250 includes a local interface/transceiver 258 that also operates in conformance with the Bluetooth wireless specification. Depending on the type of physiological sensor device employed, a hardwire connection can be established between a given physiological sensor device and the physiological data acquisition system 250 via the local interface/transceiver 258. A user interface 256 and memory 254 are coupled to the processor 252. A transfer device 256, such as a communication device configured to operate in conformance with the Bluetooth wireless specification, is coupled to the processor 252 and provides for unidirectional or bidirectional communication with a mobile terminal 122.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Nihtila
	Nihtila at [0056] In accordance with another configuration, the processor 252, user interface 256, and memory 254 represent standard components of a mobile terminal. The transceiver device 256, in this configuration, represents standard communication circuitry that provides for communication with a radio network, such as a 2G or 3G network. In this particular case, block 122 would be representative of a network, rather than a mobile terminal as is shown in FIG. 2B. Each of the physiological sensor devices is communicatively coupled to the processor 252 of the mobile terminal via wireless or hardwired connections to the local interface/transceiver 258. Wireless communication between the local interface/transceiver 258 and one or more of the physiological sensor devices is preferably accomplished in accordance with the Bluetooth wireless specification. Nihtila at [0057] Turning now to FIG. 3, there is depicted a display **300** on which various types of fitness data within the context of the present invention are displayed. **The display 300 represents a display of a mobile terminal, a television, and WEB terminal device, or the display of another access device.** Various textual data can be presented, including the data types **304** acquired by the physiological data acquisition system and user input data, such as weight and age, for example. Current fitness data **306** generated by the fitness data engine can be presented on the display **300**. Historical fitness data **308** can also be presented on the display **300**. Predicted fitness data **310** generated by the fitness data engine can be presented. Nihtila at [0066] Methods of the present invention can be implemented using the systems and devices described above. In accordance with one particular embodiment, a small number of physiological measurements is acquired from use of a physiological sensor device that requires minimal user intervention, such as a heart rate monitor. By way of example, a pedometer can be employed for calculating energy consumption and heart rate monitoring at a frequency of once a day for thirty seconds while resting. It is understood that the frequency of sampling can be different, but that in this embodiment only a minimal amount of physiological data is needed. **Each of the physiological sensing devices directly communicates with the mobile terminal (e.g., via Bluetooth), which relays the information to the network server. The**

’868 Patent	Nihtila
	fitness engine on the server calculates the impact of the data on the avatar, and the user can access the updated version of the avatar via one of several access interfaces (e.g., mobile phone, WEB terminal device, TV, etc.). From the perspective of the user's overall experience, it may be desirable to modify the avatar only on a weekly or bi-weekly basis, rather than upon receipt of each set of newly acquired physiological data. Nihtila at [0068] *See also* 7[l] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendants’ Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Nihtila , it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Nihtila , those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
Claim 8	
8. The diagnostic system of claim 7, wherein the light source comprises a plurality of semiconductor diodes that are further coupled to a multiplexer capable of combining the plurality of semiconductor diodes and generating the input light beam comprising one or more wavelengths.	*See* claim 7 above. Nihtila discloses or renders obvious the light source comprises a plurality of semiconductor diodes that are further coupled to a multiplexer capable of combining the plurality of semiconductor diodes and generating the input light beam comprising one or more wavelengths. Physiological data is preferably acquired from the user through use of non-invasive techniques. Various types of physiological data can be acquired from the user, including, in particular, heart rate data. Blood pressure data can be acquired from time to time and incorporated into the virtual physiological model of the user. Body temperature, particularly when measured during extended periods of exertion, can also be acquired. **Oxygen saturation and oxygen consumption can also be measured and incorporated into the user's virtual physiological model.** Further, percent body fat can be determined and incorporated into the user's virtual physiological model. Various other physiological parameters can be acquired or developed for incorporation into the user's avatar. Nihtila at [0029]

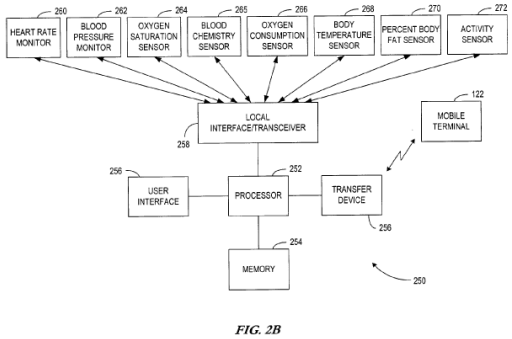
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Nihtila
	In accordance with a more complex configuration, a physiological data acquisition system of the present invention can include a blood sensing device 211. The blood sensing device 211 is representative of one or more devices that can be used to measure a number of blood related parameters. Such blood related parameters can include oxygen saturation, oxygen consumption, blood chemistry, and blood pressure, for example. Nihtila at [0054]  *FIG. 2B* Nihtila at Fig. 2B **FIG. 2B illustrates a number of different physiological sensor devices that can be employed in a physiological data acquisition system 250 of the present invention.** It is understood that the devices depicted in FIG. 2B do not represent an exhaustive listing of devices that can be employed. Moreover, it is understood that a physiological data acquisition system **250** of the present invention need not incorporate all of the devices shown in FIG. 2B, but can incorporate one or multiple devices. Nihtila at [0055] **In a more sophisticated implementation, a physiological data acquisition system 250 of the present invention can include an oxygen saturation sensor 264 which non-invasively measures oxygen saturation of the user's blood. A pulse oximeter, for example, can be used to measure and compute the arterial oxygen saturation level of the user's blood from signals received from the pulse oximeter.**

’868 Patent	Nihtila
	Nihtila at [0059] According to one configuration, **the physiological data acquisition system 250 is intended to represent a portable, and preferably wearable, unit that provides for local acquisition of physiological data from one or more physiological sensor devices.** The physiological sensor devices may be integral to or separate from the physiological data acquisition system 250. Each of the physiological sensor devices typically communicates with the physiological data acquisition system 250 via an on-board communication device, **such as a device that conforms to the Bluetooth wireless specification. The physiological data acquisition system 250 includes a local interface/transceiver 258 that also operates in conformance with the Bluetooth wireless specification. Depending on the type of physiological sensor device employed, a hardwire connection can be established between a given physiological sensor device and the physiological data acquisition system 250 via the local interface/transceiver 258. A user interface 256 and memory 254 are coupled to the processor 252. A transfer device 256, such as a communication device configured to operate in conformance with the Bluetooth wireless specification, is coupled to the processor 252 and provides for unidirectional or bidirectional communication with a mobile terminal 122.** Nihtila at [0056] According to a more sophisticated implementation, a physiological data acquisition system of the present invention can include a blood chemistry sensor device **265** which enables various non-invasive blood chemistry measurements. Such blood chemistry measurements can include measurement of hemacrit, which is a measure of the fractional level of red blood cells in the blood, hemoglobin, tissue perfusion, and oxygenation. According to one approach, noninvasive blood chemistry measurements are obtained using NIR (near infrared) spectroscopy techniques. Nihtila at [0062] By way of example, **a sensor of the blood chemistry sensor device 265 can employ photonic methods based on fluorescence. For example, the blood chemistry sensor device 265 contains a colored dye immobilized in a polymer film. A blue LED excites fluorescence while a photodiode monitors the resulting red emission. Oxygen interferes with the fluorescence. Greater concentrations of oxygen diminish the red fluorescence emission.** A suitable non-invasive blood chemistry measurement device is commercially available from PhotoSense LLC.

’868 Patent	Nihtila
	Nihtila at [0063] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendants’ Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Nihtila , it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Nihtila , those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
Claim 9	
9. The diagnostic system of claim 7, wherein at least the portion of the input light beam is adapted for use in a diagnostics to measure a property of the blood, wherein the diagnostics comprise a spectroscopic procedure, wherein the spectroscopic procedure is based at least in part on a comparison of amplitudes at a plurality of associated wavelengths transmitted or reflected from the blood.	*See* claim 7 above. Nihtila discloses or renders obvious the portion of the input light beam is adapted for use in a diagnostics to measure a property of the blood, wherein the diagnostics comprise a spectroscopic procedure, wherein the spectroscopic procedure is based at least in part on a comparison of amplitudes at a plurality of associated wavelengths transmitted or reflected from the blood. Physiological data is preferably acquired from the user through use of non-invasive techniques. Various types of physiological data can be acquired from the user, including, in particular, heart rate data. Blood pressure data can be acquired from time to time and incorporated into the virtual physiological model of the user. Body temperature, particularly when measured during extended periods of exertion, can also be acquired. **Oxygen saturation and oxygen consumption can also be measured and incorporated into the user's virtual physiological model.** Further, percent body fat can be determined and incorporated into the user's virtual physiological model. Various other physiological parameters can be acquired or developed for incorporation into the user's avatar. Nihtila at [0029] **In accordance with a more complex configuration, a physiological data acquisition system of the present invention can include a blood sensing device 211. The blood sensing device 211 is representative of one or more devices that can be used to measure a number of blood related parameters. Such blood related parameters can include oxygen saturation, oxygen consumption, blood chemistry, and blood pressure, for example.**

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Nihtila
	Nihtila at [0054]  *FIG. 2B* Nihtila at Fig. 2B **FIG. 2B illustrates a number of different physiological sensor devices that can be employed in a physiological data acquisition system 250 of the present invention.** It is understood that the devices depicted in FIG. 2B do not represent an exhaustive listing of devices that can be employed. Moreover, it is understood that a physiological data acquisition system **250** of the present invention need not incorporate all of the devices shown in FIG. 2B, but can incorporate one or multiple devices. Nihtila at [0055] **In a more sophisticated implementation, a physiological data acquisition system 250 of the present invention can include an oxygen saturation sensor 264 which non-invasively measures oxygen saturation of the user's blood. A pulse oximeter, for example, can be used to measure and compute the arterial oxygen saturation level of the user's blood from signals received from the pulse oximeter.** Nihtila at [0059] According to one configuration, **the physiological data acquisition system 250 is intended to represent a portable, and preferably wearable, unit that provides for local acquisition of physiological data from one or more physiological sensor devices.** The physiological sensor devices may be integral to or separate from the physiological data acquisition system 250. Each of the

’868 Patent	Nihtila
	physiological sensor devices typically communicates with the physiological data acquisition system 250 via an on-board communication device, **such as a device that conforms to the Bluetooth wireless specification. The physiological data acquisition system 250 includes a local interface/transceiver 258 that also operates in conformance with the Bluetooth wireless specification. Depending on the type of physiological sensor device employed, a hardwire connection can be established between a given physiological sensor device and the physiological data acquisition system 250 via the local interface/transceiver 258. A user interface 256 and memory 254 are coupled to the processor 252. A transfer device 256, such as a communication device configured to operate in conformance with the Bluetooth wireless specification, is coupled to the processor 252 and provides for unidirectional or bidirectional communication with a mobile terminal 122.** Nihtila at [0056] According to a more sophisticated implementation, a physiological data acquisition system of the present invention can include a blood chemistry sensor device **265** which enables various non-invasive blood chemistry measurements. Such blood chemistry measurements can include measurement of hemacrit, which is a measure of the fractional level of red blood cells in the blood, hemoglobin, tissue perfusion, and oxygenation. According to one approach, noninvasive blood chemistry measurements are obtained using NIR (near infrared) spectroscopy techniques. Nihtila at [0062] By way of example, **a sensor of the blood chemistry sensor device 265 can employ photonic methods based on fluorescence. For example, the blood chemistry sensor device 265 contains a colored dye immobilized in a polymer film. A blue LED excites fluorescence while a photodiode monitors the resulting red emission. Oxygen interferes with the fluorescence. Greater concentrations of oxygen diminish the red fluorescence emission.** A suitable non-invasive blood chemistry measurement device is commercially available from PhotoSense LLC. Nihtila at [0063] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references

’868 Patent	Nihtila
	identified in Defendants’ Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Nihtila , it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Nihtila , those elements, as known to them or as disclosed by other prior art identified in the cover pleading.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

EXHIBIT A6

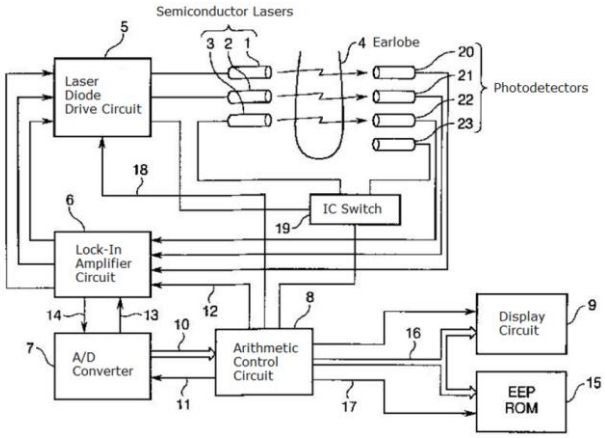
U.S. Pat. No. 9,055,868 in view of JP Patent Publication No. 2000074829 to Mochizuki Shigeki ("Shigeki")

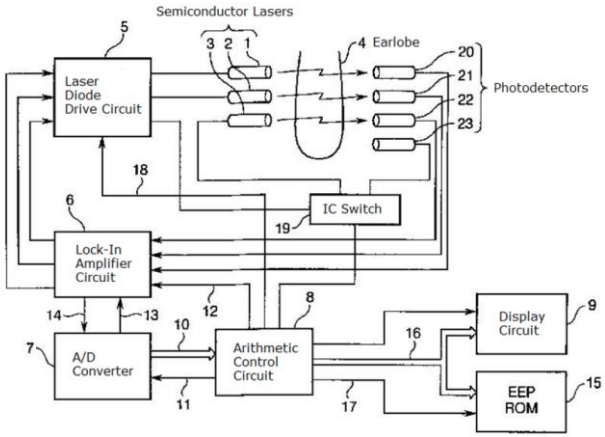
As described in detail below, Shigeki (individually or collectively) anticipates and/or renders obvious claim 7-9 ("Asserted Claims") of U.S. Patent No. 9,055,868 B2 (the "' 868 Patent") under 35 U.S.C. §102 and/or §103, either alone in combination with the knowledge of a person of ordinary skill, and/or additional prior art references discussed in discussed in Exhibits A1-A10, the contents of which are hereby incorporated by reference into this chart. One of ordinary skill in the art, as of the priority date of the '868 Patent, would have known to combine the prior art elements disclosed by the foregoing references using known methods, and to use these elements according to their established functions in order to achieve a known and predictable result. This invalidity claim chart is based on Defendants' present understanding of the Asserted Claims and Plaintiff's apparent construction of the Asserted Claims in its Preliminary Infringement Contentions ("Infringement Contentions").

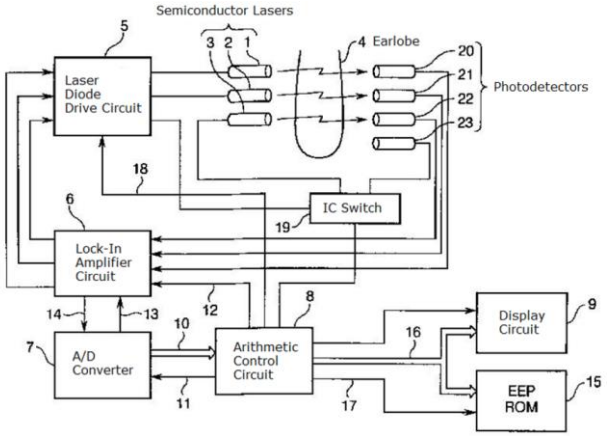
The following invalidity chart includes references to the structure, function, operation, and/or features of the technology described in Shigeki. The cited portions of Shigeki are merely illustrative, and Defendants reserve the right to rely on alternative or additional evidence, including uncited portions of Shigeki. Where a particular figure is cited, the citation should be understood to encompass the caption and description of the figure as well as any text relating to or describing the figure. Conversely, where particular text referring to a figure is cited, the citation should be understood to include the figure as well. Although the documentation collectively evidences prior knowledge, use, or sale, Defendants reserve the right to rely upon individual documents as printed publications. Where the chart below states that Shigeki "describes" or "provides for" a limitation, such disclosure may be express, inherent, or implicit. To the extent it is found Shigeki does not expressly disclose certain limitations in the asserted claim, such limitations are inherent. Defendants reserve the right to present direct evidence of the structure, function, operation, and/or features of the technology described in Shigeki (including product samples, source code, and/or witness testimony) and/or its prior art status, and to present alternative or additional documents concerning the same as evidence that the technology described in Shigeki anticipates and/or renders obvious the Asserted Claims of the '868 Patent.

This chart is subject to all reservations, objections, and disclaimers in Defendants' Invalidity Contentions and any amendment, supplement, or modification thereof, which are incorporated herein by reference in their entirety. Nothing stated herein shall be treated as an admission or suggestion that Defendants agree with Plaintiff regarding the scope of the Asserted Claims, Plainitff's apparent claim constructions, or the accuracy of any particular claim construction. Defendants reserve all rights to challenge any of the claim terms herein under 35 U.S.C. § 112, including by arguing that they are indefinite, are not supported by the written description, and/or are not enabled. Defendants further reserve all rights to amend this invalidity claim chart without leave of court pursuant to the Court's Docket Control Order, or upon a showing of good cause.

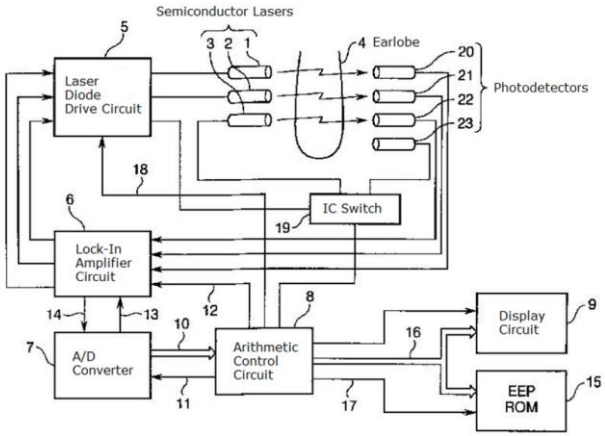
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Shigeki
Claim 7	
7[pre]. A diagnostic system comprising:	By providing this disclosure, Defendants do not take a position on whether the preamble is limiting. Shigeki discloses or renders obvious a diagnostic system.  Shigeki at Fig. 1 **FIG. 1 shows the glucose sensor** in the present invention. **This device measures the blood glucose concentration of blood flowing through the microvessels in the earlobe 4 of the human body. The wavelength of the light outputted from the first semiconductor laser 1 is 1.55 μm, which is within the glucose absorption wavelength band. It passes through the earlobe 4 and is received by the first photodetector 20. The wavelength of the light outputted from the second semiconductor laser 2 is 1.33 μm, which is outside of the glucose absorption wavelength band. It passes through the earlobe 4 and is received by the second photodetector 21. The third semiconductor laser 22 is used to measure the volume of blood flow, and the wavelength of the light that it emits has a wavelength of 0.83 μm. It passes through the earlobe 4 and is detected by the third photodetector 22. The volume of blood flow is measured using the Doppler effect, so infrared light, which has good transmissibility through biological tissue, is used to minimize the attenuation of light reflected by hemoglobin.** Shigeki at [0009]

’868 Patent	Shigeki
	One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclsoed by Shigeki, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Shigeki, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[a]. a light source comprising:	Shigeki discloses or renders obvious a diagnostic system comprises a light source.  Shigeki at Fig. 1 FIG. 1 shows the glucose sensor in the present invention. **This device measures the blood glucose concentration of blood flowing through the microvessels in the earlobe 4 of the human body. The wavelength of the light outputted from the first semiconductor laser 1 is 1.55 μm, which is within the glucose absorption wavelength band.** It passes through the earlobe 4 and is received by the first photodetector 20. **The wavelength of the light outputted from the second semiconductor laser 2 is 1.33 μm, which is outside of the glucose absorption wavelength band**. It passes through the earlobe 4 and is received by the second photodetector 21. **The third semiconductor laser 22 is used to measure the volume of blood flow, and the wavelength of the light that it emits has a wavelength of 0.83 μm**. **It passes through the earlobe 4 and is detected by the third photodetector 22. The volume of blood flow is measured using the Doppler effect, so infrared light, which has good**

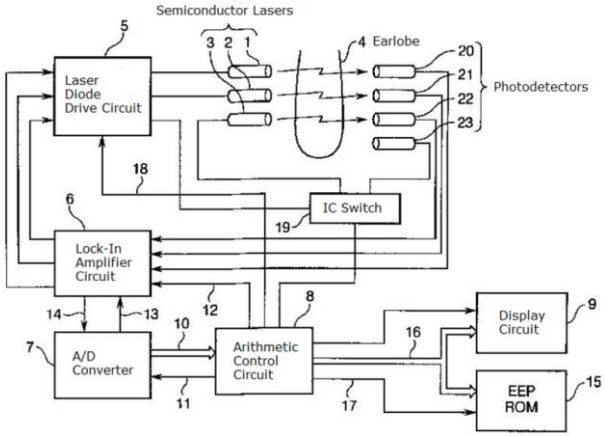
’868 Patent	Shigeki
	transmissibility through biological tissue, is used to minimize the attenuation of light reflected by hemoglobin. Shigeki at [0009] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclsoed by Shigeki, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Shigeki, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[b]. one or more semiconductor diodes generating an input light beam; and	Shigeki discloses or renders obvious the light source comprises one or more semiconductor diodes generating an input light beam.  Shigeki at Fig. 1 FIG. 1 shows the glucose sensor in the present invention. **This device measures the blood glucose concentration of blood flowing through the microvessels in the earlobe 4 of the human body. The wavelength of the light outputted from the first semiconductor laser 1 is 1.55 μm, which is within**

’868 Patent	Shigeki
	the glucose absorption wavelength band. It passes through the earlobe 4 and is received by the first photodetector 20. The wavelength of the light outputted from the second semiconductor laser 2 is 1.33 μm, which is outside of the glucose absorption wavelength band. It passes through the earlobe 4 and is received by the second photodetector 21. **The third semiconductor laser 22 is used to measure the volume of blood flow, and the wavelength of the light that it emits has a wavelength of 0.83 μm. It passes through the earlobe 4 and is detected by the third photodetector 22. The volume of blood flow is measured using the Doppler effect, so infrared light, which has good transmissibility through biological tissue, is used to minimize the attenuation of light reflected by hemoglobin.** Shigeki at [0009] The calculation procedure is shown below. **The intensity of heat radiation from the body is obtained as a voltage value from the fourth photodiode 23.** This is compared with the data in EEPROM 15, the temperature at the body measurement site is measured, and a correction coefficient k for the temperature and the first photodiode output is determined from FIG. 3. **The light emitted from the third semiconductor laser 3 passes through the earlobe 4 and is received by the third photodetector 22, and an output value is acquired.** The data in the EEPROM 15 is compared with the output value to calculate the volume of blood flow V. **The light emitted from the first semiconductor laser 1 passes through the earlobe 4 and is received by the first photodetector 20.** The output value from this photodetector is used as V1. **The light emitted from the second semiconductor laser 2 passes through the earlobe 4** and is received by the [second] photodetector 2[1]. The output value from this photodetector is used as V2. The amount of glucose X after temperature correction of the semiconductor irradiation site is calculated using the following equation. Shigeki at [0013] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclsoed by Shigeki, it would

’868 Patent	Shigeki
	have been obvious to one of ordinary skill in the art to combine, with the teachings of Shigeki, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[c]. a lens system configured to receive at least a portion of the input light beam and to communicate at least the portion of the input light beam onto a part of a user's body comprising blood,	Shigeki discloses or renders obvious the light source comprises a lens system configured to receive at least a portion of the input light beam and to communicate at least the portion of the input light beam onto a part of a user's body comprising blood.  Shigeki at Fig. 1 FIG. 1 shows the glucose sensor in the present invention. **This device measures the blood glucose concentration of blood flowing through the microvessels in the earlobe 4 of the human body. The wavelength of the light outputted from the first semiconductor laser 1 is 1.55 μm, which is within the glucose absorption wavelength band**. **It passes through the earlobe 4 and is received by the first photodetector 20**. **The wavelength of the light outputted from the second semiconductor laser 2 is 1.33 μm, which is outside of the glucose absorption wavelength band**. **It passes through the earlobe 4 and is received by the second photodetector 21**. **The third semiconductor laser 22 is used to measure the volume of blood flow, and the wavelength of the light that it emits has a wavelength of 0.83 μm**. **It passes through the earlobe 4 and is detected by the third photodetector 22. The volume of blood flow is measured using the Doppler effect, so infrared light, which has good transmissibility through biological tissue, is used to minimize the attenuation of light reflected by hemoglobin.**

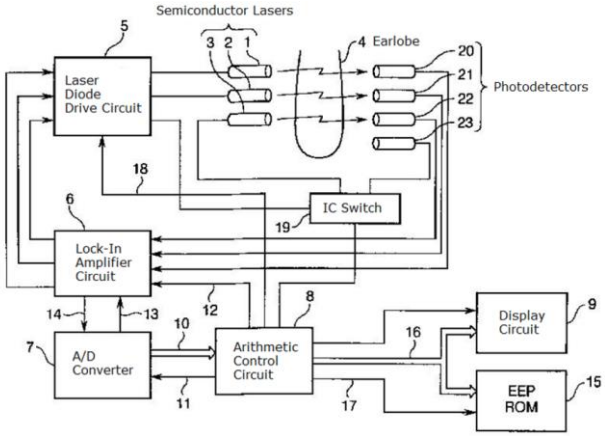
'868 Patent	Shigeki
	Shigeki at [0009] The calculation procedure is shown below. **The intensity of heat radiation from the body is obtained as a voltage value from the fourth photodiode 23**. This is compared with the data in EEPROM 15, the temperature at the body measurement site is measured, and a correction coefficient k for the temperature and the first photodiode output is determined from FIG. 3. **The light emitted from the third semiconductor laser 3 passes through the earlobe 4 and is received by the third photodetector 22, and an output value is acquired.** The data in the EEPROM 15 is compared with the output value to calculate the volume of blood flow V. **The light emitted from the first semiconductor laser 1 passes through the earlobe 4 and is received by the first photodetector 20. The output value from this photodetector is used as V1. The light emitted from the second semiconductor laser 2 passes through the earlobe 4 and is received by the [second] photodetector 2[1]. The output value from this photodetector is used as V2**. The amount of glucose X after temperature correction of the semiconductor irradiation site is calculated using the following equation. Shigeki at [0013] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant's Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclsoed by Shigeki, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Shigeki, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[d]. wherein at least the portion of the input light beam is used in a measurement on a user;	Shigeki discloses or renders obvious the portion of the input light beam is used in a measurement on a user. The present invention is a glucose sensor comprising: a light emitting means for irradiating light having wavelength λ1 in the glucose absorption wavelength band, light having wavelength λ2 outside of the glucose absorption wavelength band, and light having wavelength λ3 in the infrared wavelength band for measuring volume of blood flow at the light irradiation site; **a detecting means for detecting the intensity of the light having the three wavelengths transmitted or reflected by a living body; a calculating means for determining the light intensity ratio of λ1 and λ2, and determining the**

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Shigeki
	amount of glucose from this ratio; a detecting means for measuring body temperature; a calculating means for performing temperature correction on the amount of glucose based on body temperature; a calculating means for calculating the volume of blood flow at the light irradiation site from the light having wavelength λ3; and a calculating means for calculating the blood glucose concentration at the light irradiation site from the temperature-corrected amount of glucose and the volume of blood flow. Using the present invention, the blood glucose concentration can be measured without collecting blood, thereby reducing the burden placed on the subject and **enabling real-time measurement, which also allows for the measurement of the glucose concentration as it changes over time.** Also, **by calculating the amount of glucose from the ratio of the intensity of light having wavelength λ1, which is within the glucose absorption wavelength band, to the intensity of light having wavelength λ2, which is outside of the glucose absorption wavelength band, and then performing temperature correction, the measurement becomes less susceptible to variations in the measurement device and environmental conditions, enabling accurate measurements.** Shigeki at [0007]  Shigeki at Fig. 1 FIG. 1 shows the glucose sensor in the present invention. **This device measures the blood glucose concentration of blood flowing through the microvessels in the earlobe 4 of the human body. The wavelength of the light outputted from the first semiconductor laser 1 is 1.55 μm, which is within**

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7[e]. a software application capable of generating data based at least in part on the measurement on the user,	Shigeki discloses or renders obvious a software application capable of generating data based at least in part on the measurement on the user. **The present invention is a glucose sensor comprising: a light emitting means for irradiating light having wavelength λ1 in the glucose absorption wavelength band, light having wavelength λ2 outside of the glucose absorption wavelength band, and light having wavelength λ3 in the infrared wavelength band for measuring volume of blood flow at the light irradiation site; a detecting means for detecting the intensity of the light having the three wavelengths transmitted or reflected by a living body; a calculating means for determining the light intensity ratio of λ1 and λ2, and determining the amount of glucose from this ratio; a detecting means for measuring body temperature; a calculating means for performing temperature correction on the amount of glucose based on body temperature; a calculating means for calculating the volume of blood flow at the light irradiation site from the light having wavelength λ3; and a calculating means for calculating the blood glucose concentration at the light irradiation site from the temperature-corrected amount of glucose and the volume of blood flow.** Using the present invention, the blood glucose

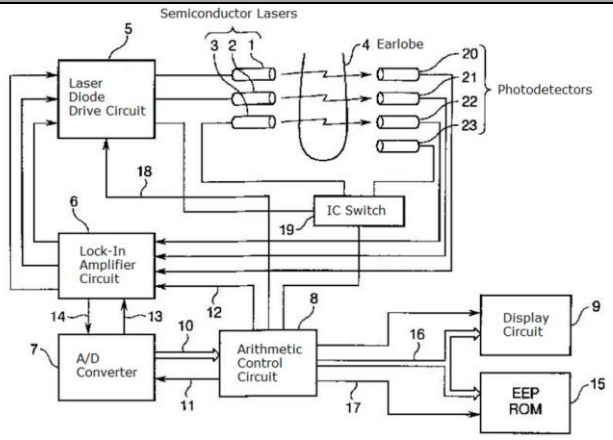
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Shigeki
	concentration can be measured without collecting blood, thereby reducing the burden placed on the subject and **enabling real-time measurement, which also allows for the measurement of the glucose concentration as it changes over time.** Also, **by calculating the amount of glucose from the ratio of the intensity of light having wavelength λ1, which is within the glucose absorption wavelength band, to the intensity of light having wavelength λ2, which is outside of the glucose absorption wavelength band, and then performing temperature correction, the measurement becomes less susceptible to variations in the measurement device and environmental conditions, enabling accurate measurements.** Shigeki at [0007]  Shigeki at Fig. 1 FIG. 1 shows the glucose sensor in the present invention. **This device measures the blood glucose concentration of blood flowing through the microvessels in the earlobe 4 of the human body. The wavelength of the light outputted from the first semiconductor laser 1 is 1.55 μm, which is within the glucose absorption wavelength band. It passes through the earlobe 4 and is received by the first photodetector 20. The wavelength of the light outputted from the second semiconductor laser 2 is 1.33 μm, which is outside of the glucose absorption wavelength band. It passes through the earlobe 4 and is received by the second photodetector 21. The third semiconductor laser 22 is used to measure the volume of blood flow, and the wavelength of the light that it emits has a wavelength**

’868 Patent	Shigeki
	of 0.83 μm. It passes through the earlobe 4 and is detected by the third photodetector 22. The volume of blood flow is measured using the Doppler effect, so infrared light, which has good transmissibility through biological tissue, is used to minimize the attenuation of light reflected by hemoglobin. Shigeki at [0009] The calculation procedure is shown below. **The intensity of heat radiation from the body is obtained as a voltage value from the fourth photodiode 23. This is compared with the data in EEPROM 15, the temperature at the body measurement site is measured, and a correction coefficient k for the temperature and the first photodiode output is determined from FIG. 3. The light emitted from the third semiconductor laser 3 passes through the earlobe 4 and is received by the third photodetector 22, and an output value is acquired. The data in the EEPROM 15 is compared with the output value to calculate the volume of blood flow V. The light emitted from the first semiconductor laser 1 passes through the earlobe 4 and is received by the first photodetector 20. The output value from this photodetector is used as V1. The light emitted from the second semiconductor laser 2 passes through the earlobe 4 and is received by the [second] photodetector 2[1]. The output value from this photodetector is used as V2**. The amount of glucose X after temperature correction of the semiconductor irradiation site is calculated using the following equation. Shigeki at [0013] $X = k \cdot (1 - V1/V2)$ **The blood glucose concentration is obtained by dividing the amount of glucose X at the irradiation site by the volume of blood flow V. This glucose concentration value is displayed on the display circuit 9. In the present embodiment, light transmitted through the body site is measured, but reflected light can also be measured**. Shigeki at [0014] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the

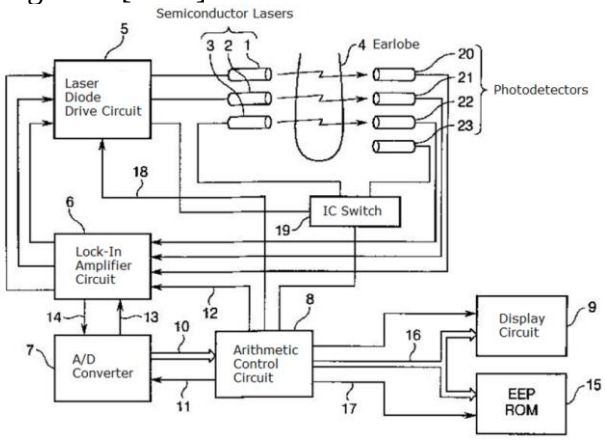
’868 Patent	Shigeki
	art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclsoed by Shigeki, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Shigeki, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[f]. wherein the data represents at least in part physiological information associated with the user;	Shigeki discloses or renders obvious the data represents at least in part physiological information associated with the user. **The present invention measures the light of wavelength .lambda.1 in the glucose absorption wavelength band, the light of wavelength .lambda.2 outside the glucose absorption wavelength band, and the blood flow at the light irradiation site.** Light emitting means for irradiating the living body with light having a wavelength λ3 in the infrared wavelength band, detecting means for detecting the intensity of the light having the three wavelengths transmitted or reflected from the living body, Calculating means for obtaining the ratio of light intensities and calculating the amount of glucose from the ratio; detecting means for measuring the biological temperature; calculating means for correcting the glucose amount from the biological temperature; and light from the λ3 **A glucose sensor comprising: arithmetic means for calculating a blood flow rate at the light irradiation site; and arithmetic means for calculating a blood glucose concentration at the light irradiation site from the temperature-corrected glucose amount and the blood flow rate. According to the present invention, since the blood glucose concentration can be measured without collecting blood, the burden on the subject can be reduced,** and **real-time measurement can be performed, and the glucose concentration that changes with time can be measured.** You can do it. In addition, **the amount of glucose is determined from the intensity ratio of the light of wavelength λ1 in the absorption wavelength band of glucose to the wavelength λ2 outside of the absorption wavelength band of glucose, and the temperature is corrected**. And it is possible to perform accurate measurement.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Shigeki
	 Shigeki at Fig. 1 FIG. 1 shows the glucose sensor in the present invention. **This device measures the blood glucose concentration of blood flowing through the microvessels in the earlobe 4 of the human body. The wavelength of the light outputted from the first semiconductor laser 1 is 1.55 μm, which is within the glucose absorption wavelength band. It passes through the earlobe 4 and is received by the first photodetector 20. The wavelength of the light outputted from the second semiconductor laser 2 is 1.33 μm, which is outside of the glucose absorption wavelength band. It passes through the earlobe 4 and is received by the second photodetector 21. The third semiconductor laser 22 is used to measure the volume of blood flow, and the wavelength of the light that it emits has a wavelength of 0.83 μm. It passes through the earlobe 4 and is detected by the third photodetector 22. The volume of blood flow is measured using the Doppler effect, so infrared light, which has good transmissibility through biological tissue, is used to minimize the attenuation of light reflected by hemoglobin.** Shigeki at [0009] The calculation procedure is shown below. **The intensity of heat radiation from the body is obtained as a voltage value from the fourth photodiode 23. This is compared with the data in EEPROM 15, the temperature at the body measurement site is measured, and a correction coefficient k for the temperature and the first photodiode output is determined from FIG. 3. The light emitted**

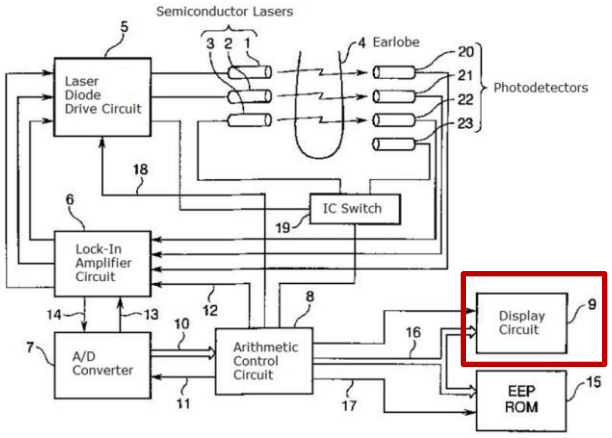
’868 Patent	Shigeki
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7[g]. the software application capable of operating on a control system adapted to receive, store and process at least a portion of the physiological information,	Shigeki discloses or renders obvious the software application capable of operating on a control system adapted to receive, store and process at least a portion of the physiological information. The present invention is a glucose sensor comprising: a light emitting means for irradiating light having wavelength λ1 in the glucose absorption wavelength band, light having wavelength λ2 outside of the glucose absorption wavelength band, and light having wavelength λ3 in the infrared wavelength band for measuring volume of blood flow at the light irradiation site; **a detecting means for detecting the**

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

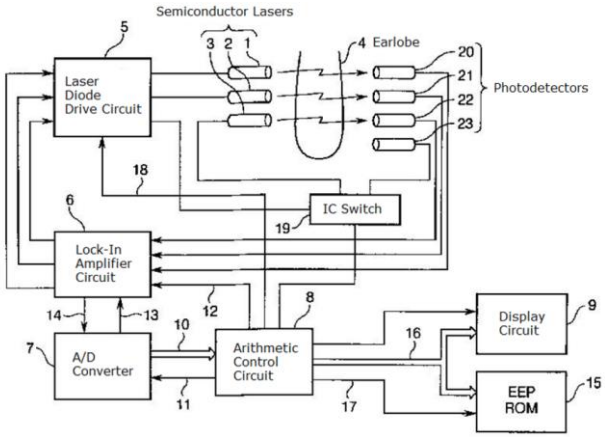
’868 Patent	Shigeki
	intensity of the light having the three wavelengths transmitted or reflected by a living body; a calculating means for determining the light intensity ratio of λ1 and λ2, and determining the amount of glucose from this ratio; a detecting means for measuring body temperature; a calculating means for performing temperature correction on the amount of glucose based on body temperature; a calculating means for calculating the volume of blood flow at the light irradiation site from the light having wavelength λ3; and a calculating means for calculating the blood glucose concentration at the light irradiation site from the temperature-corrected amount of glucose and the volume of blood flow. Using the present invention, the blood glucose concentration can be measured without collecting blood, thereby reducing the burden placed on the subject and **enabling real-time measurement, which also allows for the measurement of the glucose concentration as it changes over time.** Also, **by calculating the amount of glucose from the ratio of the intensity of light having wavelength λ1, which is within the glucose absorption wavelength band, to the intensity of light having wavelength λ2, which is outside of the glucose absorption wavelength band, and then performing temperature correction, the measurement becomes less susceptible to variations in the measurement device and environmental conditions, enabling accurate measurements.** Shigeki at [0007]  Shigeki at Fig. 1 FIG. 1 shows the glucose sensor in the present invention. **This device measures the blood glucose concentration of blood flowing through the microvessels in the earlobe 4 of the human body.** The

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	wavelength of the light outputted from the first semiconductor laser 1 is 1.55 μm, which is within the glucose absorption wavelength band. It passes through the earlobe 4 and is received by the first photodetector 20. The wavelength of the light outputted from the second semiconductor laser 2 is 1.33 μm, which is outside of the glucose absorption wavelength band. It passes through the earlobe 4 and is received by the second photodetector 21. The third semiconductor laser 22 is used to measure the volume of blood flow, and the wavelength of the light that it emits has a wavelength of 0.83 μm. **It passes through the earlobe 4 and is detected by the third photodetector 22. The volume of blood flow is measured using the Doppler effect, so infrared light, which has good transmissibility through biological tissue, is used to minimize the attenuation of light reflected by hemoglobin.** Shigeki at [0009] **A measurement is performed by placing an earlobe 4 between the semiconductor laser unit and the photodetector unit, and calculating the glucose concentration in the earlobe 4 by calculating the photodetector output values at that time. In the arithmetic control circuit 8, calculations are performed to calculate the amount of glucose using the relationship between glucose concentration values previously written to the EEPROM and the photodetector output values, and the relationship between glucose solution temperatures and the photodetector output values**. FIG. 2 shows an example of the relationship between glucose concentrations and outputs from the first photodetector 20 measured with glucose solutions placed in a container. FIG. 3 shows an example of the relationship between glucose solution temperatures and outputs from the first photodetector 20. **In FIG. 3, as the temperature of the glucose solution increases, molecular expansion and contraction become more active, resulting in less light absorption. Therefore, as the temperature of the glucose solution increases, the output of the photodetector increases. Temperature compensation is performed using the temperature obtained from the fourth photodetector 23, and the amount of glucose is divided by the volume of blood flow calculated from the third photodetector 22. The result is displayed on a display circuit 9 via digital signals 16**. Shigeki at [0012] The calculation procedure is shown below. **The intensity of heat radiation from the body is obtained as a voltage value from the fourth photodiode 23**. **This is compared with the data in EEPROM 15, the temperature at the body measurement site is measured, and a correction coefficient k for the temperature and the first photodiode output is determined from FIG. 3. The light emitted**

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	from the third semiconductor laser 3 passes through the earlobe 4 and is received by the third photodetector 22, and an output value is acquired. The data in the EEPROM 15 is compared with the output value to calculate the volume of blood flow V. The light emitted from the first semiconductor laser 1 passes through the earlobe 4 and is received by the first photodetector 20. The output value from this photodetector is used as V1. The light emitted from the second semiconductor laser 2 passes through the earlobe 4 and is received by the [second] photodetector 2[1]. The output value from this photodetector is used as V2. The amount of glucose X after temperature correction of the semiconductor irradiation site is calculated using the following equation. Shigeki at [0013] $X = k \cdot (1 - V1/V2)$ **The blood glucose concentration is obtained by dividing the amount of glucose X at the irradiation site by the volume of blood flow V. This glucose concentration value is displayed on the display circuit 9. In the present embodiment, light transmitted through the body site is measured, but reflected light can also be measured**. Shigeki at [0014] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclsoed by Shigeki, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Shigeki, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[h]. the control system having a touch-screen, circuitry for obtaining position information from a location sensor, and	Shigeki discloses or renders obvious the control system having a touch-screen, circuitry for obtaining position information from a location sensor. It is an object of the present invention to solve this problem by allowing for **non-invasive measurement of glucose concentrations.** More specifically, it is an object of the present invention to provide **a glucose sensor that can accurately measure changing glucose concentrations over time**, and that is simple, gives real-time results, and is reusable.

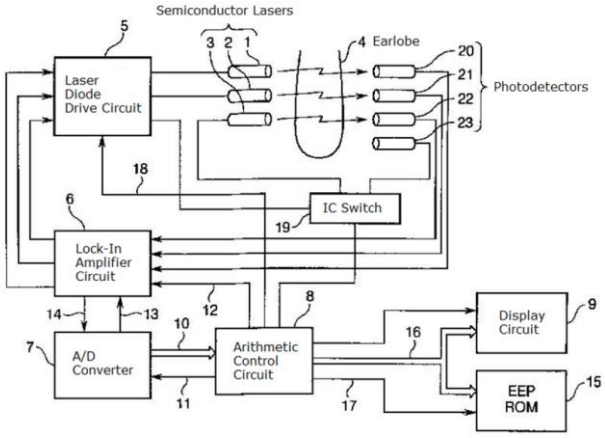
’868 Patent	Shigeki
	Shigeki at [0006]  Shigeki at Fig. 1 The body temperature at the laser irradiation is measured by receiving the heat radiation from the irradiation site with a fourth photodetector 23, which is an infrared radiation thermometer. The IC switch 19 switches between measuring the temperature at the irradiation site and measuring the volume of blood flow at the irradiation site. In the present embodiment of the invention, each signal from the photodetectors that detects each light intensity is directed to a lock-in amplifier 6. The circuit 5 used to drive the semiconductor lasers and the lock-in amplifier 6 reduce the noise caused by external disturbances that the light emitted from each semiconductor laser encounters before reaching the photodetectors. Here, modulation occurs at 10 kHz. **The analog voltages 14 from the photodetectors, which has been converted to direct current by the lock-in amplifier 6, are sent to the A/D converter 7 in synchronization with the control signal 13 and converted to digital signals. The digital signals 10 are sent to an arithmetic control circuit 8 in synchronization with an A/D converter start signal 11. In the arithmetic control circuit, calculations are performed based on the absolute values of the signals outputted from the first photodetector 20, the second photodetector 21, the third photodetector 22, and the fourth photodetector 23.**

’868 Patent	Shigeki
	Shigeki at [0010] In order to start the measurement, **a calibration operation must be performed first to maintain a predetermined level with nothing coming between the semiconductor lasers and the photodetectors. Specifically, the voltage values outputted from the photodetectors is compared with the initial setting values for the photodetectors written to the EEPROM 15.** If there is a difference, **the semiconductor drive current for the semiconductor laser diode drive circuit 5 is changed using control signals 18 so that the voltage values of the photodetectors and the initial values of the settings in the EEPROM 15 are kept at constant values before a measurement is performed.** Shigeki at [0011] **A measurement is performed by placing an earlobe 4 between the semiconductor laser unit and the photodetector unit, and calculating the glucose concentration in the earlobe 4 by calculating the photodetector output values at that time. In the arithmetic control circuit 8, calculations are performed to calculate the amount of glucose using the relationship between glucose concentration values previously written to the EEPROM and the photodetector output values, and the relationship between glucose solution temperatures and the photodetector output values**. FIG. 2 shows an example of the relationship between glucose concentrations and outputs from the first photodetector 20 measured with glucose solutions placed in a container. FIG. 3 shows an example of the relationship between glucose solution temperatures and outputs from the first photodetector 20. **In FIG. 3, as the temperature of the glucose solution increases, molecular expansion and contraction become more active, resulting in less light absorption. Therefore, as the temperature of the glucose solution increases, the output of the photodetector increases. Temperature compensation is performed using the temperature obtained from the fourth photodetector 23, and the amount of glucose is divided by the volume of blood flow calculated from the third photodetector 22. The result is displayed on a display circuit 9 via digital signals 16**. Shigeki at [0012] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the

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7[i]. a wireless transceiver to transmit wireless data over a wireless link,	Shigeki discloses or renders obvious a wireless transceiver to transmit wireless data over a wireless link.  Shigeki at Fig. 1 **FIG. 1 shows the glucose sensor in the present invention. This device measures the blood glucose concentration of blood flowing through the microvessels in the earlobe 4 of the human body.** The wavelength of the light outputted from the first semiconductor laser 1 is 1.55 μm, which is within the glucose absorption wavelength band. It passes through the earlobe 4 and is received by the first photodetector 20. The wavelength of the light outputted from the second semiconductor laser 2 is 1.33 μm, which is outside of the glucose absorption wavelength band. It passes through the earlobe 4 and is received by the second photodetector 21. The third semiconductor laser 22 is used to measure the volume of blood flow, and the wavelength of the light that it emits has a wavelength of 0.83 μm. It passes through the earlobe 4 and is detected by the third photodetector 22. **The volume of blood flow is measured using the Doppler effect, so infrared light, which has good transmissibility through biological tissue, is used to minimize the attenuation of light reflected by hemoglobin.**

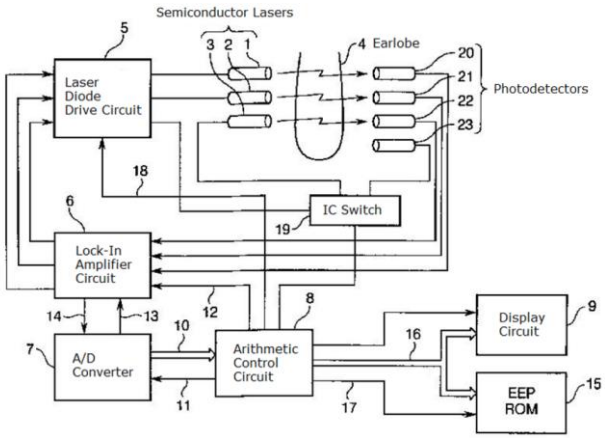
’868 Patent	Shigeki
	Shigeki at [0009] **The body temperature at the laser irradiation is measured by receiving the heat radiation from the irradiation site with a fourth photodetector 23, which is an infrared radiation thermometer. The IC switch 19 switches between measuring the temperature at the irradiation site and measuring the volume of blood flow at the irradiation site. In the present embodiment of the invention, each signal from the photodetectors that detects each light intensity is directed to a lock-in amplifier 6. The circuit 5 used to drive the semiconductor lasers and the lock-in amplifier 6 reduce the noise caused by external disturbances that the light emitted from each semiconductor laser encounters before reaching the photodetectors.** Here, modulation occurs at 10 kHz. **The analog voltages 14 from the photodetectors, which has been converted to direct current by the lock-in amplifier 6, are sent to the A/D converter 7 in synchronization with the control signal 13 and converted to digital signals. The digital signals 10 are sent to an arithmetic control circuit 8 in synchronization with an A/D converter start signal 11. In the arithmetic control circuit, calculations are performed based on the absolute values of the signals outputted from the first photodetector 20, the second photodetector 21, the third photodetector 22, and the fourth photodetector 23**. Shigeki at [0010] The blood glucose concentration is obtained by dividing the amount of glucose X at the irradiation site by the volume of blood flow V. This glucose concentration value is displayed on the display circuit 9. In the present embodiment, **light transmitted through the body site is measured, but reflected light can also be measured.** Shigeki at [0014] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclsoed by Shigeki, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Shigeki, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Shigeki
7[j]. the wireless data comprising at least a part of the physiological information,	Shigeki discloses or renders obvious the wireless data comprising at least a part of the physiological information.  Shigeki at Fig. 1 **FIG. 1 shows the glucose sensor in the present invention. This device measures the blood glucose concentration of blood flowing through the microvessels in the earlobe 4 of the human body.** The wavelength of the light outputted from the first semiconductor laser 1 is 1.55 μm, which is within the glucose absorption wavelength band. It passes through the earlobe 4 and is received by the first photodetector 20. The wavelength of the light outputted from the second semiconductor laser 2 is 1.33 μm, which is outside of the glucose absorption wavelength band. It passes through the earlobe 4 and is received by the second photodetector 21. The third semiconductor laser 22 is used to measure the volume of blood flow, and the wavelength of the light that it emits has a wavelength of 0.83 μm. It passes through the earlobe 4 and is detected by the third photodetector 22. **The volume of blood flow is measured using the Doppler effect, so infrared light, which has good transmissibility through biological tissue, is used to minimize the attenuation of light reflected by hemoglobin.** Shigeki at [0009] **The body temperature at the laser irradiation is measured by receiving the heat radiation from the irradiation site with a fourth photodetector 23, which is an infrared radiation thermometer.**

’868 Patent	Shigeki
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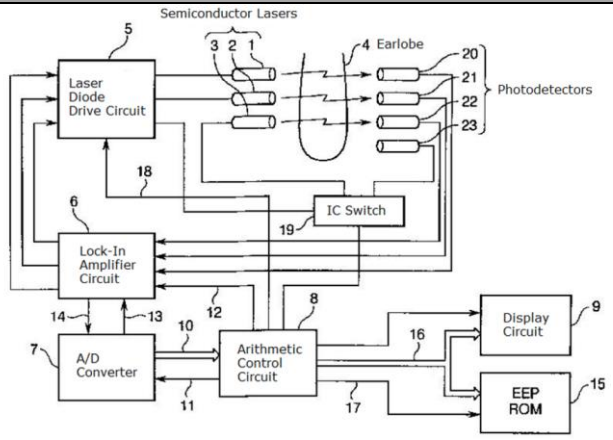
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Shigeki
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7[k]. wherein the control system is further capable of receiving voice input signals and manually entered input signals; and	Shigeki discloses or renders obvious the control system is further capable of receiving voice input signals and manually entered input signals.  Shigeki at Fig. 1 The body temperature at the laser irradiation is measured by receiving the heat radiation from the irradiation site with a fourth photodetector 23, which is an infrared radiation thermometer. The IC switch 19 switches between measuring the temperature at the irradiation site and measuring the volume of blood flow at the irradiation site. In the present embodiment of the invention, each signal from the photodetectors that detects each light intensity is directed to a lock-in amplifier 6. The circuit 5 used to drive the semiconductor lasers and the lock-in amplifier 6 reduce the noise caused by external

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

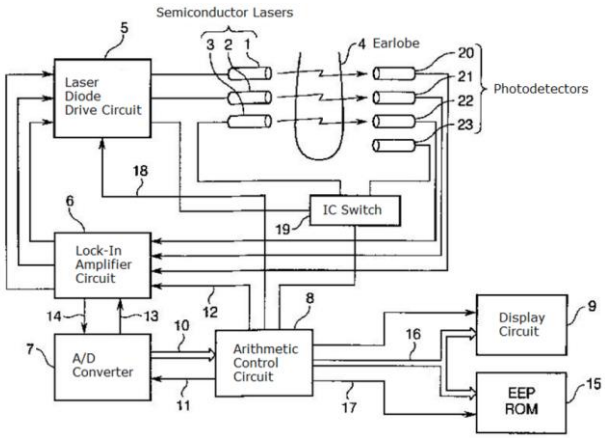
’868 Patent	Shigeki
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7[l]. a host comprising:	Shigeki discloses or renders obvious the diagnostic system comprises a host.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Shigeki
	 Shigeki at Fig. 1 **FIG. 1 shows the glucose sensor in the present invention. This device measures the blood glucose concentration of blood flowing through the microvessels in the earlobe 4 of the human body.** The wavelength of the light outputted from the first semiconductor laser 1 is 1.55 μm, which is within the glucose absorption wavelength band. It passes through the earlobe 4 and is received by the first photodetector 20. The wavelength of the light outputted from the second semiconductor laser 2 is 1.33 μm, which is outside of the glucose absorption wavelength band. It passes through the earlobe 4 and is received by the second photodetector 21. The third semiconductor laser 22 is used to measure the volume of blood flow, and the wavelength of the light that it emits has a wavelength of 0.83 μm. It passes through the earlobe 4 and is detected by the third photodetector 22. **The volume of blood flow is measured using the Doppler effect, so infrared light, which has good transmissibility through biological tissue, is used to minimize the attenuation of light reflected by hemoglobin.** Shigeki at [0009] The body temperature at the laser irradiation is measured by receiving the heat radiation from the irradiation site with a fourth photodetector 23, which is an infrared radiation thermometer. The IC switch 19 switches between measuring the temperature at the irradiation site and measuring the volume of blood flow at the irradiation site. In the present embodiment of the invention, each signal from the photodetectors that detects each light intensity is directed to a lock-in amplifier 6. The circuit 5 used to

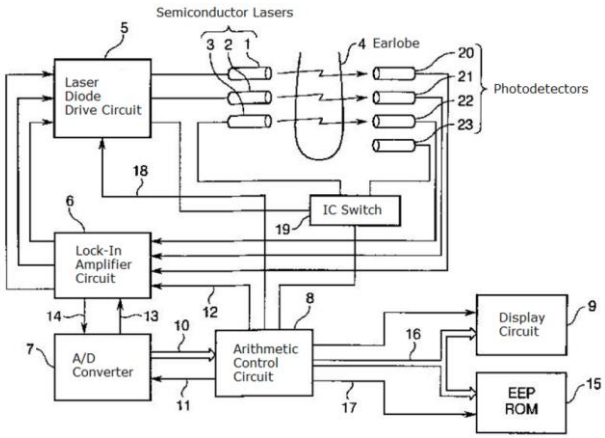
’868 Patent	Shigeki
	drive the semiconductor lasers and the lock-in amplifier 6 reduce the noise caused by external disturbances that the light emitted from each semiconductor laser encounters before reaching the photodetectors. Here, modulation occurs at 10 kHz. **The analog voltages 14 from the photodetectors, which has been converted to direct current by the lock-in amplifier 6, are sent to the A/D converter 7 in synchronization with the control signal 13 and converted to digital signals. The digital signals 10 are sent to an arithmetic control circuit 8 in synchronization with an A/D converter start signal 11. In the arithmetic control circuit, calculations are performed based on the absolute values of the signals outputted from the first photodetector 20, the second photodetector 21, the third photodetector 22, and the fourth photodetector 23.** Shigeki at [0010] In order to start the measurement, a calibration operation must be performed first to maintain a predetermined level with nothing coming between the semiconductor lasers and the photodetectors. Specifically, **the voltage values outputted from the photodetectors is compared with the initial setting values for the photodetectors written to the EEPROM 15**. If there is a difference, **the semiconductor drive current for the semiconductor laser diode drive circuit 5 is changed using control signals 18 so that the voltage values of the photodetectors and the initial values of the settings in the EEPROM 15 are kept at constant values before a measurement is performed.** Shigeki at [0011] The calculation procedure is shown below. **The intensity of heat radiation from the body is obtained as a voltage value from the fourth photodiode 23. This is compared with the data in EEPROM 15, the temperature at the body measurement site is measured, and a correction coefficient k for the temperature and the first photodiode output is determined from FIG. 3.** The light emitted from the third semiconductor laser 3 passes through the earlobe 4 and is received by the third photodetector 22, and an output value is acquired. **The data in the EEPROM 15 is compared with the output value to calculate the volume of blood flow V.** The light emitted from the first semiconductor laser 1 passes through the earlobe 4 and is received by the first photodetector 20. The output value from this photodetector is used as V1. The light emitted from the second semiconductor laser 2 passes through the earlobe 4 and is received by the [second] photodetector 2[1]. The output value from this photodetector is used as V2. The amount of glucose X after temperature correction of the semiconductor irradiation site is calculated using the following equation.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Shigeki
	Shigeki at [0013] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclsoed by Shigeki, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Shigeki, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[m]. a digital file for receiving and storing at least a portion of the wireless data;	Shigeki discloses or renders obvious the host comprises a digital file for receiving and storing at least a portion of the wireless data.  Shigeki at Fig. 1 In order to start the measurement, **a calibration operation must be performed first to maintain a predetermined level with nothing coming between the semiconductor lasers and the photodetectors. Specifically, the voltage values outputted from the photodetectors is compared with the initial setting values for the photodetectors written to the EEPROM 15.** If there is a difference, **the semiconductor drive current for the semiconductor laser diode drive circuit 5 is changed using control signals 18 so that the voltage values of the photodetectors and the initial**

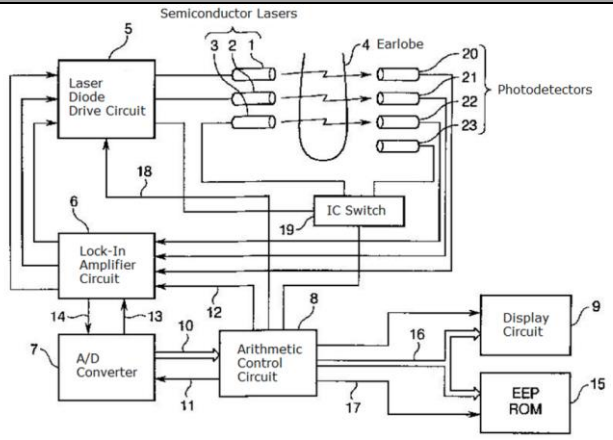
’868 Patent	Shigeki
	values of the settings in the EEPROM 15 are kept at constant values before a measurement is performed. Shigeki at [0011] **A measurement is performed by placing an earlobe 4 between the semiconductor laser unit and the photodetector unit, and calculating the glucose concentration in the earlobe 4 by calculating the photodetector output values at that time. In the arithmetic control circuit 8, calculations are performed to calculate the amount of glucose using the relationship between glucose concentration values previously written to the EEPROM** and the photodetector output values, and the relationship between glucose solution temperatures and the photodetector output values. FIG. 2 shows an example of the relationship between glucose concentrations and outputs from the first photodetector 20 measured with glucose solutions placed in a container. FIG. 3 shows an example of the relationship between glucose solution temperatures and outputs from the first photodetector 20. In FIG. 3, as the temperature of the glucose solution increases, molecular expansion and contraction become more active, resulting in less light absorption. Therefore, as the temperature of the glucose solution increases, the output of the photodetector increases. Temperature compensation is performed using the temperature obtained from the fourth photodetector 23, and the amount of glucose is divided by the volume of blood flow calculated from the third photodetector 22. The result is displayed on a display circuit 9 via digital signals 16. Shigeki at [0012] The calculation procedure is shown below. **The intensity of heat radiation from the body is obtained as a voltage value from the fourth photodiode 23. This is compared with the data in EEPROM 15, the temperature at the body measurement site is measured, and a correction coefficient k for the temperature and the first photodiode output is determined from FIG. 3.** The light emitted from the third semiconductor laser 3 passes through the earlobe 4 and is received by the third photodetector 22, and an output value is acquired. **The data in the EEPROM 15 is compared with the output value to calculate the volume of blood flow V.** The light emitted from the first semiconductor laser 1 passes through the earlobe 4 and is received by the first photodetector 20. The output value from this photodetector is used as V1. The light emitted from the second semiconductor laser 2 passes through the earlobe 4 and is received by the [second] photodetector 2[1]. The output value from this photodetector is used as V2. The amount of glucose X after temperature correction of the semiconductor irradiation site is calculated using the following equation.

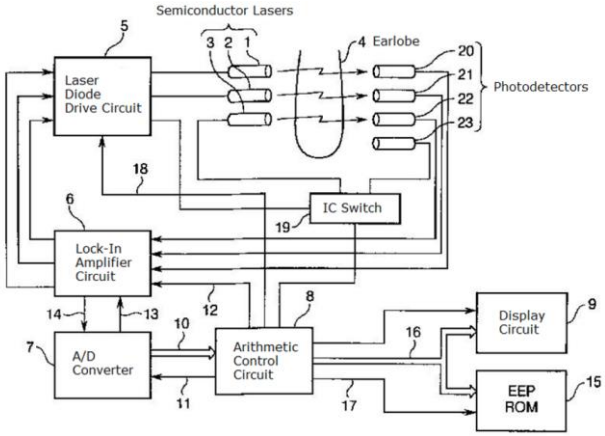
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Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Shigeki
	Shigeki at [0013] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclsoed by Shigeki, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Shigeki, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[n]. control logic at the host to process at least the portion of the wireless data to generate a status of the user;	Shigeki discloses or renders obvious the host comprises control logic at the host to process at least the portion of the wireless data to generate a status of the user.  Shigeki at Fig. 1 The body temperature at the laser irradiation is measured by receiving the heat radiation from the irradiation site with a fourth photodetector 23, which is an infrared radiation thermometer. The IC switch 19 switches between measuring the temperature at the irradiation site and measuring the volume of blood flow at the irradiation site. In the present embodiment of the invention, each signal from the photodetectors that detects each light intensity is directed to a lock-in amplifier 6. The circuit 5 used to drive the semiconductor lasers and the lock-in amplifier 6 reduce the noise caused by external

’868 Patent	Shigeki
	disturbances that the light emitted from each semiconductor laser encounters before reaching the photodetectors. Here, modulation occurs at 10 kHz. **The analog voltages 14 from the photodetectors, which has been converted to direct current by the lock-in amplifier 6, are sent to the A/D converter 7 in synchronization with the control signal 13 and converted to digital signals. The digital signals 10 are sent to an arithmetic control circuit 8 in synchronization with an A/D converter start signal 11. In the arithmetic control circuit, calculations are performed based on the absolute values of the signals outputted from the first photodetector 20, the second photodetector 21, the third photodetector 22, and the fourth photodetector 23.** Shigeki at [0010] In order to start the measurement, **a calibration operation must be performed first to maintain a predetermined level with nothing coming between the semiconductor lasers and the photodetectors. Specifically, the voltage values outputted from the photodetectors is compared with the initial setting values for the photodetectors written to the EEPROM 15.** If there is a difference, **the semiconductor drive current for the semiconductor laser diode drive circuit 5 is changed using control signals 18 so that the voltage values of the photodetectors and the initial values of the settings in the EEPROM 15 are kept at constant values before a measurement is performed.** Shigeki at [0011] **A measurement is performed by placing an earlobe 4 between the semiconductor laser unit and the photodetector unit, and calculating the glucose concentration in the earlobe 4 by calculating the photodetector output values at that time. In the arithmetic control circuit 8, calculations are performed to calculate the amount of glucose using the relationship between glucose concentration values previously written to the EEPROM and the photodetector output values, and the relationship between glucose solution temperatures and the photodetector output values**. FIG. 2 shows an example of **the relationship between glucose concentrations and outputs from the first photodetector 20 measured with glucose solutions placed in a container**. FIG. 3 shows an example of the relationship between glucose solution temperatures and outputs from the first photodetector 20. In FIG. 3, **as the temperature of the glucose solution increases, molecular expansion and contraction become more active, resulting in less light absorption. Therefore, as the temperature of the glucose solution increases, the output of the photodetector increases. Temperature compensation is**

’868 Patent	Shigeki
	performed using the temperature obtained from the fourth photodetector 23, and the amount of glucose is divided by the volume of blood flow calculated from the third photodetector 22. The result is displayed on a display circuit 9 via digital signals 16. Shigeki at [0012] The calculation procedure is shown below. **The intensity of heat radiation from the body is obtained as a voltage value from the fourth photodiode 23. This is compared with the data in EEPROM 15, the temperature at the body measurement site is measured, and a correction coefficient k for the temperature and the first photodiode output is determined from FIG. 3.** The light emitted from the third semiconductor laser 3 passes through the earlobe 4 and is received by the third photodetector 22, and an output value is acquired. **The data in the EEPROM 15 is compared with the output value to calculate the volume of blood flow V.** The light emitted from the first semiconductor laser 1 passes through the earlobe 4 and is received by the first photodetector 20. The output value from this photodetector is used as V1. The light emitted from the second semiconductor laser 2 passes through the earlobe 4 and is received by the [second] photodetector 2[1]. The output value from this photodetector is used as V2. The amount of glucose X after temperature correction of the semiconductor irradiation site is calculated using the following equation. Shigeki at [0013] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclsoed by Shigeki, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Shigeki, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[o]. a memory storage device for recording the status; and	Shigeki discloses or renders obvious the host comprises a memory storage device for recording the status.

’868 Patent	Shigeki
	 Shigeki at Fig. 1 In order to start the measurement, **a calibration operation must be performed first to maintain a predetermined level with nothing coming between the semiconductor lasers and the photodetectors. Specifically, the voltage values outputted from the photodetectors is compared with the initial setting values for the photodetectors written to the EEPROM 15.** If there is a difference, **the semiconductor drive current for the semiconductor laser diode drive circuit 5 is changed using control signals 18 so that the voltage values of the photodetectors and the initial values of the settings in the EEPROM 15 are kept at constant values before a measurement is performed.** Shigeki at [0011] The calculation procedure is shown below. **The intensity of heat radiation from the body is obtained as a voltage value from the fourth photodiode 23. This is compared with the data in EEPROM 15, the temperature at the body measurement site is measured, and a correction coefficient k for the temperature and the first photodiode output is determined from FIG. 3.** The light emitted from the third semiconductor laser 3 passes through the earlobe 4 and is received by the third photodetector 22, and an output value is acquired. **The data in the EEPROM 15 is compared with the output value to calculate the volume of blood flow V.** The light emitted from the first semiconductor laser 1 passes through the earlobe 4 and is received by the first photodetector 20. The output value from this

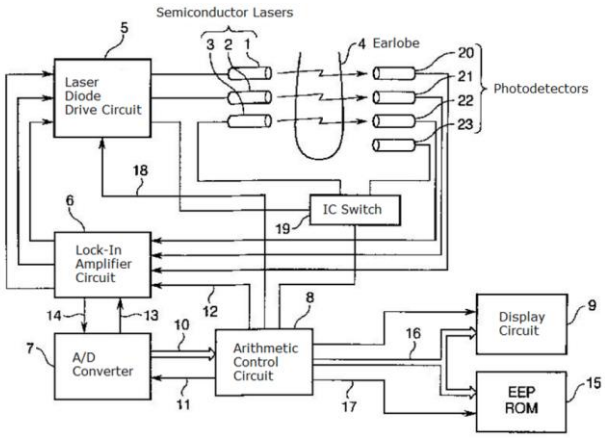
’868 Patent	Shigeki
	photodetector is used as V1. The light emitted from the second semiconductor laser 2 passes through the earlobe 4 and is received by the [second] photodetector 2[1]. The output value from this photodetector is used as V2. The amount of glucose X after temperature correction of the semiconductor irradiation site is calculated using the following equation. Shigeki at [0013] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclsoed by Shigeki, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Shigeki, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[p]. an output for communicating at least a portion of the status or associated information over a communication link to one or more display output devices,	Shigeki discloses or renders obvious the host comprises an output for communicating at least a portion of the status or associated information over a communication link to one or more display output devices, wherein the one or more display output devices are located remotely from the host.  Shigeki at Fig. 1

’868 Patent	Shigeki
	FIG. 1 shows the glucose sensor in the present invention. This device measures the blood glucose concentration of blood flowing through the microvessels in the earlobe 4 of the human body. The wavelength of the light outputted from the first semiconductor laser 1 is 1.55 μm, which is within the glucose absorption wavelength band. It passes through the earlobe 4 and is received by the first photodetector 20. The wavelength of the light outputted from the second semiconductor laser 2 is 1.33 μm, which is outside of the glucose absorption wavelength band. It passes through the earlobe 4 and is received by the second photodetector 21. The third semiconductor laser 22 is used to measure the volume of blood flow, and the wavelength of the light that it emits has a wavelength of 0.83 μm. It passes through the earlobe 4 and is detected by the third photodetector 22. **The volume of blood flow is measured using the Doppler effect, so infrared light, which has good transmissibility through biological tissue, is used to minimize the attenuation of light reflected by hemoglobin.** Shigeki at [0009] **A measurement is performed by placing an earlobe 4 between the semiconductor laser unit and the photodetector unit, and calculating the glucose concentration in the earlobe 4 by calculating the photodetector output values at that time.** In the arithmetic control circuit 8, **calculations are performed to calculate the amount of glucose using the relationship between glucose concentration values previously written to the EEPROM and the photodetector output values, and the relationship between glucose solution temperatures and the photodetector output values**. FIG. 2 shows an example of the relationship between glucose concentrations and outputs from the first photodetector 20 measured with glucose solutions placed in a container. FIG. 3 shows an example of the relationship between glucose solution temperatures and outputs from the first photodetector 20. In FIG. 3, as the temperature of the glucose solution increases, molecular expansion and contraction become more active, resulting in less light absorption. **Therefore, as the temperature of the glucose solution increases, the output of the photodetector increases. Temperature compensation is performed using the temperature obtained from the fourth photodetector 23, and the amount of glucose is divided by the volume of blood flow calculated from the third photodetector 22. The result is displayed on a display circuit 9 via digital signals 16.** Shigeki at [0012] The blood glucose concentration is obtained by dividing the amount of glucose X at the irradiation site by the volume of blood flow V. **This glucose concentration value is displayed on the display circuit**

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

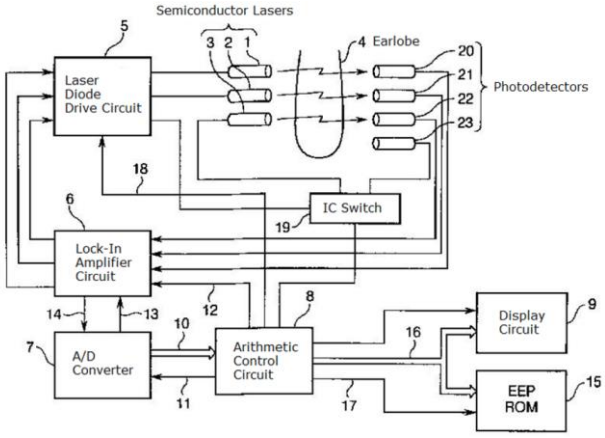
'868 Patent	Shigeki
	9. In the present embodiment, light transmitted through the body site is measured, but reflected light can also be measured. Shigeki at [0014] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant's Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclsoed by Shigeki, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Shigeki, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[q]. wherein the one or more display output devices are located remotely from the host.	Shigeki discloses or renders obvious the one or more display output devices are located remotely from the host. One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant's Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclsoed by Shigeki, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Shigeki, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
Claim 8	
8. The diagnostic system of claim 7, wherein the light source comprises a plurality of semiconductor diodes that are further coupled to a multiplexer capable of combining the plurality of semiconductor diodes and generating the input light	*See* claim 7 above. Shigeki discloses or renders obvious the light source comprises a plurality of semiconductor diodes that are further coupled to a multiplexer capable of combining the plurality of semiconductor diodes and generating the input light beam comprising one or more wavelengths. The present invention is **a glucose sensor comprising: a light emitting means for irradiating light having wavelength λ1 in the glucose absorption wavelength band, light having wavelength λ2 outside of the glucose absorption wavelength band, and light having wavelength λ3 in the infrared wavelength band** for measuring volume of blood flow at the light irradiation site; **a detecting means**

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Shigeki
beam comprising one or more wavelengths.	**for detecting the intensity of the light having the three wavelengths transmitted or reflected by a living body; a calculating means for determining the light intensity ratio of λ1 and λ2,** and determining the amount of glucose from this ratio; a detecting means for measuring body temperature; a calculating means for performing temperature correction on the amount of glucose based on body temperature; **a calculating means for calculating the volume of blood flow at the light irradiation site from the light having wavelength λ3;** and a calculating means for calculating the blood glucose concentration at the light irradiation site from the temperature-corrected amount of glucose and the volume of blood flow. Using the present invention, the blood glucose concentration can be measured without collecting blood, thereby reducing the burden placed on the subject and enabling real-time measurement, which also allows for the measurement of the glucose concentration as it changes over time. Also, **by calculating the amount of glucose from the ratio of the intensity of light having wavelength λ1, which is within the glucose absorption wavelength band, to the intensity of light having wavelength λ2, which is outside of the glucose absorption wavelength band**, and then performing temperature correction, the measurement becomes less susceptible to variations in the measurement device and environmental conditions, enabling accurate measurements. Shigeki at [0007]  Shigeki at Fig. 1

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Shigeki
	FIG. 1 shows the glucose sensor in the present invention. **This device measures the blood glucose concentration of blood flowing through the microvessels in the earlobe 4 of the human body. The wavelength of the light outputted from the first semiconductor laser 1 is 1.55 μm, which is within the glucose absorption wavelength band. It passes through the earlobe 4 and is received by the first photodetector 20. The wavelength of the light outputted from the second semiconductor laser 2 is 1.33 μm, which is outside of the glucose absorption wavelength band.** It passes through the earlobe 4 and is received by the second photodetector 21. **The third semiconductor laser 22 is used to measure the volume of blood flow, and the wavelength of the light that it emits has a wavelength of 0.83 μm. It passes through the earlobe 4 and is detected by the third photodetector 22. The volume of blood flow is measured using the Doppler effect, so infrared light, which has good transmissibility through biological tissue, is used to minimize the attenuation of light reflected by hemoglobin.** Shigeki at [0009] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclsoed by Shigeki, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Shigeki, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
Claim 9	
9. The diagnostic system of claim 7, wherein at least the portion of the input light beam is adapted for use in a diagnostics to measure a property of the blood, wherein the diagnostics comprise a spectroscopic procedure, wherein the spectroscopic procedure is based at least in part on a	*See* claim 7 above. Shigeki discloses or renders obvious the portion of the input light beam is adapted for use in a diagnostics to measure a property of the blood, wherein the diagnostics comprise a spectroscopic procedure, wherein the spectroscopic procedure is based at least in part on a comparison of amplitudes at a plurality of associated wavelengths transmitted or reflected from the blood. The present invention is **a glucose sensor comprising: a light emitting means for irradiating light having wavelength λ1 in the glucose absorption wavelength band, light having wavelength λ2 outside of the glucose absorption wavelength band, and light having wavelength λ3 in the infrared wavelength band** for measuring volume of blood flow at the light irradiation site; **a detecting means**

’868 Patent	Shigeki
comparison of amplitudes at a plurality of associated wavelengths transmitted or reflected from the blood.	**for detecting the intensity of the light having the three wavelengths transmitted or reflected by a living body; a calculating means for determining the light intensity ratio of λ1 and λ2, and determining the amount of glucose from this ratio; a detecting means for measuring body temperature; a calculating means for performing temperature correction on the amount of glucose based on body temperature; a calculating means for calculating the volume of blood flow at the light irradiation site from the light having wavelength λ3;** and **a calculating means for calculating the blood glucose concentration at the light irradiation site from the temperature-corrected amount of glucose and the volume of blood flow**. Using the present invention, the blood glucose concentration can be measured without collecting blood, thereby reducing the burden placed on the subject and enabling real-time measurement, which also allows for the measurement of the glucose concentration as it changes over time. Also, **by calculating the amount of glucose from the ratio of the intensity of light having wavelength λ1, which is within the glucose absorption wavelength band, to the intensity of light having wavelength λ2, which is outside of the glucose absorption wavelength band**, and then performing temperature correction, the measurement becomes less susceptible to variations in the measurement device and environmental conditions, enabling accurate measurements. Shigeki at [0007]  Shigeki at Fig. 1

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Shigeki
	FIG. 1 shows the glucose sensor in the present invention. **This device measures the blood glucose concentration of blood flowing through the microvessels in the earlobe 4 of the human body. The wavelength of the light outputted from the first semiconductor laser 1 is 1.55 μm, which is within the glucose absorption wavelength band. It passes through the earlobe 4 and is received by the first photodetector 20. The wavelength of the light outputted from the second semiconductor laser 2 is 1.33 μm, which is outside of the glucose absorption wavelength band.** It passes through the earlobe 4 and is received by the second photodetector 21. **The third semiconductor laser 22 is used to measure the volume of blood flow, and the wavelength of the light that it emits has a wavelength of 0.83 μm. It passes through the earlobe 4 and is detected by the third photodetector 22. The volume of blood flow is measured using the Doppler effect, so infrared light, which has good transmissibility through biological tissue, is used to minimize the attenuation of light reflected by hemoglobin.** Shigeki at [0009] The calculation procedure is shown below. **The intensity of heat radiation from the body is obtained as a voltage value from the fourth photodiode 23. This is compared with the data in EEPROM 15, the temperature at the body measurement site is measured, and a correction coefficient k for the temperature and the first photodiode output is determined from FIG. 3. The light emitted from the third semiconductor laser 3 passes through the earlobe 4 and is received by the third photodetector 22, and an output value is acquired**. **The data in the EEPROM 15 is compared with the output value to calculate the volume of blood flow V. The light emitted from the first semiconductor laser 1 passes through the earlobe 4 and is received by the first photodetector 20. The output value from this photodetector is used as V1. The light emitted from the second semiconductor laser 2 passes through the earlobe 4 and is received by the [second] photodetector 2[1]. The output value from this photodetector is used as V2**. **The amount of glucose X after temperature correction of the semiconductor irradiation site is calculated using the following equation**. Shigeki at [0013] $X = k \cdot (1 - V1/V2)$

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Shigeki
	The blood glucose concentration is obtained by dividing the amount of glucose X at the irradiation site by the volume of blood flow V. This glucose concentration value is displayed on the display circuit 9. In the present embodiment, light transmitted through the body site is measured, but reflected light can also be measured. Shigeki at [0014] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclsoed by Shigeki, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Shigeki, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

EXHIBIT A7

U.S. Pat. No. 9,055,868 in view of U.S. Patent No. 6,168,563 to Stephen J. Brown ("Brown")

As described in detail below, Brown (individually or collectively) anticipates and/or renders obvious claim 7-9 ("Asserted Claims") of U.S. Patent No. 9,055,868 B2 (the "'868 Patent") under 35 U.S.C. §102 and/or §103, either alone in combination with the knowledge of a person of ordinary skill, and/or additional prior art references discussed in discussed in Exhibits A1-A10, the contents of which are hereby incorporated by reference into this chart. One of ordinary skill in the art, as of the priority date of the '868 Patent, would have known to combine the prior art elements disclosed by the foregoing references using known methods, and to use these elements according to their established functions in order to achieve a known and predictable result. This invalidity claim chart is based on Defendants' present understanding of the Asserted Claims and Plaintiff's apparent construction of the Asserted Claims in its Preliminary Infringement Contentions ("Infringement Contentions").

The following invalidity chart includes references to the structure, function, operation, and/or features of the technology described in Brown. The cited portions of Brown are merely illustrative, and Defendants reserve the right to rely on alternative or additional evidence, including uncited portions of Brown. Where a particular figure is cited, the citation should be understood to encompass the caption and description of the figure as well as any text relating to or describing the figure. Conversely, where particular text referring to a figure is cited, the citation should be understood to include the figure as well. Although the documentation collectively evidences prior knowledge, use, or sale, Defendants reserve the right to rely upon individual documents as printed publications. Where the chart below states that Brown "describes" or "provides for" a limitation, such disclosure may be express, inherent, or implicit. To the extent it is found Brown does not expressly disclose certain limitations in the asserted claim, such limitations are inherent. Defendants reserve the right to present direct evidence of the structure, function, operation, and/or features of the technology described in Brown (including product samples, source code, and/or witness testimony) and/or its prior art status, and to present alternative or additional documents concerning the same as evidence that the technology described in Brown anticipates and/or renders obvious the Asserted Claims of the '868 Patent.

This chart is subject to all reservations, objections, and disclaimers in Defendants' Invalidity Contentions and any amendment, supplement, or modification thereof, which are incorporated herein by reference in their entirety. Nothing stated herein shall be treated as an admission or suggestion that Defendants agree with Plaintiff regarding the scope of the Asserted Claims, Plainitff's apparent claim constructions, or the accuracy of any particular claim construction. Defendants reserve all rights to challenge any of the claim terms herein under 35 U.S.C. § 112, including by arguing that they are indefinite, are not supported by the written description, and/or are not enabled. Defendants further reserve all rights to amend this invalidity claim chart without leave of court pursuant to the Court's Docket Control Order, or upon a showing of good cause.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

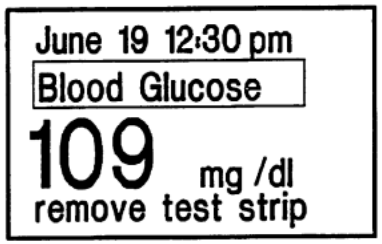
EXHIBIT A7

’868 Patent	Brown
Claim 7	
7[pre]. A diagnostic system comprising:	By providing this disclosure, Defendants do not take a position on whether the preamble is limiting. Brown discloses or renders obvious a diagnostic system. A system and method is described that enables a health care provider to monitor and manage a health condition of a patient. The system includes a health care provider apparatus operated by a health care provider and a remotely programmable patient apparatus that is operated by a patient…… The patient data may also include information supplied by a physiological monitoring device such as a blood glucose monitor that is connected to the remotely programmable patient apparatus.”). Brown at Abstract. This invention provides a new and useful system for healthcare maintenance in which the invention either serves as a peripheral device to (or incorporates) a small handheld microprocessor-based unit of the type that includes a display screen, buttons or keys that allow a user to control the operation of the device and a program cartridge or other arrangement that can be inserted in the device to adapt the device to a particular application or function. The invention in effect converts the handheld microprocessor device into a healthcare monitoring system that has significant advantages over systems such as the currently available blood glucose monitoring systems. To perform this conversion, the invention includes a microprocessor-based healthcare data management unit, a program cartridge and a monitoring unit. When inserted in the handheld microprocessor unit, the program cartridge provides the software necessary (program instructions) to program the handheld microprocessor unit for operation with the microprocessor-based data management unit. Signal communication between the data management unit and the handheld microprocessor unit is established by an interface cable. A second interface cable can be used to establish signal communication between the data management unit and the monitoring unit or, alternatively, the monitoring unit can be constructed as a plug-in unit having an electrical connector that mates with a connector mounted within a region that is configured for receiving the monitoring unit. Brown at 6:18-45 FIG. 1 depicts a self-care health monitoring system arranged in accordance with the invention. In the arrangement shown in FIG. 1, a data management unit 10 is electrically interconnected with a handheld microprocessor-based unit 12 via a cable 14. In the depicted arrangement, data management unit 10

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Brown
	also is electrically interconnected with a blood glucose monitor 16 of the type capable of sensing blood glucose level and producing an electrical signal representative thereof. Although FIG. 1 illustrates blood glucose monitor 16 as being connected to data management unit 10 by a cable 18, it may be preferable to construct blood glucose monitor 16 as a plug-in unit that is placed in a recess or other suitable opening or slot in data management unit 10. Regardless of the manner in which blood glucose monitor 16 is interconnected with data management unit 10, both that interconnection and cable 14 are configured for serial data communication between the interconnected devices. Brown at 11:22-39 As is indicated by monitor 22 of FIG. 1, various other devices can be provided for monitoring conditions such as blood pressure, pulse, and body temperature to thereby realize systems for self-care monitoring and control of conditions such as hypertension, certain heart conditions and various other afflictions and physical conditions. Brown at 11:51-57. FIGS. 4-10 illustrate typical screen displays that are generated by the arrangement of the invention described relative to FIGS. 1-3. Reference will first be made to FIGS. 4 and 5, which exemplify screen displays that are associated with operation of the invention in the blood glucose monitoring mode. Specifically, in the currently preferred embodiments of the invention, blood glucose monitor 16 operates in conjunction with data management unit 10 and handheld microprocessor unit 12 to: (a) perform a test or calibration sequence in which tests are performed to confirm that the system is operating properly; and, (b) perform the blood glucose test sequence in which blood glucose meter 16 senses the user's blood glucose level. Suitable calibration procedures for blood glucose monitors are known in the art. For example, blood glucose monitors often are supplied with a “code strip,” that is inserted in the monitor and results in a predetermined value being displayed and stored in memory at the conclusion of the code strip calibration procedure. When such a code strip calibration procedure is used in the practice of the invention, the procedure is selected from one of the system menus. For example, if the system main menu includes a “monitor” menu item, a submenu displaying system calibration options and an option for initiating the blood glucose test may be displayed when the monitor menu item is selected. When a code strip option is available and selected, a sequence of instructions is generated and displayed by display screen 28 of handheld microprocessor unit 12 to prompt the user to insert the code strip and perform all other required operations. At the conclusion of the code strip

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Brown
	calibration sequence, display unit 28 of handheld microprocessor unit 12 displays a message indicating whether or not the calibration procedure has been successfully completed. For example, FIG. 4 illustrates a screen display that informs the system user that the calibration procedure was not successful and that the code strip should be inserted again (i.e., the calibration procedure is to be repeated). As is indicated in FIG. 4, display screens that indicate a potential malfunction of the system include a prominent message such as the “Attention” notation included in the screen display of FIG. 4. Brown at 20:28-67 The patient monitoring device 328 illustrated in FIG. 32 is variously referred to above as the blood glucose monitor 16, peak flow meter 20, additional monitor 22 (FIG. 1), or monitoring device 2028 (FIG. 12). Brown at 36:5-8 *Fig. 5.*  Brown at Fig. 5. One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Brown, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Brown, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[a]. a light source comprising:	Brown discloses or renders obvious a diagnostic system comprises a light source.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Brown
	FIG. 1 depicts a self-care health monitoring system arranged in accordance with the invention. In the arrangement shown in FIG. 1, a data management unit 10 is electrically interconnected with a handheld microprocessor-based unit 12 via a cable 14. In the depicted arrangement, data management unit 10 also is electrically interconnected with a blood glucose monitor 16 of the type capable of sensing blood glucose level and producing an electrical signal representative thereof. Although FIG. 1 illustrates blood glucose monitor 16 as being connected to data management unit 10 by a cable 18, it may be preferable to construct blood glucose monitor 16 as a plug-in unit that is placed in a recess or other suitable opening or slot in data management unit 10. Regardless of the manner in which blood glucose monitor 16 is interconnected with data management unit 10, both that interconnection and cable 14 are configured for serial data communication between the interconnected devices. Brown at 11:22-39 As is indicated by monitor 22 of FIG. 1, various other devices can be provided for monitoring conditions such as blood pressure, pulse, and body temperature to thereby realize systems for self-care monitoring and control of conditions such as hypertension, certain heart conditions and various other afflictions and physical conditions. Brown at 11:51-57. FIGS. 4-10 illustrate typical screen displays that are generated by the arrangement of the invention described relative to FIGS. 1-3. Reference will first be made to FIGS. 4 and 5, which exemplify screen displays that are associated with operation of the invention in the blood glucose monitoring mode. Specifically, in the currently preferred embodiments of the invention, blood glucose monitor 16 operates in conjunction with data management unit 10 and handheld microprocessor unit 12 to: (a) perform a test or calibration sequence in which tests are performed to confirm that the system is operating properly; and, (b) perform the blood glucose test sequence in which blood glucose meter 16 senses the user's blood glucose level. Suitable calibration procedures for blood glucose monitors are known in the art. For example, blood glucose monitors often are supplied with a “code strip,” that is inserted in the monitor and results in a predetermined value being displayed and stored in memory at the conclusion of the code strip calibration procedure. When such a code strip calibration procedure is used in the practice of the invention, the procedure is selected from one of the system menus. For example, if the system main menu includes a “monitor” menu item, a submenu displaying system

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Brown
	calibration options and an option for initiating the blood glucose test may be displayed when the monitor menu item is selected. When a code strip option is available and selected, a sequence of instructions is generated and displayed by display screen 28 of handheld microprocessor unit 12 to prompt the user to insert the code strip and perform all other required operations. At the conclusion of the code strip calibration sequence, display unit 28 of handheld microprocessor unit 12 displays a message indicating whether or not the calibration procedure has been successfully completed. For example, FIG. 4 illustrates a screen display that informs the system user that the calibration procedure was not successful and that the code strip should be inserted again (i.e., the calibration procedure is to be repeated). As is indicated in FIG. 4, display screens that indicate a potential malfunction of the system include a prominent message such as the “Attention” notation included in the screen display of FIG. 4. Brown at 20:28-67 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Brown, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Brown, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[b]. one or more semiconductor diodes generating an input light beam; and	Brown discloses or renders obvious the light source comprises one or more semiconductor diodes generating an input light beam. FIG. 1 depicts a self-care health monitoring system arranged in accordance with the invention. In the arrangement shown in FIG. 1, a data management unit 10 is electrically interconnected with a handheld microprocessor-based unit 12 via a cable 14. In the depicted arrangement, data management unit 10 also is electrically interconnected with a blood glucose monitor 16 of the type capable of sensing blood glucose level and producing an electrical signal representative thereof. Although FIG. 1 illustrates blood glucose monitor 16 as being connected to data management unit 10 by a cable 18, it may be preferable to construct blood glucose monitor 16 as a plug-in unit that is placed in a recess or other suitable opening or slot in data management unit 10. Regardless of the manner in which blood glucose monitor 16 is interconnected with data management unit 10, both that interconnection and cable 14 are configured for serial data communication between the interconnected devices.

’868 Patent	Brown
	Brown at 11:22-39 As is indicated by monitor 22 of FIG. 1, various other devices can be provided for monitoring conditions such as blood pressure, pulse, and body temperature to thereby realize systems for self-care monitoring and control of conditions such as hypertension, certain heart conditions and various other afflictions and physical conditions. Brown at 11:51-57. FIGS. 4-10 illustrate typical screen displays that are generated by the arrangement of the invention described relative to FIGS. 1-3. Reference will first be made to FIGS. 4 and 5, which exemplify screen displays that are associated with operation of the invention in the blood glucose monitoring mode. Specifically, in the currently preferred embodiments of the invention, blood glucose monitor 16 operates in conjunction with data management unit 10 and handheld microprocessor unit 12 to: (a) perform a test or calibration sequence in which tests are performed to confirm that the system is operating properly; and, (b) perform the blood glucose test sequence in which blood glucose meter 16 senses the user's blood glucose level. Suitable calibration procedures for blood glucose monitors are known in the art. For example, blood glucose monitors often are supplied with a “code strip,” that is inserted in the monitor and results in a predetermined value being displayed and stored in memory at the conclusion of the code strip calibration procedure. When such a code strip calibration procedure is used in the practice of the invention, the procedure is selected from one of the system menus. For example, if the system main menu includes a “monitor” menu item, a submenu displaying system calibration options and an option for initiating the blood glucose test may be displayed when the monitor menu item is selected. When a code strip option is available and selected, a sequence of instructions is generated and displayed by display screen 28 of handheld microprocessor unit 12 to prompt the user to insert the code strip and perform all other required operations. At the conclusion of the code strip calibration sequence, display unit 28 of handheld microprocessor unit 12 displays a message indicating whether or not the calibration procedure has been successfully completed. For example, FIG. 4 illustrates a screen display that informs the system user that the calibration procedure was not successful and that the code strip should be inserted again (i.e., the calibration procedure is to be repeated). As is indicated in FIG. 4, display screens that indicate a potential malfunction of the system include a prominent message such as the “Attention” notation included in the screen display of FIG. 4. Brown at 20:28-67

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Brown
	One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Brown, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Brown, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[c]. a lens system configured to receive at least a portion of the input light beam and to communicate at least the portion of the input light beam onto a part of a user's body comprising blood	Brown discloses or renders obvious the light source comprises a lens system configured to receive at least a portion of the input light beam and to communicate at least the portion of the input light beam onto a part of a user's body comprising blood. FIG. 1 depicts a self-care health monitoring system arranged in accordance with the invention. In the arrangement shown in FIG. 1, a data management unit 10 is electrically interconnected with a handheld microprocessor-based unit 12 via a cable 14. In the depicted arrangement, data management unit 10 also is electrically interconnected with a blood glucose monitor 16 of the type capable of sensing blood glucose level and producing an electrical signal representative thereof. Although FIG. 1 illustrates blood glucose monitor 16 as being connected to data management unit 10 by a cable 18, it may be preferable to construct blood glucose monitor 16 as a plug-in unit that is placed in a recess or other suitable opening or slot in data management unit 10. Regardless of the manner in which blood glucose monitor 16 is interconnected with data management unit 10, both that interconnection and cable 14 are configured for serial data communication between the interconnected devices. Brown at 11:22-39 As is indicated by monitor 22 of FIG. 1, various other devices can be provided for monitoring conditions such as blood pressure, pulse, and body temperature to thereby realize systems for self-care monitoring and control of conditions such as hypertension, certain heart conditions and various other afflictions and physical conditions. Brown at 11:51-57. FIGS. 4-10 illustrate typical screen displays that are generated by the arrangement of the invention described relative to FIGS. 1-3. Reference will first be made to FIGS. 4 and 5, which exemplify screen

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Brown
	displays that are associated with operation of the invention in the blood glucose monitoring mode. Specifically, in the currently preferred embodiments of the invention, blood glucose monitor 16 operates in conjunction with data management unit 10 and handheld microprocessor unit 12 to: (a) perform a test or calibration sequence in which tests are performed to confirm that the system is operating properly; and, (b) perform the blood glucose test sequence in which blood glucose meter 16 senses the user's blood glucose level. Suitable calibration procedures for blood glucose monitors are known in the art. For example, blood glucose monitors often are supplied with a “code strip,” that is inserted in the monitor and results in a predetermined value being displayed and stored in memory at the conclusion of the code strip calibration procedure. When such a code strip calibration procedure is used in the practice of the invention, the procedure is selected from one of the system menus. For example, if the system main menu includes a “monitor” menu item, a submenu displaying system calibration options and an option for initiating the blood glucose test may be displayed when the monitor menu item is selected. When a code strip option is available and selected, a sequence of instructions is generated and displayed by display screen 28 of handheld microprocessor unit 12 to prompt the user to insert the code strip and perform all other required operations. At the conclusion of the code strip calibration sequence, display unit 28 of handheld microprocessor unit 12 displays a message indicating whether or not the calibration procedure has been successfully completed. For example, FIG. 4 illustrates a screen display that informs the system user that the calibration procedure was not successful and that the code strip should be inserted again (i.e., the calibration procedure is to be repeated). As is indicated in FIG. 4, display screens that indicate a potential malfunction of the system include a prominent message such as the “Attention” notation included in the screen display of FIG. 4. Brown at 20:28-67 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Brown, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Brown, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[d]. wherein at least the portion of the input light	Brown discloses or renders obvious the portion of the input light beam is used in a measurement on a user.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Brown
beam is used in a measurement on a user;	FIG. 1 depicts a self-care health monitoring system arranged in accordance with the invention. In the arrangement shown in FIG. 1, a data management unit 10 is electrically interconnected with a handheld microprocessor-based unit 12 via a cable 14. In the depicted arrangement, data management unit 10 also is electrically interconnected with a blood glucose monitor 16 of the type capable of sensing blood glucose level and producing an electrical signal representative thereof. Although FIG. 1 illustrates blood glucose monitor 16 as being connected to data management unit 10 by a cable 18, it may be preferable to construct blood glucose monitor 16 as a plug-in unit that is placed in a recess or other suitable opening or slot in data management unit 10. Regardless of the manner in which blood glucose monitor 16 is interconnected with data management unit 10, both that interconnection and cable 14 are configured for serial data communication between the interconnected devices. Brown at 11:22-39 As is indicated by monitor 22 of FIG. 1, various other devices can be provided for monitoring conditions such as blood pressure, pulse, and body temperature to thereby realize systems for self-care monitoring and control of conditions such as hypertension, certain heart conditions and various other afflictions and physical conditions. Brown at 11:51-57. FIGS. 4-10 illustrate typical screen displays that are generated by the arrangement of the invention described relative to FIGS. 1-3. Reference will first be made to FIGS. 4 and 5, which exemplify screen displays that are associated with operation of the invention in the blood glucose monitoring mode. Specifically, in the currently preferred embodiments of the invention, blood glucose monitor 16 operates in conjunction with data management unit 10 and handheld microprocessor unit 12 to: (a) perform a test or calibration sequence in which tests are performed to confirm that the system is operating properly; and, (b) perform the blood glucose test sequence in which blood glucose meter 16 senses the user's blood glucose level. Suitable calibration procedures for blood glucose monitors are known in the art. For example, blood glucose monitors often are supplied with a “code strip,” that is inserted in the monitor and results in a predetermined value being displayed and stored in memory at the conclusion of the code strip calibration procedure. When such a code strip calibration procedure is used in the practice of the invention, the procedure is selected from one of the system menus. For example, if the system main menu includes a “monitor” menu item, a submenu displaying system calibration options and an option for initiating the blood glucose test may be displayed when the monitor

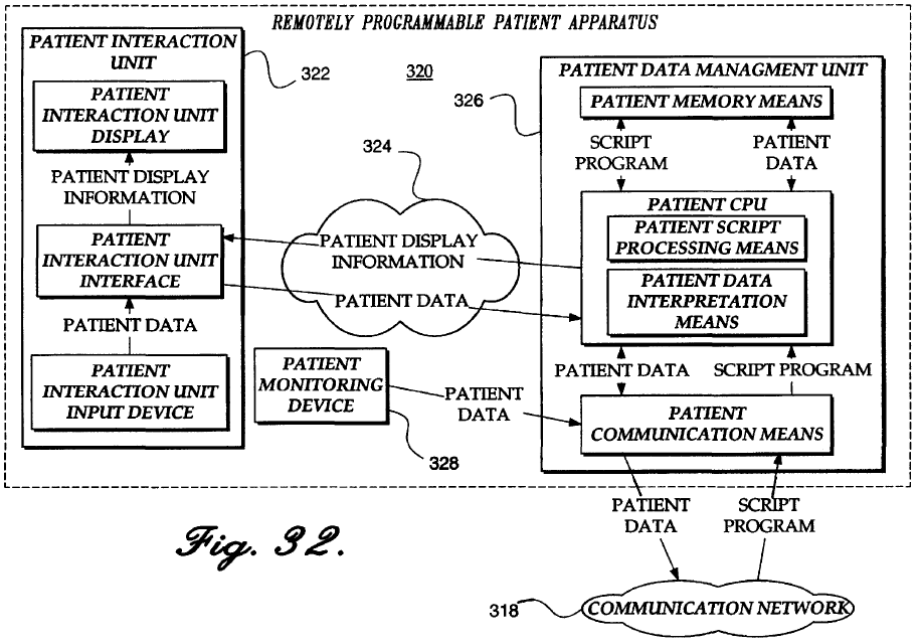
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Brown
	menu item is selected. When a code strip option is available and selected, a sequence of instructions is generated and displayed by display screen 28 of handheld microprocessor unit 12 to prompt the user to insert the code strip and perform all other required operations. At the conclusion of the code strip calibration sequence, display unit 28 of handheld microprocessor unit 12 displays a message indicating whether or not the calibration procedure has been successfully completed. For example, FIG. 4 illustrates a screen display that informs the system user that the calibration procedure was not successful and that the code strip should be inserted again (i.e., the calibration procedure is to be repeated). As is indicated in FIG. 4, display screens that indicate a potential malfunction of the system include a prominent message such as the “Attention” notation included in the screen display of FIG. 4. Brown at 20:28-67 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Brown, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Brown, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[e]. a software application capable of generating data based at least in part on the measurement on the user,	Brown discloses or renders obvious a software application capable of generating data based at least in part on the measurement on the user. A system and method is described that enables a health care provider to monitor and manage a health condition of a patient. The system includes a health care provider apparatus operated by a health care provider and a remotely programmable patient apparatus that is operated by a patient. The health care provider develops a script program using the health care provider apparatus and then sends the script program to a remotely programmable patient apparatus through a communication network such as the World Wide Web. The script program is a computer-executable patient protocol that provides information to the patient about the patient's health condition and that interactively monitors the patient health condition by asking the patient questions and by receiving answers to those questions. The answers to these health related questions are then forwarded as patient data from the remotely programmable patient apparatus to the health care provider apparatus through the communication network. The patient data may also include information supplied by a physiological monitoring device such as a blood glucose monitor that is connected to the remotely programmable patient apparatus.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

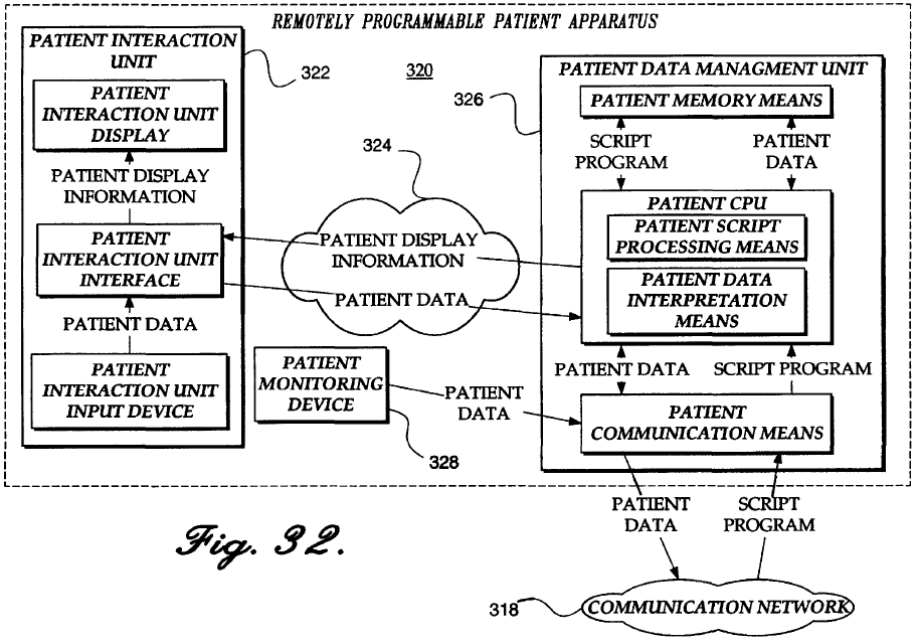
’868 Patent	Brown
	When the patient data arrives at the health care provider apparatus, the patient data is processed for further management of the patient's health condition by the health care provider, such as forwarding another script program to the remotely programmable patient apparatus. Brown at Abstract. In FIG. 32, the Remotely Programmable Patient Apparatus 320 comprises a Patient Interaction Unit 322, which is connected through a patient communication network 324 to a Patient Data Management Unit 326. In the detailed description above, the Remotely Programmable Patient Apparatus 320 is sometimes referred to as an individual self-care health monitoring system 58 (FIG. 2). The Patient Interaction Unit 322 is variously described as handheld microprocessor unit 12 (FIG. 1), a commercially available compact video game system (such as the system manufactured by Nintendo of America Inc. under the trademark “GAME BOY”) (see e.g., FIG. 1), a game console 102 (FIG. 11), a palm-top computer, or a remote apparatus 2026, 2032 (FIGS. 12 and 14). The Patient Data Management Unit 326 is alternatively described above as being a part of the remote apparatus 2026, 2032 (FIGS. 12 and 14) or as being a separate data management unit 10 (FIG. 1). The patient communication network 324 is sometimes referred to above as a cable 14 and may also be a wire or other signal communication medium, as would be apparent to those skilled in the art. The Remotely Programmable Patient Apparatus 320 is also coupled to the communication network 318. The patient monitoring device 328 illustrated in FIG. 32 is variously referred to above as the blood glucose monitor 16, peak flow meter 20, additional monitor 22 (FIG. 1), or monitoring device 2028 (FIG. 12). Brown at 35:50-36:8 8. The method of claim 7, wherein the health care provider data management unit further comprises a patient data interpretation means for interpreting the patient data. Brown at cl. 8

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Brown
	 *Fig. 32.* Brown at Fig. 32. One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Brown, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Brown, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[f]. wherein the data represents at least in part physiological information associated with the user;	Brown discloses or renders obvious the data represents at least in part physiological information associated with the user. A system and method is described that enables a health care provider to monitor and manage a health condition of a patient. The system includes a health care provider apparatus operated by a health care provider and a remotely programmable patient apparatus that is operated by a patient. The health care

’868 Patent	Brown
	provider develops a script program using the health care provider apparatus and then sends the script program to a remotely programmable patient apparatus through a communication network such as the World Wide Web. The script program is a computer-executable patient protocol that provides information to the patient about the patient's health condition and that interactively monitors the patient health condition by asking the patient questions and by receiving answers to those questions. The answers to these health related questions are then forwarded as patient data from the remotely programmable patient apparatus to the health care provider apparatus through the communication network. The patient data may also include information supplied by a physiological monitoring device such as a blood glucose monitor that is connected to the remotely programmable patient apparatus. When the patient data arrives at the health care provider apparatus, the patient data is processed for further management of the patient's health condition by the health care provider, such as forwarding another script program to the remotely programmable patient apparatus. Brown at Abstract. In FIG. 32, the Remotely Programmable Patient Apparatus 320 comprises a Patient Interaction Unit 322, which is connected through a patient communication network 324 to a Patient Data Management Unit 326. In the detailed description above, the Remotely Programmable Patient Apparatus 320 is sometimes referred to as an individual self-care health monitoring system 58 (FIG. 2). The Patient Interaction Unit 322 is variously described as handheld microprocessor unit 12 (FIG. 1), a commercially available compact video game system (such as the system manufactured by Nintendo of America Inc. under the trademark “GAME BOY”) (see e.g., FIG. 1), a game console 102 (FIG. 11), a palm-top computer, or a remote apparatus 2026, 2032 (FIGS. 12 and 14). The Patient Data Management Unit 326 is alternatively described above as being a part of the remote apparatus 2026, 2032 (FIGS. 12 and 14) or as being a separate data management unit 10 (FIG. 1). The patient communication network 324 is sometimes referred to above as a cable 14 and may also be a wire or other signal communication medium, as would be apparent to those skilled in the art. The Remotely Programmable Patient Apparatus 320 is also coupled to the communication network 318. The patient monitoring device 328 illustrated in FIG. 32 is variously referred to above as the blood glucose monitor 16, peak flow meter 20, additional monitor 22 (FIG. 1), or monitoring device 2028 (FIG. 12). Brown at 35:50-36:8

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

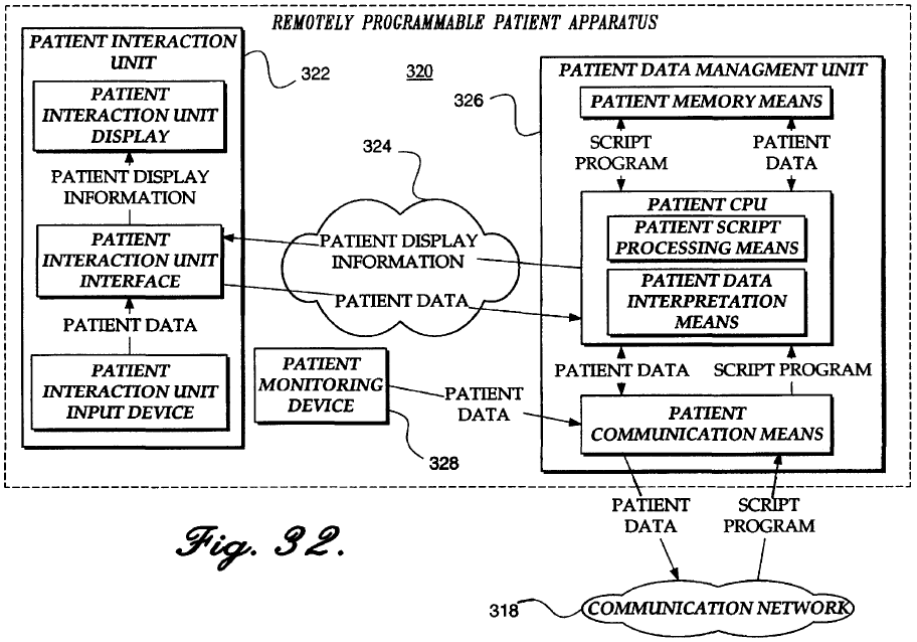
’868 Patent	Brown
	8. The method of claim 7, wherein the health care provider data management unit further comprises a patient data interpretation means for interpreting the patient data. Brown at cl. 8  Fig. 32. Brown at Fig. 32. One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Brown, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Brown, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.

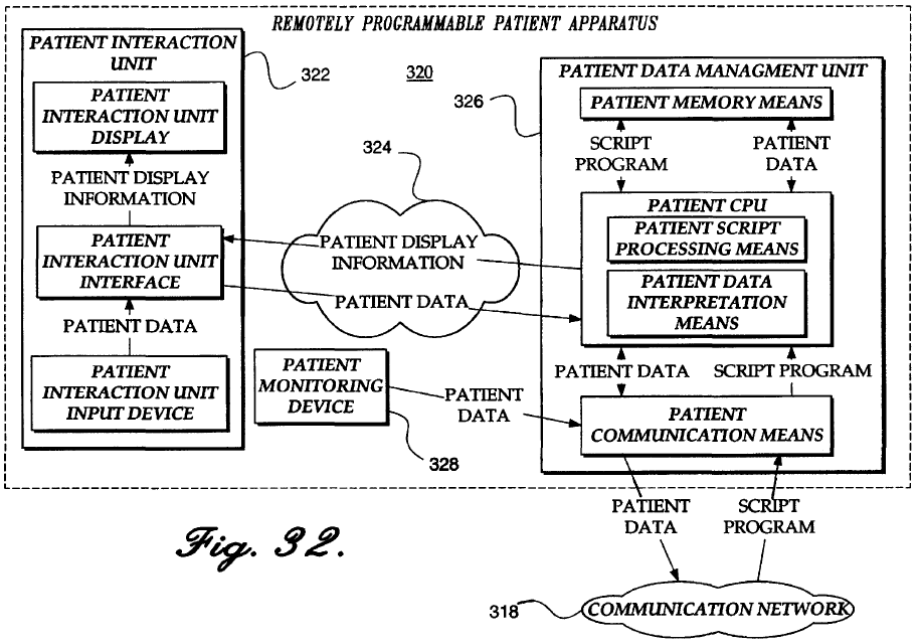
’868 Patent	Brown
7[g]. the software application capable of operating on a control system adapted to receive, store and process at least a portion of the physiological information,	Brown discloses or renders obvious the software application capable of operating on a control system adapted to receive, store and process at least a portion of the physiological information. The invention also includes provision for data analysis and memory storage of information provided by the user and/or the healthcare professional. In particular, the data management units of the currently preferred embodiments of the invention include a data port such as an RS-232 connection that allows the system user or healthcare professional to establish signal communication between the data management unit and a personal computer or other data processing arrangement. Blood glucose test data or other information can then be downloaded for analysis and record keeping purposes. Alternatively, information such as changes in the user's treatment and monitoring regimen can be entered into system memory. Brown at 7:59-8:4 In other situations, the functions and operations associated with processing of the monitored health care data may be performed by a microprocessor that is added to or already present in the monitoring device that is used to monitor blood glucose or other condition. Brown at 8:46-50 In the preferred embodiment, the user interface includes a display for displaying the queries and user input buttons for entering the responses to the queries. In an alternative embodiment, the user interface includes a speech synthesizer for audibly communicating the queries and a speech recognizer for receiving spoken responses to the queries. Brown at 9:47-52 System 2016 also includes first and second remotely programmable apparatuses 2026 and 2032 for monitoring first and second patients, respectively. Each apparatus is designed to interact with a patient in accordance with script programs received from server 2018. Each apparatus is in communication with server 2018 through communication network 2024, preferably the Internet. Alternatively, each apparatus may be placed in communication with server 2018 via wireless communication networks, cellular networks, telephone networks, or any other network which allows each apparatus to exchange data with

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Brown
	server 2018. For clarity of illustration, only two apparatuses are shown in FIG. 12. It is to be understood that system 2016 may include any number of apparatuses for monitoring any number of patients. Brown at 25:12-25 FIG. 13 shows server 2018, workstation 2020, and apparatus 2026 in greater detail. Server 2018 includes a database 2038 for storing script programs 2040. The script programs are executed by each apparatus to communicate queries and messages to a patient, receive responses 2042 to the queries, collect monitoring device measurements 2044, and transmit responses 2042 and measurements 2044 to server 2018. Brown at 25:43-49 Four user input buttons 2070A, 2070B, 2070C, and 2070D are located adjacent display 2064. The user input buttons are for entering in apparatus 2026 responses to the queries and prompts. In the preferred embodiment, the user input buttons are momentary contact push buttons. In alternative embodiments, the user input buttons may be replaced by switches, keys, a touch sensitive display screen, or any other data input device. Brown at 26:1-8 Referring again to FIG. 13, server 2018 includes a monitoring application 2048. Monitoring application 2048 is a controlling software application executed by server 2018 to perform the various functions described below. Brown at 27:11-14 2. The method of claim 1, wherein the patient interaction unit is a palm-top computer, the display means being provided by a display screen of the palm top computer, and the patient interaction unit input device is a palm-top computer input device such as a touch screen. Brown at Claim 2

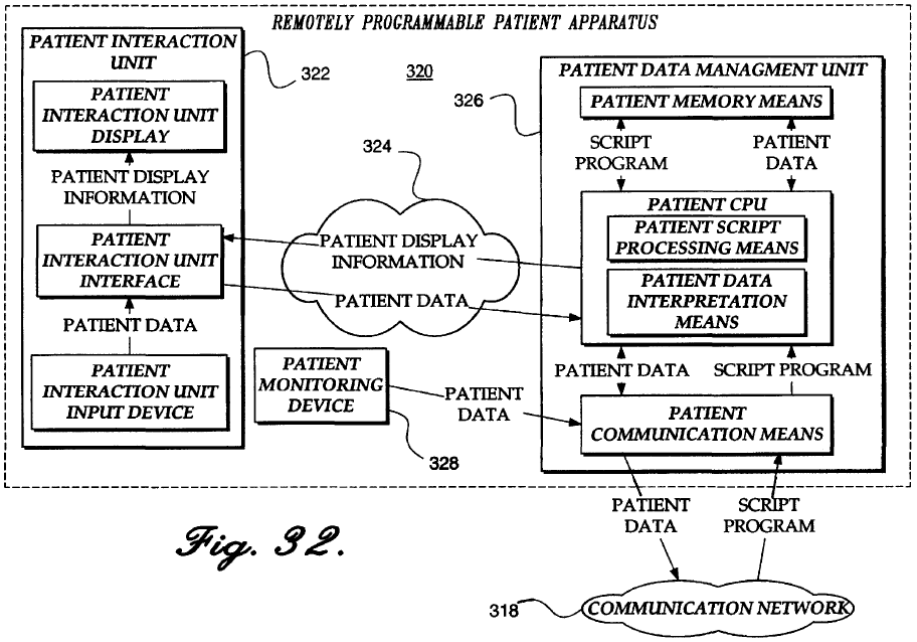
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Brown
	 *Fig. 32.* Brown at Fig. 32 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Brown, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Brown, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[h]. the control system having a touch-screen, circuitry for obtaining position information from a location sensor, and	Brown discloses or renders obvious the control system having a touch-screen, circuitry for obtaining position information from a location sensor. Four user input buttons 2070A, 2070B, 2070C, and 2070D are located adjacent display 2064. The user input buttons are for entering in apparatus 2026 responses to the queries and prompts. In the preferred embodiment, the user input buttons are momentary contact push buttons. In alternative embodiments,

’868 Patent	Brown
	the user input buttons may be replaced by switches, keys, a touch sensitive display screen, or any other data input device. Brown at 26:1-8 2. The method of claim 1, wherein the patient interaction unit is a palm-top computer, the display means being provided by a display screen of the palm top computer, and the patient interaction unit input device is a palm-top computer input device such as a touch screen. Brown at Claim 2  *Fig. 32.* Brown at Fig. 32 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of

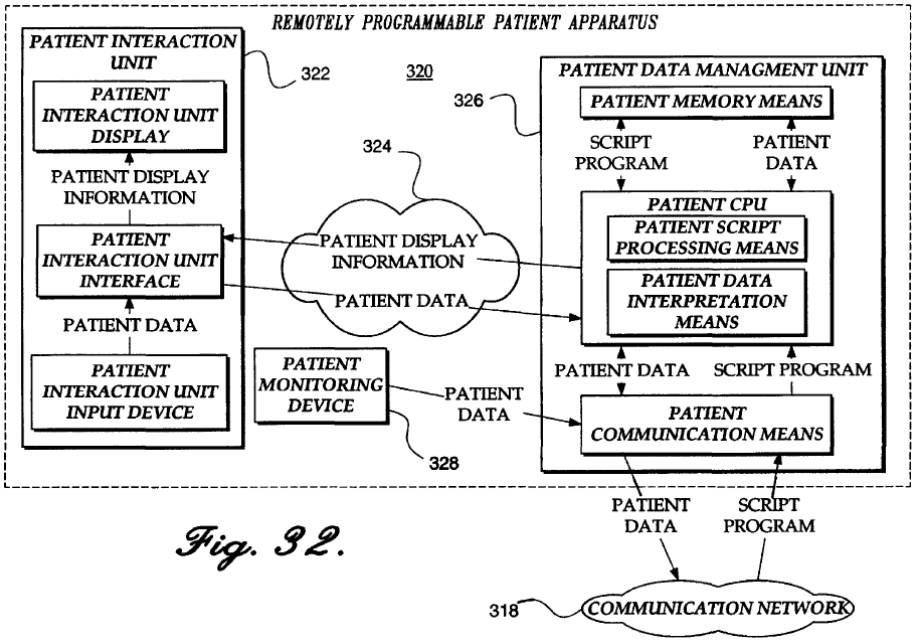
’868 Patent	Brown
	the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Brown, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Brown, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[i]. a wireless transceiver to transmit wireless data over a wireless link,	Brown discloses or renders obvious a wireless transceiver to transmit wireless data over a wireless link. System 2016 also includes first and second remotely programmable apparatuses 2026 and 2032 for monitoring first and second patients, respectively. Each apparatus is designed to interact with a patient in accordance with script programs received from server 2018. Each apparatus is in communication with server 2018 through communication network 2024, preferably the Internet. Alternatively, each apparatus may be placed in communication with server 2018 via wireless communication networks, cellular networks, telephone networks, or any other network which allows each apparatus to exchange data with server 2018. For clarity of illustration, only two apparatuses are shown in FIG. 12. It is to be understood that system 2016 may include any number of apparatuses for monitoring any number of patients. Brown at 25:12-25

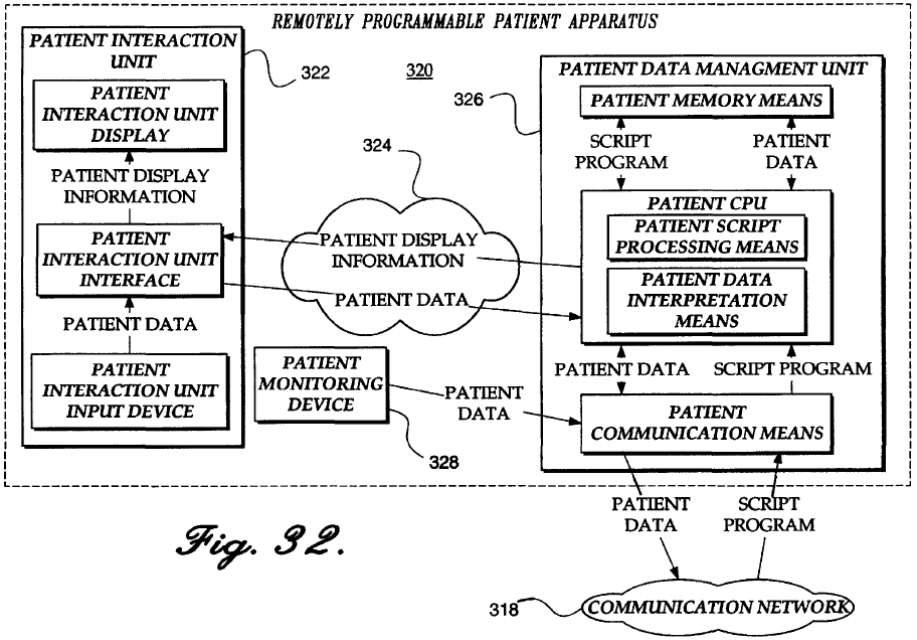
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Brown
	 *Fig. 32.* Brown at Fig. 32 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Brown, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Brown, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[j]. the wireless data comprising at least a part of the physiological information,	Brown discloses or renders obvious the wireless data comprising at least a part of the physiological information. The invention also includes provision for data analysis and memory storage of information provided by the user and/or the healthcare professional. In particular, the data management units of the currently preferred embodiments of the invention include a data port such as an RS-232 connection that allows the

’868 Patent	Brown
	system user or healthcare professional to establish signal communication between the data management unit and a personal computer or other data processing arrangement. Blood glucose test data or other information can then be downloaded for analysis and record keeping purposes. Alternatively, information such as changes in the user's treatment and monitoring regimen can be entered into system memory. Brown at 7:59-8:4 System 2016 also includes first and second remotely programmable apparatuses 2026 and 2032 for monitoring first and second patients, respectively. Each apparatus is designed to interact with a patient in accordance with script programs received from server 2018. Each apparatus is in communication with server 2018 through communication network 2024, preferably the Internet. Alternatively, each apparatus may be placed in communication with server 2018 via wireless communication networks, cellular networks, telephone networks, or any other network which allows each apparatus to exchange data with server 2018. For clarity of illustration, only two apparatuses are shown in FIG. 12. It is to be understood that system 2016 may include any number of apparatuses for monitoring any number of patients. Brown at 25:12-25

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

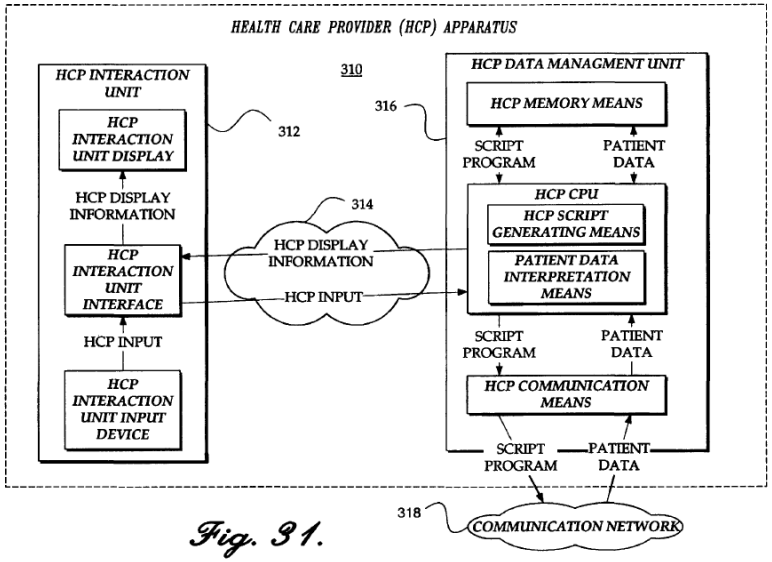
’868 Patent	Brown
	 *Fig. 32.* Brown at Fig. 32 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Brown, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Brown, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[k]. wherein the control system is further capable of receiving voice input signals and manually entered input signals; and	Brown discloses or renders obvious the control system is further capable of receiving voice input signals and manually entered input signals. In the preferred embodiment, the user interface includes a display for displaying the queries and user input buttons for entering the responses to the queries. In an alternative embodiment, the user interface

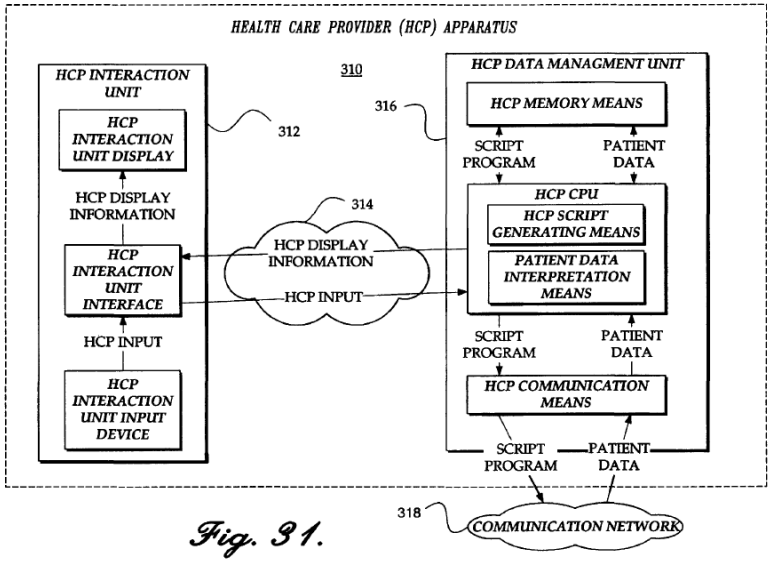
’868 Patent	Brown
	includes a speech synthesizer for audibly communicating the queries and a speech recognizer for receiving spoken responses to the queries. Brown at 9:47-52  *Fig. 32.* Brown at Fig. 32 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Brown, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Brown, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[l]. a host comprising:	Brown discloses or renders obvious the diagnostic system comprises a host.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Brown
	FIG. 13 shows server 2018, workstation 2020, and apparatus 2026 in greater detail. Server 2018 includes a database 2038 for storing script programs 2040. The script programs are executed by each apparatus to communicate queries and messages to a patient, receive responses 2042 to the queries, collect monitoring device measurements 2044, and transmit responses 2042 and measurements 2044 to server 2018. Brown at 25:43-49 Referring again to FIG. 13, server 2018 includes a monitoring application 2048. Monitoring application 2048 is a controlling software application executed by server 2018 to perform the various functions described below. Brown at 27:11-14 The HCP Data Management Unit 316 is alternatively described above as a clearinghouse 54 (FIGS. 1-2) or a server 2018 (FIG. 12), which is described as a stand-alone personal computer or a network of computers. Brown at 35:36-40

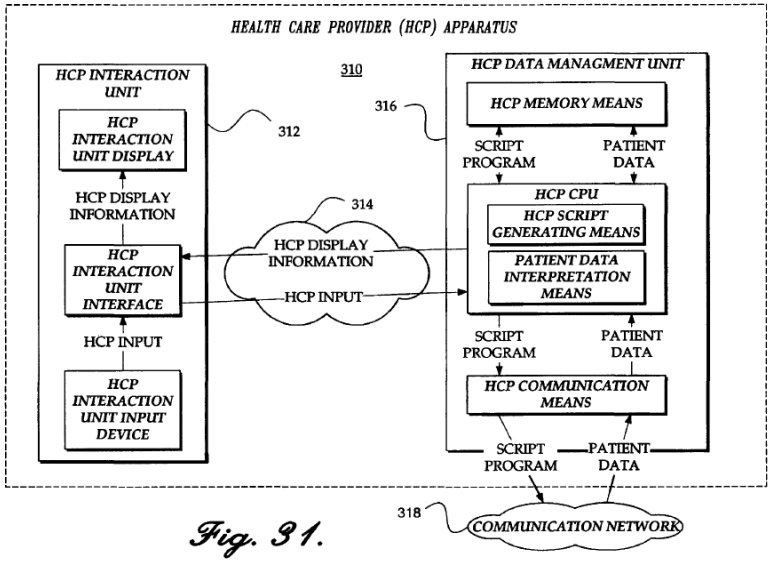
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Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

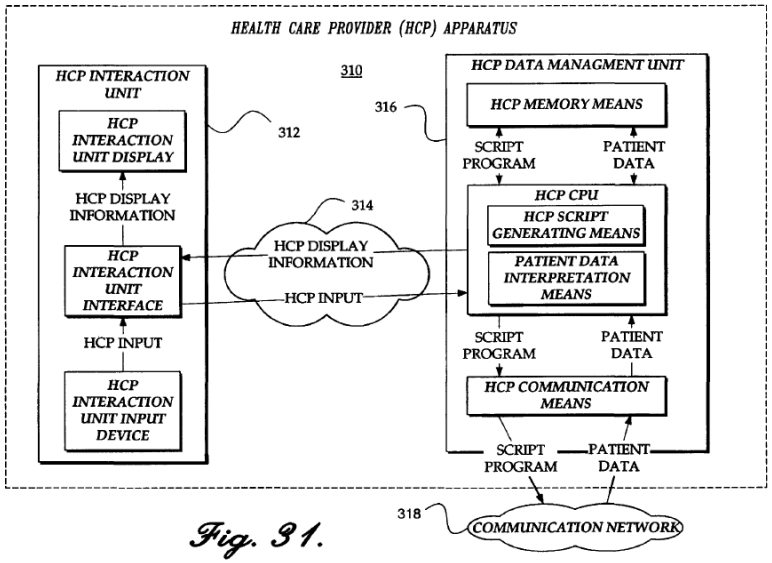
’868 Patent	Brown
	 Fig. 31. Brown at Fig. 31 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Brown, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Brown, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[m]. a digital file for receiving and storing at least a portion of the wireless data;	Brown discloses or renders obvious the host comprises a digital file for receiving and storing at least a portion of the wireless data. Each apparatus is designed to interact with a patient in accordance with script programs received from server 2018. Each apparatus is in communication with server 2018 through communication network 2024, preferably the Internet. Alternatively, each apparatus may be placed in communication with server 2018 via wireless communication networks, cellular networks, telephone networks, or any other network which allows each apparatus to exchange data with server 2018. For clarity of illustration, only two

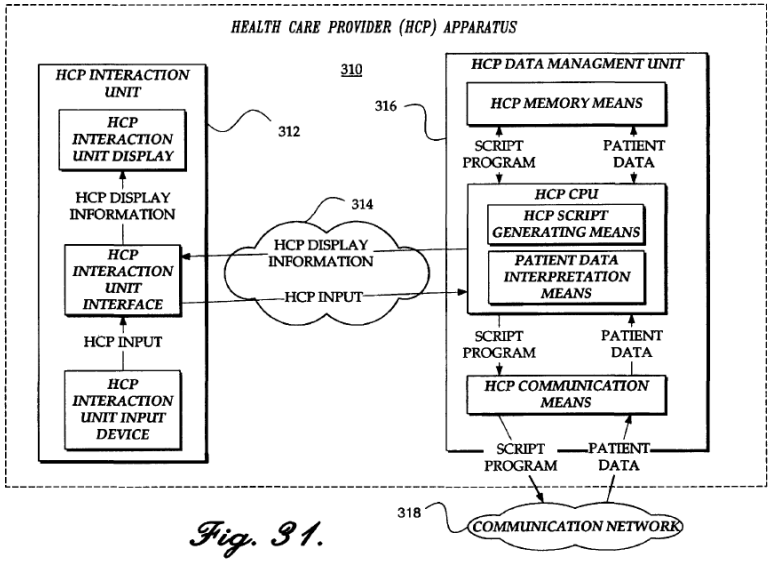
’868 Patent	Brown
	apparatuses are shown in FIG. 12. It is to be understood that system 2016 may include any number of apparatuses for monitoring any number of patients. Brown at 25:14-25 FIG. 13 shows server 2018, workstation 2020, and apparatus 2026 in greater detail. Server 2018 includes a database 2038 for storing script programs 2040. The script programs are executed by each apparatus to communicate queries and messages to a patient, receive responses 2042 to the queries, collect monitoring device measurements 2044, and transmit responses 2042 and measurements 2044 to server 2018. Database 2038 is designed to store the responses 2042 and measurements 2044. Brown at 25:42-51  Fig. 31. Brown at Fig. 31 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references

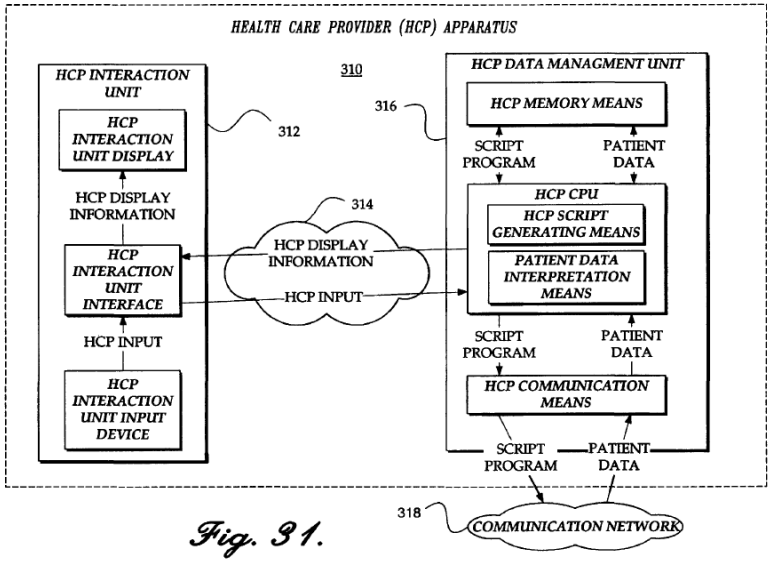
’868 Patent	Brown
	identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Brown, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Brown, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[n]. control logic at the host to process at least the portion of the wireless data to generate a status of the user;	Brown discloses or renders obvious the host comprises control logic at the host to process at least the portion of the wireless data to generate a status of the user. System 2016 also includes first and second remotely programmable apparatuses 2026 and 2032 for monitoring first and second patients, respectively. Each apparatus is designed to interact with a patient in accordance with script programs received from server 2018. Each apparatus is in communication with server 2018 through communication network 2024, preferably the Internet. Alternatively, each apparatus may be placed in communication with server 2018 via wireless communication networks, cellular networks, telephone networks, or any other network which allows each apparatus to exchange data with server 2018. For clarity of illustration, only two apparatuses are shown in FIG. 12. It is to be understood that system 2016 may include any number of apparatuses for monitoring any number of patients. Brown at 25:12-25 8. The method of claim 7, wherein the health care provider data management unit further comprises a patient data interpretation means for interpreting the patient data. Brown at Claim 8

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Brown
	 *Fig. 31.* Brown at Fig. 31 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Brown, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Brown, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[o]. a memory storage device for recording the status; and	Brown discloses or renders obvious the host comprises a memory storage device for recording the status. The server also preferably includes a report generator connected to the database for generating a report of the measurements and responses. The report is displayed on the remote interface. Brown at 10:2-5 FIG. 13 shows server 2018, workstation 2020, and apparatus 2026 in greater detail. Server 2018 includes a database 2038 for storing script programs 2040. The script programs are executed by each

’868 Patent	Brown
	apparatus to communicate queries and messages to a patient, receive responses 2042 to the queries, collect monitoring device measurements 2044, and transmit responses 2042 and measurements 2044 to server 2018. Database 2038 is designed to store the responses 2042 and measurements 2044. Brown at 25:42-51  Fig. 31. Brown at Fig. 31 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Brown, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Brown, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[p]. an output for communicating at least a portion of the status or	Brown discloses or renders obvious the host comprises an output for communicating at least a portion of the status or associated information over a communication link to one or more display output devices, wherein the one or more display output devices are located remotely from the host.

’868 Patent	Brown
associated information over a communication link to one or more display output devices,	The server also preferably includes a report generator connected to the database for generating a report of the measurements and responses. The report is displayed on the remote interface. Brown at 10:2-5 … A). a health care provider interaction unit display that is controlled by a health care provider interaction unit interface, the health care provider interaction unit interface accepting a health care provider display information and rendering the health care provider display information for display on the health care provider interaction unit display; … Brown at Claim 1  Fig. 31. Brown at Fig. 31 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references

’868 Patent	Brown
	identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Brown, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Brown, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[q]. wherein the one or more display output devices are located remotely from the host.	Brown discloses or renders obvious the one or more display output devices are located remotely from the host. The server also preferably includes a report generator connected to the database for generating a report of the measurements and responses. The report is displayed on the remote interface. Brown at 10:2-5 … A). a health care provider interaction unit display that is controlled by a health care provider interaction unit interface, the health care provider interaction unit interface accepting a health care provider display information and rendering the health care provider display information for display on the health care provider interaction unit display; … Brown at Claim 1  Fig. 31.

’868 Patent	Brown
	Brown at Fig. 31 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Brown, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Brown, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
Claim 8	
8. The diagnostic system of claim 7, wherein the light source comprises a plurality of semiconductor diodes that are further coupled to a multiplexer capable of combining the plurality of semiconductor diodes and generating the input light beam comprising one or more wavelengths.	*See* claim 7 above. Brown discloses or renders obvious the light source comprises a plurality of semiconductor diodes that are further coupled to a multiplexer capable of combining the plurality of semiconductor diodes and generating the input light beam comprising one or more wavelengths. FIG. 1 depicts a self-care health monitoring system arranged in accordance with the invention. In the arrangement shown in FIG. 1, a data management unit 10 is electrically interconnected with a handheld microprocessor-based unit 12 via a cable 14. In the depicted arrangement, data management unit 10 also is electrically interconnected with a blood glucose monitor 16 of the type capable of sensing blood glucose level and producing an electrical signal representative thereof. Although FIG. 1 illustrates blood glucose monitor 16 as being connected to data management unit 10 by a cable 18, it may be preferable to construct blood glucose monitor 16 as a plug-in unit that is placed in a recess or other suitable opening or slot in data management unit 10. Regardless of the manner in which blood glucose monitor 16 is interconnected with data management unit 10, both that interconnection and cable 14 are configured for serial data communication between the interconnected devices. Brown at 11:22-39 As is indicated by monitor 22 of FIG. 1, various other devices can be provided for monitoring conditions such as blood pressure, pulse, and body temperature to thereby realize systems for self-care monitoring and control of conditions such as hypertension, certain heart conditions and various other afflictions and physical conditions.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Brown
	Brown at 11:51-57. FIGS. 4-10 illustrate typical screen displays that are generated by the arrangement of the invention described relative to FIGS. 1-3. Reference will first be made to FIGS. 4 and 5, which exemplify screen displays that are associated with operation of the invention in the blood glucose monitoring mode. Specifically, in the currently preferred embodiments of the invention, blood glucose monitor 16 operates in conjunction with data management unit 10 and handheld microprocessor unit 12 to: (a) perform a test or calibration sequence in which tests are performed to confirm that the system is operating properly; and, (b) perform the blood glucose test sequence in which blood glucose meter 16 senses the user's blood glucose level. Suitable calibration procedures for blood glucose monitors are known in the art. For example, blood glucose monitors often are supplied with a “code strip,” that is inserted in the monitor and results in a predetermined value being displayed and stored in memory at the conclusion of the code strip calibration procedure. When such a code strip calibration procedure is used in the practice of the invention, the procedure is selected from one of the system menus. For example, if the system main menu includes a “monitor” menu item, a submenu displaying system calibration options and an option for initiating the blood glucose test may be displayed when the monitor menu item is selected. When a code strip option is available and selected, a sequence of instructions is generated and displayed by display screen 28 of handheld microprocessor unit 12 to prompt the user to insert the code strip and perform all other required operations. At the conclusion of the code strip calibration sequence, display unit 28 of handheld microprocessor unit 12 displays a message indicating whether or not the calibration procedure has been successfully completed. For example, FIG. 4 illustrates a screen display that informs the system user that the calibration procedure was not successful and that the code strip should be inserted again (i.e., the calibration procedure is to be repeated). As is indicated in FIG. 4, display screens that indicate a potential malfunction of the system include a prominent message such as the “Attention” notation included in the screen display of FIG. 4. Brown at 20:28-67 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Brown, it would

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Brown
	have been obvious to one of ordinary skill in the art to combine, with the teachings of Brown, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
Claim 9	
9. The diagnostic system of claim 7, wherein at least the portion of the input light beam is adapted for use in a diagnostics to measure a property of the blood, wherein the diagnostics comprise a spectroscopic procedure, wherein the spectroscopic procedure is based at least in part on a comparison of amplitudes at a plurality of associated wavelengths transmitted or reflected from the blood.	*See* claim 7 above. Brown discloses or renders obvious the portion of the input light beam is adapted for use in a diagnostics to measure a property of the blood, wherein the diagnostics comprise a spectroscopic procedure, wherein the spectroscopic procedure is based at least in part on a comparison of amplitudes at a plurality of associated wavelengths transmitted or reflected from the blood. FIG. 1 depicts a self-care health monitoring system arranged in accordance with the invention. In the arrangement shown in FIG. 1, a data management unit 10 is electrically interconnected with a handheld microprocessor-based unit 12 via a cable 14. In the depicted arrangement, data management unit 10 also is electrically interconnected with a blood glucose monitor 16 of the type capable of sensing blood glucose level and producing an electrical signal representative thereof. Although FIG. 1 illustrates blood glucose monitor 16 as being connected to data management unit 10 by a cable 18, it may be preferable to construct blood glucose monitor 16 as a plug-in unit that is placed in a recess or other suitable opening or slot in data management unit 10. Regardless of the manner in which blood glucose monitor 16 is interconnected with data management unit 10, both that interconnection and cable 14 are configured for serial data communication between the interconnected devices. Brown at 11:22-39 As is indicated by monitor 22 of FIG. 1, various other devices can be provided for monitoring conditions such as blood pressure, pulse, and body temperature to thereby realize systems for self-care monitoring and control of conditions such as hypertension, certain heart conditions and various other afflictions and physical conditions. Brown at 11:51-57. FIGS. 4-10 illustrate typical screen displays that are generated by the arrangement of the invention described relative to FIGS. 1-3. Reference will first be made to FIGS. 4 and 5, which exemplify screen displays that are associated with operation of the invention in the blood glucose monitoring mode. Specifically, in the currently preferred embodiments of the invention, blood glucose monitor 16

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Brown
	operates in conjunction with data management unit 10 and handheld microprocessor unit 12 to: (a) perform a test or calibration sequence in which tests are performed to confirm that the system is operating properly; and, (b) perform the blood glucose test sequence in which blood glucose meter 16 senses the user's blood glucose level. Suitable calibration procedures for blood glucose monitors are known in the art. For example, blood glucose monitors often are supplied with a “code strip,” that is inserted in the monitor and results in a predetermined value being displayed and stored in memory at the conclusion of the code strip calibration procedure. When such a code strip calibration procedure is used in the practice of the invention, the procedure is selected from one of the system menus. For example, if the system main menu includes a “monitor” menu item, a submenu displaying system calibration options and an option for initiating the blood glucose test may be displayed when the monitor menu item is selected. When a code strip option is available and selected, a sequence of instructions is generated and displayed by display screen 28 of handheld microprocessor unit 12 to prompt the user to insert the code strip and perform all other required operations. At the conclusion of the code strip calibration sequence, display unit 28 of handheld microprocessor unit 12 displays a message indicating whether or not the calibration procedure has been successfully completed. For example, FIG. 4 illustrates a screen display that informs the system user that the calibration procedure was not successful and that the code strip should be inserted again (i.e., the calibration procedure is to be repeated). As is indicated in FIG. 4, display screens that indicate a potential malfunction of the system include a prominent message such as the “Attention” notation included in the screen display of FIG. 4. Brown at 20:28-67 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Brown, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Brown, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

EXHIBIT A8

U.S. Pat. No. 9,055,868 in view of U.S. Patent Publication No. 2002/0049389 to Marcio Abreu ("Abreu")

As described in detail below, Abreu (individually or collectively) anticipates and/or renders obvious claim 7-9 ("Asserted Claims") of U.S. Patent No. 9,055,868 B2 (the "'868 Patent") under 35 U.S.C. §102 and/or §103, either alone in combination with the knowledge of a person of ordinary skill, and/or additional prior art references discussed in discussed in Exhibits A1-A10, the contents of which are hereby incorporated by reference into this chart. One of ordinary skill in the art, as of the priority date of the '868 Patent, would have known to combine the prior art elements disclosed by the foregoing references using known methods, and to use these elements according to their established functions in order to achieve a known and predictable result. This invalidity claim chart is based on Defendants' present understanding of the Asserted Claims and Plaintiff's apparent construction of the Asserted Claims in its Preliminary Infringement Contentions ("Infringement Contentions").

The following invalidity chart includes references to the structure, function, operation, and/or features of the technology described in Abreu. The cited portions of Abreu are merely illustrative, and Defendants reserve the right to rely on alternative or additional evidence, including uncited portions of Abreu. Where a particular figure is cited, the citation should be understood to encompass the caption and description of the figure as well as any text relating to or describing the figure. Conversely, where particular text referring to a figure is cited, the citation should be understood to include the figure as well. Although the documentation collectively evidences prior knowledge, use, or sale, Defendants reserve the right to rely upon individual documents as printed publications. Where the chart below states that Abreu "describes" or "provides for" a limitation, such disclosure may be express, inherent, or implicit. To the extent it is found Abreu does not expressly disclose certain limitations in the asserted claim, such limitations are inherent. Defendants reserve the right to present direct evidence of the structure, function, operation, and/or features of the technology described in Abreu (including product samples, source code, and/or witness testimony) and/or its prior art status, and to present alternative or additional documents concerning the same as evidence that the technology described in Abreu anticipates and/or renders obvious the Asserted Claims of the '868 Patent.

This chart is subject to all reservations, objections, and disclaimers in Defendants' Invalidity Contentions and any amendment, supplement, or modification thereof, which are incorporated herein by reference in their entirety. Nothing stated herein shall be treated as an admission or suggestion that Defendants agree with Plaintiff regarding the scope of the Asserted Claims, Plainitff's apparent claim constructions, or the accuracy of any particular claim construction. Defendants reserve all rights to challenge any of the claim terms herein under 35 U.S.C. § 112, including by arguing that they are indefinite, are not supported by the written description, and/or are not enabled. Defendants further reserve all rights to amend this invalidity claim chart without leave of court pursuant to the Court's Docket Control Order, or upon a showing of good cause.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

EXHIBIT A8

’868 Patent	Abreu
Claim 7	
7[pre]. A diagnostic system comprising:	By providing this disclosure, Defendants do not take a position on whether the preamble is limiting. Abreu discloses or renders obvious a diagnostic system. Utilization of a contact device placed on the eye in order to detect physical and chemical parameters of the body as well as the non-invasive delivery of compounds according to these physical and chemical parameters, with signals being transmitted continuously as electromagnetic waves, radio waves, infrared and the like. One of the parameters to be detected includes non-invasive blood analysis utilizing chemical changes and chemical products that are found in the conjunctiva and in the tear film Abreu at Abstract. It is an object of the present invention to address the above needs in the art and provide the accuracy and precision needed for clinical application by being able to eliminate or substantially reduce the sources of errors, interference, and variability found in the prior art. By greatly reducing or eliminating the interfering constituents and providing a much higher signal to noise ratio, the present invention can provide the answers and results needed for accurate and precise measurement of chemical components in vivo using optical means such as infrared spectroscopy. Moreover, the apparatus and methods of the present invention by enhancing the signal allows clinical useful readings to be obtained with various techniques and using different types of electromagnetic radiation. Besides near-infrared spectroscopy, the present invention provides superior results and higher signal to noise ratio when using any other form of electromagnetic radiation such as for example mid-infrared radiation, radio wave impedance, photoacoustic spectroscopy, Raman spectroscopy, visible spectroscopy, ultraviolet spectroscopy, fluorescent spectroscopy, scattering spectroscopy, and optical rotation of polarized light as well as other techniques such as fluorescent (including Maillard reaction, light induced fluorescence, and induction of glucose fluorescence by ultraviolet light), colorimetric, refractive index, light reflection, thermal gradient, Attenuated Total Internal Reflection, molecular imprinting, and the like. Abreu at [0276] Melanin is a cromophore and there is some amount of melanin in the skin of all normal individuals, with the exception of pathologic status as in complete albinos. The skin with melanin absorbs near-infrared light which is the spectral region of interest in near-infrared spectroscopy and the region, for example, where glucose absorbs light. The present invention eliminates surface barriers and sources of

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Abreu
	error and variability such as melanin present in the skin and which varies from site to site and from individual to individual. Normal conjunctiva does not have melanin. Abreu at [0368] Substances of interest can include any substance present adjacent to the conjunctiva or surface of the eye which is capable of being analyzed by electromagnetic means. For example but not by way of limitation such substances can include any substance present in plasma such as molecular, chemical or cellular, and for example exogenous chemicals such as drugs and alcohol as well as endogenous chemicals such as glucose, oxygen, bicarbonate, cardiac markers, cancer markers, hormones, glutamate, urea, fatty acids, cholesterol, triglycerides, proteins, creatinine, aminoacids and the like and cellular constituents such as cancer cells, and the like. Values such as pH can also be calculated as pH can be related to light absorption using reflectance spectroscopy. Abreu at [0429] The magnitude of the absorption peak is directly related to the concentration of glucose. Suitable analyzers include modified Fourier Transform Infrared (FTIR) spectrometers with chemometric software packages. Those are available from the PerkinElmer Corporation (Wellesley, Mass.) and Thermo Nicolet Company (Madison, Wis.). Abreu at [1103] FIG. 100(C) shows a schematic block diagram of one preferred far-infrared spectroscopy measuring apparatus of the present invention. The apparatus includes a thermal infrared detector 2654 which has a filter 2662 and a sensing element 2664 with said sensing element 2664 being preferably a thermopile and responding to thermal infrared radiation 2660 naturally emitted by the eye. A variety of infrared sensors responsive to thermal radiation can be used as sensor 2664 besides a thermopile, such as for example, optoelectronic sensors including thermistor-based infrared sensor, temperature sensitive resistor, pyroelectric sensors, and the like, and preferably thin membrane sensors. The detector 2654 faces the conjunctiva 2656 and if the face of the detector 2654 is encased by the housing 2652 material, said material is preferably transparent to infrared radiation. Abreu at [1159]

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Abreu
	For this exemplary measurement of glucose, wavelength centered around 9,400 nm (glucose band) was used. There is a prominent absorption peak of glucose around 9,400 nm due to the carbon-oxygen-carbon bond in its pyrane ring present in the glucose molecule. The contact device filter system allowed passage of the glucose band which is used as a reference measuring point while simultaneously measuring thermal energy absorption outside the glucose band. The thermal energy absorption in the glucose band by plasma glucose is spectroscopically determined by comparing the measured and predicted radiation at the conjunctival surface. Abreu at [1166] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Abreu, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Abreu, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[a]. a light source comprising:	Abreu discloses or renders obvious a diagnostic system comprises a light source. It is an object of the present invention to address the above needs in the art and provide the accuracy and precision needed for clinical application by being able to eliminate or substantially reduce the sources of errors, interference, and variability found in the prior art. By greatly reducing or eliminating the interfering constituents and providing a much higher signal to noise ratio, the present invention can provide the answers and results needed for accurate and precise measurement of chemical components in vivo using optical means such as infrared spectroscopy. Moreover, the apparatus and methods of the present invention by enhancing the signal allows clinical useful readings to be obtained with various techniques and using different types of electromagnetic radiation. Besides near-infrared spectroscopy, the present invention provides superior results and higher signal to noise ratio when using any other form of electromagnetic radiation such as for example mid-infrared radiation, radio wave impedance, photoacoustic spectroscopy, Raman spectroscopy, visible spectroscopy, ultraviolet spectroscopy, fluorescent spectroscopy, scattering spectroscopy, and optical rotation of polarized light as well as other techniques such as fluorescent (including Maillard reaction, light induced fluorescence, and induction

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Abreu
	of glucose fluorescence by ultraviolet light), colorimetric, refractive index, light reflection, thermal gradient, Attenuated Total Internal Reflection, molecular imprinting, and the like. Abreu at [0276] The method and apparatus of the present invention include for example glucose measurement in the near infrared wavelength region between 750 and 3000 nm and preferably in the region where the highest absorption peaks are known to occur, for glucose for example in the region between 2080 to 2200 nm and for cholesterol centered around 2300 nm. The spectral region can also include infrared or visible wavelength to detect other chemical substances besides glucose or cholesterol. Abreu at [0294] Melanin is a cromophore and there is some amount of melanin in the skin of all normal individuals, with the exception of pathologic status as in complete albinos. The skin with melanin absorbs near-infrared light which is the spectral region of interest in near-infrared spectroscopy and the region, for example, where glucose absorbs light. The present invention eliminates surface barriers and sources of error and variability such as melanin present in the skin and which varies from site to site and from individual to individual. Normal conjunctiva does not have melanin. Abreu at [0368] Substances of interest can include any substance present adjacent to the conjunctiva or surface of the eye which is capable of being analyzed by electromagnetic means. For example but not by way of limitation such substances can include any substance present in plasma such as molecular, chemical or cellular, and for example exogenous chemicals such as drugs and alcohol as well as endogenous chemicals such as glucose, oxygen, bicarbonate, cardiac markers, cancer markers, hormones, glutamate, urea, fatty acids, cholesterol, triglycerides, proteins, creatinine, aminoacids and the like and cellular constituents such as cancer cells, and the like. Values such as pH can also be calculated as pH can be related to light absorption using reflectance spectroscopy. Abreu at [0429]

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Abreu
	FIG. 85 shows a schematic block diagram of one preferred reflectance measuring apparatus of the present invention. The system includes a radiation source 2300 emitting preferably at least one near-infrared wavelength, but alternatively a plurality of different wavelengths can be used. The light source emits radiation 2302, preferably between 750 and 3000 nm, including a wavelength typical of the absorption spectrum for the substance of interest…. Abreu at [1077] A variety of radiation sources 2300 can be used in the present invention including LEDs with or without a spectral filter, a variety of lasers including diode lasers, halogen lights and white light sources having maximum output power in the near infrared region with or without a filter, and the like…. Abreu at [1085] The magnitude of the absorption peak is directly related to the concentration of glucose. Suitable analyzers include modified Fourier Transform Infrared (FTIR) spectrometers with chemometric software packages. Those are available from the PerkinElmer Corporation (Wellesley, Mass.) and Thermo Nicolet Company (Madison, Wis.). Abreu at [1103] FIG. 100(C) shows a schematic block diagram of one preferred far-infrared spectroscopy measuring apparatus of the present invention. The apparatus includes a thermal infrared detector 2654 which has a filter 2662 and a sensing element 2664 with said sensing element 2664 being preferably a thermopile and responding to thermal infrared radiation 2660 naturally emitted by the eye. A variety of infrared sensors responsive to thermal radiation can be used as sensor 2664 besides a thermopile, such as for example, optoelectronic sensors including thermistor-based infrared sensor, temperature sensitive resistor, pyroelectric sensors, and the like, and preferably thin membrane sensors. The detector 2654 faces the conjunctiva 2656 and if the face of the detector 2654 is encased by the housing 2652 material, said material is preferably transparent to infrared radiation. Abreu at [1159]

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Abreu
	For this exemplary measurement of glucose, wavelength centered around 9,400 nm (glucose band) was used. There is a prominent absorption peak of glucose around 9,400 nm due to the carbon-oxygen-carbon bond in its pyrane ring present in the glucose molecule. The contact device filter system allowed passage of the glucose band which is used as a reference measuring point while simultaneously measuring thermal energy absorption outside the glucose band. The thermal energy absorption in the glucose band by plasma glucose is spectroscopically determined by comparing the measured and predicted radiation at the conjunctival surface. Abreu at [1166] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Abreu, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Abreu, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[b]. one or more semiconductor diodes generating an input light beam; and	Abreu discloses or renders obvious the light source comprises one or more semiconductor diodes generating an input light beam. Substances of interest can include any substance present adjacent to the conjunctiva or surface of the eye which is capable of being analyzed by electromagnetic means. For example but not by way of limitation such substances can include any substance present in plasma such as molecular, chemical or cellular, and for example exogenous chemicals such as drugs and alcohol as well as endogenous chemicals such as glucose, oxygen, bicarbonate, cardiac markers, cancer markers, hormones, glutamate, urea, fatty acids, cholesterol, triglycerides, proteins, creatinine, aminoacids and the like and cellular constituents such as cancer cells, and the like. Values such as pH can also be calculated as pH can be related to light absorption using reflectance spectroscopy. Abreu at [0429] FIG. 85 shows a schematic block diagram of one preferred reflectance measuring apparatus of the present invention. The system includes a radiation source 2300 emitting preferably at least one near-infrared wavelength, but alternatively a plurality of different wavelengths can be used. The light source

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Abreu
	emits radiation 2302, preferably between 750 and 3000 nm, including a wavelength typical of the absorption spectrum for the substance of interest…. Abreu at [1077] A variety of radiation sources 2300 can be used in the present invention including LEDs with or without a spectral filter, a variety of lasers including diode lasers, halogen lights and white light sources having maximum output power in the near infrared region with or without a filter, and the like. The radiation sources 2300 have preferably enough power and wavelengths required for the measurements and a high spectral correlation with the substance of interest 2350. The range of wavelengths chosen preferably corresponds to a known range and includes the band of absorption for the substance of interest 2350. Abreu at [1085] The magnitude of the absorption peak is directly related to the concentration of glucose. Suitable analyzers include modified Fourier Transform Infrared (FTIR) spectrometers with chemometric software packages. Those are available from the PerkinElmer Corporation (Wellesley, Mass.) and Thermo Nicolet Company (Madison, Wis.). Abreu at [1103] FIG. 100(C) shows a schematic block diagram of one preferred far-infrared spectroscopy measuring apparatus of the present invention. The apparatus includes a thermal infrared detector 2654 which has a filter 2662 and a sensing element 2664 with said sensing element 2664 being preferably a thermopile and responding to thermal infrared radiation 2660 naturally emitted by the eye. A variety of infrared sensors responsive to thermal radiation can be used as sensor 2664 besides a thermopile, such as for example, optoelectronic sensors including thermistor-based infrared sensor, temperature sensitive resistor, pyroelectric sensors, and the like, and preferably thin membrane sensors. The detector 2654 faces the conjunctiva 2656 and if the face of the detector 2654 is encased by the housing 2652 material, said material is preferably transparent to infrared radiation. Abreu at [1159]

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Abreu
	For this exemplary measurement of glucose, wavelength centered around 9,400 nm (glucose band) was used. There is a prominent absorption peak of glucose around 9,400 nm due to the carbon-oxygen-carbon bond in its pyrane ring present in the glucose molecule. The contact device filter system allowed passage of the glucose band which is used as a reference measuring point while simultaneously measuring thermal energy absorption outside the glucose band. The thermal energy absorption in the glucose band by plasma glucose is spectroscopically determined by comparing the measured and predicted radiation at the conjunctival surface. Abreu at [1166] An LED, laser or other light sources delivering radiation in the infrared region can also be used in the device 2711 as a substitute for heating element 2713. The use of the infrared wavelength including the use of LEDs results in delivering radiation that is minimally absorbed by photoreceptors in the retina. The diameter of the LED, light source or heating element can preferably vary between 0.5 mm to 6 mm depending on the size of the lesion being treated. A thermocouple 2715 can be incorporated to measure temperature real time which is transmitted to an external receiver 2725 via transceiver 2719. Abreu at [1233] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Abreu, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Abreu, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[c]. a lens system configured to receive at least a portion of the input light beam and to communicate at least the portion of the input light beam onto a part of a user's body comprising blood	Abreu discloses or renders obvious the light source comprises a lens system configured to receive at least a portion of the input light beam and to communicate at least the portion of the input light beam onto a part of a user's body comprising blood. FIG. 85 shows a schematic block diagram of one preferred reflectance measuring apparatus of the present invention. The system includes a radiation source 2300 emitting preferably at least one near-infrared wavelength, but alternatively a plurality of different wavelengths can be used. The light source emits radiation 2302, preferably between 750 and 3000 nm, including a wavelength typical of the

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Abreu
	absorption spectrum for the substance of interest. The radiation is then filtered and focused by the optical interface system 2304 onto fiber optic cable 2306 which transmits the radiation to the plasma/conjunctiva interface 2310. The plasma/conjunctiva interface 2310 is comprised of the thin conjunctiva lining 2320 with plasma interface 2330 and a substance of interest 2350 underneath said conjunctiva 2320. Optic fiber cable 2306 is part of a dual optic fiber cable system preferably with fiber cable 2306 and collecting fiber cable 2312 located side-by-side. The diameter of the optic fiber is 300 μm, although a variety of diameters can be used. Abreu at [1077] The optic fiber 2306 delivers the radiation 2302 provided by the source 2300 to the plasma interface 2330. The radiation 2302 directed at the plasma 2330 is partially absorbed and scattered according to the interaction with the conjunctival lining 2320 and the substance of interest 2350 present in the plasma 2330. Conjunctiva 2320 is the only tissue interposed between radiation 2302 and the substance of interest 2350. The conjunctiva 2320 does not absorb near-infrared light and scattering is insignificant as the conjunctiva is an extremely thin membrane. Part of the radiation 2302 is then absorbed by the substance of interest 2350 and the resulting radiation emitted from the eye corresponds to said substance of interest 2350. Abreu at [1079] Light source 2300 can provide the bandwidth of interest with said light 2302 being directed at the substance of interest 2350. A variety of filters can be used to selectively pass one or more wavelengths which highly correlate with the substance of interest 2350. The light radiation 2302 can be directly emitted from a light source 2300 and directly collected by a photodetector 2318, or the light radiation 2302 can be delivered and collected using optic fiber cables. An interface lens system can be used to convert the rays to spatial parallel rays, such as from an incident divergent beam to a spatially parallel beam. Abreu at [1086] 2. Fiber optics. Fiber optics transmits the photons from the light source to the conjunctival site on the patient and from the conjunctival site to a detector. In general photons follow an elliptical path through the sample from the source to the detector. Fiber optic separation is important in determining the area

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Abreu
	of interrogation by the incident photons. The shorter the interoptode distance, the less deep is the penetration of light. In the probe arrangement (sensor head) for the conjunctiva, the optic fibers were separated by a distance of 0.5 mm. Alternatively, a distance of 0.1 mm was used for interrogating substances present in the superficial structure of the conjunctiva/plasma interface and thinner interface areas. The collecting optic fiber collected the resulting radiation. The resulting radiation contains spectral information for each plasma constituent and due to its optimal point of detection as disclosed in the invention there is no significant background spectral information. Abreu at [1094] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Abreu, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Abreu, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[d]. wherein at least the portion of the input light beam is used in a measurement on a user;	Abreu discloses or renders obvious the portion of the input light beam is used in a measurement on a user. FIG. 85 shows a schematic block diagram of one preferred reflectance measuring apparatus of the present invention. The system includes a radiation source 2300 emitting preferably at least one near-infrared wavelength, but alternatively a plurality of different wavelengths can be used. The light source emits radiation 2302, preferably between 750 and 3000 nm, including a wavelength typical of the absorption spectrum for the substance of interest. The radiation is then filtered and focused by the optical interface system 2304 onto fiber optic cable 2306 which transmits the radiation to the plasma/conjunctiva interface 2310. The plasma/conjunctiva interface 2310 is comprised of the thin conjunctiva lining 2320 with plasma interface 2330 and a substance of interest 2350 underneath said conjunctiva 2320. Optic fiber cable 2306 is part of a dual optic fiber cable system preferably with fiber cable 2306 and collecting fiber cable 2312 located side-by-side. The diameter of the optic fiber is 300 μm, although a variety of diameters can be used. Abreu at [1077]

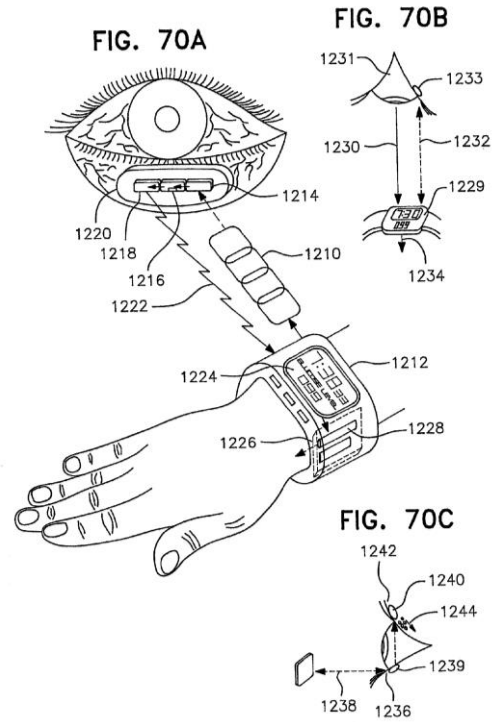
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Abreu
	The optic fiber 2306 delivers the radiation 2302 provided by the source 2300 to the plasma interface 2330. The radiation 2302 directed at the plasma 2330 is partially absorbed and scattered according to the interaction with the conjunctival lining 2320 and the substance of interest 2350 present in the plasma 2330. Conjunctiva 2320 is the only tissue interposed between radiation 2302 and the substance of interest 2350. The conjunctiva 2320 does not absorb near-infrared light and scattering is insignificant as the conjunctiva is an extremely thin membrane. Part of the radiation 2302 is then absorbed by the substance of interest 2350 and the resulting radiation emitted from the eye corresponds to said substance of interest 2350. Abreu at [1079] Light source 2300 can provide the bandwidth of interest with said light 2302 being directed at the substance of interest 2350. A variety of filters can be used to selectively pass one or more wavelengths which highly correlate with the substance of interest 2350. The light radiation 2302 can be directly emitted from a light source 2300 and directly collected by a photodetector 2318, or the light radiation 2302 can be delivered and collected using optic fiber cables. An interface lens system can be used to convert the rays to spatial parallel rays, such as from an incident divergent beam to a spatially parallel beam. Abreu at [1086] 2. Fiber optics. Fiber optics transmits the photons from the light source to the conjunctival site on the patient and from the conjunctival site to a detector. In general photons follow an elliptical path through the sample from the source to the detector. Fiber optic separation is important in determining the area of interrogation by the incident photons. The shorter the interoptode distance, the less deep is the penetration of light. In the probe arrangement (sensor head) for the conjunctiva, the optic fibers were separated by a distance of 0.5 mm. Alternatively, a distance of 0.1 mm was used for interrogating substances present in the superficial structure of the conjunctiva/plasma interface and thinner interface areas. The collecting optic fiber collected the resulting radiation. The resulting radiation contains spectral information for each plasma constituent and due to its optimal point of detection as disclosed in the invention there is no significant background spectral information. Abreu at [1094]

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Abreu
	One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Abreu, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Abreu, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[e]. a software application capable of generating data based at least in part on the measurement on the user,	Abreu discloses or renders obvious a software application capable of generating data based at least in part on the measurement on the user. Several variables can be simultaneously transmitted using different frequencies using several transmitters housed in the contact device. Alternatively, a single transmitter (3 channel transmitter) can transmit combined voltages to a receiver, with the signal being subsequently decoded, separated into three parts, filtered and regenerated as the three original voltages (different variables such as glucose level, pressure and temperature). A multiple channel system incorporating all signal processing on a single integrated circuit minimizes interconnections and can be preferably mounted in the apparatus of the invention when multiple simultaneous signal transmission is needed such as transmitting the level of glucose, temperature, bioelectrical, and pressure. A single-chip processor can be combined with a logic chip to also form a multichannel system for the apparatus of the invention allowing measurement of several parameters as well as activation of transducers. Abreu at [0159] Processor 2324 can contain or be connected to a memory unit 2326 which can store data related to calibration, patient's measurement data, reference data, suitable algorithms, and the like. Display part 2328 is adapted to output results of the concentration of the substance of interest by the processor. The processor 2324 can also be connected to an audio transmitter 2334, such as a speaker, which can audibly communicate abnormal levels, and to a device 2332 for delivery of medications according to the concentration of the substance of interest 2350. Abreu at [1083]

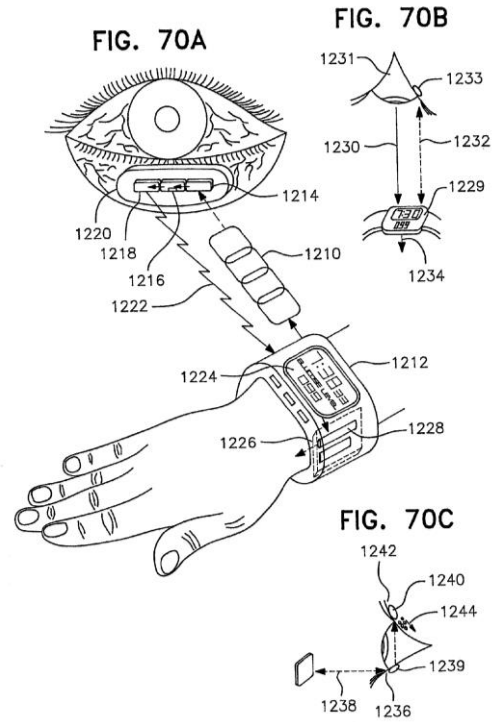
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Abreu
	 Abreu at Figs. 70A-C One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Abreu, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Abreu, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[f]. wherein the data represents at least in part physiological information associated with the user;	Abreu discloses or renders obvious the data represents at least in part physiological information associated with the user.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

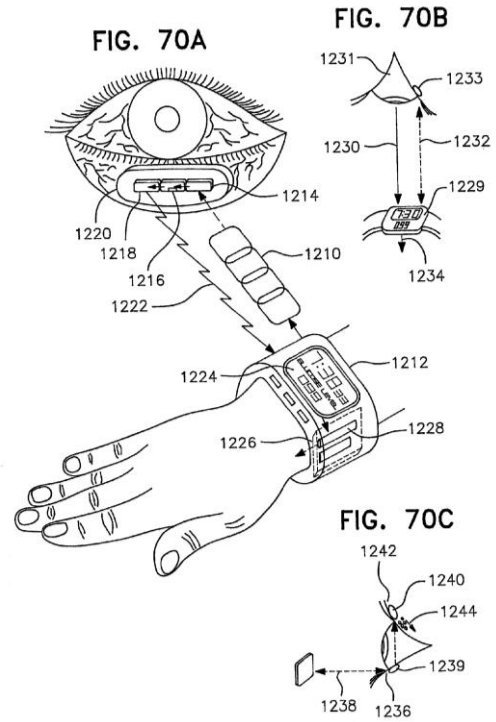
’868 Patent	Abreu
	Several variables can be simultaneously transmitted using different frequencies using several transmitters housed in the contact device. Alternatively, a single transmitter (3 channel transmitter) can transmit combined voltages to a receiver, with the signal being subsequently decoded, separated into three parts, filtered and regenerated as the three original voltages (different variables such as glucose level, pressure and temperature). A multiple channel system incorporating all signal processing on a single integrated circuit minimizes interconnections and can be preferably mounted in the apparatus of the invention when multiple simultaneous signal transmission is needed such as transmitting the level of glucose, temperature, bioelectrical, and pressure. A single-chip processor can be combined with a logic chip to also form a multichannel system for the apparatus of the invention allowing measurement of several parameters as well as activation of transducers. Abreu at [0159] Processor 2324 can contain or be connected to a memory unit 2326 which can store data related to calibration, patient's measurement data, reference data, suitable algorithms, and the like. Display part 2328 is adapted to output results of the concentration of the substance of interest by the processor. The processor 2324 can also be connected to an audio transmitter 2334, such as a speaker, which can audibly communicate abnormal levels, and to a device 2332 for delivery of medications according to the concentration of the substance of interest 2350. Abreu at [1083]

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Abreu
	 Abreu at Figs. 70A-C One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Abreu, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Abreu, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[g]. the software application capable of operating on a control system adapted to receive,	Abreu discloses or renders obvious the software application capable of operating on a control system adapted to receive, store and process at least a portion of the physiological information.

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store and process at least a portion of the physiological information,	Several variables can be simultaneously transmitted using different frequencies using several transmitters housed in the contact device. Alternatively, a single transmitter (3 channel transmitter) can transmit combined voltages to a receiver, with the signal being subsequently decoded, separated into three parts, filtered and regenerated as the three original voltages (different variables such as glucose level, pressure and temperature). A multiple channel system incorporating all signal processing on a single integrated circuit minimizes interconnections and can be preferably mounted in the apparatus of the invention when multiple simultaneous signal transmission is needed such as transmitting the level of glucose, temperature, bioelectrical, and pressure. A single-chip processor can be combined with a logic chip to also form a multichannel system for the apparatus of the invention allowing measurement of several parameters as well as activation of transducers. Abreu at [0159] Processor 2324 can contain or be connected to a memory unit 2326 which can store data related to calibration, patient's measurement data, reference data, suitable algorithms, and the like. Display part 2328 is adapted to output results of the concentration of the substance of interest by the processor. The processor 2324 can also be connected to an audio transmitter 2334, such as a speaker, which can audibly communicate abnormal levels, and to a device 2332 for delivery of medications according to the concentration of the substance of interest 2350. Abreu at [1083]

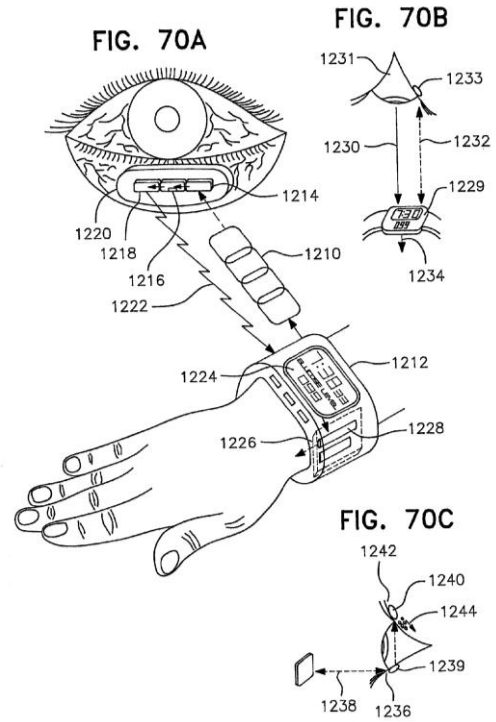
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

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7[h]. the control system having a touch-screen, circuitry for obtaining	Abreu discloses or renders obvious the control system having a touch-screen, circuitry for obtaining position information from a location sensor.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

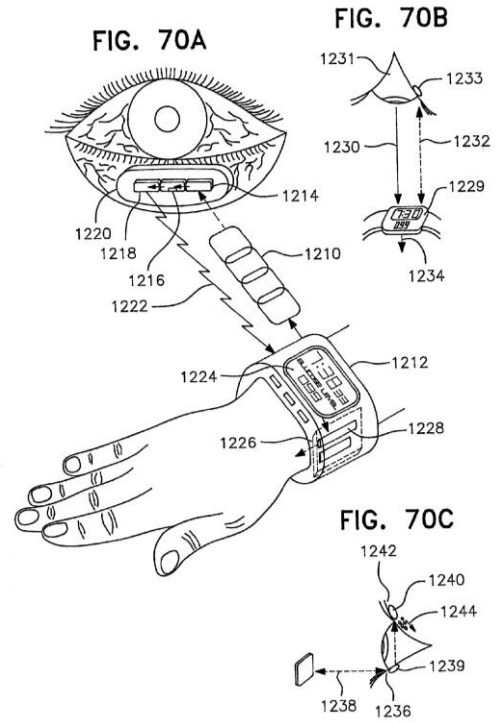
’868 Patent	Abreu
position information from a location sensor, and	Several variables can be simultaneously transmitted using different frequencies using several transmitters housed in the contact device. Alternatively, a single transmitter (3 channel transmitter) can transmit combined voltages to a receiver, with the signal being subsequently decoded, separated into three parts, filtered and regenerated as the three original voltages (different variables such as glucose level, pressure and temperature). A multiple channel system incorporating all signal processing on a single integrated circuit minimizes interconnections and can be preferably mounted in the apparatus of the invention when multiple simultaneous signal transmission is needed such as transmitting the level of glucose, temperature, bioelectrical, and pressure. A single-chip processor can be combined with a logic chip to also form a multichannel system for the apparatus of the invention allowing measurement of several parameters as well as activation of transducers. Abreu at [0159] Processor 2324 can contain or be connected to a memory unit 2326 which can store data related to calibration, patient's measurement data, reference data, suitable algorithms, and the like. Display part 2328 is adapted to output results of the concentration of the substance of interest by the processor. The processor 2324 can also be connected to an audio transmitter 2334, such as a speaker, which can audibly communicate abnormal levels, and to a device 2332 for delivery of medications according to the concentration of the substance of interest 2350. Abreu at [1083]

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

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7[i]. a wireless transceiver to transmit wireless data over a wireless link,	Abreu discloses or renders obvious a wireless transceiver to transmit wireless data over a wireless link. Several variables can be simultaneously transmitted using different frequencies using several transmitters housed in the contact device. Alternatively, a single transmitter (3 channel transmitter) can

’868 Patent	Abreu
	transmit combined voltages to a receiver, with the signal being subsequently decoded, separated into three parts, filtered and regenerated as the three original voltages (different variables such as glucose level, pressure and temperature). A multiple channel system incorporating all signal processing on a single integrated circuit minimizes interconnections and can be preferably mounted in the apparatus of the invention when multiple simultaneous signal transmission is needed such as transmitting the level of glucose, temperature, bioelectrical, and pressure. A single-chip processor can be combined with a logic chip to also form a multichannel system for the apparatus of the invention allowing measurement of several parameters as well as activation of transducers. Abreu at [0159] Processor 2324 can contain or be connected to a memory unit 2326 which can store data related to calibration, patient's measurement data, reference data, suitable algorithms, and the like. Display part 2328 is adapted to output results of the concentration of the substance of interest by the processor. The processor 2324 can also be connected to an audio transmitter 2334, such as a speaker, which can audibly communicate abnormal levels, and to a device 2332 for delivery of medications according to the concentration of the substance of interest 2350. Abreu at [1083]

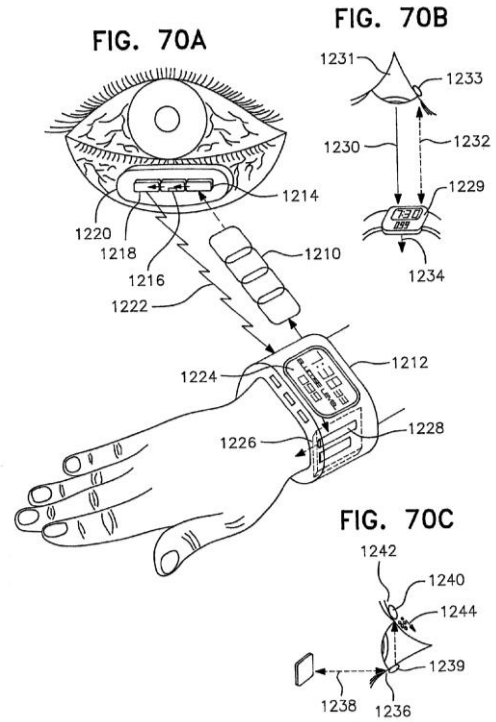
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7[j]. the wireless data comprising at least a part of the physiological information,	Abreu discloses or renders obvious the wireless data comprising at least a part of the physiological information.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Abreu
	Several variables can be simultaneously transmitted using different frequencies using several transmitters housed in the contact device. Alternatively, a single transmitter (3 channel transmitter) can transmit combined voltages to a receiver, with the signal being subsequently decoded, separated into three parts, filtered and regenerated as the three original voltages (different variables such as glucose level, pressure and temperature). A multiple channel system incorporating all signal processing on a single integrated circuit minimizes interconnections and can be preferably mounted in the apparatus of the invention when multiple simultaneous signal transmission is needed such as transmitting the level of glucose, temperature, bioelectrical, and pressure. A single-chip processor can be combined with a logic chip to also form a multichannel system for the apparatus of the invention allowing measurement of several parameters as well as activation of transducers. Abreu at [0159] Processor 2324 can contain or be connected to a memory unit 2326 which can store data related to calibration, patient's measurement data, reference data, suitable algorithms, and the like. Display part 2328 is adapted to output results of the concentration of the substance of interest by the processor. The processor 2324 can also be connected to an audio transmitter 2334, such as a speaker, which can audibly communicate abnormal levels, and to a device 2332 for delivery of medications according to the concentration of the substance of interest 2350. Abreu at [1083]

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

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7[k]. wherein the control system is further capable of receiving voice input signals	Abreu discloses or renders obvious the control system is further capable of receiving voice input signals and manually entered input signals.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

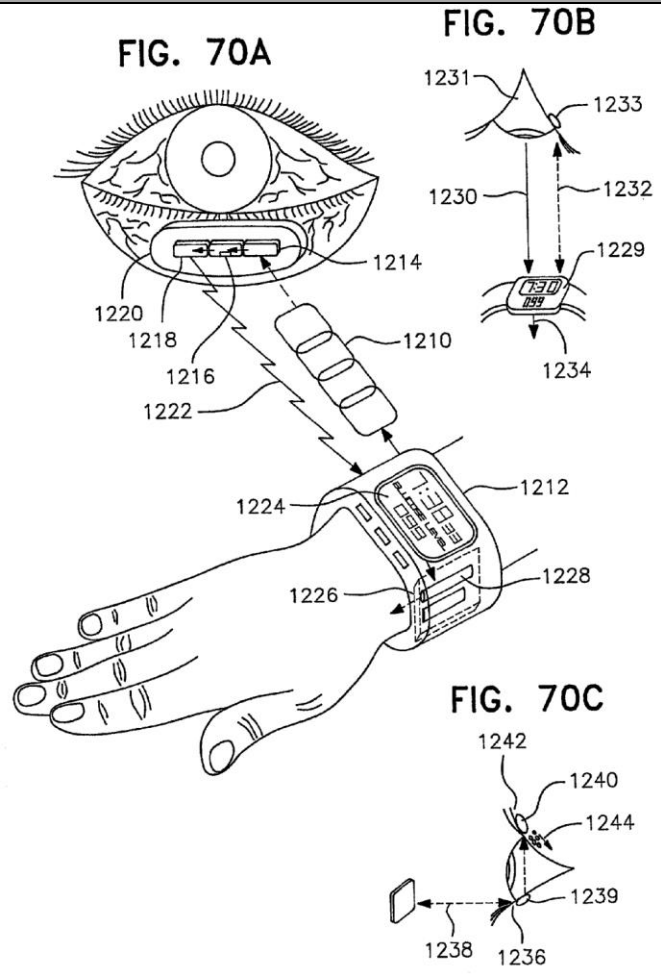
’868 Patent	Abreu
and manually entered input signals; and	Utilization of a contact device placed on the eye in order to detect physical and chemical parameters of the body as well as the non-invasive delivery of compounds according to these physical and chemical parameters, with signals being transmitted continuously as electromagnetic waves, radio waves, infrared and the like. One of the parameters to be detected includes non-invasive blood analysis utilizing chemical changes and chemical products that are found in the conjunctiva and in the tear film. A transensor mounted in the contact device laying on the cornea or the surface of the eye is capable of evaluating and measuring physical and chemical parameters in the eye including non-invasive blood analysis. The system utilizes eye lid motion and/or closure of the eye lid to activate a microminiature radio frequency sensitive transensor mounted in the contact device. The signal can be communicated by wires or radio telemetered to an externally placed receiver. The signal can then be processed, analyzed and stored. Several parameters can be detected including a complete non-invasive analysis of blood components, measurement of systemic and ocular blood flow, measurement of heart rate and respiratory rate, tracking operations, detection of ovulation, detection of radiation and drug effects, diagnosis of ocular and systemic disorders and the like. Abreu at Abstract An alternative embodiment of the present invention will now be described. The apparatus and method is based on a different and novel concept originated by the inventor in which a transensor mounted in the contact device laying on the cornea or the surface of the eye is capable of evaluating and measuring physical and chemical parameters in the eye including non-invasive blood analysis. The alternative embodiment preferably utilizes a transensor mounted in the contact device which is preferably laying in contact with the cornea and is preferably activated by the process of eye lid motion and/or closure of the eye lid. The system preferably utilizes eye lid motion and/or closure of the eye lid to activate a microminiature radio frequency sensitive transensor mounted in the contact device. The signal can be communicated by cable, but is preferably actively or passively radio telemetered to an externally placed receiver. The signal can then be processed, analyzed and stored. Abreu at [0099] Radiation sensitive endoradiosondes are known and can be used in the contact device to measure the amount of radiation and the presence of radioactive corpuscules in the tear film or in front of the eye which correlates to its presence in the body. The amount of hydration and humidity of the eye can be sensed with an electrical discharge and variable resistance moisture sensor mounted in the contact device.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Abreu
	Motion and deceleration can be detected by a mounted accelerometer in the contact device. Voltages accompanying the function of the eye, brain, and muscles can be detected by suitable electrodes mounted in the device and can be used to modulate the frequency of the transmitter. In the case of transmission of muscle potentials, the contact device is placed not on the cornea, but next to the extraocular muscle to be evaluated and the signals remotely transmitted. A fixed frequency transmitter can be mounted in the contact device and used as a tracking device which utilizes a satellite tracking system by noting the frequency received from the fixed frequency transmitter to a passing satellite Abreu at [0136] The system further comprises a contact device in which a microminiature gas-sensitive, such as oxygen-sensitive, radio frequency transensor is mounted in the contact device which in turn is placed on the cornea and/or surface of the eye. The system also comprises a contact device in which a microminiature blood velocity-sensitive radio frequency transensor is mounted in the contact device which in turn is placed on the conjunctiva and is preferably activated by eye lid motion and/or closure of the eye lid. The system also comprises a contact device in which a radio frequency transensor capable of measuring the negative resistance of nerve fibers is mounted in the contact device which in turn is preferably placed on the cornea and/or surface of the eye. By measuring the electrical resistance, the effects of microorganisms, drugs, poisons and anesthetics can be evaluated. The system also comprises a contact device in which a microminiature radiation-sensitive radio frequency transensor is mounted in the contact device which in turn is preferably placed on the cornea. Abreu at [0145] A dual system ICL with tracking and chemical sensing can be an important embodiment in the battlefield as troops exposed to chemical weapons are not only identified as exposed to chemical weapons but also immediately located. In this exemplary embodiment the ICL position can be located using for instance Global Positioning System (GPS), fixed frequency, or the like. The GPS is a sophisticated satellite-based positioning system initially built in the mid-1970s by the United States Department of Defense to be used primarily in military operations to indicate the position of a receiver on the ground. Radio pulses as spheres of position from the satellites in orbit intersect with the surface of the earth marking the transceiver exact position. ICL transceivers for instance in one eye determines position and a chemical sensing ICL in the other eye determines a chemical compound. Besides being placed externally in the

’868 Patent	Abreu
	eye, during military use, the ICL, both tracking and chemical sensing, can be easily and temporarily surgically implanted in the conjunctival pocket. Abreu at [0243] FIG. 70B shows a summary of the system which includes the natural motion of looking at a wrist- watch 1229 by eye 1231 to check time 1230 which automatically activate the ICL 1233 to transmit the signal 1232 and deliver the substance into the user's skin 1234. Abreu at [1020]

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

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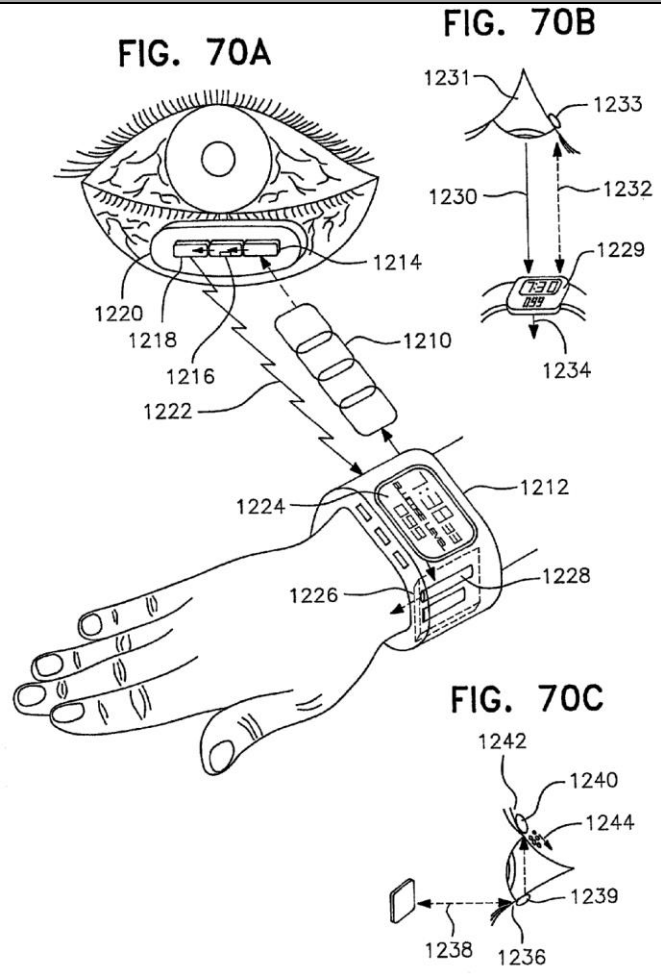
’868 Patent	Abreu
	have been obvious to one of ordinary skill in the art to combine, with the teachings of Abreu, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[l]. a host comprising:	Abreu discloses or renders obvious the diagnostic system comprises a host. Utilization of a contact device placed on the eye in order to detect physical and chemical parameters of the body as well as the non-invasive delivery of compounds according to these physical and chemical parameters, with signals being transmitted continuously as electromagnetic waves, radio waves, infrared and the like. One of the parameters to be detected includes non-invasive blood analysis utilizing chemical changes and chemical products that are found in the conjunctiva and in the tear film. A transensor mounted in the contact device laying on the cornea or the surface of the eye is capable of evaluating and measuring physical and chemical parameters in the eye including non-invasive blood analysis. The system utilizes eye lid motion and/or closure of the eye lid to activate a microminiature radio frequency sensitive transensor mounted in the contact device. The signal can be communicated by wires or radio telemetered to an externally placed receiver. The signal can then be processed, analyzed and stored. Several parameters can be detected including a complete non-invasive analysis of blood components, measurement of systemic and ocular blood flow, measurement of heart rate and respiratory rate, tracking operations, detection of ovulation, detection of radiation and drug effects, diagnosis of ocular and systemic disorders and the like. Abreu at Abstract An alternative embodiment of the present invention will now be described. The apparatus and method is based on a different and novel concept originated by the inventor in which a transensor mounted in the contact device laying on the cornea or the surface of the eye is capable of evaluating and measuring physical and chemical parameters in the eye including non-invasive blood analysis. The alternative embodiment preferably utilizes a transensor mounted in the contact device which is preferably laying in contact with the cornea and is preferably activated by the process of eye lid motion and/or closure of the eye lid. The system preferably utilizes eye lid motion and/or closure of the eye lid to activate a microminiature radio frequency sensitive transensor mounted in the contact device. The signal can be communicated by cable, but is preferably actively or passively radio telemetered to an externally placed receiver. The signal can then be processed, analyzed and stored. Abreu at [0099]

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

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	Radiation sensitive endoradiosondes are known and can be used in the contact device to measure the amount of radiation and the presence of radioactive corpuscules in the tear film or in front of the eye which correlates to its presence in the body. The amount of hydration and humidity of the eye can be sensed with an electrical discharge and variable resistance moisture sensor mounted in the contact device. Motion and deceleration can be detected by a mounted accelerometer in the contact device. Voltages accompanying the function of the eye, brain, and muscles can be detected by suitable electrodes mounted in the device and can be used to modulate the frequency of the transmitter. In the case of transmission of muscle potentials, the contact device is placed not on the cornea, but next to the extraocular muscle to be evaluated and the signals remotely transmitted. A fixed frequency transmitter can be mounted in the contact device and used as a tracking device which utilizes a satellite tracking system by noting the frequency received from the fixed frequency transmitter to a passing satellite Abreu at [0136] The system further comprises a contact device in which a microminiature gas-sensitive, such as oxygen-sensitive, radio frequency transensor is mounted in the contact device which in turn is placed on the cornea and/or surface of the eye. The system also comprises a contact device in which a microminiature blood velocity-sensitive radio frequency transensor is mounted in the contact device which in turn is placed on the conjunctiva and is preferably activated by eye lid motion and/or closure of the eye lid. The system also comprises a contact device in which a radio frequency transensor capable of measuring the negative resistance of nerve fibers is mounted in the contact device which in turn is preferably placed on the cornea and/or surface of the eye. By measuring the electrical resistance, the effects of microorganisms, drugs, poisons and anesthetics can be evaluated. The system also comprises a contact device in which a microminiature radiation-sensitive radio frequency transensor is mounted in the contact device which in turn is preferably placed on the cornea. Abreu at [0145] A dual system ICL with tracking and chemical sensing can be an important embodiment in the battlefield as troops exposed to chemical weapons are not only identified as exposed to chemical weapons but also immediately located. In this exemplary embodiment the ICL position can be located using for instance Global Positioning System (GPS), fixed frequency, or the like. The GPS is a sophisticated satellite-based positioning system initially built in the mid-1970s by the United States Department of Defense to be used primarily in military operations to indicate the position of a receiver on the ground. Radio pulses as

’868 Patent	Abreu
	spheres of position from the satellites in orbit intersect with the surface of the earth marking the transceiver exact position. ICL transceivers for instance in one eye determines position and a chemical sensing ICL in the other eye determines a chemical compound. Besides being placed externally in the eye, during military use, the ICL, both tracking and chemical sensing, can be easily and temporarily surgically implanted in the conjunctival pocket. Abreu at [0243] FIG. 70B shows a summary of the system which includes the natural motion of looking at a wrist- watch 1229 by eye 1231 to check time 1230 which automatically activate the ICL 1233 to transmit the signal 1232 and deliver the substance into the user's skin 1234. Abreu at [1020]

Omni MedSci Ex. 2002
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	have been obvious to one of ordinary skill in the art to combine, with the teachings of Abreu, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[m]. a digital file for receiving and storing at least a portion of the wireless data;	Abreu discloses or renders obvious the host comprises a digital file for receiving and storing at least a portion of the wireless data. Utilization of a contact device placed on the eye in order to detect physical and chemical parameters of the body as well as the non-invasive delivery of compounds according to these physical and chemical parameters, with signals being transmitted continuously as electromagnetic waves, radio waves, infrared and the like. One of the parameters to be detected includes non-invasive blood analysis utilizing chemical changes and chemical products that are found in the conjunctiva and in the tear film. A transensor mounted in the contact device laying on the cornea or the surface of the eye is capable of evaluating and measuring physical and chemical parameters in the eye including non-invasive blood analysis. The system utilizes eye lid motion and/or closure of the eye lid to activate a microminiature radio frequency sensitive transensor mounted in the contact device. The signal can be communicated by wires or radio telemetered to an externally placed receiver. The signal can then be processed, analyzed and stored. Several parameters can be detected including a complete non-invasive analysis of blood components, measurement of systemic and ocular blood flow, measurement of heart rate and respiratory rate, tracking operations, detection of ovulation, detection of radiation and drug effects, diagnosis of ocular and systemic disorders and the like. Abreu at Abstract An alternative embodiment of the present invention will now be described. The apparatus and method is based on a different and novel concept originated by the inventor in which a transensor mounted in the contact device laying on the cornea or the surface of the eye is capable of evaluating and measuring physical and chemical parameters in the eye including non-invasive blood analysis. The alternative embodiment preferably utilizes a transensor mounted in the contact device which is preferably laying in contact with the cornea and is preferably activated by the process of eye lid motion and/or closure of the eye lid. The system preferably utilizes eye lid motion and/or closure of the eye lid to activate a microminiature radio frequency sensitive transensor mounted in the contact device. The signal can be communicated by cable, but is preferably actively or passively radio telemetered to an externally placed receiver. The signal can then be processed, analyzed and stored. Abreu at [0099]

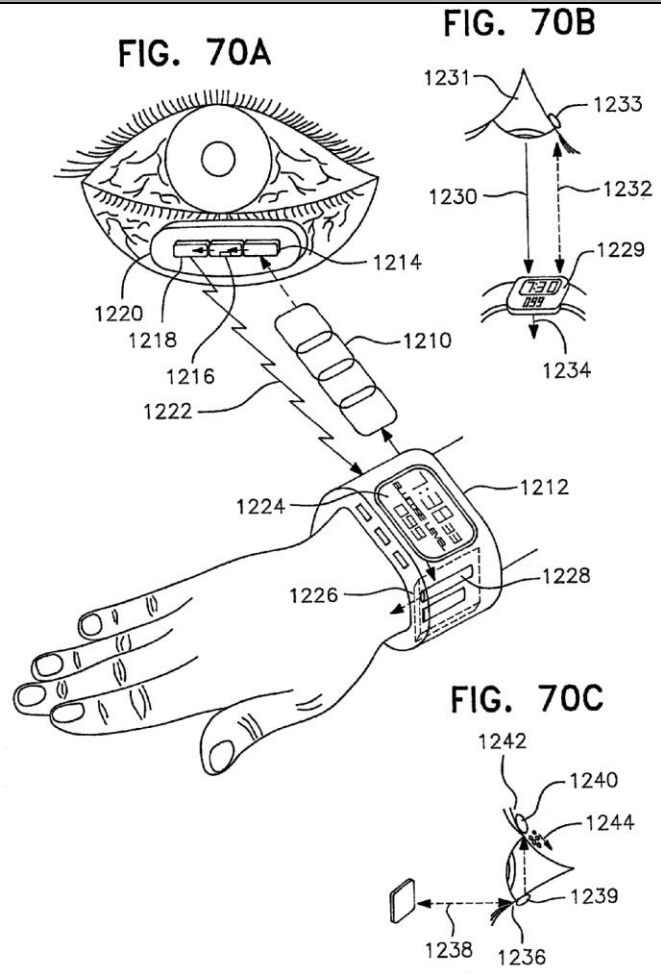
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Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

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Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

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	used primarily in military operations to indicate the position of a receiver on the ground. Radio pulses as spheres of position from the satellites in orbit intersect with the surface of the earth marking the transceiver exact position. ICL transceivers for instance in one eye determines position and a chemical sensing ICL in the other eye determines a chemical compound. Besides being placed externally in the eye, during military use, the ICL, both tracking and chemical sensing, can be easily and temporarily surgically implanted in the conjunctival pocket. Abreu at [0243] FIG. 70B shows a summary of the system which includes the natural motion of looking at a wrist- watch 1229 by eye 1231 to check time 1230 which automatically activate the ICL 1233 to transmit the signal 1232 and deliver the substance into the user's skin 1234. Abreu at [1020]

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Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

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	 Abreu at Fig. 70 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Abreu, it would

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

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	have been obvious to one of ordinary skill in the art to combine, with the teachings of Abreu, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[n]. control logic at the host to process at least the portion of the wireless data to generate a status of the user;	Abreu discloses or renders obvious the host comprises control logic at the host to process at least the portion of the wireless data to generate a status of the user. Utilization of a contact device placed on the eye in order to detect physical and chemical parameters of the body as well as the non-invasive delivery of compounds according to these physical and chemical parameters, with signals being transmitted continuously as electromagnetic waves, radio waves, infrared and the like. One of the parameters to be detected includes non-invasive blood analysis utilizing chemical changes and chemical products that are found in the conjunctiva and in the tear film. A transensor mounted in the contact device laying on the cornea or the surface of the eye is capable of evaluating and measuring physical and chemical parameters in the eye including non-invasive blood analysis. The system utilizes eye lid motion and/or closure of the eye lid to activate a microminiature radio frequency sensitive transensor mounted in the contact device. The signal can be communicated by wires or radio telemetered to an externally placed receiver. The signal can then be processed, analyzed and stored. Several parameters can be detected including a complete non-invasive analysis of blood components, measurement of systemic and ocular blood flow, measurement of heart rate and respiratory rate, tracking operations, detection of ovulation, detection of radiation and drug effects, diagnosis of ocular and systemic disorders and the like. Abreu at Abstract An alternative embodiment of the present invention will now be described. The apparatus and method is based on a different and novel concept originated by the inventor in which a transensor mounted in the contact device laying on the cornea or the surface of the eye is capable of evaluating and measuring physical and chemical parameters in the eye including non-invasive blood analysis. The alternative embodiment preferably utilizes a transensor mounted in the contact device which is preferably laying in contact with the cornea and is preferably activated by the process of eye lid motion and/or closure of the eye lid. The system preferably utilizes eye lid motion and/or closure of the eye lid to activate a microminiature radio frequency sensitive transensor mounted in the contact device. The signal can be communicated by cable, but is preferably actively or passively radio telemetered to an externally placed receiver. The signal can then be processed, analyzed and stored. Abreu at [0099]

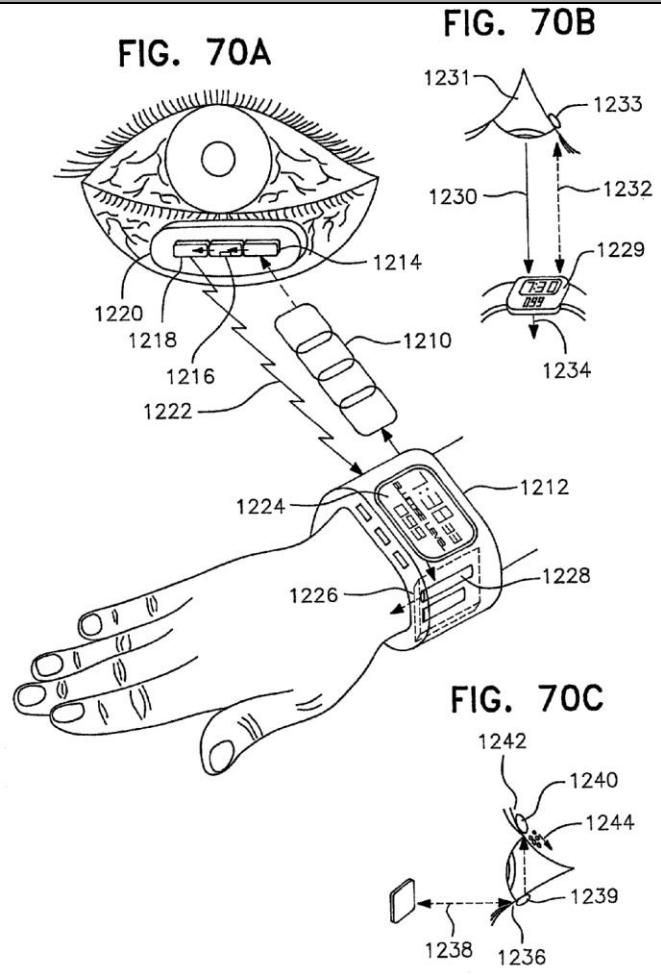
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

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	Radiation sensitive endoradiosondes are known and can be used in the contact device to measure the amount of radiation and the presence of radioactive corpuscules in the tear film or in front of the eye which correlates to its presence in the body. The amount of hydration and humidity of the eye can be sensed with an electrical discharge and variable resistance moisture sensor mounted in the contact device. Motion and deceleration can be detected by a mounted accelerometer in the contact device. Voltages accompanying the function of the eye, brain, and muscles can be detected by suitable electrodes mounted in the device and can be used to modulate the frequency of the transmitter. In the case of transmission of muscle potentials, the contact device is placed not on the cornea, but next to the extraocular muscle to be evaluated and the signals remotely transmitted. A fixed frequency transmitter can be mounted in the contact device and used as a tracking device which utilizes a satellite tracking system by noting the frequency received from the fixed frequency transmitter to a passing satellite Abreu at [0136] The system further comprises a contact device in which a microminiature gas-sensitive, such as oxygen-sensitive, radio frequency transensor is mounted in the contact device which in turn is placed on the cornea and/or surface of the eye. The system also comprises a contact device in which a microminiature blood velocity-sensitive radio frequency transensor is mounted in the contact device which in turn is placed on the conjunctiva and is preferably activated by eye lid motion and/or closure of the eye lid. The system also comprises a contact device in which a radio frequency transensor capable of measuring the negative resistance of nerve fibers is mounted in the contact device which in turn is preferably placed on the cornea and/or surface of the eye. By measuring the electrical resistance, the effects of microorganisms, drugs, poisons and anesthetics can be evaluated. The system also comprises a contact device in which a microminiature radiation-sensitive radio frequency transensor is mounted in the contact device which in turn is preferably placed on the cornea. Abreu at [0145] A dual system ICL with tracking and chemical sensing can be an important embodiment in the battlefield as troops exposed to chemical weapons are not only identified as exposed to chemical weapons but also immediately located. In this exemplary embodiment the ICL position can be located using for instance Global Positioning System (GPS), fixed frequency, or the like. The GPS is a sophisticated satellite-based positioning system initially built in the mid-1970s by the United States Department of Defense to be

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Omni MedSci Ex. 2002
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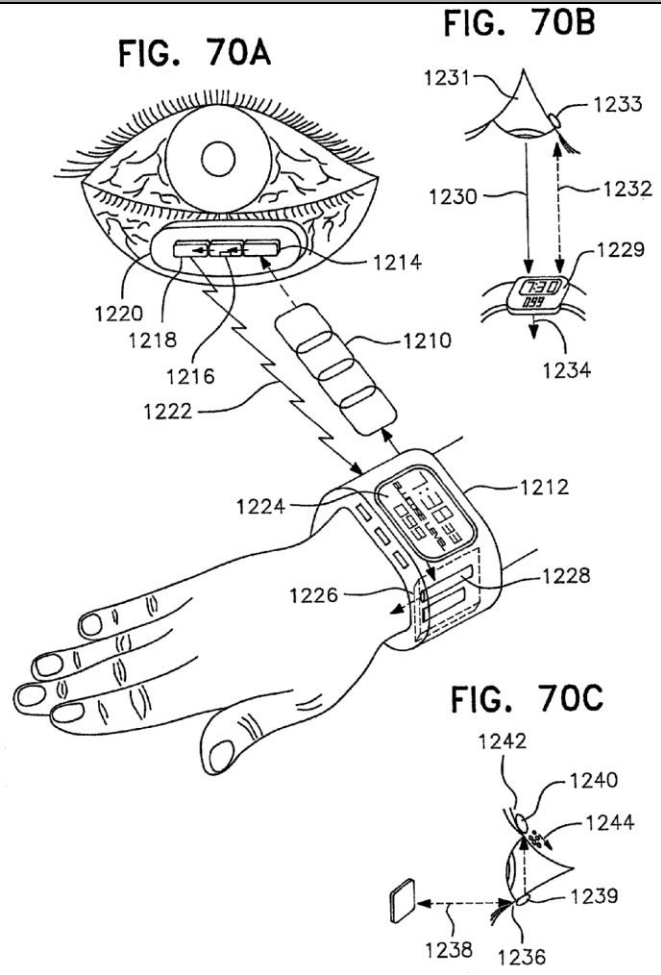
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7[o]. a memory storage device for recording the status; and	Abreu discloses or renders obvious the host comprises a memory storage device for recording the status. Utilization of a contact device placed on the eye in order to detect physical and chemical parameters of the body as well as the non-invasive delivery of compounds according to these physical and chemical parameters, with signals being transmitted continuously as electromagnetic waves, radio waves, infrared and the like. One of the parameters to be detected includes non-invasive blood analysis utilizing chemical changes and chemical products that are found in the conjunctiva and in the tear film. A transensor mounted in the contact device laying on the cornea or the surface of the eye is capable of evaluating and measuring physical and chemical parameters in the eye including non-invasive blood analysis. The system utilizes eye lid motion and/or closure of the eye lid to activate a microminiature radio frequency sensitive transensor mounted in the contact device. The signal can be communicated by wires or radio telemetered to an externally placed receiver. The signal can then be processed, analyzed and stored. Several parameters can be detected including a complete non-invasive analysis of blood components, measurement of systemic and ocular blood flow, measurement of heart rate and respiratory rate, tracking operations, detection of ovulation, detection of radiation and drug effects, diagnosis of ocular and systemic disorders and the like. Abreu at Abstract An alternative embodiment of the present invention will now be described. The apparatus and method is based on a different and novel concept originated by the inventor in which a transensor mounted in the contact device laying on the cornea or the surface of the eye is capable of evaluating and measuring physical and chemical parameters in the eye including non-invasive blood analysis. The alternative embodiment preferably utilizes a transensor mounted in the contact device which is preferably laying in contact with the cornea and is preferably activated by the process of eye lid motion and/or closure of the eye lid. The system preferably utilizes eye lid motion and/or closure of the eye lid to activate a microminiature radio frequency sensitive transensor mounted in the contact device. The signal can be communicated by cable, but is preferably actively or passively radio telemetered to an externally placed receiver. The signal can then be processed, analyzed and stored. Abreu at [0099]

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7[p]. an output for communicating at least a portion of the status or associated information over a communication link to one or more display output devices,	Abreu discloses or renders obvious the host comprises an output for communicating at least a portion of the status or associated information over a communication link to one or more display output devices, wherein the one or more display output devices are located remotely from the host. Utilization of a contact device placed on the eye in order to detect physical and chemical parameters of the body as well as the non-invasive delivery of compounds according to these physical and chemical parameters, with signals being transmitted continuously as electromagnetic waves, radio waves, infrared and the like. One of the parameters to be detected includes non-invasive blood analysis utilizing chemical changes and chemical products that are found in the conjunctiva and in the tear film. A transensor mounted in the contact device laying on the cornea or the surface of the eye is capable of evaluating and measuring physical and chemical parameters in the eye including non-invasive blood analysis. The system utilizes eye lid motion and/or closure of the eye lid to activate a microminiature radio frequency sensitive transensor mounted in the contact device. The signal can be communicated by wires or radio telemetered to an externally placed receiver. The signal can then be processed, analyzed and stored. Several parameters can be detected including a complete non-invasive analysis of blood components, measurement of systemic and ocular blood flow, measurement of heart rate and respiratory rate, tracking operations, detection of ovulation, detection of radiation and drug effects, diagnosis of ocular and systemic disorders and the like. Abreu at Abstract An alternative embodiment of the present invention will now be described. The apparatus and method is based on a different and novel concept originated by the inventor in which a transensor mounted in the contact device laying on the cornea or the surface of the eye is capable of evaluating and measuring physical and chemical parameters in the eye including non-invasive blood analysis. The alternative embodiment preferably utilizes a transensor mounted in the contact device which is preferably laying in contact with the cornea and is preferably activated by the process of eye lid motion and/or closure of the eye lid. The system preferably utilizes eye lid motion and/or closure of the eye lid to activate a microminiature radio frequency sensitive transensor mounted in the contact device. The signal can be communicated by cable, but is preferably actively or passively radio telemetered to an externally placed receiver. The signal can then be processed, analyzed and stored.

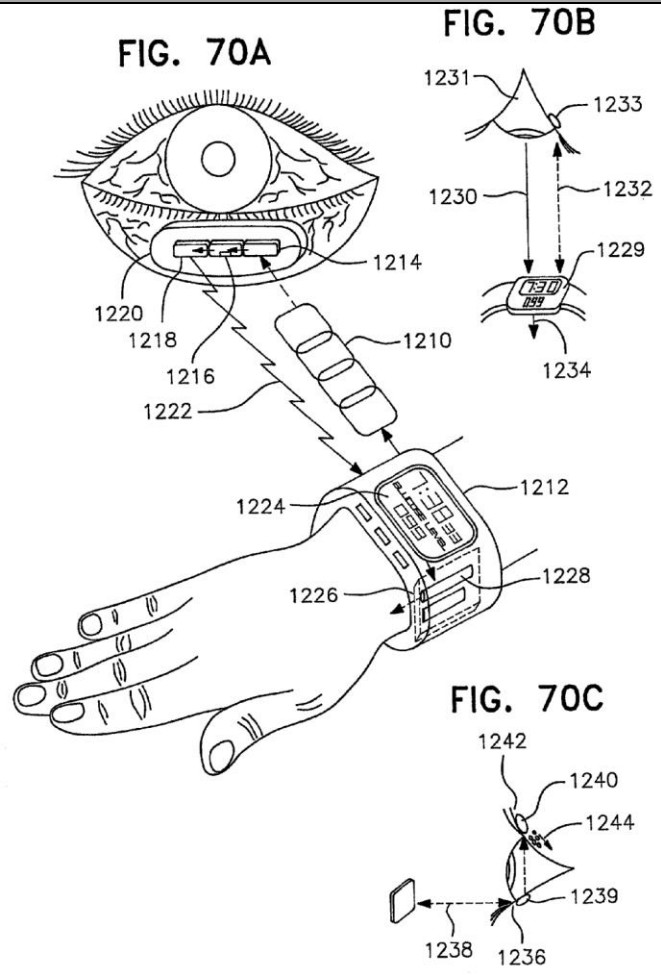
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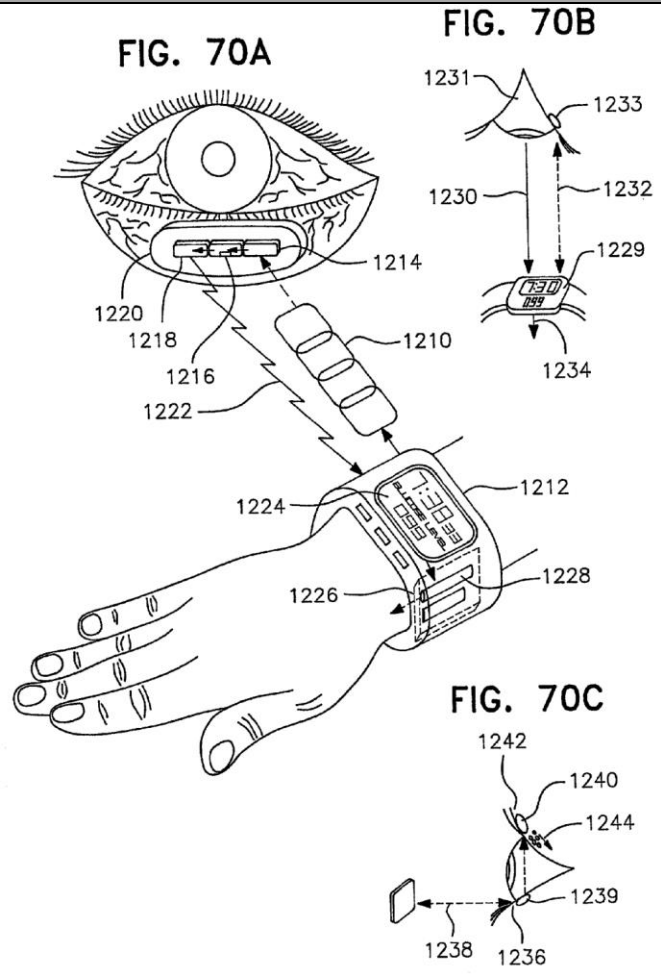
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7[q]. wherein the one or more display output devices are located remotely from the host.	Abreu discloses or renders obvious the one or more display output devices are located remotely from the host. Utilization of a contact device placed on the eye in order to detect physical and chemical parameters of the body as well as the non-invasive delivery of compounds according to these physical and chemical parameters, with signals being transmitted continuously as electromagnetic waves, radio waves, infrared and the like. One of the parameters to be detected includes non-invasive blood analysis utilizing chemical changes and chemical products that are found in the conjunctiva and in the tear film. A transensor mounted in the contact device laying on the cornea or the surface of the eye is capable of evaluating and measuring physical and chemical parameters in the eye including non-invasive blood analysis. The system utilizes eye lid motion and/or closure of the eye lid to activate a microminiature radio frequency sensitive transensor mounted in the contact device. The signal can be communicated by wires or radio telemetered to an externally placed receiver. The signal can then be processed, analyzed and stored. Several parameters can be detected including a complete non-invasive analysis of blood components, measurement of systemic and ocular blood flow, measurement of heart rate and respiratory rate, tracking operations, detection of ovulation, detection of radiation and drug effects, diagnosis of ocular and systemic disorders and the like. Abreu at Abstract An alternative embodiment of the present invention will now be described. The apparatus and method is based on a different and novel concept originated by the inventor in which a transensor mounted in the contact device laying on the cornea or the surface of the eye is capable of evaluating and measuring physical and chemical parameters in the eye including non-invasive blood analysis. The alternative embodiment preferably utilizes a transensor mounted in the contact device which is preferably laying in contact with the cornea and is preferably activated by the process of eye lid motion and/or closure of the eye lid. The system preferably utilizes eye lid motion and/or closure of the eye lid to activate a microminiature radio frequency sensitive transensor mounted in the contact device. The signal can be communicated by cable, but is preferably actively or passively radio telemetered to an externally placed receiver. The signal can then be processed, analyzed and stored.

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Omni MedSci Ex. 2002
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Claim 8	
8. The diagnostic system of claim 7, wherein the light source comprises a plurality of semiconductor diodes that are further coupled to a multiplexer capable of combining the plurality of semiconductor diodes and generating the input light beam comprising one or more wavelengths.	*See* claim 7 above. Abreu discloses or renders obvious the light source comprises a plurality of semiconductor diodes that are further coupled to a multiplexer capable of combining the plurality of semiconductor diodes and generating the input light beam comprising one or more wavelengths. It is an object of the present invention to address the above needs in the art and provide the accuracy and precision needed for clinical application by being able to eliminate or substantially reduce the sources of errors, interference, and variability found in the prior art. By greatly reducing or eliminating the interfering constituents and providing a much higher signal to noise ratio, the present invention can provide the answers and results needed for accurate and precise measurement of chemical components in vivo using optical means such as infrared spectroscopy. Moreover, the apparatus and methods of the present invention by enhancing the signal allows clinical useful readings to be obtained with various techniques and using different types of electromagnetic radiation. Besides near-infrared spectroscopy, the present invention provides superior results and higher signal to noise ratio when using any other form of electromagnetic radiation such as for example mid-infrared radiation, radio wave impedance, photoacoustic spectroscopy, Raman spectroscopy, visible spectroscopy, ultraviolet spectroscopy, fluorescent spectroscopy, scattering spectroscopy, and optical rotation of polarized light as well as other techniques such as fluorescent (including Maillard reaction, light induced fluorescence, and induction of glucose fluorescence by ultraviolet light), colorimetric, refractive index, light reflection, thermal gradient, Attenuated Total Internal Reflection, molecular imprinting, and the like. Abreu at [0276] The method and apparatus of the present invention include for example glucose measurement in the near infrared wavelength region between 750 and 3000 nm and preferably in the region where the highest absorption peaks are known to occur, for glucose for example in the region between 2080 to 2200 nm and for cholesterol centered around 2300 nm. The spectral region can also include infrared or visible wavelength to detect other chemical substances besides glucose or cholesterol. Abreu at [0294]

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

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	Melanin is a cromophore and there is some amount of melanin in the skin of all normal individuals, with the exception of pathologic status as in complete albinos. The skin with melanin absorbs near-infrared light which is the spectral region of interest in near-infrared spectroscopy and the region, for example, where glucose absorbs light. The present invention eliminates surface barriers and sources of error and variability such as melanin present in the skin and which varies from site to site and from individual to individual. Normal conjunctiva does not have melanin. Abreu at [0368] Substances of interest can include any substance present adjacent to the conjunctiva or surface of the eye which is capable of being analyzed by electromagnetic means. For example but not by way of limitation such substances can include any substance present in plasma such as molecular, chemical or cellular, and for example exogenous chemicals such as drugs and alcohol as well as endogenous chemicals such as glucose, oxygen, bicarbonate, cardiac markers, cancer markers, hormones, glutamate, urea, fatty acids, cholesterol, triglycerides, proteins, creatinine, aminoacids and the like and cellular constituents such as cancer cells, and the like. Values such as pH can also be calculated as pH can be related to light absorption using reflectance spectroscopy. Abreu at [0429] FIG. 85 shows a schematic block diagram of one preferred reflectance measuring apparatus of the present invention. The system includes a radiation source 2300 emitting preferably at least one near-infrared wavelength, but alternatively a plurality of different wavelengths can be used. The light source emits radiation 2302, preferably between 750 and 3000 nm, including a wavelength typical of the absorption spectrum for the substance of interest…. Abreu at [1077] A variety of radiation sources 2300 can be used in the present invention including LEDs with or without a spectral filter, a variety of lasers including diode lasers, halogen lights and white light sources having maximum output power in the near infrared region with or without a filter, and the like…. Abreu at [1085]

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Abreu
	The magnitude of the absorption peak is directly related to the concentration of glucose. Suitable analyzers include modified Fourier Transform Infrared (FTIR) spectrometers with chemometric software packages. Those are available from the PerkinElmer Corporation (Wellesley, Mass.) and Thermo Nicolet Company (Madison, Wis.). Abreu at [1103] FIG. 100(C) shows a schematic block diagram of one preferred far-infrared spectroscopy measuring apparatus of the present invention. The apparatus includes a thermal infrared detector 2654 which has a filter 2662 and a sensing element 2664 with said sensing element 2664 being preferably a thermopile and responding to thermal infrared radiation 2660 naturally emitted by the eye. A variety of infrared sensors responsive to thermal radiation can be used as sensor 2664 besides a thermopile, such as for example, optoelectronic sensors including thermistor-based infrared sensor, temperature sensitive resistor, pyroelectric sensors, and the like, and preferably thin membrane sensors. The detector 2654 faces the conjunctiva 2656 and if the face of the detector 2654 is encased by the housing 2652 material, said material is preferably transparent to infrared radiation. Abreu at [1159] For this exemplary measurement of glucose, wavelength centered around 9,400 nm (glucose band) was used. There is a prominent absorption peak of glucose around 9,400 nm due to the carbon-oxygen-carbon bond in its pyrane ring present in the glucose molecule. The contact device filter system allowed passage of the glucose band which is used as a reference measuring point while simultaneously measuring thermal energy absorption outside the glucose band. The thermal energy absorption in the glucose band by plasma glucose is spectroscopically determined by comparing the measured and predicted radiation at the conjunctival surface. Abreu at [1166] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Abreu
	incorporated by reference into this chart. To the extent this limitation is not disclosed by Abreu, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Abreu, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
Claim 9	
9. The diagnostic system of claim 7, wherein at least the portion of the input light beam is adapted for use in a diagnostics to measure a property of the blood, wherein the diagnostics comprise a spectroscopic procedure, wherein the spectroscopic procedure is based at least in part on a comparison of amplitudes at a plurality of associated wavelengths transmitted or reflected from the blood.	*See* claim 7 above. Abreu discloses or renders obvious the portion of the input light beam is adapted for use in a diagnostics to measure a property of the blood, wherein the diagnostics comprise a spectroscopic procedure, wherein the spectroscopic procedure is based at least in part on a comparison of amplitudes at a plurality of associated wavelengths transmitted or reflected from the blood. It is an object of the present invention to address the above needs in the art and provide the accuracy and precision needed for clinical application by being able to eliminate or substantially reduce the sources of errors, interference, and variability found in the prior art. By greatly reducing or eliminating the interfering constituents and providing a much higher signal to noise ratio, the present invention can provide the answers and results needed for accurate and precise measurement of chemical components in vivo using optical means such as infrared spectroscopy. Moreover, the apparatus and methods of the present invention by enhancing the signal allows clinical useful readings to be obtained with various techniques and using different types of electromagnetic radiation. Besides near-infrared spectroscopy, the present invention provides superior results and higher signal to noise ratio when using any other form of electromagnetic radiation such as for example mid-infrared radiation, radio wave impedance, photoacoustic spectroscopy, Raman spectroscopy, visible spectroscopy, ultraviolet spectroscopy, fluorescent spectroscopy, scattering spectroscopy, and optical rotation of polarized light as well as other techniques such as fluorescent (including Maillard reaction, light induced fluorescence, and induction of glucose fluorescence by ultraviolet light), colorimetric, refractive index, light reflection, thermal gradient, Attenuated Total Internal Reflection, molecular imprinting, and the like. Abreu at [0276] The method and apparatus of the present invention include for example glucose measurement in the near infrared wavelength region between 750 and 3000 nm and preferably in the region where the highest absorption peaks are known to occur, for glucose for example in the region between 2080 to 2200 nm and for cholesterol centered around 2300 nm. The spectral region can also include infrared or visible wavelength to detect other chemical substances besides glucose or cholesterol.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Abreu
	Abreu at [0294] Melanin is a cromophore and there is some amount of melanin in the skin of all normal individuals, with the exception of pathologic status as in complete albinos. The skin with melanin absorbs near-infrared light which is the spectral region of interest in near-infrared spectroscopy and the region, for example, where glucose absorbs light. The present invention eliminates surface barriers and sources of error and variability such as melanin present in the skin and which varies from site to site and from individual to individual. Normal conjunctiva does not have melanin. Abreu at [0368] Substances of interest can include any substance present adjacent to the conjunctiva or surface of the eye which is capable of being analyzed by electromagnetic means. For example but not by way of limitation such substances can include any substance present in plasma such as molecular, chemical or cellular, and for example exogenous chemicals such as drugs and alcohol as well as endogenous chemicals such as glucose, oxygen, bicarbonate, cardiac markers, cancer markers, hormones, glutamate, urea, fatty acids, cholesterol, triglycerides, proteins, creatinine, aminoacids and the like and cellular constituents such as cancer cells, and the like. Values such as pH can also be calculated as pH can be related to light absorption using reflectance spectroscopy. Abreu at [0429] FIG. 85 shows a schematic block diagram of one preferred reflectance measuring apparatus of the present invention. The system includes a radiation source 2300 emitting preferably at least one near-infrared wavelength, but alternatively a plurality of different wavelengths can be used. The light source emits radiation 2302, preferably between 750 and 3000 nm, including a wavelength typical of the absorption spectrum for the substance of interest…. Abreu at [1077] A variety of radiation sources 2300 can be used in the present invention including LEDs with or without a spectral filter, a variety of lasers including diode lasers, halogen lights and white light sources having maximum output power in the near infrared region with or without a filter, and the like….

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Abreu
	Abreu at [1085] The magnitude of the absorption peak is directly related to the concentration of glucose. Suitable analyzers include modified Fourier Transform Infrared (FTIR) spectrometers with chemometric software packages. Those are available from the PerkinElmer Corporation (Wellesley, Mass.) and Thermo Nicolet Company (Madison, Wis.). Abreu at [1103] FIG. 100(C) shows a schematic block diagram of one preferred far-infrared spectroscopy measuring apparatus of the present invention. The apparatus includes a thermal infrared detector 2654 which has a filter 2662 and a sensing element 2664 with said sensing element 2664 being preferably a thermopile and responding to thermal infrared radiation 2660 naturally emitted by the eye. A variety of infrared sensors responsive to thermal radiation can be used as sensor 2664 besides a thermopile, such as for example, optoelectronic sensors including thermistor-based infrared sensor, temperature sensitive resistor, pyroelectric sensors, and the like, and preferably thin membrane sensors. The detector 2654 faces the conjunctiva 2656 and if the face of the detector 2654 is encased by the housing 2652 material, said material is preferably transparent to infrared radiation. Abreu at [1159] For this exemplary measurement of glucose, wavelength centered around 9,400 nm (glucose band) was used. There is a prominent absorption peak of glucose around 9,400 nm due to the carbon-oxygen-carbon bond in its pyrane ring present in the glucose molecule. The contact device filter system allowed passage of the glucose band which is used as a reference measuring point while simultaneously measuring thermal energy absorption outside the glucose band. The thermal energy absorption in the glucose band by plasma glucose is spectroscopically determined by comparing the measured and predicted radiation at the conjunctival surface. Abreu at [1166] Radio wave impedance techniques can also be used and enhanced by the principles of the invention. Impedance is proportional to the differences in amplitude and phase of the wave compared to a reference

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Abreu
	wave. Radio waves promote excitation of molecular rotation. In reference to FIG. 103, the substance of interest 2350 interacts with the radio wave 2700 to attenuate the amplitude and shift the phase of the wave creating a resulting wave 2702. The resulting impedance 2702 is proportional to the concentration of the substance of interest 2350 which can be calculated using a conversion factor. Abreu at [1201] One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Abreu, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Abreu, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

EXHIBIT A9

U.S. Pat. No. 9,055,868 in view of U.S. Patent No. 6,602,191 to Roger Quy ("Quy")

As described in detail below, Quy (individually or collectively) anticipates and/or renders obvious claim 7-9 ("Asserted Claims") of U.S. Patent No. 9,055,868 B2 (the "'868 Patent") under 35 U.S.C. §102 and/or §103, either alone in combination with the knowledge of a person of ordinary skill, and/or additional prior art references discussed in discussed in Exhibits A1-A10, the contents of which are hereby incorporated by reference into this chart. One of ordinary skill in the art, as of the priority date of the '868 Patent, would have known to combine the prior art elements disclosed by the foregoing references using known methods, and to use these elements according to their established functions in order to achieve a known and predictable result. This invalidity claim chart is based on Defendants' present understanding of the Asserted Claims and Plaintiff's apparent construction of the Asserted Claims in its Preliminary Infringement Contentions ("Infringement Contentions").

The following invalidity chart includes references to the structure, function, operation, and/or features of the technology described in Quy. The cited portions of Quy are merely illustrative, and Defendants reserve the right to rely on alternative or additional evidence, including uncited portions of Quy. Where a particular figure is cited, the citation should be understood to encompass the caption and description of the figure as well as any text relating to or describing the figure. Conversely, where particular text referring to a figure is cited, the citation should be understood to include the figure as well. Although the documentation collectively evidences prior knowledge, use, or sale, Defendants reserve the right to rely upon individual documents as printed publications. Where the chart below states that Quy "describes" or "provides for" a limitation, such disclosure may be express, inherent, or implicit. To the extent it is found Quy does not expressly disclose certain limitations in the asserted claim, such limitations are inherent. Defendants reserve the right to present direct evidence of the structure, function, operation, and/or features of the technology described in Quy (including product samples, source code, and/or witness testimony) and/or its prior art status, and to present alternative or additional documents concerning the same as evidence that the technology described in Quy anticipates and/or renders obvious the Asserted Claims of the '868 Patent.

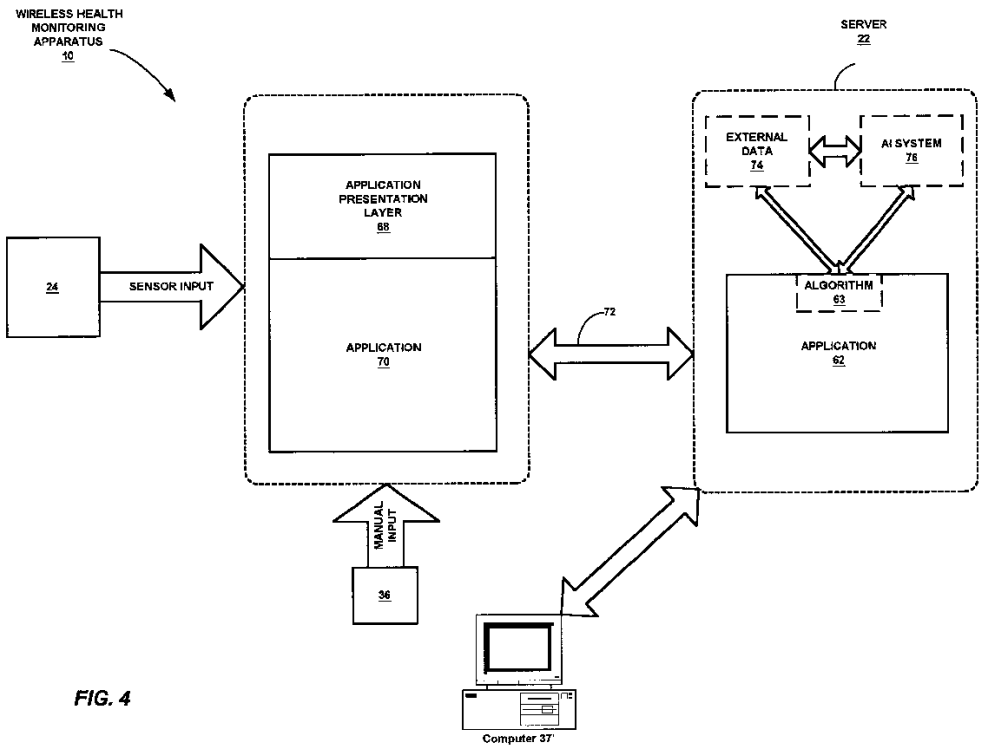
This chart is subject to all reservations, objections, and disclaimers in Defendants' Invalidity Contentions and any amendment, supplement, or modification thereof, which are incorporated herein by reference in their entirety. Nothing stated herein shall be treated as an admission or suggestion that Defendants agree with Plaintiff regarding the scope of the Asserted Claims, Plainitff's apparent claim constructions, or the accuracy of any particular claim construction. Defendants reserve all rights to challenge any of the claim terms herein under 35 U.S.C. § 112, including by arguing that they are indefinite, are not supported by the written description, and/or are not enabled. Defendants further reserve all rights to amend this invalidity claim chart without leave of court pursuant to the Court's Docket Control Order, or upon a showing of good cause.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

EXHIBIT A9

’868 Patent	Quy
Claim 7	
7[pre]. A diagnostic system comprising:	By providing this disclosure, Defendants do not take a position on whether the preamble is limiting. Quy discloses or renders obvious a diagnostic system. It will be understood that the above description of a “Method and Apparatus for Health and Disease Management Combining Patient Data Monitoring with Wireless Internet Connectivity” has been with respect to particular embodiments of the invention. While this description is fully capable of attaining the objects of the invention, it is understood that the same is merely representative of the broad scope of the invention envisioned, and that numerous variations of the above embodiments may be known or may become known or are obvious or may become obvious to one of ordinary skill in the art, and these variations are fully within the broad scope of the invention. For example, while certain wireless technologies have been described herein, other such wireless technologies may also be employed. Furthermore, while various types of medical devices have been mentioned, numerous other types may also be used in the embodiments of the invention, including pulse oximeters, syringe drivers, infusion pumps, spirometers, ventilators, anesthesia monitors, and so on. Accordingly, the scope of the invention is to be limited only by the claims appended hereto, and equivalents thereof. In these claims, a reference to an element in the singular is not intended to mean “one and only one” unless explicitly stated. Rather, the same is intended to mean “one or more”. All structural and functional equivalents to the elements of the above-described preferred embodiment that are known or later come to be known to those of ordinary skill in the art are expressly incorporated herein by reference and are intended to be encompassed by the present claims. Moreover, it is not necessary for a device or method to address each and every problem sought to be solved by the present invention, for it to be encompassed by the present claims. Furthermore, no element, component, or method step in the present invention is intended to be dedicated to the public regardless of whether the element, component, or method step is explicitly recited in the claims. No claim element herein is to be construed under the provisions of 35 U.S.C. §§112, ¶6, unless the element is expressly recited using the phrase “means for”. Quy at 12:51-13:22

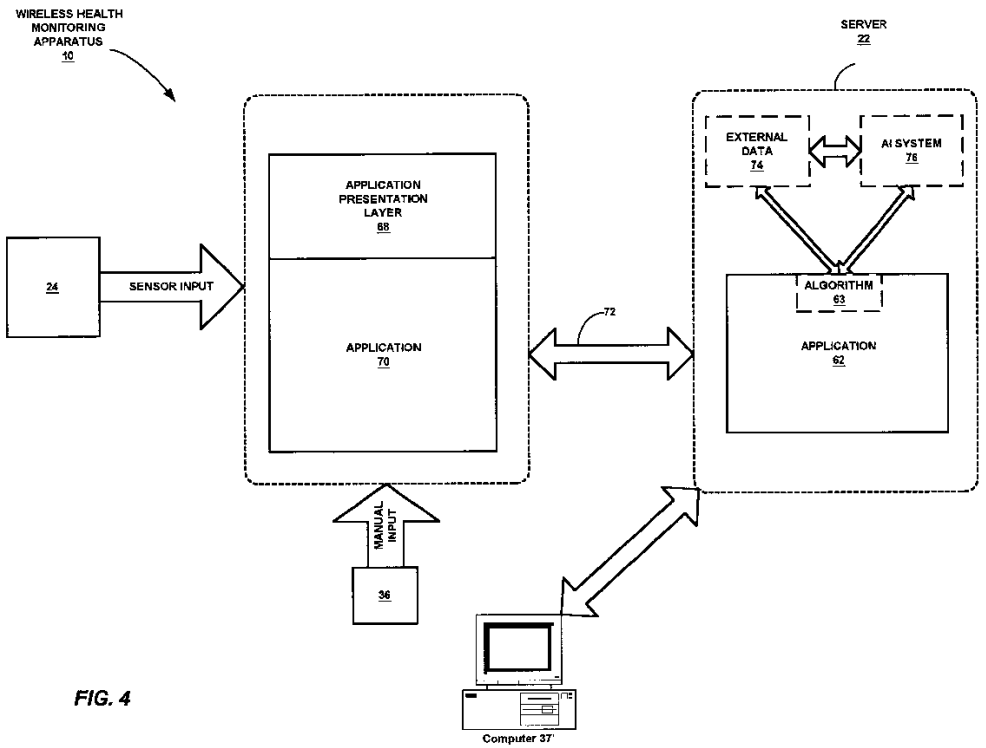
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Quy
	 *FIG. 4* Quy at Fig. 4 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Quy, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Quy, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[a]. a light source comprising:	Quy discloses or renders obvious a diagnostic system comprises a light source.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

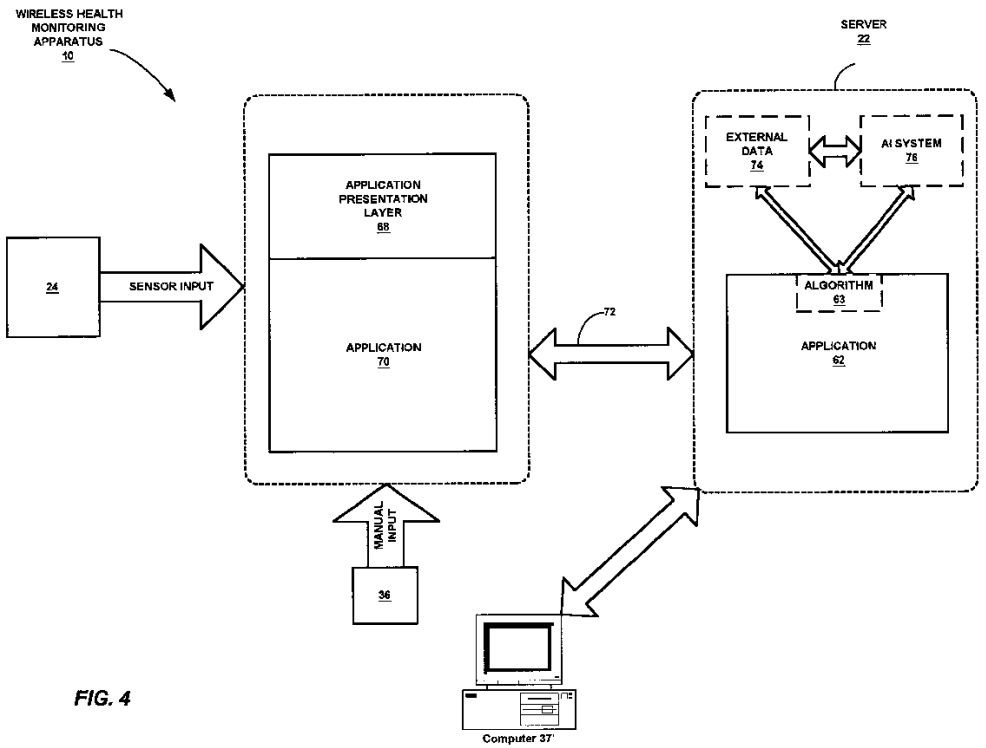
’868 Patent	Quy
	It will be understood that the above description of a “Method and Apparatus for Health and Disease Management Combining Patient Data Monitoring with Wireless Internet Connectivity” has been with respect to particular embodiments of the invention. While this description is fully capable of attaining the objects of the invention, it is understood that the same is merely representative of the broad scope of the invention envisioned, and that numerous variations of the above embodiments may be known or may become known or are obvious or may become obvious to one of ordinary skill in the art, and these variations are fully within the broad scope of the invention. For example, while certain wireless technologies have been described herein, other such wireless technologies may also be employed. Furthermore, while various types of medical devices have been mentioned, numerous other types may also be used in the embodiments of the invention, including pulse oximeters, syringe drivers, infusion pumps, spirometers, ventilators, anesthesia monitors, and so on. Accordingly, the scope of the invention is to be limited only by the claims appended hereto, and equivalents thereof. In these claims, a reference to an element in the singular is not intended to mean “one and only one” unless explicitly stated. Rather, the same is intended to mean “one or more”. All structural and functional equivalents to the elements of the above-described preferred embodiment that are known or later come to be known to those of ordinary skill in the art are expressly incorporated herein by reference and are intended to be encompassed by the present claims. Moreover, it is not necessary for a device or method to address each and every problem sought to be solved by the present invention, for it to be encompassed by the present claims. Furthermore, no element, component, or method step in the present invention is intended to be dedicated to the public regardless of whether the element, component, or method step is explicitly recited in the claims. No claim element herein is to be construed under the provisions of 35 U.S.C. §§112, ¶6, unless the element is expressly recited using the phrase “means for”. Quy at 12:51-13:22

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Quy
	 *FIG. 4* Quy at Fig. 4 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Quy, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Quy, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[b]. one or more semiconductor diodes	Quy discloses or renders obvious the light source comprises one or more semiconductor diodes generating an input light beam.

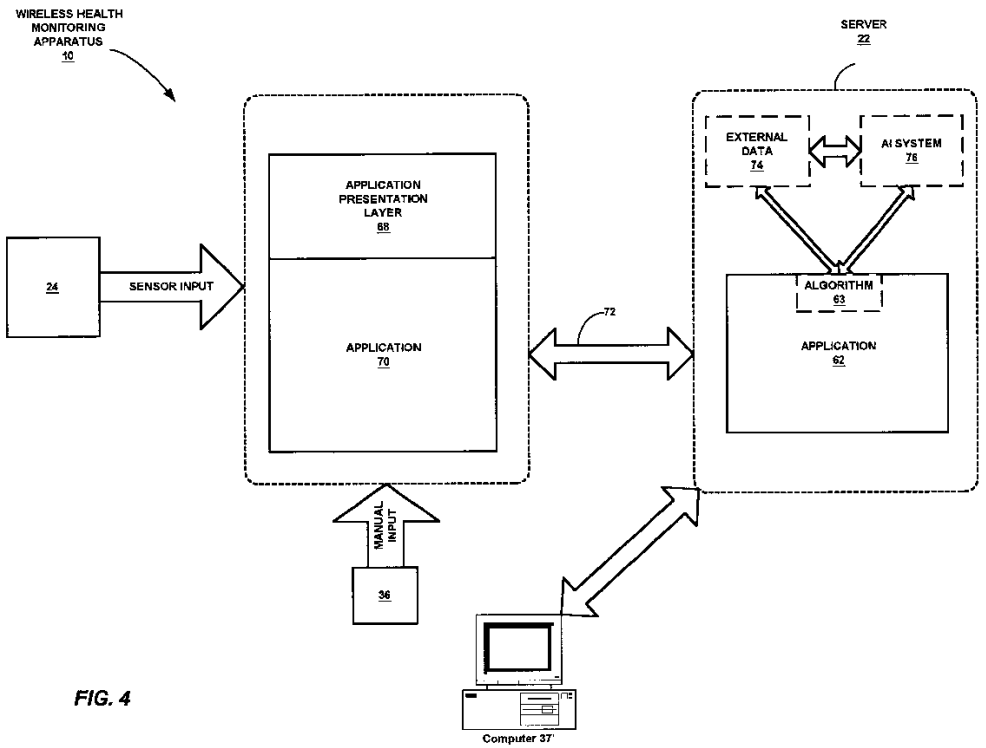
’868 Patent	Quy
generating an input light beam; and	It will be understood that the above description of a “Method and Apparatus for Health and Disease Management Combining Patient Data Monitoring with Wireless Internet Connectivity” has been with respect to particular embodiments of the invention. While this description is fully capable of attaining the objects of the invention, it is understood that the same is merely representative of the broad scope of the invention envisioned, and that numerous variations of the above embodiments may be known or may become known or are obvious or may become obvious to one of ordinary skill in the art, and these variations are fully within the broad scope of the invention. For example, while certain wireless technologies have been described herein, other such wireless technologies may also be employed. Furthermore, while various types of medical devices have been mentioned, numerous other types may also be used in the embodiments of the invention, including pulse oximeters, syringe drivers, infusion pumps, spirometers, ventilators, anesthesia monitors, and so on. Accordingly, the scope of the invention is to be limited only by the claims appended hereto, and equivalents thereof. In these claims, a reference to an element in the singular is not intended to mean “one and only one” unless explicitly stated. Rather, the same is intended to mean “one or more”. All structural and functional equivalents to the elements of the above-described preferred embodiment that are known or later come to be known to those of ordinary skill in the art are expressly incorporated herein by reference and are intended to be encompassed by the present claims. Moreover, it is not necessary for a device or method to address each and every problem sought to be solved by the present invention, for it to be encompassed by the present claims. Furthermore, no element, component, or method step in the present invention is intended to be dedicated to the public regardless of whether the element, component, or method step is explicitly recited in the claims. No claim element herein is to be construed under the provisions of 35 U.S.C. §§112, ¶6, unless the element is expressly recited using the phrase “means for”. Quy at 12:51-13:22

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Quy
	 *FIG. 4* Quy at Fig. 4 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Quy, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Quy, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[c]. a lens system configured to receive at least a portion of the input light	Quy discloses or renders obvious the light source comprises a lens system configured to receive at least a portion of the input light beam and to communicate at least the portion of the input light beam onto a part of a user's body comprising blood.

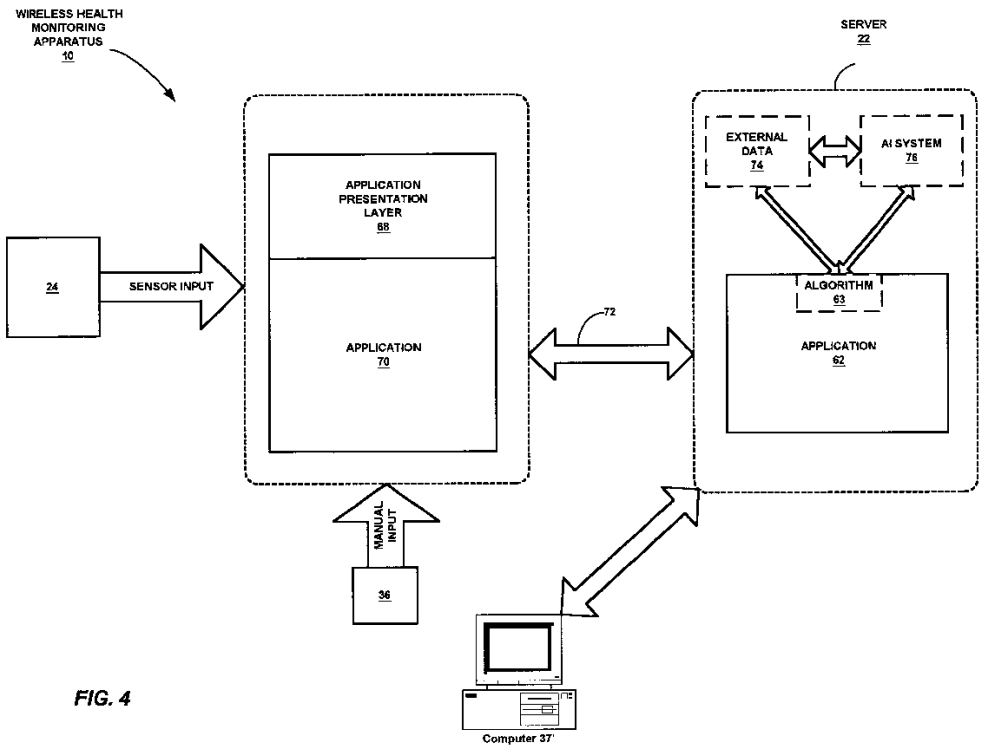
’868 Patent	Quy
beam and to communicate at least the portion of the input light beam onto a part of a user's body comprising blood	It will be understood that the above description of a “Method and Apparatus for Health and Disease Management Combining Patient Data Monitoring with Wireless Internet Connectivity” has been with respect to particular embodiments of the invention. While this description is fully capable of attaining the objects of the invention, it is understood that the same is merely representative of the broad scope of the invention envisioned, and that numerous variations of the above embodiments may be known or may become known or are obvious or may become obvious to one of ordinary skill in the art, and these variations are fully within the broad scope of the invention. For example, while certain wireless technologies have been described herein, other such wireless technologies may also be employed. Furthermore, while various types of medical devices have been mentioned, numerous other types may also be used in the embodiments of the invention, including pulse oximeters, syringe drivers, infusion pumps, spirometers, ventilators, anesthesia monitors, and so on. Accordingly, the scope of the invention is to be limited only by the claims appended hereto, and equivalents thereof. In these claims, a reference to an element in the singular is not intended to mean “one and only one” unless explicitly stated. Rather, the same is intended to mean “one or more”. All structural and functional equivalents to the elements of the above-described preferred embodiment that are known or later come to be known to those of ordinary skill in the art are expressly incorporated herein by reference and are intended to be encompassed by the present claims. Moreover, it is not necessary for a device or method to address each and every problem sought to be solved by the present invention, for it to be encompassed by the present claims. Furthermore, no element, component, or method step in the present invention is intended to be dedicated to the public regardless of whether the element, component, or method step is explicitly recited in the claims. No claim element herein is to be construed under the provisions of 35 U.S.C. §§112, ¶6, unless the element is expressly recited using the phrase “means for”. Quy at 12:51-13:22

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Quy
	 *FIG. 4* Quy at Fig. 4 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Quy, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Quy, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[d]. wherein at least the portion of the input light	Quy discloses or renders obvious the portion of the input light beam is used in a measurement on a user.

’868 Patent	Quy
beam is used in a measurement on a user;	It will be understood that the above description of a “Method and Apparatus for Health and Disease Management Combining Patient Data Monitoring with Wireless Internet Connectivity” has been with respect to particular embodiments of the invention. While this description is fully capable of attaining the objects of the invention, it is understood that the same is merely representative of the broad scope of the invention envisioned, and that numerous variations of the above embodiments may be known or may become known or are obvious or may become obvious to one of ordinary skill in the art, and these variations are fully within the broad scope of the invention. For example, while certain wireless technologies have been described herein, other such wireless technologies may also be employed. Furthermore, while various types of medical devices have been mentioned, numerous other types may also be used in the embodiments of the invention, including pulse oximeters, syringe drivers, infusion pumps, spirometers, ventilators, anesthesia monitors, and so on. Accordingly, the scope of the invention is to be limited only by the claims appended hereto, and equivalents thereof. In these claims, a reference to an element in the singular is not intended to mean “one and only one” unless explicitly stated. Rather, the same is intended to mean “one or more”. All structural and functional equivalents to the elements of the above-described preferred embodiment that are known or later come to be known to those of ordinary skill in the art are expressly incorporated herein by reference and are intended to be encompassed by the present claims. Moreover, it is not necessary for a device or method to address each and every problem sought to be solved by the present invention, for it to be encompassed by the present claims. Furthermore, no element, component, or method step in the present invention is intended to be dedicated to the public regardless of whether the element, component, or method step is explicitly recited in the claims. No claim element herein is to be construed under the provisions of 35 U.S.C. §§112, ¶6, unless the element is expressly recited using the phrase “means for”. Quy at 12:51-13:22

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

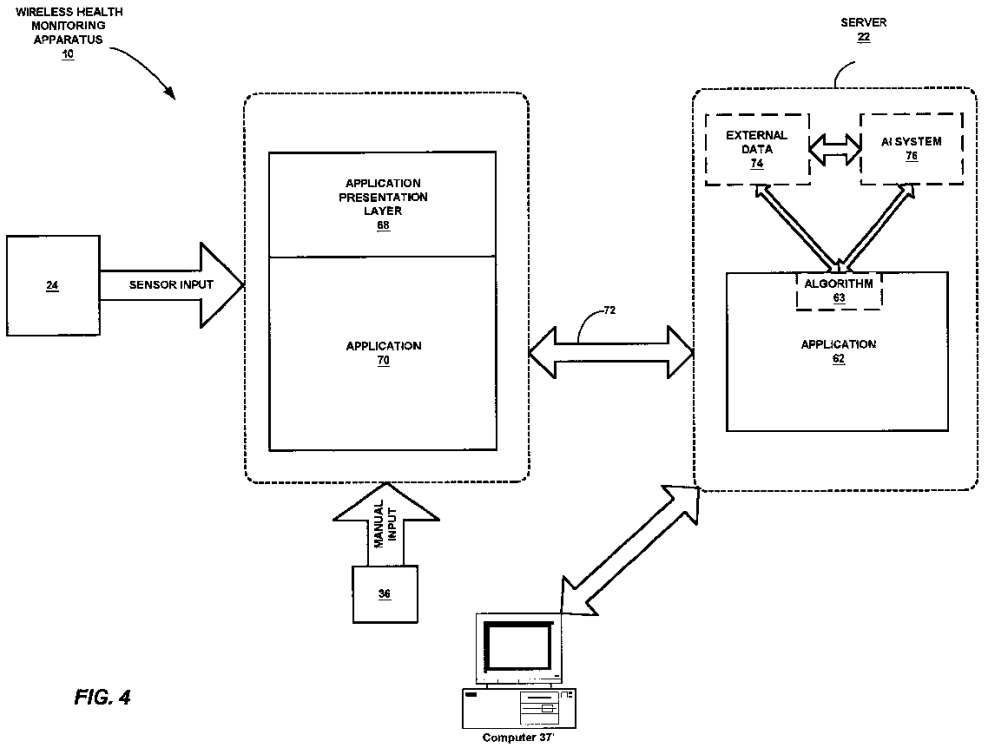
’868 Patent	Quy
	 *FIG. 4* Quy at Fig. 4 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Quy, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Quy, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[e]. a software application capable of generating data	Quy discloses or renders obvious a software application capable of generating data based at least in part on the measurement on the user.

’868 Patent	Quy
based at least in part on the measurement on the user,	In this way, the patient may be afforded a more convenient environment in which to manipulate data to supplement the data input to the WWD. The deployment of voice processing technology may be used to enable an even more convenient user interface: i.e., one to which patients can talk. Quy at 4:62-65 Referring to FIG. 3, WHMA 10 is shown communicating wirelessly with the Internet. In doing so, WHMA 10 generally sends a wireless signal to a base station 14 (in known fashion) that is connected to a server 18 that is in signal communication (in known fashion) with the internet. Server 18 communicates via a protocol (in known fashion) to Internet 20, which also communicates via a protocol (in known fashion) to a server 22 running an application 62. Server 22 may be accessed (in known fashion) by a client computer 44 through a connection 64. Quy at 7:41-50 Application 62 running on server 22 may interact with WHMA 10 in a number of ways. Referring to FIG. 4, WHMA 10 is shown in signal communication with server 22 via a connection 72. Connection 72 schematically represents the wireless Internet connection and intervening pathways. WHMA 10 includes an application that may be viewed as having two components: a base wireless or device application 70 and an application presentation layer or user interface 68. User interface 68 is employed to, e.g., present a menu of options to the user, to allow the user to choose inputs, and to generally operate the device. User interface 68 may vary widely in sophistication, e.g., from a simple data entry field to a full graphical user interface. These applications may accept as inputs data from a sensor 24 as well as from a manual input 36. Quy at 7:61-8:8 Server 22 has a base server application 62 with which the same calculates or provides a response based at least in part on data from WHMA 10. Application 62 may include an algorithm 63 for analyzing data from the HMD, and either application 62 or algorithm 63 may optionally access data from an external data source 74 and may further consult an artificial intelligence system 76. Quy at 8:9-14

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Quy
	External data source 74 may be a memory or disk or other such storage that stores health data, such as healthy and unhealthy weight/height ranges, healthy and unhealthy cholesterol counts, the patient's or subject's prior medical or health history, healthy and unhealthy blood pressure values, information corresponding to the caloric and other nutritional content of foods, information corresponding to the caloric expenditure values of various exercises, algorithms for calculating various health parameters, etc. In general, any data that may benefit the health of a subject or patient may be stored in external data source 74. External data source 74 may also include online access of health information from external web sites, ftp servers, or other sources. Quy at 8:15-27 It should also be noted that each of application 62, algorithm 63, external data source 74, or AI system 76, may physically reside on more than one server, e.g., on an array of servers for, e.g., storage or multiple processing purposes. Each of application 62, algorithm 63, external data source 74, or AI system 76, or combinations of each, may also respectively reside on different servers. Quy at 8:40-46 The extent to which server application 62 interacts with wireless application 70 depends on the use to which the system is put. For example, in a less interactive embodiment, device application 70 may act to measure a diabetic patient's blood glucose level and report the same to server application 62. In this case, a physician may simply review the measured value and send the patient an email reporting that the value is acceptable or not. In a highly interactive embodiment, a patient may have numerous HMDs 11 connected via optional adaptors to a WWD 12, and **wireless application 70 may correspondingly send a large amount of health data to server application 62**. The physician, accessing server application 62, may in turn send detailed care plans to a caregiver via connection 72. The received data may be analyzed using algorithm 63, external data source 74, and AI system 76. In this sense, the two applications may be highly interactive. Quy at 8:47-62 The program is started (step 142) and a sensor measures a health parameter (step 116). The sensor may send the parameter to a medical device (step 118). The medical device then sends the parameter to the WWD (step 120). The WWD then wirelessly communicates the parameter to the application server

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

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	(step 122), e.g., via the wireless web. The application server processes the parameter (step 124), and calculates or provides a response (step 126) based at least in part on the parameter. The application server may optionally employ algorithm 63 (step 125), external data (step 132) or an AI system (step 134) in the calculation. The application server then sends the response to the WWD (step 128), where the response is displayed (step 130). Quy at 9:23-35 FIG. 5 also shows a physician review and notification. In this option, the responses are displayed on a client computer (step 136) in signal communication with the application server. Quy at 9:56-59  *FIG. 4*

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	Quy at Fig. 4 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Quy, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Quy, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[f]. wherein the data represents at least in part physiological information associated with the user;	Quy discloses or renders obvious the data represents at least in part physiological information associated with the user. In this way, the patient may be afforded a more convenient environment in which to manipulate data to supplement the data input to the WWD. The deployment of voice processing technology may be used to enable an even more convenient user interface: i.e., one to which patients can talk. Quy at 4:62-65 Referring to FIG. 3, WHMA 10 is shown communicating wirelessly with the Internet. In doing so, WHMA 10 generally sends a wireless signal to a base station 14 (in known fashion) that is connected to a server 18 that is in signal communication (in known fashion) with the internet. Server 18 communicates via a protocol (in known fashion) to Internet 20, which also communicates via a protocol (in known fashion) to a server 22 running an application 62. Server 22 may be accessed (in known fashion) by a client computer 44 through a connection 64. Quy at 7:41-50 Application 62 running on server 22 may interact with WHMA 10 in a number of ways. Referring to FIG. 4, WHMA 10 is shown in signal communication with server 22 via a connection 72. Connection 72 schematically represents the wireless Internet connection and intervening pathways. WHMA 10 includes an application that may be viewed as having two components: a base wireless or device application 70 and an application presentation layer or user interface 68. User interface 68 is employed to, e.g., present a menu of options to the user, to allow the user to choose inputs, and to generally operate

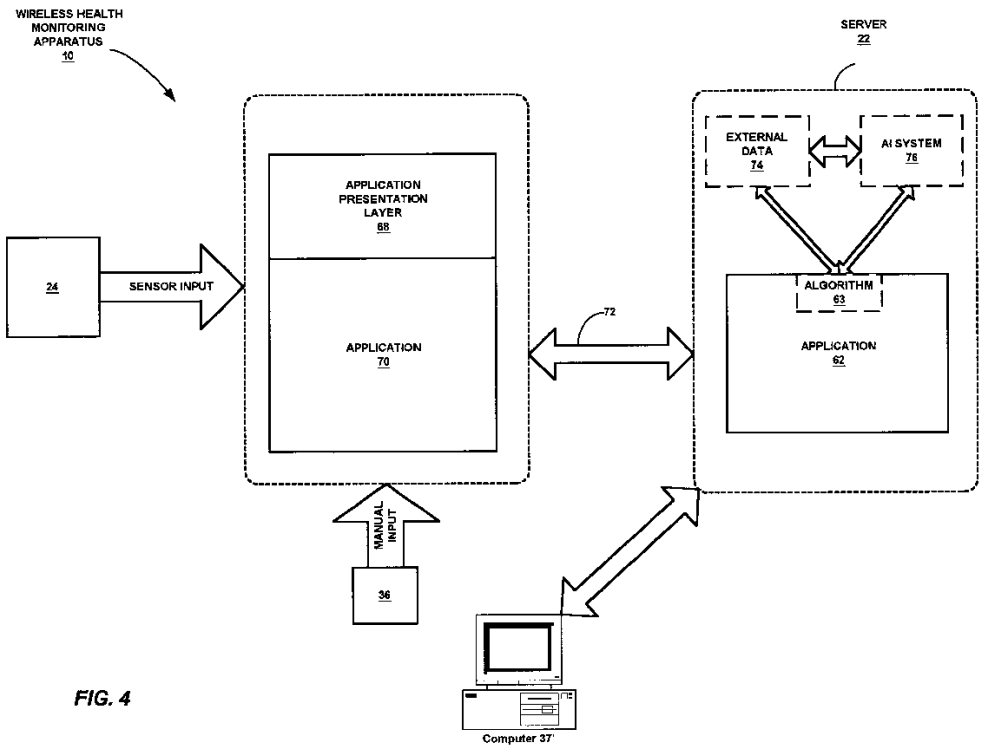
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

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	the device. User interface 68 may vary widely in sophistication, e.g., from a simple data entry field to a full graphical user interface. These applications may accept as inputs data from a sensor 24 as well as from a manual input 36. Quy at 7:61-8:8 Server 22 has a base server application 62 with which the same calculates or provides a response based at least in part on data from WHMA 10. Application 62 may include an algorithm 63 for analyzing data from the HMD, and either application 62 or algorithm 63 may optionally access data from an external data source 74 and may further consult an artificial intelligence system 76. Quy at 8:9-14 External data source 74 may be a memory or disk or other such storage that stores health data, such as healthy and unhealthy weight/height ranges, healthy and unhealthy cholesterol counts, the patient's or subject's prior medical or health history, healthy and unhealthy blood pressure values, information corresponding to the caloric and other nutritional content of foods, information corresponding to the caloric expenditure values of various exercises, algorithms for calculating various health parameters, etc. In general, any data that may benefit the health of a subject or patient may be stored in external data source 74. External data source 74 may also include online access of health information from external web sites, ftp servers, or other sources. Quy at 8:15-27 It should also be noted that each of application 62, algorithm 63, external data source 74, or AI system 76, may physically reside on more than one server, e.g., on an array of servers for, e.g., storage or multiple processing purposes. Each of application 62, algorithm 63, external data source 74, or AI system 76, or combinations of each, may also respectively reside on different servers. Quy at 8:40-46 The extent to which server application 62 interacts with wireless application 70 depends on the use to which the system is put. For example, in a less interactive embodiment, device application 70 may act to measure a diabetic patient's blood glucose level and report the same to server application 62. In this

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

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Omni MedSci Ex. 2002
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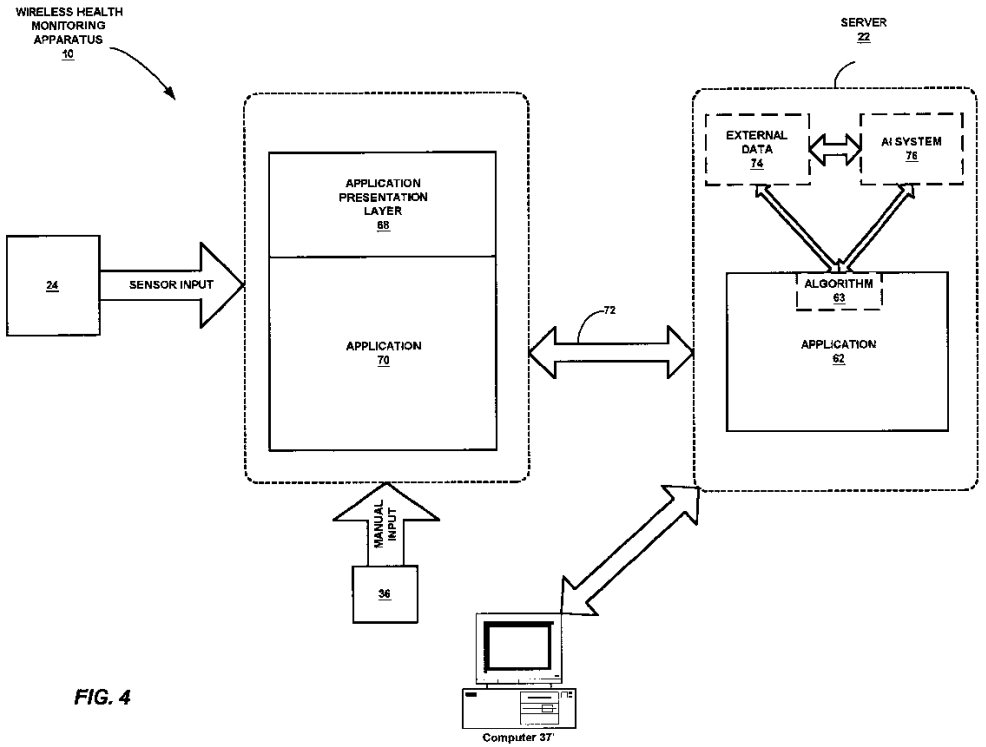
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7[g]. the software application capable of operating on a control	Quy discloses or renders obvious the software application capable of operating on a control system adapted to receive, store and process at least a portion of the physiological information.

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system adapted to receive, store and process at least a portion of the physiological information,	In this way, the patient may be afforded a more convenient environment in which to manipulate data to supplement the data input to the WWD. The deployment of voice processing technology may be used to enable an even more convenient user interface: i.e., one to which patients can talk. Quy at 4:62-65 Referring to FIG. 3, WHMA 10 is shown communicating wirelessly with the Internet. In doing so, WHMA 10 generally sends a wireless signal to a base station 14 (in known fashion) that is connected to a server 18 that is in signal communication (in known fashion) with the internet. Server 18 communicates via a protocol (in known fashion) to Internet 20, which also communicates via a protocol (in known fashion) to a server 22 running an application 62. Server 22 may be accessed (in known fashion) by a client computer 44 through a connection 64. Quy at 7:41-50 Application 62 running on server 22 may interact with WHMA 10 in a number of ways. Referring to FIG. 4, WHMA 10 is shown in signal communication with server 22 via a connection 72. Connection 72 schematically represents the wireless Internet connection and intervening pathways. WHMA 10 includes an application that may be viewed as having two components: a base wireless or device application 70 and an application presentation layer or user interface 68. User interface 68 is employed to, e.g., present a menu of options to the user, to allow the user to choose inputs, and to generally operate the device. User interface 68 may vary widely in sophistication, e.g., from a simple data entry field to a full graphical user interface. These applications may accept as inputs data from a sensor 24 as well as from a manual input 36. Quy at 7:61-8:8 Server 22 has a base server application 62 with which the same calculates or provides a response based at least in part on data from WHMA 10. Application 62 may include an algorithm 63 for analyzing data from the HMD, and either application 62 or algorithm 63 may optionally access data from an external data source 74 and may further consult an artificial intelligence system 76. Quy at 8:9-14

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

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Omni MedSci Ex. 2002
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7[h]. the control system having a touch-screen, circuitry for obtaining position information from a location sensor, and	Quy discloses or renders obvious the control system having a touch-screen, circuitry for obtaining position information from a location sensor. In this way, the patient may be afforded a more convenient environment in which to manipulate data to supplement the data input to the WWD. The deployment of voice processing technology may be used to enable an even more convenient user interface: i.e., one to which patients can talk. Quy at 4:62-65 Referring to FIG. 3, WHMA 10 is shown communicating wirelessly with the Internet. In doing so, WHMA 10 generally sends a wireless signal to a base station 14 (in known fashion) that is connected to a server 18 that is in signal communication (in known fashion) with the internet. Server 18 communicates via a protocol (in known fashion) to Internet 20, which also communicates via a protocol (in known fashion) to a server 22 running an application 62. Server 22 may be accessed (in known fashion) by a client computer 44 through a connection 64. Quy at 7:41-50 Application 62 running on server 22 may interact with WHMA 10 in a number of ways. Referring to FIG. 4, WHMA 10 is shown in signal communication with server 22 via a connection 72. Connection 72 schematically represents the wireless Internet connection and intervening pathways. WHMA 10 includes an application that may be viewed as having two components: a base wireless or device application 70 and an application presentation layer or user interface 68. User interface 68 is employed to, e.g., present a menu of options to the user, to allow the user to choose inputs, and to generally operate

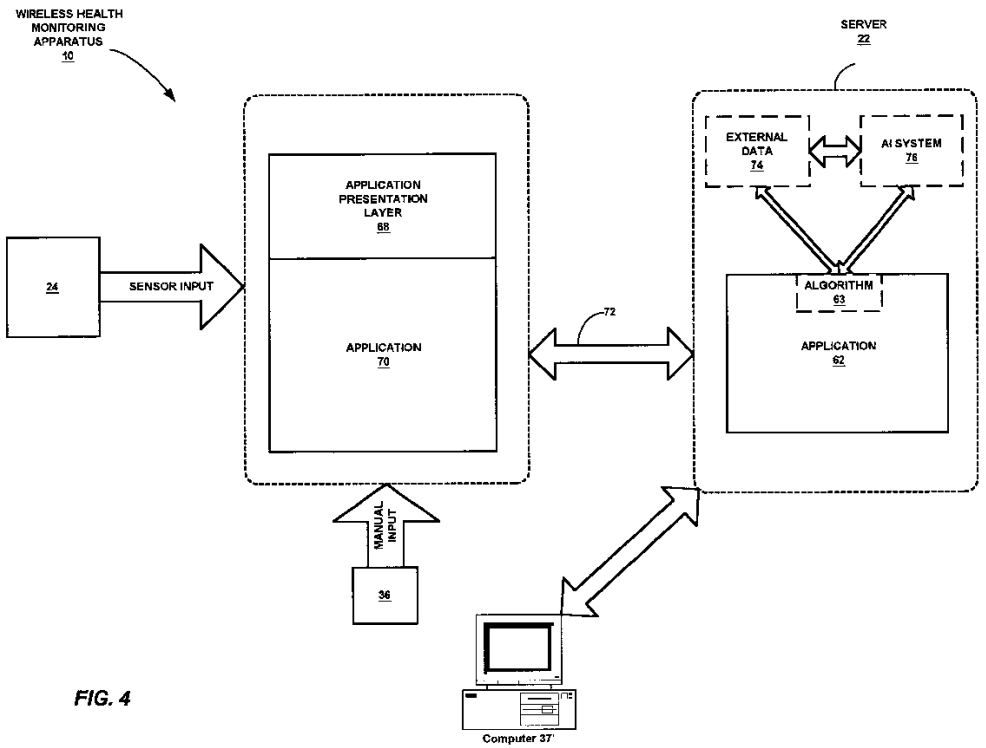
Omni MedSci Ex. 2002
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Omni MedSci Ex. 2002
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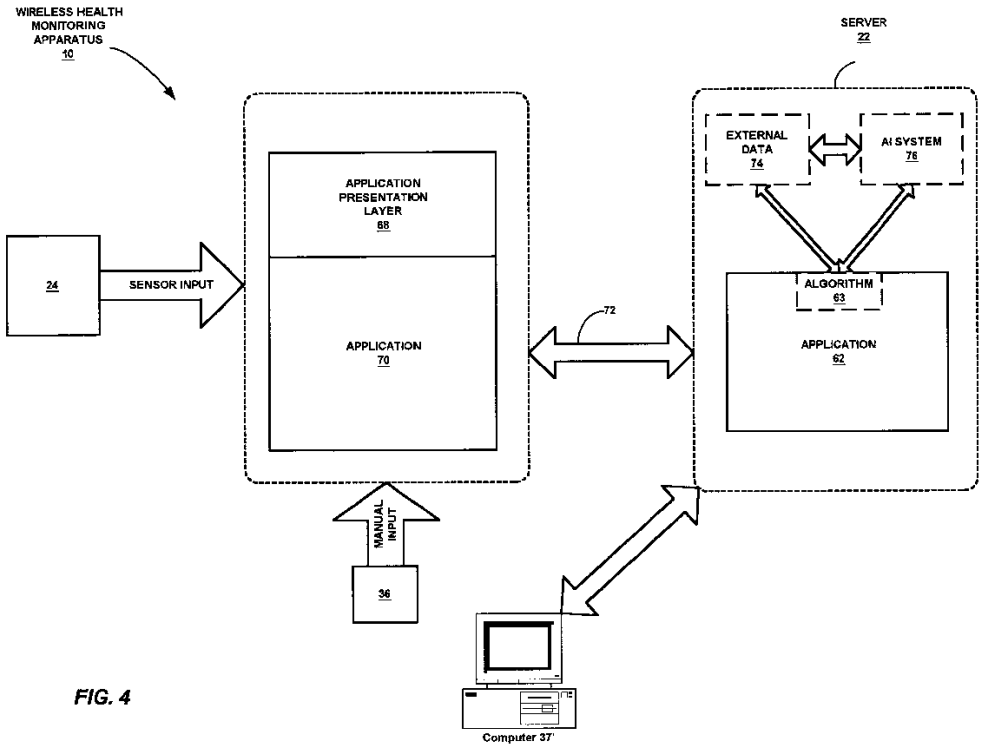
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	 FIG. 4 Quy at Fig. 4 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Quy, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Quy, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[i]. a wireless transceiver to transmit wireless data over a wireless link,	Quy discloses or renders obvious a wireless transceiver to transmit wireless data over a wireless link.

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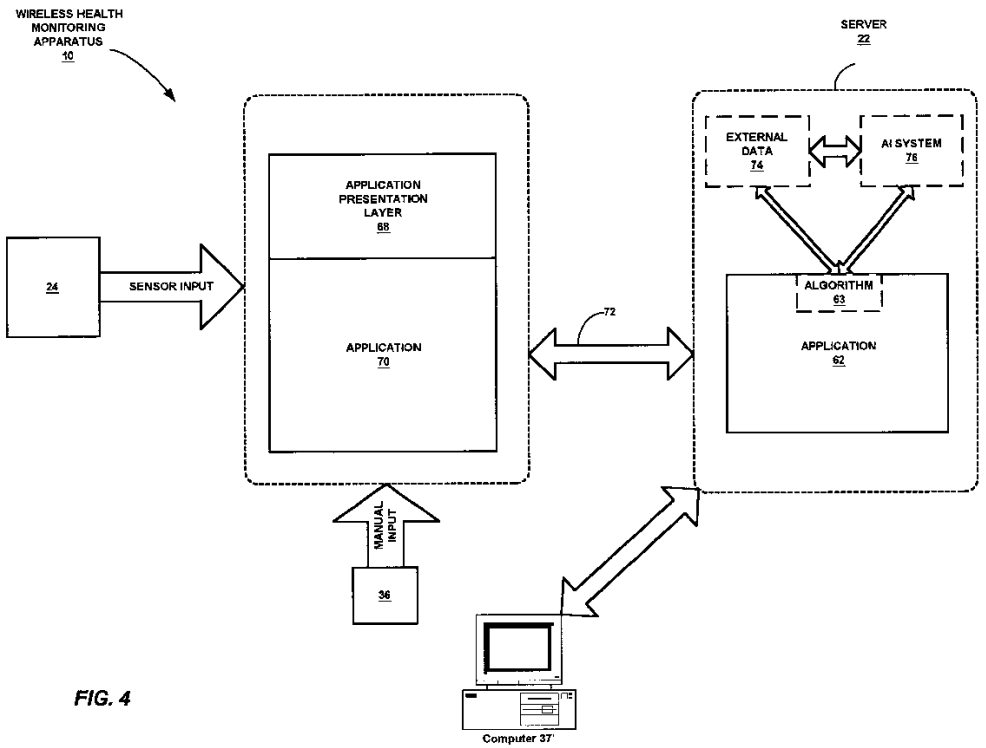
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7[j]. the wireless data comprising at least a part of the physiological information,	Quy discloses or renders obvious the wireless data comprising at least a part of the physiological information. In this way, the patient may be afforded a more convenient environment in which to manipulate data to supplement the data input to the WWD. The deployment of voice processing technology may be used to enable an even more convenient user interface: i.e., one to which patients can talk. Quy at 4:62-65 Referring to FIG. 3, WHMA 10 is shown communicating wirelessly with the Internet. In doing so, WHMA 10 generally sends a wireless signal to a base station 14 (in known fashion) that is connected to a server 18 that is in signal communication (in known fashion) with the internet. Server 18 communicates via a protocol (in known fashion) to Internet 20, which also communicates via a protocol (in known fashion) to a server 22 running an application 62. Server 22 may be accessed (in known fashion) by a client computer 44 through a connection 64. Quy at 7:41-50 Application 62 running on server 22 may interact with WHMA 10 in a number of ways. Referring to FIG. 4, WHMA 10 is shown in signal communication with server 22 via a connection 72. Connection 72 schematically represents the wireless Internet connection and intervening pathways. WHMA 10 includes an application that may be viewed as having two components: a base wireless or device application 70 and an application presentation layer or user interface 68. User interface 68 is employed to, e.g., present a menu of options to the user, to allow the user to choose inputs, and to generally operate

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	case, a physician may simply review the measured value and send the patient an email reporting that the value is acceptable or not. In a highly interactive embodiment, a patient may have numerous HMDs 11 connected via optional adaptors to a WWD 12, and **wireless application 70 may correspondingly send a large amount of health data to server application 62**. The physician, accessing server application 62, may in turn send detailed care plans to a caregiver via connection 72. The received data may be analyzed using algorithm 63, external data source 74, and AI system 76. In this sense, the two applications may be highly interactive. Quy at 8:47-62 The program is started (step 142) and a sensor measures a health parameter (step 116). The sensor may send the parameter to a medical device (step 118). The medical device then sends the parameter to the WWD (step 120). The WWD then wirelessly communicates the parameter to the application server (step 122), e.g., via the wireless web. The application server processes the parameter (step 124), and calculates or provides a response (step 126) based at least in part on the parameter. The application server may optionally employ algorithm 63 (step 125), external data (step 132) or an AI system (step 134) in the calculation. The application server then sends the response to the WWD (step 128), where the response is displayed (step 130). Quy at 9:23-35 FIG. 5 also shows a physician review and notification. In this option, the responses are displayed on a client computer (step 136) in signal communication with the application server. Quy at 9:56-59

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

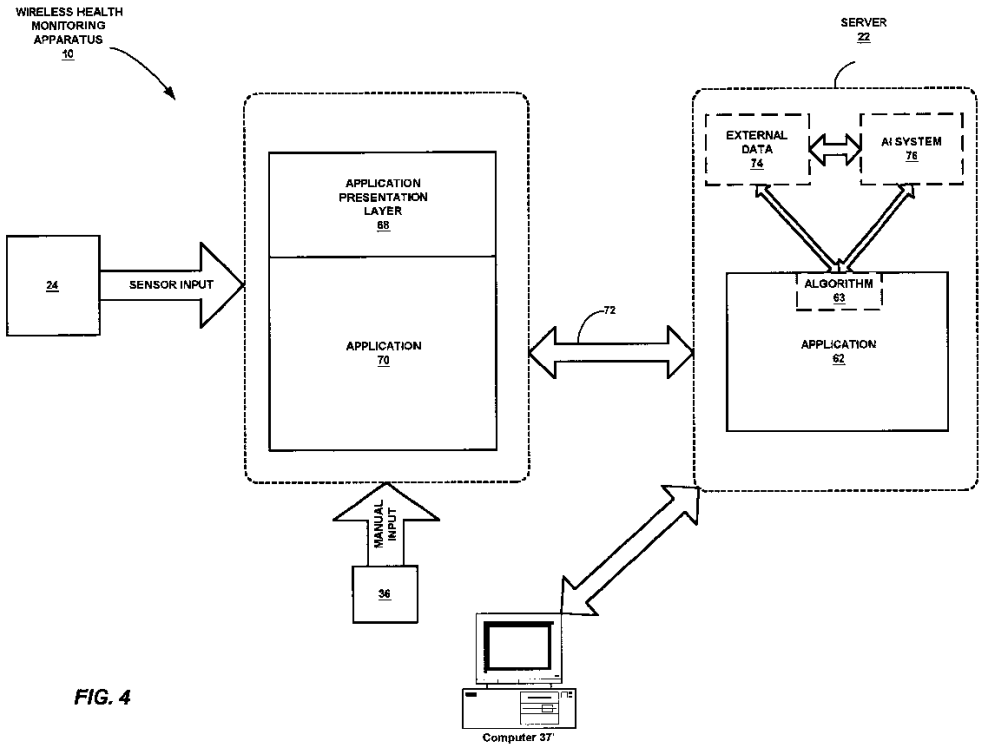
’868 Patent	Quy
	 *FIG. 4* Quy at Fig. 4 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Quy, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Quy, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[k]. wherein the control system is further capable of receiving voice input signals	Quy discloses or renders obvious the control system is further capable of receiving voice input signals and manually entered input signals.

’868 Patent	Quy
and manually entered input signals; and	In this way, the patient may be afforded a more convenient environment in which to manipulate data to supplement the data input to the WWD. The deployment of voice processing technology may be used to enable an even more convenient user interface: i.e., one to which patients can talk. Quy at 4:62-65 Referring to FIG. 3, WHMA 10 is shown communicating wirelessly with the Internet. In doing so, WHMA 10 generally sends a wireless signal to a base station 14 (in known fashion) that is connected to a server 18 that is in signal communication (in known fashion) with the internet. Server 18 communicates via a protocol (in known fashion) to Internet 20, which also communicates via a protocol (in known fashion) to a server 22 running an application 62. Server 22 may be accessed (in known fashion) by a client computer 44 through a connection 64. Quy at 7:41-50 Application 62 running on server 22 may interact with WHMA 10 in a number of ways. Referring to FIG. 4, WHMA 10 is shown in signal communication with server 22 via a connection 72. Connection 72 schematically represents the wireless Internet connection and intervening pathways. WHMA 10 includes an application that may be viewed as having two components: a base wireless or device application 70 and an application presentation layer or user interface 68. User interface 68 is employed to, e.g., present a menu of options to the user, to allow the user to choose inputs, and to generally operate the device. User interface 68 may vary widely in sophistication, e.g., from a simple data entry field to a full graphical user interface. These applications may accept as inputs data from a sensor 24 as well as from a manual input 36. Quy at 7:61-8:8 Server 22 has a base server application 62 with which the same calculates or provides a response based at least in part on data from WHMA 10. Application 62 may include an algorithm 63 for analyzing data from the HMD, and either application 62 or algorithm 63 may optionally access data from an external data source 74 and may further consult an artificial intelligence system 76. Quy at 8:9-14

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Quy
	External data source 74 may be a memory or disk or other such storage that stores health data, such as healthy and unhealthy weight/height ranges, healthy and unhealthy cholesterol counts, the patient's or subject's prior medical or health history, healthy and unhealthy blood pressure values, information corresponding to the caloric and other nutritional content of foods, information corresponding to the caloric expenditure values of various exercises, algorithms for calculating various health parameters, etc. In general, any data that may benefit the health of a subject or patient may be stored in external data source 74. External data source 74 may also include online access of health information from external web sites, ftp servers, or other sources. Quy at 8:15-27 It should also be noted that each of application 62, algorithm 63, external data source 74, or AI system 76, may physically reside on more than one server, e.g., on an array of servers for, e.g., storage or multiple processing purposes. Each of application 62, algorithm 63, external data source 74, or AI system 76, or combinations of each, may also respectively reside on different servers. Quy at 8:40-46 The extent to which server application 62 interacts with wireless application 70 depends on the use to which the system is put. For example, in a less interactive embodiment, device application 70 may act to measure a diabetic patient's blood glucose level and report the same to server application 62. In this case, a physician may simply review the measured value and send the patient an email reporting that the value is acceptable or not. In a highly interactive embodiment, a patient may have numerous HMDs 11 connected via optional adaptors to a WWD 12, and **wireless application 70 may correspondingly send a large amount of health data to server application 62**. The physician, accessing server application 62, may in turn send detailed care plans to a caregiver via connection 72. The received data may be analyzed using algorithm 63, external data source 74, and AI system 76. In this sense, the two applications may be highly interactive. Quy at 8:47-62 The program is started (step 142) and a sensor measures a health parameter (step 116). The sensor may send the parameter to a medical device (step 118). The medical device then sends the parameter to the WWD (step 120). The WWD then wirelessly communicates the parameter to the application server

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Quy
	(step 122), e.g., via the wireless web. The application server processes the parameter (step 124), and calculates or provides a response (step 126) based at least in part on the parameter. The application server may optionally employ algorithm 63 (step 125), external data (step 132) or an AI system (step 134) in the calculation. The application server then sends the response to the WWD (step 128), where the response is displayed (step 130). Quy at 9:23-35 FIG. 5 also shows a physician review and notification. In this option, the responses are displayed on a client computer (step 136) in signal communication with the application server. Quy at 9:56-59  *FIG. 4*

’868 Patent	Quy
	Quy at Fig. 4 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Quy, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Quy, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[l]. a host comprising:	Quy discloses or renders obvious the diagnostic system comprises a host. In this way, the patient may be afforded a more convenient environment in which to manipulate data to supplement the data input to the WWD. The deployment of voice processing technology may be used to enable an even more convenient user interface: i.e., one to which patients can talk. Quy at 4:62-65 Referring to FIG. 3, WHMA 10 is shown communicating wirelessly with the Internet. In doing so, WHMA 10 generally sends a wireless signal to a base station 14 (in known fashion) that is connected to a server 18 that is in signal communication (in known fashion) with the internet. Server 18 communicates via a protocol (in known fashion) to Internet 20, which also communicates via a protocol (in known fashion) to a server 22 running an application 62. Server 22 may be accessed (in known fashion) by a client computer 44 through a connection 64. Quy at 7:41-50 Application 62 running on server 22 may interact with WHMA 10 in a number of ways. Referring to FIG. 4, WHMA 10 is shown in signal communication with server 22 via a connection 72. Connection 72 schematically represents the wireless Internet connection and intervening pathways. WHMA 10 includes an application that may be viewed as having two components: a base wireless or device application 70 and an application presentation layer or user interface 68. User interface 68 is employed to, e.g., present a menu of options to the user, to allow the user to choose inputs, and to generally operate the device. User interface 68 may vary widely in sophistication, e.g., from a simple data entry field to

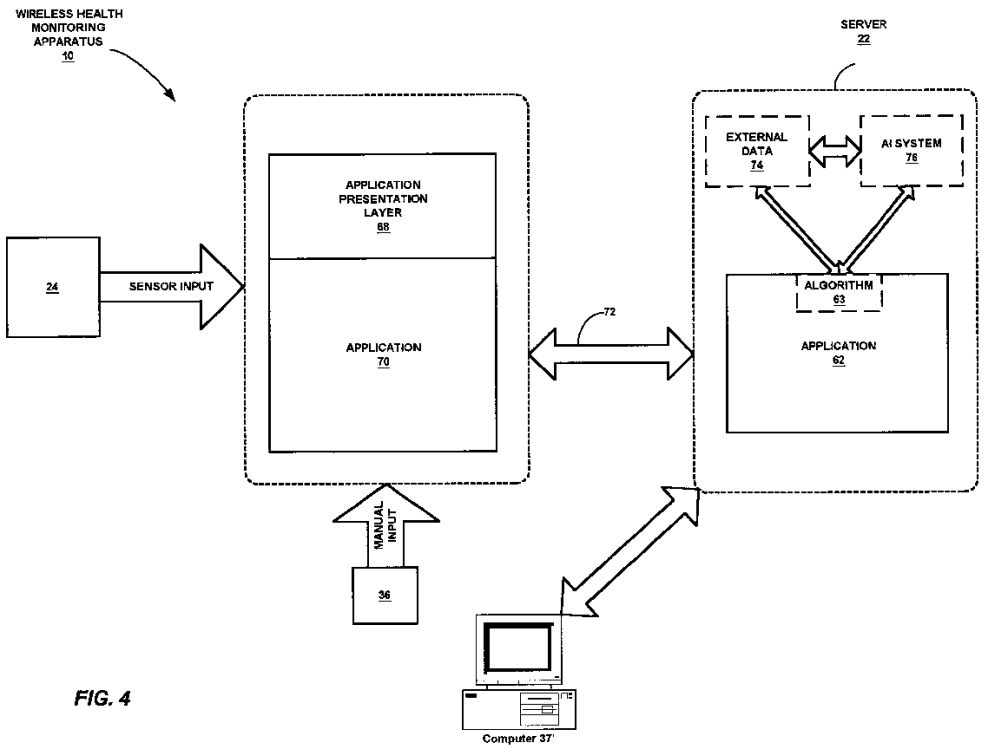
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Quy
	a full graphical user interface. These applications may accept as inputs data from a sensor 24 as well as from a manual input 36. Quy at 7:61-8:8 Server 22 has a base server application 62 with which the same calculates or provides a response based at least in part on data from WHMA 10. Application 62 may include an algorithm 63 for analyzing data from the HMD, and either application 62 or algorithm 63 may optionally access data from an external data source 74 and may further consult an artificial intelligence system 76. Quy at 8:9-14 External data source 74 may be a memory or disk or other such storage that stores health data, such as healthy and unhealthy weight/height ranges, healthy and unhealthy cholesterol counts, the patient's or subject's prior medical or health history, healthy and unhealthy blood pressure values, information corresponding to the caloric and other nutritional content of foods, information corresponding to the caloric expenditure values of various exercises, algorithms for calculating various health parameters, etc. In general, any data that may benefit the health of a subject or patient may be stored in external data source 74. External data source 74 may also include online access of health information from external web sites, ftp servers, or other sources. Quy at 8:15-27 It should also be noted that each of application 62, algorithm 63, external data source 74, or AI system 76, may physically reside on more than one server, e.g., on an array of servers for, e.g., storage or multiple processing purposes. Each of application 62, algorithm 63, external data source 74, or AI system 76, or combinations of each, may also respectively reside on different servers. Quy at 8:40-46 The extent to which server application 62 interacts with wireless application 70 depends on the use to which the system is put. For example, in a less interactive embodiment, device application 70 may act to measure a diabetic patient's blood glucose level and report the same to server application 62. In this case, a physician may simply review the measured value and send the patient an email reporting that

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Quy
	the value is acceptable or not. In a highly interactive embodiment, a patient may have numerous HMDs 11 connected via optional adaptors to a WWD 12, and **wireless application 70 may correspondingly send a large amount of health data to server application 62**. The physician, accessing server application 62, may in turn send detailed care plans to a caregiver via connection 72. The received data may be analyzed using algorithm 63, external data source 74, and AI system 76. In this sense, the two applications may be highly interactive. Quy at 8:47-62 The program is started (step 142) and a sensor measures a health parameter (step 116). The sensor may send the parameter to a medical device (step 118). The medical device then sends the parameter to the WWD (step 120). The WWD then wirelessly communicates the parameter to the application server (step 122), e.g., via the wireless web. The application server processes the parameter (step 124), and calculates or provides a response (step 126) based at least in part on the parameter. The application server may optionally employ algorithm 63 (step 125), external data (step 132) or an AI system (step 134) in the calculation. The application server then sends the response to the WWD (step 128), where the response is displayed (step 130). Quy at 9:23-35 FIG. 5 also shows a physician review and notification. In this option, the responses are displayed on a client computer (step 136) in signal communication with the application server. Quy at 9:56-59

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

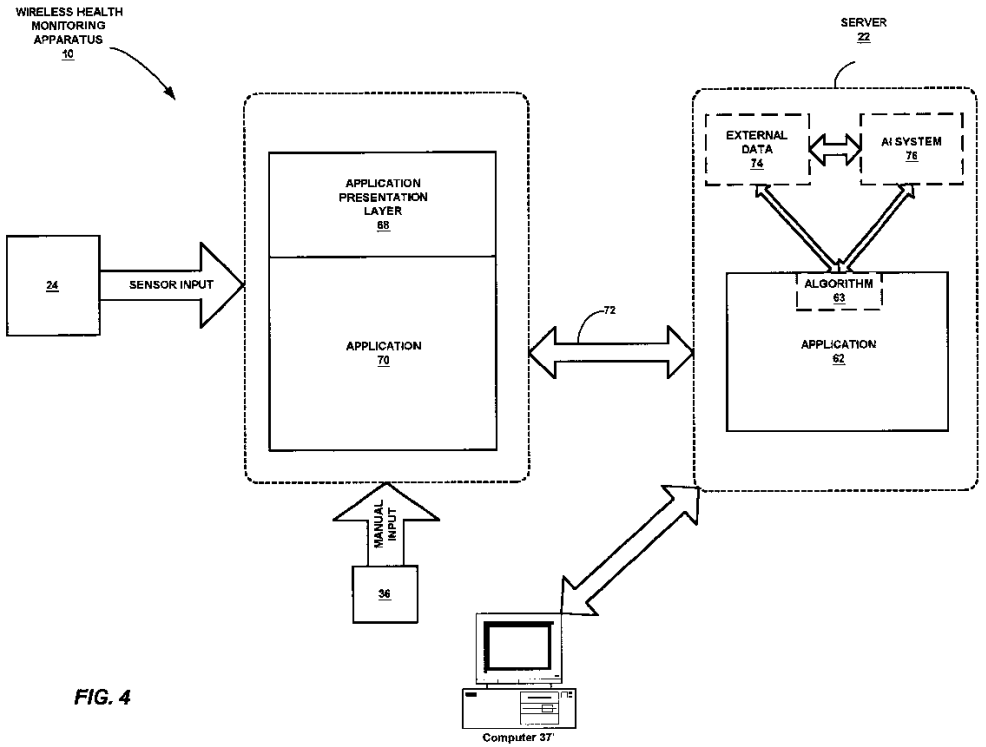
’868 Patent	Quy
	 *FIG. 4* Quy at Fig. 4 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Quy, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Quy, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[m]. a digital file for receiving and storing at least	Quy discloses or renders obvious the host comprises a digital file for receiving and storing at least a portion of the wireless data.

’868 Patent	Quy
a portion of the wireless data;	In this way, the patient may be afforded a more convenient environment in which to manipulate data to supplement the data input to the WWD. The deployment of voice processing technology may be used to enable an even more convenient user interface: i.e., one to which patients can talk. Quy at 4:62-65 Referring to FIG. 3, WHMA 10 is shown communicating wirelessly with the Internet. In doing so, WHMA 10 generally sends a wireless signal to a base station 14 (in known fashion) that is connected to a server 18 that is in signal communication (in known fashion) with the internet. Server 18 communicates via a protocol (in known fashion) to Internet 20, which also communicates via a protocol (in known fashion) to a server 22 running an application 62. Server 22 may be accessed (in known fashion) by a client computer 44 through a connection 64. Quy at 7:41-50 Application 62 running on server 22 may interact with WHMA 10 in a number of ways. Referring to FIG. 4, WHMA 10 is shown in signal communication with server 22 via a connection 72. Connection 72 schematically represents the wireless Internet connection and intervening pathways. WHMA 10 includes an application that may be viewed as having two components: a base wireless or device application 70 and an application presentation layer or user interface 68. User interface 68 is employed to, e.g., present a menu of options to the user, to allow the user to choose inputs, and to generally operate the device. User interface 68 may vary widely in sophistication, e.g., from a simple data entry field to a full graphical user interface. These applications may accept as inputs data from a sensor 24 as well as from a manual input 36. Quy at 7:61-8:8 Server 22 has a base server application 62 with which the same calculates or provides a response based at least in part on data from WHMA 10. Application 62 may include an algorithm 63 for analyzing data from the HMD, and either application 62 or algorithm 63 may optionally access data from an external data source 74 and may further consult an artificial intelligence system 76. Quy at 8:9-14

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

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Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

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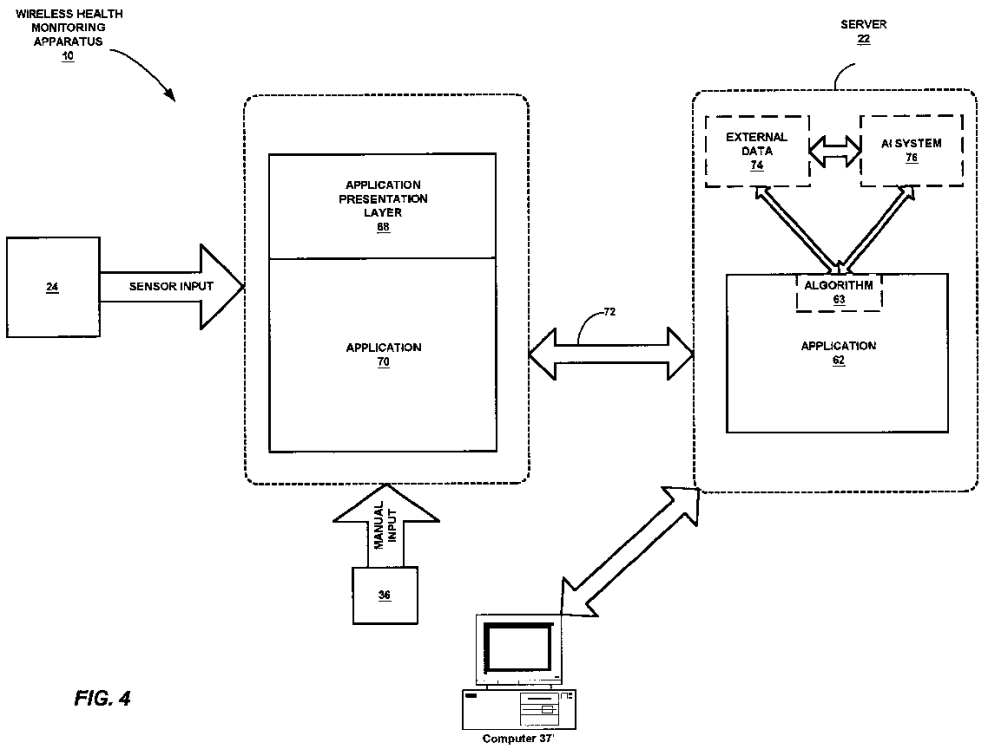
’868 Patent	Quy
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7[n]. control logic at the host to process at least the portion of the wireless data to generate a status of the user;	Quy discloses or renders obvious the host comprises control logic at the host to process at least the portion of the wireless data to generate a status of the user. In this way, the patient may be afforded a more convenient environment in which to manipulate data to supplement the data input to the WWD. The deployment of voice processing technology may be used to enable an even more convenient user interface: i.e., one to which patients can talk. Quy at 4:62-65 Referring to FIG. 3, WHMA 10 is shown communicating wirelessly with the Internet. In doing so, WHMA 10 generally sends a wireless signal to a base station 14 (in known fashion) that is connected to a server 18 that is in signal communication (in known fashion) with the internet. Server 18 communicates via a protocol (in known fashion) to Internet 20, which also communicates via a protocol (in known fashion) to a server 22 running an application 62. Server 22 may be accessed (in known fashion) by a client computer 44 through a connection 64. Quy at 7:41-50 Application 62 running on server 22 may interact with WHMA 10 in a number of ways. Referring to FIG. 4, WHMA 10 is shown in signal communication with server 22 via a connection 72. Connection 72 schematically represents the wireless Internet connection and intervening pathways. WHMA 10 includes an application that may be viewed as having two components: a base wireless or device application 70 and an application presentation layer or user interface 68. User interface 68 is employed to, e.g., present a menu of options to the user, to allow the user to choose inputs, and to generally operate

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

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Omni MedSci Ex. 2002
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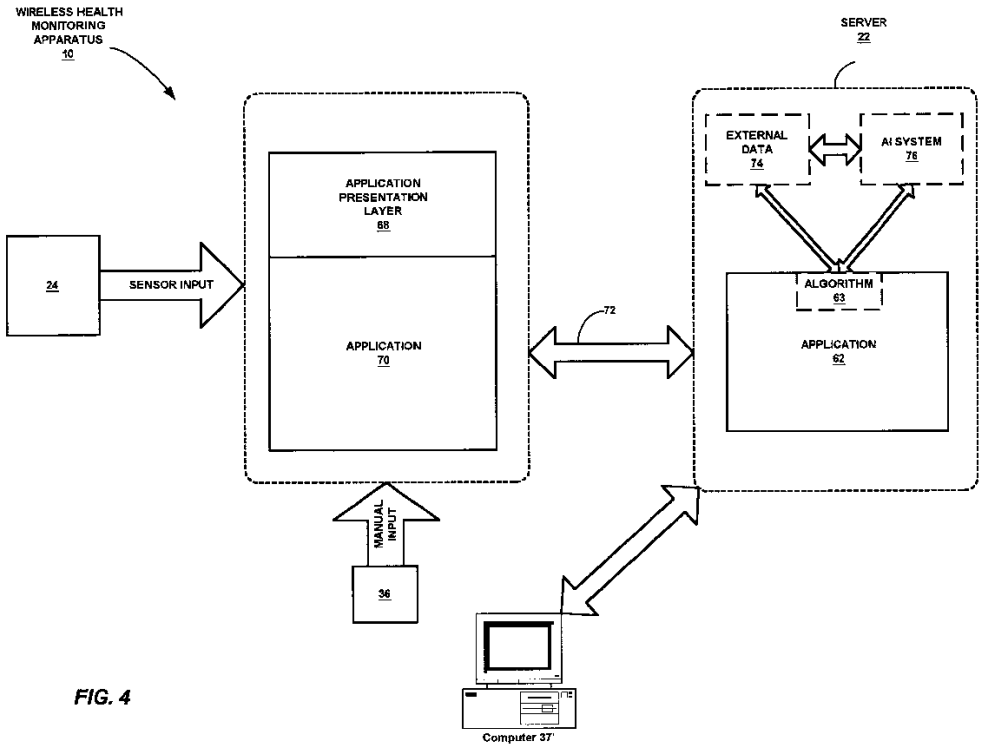
’868 Patent	Quy
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7[o]. a memory storage device for recording the status; and	Quy discloses or renders obvious the host comprises a memory storage device for recording the status.

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	In this way, the patient may be afforded a more convenient environment in which to manipulate data to supplement the data input to the WWD. The deployment of voice processing technology may be used to enable an even more convenient user interface: i.e., one to which patients can talk. Quy at 4:62-65 Referring to FIG. 3, WHMA 10 is shown communicating wirelessly with the Internet. In doing so, WHMA 10 generally sends a wireless signal to a base station 14 (in known fashion) that is connected to a server 18 that is in signal communication (in known fashion) with the internet. Server 18 communicates via a protocol (in known fashion) to Internet 20, which also communicates via a protocol (in known fashion) to a server 22 running an application 62. Server 22 may be accessed (in known fashion) by a client computer 44 through a connection 64. Quy at 7:41-50 Application 62 running on server 22 may interact with WHMA 10 in a number of ways. Referring to FIG. 4, WHMA 10 is shown in signal communication with server 22 via a connection 72. Connection 72 schematically represents the wireless Internet connection and intervening pathways. WHMA 10 includes an application that may be viewed as having two components: a base wireless or device application 70 and an application presentation layer or user interface 68. User interface 68 is employed to, e.g., present a menu of options to the user, to allow the user to choose inputs, and to generally operate the device. User interface 68 may vary widely in sophistication, e.g., from a simple data entry field to a full graphical user interface. These applications may accept as inputs data from a sensor 24 as well as from a manual input 36. Quy at 7:61-8:8 Server 22 has a base server application 62 with which the same calculates or provides a response based at least in part on data from WHMA 10. Application 62 may include an algorithm 63 for analyzing data from the HMD, and either application 62 or algorithm 63 may optionally access data from an external data source 74 and may further consult an artificial intelligence system 76. Quy at 8:9-14

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Quy
	External data source 74 may be a memory or disk or other such storage that stores health data, such as healthy and unhealthy weight/height ranges, healthy and unhealthy cholesterol counts, the patient's or subject's prior medical or health history, healthy and unhealthy blood pressure values, information corresponding to the caloric and other nutritional content of foods, information corresponding to the caloric expenditure values of various exercises, algorithms for calculating various health parameters, etc. In general, any data that may benefit the health of a subject or patient may be stored in external data source 74. External data source 74 may also include online access of health information from external web sites, ftp servers, or other sources. Quy at 8:15-27 It should also be noted that each of application 62, algorithm 63, external data source 74, or AI system 76, may physically reside on more than one server, e.g., on an array of servers for, e.g., storage or multiple processing purposes. Each of application 62, algorithm 63, external data source 74, or AI system 76, or combinations of each, may also respectively reside on different servers. Quy at 8:40-46 The extent to which server application 62 interacts with wireless application 70 depends on the use to which the system is put. For example, in a less interactive embodiment, device application 70 may act to measure a diabetic patient's blood glucose level and report the same to server application 62. In this case, a physician may simply review the measured value and send the patient an email reporting that the value is acceptable or not. In a highly interactive embodiment, a patient may have numerous HMDs 11 connected via optional adaptors to a WWD 12, and **wireless application 70 may correspondingly send a large amount of health data to server application 62**. The physician, accessing server application 62, may in turn send detailed care plans to a caregiver via connection 72. The received data may be analyzed using algorithm 63, external data source 74, and AI system 76. In this sense, the two applications may be highly interactive. Quy at 8:47-62 The program is started (step 142) and a sensor measures a health parameter (step 116). The sensor may send the parameter to a medical device (step 118). The medical device then sends the parameter to the WWD (step 120). The WWD then wirelessly communicates the parameter to the application server

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Quy
	(step 122), e.g., via the wireless web. The application server processes the parameter (step 124), and calculates or provides a response (step 126) based at least in part on the parameter. The application server may optionally employ algorithm 63 (step 125), external data (step 132) or an AI system (step 134) in the calculation. The application server then sends the response to the WWD (step 128), where the response is displayed (step 130). Quy at 9:23-35 FIG. 5 also shows a physician review and notification. In this option, the responses are displayed on a client computer (step 136) in signal communication with the application server. Quy at 9:56-59  *FIG. 4*

’868 Patent	Quy
	Quy at Fig. 4 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Quy, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Quy, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[p]. an output for communicating at least a portion of the status or associated information over a communication link to one or more display output devices,	Quy discloses or renders obvious the host comprises an output for communicating at least a portion of the status or associated information over a communication link to one or more display output devices, wherein the one or more display output devices are located remotely from the host. In this way, the patient may be afforded a more convenient environment in which to manipulate data to supplement the data input to the WWD. The deployment of voice processing technology may be used to enable an even more convenient user interface: i.e., one to which patients can talk. Quy at 4:62-65 Referring to FIG. 3, WHMA 10 is shown communicating wirelessly with the Internet. In doing so, WHMA 10 generally sends a wireless signal to a base station 14 (in known fashion) that is connected to a server 18 that is in signal communication (in known fashion) with the internet. Server 18 communicates via a protocol (in known fashion) to Internet 20, which also communicates via a protocol (in known fashion) to a server 22 running an application 62. Server 22 may be accessed (in known fashion) by a client computer 44 through a connection 64. Quy at 7:41-50 Application 62 running on server 22 may interact with WHMA 10 in a number of ways. Referring to FIG. 4, WHMA 10 is shown in signal communication with server 22 via a connection 72. Connection 72 schematically represents the wireless Internet connection and intervening pathways. WHMA 10 includes an application that may be viewed as having two components: a base wireless or device application 70 and an application presentation layer or user interface 68. User interface 68 is employed

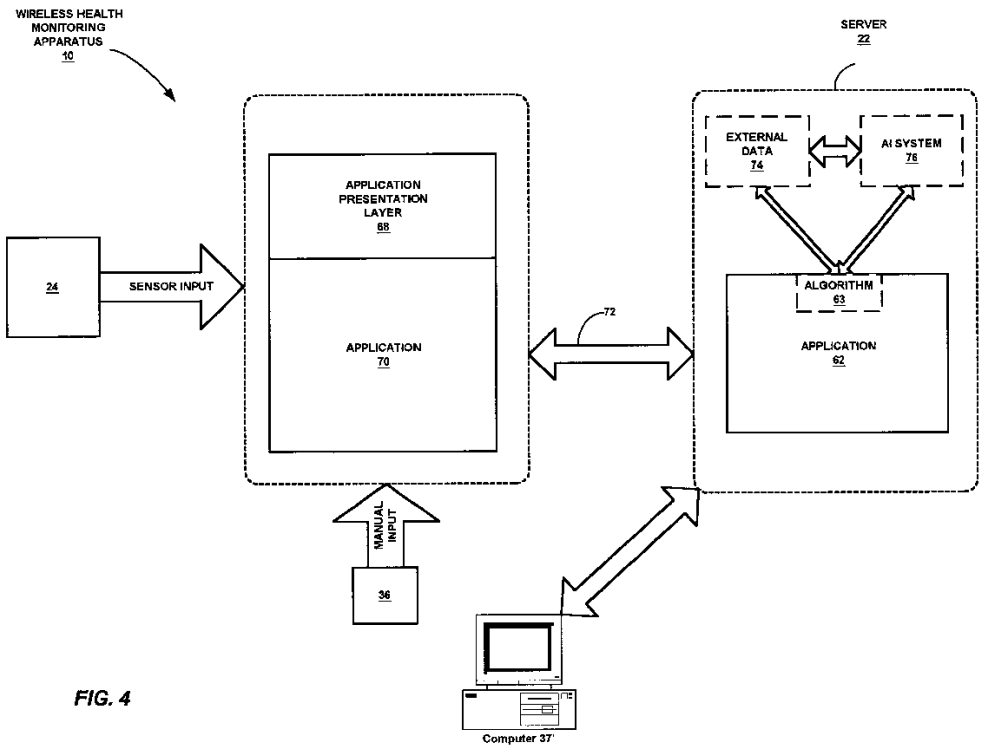
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Quy
	to, e.g., present a menu of options to the user, to allow the user to choose inputs, and to generally operate the device. User interface 68 may vary widely in sophistication, e.g., from a simple data entry field to a full graphical user interface. These applications may accept as inputs data from a sensor 24 as well as from a manual input 36. Quy at 7:61-8:8 Server 22 has a base server application 62 with which the same calculates or provides a response based at least in part on data from WHMA 10. Application 62 may include an algorithm 63 for analyzing data from the HMD, and either application 62 or algorithm 63 may optionally access data from an external data source 74 and may further consult an artificial intelligence system 76. Quy at 8:9-14 External data source 74 may be a memory or disk or other such storage that stores health data, such as healthy and unhealthy weight/height ranges, healthy and unhealthy cholesterol counts, the patient's or subject's prior medical or health history, healthy and unhealthy blood pressure values, information corresponding to the caloric and other nutritional content of foods, information corresponding to the caloric expenditure values of various exercises, algorithms for calculating various health parameters, etc. In general, any data that may benefit the health of a subject or patient may be stored in external data source 74. External data source 74 may also include online access of health information from external web sites, ftp servers, or other sources. Quy at 8:15-27 It should also be noted that each of application 62, algorithm 63, external data source 74, or AI system 76, may physically reside on more than one server, e.g., on an array of servers for, e.g., storage or multiple processing purposes. Each of application 62, algorithm 63, external data source 74, or AI system 76, or combinations of each, may also respectively reside on different servers. Quy at 8:40-46 The extent to which server application 62 interacts with wireless application 70 depends on the use to which the system is put. For example, in a less interactive embodiment, device application 70 may act

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Quy
	to measure a diabetic patient's blood glucose level and report the same to server application 62. In this case, a physician may simply review the measured value and send the patient an email reporting that the value is acceptable or not. In a highly interactive embodiment, a patient may have numerous HMDs 11 connected via optional adaptors to a WWD 12, and **wireless application 70 may correspondingly send a large amount of health data to server application 62**. The physician, accessing server application 62, may in turn send detailed care plans to a caregiver via connection 72. The received data may be analyzed using algorithm 63, external data source 74, and AI system 76. In this sense, the two applications may be highly interactive. Quy at 8:47-62 The program is started (step 142) and a sensor measures a health parameter (step 116). The sensor may send the parameter to a medical device (step 118). The medical device then sends the parameter to the WWD (step 120). The WWD then wirelessly communicates the parameter to the application server (step 122), e.g., via the wireless web. The application server processes the parameter (step 124), and calculates or provides a response (step 126) based at least in part on the parameter. The application server may optionally employ algorithm 63 (step 125), external data (step 132) or an AI system (step 134) in the calculation. The application server then sends the response to the WWD (step 128), where the response is displayed (step 130). Quy at 9:23-35 FIG. 5 also shows a physician review and notification. In this option, the responses are displayed on a client computer (step 136) in signal communication with the application server. Quy at 9:56-59

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

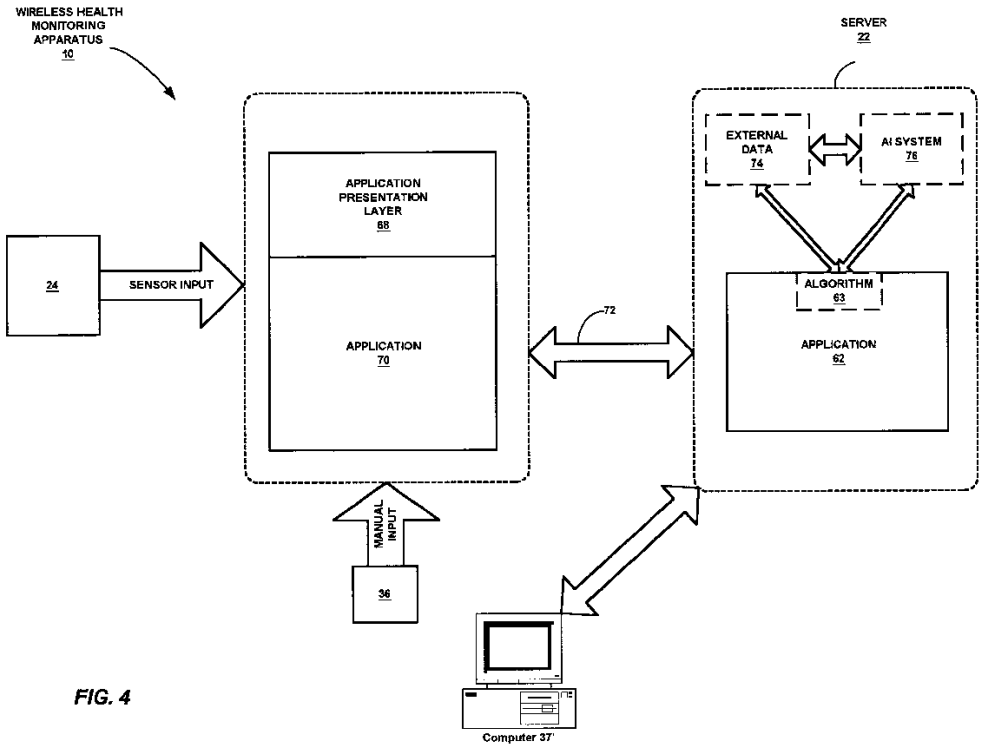
’868 Patent	Quy
	 *FIG. 4* Quy at Fig. 4 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Quy, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Quy, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[q]. wherein the one or more display output devices	Quy discloses or renders obvious the one or more display output devices are located remotely from the host.

’868 Patent	Quy
are located remotely from the host.	In this way, the patient may be afforded a more convenient environment in which to manipulate data to supplement the data input to the WWD. The deployment of voice processing technology may be used to enable an even more convenient user interface: i.e., one to which patients can talk. Quy at 4:62-65 Referring to FIG. 3, WHMA 10 is shown communicating wirelessly with the Internet. In doing so, WHMA 10 generally sends a wireless signal to a base station 14 (in known fashion) that is connected to a server 18 that is in signal communication (in known fashion) with the internet. Server 18 communicates via a protocol (in known fashion) to Internet 20, which also communicates via a protocol (in known fashion) to a server 22 running an application 62. Server 22 may be accessed (in known fashion) by a client computer 44 through a connection 64. Quy at 7:41-50 Application 62 running on server 22 may interact with WHMA 10 in a number of ways. Referring to FIG. 4, WHMA 10 is shown in signal communication with server 22 via a connection 72. Connection 72 schematically represents the wireless Internet connection and intervening pathways. WHMA 10 includes an application that may be viewed as having two components: a base wireless or device application 70 and an application presentation layer or user interface 68. User interface 68 is employed to, e.g., present a menu of options to the user, to allow the user to choose inputs, and to generally operate the device. User interface 68 may vary widely in sophistication, e.g., from a simple data entry field to a full graphical user interface. These applications may accept as inputs data from a sensor 24 as well as from a manual input 36. Quy at 7:61-8:8 Server 22 has a base server application 62 with which the same calculates or provides a response based at least in part on data from WHMA 10. Application 62 may include an algorithm 63 for analyzing data from the HMD, and either application 62 or algorithm 63 may optionally access data from an external data source 74 and may further consult an artificial intelligence system 76. Quy at 8:9-14

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

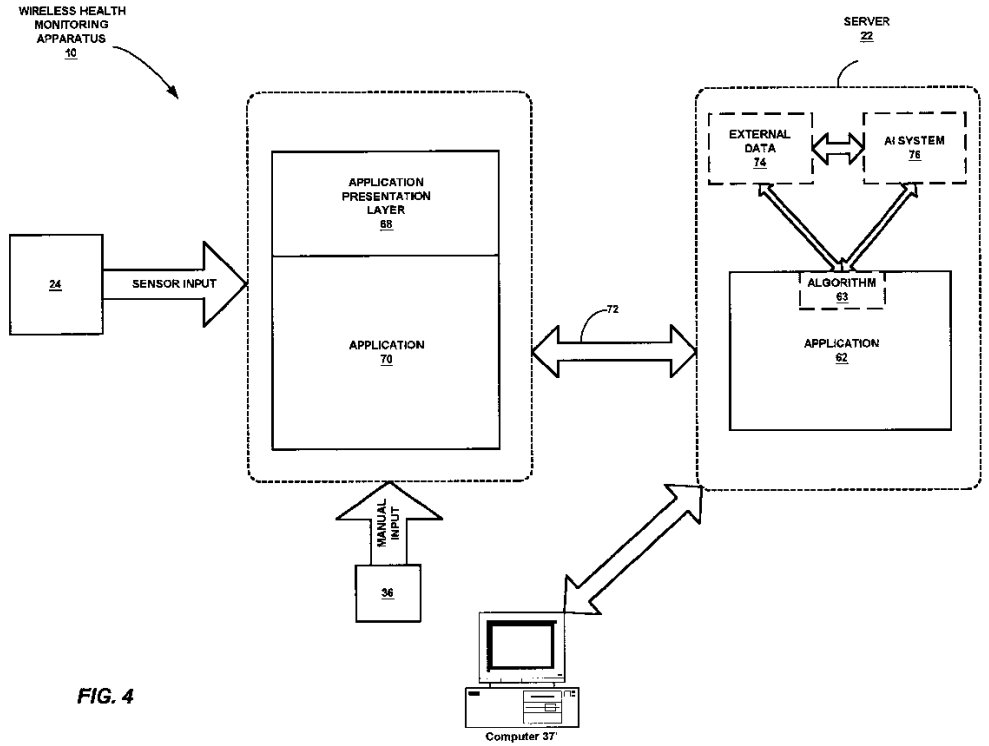
’868 Patent	Quy
	External data source 74 may be a memory or disk or other such storage that stores health data, such as healthy and unhealthy weight/height ranges, healthy and unhealthy cholesterol counts, the patient's or subject's prior medical or health history, healthy and unhealthy blood pressure values, information corresponding to the caloric and other nutritional content of foods, information corresponding to the caloric expenditure values of various exercises, algorithms for calculating various health parameters, etc. In general, any data that may benefit the health of a subject or patient may be stored in external data source 74. External data source 74 may also include online access of health information from external web sites, ftp servers, or other sources. Quy at 8:15-27 It should also be noted that each of application 62, algorithm 63, external data source 74, or AI system 76, may physically reside on more than one server, e.g., on an array of servers for, e.g., storage or multiple processing purposes. Each of application 62, algorithm 63, external data source 74, or AI system 76, or combinations of each, may also respectively reside on different servers. Quy at 8:40-46 The extent to which server application 62 interacts with wireless application 70 depends on the use to which the system is put. For example, in a less interactive embodiment, device application 70 may act to measure a diabetic patient's blood glucose level and report the same to server application 62. In this case, a physician may simply review the measured value and send the patient an email reporting that the value is acceptable or not. In a highly interactive embodiment, a patient may have numerous HMDs 11 connected via optional adaptors to a WWD 12, and **wireless application 70 may correspondingly send a large amount of health data to server application 62**. The physician, accessing server application 62, may in turn send detailed care plans to a caregiver via connection 72. The received data may be analyzed using algorithm 63, external data source 74, and AI system 76. In this sense, the two applications may be highly interactive. Quy at 8:47-62 The program is started (step 142) and a sensor measures a health parameter (step 116). The sensor may send the parameter to a medical device (step 118). The medical device then sends the parameter to the WWD (step 120). The WWD then wirelessly communicates the parameter to the application server

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Quy
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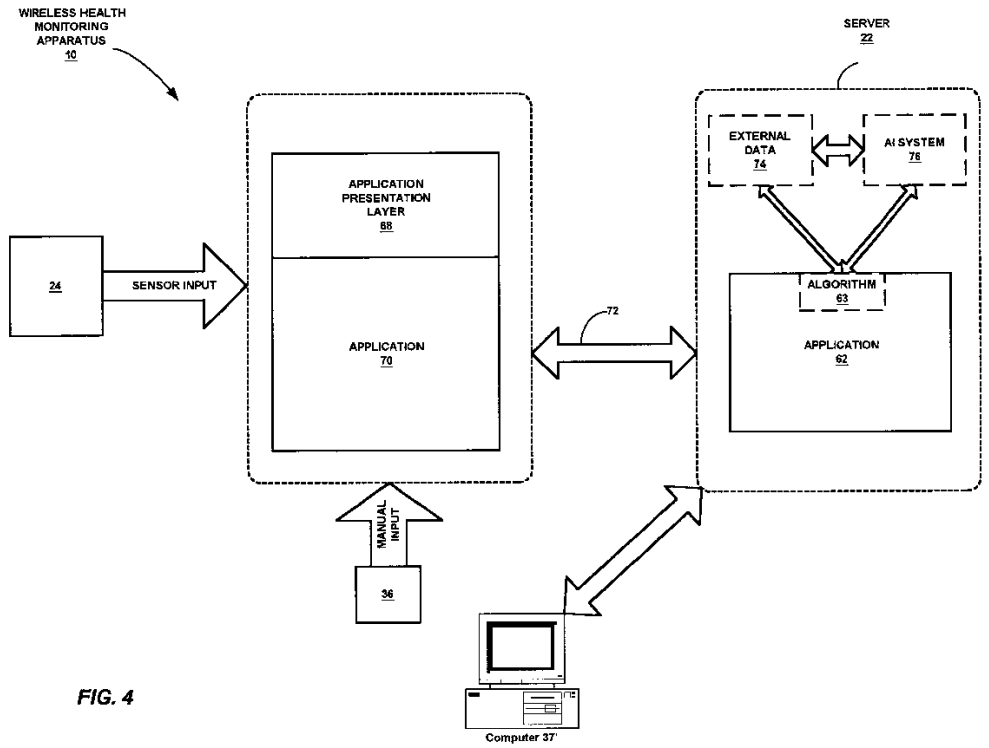
’868 Patent	Quy
	Quy at Fig. 4 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Quy, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Quy, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
Claim 8	
8. The diagnostic system of claim 7, wherein the light source comprises a plurality of semiconductor diodes that are further coupled to a multiplexer capable of combining the plurality of semiconductor diodes and generating the input light beam comprising one or more wavelengths.	*See* claim 7 above. Quy discloses or renders obvious the light source comprises a plurality of semiconductor diodes that are further coupled to a multiplexer capable of combining the plurality of semiconductor diodes and generating the input light beam comprising one or more wavelengths. It will be understood that the above description of a “Method and Apparatus for Health and Disease Management Combining Patient Data Monitoring with Wireless Internet Connectivity” has been with respect to particular embodiments of the invention. While this description is fully capable of attaining the objects of the invention, it is understood that the same is merely representative of the broad scope of the invention envisioned, and that numerous variations of the above embodiments may be known or may become known or are obvious or may become obvious to one of ordinary skill in the art, and these variations are fully within the broad scope of the invention. For example, while certain wireless technologies have been described herein, other such wireless technologies may also be employed. Furthermore, while various types of medical devices have been mentioned, numerous other types may also be used in the embodiments of the invention, including pulse oximeters, syringe drivers, infusion pumps, spirometers, ventilators, anesthesia monitors, and so on. Accordingly, the scope of the invention is to be limited only by the claims appended hereto, and equivalents thereof. In these claims, a reference to an element in the singular is not intended to mean “one and only one” unless explicitly stated. Rather, the same is intended to mean “one or more”. All structural and functional equivalents to the elements of the above-described preferred embodiment that are known or later come to be known to those of ordinary skill in the art are expressly incorporated herein by reference and are intended to be encompassed by the present claims. Moreover, it is not necessary for a device or method to address

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Quy
	each and every problem sought to be solved by the present invention, for it to be encompassed by the present claims. Furthermore, no element, component, or method step in the present invention is intended to be dedicated to the public regardless of whether the element, component, or method step is explicitly recited in the claims. No claim element herein is to be construed under the provisions of 35 U.S.C. §§112, ¶6, unless the element is expressly recited using the phrase “means for”. Quy at 12:51-13:22  *FIG. 4* Quy at Fig. 4 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the

’868 Patent	Quy
	art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Quy, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Quy, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
Claim 9	
9. The diagnostic system of claim 7, wherein at least the portion of the input light beam is adapted for use in a diagnostics to measure a property of the blood, wherein the diagnostics comprise a spectroscopic procedure, wherein the spectroscopic procedure is based at least in part on a comparison of amplitudes at a plurality of associated wavelengths transmitted or reflected from the blood.	*See* claim 7 above. Quy discloses or renders obvious the portion of the input light beam is adapted for use in a diagnostics to measure a property of the blood, wherein the diagnostics comprise a spectroscopic procedure, wherein the spectroscopic procedure is based at least in part on a comparison of amplitudes at a plurality of associated wavelengths transmitted or reflected from the blood. It will be understood that the above description of a “Method and Apparatus for Health and Disease Management Combining Patient Data Monitoring with Wireless Internet Connectivity” has been with respect to particular embodiments of the invention. While this description is fully capable of attaining the objects of the invention, it is understood that the same is merely representative of the broad scope of the invention envisioned, and that numerous variations of the above embodiments may be known or may become known or are obvious or may become obvious to one of ordinary skill in the art, and these variations are fully within the broad scope of the invention. For example, while certain wireless technologies have been described herein, other such wireless technologies may also be employed. Furthermore, while various types of medical devices have been mentioned, numerous other types may also be used in the embodiments of the invention, including pulse oximeters, syringe drivers, infusion pumps, spirometers, ventilators, anesthesia monitors, and so on. Accordingly, the scope of the invention is to be limited only by the claims appended hereto, and equivalents thereof. In these claims, a reference to an element in the singular is not intended to mean “one and only one” unless explicitly stated. Rather, the same is intended to mean “one or more”. All structural and functional equivalents to the elements of the above-described preferred embodiment that are known or later come to be known to those of ordinary skill in the art are expressly incorporated herein by reference and are intended to be encompassed by the present claims. Moreover, it is not necessary for a device or method to address each and every problem sought to be solved by the present invention, for it to be encompassed by the present claims. Furthermore, no element, component, or method step in the present invention is intended to be dedicated to the public regardless of whether the element, component, or method step is explicitly

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

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	recited in the claims. No claim element herein is to be construed under the provisions of 35 U.S.C. §§112, ¶6, unless the element is expressly recited using the phrase “means for”. Quy at 12:51-13:22  *FIG. 4* Quy at Fig. 4 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Quy, it would

’868 Patent	Quy
	have been obvious to one of ordinary skill in the art to combine, with the teachings of Quy, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

EXHIBIT A10

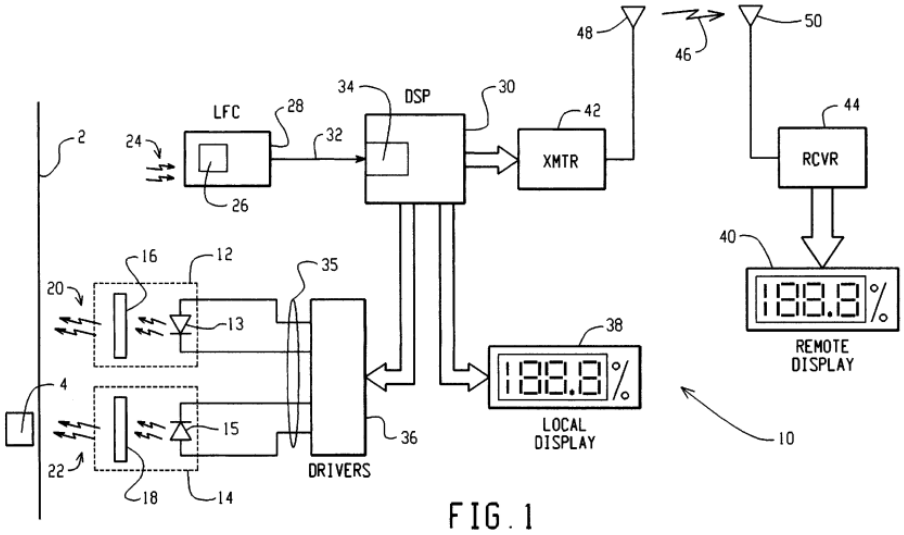
U.S. Pat. No. 9,055,868 in view of U.S. Patent No. 5,830,137 to John Edward Scharf (Scharf")

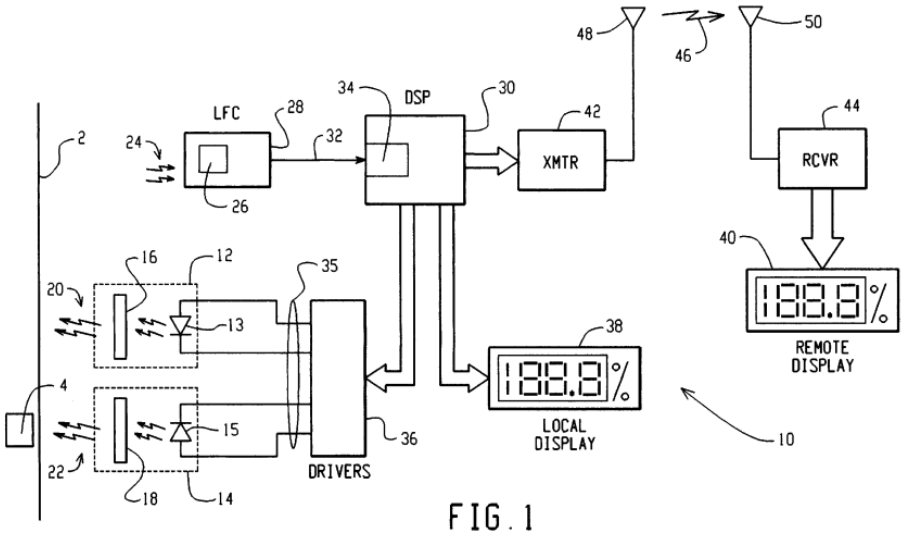
As described in detail below, Scharf (individually or collectively) anticipates and/or renders obvious claim 7-9 ("Asserted Claims") of U.S. Patent No. 9,055,868 B2 (the "'868 Patent") under 35 U.S.C. §102 and/or §103, either alone in combination with the knowledge of a person of ordinary skill, and/or additional prior art references discussed in discussed in Exhibits A1-A10, the contents of which are hereby incorporated by reference into this chart. One of ordinary skill in the art, as of the priority date of the '868 Patent, would have known to combine the prior art elements disclosed by the foregoing references using known methods, and to use these elements according to their established functions in order to achieve a known and predictable result. This invalidity claim chart is based on Defendants' present understanding of the Asserted Claims and Plaintiff's apparent construction of the Asserted Claims in its Preliminary Infringement Contentions ("Infringement Contentions").

The following invalidity chart includes references to the structure, function, operation, and/or features of the technology described in Scharf. The cited portions of Scharf are merely illustrative, and Defendants reserve the right to rely on alternative or additional evidence, including uncited portions of Scharf. Where a particular figure is cited, the citation should be understood to encompass the caption and description of the figure as well as any text relating to or describing the figure. Conversely, where particular text referring to a figure is cited, the citation should be understood to include the figure as well. Although the documentation collectively evidences prior knowledge, use, or sale, Defendants reserve the right to rely upon individual documents as printed publications. Where the chart below states that Scharf "describes" or "provides for" a limitation, such disclosure may be express, inherent, or implicit. To the extent it is found Scharf does not expressly disclose certain limitations in the asserted claim, such limitations are inherent. Defendants reserve the right to present direct evidence of the structure, function, operation, and/or features of the technology described in Scharf (including product samples, source code, and/or witness testimony) and/or its prior art status, and to present alternative or additional documents concerning the same as evidence that the technology described in Scharf anticipates and/or renders obvious the Asserted Claims of the '868 Patent.

This chart is subject to all reservations, objections, and disclaimers in Defendants' Invalidity Contentions and any amendment, supplement, or modification thereof, which are incorporated herein by reference in their entirety. Nothing stated herein shall be treated as an admission or suggestion that Defendants agree with Plaintiff regarding the scope of the Asserted Claims, Plainitff's apparent claim constructions, or the accuracy of any particular claim construction. Defendants reserve all rights to challenge any of the claim terms herein under 35 U.S.C. § 112, including by arguing that they are indefinite, are not supported by the written description, and/or are not enabled. Defendants further reserve all rights to amend this invalidity claim chart without leave of court pursuant to the Court's Docket Control Order, or upon a showing of good cause.

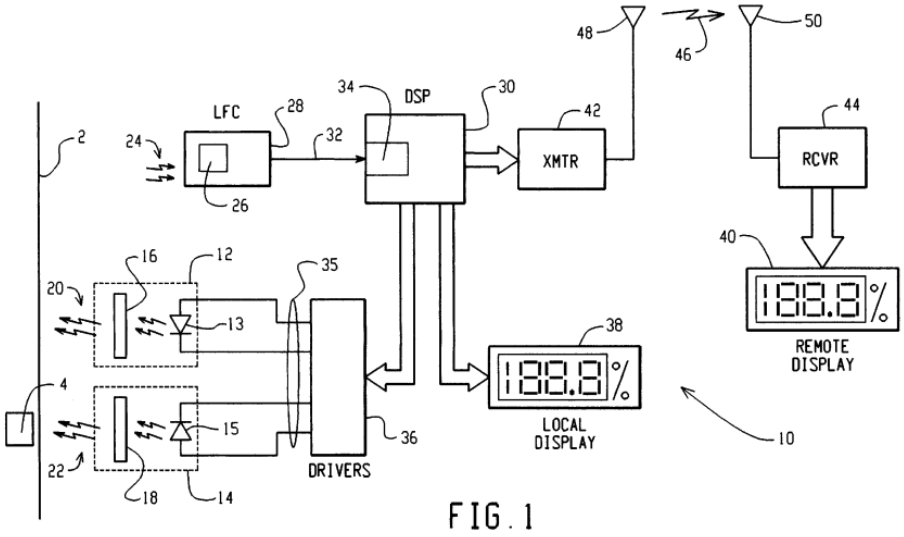
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Scharf
Claim 7	
7[pre]. A diagnostic system comprising:	By providing this disclosure, Defendants do not take a position on whether the preamble is limiting. Scharf discloses or renders obvious a diagnostic system. A reflectance pulse oximeter that determines oxygen saturation of hemoglobin using two sources of electromagnetic radiation in the green optical region, which provides the maximum reflectance pulsation spectrum. The use of green light allows placement of an oximetry probe at central body sites (e.g., wrist, thigh, abdomen, forehead, scalp, and back). Preferably, the two green light sources alternately emit light at 560 nm and 577 nm, respectively, which gives the biggest difference in hemoglobin extinction coefficients between deoxyhemoglobin, RHb, and oxyhemoglobin, HbO2. Scharf at Abstract.  FIG. 1 Scharf at Fig. 1 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references

’868 Patent	Scharf
	identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Scharf, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Scharf, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[a]. a light source comprising:	Scharf discloses or renders obvious a diagnostic system comprises a light source. A reflectance pulse oximeter that determines oxygen saturation of hemoglobin using two sources of electromagnetic radiation in the green optical region, which provides the maximum reflectance pulsation spectrum. The use of green light allows placement of an oximetry probe at central body sites (e.g., wrist, thigh, abdomen, forehead, scalp, and back). Preferably, the two green light sources alternately emit light at 560 nm and 577 nm, respectively, which gives the biggest difference in hemoglobin extinction coefficients between deoxyhemoglobin, RHb, and oxyhemoglobin, HbO2. Scharf at Abstract.  FIG. 1 Scharf at Fig. 1

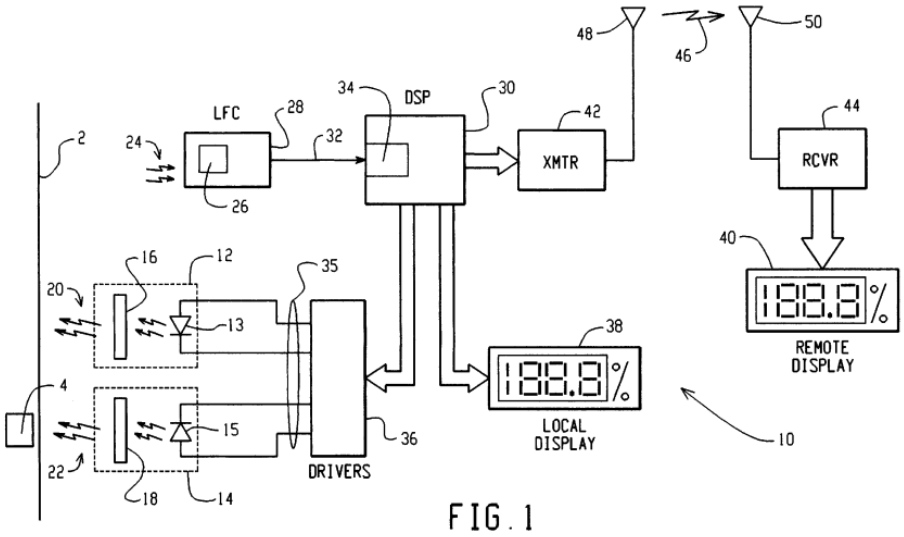
’868 Patent	Scharf
	One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Scharf, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Scharf, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[b]. one or more semiconductor diodes generating an input light beam; and	Scharf discloses or renders obvious the light source comprises one or more semiconductor diodes generating an input light beam. Referring now more particularly to the accompanying drawings, FIG. 1 shows a pulse oximeter 10 according to the present invention. The oximeter 10 of the present invention comprises two emitters of green light 12, 14 that illuminate a volume of intravascular blood 4. The green light sources 12, 14 are shown schematically as including light emitting diodes (LEDs) 13, 15 in FIG. 1; however, other green light sources can be used, such as laser diodes, filtered white light sources, filtered broad-band LEDs, etc. Suitable LEDs 13, 15 include part. nos. TLGA-183P (peak wavelength 574 nm) and TLPGA-183P (peak wavelength 562 nm) from Toshiba Ltd. through various sources, such as Marktech International, 5 Hemlock Street, Latham, N.Y. 12110, (518) 786-6591. The wavelengths of light that can be used range from about 500 nm to about 600 nm. Scharf at 4:8-22 Depending on the particular green light sources chosen, green optical filters 16, 18 might be needed. For example, if the Toshiba Ltd. part nos. TLGA183P and TLPGA-183P are used as green LEDs 13, 15 then narrow-band optical filters 16, 18 need to be used. Suitable optical filters include custom-made molded acrylic aspheric lens/filters having peak wavelengths of 560 nm and 580 nm, respectively, and which have bandwidths of less than 5 nm, which are available from Innovations In Optics, Inc., address 38 Montvale Avenue, Suite 215, Storeham, Mass. 02180, (716) 279-0806. Also, depending on the particular green light sources used, more than one emitter of green light might be needed. For example, if green LEDs TLGA183P and TLPGA-183P are used, then one to four LEDs of each green frequency are needed. Scharf at 4:22-37

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Scharf
	Although shown as flat surfaces, face pieces 16, 18, and 91 can alternatively be shaped to form discrete lenses (not shown) to focus the radiant energy from the LEDs 13a-13d and 15a-15d onto the skin 2 and into the blood 4 and from the skin 2 onto the photodiode 26, 62. The face 88 steps down at an annular shoulder 96 to a thinner portion 89, which engages the lip 83 of the housing 82. Schart at 8:59-65  FIG. 1 Scharf at Fig. 1 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Scharf, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Scharf, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.

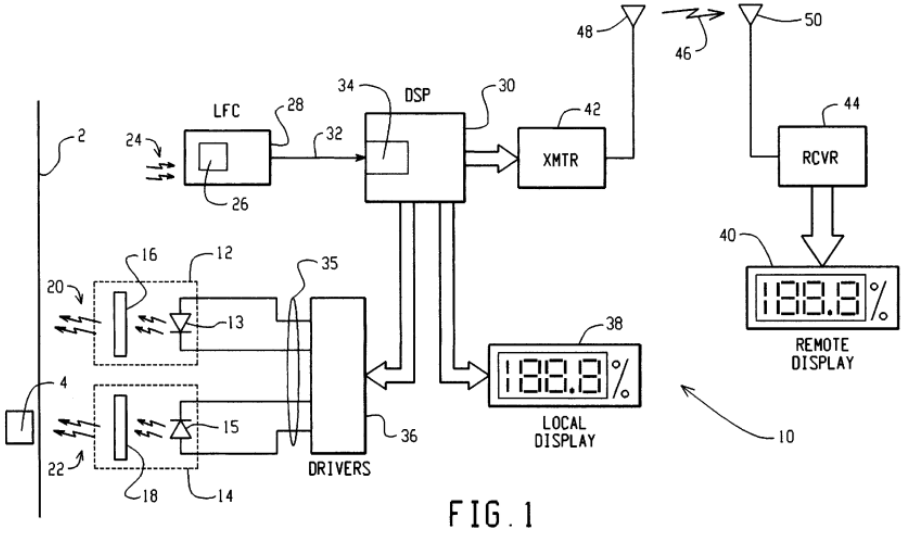
’868 Patent	Scharf
7[c]. a lens system configured to receive at least a portion of the input light beam and to communicate at least the portion of the input light beam onto a part of a user's body comprising blood	Scharf discloses or renders obvious the light source comprises a lens system configured to receive at least a portion of the input light beam and to communicate at least the portion of the input light beam onto a part of a user's body comprising blood. Referring now more particularly to the accompanying drawings, FIG. 1 shows a pulse oximeter 10 according to the present invention. The oximeter 10 of the present invention comprises two emitters of green light 12, 14 that illuminate a volume of intravascular blood 4. The green light sources 12, 14 are shown schematically as including light emitting diodes (LEDs) 13, 15 in FIG. 1; however, other green light sources can be used, such as laser diodes, filtered white light sources, filtered broad-band LEDs, etc. Suitable LEDs 13, 15 include part. nos. TLGA-183P (peak wavelength 574 nm) and TLPGA-183P (peak wavelength 562 nm) from Toshiba Ltd. through various sources, such as Marktech International, 5 Hemlock Street, Latham, N.Y. 12110, (518) 786-6591. The wavelengths of light that can be used range from about 500 nm to about 600 nm. Scharf at 4:8-22 Depending on the particular green light sources chosen, green optical filters 16, 18 might be needed. For example, if the Toshiba Ltd. part nos. TLGA183P and TLPGA-183P are used as green LEDs 13, 15 then narrow-band optical filters 16, 18 need to be used. Suitable optical filters include custom-made molded acrylic aspheric lens/filters having peak wavelengths of 560 nm and 580 nm, respectively, and which have bandwidths of less than 5 nm, which are available from Innovations In Optics, Inc., address 38 Montvale Avenue, Suite 215, Storeham, Mass. 02180, (716) 279-0806. Also, depending on the particular green light sources used, more than one emitter of green light might be needed. For example, if green LEDs TLGA183P and TLPGA-183P are used, then one to four LEDs of each green frequency are needed. Scharf at 4:22-37 Although shown as flat surfaces, face pieces 16, 18, and 91 can alternatively be shaped to form discrete lenses (not shown) to focus the radiant energy from the LEDs 13a-13d and 15a-15d onto the skin 2 and into the blood 4 and from the skin 2 onto the photodiode 26, 62. The face 88 steps down at an annular shoulder 96 to a thinner portion 89, which engages the lip 83 of the housing 82. Schart at 8:59-65

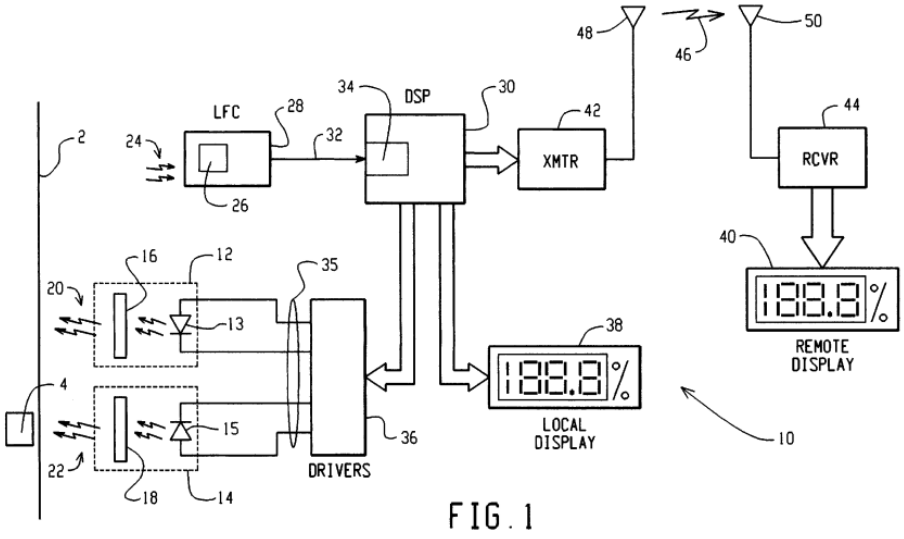
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

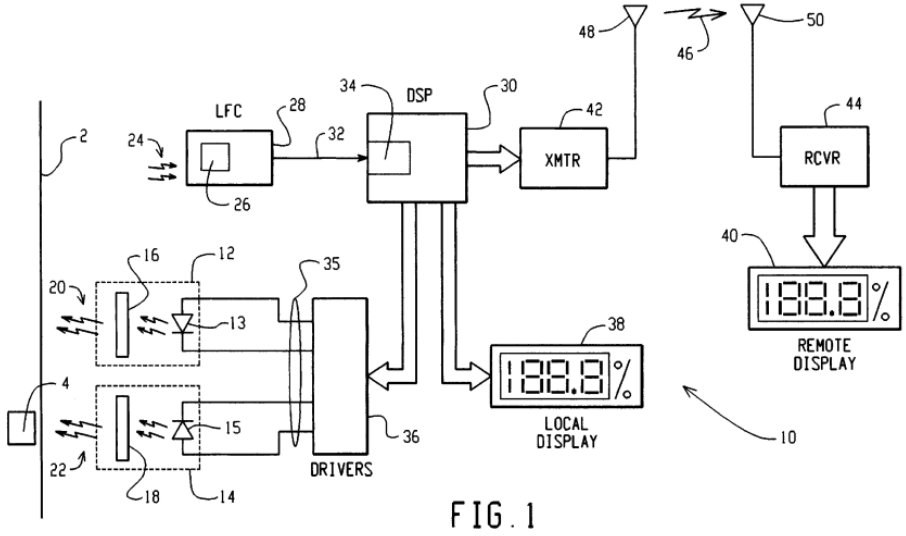
’868 Patent	Scharf
	 FIG. 1 Scharf at Fig. 1 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Scharf, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Scharf, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[d]. wherein at least the portion of the input light beam is used in a measurement on a user;	Scharf discloses or renders obvious the portion of the input light beam is used in a measurement on a user. Referring now more particularly to the accompanying drawings, FIG. 1 shows a pulse oximeter 10 according to the present invention. The oximeter 10 of the present invention comprises two emitters of green light 12, 14 that illuminate a volume of intravascular blood 4. The green light sources 12, 14 are shown schematically as including light emitting diodes (LEDs) 13, 15 in FIG. 1; however, other green light sources can be used, such as laser diodes, filtered white light sources, filtered broad-band LEDs,

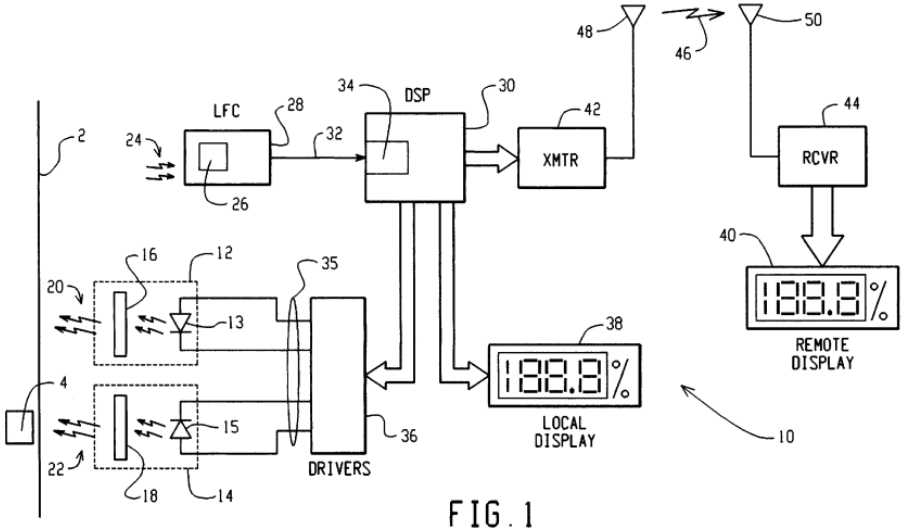
’868 Patent	Scharf
	etc. Suitable LEDs 13, 15 include part. nos. TLGA-183P (peak wavelength 574 nm) and TLPGA-183P (peak wavelength 562 nm) from Toshiba Ltd. through various sources, such as Marktech International, 5 Hemlock Street, Latham, N.Y. 12110, (518) 786-6591. The wavelengths of light that can be used range from about 500 nm to about 600 nm. Scharf at 4:8-22 Depending on the particular green light sources chosen, green optical filters 16, 18 might be needed. For example, if the Toshiba Ltd. part nos. TLGA183P and TLPGA-183P are used as green LEDs 13, 15 then narrow-band optical filters 16, 18 need to be used. Suitable optical filters include custom-made molded acrylic aspheric lens/filters having peak wavelengths of 560 nm and 580 nm, respectively, and which have bandwidths of less than 5 nm, which are available from Innovations In Optics, Inc., address 38 Montvale Avenue, Suite 215, Storeham, Mass. 02180, (716) 279-0806. Also, depending on the particular green light sources used, more than one emitter of green light might be needed. For example, if green LEDs TLGA183P and TLPGA-183P are used, then one to four LEDs of each green frequency are needed. Scharf at 4:22-37 Although shown as flat surfaces, face pieces 16, 18, and 91 can alternatively be shaped to form discrete lenses (not shown) to focus the radiant energy from the LEDs 13a-13d and 15a-15d onto the skin 2 and into the blood 4 and from the skin 2 onto the photodiode 26, 62. The face 88 steps down at an annular shoulder 96 to a thinner portion 89, which engages the lip 83 of the housing 82. Schart at 8:59-65

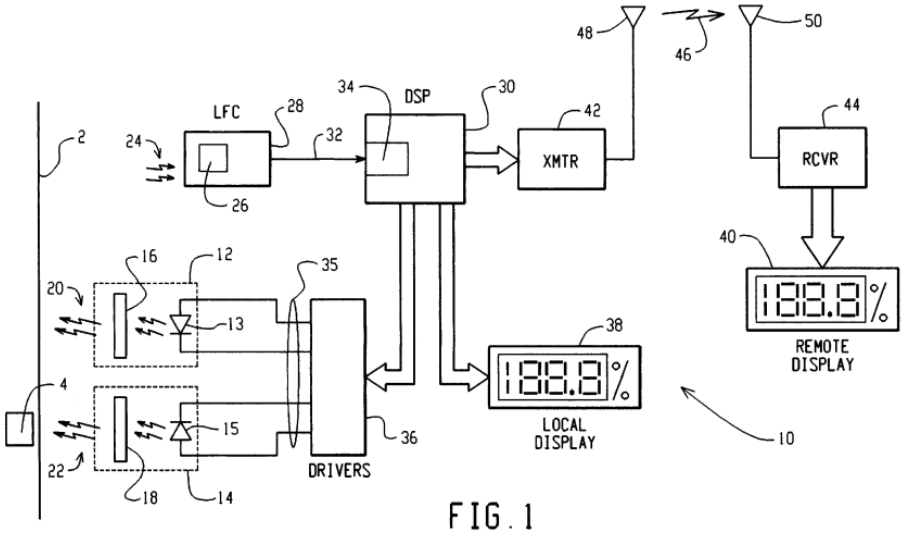
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Scharf
	 FIG. 1 Scharf at Fig. 1 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Scharf, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Scharf, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[e]. a software application capable of generating data based at least in part on the measurement on the user,	Scharf discloses or renders obvious a software application capable of generating data based at least in part on the measurement on the user. A reflectance pulse oximeter that determines oxygen saturation of hemoglobin using two sources of electromagnetic radiation in the green optical region, which provides the maximum reflectance pulsation spectrum. The use of green light allows placement of an oximetry probe at central body sites (e.g., wrist, thigh, abdomen, forehead, scalp, and back). Preferably, the two green light sources alternately emit light at 560 nm and 577 nm, respectively, which gives the biggest difference in hemoglobin extinction coefficients between deoxyhemoglobin, RHb, and oxyhemoglobin, HbO2.

’868 Patent	Scharf
	Scharf at Abstract.  FIG. 1 Scharf at Fig. 1 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Scharf, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Scharf, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[f]. wherein the data represents at least in part physiological information associated with the user;	Scharf discloses or renders obvious the data represents at least in part physiological information associated with the user. A reflectance pulse oximeter that determines oxygen saturation of hemoglobin using two sources of electromagnetic radiation in the green optical region, which provides the maximum reflectance pulsation spectrum. The use of green light allows placement of an oximetry probe at central body sites

’868 Patent	Scharf
	(e.g., wrist, thigh, abdomen, forehead, scalp, and back). Preferably, the two green light sources alternately emit light at 560 nm and 577 nm, respectively, which gives the biggest difference in hemoglobin extinction coefficients between deoxyhemoglobin, RHb, and oxyhemoglobin, HbO2. Scharf at Abstract.  FIG. 1 Scharf at Fig. 1 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Scharf, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Scharf, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[g]. the software application capable of operating on a control	Scharf discloses or renders obvious the software application capable of operating on a control system adapted to receive, store and process at least a portion of the physiological information.

’868 Patent	Scharf
system adapted to receive, store and process at least a portion of the physiological information,	A reflectance pulse oximeter that determines oxygen saturation of hemoglobin using two sources of electromagnetic radiation in the green optical region, which provides the maximum reflectance pulsation spectrum. The use of green light allows placement of an oximetry probe at central body sites (e.g., wrist, thigh, abdomen, forehead, scalp, and back). Preferably, the two green light sources alternately emit light at 560 nm and 577 nm, respectively, which gives the biggest difference in hemoglobin extinction coefficients between deoxyhemoglobin, RHb, and oxyhemoglobin, HbO2. Scharf at Abstract.  FIG. 1 Scharf at Fig. 1 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Scharf, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Scharf, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.

’868 Patent	Scharf
7[h]. the control system having a touch-screen, circuitry for obtaining position information from a location sensor, and	Scharf discloses or renders obvious the control system having a touch-screen, circuitry for obtaining position information from a location sensor. A reflectance pulse oximeter that determines oxygen saturation of hemoglobin using two sources of electromagnetic radiation in the green optical region, which provides the maximum reflectance pulsation spectrum. The use of green light allows placement of an oximetry probe at central body sites (e.g., wrist, thigh, abdomen, forehead, scalp, and back). Preferably, the two green light sources alternately emit light at 560 nm and 577 nm, respectively, which gives the biggest difference in hemoglobin extinction coefficients between deoxyhemoglobin, RHb, and oxyhemoglobin, HbO2. Scharf at Abstract.  FIG. 1 Scharf at Fig. 1 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are

’868 Patent	Scharf
	incorporated by reference into this chart. To the extent this limitation is not disclosed by Scharf, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Scharf, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[i]. a wireless transceiver to transmit wireless data over a wireless link,	Scharf discloses or renders obvious a wireless transceiver to transmit wireless data over a wireless link. The processor 30 and the remote display 40 are placed in circuit communication via a transmitter 42 and receiver 44. The transmitter 42 transmits a signal 46 using an antenna 48. The receiver 44 receives the signal 46 using a second antenna 50 and passes the information to the display circuit 40. The transmitter 42, receiver 44, and the two antennas 48, 50 can be any suitable radio frequency or other wireless telemetry system, including infrared, biomedical (49 MHz), or microwave systems. These telemetry systems are well known in the art and widely available from common sources. Additionally, spread spectrum technology (˜900 MHz or 2.4 GHz) provides a highly secure link, a high noise immunity, and a high informational capacity, all of which are desirable in clinical and health care environments. A suitable 902-908 MHz or 2.4 GHz spread spectrum transmitter/receiver pair is available from common sources, such as Digital Wireless Corp., One Meczway, Norgrass, Ga., 30093 (transmitter) and Telxon Pen-Based Computer, 3330 W. Market Street, P.O. Box 5582, Akron, Ohio 44334-0582 (receiver). Scharf at 7:48-67 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Scharf, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Scharf, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[j]. the wireless data comprising at least a part of the physiological information,	Scharf discloses or renders obvious the wireless data comprising at least a part of the physiological information. The processor 30 and the remote display 40 are placed in circuit communication via a transmitter 42 and receiver 44. The transmitter 42 transmits a signal 46 using an antenna 48. The receiver 44 receives the signal 46 using a second antenna 50 and passes the information to the display circuit 40. The transmitter 42, receiver 44, and the two antennas 48, 50 can be any suitable radio frequency or other

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Scharf
	wireless telemetry system, including infrared, biomedical (49 MHz), or microwave systems. These telemetry systems are well known in the art and widely available from common sources. Additionally, spread spectrum technology (˜900 MHz or 2.4 GHz) provides a highly secure link, a high noise immunity, and a high informational capacity, all of which are desirable in clinical and health care environments. A suitable 902-908 MHz or 2.4 GHz spread spectrum transmitter/receiver pair is available from common sources, such as Digital Wireless Corp., One Meczway, Norgrass, Ga., 30093 (transmitter) and Telxon Pen-Based Computer, 3330 W. Market Street, P.O. Box 5582, Akron, Ohio 44334-0582 (receiver). Scharf at 7:48-67 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Scharf, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Scharf, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[k]. wherein the control system is further capable of receiving voice input signals and manually entered input signals; and	Scharf discloses or renders obvious the control system is further capable of receiving voice input signals and manually entered input signals. FIG. 8 also shows a block diagram of the power components of the oximeter 10 of the present invention: a battery 140, a power control switch 142, a switching regulator 144, and a low battery detector 146, all in circuit communication as shown in FIG. 8. The power control switch 142 accepts as inputs a transceived CTS signal 148 and a control line 150 from the processor 30. The power control switch 142 also can accept an input from a switch (not shown) that can be, e.g., made as part of a probe according to the present invention or physically annexed to the oximeter enclosure (not shown). The switching regulator 144 generates +5 VDC from the battery voltage, VBAT. That is, the switching regulator 144 provides regulated voltages for the electronic devices from the battery or, alternatively, an external power source (not shown), as known to those skilled in the art. The low battery detector 146 detects when the battery voltage VBAT is at a voltage indicative of the end of the lifetime of the battery 140 or that the battery needs to undergo a charging from a battery charger (not shown). Once detected, the low battery detector 146 transmits a corresponding signal 151 to the processor 30 so the processor 30 can take appropriate action such as indicating a low battery condition via the display(s) 38, 40 or turning the

’868 Patent	Scharf
	oximeter 10 off to protect system components from an undervoltage situation. Finally, FIG. 8 shows the implementation of an RS-232C serial port 152 using serial transmit 154 and serial receive 156 ports of the processor 30 and an RS-232C transceiver 158 to transmit and receive RS-232C signals at a proper RS-232C level. The RS-232C port 152 can be used to upload to, e.g., a personal computer the numeric counts for the number of rising edges of the gated LFC signal 136 for each source 12, 14 and the number of rising edges of the gated clock signal 138 for each source 12, 14. One possible transmission format for transmitting data from the processor 30 to a personal computer includes a synchronizing byte, 16 bits of gated LFC signal data for the first source 12, 16 bits of gated clock data for the first source 12, 16 bits of gated LFC signal data for the second source 14, 16 bits of gated clock data for the second source 14, a status byte (e.g., overflow indication, battery condition, etc.), and a parity byte. Scharf at 10:31-11:4 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Scharf, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Scharf, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[l]. a host comprising:	Scharf discloses or renders obvious the diagnostic system comprises a host. The processor 30 and the remote display 40 are placed in circuit communication via a transmitter 42 and receiver 44. The transmitter 42 transmits a signal 46 using an antenna 48. The receiver 44 receives the signal 46 using a second antenna 50 and passes the information to the display circuit 40. The transmitter 42, receiver 44, and the two antennas 48, 50 can be any suitable radio frequency or other wireless telemetry system, including infrared, biomedical (49 MHz), or microwave systems. These telemetry systems are well known in the art and widely available from common sources. Additionally, spread spectrum technology (˜900 MHz or 2.4 GHz) provides a highly secure link, a high noise immunity, and a high informational capacity, all of which are desirable in clinical and health care environments. A suitable 902-908 MHz or 2.4 GHz spread spectrum transmitter/receiver pair is available from common sources, such as Digital Wireless Corp., One Meczway, Norgrass, Ga., 30093 (transmitter) and Telxon Pen-Based Computer, 3330 W. Market Street, P.O. Box 5582, Akron, Ohio 44334-0582 (receiver).

’868 Patent	Scharf
	Scharf at 7:48-67 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Scharf, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Scharf, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[m]. a digital file for receiving and storing at least a portion of the wireless data;	Scharf discloses or renders obvious the host comprises a digital file for receiving and storing at least a portion of the wireless data. The processor 30 and the remote display 40 are placed in circuit communication via a transmitter 42 and receiver 44. The transmitter 42 transmits a signal 46 using an antenna 48. The receiver 44 receives the signal 46 using a second antenna 50 and passes the information to the display circuit 40. The transmitter 42, receiver 44, and the two antennas 48, 50 can be any suitable radio frequency or other wireless telemetry system, including infrared, biomedical (49 MHz), or microwave systems. These telemetry systems are well known in the art and widely available from common sources. Additionally, spread spectrum technology (˜900 MHz or 2.4 GHz) provides a highly secure link, a high noise immunity, and a high informational capacity, all of which are desirable in clinical and health care environments. A suitable 902-908 MHz or 2.4 GHz spread spectrum transmitter/receiver pair is available from common sources, such as Digital Wireless Corp., One Meczway, Norgrass, Ga., 30093 (transmitter) and Telxon Pen-Based Computer, 3330 W. Market Street, P.O. Box 5582, Akron, Ohio 44334-0582 (receiver). Scharf at 7:48-67 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Scharf, it would

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Scharf
	have been obvious to one of ordinary skill in the art to combine, with the teachings of Scharf, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[n]. control logic at the host to process at least the portion of the wireless data to generate a status of the user;	Scharf discloses or renders obvious the host comprises control logic at the host to process at least the portion of the wireless data to generate a status of the user. The processor 30 and the remote display 40 are placed in circuit communication via a transmitter 42 and receiver 44. The transmitter 42 transmits a signal 46 using an antenna 48. The receiver 44 receives the signal 46 using a second antenna 50 and passes the information to the display circuit 40. The transmitter 42, receiver 44, and the two antennas 48, 50 can be any suitable radio frequency or other wireless telemetry system, including infrared, biomedical (49 MHz), or microwave systems. These telemetry systems are well known in the art and widely available from common sources. Additionally, spread spectrum technology (˜900 MHz or 2.4 GHz) provides a highly secure link, a high noise immunity, and a high informational capacity, all of which are desirable in clinical and health care environments. A suitable 902-908 MHz or 2.4 GHz spread spectrum transmitter/receiver pair is available from common sources, such as Digital Wireless Corp., One Meczway, Norgrass, Ga., 30093 (transmitter) and Telxon Pen-Based Computer, 3330 W. Market Street, P.O. Box 5582, Akron, Ohio 44334-0582 (receiver). Scharf at 7:48-67 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Scharf, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Scharf, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[o]. a memory storage device for recording the status; and	Scharf discloses or renders obvious the host comprises a memory storage device for recording the status. The processor 30 may be any processor that can process oximetry data in real time and interface and control the various devices shown in FIG. 1. One suitable processor is a PIC17C43 8-bit CMOS EPROM microcontroller, which is available from Microchip Technology Inc., address 2355 West Chandler Blvd., Chandler, Ariz. 85224-6199, (602) 786-7668. Another suitable processor is the TMS320C32 digital signal processor, also manufactured by Texas Instruments. Another suitable

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Scharf
	processor is a Zilog 893XX. These processors have internal counters 34. Many other CISC and RISC microprocessors, microcontrollers, and digital signal processors can be used. Some might require random access memory (RAM), read-only memory (ROM), and associated control circuitry, such as decoders and multi-phase clocks, floating point coprocessors, etc. (all not shown) all in circuit communication, as is well known in the art. To be suitable, the processor 30 must be capable of being a signal analyzer. That is, the processor 30 must have the computational capacity to determine the saturation value from the collected data (LFC periodic pulses or ADC data, etc.). Scharf at 5:41-60 Referring now to FIG. 9, a flow chart showing the role of the processor 30 in the pulse oximeter 10 of the present invention is shown. Essentially, the processor 30 collects data in the form of a digitized signal, calculates a coefficient for the oxygen saturation value from the digitized signal, determines the final saturation value by reading the saturation value for the calculated coefficient from a look-up table stored in memory, and then causes the display(s) 38, 40 to display a visual image corresponding to the final saturation value or other oximetry data. Scharf at 11:5-14 In the case of the power spectral density, the PSD for the wavelength of the light from the first source 12 (PSD.sub.λ1) and the PSD for the wavelength of the light from the second source 14 (PSD.sub.λ2) are determined at about 1 hertz (the cardiac spectral line). Then, R=(PSD.sub.λ1)/(PSD.sub.λ2) and R can be used to derive the saturation value from a lookup table in memory, as is known to those in the art. The lookup table can be derived by those in the art from widely available hemoglobin spectral absorption curves and experimental empirical data. For example, using 577 and 560 nm light sources and using R=(PSD.sub.λ1=577 nm)/(PSD.sub.λ2=560 nm) at the cardiac spectral line, the following table can be used to determine the oxygen saturation level from the ratio R: Scharf at 12:22-34 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are

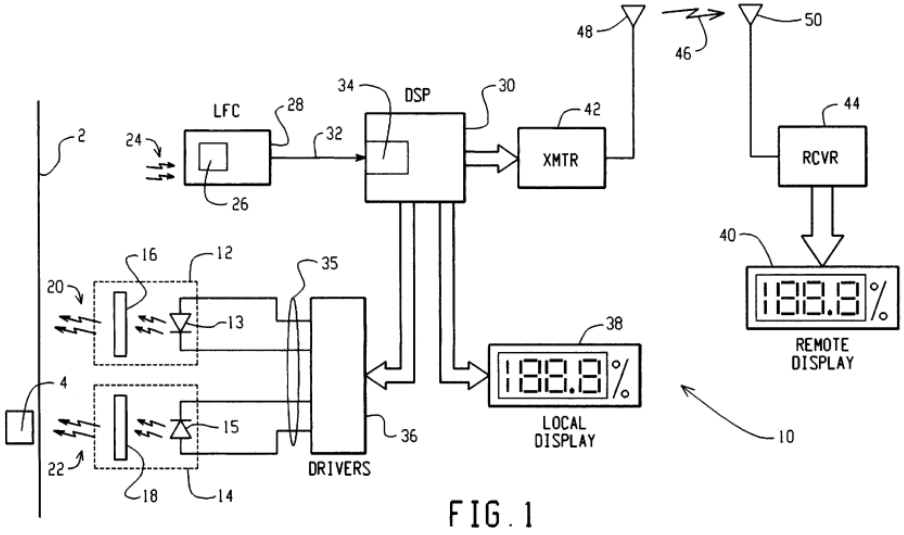
Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Scharf
	incorporated by reference into this chart. To the extent this limitation is not disclosed by Scharf, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Scharf, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
7[p]. an output for communicating at least a portion of the status or associated information over a communication link to one or more display output devices,	Scharf discloses or renders obvious the host comprises an output for communicating at least a portion of the status or associated information over a communication link to one or more display output devices, wherein the one or more display output devices are located remotely from the host. Preferably, the processor 30 is in circuit communication with a local display 38 to display a visual image corresponding to the oximetry data. The local display 38 can be any display capable of displaying a visual image corresponding to one or more oxygen saturation values at the desired resolution. The local display 38 can display any number of different visual images corresponding to the oximetry data. For example, a simple numeric liquid crystal display (LCD) can be used to numerically display the saturation value. In the alternative, or in addition, a graphical LCD can be used to display the saturation value and display the pulse plethysmograph waveform. In addition, discrete display LEDs (not shown) may be used if the designer desires to display merely a binary oxygen saturation level. For example, green, yellow, and red discrete LEDs can be configured to represent safe, critical, and emergency conditions corresponding to saturation values of greater than 90 percent, 70 to 90 percent, and less than 70 percent, respectively. Scharf at 7:21-37 Preferably, the processor 30 is also in circuit communication with a remote display 40 to display a second visual image corresponding to the oximetry data. Like the local display, the remote display 40 can have any number of configurations. In addition to the displays listed above in connection with the local display 38, the remote display can be an integral part of a nurses' station receiver or some other personal data receiver. In the alternative, the remote receiver can be a standard personal computer (not shown) configured to display the desired image and numerical values. Scharf at 7:38-47 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

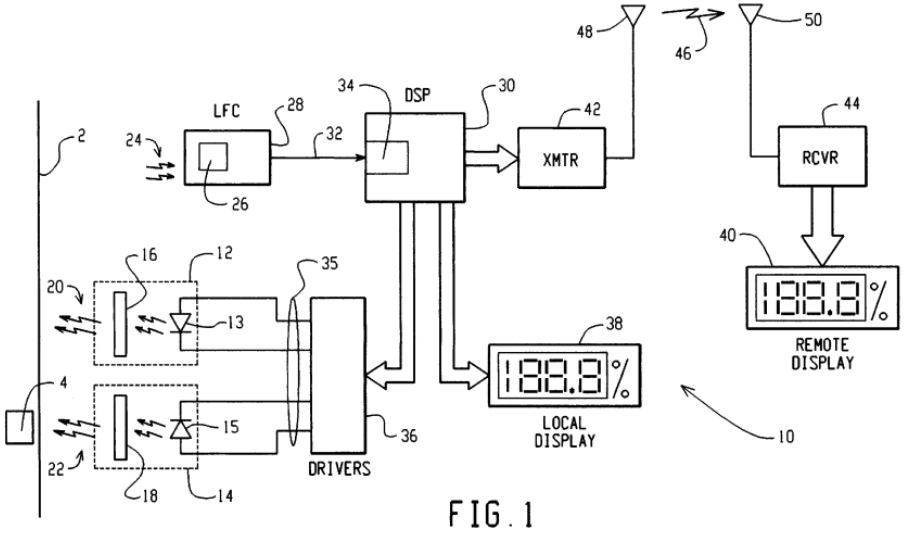
’868 Patent	Scharf
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7[q]. wherein the one or more display output devices are located remotely from the host.	Scharf discloses or renders obvious the one or more display output devices are located remotely from the host. Preferably, the processor 30 is in circuit communication with a local display 38 to display a visual image corresponding to the oximetry data. The local display 38 can be any display capable of displaying a visual image corresponding to one or more oxygen saturation values at the desired resolution. The local display 38 can display any number of different visual images corresponding to the oximetry data. For example, a simple numeric liquid crystal display (LCD) can be used to numerically display the saturation value. In the alternative, or in addition, a graphical LCD can be used to display the saturation value and display the pulse plethysmograph waveform. In addition, discrete display LEDs (not shown) may be used if the designer desires to display merely a binary oxygen saturation level. For example, green, yellow, and red discrete LEDs can be configured to represent safe, critical, and emergency conditions corresponding to saturation values of greater than 90 percent, 70 to 90 percent, and less than 70 percent, respectively. Scharf at 7:21-37 Preferably, the processor 30 is also in circuit communication with a remote display 40 to display a second visual image corresponding to the oximetry data. Like the local display, the remote display 40 can have any number of configurations. In addition to the displays listed above in connection with the local display 38, the remote display can be an integral part of a nurses' station receiver or some other personal data receiver. In the alternative, the remote receiver can be a standard personal computer (not shown) configured to display the desired image and numerical values. Scharf at 7:38-47

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Scharf
	 FIG. 1 Scharf at Fig. 1 One of ordinary skill would find this limitation disclosed either expressly or inherently in the teachings of the reference and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention, as evidenced, for example, by substantial other references identified in Defendant’s Invalidity Contentions. Rather than repeat those disclosures here, they are incorporated by reference into this chart. To the extent this limitation is not disclosed by Scharf, it would have been obvious to one of ordinary skill in the art to combine, with the teachings of Scharf, those elements, as known to them or as disclosed by other prior art identified in the cover pleading.
Claim 8	
8. The diagnostic system of claim 7, wherein the light source comprises a plurality of semiconductor diodes that are further coupled to a multiplexer capable of combining the plurality of semiconductor diodes and	*See* claim 7 above. Scharf discloses or renders obvious the light source comprises a plurality of semiconductor diodes that are further coupled to a multiplexer capable of combining the plurality of semiconductor diodes and generating the input light beam comprising one or more wavelengths. Referring now more particularly to the accompanying drawings, FIG. 1 shows a pulse oximeter 10 according to the present invention. The oximeter 10 of the present invention comprises two emitters of

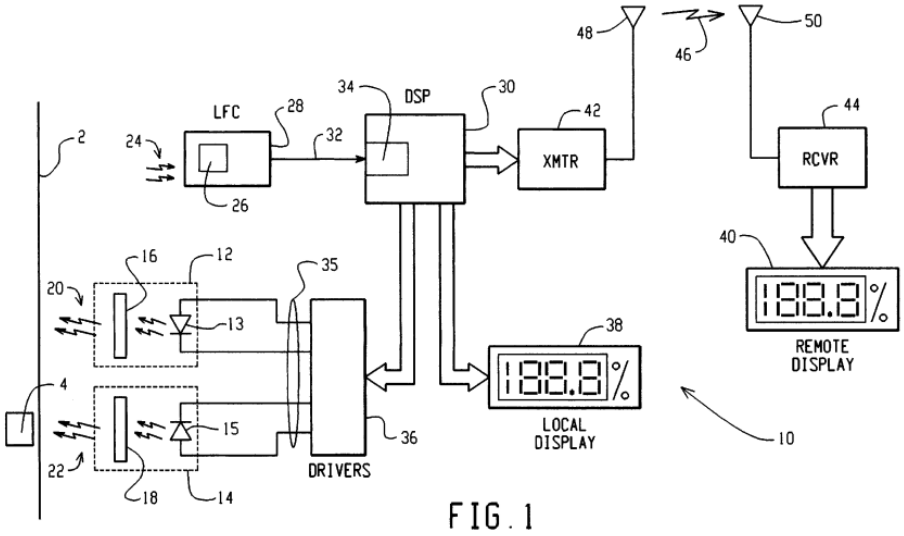
’868 Patent	Scharf
generating the input light beam comprising one or more wavelengths.	green light 12, 14 that illuminate a volume of intravascular blood 4. The green light sources 12, 14 are shown schematically as including light emitting diodes (LEDs) 13, 15 in FIG. 1; however, other green light sources can be used, such as laser diodes, filtered white light sources, filtered broad-band LEDs, etc. Suitable LEDs 13, 15 include part. nos. TLGA-183P (peak wavelength 574 nm) and TLPGA-183P (peak wavelength 562 nm) from Toshiba Ltd. through various sources, such as Marktech International, 5 Hemlock Street, Latham, N.Y. 12110, (518) 786-6591. The wavelengths of light that can be used range from about 500 nm to about 600 nm. Scharf at 4:8-22 Depending on the particular green light sources chosen, green optical filters 16, 18 might be needed. For example, if the Toshiba Ltd. part nos. TLGA183P and TLPGA-183P are used as green LEDs 13, 15 then narrow-band optical filters 16, 18 need to be used. Suitable optical filters include custom-made molded acrylic aspheric lens/filters having peak wavelengths of 560 nm and 580 nm, respectively, and which have bandwidths of less than 5 nm, which are available from Innovations In Optics, Inc., address 38 Montvale Avenue, Suite 215, Storeham, Mass. 02180, (716) 279-0806. Also, depending on the particular green light sources used, more than one emitter of green light might be needed. For example, if green LEDs TLGA183P and TLPGA-183P are used, then one to four LEDs of each green frequency are needed. Scharf at 4:22-37 Although shown as flat surfaces, face pieces 16, 18, and 91 can alternatively be shaped to form discrete lenses (not shown) to focus the radiant energy from the LEDs 13a-13d and 15a-15d onto the skin 2 and into the blood 4 and from the skin 2 onto the photodiode 26, 62. The face 88 steps down at an annular shoulder 96 to a thinner portion 89, which engages the lip 83 of the housing 82. Schart at 8:59-65

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Scharf
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Claim 9	
9. The diagnostic system of claim 7, wherein at least the portion of the input light beam is adapted for use in a diagnostics to measure a property of the blood, wherein the diagnostics comprise a spectroscopic	*See* claim 7 above. Scharf discloses or renders obvious the portion of the input light beam is adapted for use in a diagnostics to measure a property of the blood, wherein the diagnostics comprise a spectroscopic procedure, wherein the spectroscopic procedure is based at least in part on a comparison of amplitudes at a plurality of associated wavelengths transmitted or reflected from the blood.

’868 Patent	Scharf
procedure, wherein the spectroscopic procedure is based at least in part on a comparison of amplitudes at a plurality of associated wavelengths transmitted or reflected from the blood.	Referring now more particularly to the accompanying drawings, FIG. 1 shows a pulse oximeter 10 according to the present invention. The oximeter 10 of the present invention comprises two emitters of green light 12, 14 that illuminate a volume of intravascular blood 4. The green light sources 12, 14 are shown schematically as including light emitting diodes (LEDs) 13, 15 in FIG. 1; however, other green light sources can be used, such as laser diodes, filtered white light sources, filtered broad-band LEDs, etc. Suitable LEDs 13, 15 include part. nos. TLGA-183P (peak wavelength 574 nm) and TLPGA-183P (peak wavelength 562 nm) from Toshiba Ltd. through various sources, such as Marktech International, 5 Hemlock Street, Latham, N.Y. 12110, (518) 786-6591. The wavelengths of light that can be used range from about 500 nm to about 600 nm. Scharf at 4:8-22 Depending on the particular green light sources chosen, green optical filters 16, 18 might be needed. For example, if the Toshiba Ltd. part nos. TLGA183P and TLPGA-183P are used as green LEDs 13, 15 then narrow-band optical filters 16, 18 need to be used. Suitable optical filters include custom-made molded acrylic aspheric lens/filters having peak wavelengths of 560 nm and 580 nm, respectively, and which have bandwidths of less than 5 nm, which are available from Innovations In Optics, Inc., address 38 Montvale Avenue, Suite 215, Storeham, Mass. 02180, (716) 279-0806. Also, depending on the particular green light sources used, more than one emitter of green light might be needed. For example, if green LEDs TLGA183P and TLPGA-183P are used, then one to four LEDs of each green frequency are needed. Scharf at 4:22-37 Although shown as flat surfaces, face pieces 16, 18, and 91 can alternatively be shaped to form discrete lenses (not shown) to focus the radiant energy from the LEDs 13a-13d and 15a-15d onto the skin 2 and into the blood 4 and from the skin 2 onto the photodiode 26, 62. The face 88 steps down at an annular shoulder 96 to a thinner portion 89, which engages the lip 83 of the housing 82. Schart at 8:59-65 In the case of the power spectral density, the PSD for the wavelength of the light from the first source 12 (PSD.sub.λ1) and the PSD for the wavelength of the light from the second source 14 (PSD.sub.λ2) are determined at about 1 hertz (the cardiac spectral line). Then, R=(PSD.sub.λ1)/(PSD.sub.λ2) and R

Omni MedSci Ex. 2002
Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01249

’868 Patent	Scharf
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