

Patent No. 9,788,735
Petition for *Inter Partes* Review

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SOTERA WIRELESS, INC.
Petitioner

v.

MASIMO CORPORATION
Patent Owner

Patent No. 9,788,735
Issue Date: October 17, 2017
Title: BODY WORN MOBILE MEDICAL PATIENT MONITOR

Inter Partes Review No. IPR2020-00954

**PETITION FOR *INTER PARTES* REVIEW OF
U.S. PATENT NO. 9,788,735
UNDER 35 U.S.C. §§ 311-319 AND 37 C.F.R. § 42**

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1003	Expert Declaration of George Yanulis
1004	<i>Curriculum Vitae</i> for George Yanulis
1005	U.S. Patent No. 6,840,904 to Goldberg (“Goldberg”)
1006	PCT Publication No. WO 00/42911 to Kiani et al. (“Kiani”)
1007	EP0880936A2 to Akai (“Akai”)
1008	U.S. Patent No. 5,919,141 to Money (“Money”)
1009	PCT Publication No. WO 99/13698 to Estep (“Estep”)
1010	’735 Patent File History Excerpt, Application as filed on April 27, 2017
1011	’735 Patent File History Excerpt, Preliminary Amendment filed May 22, 2017
1012	’735 Patent File History Excerpt, Pre-Interview Office Action issued July 3, 2017
1013	U.S. Patent No. 6,241,684 to Amano (“Amano”)
1014	’735 Patent File History Excerpt, Notice of Allowance with Examiner’s Amendment issued Aug. 28, 2017
1015	Masimo’s Adversary Complaint, United States Bankruptcy Court for the Southern District of California, <i>In re: Sotera Wireless, Inc.</i> , No. 16-05968-LT11, filed October 7, 2016
1016	U.S. Patent No. 4,425,921 to Fujisaki (“Fujisaki”)
1017	International Publication No. WO00/44274
1018	Japanese Publication No. JP0558122A, with English Machine Translation
1019	U.S. Patent No. 4,338,950
1020	U.S. Patent No. 4,450,843
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1022	U.S. Patent No. 5,539,706
1023	U.S. Patent No. 6,850,788 (Parent to '735 Patent)
1024	U.S. Patent No. 7,844,314 (Parent to '735 Patent)
1025	U.S. Patent No. 7,844,315 (Parent to '735 Patent)
1026	U.S. Patent No. 8,548,548 (Parent to '735 Patent)
1027	U.S. Patent No. 9,113,831 (Parent to '735 Patent)
1028	U.S. Patent No. 9,113,832 (Parent to '735 Patent)
1029	Masimo's Complaint for Patent Infringement against Sotera (ECF No. 1), filed June 12, 2019
1030	Service of Summons and Complaint upon Sotera (ECF No. 5)
1031	U.S. Patent No. 10,213,108 ("the '108 patent")

LISTING OF CLAIMS

U.S. Patent No. 9,788,735 (Claims 1-20)

Claim Designation	Claim Language
Independent Claim 1 (Preamble) Limitation 1(a)	A body worn mobile medical monitoring device configured to minimize cable wiring from a sensor by placement of one or more sensor communication ports, the mobile medical monitoring device comprising:
Limitation 1(b)	a housing configured to be secured on a lower arm of a patient being monitored via a strap extending around the lower arm of the patient;
Limitation 1(c)	a display positioned on a face of the housing, opposite the strap, so as to be visible to a user;
Limitation 1(d)	a first sensor communication port positioned on a side of the housing and configured to face a hand of the lower arm of the patient when the mobile medical monitoring device is mounted to the lower arm of the patient, wherein: the side of the housing faces the hand of the lower arm of the patient of the patient when the mobile medical monitoring device is mounted to the lower arm of the patient,
Limitation 1(e)	the first sensor communication port is configured to provide wired communication with a pulse oximetry sensor attached to a digit of the hand of the patient,
Limitation 1(f)	the wired communication with the pulse oximetry sensor provided at least partly in the analog domain, and
Limitation 1(g)	the first sensor communication port is positioned on the side of the housing such that a path from the first sensor communication port on the side of the housing to the digit of the patient is substantially perpendicular to the side of the housing and shorter than any other path from any other side of the housing to the digit of the patient;
Limitation 1(h)	a plurality of additional sensor communications ports positioned on the housing and configured to provide wired communication with a plurality of additional physiological sensors at least partly in the digital domain; and
Limitation 1(i)	one or more processors and a transmitter configured to:
Limitation 1(j)	display, on the display, physiological measurements derived

Claim Designation	Claim Language
	from the pulse oximetry sensor and the plurality of additional physiological sensors; and
Limitation 1(k)	wirelessly transmit information indicative of the physiological measurements to a remote computing device.
Claim 2	The mobile medical monitoring device of claim 1, wherein the wired communication with the pulse oximetry sensor is provided via a tail extending from the pulse oximetry sensor.
Claim 3	The mobile medical monitoring device of claim 2, wherein the tail comprises a cable that is configured to be removably attachable to the first sensor communication port.
Claim 4	The mobile medical monitoring device of claim 3, wherein a length of the cable corresponds to the path from the sensor communication port on the side of the housing to the digit of the patient.
Claim 5	The mobile medical monitoring device of claim 3, wherein the cable is appropriately sized based on the path from the sensor communication port on the side of the housing to the digit of the patient.
Claim 6	The mobile medical monitoring device of claim 3, wherein the path from the sensor communication port on the side of the housing to the digit of the patient runs at least partly along a backside of the hand of the patient.
Claim 7	The mobile medical monitoring device of claim 1, wherein the face of the housing comprises a single user interface.
Claim 8	The mobile medical monitoring device of claim 7, wherein the single user interface comprises the display.
Claim 9 Limitation 9(a)	The mobile medical monitoring device of claim 8, wherein:

Claim Designation	Claim Language
Limitation 9(b)	the housing comprises a back side that is opposite the face of the housing,
Limitation 9(c)	the strap is mountable to the back side of the housing, and the face of the housing is raised from the strap and the lower arm of the patient to enable positioning of the first sensor communication port on the side of the housing between the lower arm of the patient and the face of the housing.
Claim 10 Limitation 10(a)	The mobile medical monitoring device of claim 9, wherein: the front side of the housing comprises a bezel and the display, and
Limitation 10(b)	a top of the first sensor communication port is located below the face of the housing.
Claim 11	The mobile medical monitoring device of claim 10, wherein the display is positioned centrally on the face of the housing.
Claim 12	The mobile medical monitoring device of claim 11, wherein the display positioned on the face of the housing is sized such that the display covers most of a length of a shortest dimension of the face of the housing.
Independent Claim 13 (Preamble) Limitation 13(a)	A body worn, battery-powered medical monitoring device configured to provide on-patient and remote monitoring of patient physiological parameters, the medical monitoring device comprising:
Limitation 13(b)	a battery configured to provide power to the medical monitoring device such that the medical monitoring device may operate without a wired power connection;
Limitation 13(c)	a case configured to house the battery;
Limitation 13(d)	a strap configured to attach the case to an arm of a patient and be mountable to the case;
Limitation 13(e)	a first communications port positioned on a face of a side of the case configured to be nearest to a hand of the arm of the patient when the case is mounted to the arm of the patient,
Limitation 13(f)	the first communications port configured to removably couple

Claim Designation	Claim Language
	with a cable of a finger- or thumb-type pulse oximetry sensor and positioned on the face of the side of the case to provide a path from the first communications port to a digit of the hand of the patient that avoids tangling of the cable,
Limitation 13(g)	the first communications port configured such that the cable perpendicularly extends from the face of the side of the case when the cable is coupled to the first communications port;
Limitation 13(h)	a second communications port configured to provide wired communications with a second physiological sensor arrangement at least partly via digital communications;
Limitation 13(i)	a third communications port configured to provide wired communications with a third physiological sensor arrangement;
Limitation 13(j)	a display configured to provide real time measurements of patient physiological parameters based at least in part on data obtained from at least the pulse oximetry sensor via the first communications port; and
Limitation 13(k)	a transmitter configured to wirelessly transmit information indicative of real time measurements of patient physiological parameters based at least in part on data obtained from the pulse oximetry sensor via the first communications port.
Claim 14	The medical monitoring device of claim 13, wherein the path from the first communications port to a digit of the hand is shorter than any path from any communications port located on any other side of the case to the digit of the hand.
Claim 15	The medical monitoring device of claim 13 further comprising:
Limitation 15(a)	one or more hardware processors configured to:
Limitation 15(b)	process the data obtained from the pulse oximetry sensor; and
Limitation 15(c)	determine, based at least in part on the data, the real time measurements of patient physiological parameters.
Claim 16	The medical monitoring device of claim 15, wherein: the one
Limitation 16(a)	or more hardware processors are further configured to: receive additional data from at least the second physiological sensor

Claim Designation	Claim Language
	arrangement and the third physiological sensor arrangement;
Limitation 16(b)	determine, based at least in part on the additional data, real time measurements of additional patient physiological parameters; and
Limitation 16(c)	cause to be displayed, on the display, the real time measurements of additional patient physiological parameters; and
Limitation 16(d)	the transmitter is further configured to: wirelessly transmit information indicative of real time measurements of additional patient physiological parameters based at least in part on the additional data.
Claim 17	The medical monitoring device of claim 16, wherein the display is positioned on a front, user-facing side of the case to enable a user to view the real time measurements of patient physiological parameters and the real time measurements of additional patient physiological parameters.
Claim 18	The medical monitoring device of claim 17, wherein the second physiological sensor arrangement comprises an EKG sensor arrangement and the third physiological sensor arrangement comprises a blood pressure sensor arrangement.
Claim 19 Limitation 19(a)	The medical monitoring device of claim 18, wherein: the first, second, and third communication ports are communicatively coupled to respective first, second, and third sensor interfaces; and
Limitation 19(b)	the first, second, and third sensor interfaces are uniquely configured to receive signals from the respective pulse oximetry sensor, EKG sensor arrangement, and blood pressure sensor arrangement.
Independent Claim 20 (Preamble) Limitation 20(a)	A body worn portable patient monitoring device configured to provide on-patient and remote monitoring of patient physiological parameters, the portable patient monitoring device comprising:

Claim Designation	Claim Language
Limitation 20(b)	a pulse oximetry sensor configured to be wrapped around a digit of a patient, the pulse oximetry sensor including at least:
Limitation 20(c)	a light emitter configured to emit light into a tissue site of the digit of the patient;
Limitation 20(d)	a light detector configured output a first signal responsive to at least a portion of the emitted light after attenuation by tissue of the tissue site; and
Limitation 20(e)	a cable extending from the pulse oximetry sensor and configured to electrically convey the first signal;
Limitation 20(f)	a blood pressure sensor configured to output a second signal responsive to at least a blood pressure parameter of the patient;
Limitation 20(g)	an additional sensor arrangement configured to output a third signal responsive to at least one additional physiological parameter of the patient other than blood pressure or oxygen saturation, the at least one additional physiological parameter including at least one of: temperature or respiration rate;
Limitation 20(h)	a housing configured to be secured to a lower arm of the patient, the housing having a size and shape configured to be secured to the lower arm of the patient;
Limitation 20(i)	a strap mountable to the back side of the housing, the strap configured to secure the housing to the lower arm of the patient;
Limitation 20(j)	a display positioned on a front side of the housing that is opposite a back side of the housing, the display configured to show a status of the portable patient monitoring device and one or more parameter measurements so as to be viewable by a user,
Limitation 20(k)	wherein the display is positioned centrally on the front side of the display and is sized such that the display spans most of a length of a shortest dimension of the front side of the housing, and
Limitation 20(l)	wherein the front side of the housing comprises a single user interface and a bezel;
Limitation 20(m)	one or more user input mechanisms configured to control an operational mode of the portable patient monitoring device in response to inputs from a user;

Claim Designation	Claim Language
Limitation 20(n)	a first sensor port positioned on a face of a first side of the housing, wherein: the face of the first side of the housing is configured to face toward a hand having the digit of the patient under measurement when the housing is secured to the lower arm of the patient,
Limitation 20(o)	the first sensor port is configured to removably physically couple with the pulse oximetry sensor via the cable and to electrically receive the first signal from the pulse oximetry sensor,
Limitation 20(p)	the cable is configured to run from the first sensor port, at least part way along a path substantially perpendicular to the face of the first side of the housing, down the arm of the patient, and to the digit of the patient to which the pulse oximetry sensor is configured to be wrapped around,
Limitation 20(q)	the front side of the housing is raised from the strap and the lower arm of the patient to enable positioning of the first sensor port on the first side of the housing between the lower arm of the patient and the front side of the housing, and
Limitation 20(r)	a top of the first sensor port is located below the front of the housing;
Limitation 20(s)	a second sensor port positioned on the housing and configured to provide wired electrical communication with the blood pressure sensor arrangement and to electrically receive second signal from the blood pressure sensor arrangement;
Limitation 20(t)	a third sensor port positioned on the housing and configured to provide electrical wired communication with the additional sensor arrangement and to electrically receive the third signal from the additional sensor arrangement;
Limitation 20(u)	a rechargeable battery positioned within the housing and configured to power the portable patient monitoring device such that the portable patient monitoring device is portable and wearable by the patient;
Limitation 20(v)	one or more signal processing arrangements positioned within the housing and configured to:
Limitation 20(w)	receive the first signal from the pulse oximetry sensor via one or more sensor interfaces,
Limitation 20(x)	wherein the first signal is provided at least partly as an analog

Claim Designation	Claim Language
	signal;
Limitation 20(y)	process the first signal from the pulse oximetry sensor to determine measurements of oxygen saturation and pulse rate;
Limitation 20(z)	receive the second signal from the blood pressure sensor arrangement via the one or more sensor interfaces, the second signal responsive to at least a blood pressure parameter of the patient;
Limitation 20(aa)	receive the third signal from the additional sensor arrangement via the one or more sensor interfaces, the third signal responsive to the at least one additional physiological parameter of the patient including at least one of: temperature or respiration rate,
Limitation 20(bb)	wherein the third signal is provided at least partly as a digital signal; and
Limitation 20(cc)	cause the measurements of oxygen saturation, pulse rate, blood pressure, and the at least one additional physiological parameter to all be displayed on the display of the portable patient monitoring device; and
Limitation 20(dd)	a transmitter positioned within the housing and configured to:
Limitation 20(ee)	wirelessly transmit a transmit signal including the information indicating the measurements of oxygen saturation, pulse rate, blood pressure, and the at least one additional physiological parameter to a separate computing device configured to display, on a remote display, the measurements of oxygen saturation, pulse rate, blood pressure, and the at least one additional physiological parameter.

I. FORMALITIES

A. Mandatory Notices (37 C.F.R. § 42.8(a)(1))

1. Real Party in Interest (37 C.F.R. § 42.8(b)(1))

Petitioner Sotera Wireless, Inc. (“Sotera”) is the real party-in-interest in this petition, and Hon Hai Precision Industry Co., Ltd.’s (“Hon Hai”) is also named as a real party-in-interest in this Petition. Sotera and Hon Hai are codefendants in a related proceeding identified in Section 1(A)(4). Petitioner does not believe that Hon Hai rises to the level of a real party-in-interest, as Hon Hai has not exercised any control over this Petition or Sotera’s decision to file this Petition. However, because Hon Hai agrees to be bound by the estoppel provisions of 35 U.S.C. § 315(e), and in order to prevent a costly challenge by Patent Owner regarding whether Hon Hai is a real-party-in interest, Hon Hai has been named a real party-in-interest.

2. Designation of Lead and Backup Counsel (37 C.F.R. § 42.8(b)(3))

Lead Counsel	First Backup Counsel
Rudolph A. Telscher, Jr. Reg. No. 36,032 Husch Blackwell LLP 190 Carondelet Plaza, Suite 600 St. Louis, MO 63105 (314) 480-1500 Tel (314) 480-1505 Fax PTAB-RTelscher@huschblackwell.com	Nathan P. Sportel Reg. No. 67,980 Husch Blackwell LLP 120 South Riverside Plaza, Suite 2200 Chicago, IL 60606 (312) 655-1500 Tel (312) 655-1501 Fax Nathan.Sportel@huschblackwell.com
	Backup Counsel

Daisy Manning Reg. No. 66,369 Husch Blackwell LLP 190 Carondelet Plaza, Suite 600 St. Louis, MO 63105 (314) 480-1500 Tel (314) 480-1505 Fax PTAB-DManning@huschblackwell.com

3. Notice of Service (37 C.F.R. § 42.8(b)(4))

Please direct all correspondence to lead counsel at the above address.

Petitioner also consents to email service at the above email addresses for lead and back-up counsel and hand delivery at the above addresses for lead and backup counsel.

4. Related Proceedings (37 C.F.R. § 42.8(b)(2))

U.S. Patent No. 9,788,735 is presently asserted in *Masimo Corp. v. Sotera Wireless, Inc.*, Case No. 3:19-cv-01100-BAS-NLS (S.D. Cal.). The complaint (EX1029) was served on June 13, 2019 (EX1030). Thus, this Petition is filed within one year after Sotera was served with a complaint for infringement. Sotera has not filed a separate civil action challenging the validity of the claims of the '735 Patent. A petition for *inter partes* review of U.S. Patent No. 10,213,108 (parent to the '735 patent and also asserted in the district court case) was filed by Sotera on May 8, 2020 as IPR2020-00912.

B. Grounds for Standing (37 C.F.R. § 42.104(a))

Petitioner hereby certifies the '735 patent is available for *inter partes* review, and Petitioner is not barred or estopped from requesting an *inter partes* review challenging the patent claims on the Grounds identified in the petition.

C. Procedural Statements

This Petition is filed in accordance with 37 C.F.R. § 42.106(a). A Power of Attorney (37 C.F.R. § 42.10(b)) and Exhibit List (37 C.F.R. § 42.63(e)) are filed concurrently with this Petition. The fee is being paid via Deposit Acct. No. 23-0920. The United States Patent and Trademark Office is authorized to charge any fee deficiency, or credit any overpayment, to Deposit Acct. No. 23-0920.

II. INTRODUCTION

Pursuant to 35 U.S.C. §§ 311-319 and 37 C.F.R. § 42, the undersigned, on behalf of and representing Sotera, petitions for *inter partes* review of claims 1-20 of U.S. Patent No. 9,788,735, entitled “Body Worn Mobile Medical Patient Monitor” (“the ‘735 patent”), issued to Ammar Al-Ali and assigned to Masimo Corporation (“Masimo”). EX1001.

The claims generally recite a wearable patient monitoring device that wirelessly communicates physiological data generated by conventional medical sensor technology. EX1001, Abstract. However, Masimo did not invent body-worn, medical devices that track and wirelessly transmit physiological data. Instead, Masimo obtained an allowance by amending the claims to recite limitations directed to the wearable housing’s physical configuration (e.g., positioning a port in relation to a sensor). As will become clear, there is nothing remotely inventive about a body-worn, medical monitor with a port positioned on a side of the monitor facing a patient’s hand, i.e., the shortest distance for the wire. Indeed, Masimo never even sought protection for the claimed wearable patient monitoring device of the ‘735 patent, which claims priority to a 2002 provisional application, until 2017 and four years *after* it became aware of Sotera’s accused wearable patient monitor. EX1001, [22]; EX1029, ¶¶ 2, 25; EX1015, ¶¶ 6-9.

A petition for *inter partes* review must demonstrate “a reasonable likelihood that the petitioner would prevail with respect to at least one of the claims challenged in the petition.” 35 U.S.C. § 314(a). The Petition meets this threshold.

III. STATEMENT OF THE PRECISE RELIEF REQUESTED AND THE REASONS THEREFOR (37 C.F.R. § 42.22(a))

Petitioner respectfully requests a final written decision that claims 1-20 of the '735 patent are invalid under 35 U.S.C. § 103(a). Claims 1, 13, and 20 are independent.

Petitioner requests *inter partes* review of the '735 patent based on the following patents, all of which were filed, issued, or published prior to the earliest priority date of the '735 patent, which is March 25, 2002. The prior art relevant to this Petition includes: U.S. Patent No. 6,840,904 to Goldberg (“Goldberg”) (EX1005), filed on October 11, 2001 and issued January 11, 2005; EP0880936A2 to Akai (“Akai”) (EX1007), filed on October 30, 1997 and published December 2, 1998; PCT Publication No. WO 00/42911 to Kiani (“Kiani”) (EX1006) published July 27, 2000; U.S. Patent No. 5,919,141 to Money (“Money”) (EX1008) filed on September 13, 1996 and issued July 6, 1999, U.S. Patent No. 4,425,921 to Fujisaki (“Fujisaki”) (EX1016) filed on September 11, 1981 and issued on January 17, 1984, and PCT Publication No. WO 99/13698 to Estep (“Estep”) filed on August 28, 1998 and published March 18, 1999 (EX1009). Akai, Kiani, Money, Fujisaki,

and Estep are prior art to the '735 Patent under 35 U.S.C. § 102(b), and Goldberg is prior art to the '735 Patent under 35 U.S.C. § 102(e).

This Petition further relies upon the Declaration of George Yanulis (“Yanulis Decl.” (EX1003); Yanulis CV (EX1004)), which is relevant to the skill, knowledge, and experience of a person having original skill in the art (“PHOSITA”) at the time of the invention and how that person would have understood and applied the prior art. The statutory grounds on which the challenge is based are:

- (1) Claims 1-2 and 7-9 are unpatentable under 35 U.S.C. § 103(a) in view of Goldberg, Kiani, and Money.
- (2) Claims 3-6 and 13-19 are unpatentable under 35 U.S.C. § 103(a) in view of Goldberg, Kiani, Money, and Fujisaki.
- (3) Claims 10-12 are unpatentable under 35 U.S.C. § 103(a) in view of Goldberg, Kiani, Money, and Estep.
- (4) Claim 20 is unpatentable under 35 U.S.C. § 103(a) in view of Goldberg, Kiani, Money, Fujisaki, and Estep.
- (5) Claims 1-2 and 7-9 are unpatentable under 35 U.S.C. § 103(a) in view of Money, Akai, and Kiani.
- (6) Claims 3-6 and 13-19 are unpatentable under 35 U.S.C. § 103(a) in view of Money, Akai, Kiani, and Fujisaki.

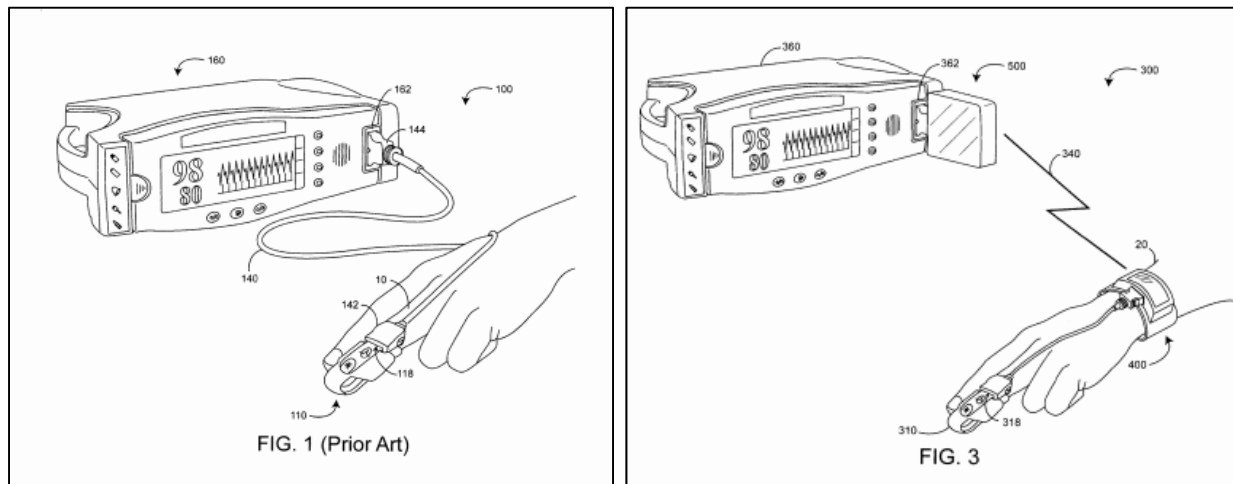
(7) Claims 10-12 are unpatentable under 35 U.S.C. § 103(a) in view of Money, Akai, Kiani, and Estep.

(8) Claim 20 is unpatentable under 35 U.S.C. § 103(a) in view of Money, Akai, Kiani, Fujisaki, and Estep.

IV. U.S. PATENT NO. 9,788,735 (“THE ’735 PATENT”) (EX1001)

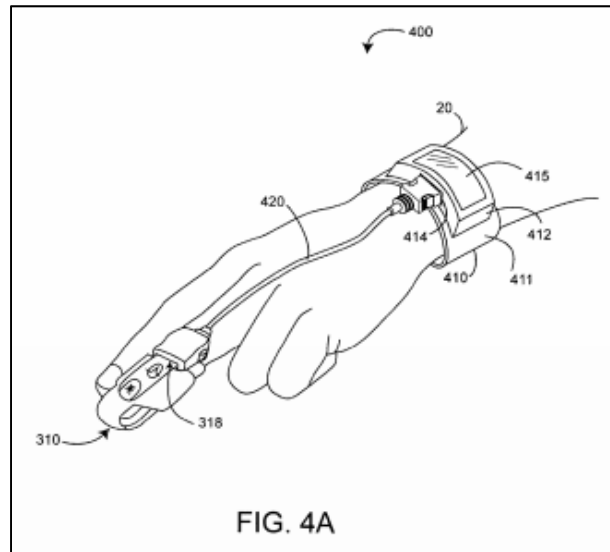
A. Specification and Claims

The ’735 patent merely sought to make bedside pulse oximetry monitoring wireless. EX1001, 2:22-38. A comparison between the Applicant Admitted Prior Art and Masimo’s alleged invention can be seen by comparing FIG. 1 to FIG. 3:



The only difference between the conventional system of FIG. 1 and the alleged invention of the ’735 Patent is the omission of a wired connection between a sensor and a conventional bedside monitor. EX1001, 4:54-64. Unfortunately, Applicant discovered that “cutting the cord” was not a novel idea. EX1012.

The '735 Patent describes a wrist-mounted module 410. EX1001, 5:28-33. Importantly, a cable 420 mates with a module connector 414, and this connector supposedly causes a wire to run toward a sensor “substantially perpendicular to the side of the [case 412].” EX1001, 5:33-39, 13:38-44, FIG. 4A.



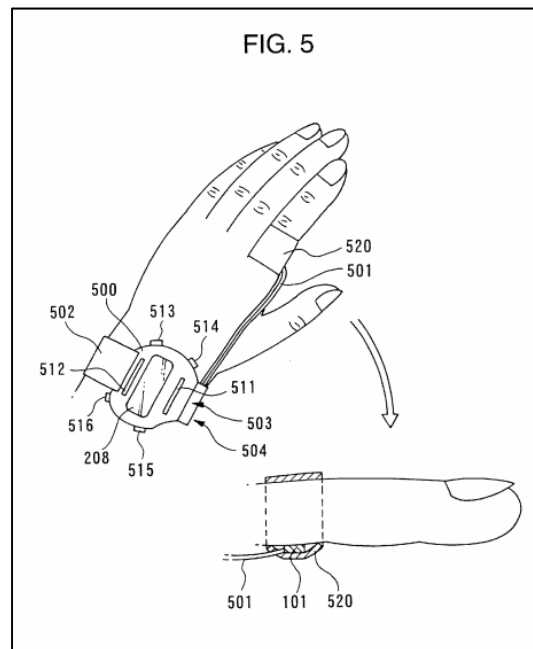
Through the wired connection to the sensor 310, the wrist-mounted module 410 receives pulse oximetry data and displays the pulse oximetry data on a display 415. EX1001, 5:35-42, 6:36-67. Additionally, the '735 Patent explains the wearable device can communicate with multiple sensors. EX1001, 11:56-12:35.

B. Prosecution History of the '735 Patent

The '735 Patent comes from a long family of patent applications all having a priority date of March 25, 2002. EX1001, [63] Related U.S. Application Data. None of file histories of the parent applications are relevant to the claims of the '735 Patent because the parent applications were directed to the combined wireless

transmitter/bedside monitor receiver system. EX1003, ¶ 22; EX1023, 12:49-14:65; EX1024, 12:43-14:39; EX1025, 11:60-14:11; EX1026, 12:45-14:21; EX1027, 12:49-14:48; EX1028, 12:48-13:26. Only U.S. Patent No. 10,213,108 is similar to the '735 Patent claims, but that prosecution history is nearly identical, even overcoming the same art using similar claim amendments. EX1031, 13:9-16:54.

During prosecution of the '735 Patent, the application was rejected in view of U.S. Patent No. 6,241,684 to Amano ("Amano") (EX1013), which relates to an exercise wristwatch connected to a finger-mounted, pulse-measuring sensor. EX1012, pp. 4-6.



EX1013, Fig. 5.

In response, the Examiner amended the claims to recite a path to the pulse oximetry sensor “substantially perpendicular to the side of the housing” to overcome Amano. *Compare* EX1010, p. 29; EX1011, pp. 2-9; EX1014, pp. 6-11.

After interviewing with Applicant, the Examiner conducted a search using only **one search term** prior to allowing the application. EX1014, p. 21. In the Notice of Allowance, the Examiner specifically pointed to the pulse oximetry sensor port’s positioning on the housing as the difference between Amano and the claims (Amano’s port was located at the “6 o’clock position,” per the Examiner, an inconsequential distinction). EX1014, p. 14. Regardless, the exact configuration of the ’735 Patent is shown in numerous pieces of prior art, including the prior art cited herein. EX1003, ¶ 21; EX1005-1009; EX1016; EX1017-EX1022.

V. BACKGROUND OF PATIENT MONITORING AND THE PRIOR ART REPLIED UPON IN THIS PETITION

A. Prior Art Patents and Printed Publications Relied Upon

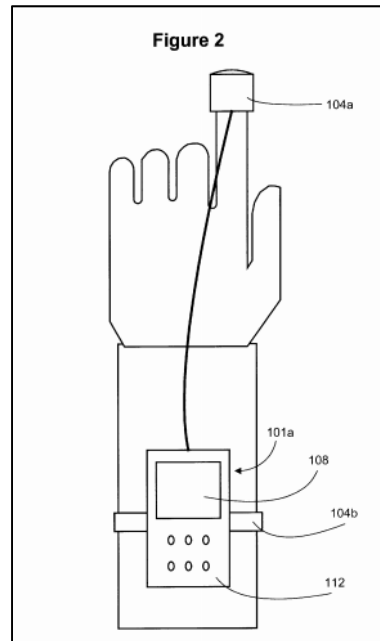
This challenge is based on six prior art references: Goldberg, Kiani, Money, Akai, Fujisaki, and Estep.

1. Goldberg

Goldberg broadly discloses a wireless, wearable patient monitoring device. EX1005, Abstract. More specifically, Goldberg teaches a portable device 100 that receives data from three or more sensors, displays sensor data, and wirelessly

transmits sensor data to a remote computer. EX1003, ¶ 37; EX1005, 1:29-44, 2:27-29, 4:20-30, 4:50-56, 5:3-8, 2:37-42, 2:47-55.

Goldberg's housing 112 is configured exactly as claimed by the '735 Patent. EX1003, ¶¶ 38-39; EX1005, FIG. 2.



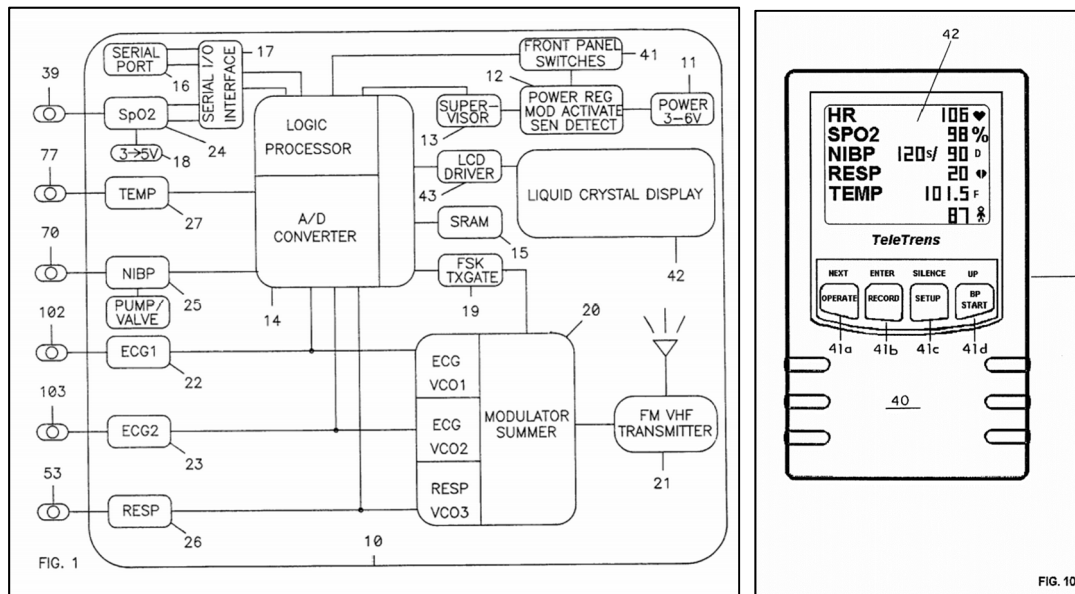
2. Kiani

Kiani broadly discloses a portable pulse oximetry sensor that communicates with conventional bedside monitors, similar to the '735 Patent. EX1006, Abstract, 5:33-6:2.

Kiani describes conventional pulse oximetry sensors. Importantly, Kiani teaches that medical sensors communicate using ports. EX1003, ¶¶ 40-41; EX1006, 3:21-23, 5:21-22, 8:31-9:2, FIG. 5.

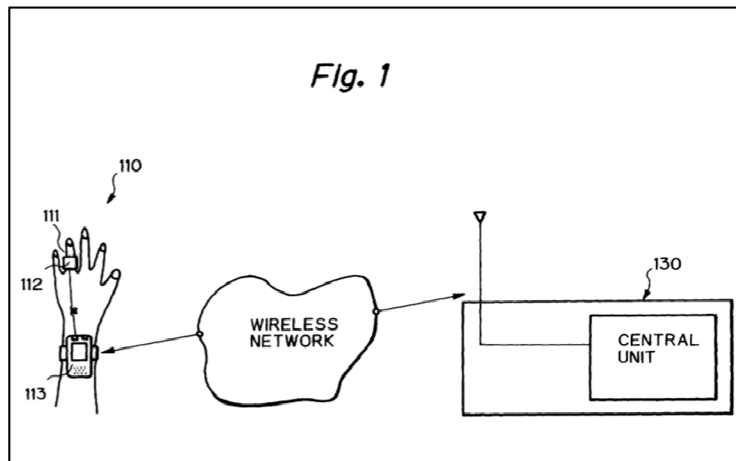
3. Money

Money teaches a wearable, remote monitoring device 10 that communicates with numerous sensors. EX1003, ¶ 42; EX1008, 5:4-28, FIG. 1. Money teaches the patient monitor receives digital signals from some sensors and analog signals from other sensors. EX1003, ¶¶ 42; EX1008, 5:48-51, 7:4-8, 7:16-20, 7:58-62, 12:4-7, 13:24-32. Money teaches the device displays readings from all the connected sensors on a display and wirelessly transmits those readings to a central monitoring station. EX1003, ¶ 42; EX1008, 5:10-13, 6:21-55.



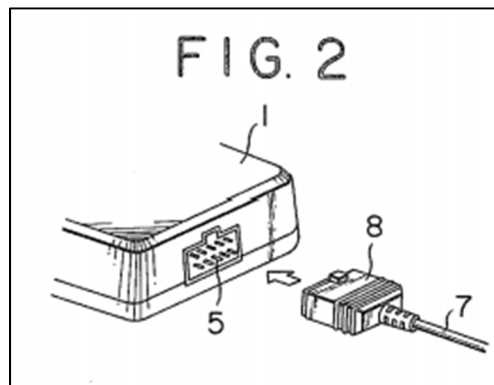
4. Akai

Akai broadly discloses a wearable monitoring device that connects to three or more sensors, displays sensor readings, and wirelessly transmits those readings to a central computer. EX1007, Abstract. Akai's housing is configured exactly as claimed by the '735 Patent. EX1003, ¶ 43; EX1007, FIG. 1.



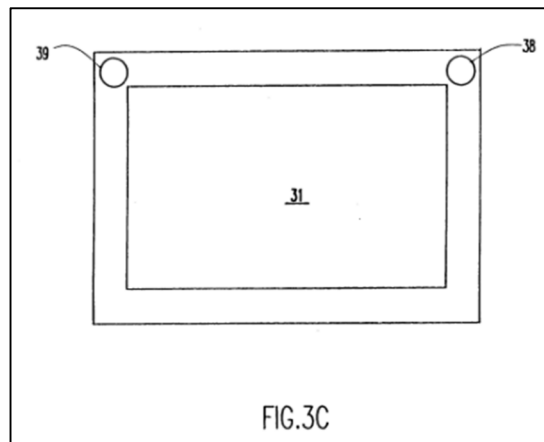
5. Fujisaki

Fujisaki teaches removable cables to interface with sensors. EX1003, ¶ 44; EX1016, 5:37-44, FIGs. 2, 6.



6. Estep

Estep teaches a wearable device with a display 31 surrounded by a bezel (i.e., border). EX1009, 4:24-27, FIG. 3CEX1003, ¶ 45.



VI. A PERSON HAVING ORDINARY SKILL IN THE ART

The prior art and the Yanulis Declaration (EX1003) demonstrate a PHOSITA, at the time the '735 Patent was filed, would have been a person with at least a B.S. degree in electrical or biomedical engineering or a related field with at least two years' experience designing patient monitoring systems. Less work experience may be compensated by a higher level of education, such as a master's degree, and vice versa. EX1003, ¶¶ 25-32.

VII. CLAIM CONSTRUCTION UNDER 37 C.F.R. § 42.104(b)(3)

Unless otherwise addressed herein, the terms of the unexpired '735 patent's claims are to be given their plain and ordinary meaning, as understood by one of ordinary skill in the art, in view of the '735 patent's specification¹. EX1003, ¶¶ 33-

¹ Currently, Petitioner and Masimo disagree as to the construction of some terms in the corresponding District Court litigation. However, the claims are invalid under

36. See 37 C.F.R. § 42.100(b); 83 FR 51340; *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc).

VIII. DISCRETION UNDER § 325(d)

The Board uses a two-prong test to determine whether it will deny institution under 35 U.S.C. § 325(d). Under the first prong, the Board determines whether the same or substantially the same prior art or arguments were previously considered by the USPTO. *Advanced Bionics LLC v. MED-EL Elektromedizinische Geräte GmbH*, IPR2019-01469, Paper 6 (PTAB Feb. 13, 2020) (Precedential). None of the references cited in this petition were previously considered by the USPTO.

EX1001, [56] References Cited.

Nor are the references cited herein substantially the same as the references considered during prosecution. In fact, two references herein show the claimed housing configuration found by the Examiner to be the alleged point of novelty. Thus, the prior art relied upon herein teaches the very limitation found by the Examiner to be missing from the prior art, which is highly persuasive evidence supporting a decision to institute trial. *Vestas-American Wind Technology, Inc. v. General Electric Co.*, IPR2018-01015, slip op. at 23-24 (Paper 9) (PTAB Nov. 14,

either party's construction. As such, the Board need not construe any claim terms to find the claims invalid.

2018); *see Becton, Dickinson & Co. v. B. Braun Melsungen AG*, IPR2017-01586, slip op. at 17–18 (Paper 8) (PTAB Dec. 15, 2017) (informative).

Because the prior art and arguments are not the same or substantially similar, the second prong does not apply.

IX. GROUND FOR UNPATENTABILITY

Petitioner requests cancellation of the challenged claims on the following Grounds:

A. Ground 1: Claims 1-2 and 7-9 are unpatentable under 35 U.S.C. § 103(a) in view of Goldberg, Kiani, and Money

1. Obviousness in view of Goldberg, Kiani, and Money

Goldberg, Kiani, and Money are all related to the same field (portable, wearable patient monitoring) and describe the same device: a portable medical monitor. EX1005, Abstract; EX1006, Abstract; EX1008, Abstract. Furthermore, Goldberg, Kiani, and Money all use portability to solve the same problem, namely, to portably monitor a patient. EX1005, Abstract; EX1006, 2:34-3:4; EX1008, 2:64-3:2, 3:14-20; EX1003, ¶ 54; *In re Bigio*, 381 F.3d 1320, 1325 (Fed. Cir. 2004); MPEP 2141.01(a). Thus, Goldberg, Kiani, and Money are analogous art.

2. Independent Claim 1

a. Limitation 1(a)²

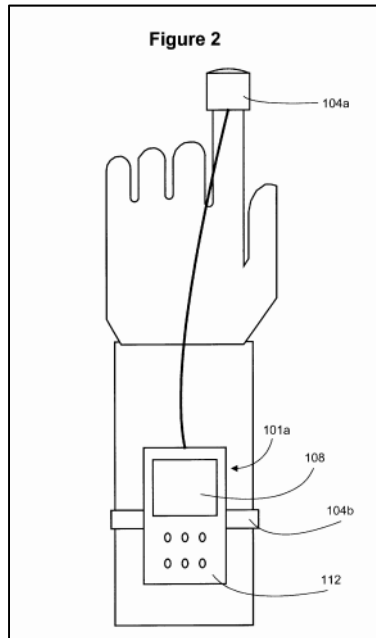
This preamble merely describes an intended use of the body worn medical monitoring device, which does not instill patentable weight. *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305 (Fed. Cir. 1999); EX1003, ¶ 55.

To the extent the preamble is limiting, Goldberg teaches a body worn medical monitoring device to minimize cable wiring from a sensor by placement of one or more sensor communication ports. EX1005, 4:57-67. More specifically, Goldberg teaches a portable device 100 worn on a person's wrist or forearm, which receives data from at least a pulse oximetry sensor, a blood pressure cuff sensor, and a third sensor (e.g., an electrolyte sensor, etc.). EX1005, 4:57-67, 5:3-8, 5:39-47. Thus, Goldberg teaches body worn, medical monitoring device. EX1003, ¶ 56.

Additionally, Goldberg positioned the wire between the pulse oximetry sensor 104a and the housing 112 at the closest possible location to the patient's hand, where a pulse oximetry sensor attaches to minimize the length of the wire

² Because Petitioner included the full claim language of the '735 Patent in the Listing of Claims, Petitioner does not reproduce the full claim language here. The Board is encouraged to reference the Listing of Claims at p. xiii to see the full claim language, if necessary.

using the shortest distance between two points. EX1003, ¶ 57; EX1005, 4:26-29; 4:60-62, FIG. 2.



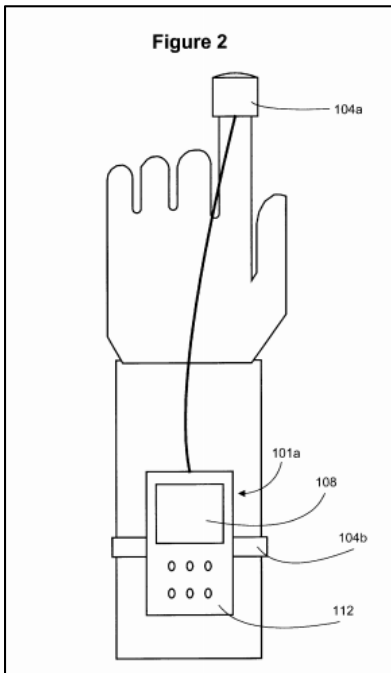
The port's position minimizes the amount of wiring from the sensor to the housing. EX1005, FIG. 2; EX1003, ¶¶ 58. As explained in more detail below (Section IX.A.2.d), a PHOSITA would understand the wire electrically connects to the housing via a port, or it would have been obvious to include a port as part of this electrical connection in view of Kiani. EX1003, ¶ 58; EX1005, 4:19-29.

Although the preamble should not be given patentable weight, Goldberg in view of Kiani renders the preamble obvious. EX1003, ¶¶ 55-58.

b. Limitation 1(b)

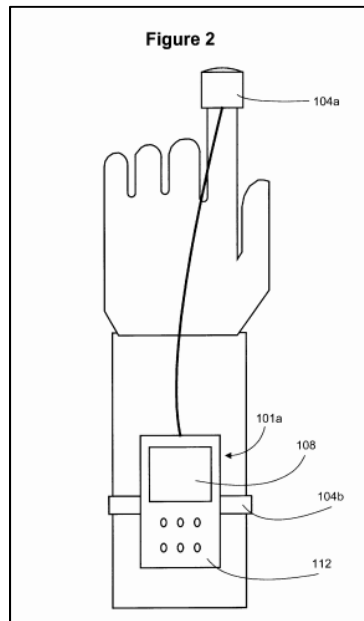
Goldberg teaches a housing 112 secured to the person's arm via a strap. EX1003, ¶¶ 59-60; EX1005, 4:19-30, 4:57-60, 4:64-67, FIG. 2. Goldberg teaches a

blood pressure cuff sensor 104b that functions as both a sensor and a strap used to secure the portable device by wrapping around the patient's wrist/arm. EX1003, ¶ 59; EX1005, 4:57-60, 4:64-67, FIG. 2. Indeed, Goldberg calls the blood pressure cuff a strap. *Id.*



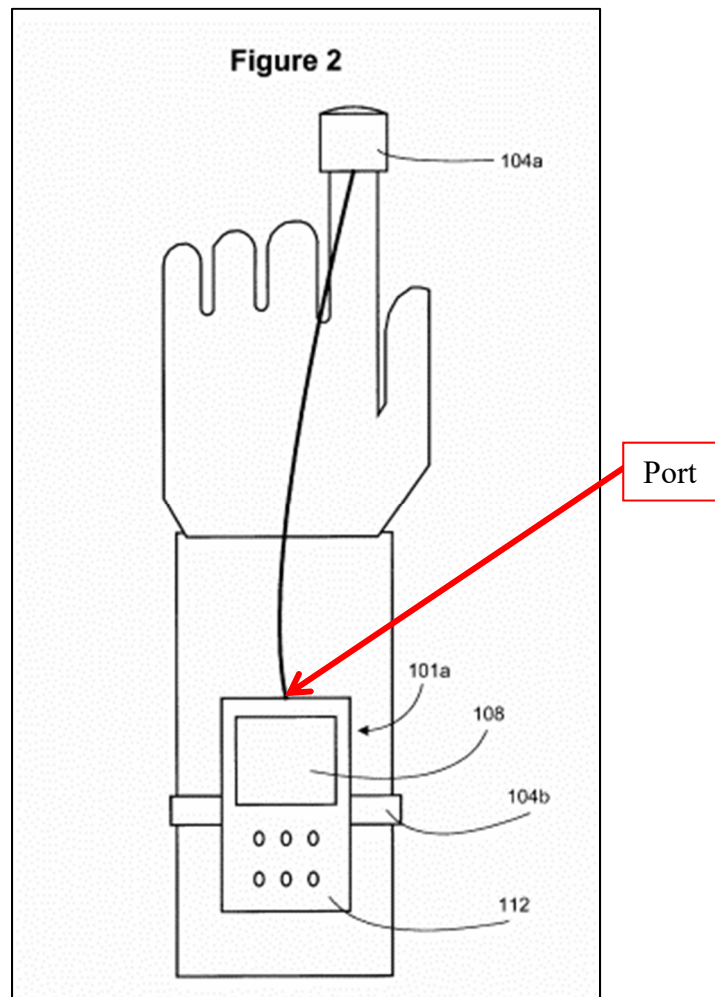
c. Limitation 1(c)

Goldberg teaches a display 108 that displays sensor data. EX1003, ¶ 62; EX1005, 6:32-45, FIGs. 6A-B. Goldberg illustrates the display as being visible when the portable device is strapped to a patient's wrist, so Goldberg's display is positioned on a face of the housing opposite the strap and visible to a user. EX1003, ¶¶ 61-62; EX1005, FIG. 2.



d. Limitation 1(d)

Goldberg teaches a pulse oximetry sensor 104a connects to a controller 102 of the portable device via a wire. EX1003, ¶ 63; EX1005, 4:13-29. As shown in FIG. 2 of Goldberg, a first sensor communication port, facilitating the wired connection, faces the hand and exists on the side of the housing facing the hand when the person is wearing the portable device. EX1003, ¶ 66; EX1005, FIG. 2 (annotated).



A PHOSITA would assume Goldberg teaches a port because Goldberg shows that a wire extends between the pulse oximetry sensor 104a and *into* the housing and because Goldberg teaches the controller receives electronic signals from the sensor 104a. EX1003, ¶ 64; EX1005, 4:19-29. This teaching complies with the meaning of a port to a PHOSITA. EX1001, 5:3-5:5, 6:3-5, 6:12-14, 6:19-21, 7:44-46; EX1003, ¶ 64. Indeed, a PHOSITA would assume the wire shown above includes a port because ports are a common and typical electrical connection

for a housing. EX1005, 4:19-29; EX1003, ¶ 64. Therefore, Goldberg teaches a sensor port. *Id.*

To the extent Goldberg doesn't explicitly recite a port, Kiani teaches that sensor input ports 540, 550 were well-known for wired communication. EX1006, 3:21-27, 8:31-9:2. As such, Kiani explicitly explains that which was implicitly known to a PHOSITA: wired connections can communicate with electrical devices via ports, such as the wired connection of the pulse oximetry sensor 104a shown in Goldberg. *Id.*; EX1003, ¶ 65. It would have been obvious to include the port taught by Kiani on the portable device of Goldberg to establish easy removal and replacement of the sensor 104a, and predictably resulting in a secure, wired connection. EX1006, 2:34-3:4; EX1003, ¶¶ 64-65. The combination of Kiani and Goldberg is particularly proper because Kiani merely states the inferences a PHOSITA would make when reading Goldberg. EX1003, ¶ 65; *In re Preda*, 401 F.2d 825, 826 (CCPA 1968); MPEP 2144.01. Indeed, Kiani explains facts readily understood by a PHOSITA—wired connections often include ports. EX1006, 3:11-14, 4:19-22. Stated differently, Kiani merely represents common knowledge in the art or well-known prior art techniques. *In re Knapp Monarch Co.*, 296 F.2d 230 (CCPA 1961).

Particularly, in a medical context, hardwired sensors are undesirable. EX1003, ¶ 64. A PHOSITA would know that patients suffer from a variety of

ailments, which require monitoring of different sets of vital signs. *Id.* As such, doctors demand and expect patient monitors that conform and adapt as needed, based on a particular patient, the patient's ailment, and the monitored vital signs associated with that ailment. *Id.* In other words, a PHOSITA would know, using common sense and basic knowledge about the medical field, to build wired connections that allow for sensors to be readily connected and disconnected as needed, and ports were known to provide such adaptability. *Id.*; *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398 (2007). Therefore, in a medical setting, a PHOSITA would be motivated to include ports on a multi-parameter monitor, like the portable device 100 of Goldberg, using only basic common sense and knowledge of user expectations, which would be the expectations of clinicians. EX1003, ¶ 64; EX1005, 5:3-8.

At most, “modifying” Goldberg with Kiani represents a combination of prior art elements (wired electrical connections and wired electrical connections using ports) according to known methods to yield predictable results (secure wired communication). EX1003, ¶ 65.

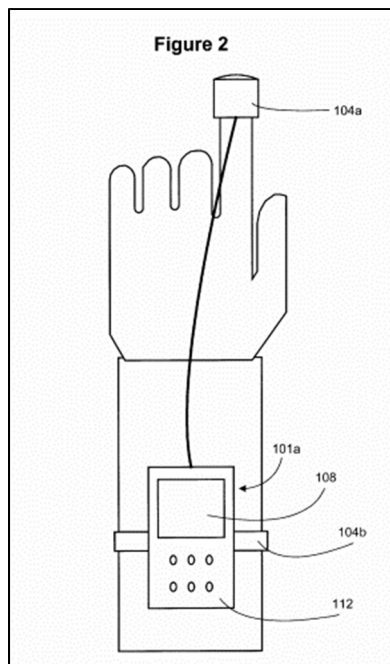
Therefore, Goldberg and Kiani render this limitation obvious. *Id.*, ¶ 67.

e. Limitation 1(e)

Goldberg teaches the pulse oximetry sensor provides electrical signals representing oxygen saturation to the electronic controller via a wired connection.

EX1005, 4:19-29, FIG. 2. Goldberg either implicitly teaches a first sensor port, or it would have been obvious to include a sensor port in view of Kiani. Section IX.A.2.d. Thus, Goldberg alone or in view of Kiani teaches or renders obvious this limitation. EX1003, ¶¶ 63-64, 68-69.

Also, Goldberg teaches a pulse oximetry sensor attached to a patient's finger. EX1003, ¶ 69; EX1005, 4:60-62, FIG. 2.



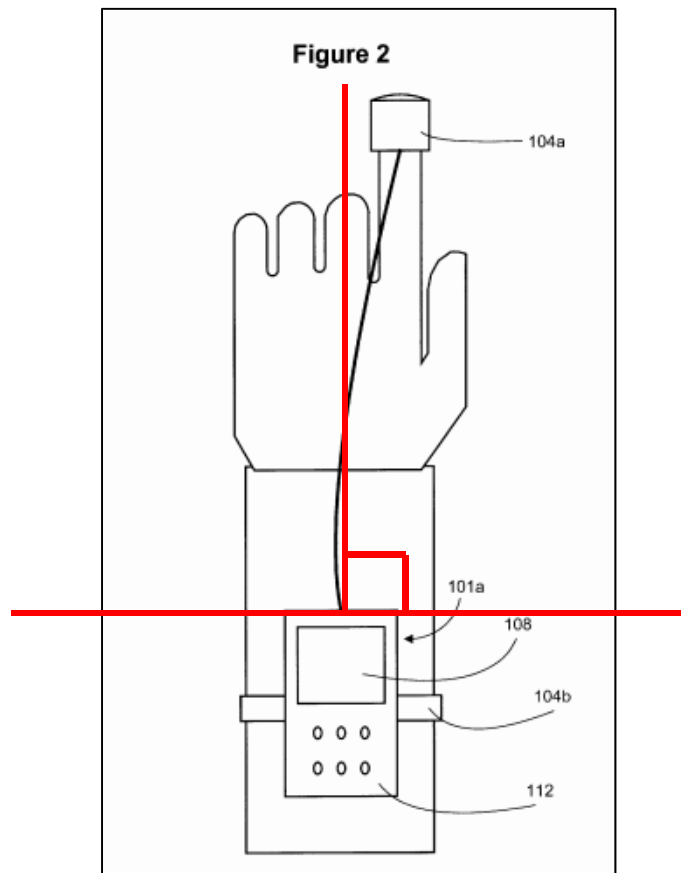
f. Limitation 1(f)

To the extent Goldberg doesn't expressly teach whether the signal from the pulse oximetry sensor is analog or digital, Kiani teaches a sensor interface 120 with an amplifier and a filter that receives an analog signal from a pulse oximetry sensor. EX1006, 1:26-28. As admitted by the '735 Patent, a PHOSITA would understand an amplifier and a filter are only necessary to interpret an analog signal.

EX1001, 6:61-65; EX1003, ¶ 70. While Kiani teaches the implicit teachings of Goldberg, at worst, the combination of Goldberg and Kiani represents a substitution of one equivalent SpO2 sensor for another to achieve predictable results (transferring oxygen saturation data via an analog signal). *KSR*, 550 U.S. at 417. Additionally, it would have been obvious to provide the wired communication with the pulse oximetry sensor of Goldberg in the analog domain because there are only a finite number of options (two) for transmitting signals: analog or digital, and choosing analog would have been, at worst, obvious to try. *Id.* at 421; EX1003, ¶¶ 71-73. Or, it would have been obvious to modify a digital signal to be analog with a basic digital-to-analog converter. EX1003, ¶ 71. Thus, Goldberg in view of Kiani renders obvious receiving an analog signal from the pulse oximetry sensor. EX1003, ¶ 70.

g. Limitation 1(g)

Goldberg illustrates the wire between the pulse oximetry sensor and the housing as extending from the first sensor port following a path substantially perpendicular to the first side (side facing the patient's hand) of the housing (annotated below). EX1005, FIG. 2. As shown, the wire's path is the shortest from any side of the housing when the sensor is attached to the patient's finger because the wire's path is the most direct path possible from the housing to the finger. *Id.*; EX1003, ¶¶ 74-75.



EX1005, FIG. 2 (annotated).

h. Limitation 1(h)

Goldberg teaches a system capable of communicating with more than two sensors. EX1003, ¶ 76; EX1005, 4:19-29, 5:3-8. Indeed, it was very common in the medical field to monitor multiple vital signs simultaneously. EX1003, ¶ 76; EX1005, 4:14-17, 4:57-5:8; EX1006, 1:9-11. For example, Goldberg explains the portable device 100a communicates with three or more sensors (SpO₂, blood pressure, and electrolyte), but the electrolyte sensor could also be replaced with an ECG, temperature, or respiration rate sensor. EX1005, 4:57-5:8, 1:37-44, 4:24-27.

Goldberg teaches sensors communicate with the controller via wired connections. EX1005, 4:19-29, 5:3-8. Thus, Goldberg teaches an embodiment that receives signals from a second sensor (blood pressure) and a third sensor (e.g., electrolyte or others) via wired connections via second and third sensor ports. EX1005, 4:67-5:8, 4:19-29.

Again, Goldberg implicitly teaches these wired connections include ports. EX1005, 4:19-29, 5:3-8; EX1003, ¶ 77. Alternatively, sensor ports were conventional for wired connections, and it would have been obvious to include sensor ports for all wired connections with sensors. EX1003, ¶ 78; EX1006, 3:21-27, 8:31-9:2; *see also* EX1008, 6:11-20. Kiani also teaches sensor ports are positioned on a monitor's housing. EX1006, FIG. 5. As such, Goldberg as "modified" by Kiani would predictably include a plurality of ports positioned on the housing 112 and configured to receive signals from the blood pressure and electrolyte (or others) sensors via wired connections. EX1005, 4:19-29, 5:3-8; EX1003, ¶ 78.

Additionally, adding generic, additional sensor ports is an obvious duplication of parts. *In re Harza*, 274 F.2d 669 (CCPA 1960); MPEP 2144.04(VI)(B). Thus, Goldberg teaches a plurality of sensor communication ports positioned on the housing and configured to provided wired communication with a

plurality of physiological sensors. EX1005, 4:57-5:8, 1:37-44, 4:24-27; EX1003, ¶¶ 78-79.

Goldberg doesn't expressly teach whether the sensors communicate via digital (or analog) communications, but Goldberg teaches the portable device 100 can communicate with any sensor, which would include analog and digital devices. EX1005, 5:6-8. At the very least, it would have been obvious to try transferring digital data, especially for discrete measurements (e.g., temperature or blood pressure), because there are only two signal possibilities: analog or digital. *KSR*, 550 U.S. at 421; EX1003, ¶ 80. Modern electrical devices communicate using digital packets, so it would have been obvious to transmit data digitally as packets. EX1008, 13:24-32.

To the extent Goldberg in view of Kiani doesn't expressly teach a system that receives analog signals from a first sensor and digital signals from another sensor, Money teaches a system that receives analog signals from some sensors and digital signals from others. EX1003, ¶ 81; EX1008, 5:48-51, 7:4-8, 7:16-20, 7:58-62, 12:4-7, 13:24-32. Money even describes the power requirements and requisite circuitry to communicate with both sensor types. EX1008, 7:4-20; EX1003, ¶ 82. Indeed, Money seeks to connect to a wide variety of devices, transmitting both analog and digital information, which Goldberg also desires. *Id.*; EX1005, 5:6-8.

Specifically, in Money, the patient monitor 10 receives discrete, digital data packets via an RS232 serial port, thereby unequivocally teaching data transmitted digitally. EX1003, ¶ 83; EX1008, 7:58-62, 12:4-7, 13:24-32. Beyond a PHOSITA's understanding that RS232 transmits and receives serial, digital data, Money teaches the RS232 port receives data packets, which are inherently digital (an analog signal cannot be packetized). EX1003, ¶ 84; EX1008, 13:24-32. Thus, Money teaches a monitor that communicates with both analog and digital signals.

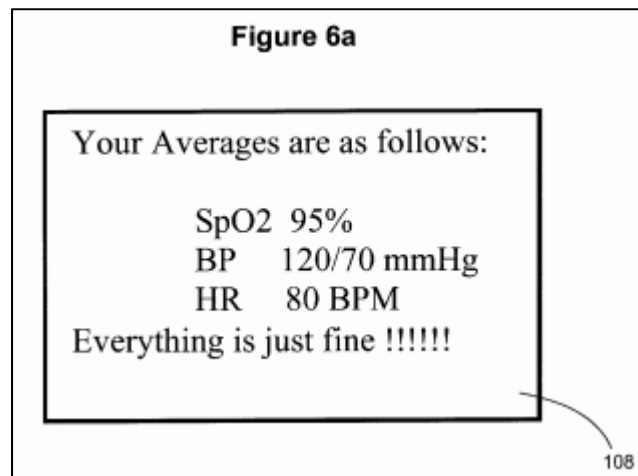
Modifying the combination of Goldberg and Kiani with Money would have predictably resulted in a system that receives both analog and digital information from various sensors. EX1003, ¶¶ 85-86. A PHOSITA would have been motivated to modify Goldberg with Money to expand the number of devices the portable device of Goldberg can communicate with. *Id.*; EX1005, 6-8; EX1008, 7:4-20. Money teaches how to receive digital data: packetizing data transmitted according to known, standardized, and ubiquitous hardware and protocols, such as RS232. EX1003, ¶¶ 83-84; EX1008, 6:11-20, 7:58-62, 13:24-32. Thus, modifying Goldberg/Kiani with Money would have been a combination of familiar elements according to known methods yielding predictable results. *KSR*, 550 U.S. at 415-16.

i. Limitation 1(i)

Goldberg teaches a controller 102 configured to process sensor signals. EX1003, ¶ 87; EX1005, 4:34-36.

j. Limitation 1(j)

Goldberg teaches the controller derives and displays, on the display, measurements of oxygen saturation, blood pressure, glucose based on the signals received from the sensors. EX1003, ¶ 88; EX1005, 4:19-23, 4:30-36, 50-55, FIGs. 6A-C.



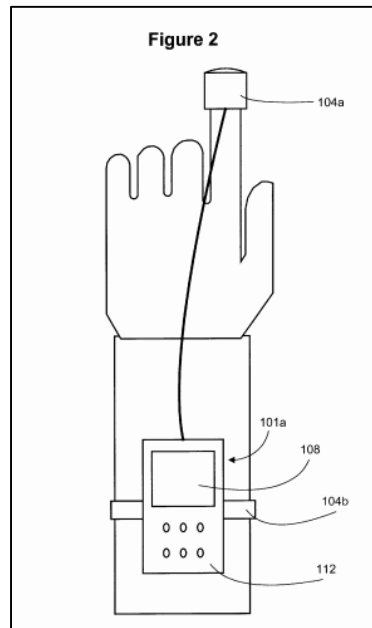
k. Limitation 1(k)

Goldberg teaches the communication unit 110 wirelessly transmits sensor measurements, including oxygen saturation and blood pressure, to a remote computer 302. EX1005, 4:19-23, 4:50-55, 5:9-24, FIGs. 6A-C; EX1003, ¶ 89.

3. Dependent Claim 2

The '735 Patent fails to teach how a "tail" is different from a wire. EX1001, 5:45-47. Thus, a PHOSITA would assume a tail is a wire. EX1003, ¶¶ 90-91.

Goldberg teaches a pulse oximetry sensor that includes a wire connecting the pulse oximetry sensor to the controller. EX1005, 4:19-29, FIG. 2.



4. Dependent Claim 7

Goldberg teaches a single display for displaying data. EX1005, 4:30-34, 6:32-46. A display is a user interface. EX1001, 14:12-14; EX1005, 4:30-34, 6:32-46; EX1003, ¶ 92.

5. Dependent Claim 8

Goldberg teaches a display for displaying data. EX1005, 4:30-34, 6:32-46; EX1003, ¶ 93.

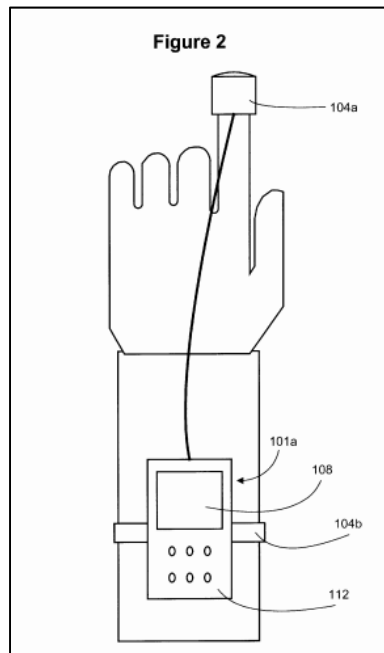
6. Dependent Claim 9

a. Limitation 9(a)

Goldberg teaches a box-shaped housing having six sides. EX1005, FIG. 2. Thus, Goldberg teaches a back side of the housing (not shown but facing into the

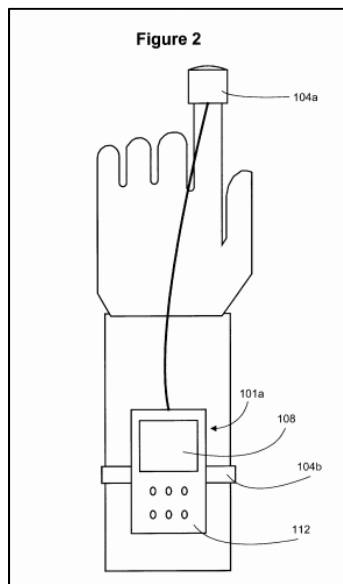
patient's arm) opposite the face of the housing (where the display is positioned).

Id.; EX1003, ¶ 94.



b. Limitation 9(b)

FIG. 2 of Goldberg illustrates the housing positioned over the blood pressure strap. Because Goldberg illustrates the housing over the strap, a PHOSITA would understand the strap is mounted to the back side of the housing. EX1005, FIG. 2; EX1003, ¶¶ 95-96. Thus, Goldberg teaches and a PHOSITA would understand the blood pressure cuff is secured to the back side of the housing.



Additionally, Goldberg teaches the housing can be strapped to the patient according to any conventional strap apparatus. EX1005, 4:57-60. As such, even if Goldberg doesn't expressly explain, in words, that the blood pressure cuff is secured to the back side of the housing, it would have been obvious to secure the blood pressure cuff to the back side of the housing because there are only a finite number (two) of identifiable places to mount a strap to Goldberg's housing: (1) mounting a strap to the back side of the housing, or (2) mounting the strap to the left and right sides of the housing. *KSR*, 550 U.S. at 421. The box-shaped housing shown by Goldberg only has six sides, and the strap cannot cover the display, lest the purpose of the display (to display data) would be defeated. EX1005, 4:30-33; EX1003, ¶ 98. Nor can the strap mount to the top and bottom sides (as shown in FIG. 2) because the top side is blocked by the cable extending to the pulse

oximetry sensor, and such an arrangement would not wrap around a person's wrist. EX1005, 4:30-33, FIG. 2; EX1003, ¶ 98. Thus, there are only two options for mounting the strap to the housing (back side or left/right sides). *Id.* With only two options, both of which would predictably secure the strap to the housing for wrapping around a patient's wrist, mounting the strap to the back side of the housing would be obvious to try, even though Goldberg clearly shows the strap attached to the back of the housing. *Id.* Therefore, this limitation is the work "not of innovation but of ordinary skill and common sense." *KSR*, 550 U.S. at 421.

Technically, the blood pressure cuff ***must*** mount to the back side of the housing to accurately detect blood pressure because blood pressure cuffs must wrap entirely around a patient's arm. EX1003, ¶ 97. A PHOSITA would know that a blood pressure cuff wraps entirely around a person's arm to engage an artery. *Id.* If the blood pressure sensor were mounted to the left and right sides of the housing, then the housing would have direct contact with the skin, and the housing would press against the skin as pressure is applied by the blood pressure sensor. *Id.* The housing's solid surface might disrupt the pressure applied by the blood pressure cuff and cause erroneous readings. *Id.* Thus, a PHOSITA would understand the strap of Goldberg ***must*** mount to the rear surface of the housing, lest the cuff be unable to accurately detect blood pressure readings. *Id.*; EX1003, ¶ 99.

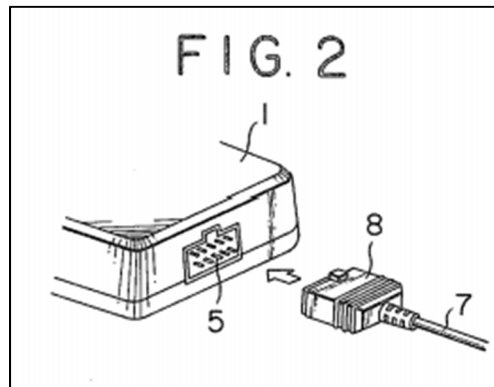
c. Limitation 9(c)

Goldberg teaches a three-dimensional housing and space on the side facing the patient's hand for the wire from the pulse oximetry sensor to extend into the housing 112. EX1005, FIG. 2; EX1003, ¶ 100.

B. Ground 2: Claims 3-6 and 13-19 are unpatentable under 35 U.S.C. § 103(a) in view of Goldberg, Kiani, Money, and Fujisaki

1. Dependent Claim 3

Goldberg teaches a wired connection between the portable device and the pulse oximetry sensor. EX1003, ¶ 102; EX1005, 4:26-29. To the extent Goldberg doesn't expressly teach the cable is removable, it would have been obvious to make the cable removable from the first sensor port in view of Fujisaki. A wired connection must be either hard-wired or removable. Fujisaki teaches removable wired connections. EX1016, 5:37-44, FIGs. 2, 6. Specifically, Fujisaki shows a wearable device having cable removably connected with a connector plug (i.e., port). *Id.*; EX1003, ¶ 103. This is particularly obvious and important in the medical field where medical staff must be able to change out sensors efficiently. EX1003, ¶ 104.

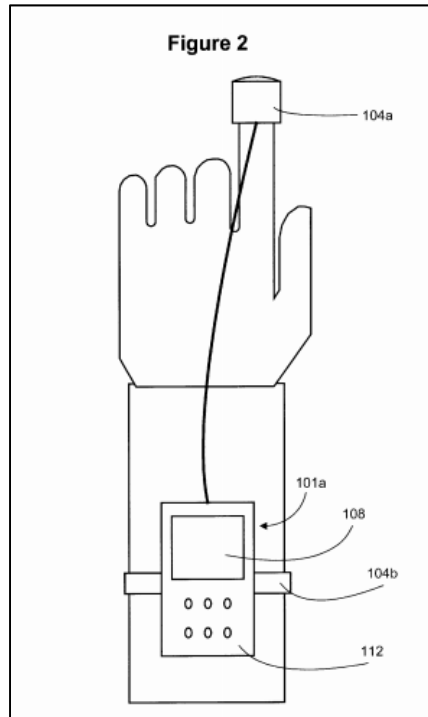


As taught by Fujisaki, a removable cable allows for replacement of a sensor with another sensor. *Id.*; EX1016, 5:37-44, FIGs. 2, 6. Fujisaki allows for a port to communicate with a variety of different sensors. *Id.* Thus, a PHOSITA would combine the teachings of Goldberg and Fujisaki to build a set of medical sensors appropriate for a patient's condition. *Id.*

Alternatively, if the pulse oximetry sensor 104a was found to be faulty, and if the cable was removable, then a caregiver would unplug the faulty sensor and replace the sensor without replacing the entire portable wireless device. EX1016, 5:37-44, FIGs. 2, 6; EX1003, ¶ 105. Such a plug-and-play option would obviate the need to commission a new portable device, including setting up a patient profile and connecting the portable device to the network. EX1005, 5:9-24; EX1003, ¶ 105. Under either scenario, a removable cable would predictably yield a device that can be plugged in to function and removed to be replaced or connected to a new device. EX1003, ¶ 106.

2. Dependent Claim 4

Goldberg illustrates the length of the wire between the sensor and the housing corresponds to the length between the housing 112 and the patient's finger. EX1005, FIG. 2; 4:19-29, 4:60-62; EX1003, ¶ 107.



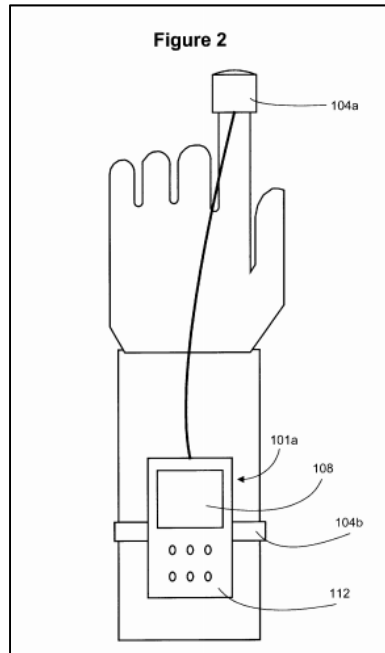
3. Dependent Claim 5

Goldberg illustrates the length of the wire between the sensor and the housing is appropriately sized based on the length between the side of the housing facing the patient's hand and the patient's finger. EX1005, FIG. 2; 4:19-29, 4:60-62; EX1003, ¶ 108.

4. Dependent Claim 6

Goldberg illustrates the wired connection to the sensor runs partially along the backside of the person's hand to the finger where the sensor is attached.

EX1005, FIG. 2; 4:19-29, 4:60-62; EX1003, ¶ 109.



5. Independent Claim 13

a. Limitation 13(a)

To the extent the preamble is limiting (it's not), Goldberg in view of Kiani and Money teaches a body worn, medical monitoring device. Section IX.A.2.a. Goldberg further teaches a portable device, thereby implicitly teaching a battery. EX1005, Abstract, 4:57-60; EX1003, ¶¶ 112-113. Finally, the portable device of Goldberg transmits sensor readings to a remote computer, thereby teaching on-

patient and remote monitoring or physiological parameters. EX1005, 5:9-24; EX1003, ¶ 111.

b. Limitation 13(b)

Goldberg teaches a *portable* electronic device. EX1005, Abstract, 4:57-60. Without a battery, the portable, electronic device either wouldn't be portable or wouldn't be functional, thereby implicitly teaching a battery. EX1003, ¶¶ 112-113, 115.

To the extent Goldberg doesn't explicitly teach the portable device is powered by a battery, Kiani teaches that portable devices are battery powered. EX1006, 5:21-22, 9:11-13. Kiani teaches all electrical components of the handheld device 500 are powered by the battery. *Id.* It would have been obvious to include a battery in the portable device of Goldberg so the portable device operates without being tethered to a wall outlet. EX1003, ¶¶ 112-113. This combination of Goldberg and Kiani is proper because Kiani expressly discloses that which Goldberg implicitly teaches. *Preda*, 401 F.2d at 826; MPEP 2144.01. Kiani demonstrate facts that are "capable of such instant and unquestionable demonstration" as to defy dispute. *Id.* As such, combining Goldberg and Kiani doesn't modify the teachings of Goldberg; it merely expressly states the features Goldberg omits because they were unnecessary to enable his invention. *In re Buchner*, 929 F.2d 660, 661 (Fed. Cir. 1991).

c. Limitation 13(c)

Goldberg teaches a housing, which is a case. EX1005, 4:57-60. The housing of Goldberg would house the battery when “modified” by Kiani. EX1006, 5:21-22; EX1003, ¶ 116.

d. Limitation 13(d)

Goldberg teaches a blood pressure strap that functions as both a sensor and a strap used to secure the portable device to the patient’s wrist/arm. EX1005, 4:57-60, 4:64-67; EX1003, ¶ 117.

e. Limitation 13(e)

Goldberg in view of Kiani and Money teaches this limitation. Section IX.A.2.d. As shown in FIG. 2 of Goldberg, the wire from the pulse oximetry sensor 104a extends to the side of housing nearest to the patient’s hand when the patient’s is wearing the portable device. EX1005, FIG. 2; EX1003, ¶¶ 63-67, 118.

f. Limitation 13(f)

Goldberg in view of Kiani teaches a first communication port coupled with a cable and positioned on a side of the case to provide a path from the first communication port to a patient’s finger. *See* Sections IX.A.2.e and IX.A.2.g.

Also, Goldberg teaches the pulse oximetry sensor is a “finger-type” sensor because it attaches to the patient’s finger. EX1005, 4:60-64; EX1003, ¶ 120.

Further, Goldberg illustrates a relatively taut wire between the first sensor port and

the pulse oximetry sensor. EX1005, FIG. 2. Hence, the wire, as illustrated, would avoid tangling. *Id.*; EX1003, ¶ 120.

Finally, the cable between the sensor 104a and the housing would be removable from the first port as modified by Fujisaki. *See* Section IX.B.1; EX1003, ¶¶ 102-106, 121; EX1016, 5:37-44, FIGs. 2, 6.

g. Limitation 13(g)

See Section IX.A.2.g.

h. Limitation 13(h)

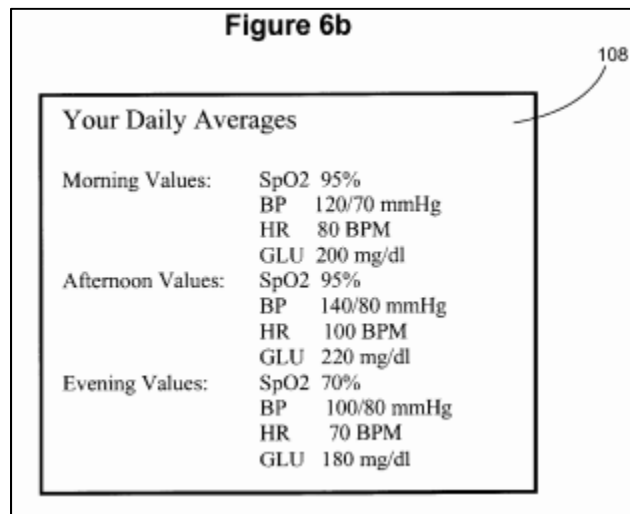
See Section IX.A.2.h.

i. Limitation 13(i)

See Section IX.A.2.h.

j. Limitation 13(j)

Goldberg in view of Kiani and Money teaches a display. Section IX.A.2.c. According to Goldberg, the display displays real-time oxygen saturation readings based on data obtained by the pulse oximetry sensor 104a. EX1005, 4:19-23, 4:30-36, 4:50-55, 6:32-45, FIGs. 6A-C; EX1003, ¶ 125.



k. Limitation 13(k)

Goldberg teaches the communication unit wirelessly transmits sensor data or physiological measurements to the remote computer. EX1005, 5:9-24. Goldberg teaches the sensor data or physiological measurements include oxygen saturation and pulse rate. EX1005, 4:19-23, 4:50-55, 4:60-64, FIGs. 6A-C; EX1003, ¶ 126.

6. Dependent Claim 14

See Section IX.A.2.g.

7. Dependent Claim 15

a. Limitation 15(a)

See Section IX.A.2.i.

b. Limitation 15(b)

Goldberg teaches the controller processes data obtained from the pulse oximetry sensor. EX1005, 4:34-36, 4:62-64; EX1003, ¶ 129.

c. Limitation 15(c)

Goldberg teaches the controller determining real time oxygen saturation measurements, including oxygen saturation measurements. EX1005, 4:30-36, 4:62-64; EX1003, ¶ 130.

8. Dependent Claim 16

a. Limitation 16(a)

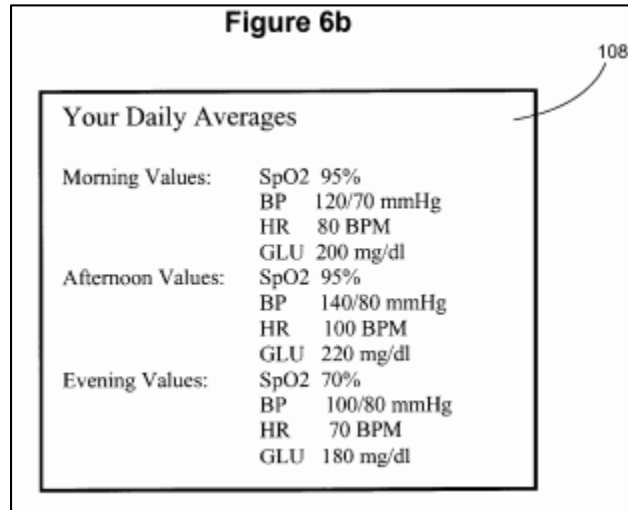
Goldberg teaches a patient monitoring system that receives signals from three or more sensors. EX1005, 4:19-29, 5:3-8; EX1003, ¶¶ 76-79, 131; *see also* Sections IX.B.5.h-i. More specifically, Goldberg teaches a controller that receives signals from a pulse oximetry sensor, a blood pressure sensor, and an electrolyte sensor. EX1005, 4:19-29, 4:57-5:8; EX1003, ¶¶ 76-77. However, Goldberg teaches the controller can communicate with any sensor, including an EKG sensor. EX1005, 5:6-8, 1:37-44; EX1003, ¶ 137.

b. Limitation 16(b)

Goldberg teaches the controller determines real time blood pressure and glucose or EKG measurements based on the signals received from the connected sensors (e.g., blood pressure and glucose or EKG). EX1005, 2:30-32, 4:34-36, 4:50-55, 4:56-5:8, 1:37-44; EX1003, ¶ 132.

c. Limitation 16(c)

Goldberg teaches real-time measurements from all sensors are displayed based on signals received from the connected sensors. EX1005, 4:19-29, 5:3-8, 5:36-53, 6:32-46, FIGs. 6a-c; EX1003, ¶ 133.



d. Limitation 16(d)

Goldberg teaches the communication unit wirelessly transmitting sensor data and measurements to a remote computer. EX1005, 5:9-24; EX1003, ¶ 134.

According to Goldberg, the sensor measurements include oxygen saturation, blood pressure, and glucose/electrolyte or ECG. EX1005, 4:50-56, 1:37-44, 4:34-36, 4:50-55. Thus, Goldberg teaches the communications unit wirelessly transmitting real-time oxygen saturation, blood pressure, and glucose or EKG data to the remote computer. EX1005, 4:19-29, 4:57-5:8, 6:15-17; EX1003, ¶ 134.

9. Dependent Claim 17

Goldberg teaches a display positioned on a front, user-facing side of the housing to enable a user to view patient physiological parameters. Section IX.A.2.c. Goldberg teaches the patient physiological parameters can include pulse oximetry, blood pressure, and glucose. EX1005, 4:19-29, 5:3-8, 5:36-53, 6:32-46, FIGs. 6a-c; EX1003, ¶¶ 135-136. Goldberg further teaches the display displays real time data. *Id.*

10. Dependent Claim 18

Goldberg teaches the portable device can receive data from both a blood pressure sensor and an EKG sensor. EX1005, 4:64-67, 1:37-44, 4:50-56, 5:5-8, FIG. 2; EX1003, ¶ 137.

11. Dependent Claim 19

a. Limitation 19(a)

Goldberg teaches the portable device receiving data from a plurality of sensors. EX1005, 4:34-36, 4:50-55, 4:57-5:8; EX1003, ¶ 138. A PHOSITA would understand a sensor interface is circuitry that decodes signals from the sensors and provides the data represented by the signals to the controller. EX1003, ¶ 138. Indeed, a PHOSITA would understand a sensor interface is merely circuitry necessary to receive a signal from another device. *Id.* Money expressly states that which a PHOSITA would understand. More specifically, Money teaches sensor

interfaces are circuits for connection between a device and sensors. EX1008, Abstract, 3:14-24; EX1003, ¶ 139. Additionally, Money teaches a respective interface for each connected sensor. EX1008, Abstract, 5:38-51; EX1003, ¶ 139. It would have been obvious to include respective sensor interfaces, as taught by Money, in the portable device of Goldberg so the portable device of Goldberg could communicate with various sensors. EX1005, 5:3-8; EX1008, 2:15-25; EX1003, ¶ 140. Therefore, including sensor interfaces, as taught by Money, in the portable device of Goldberg represents a combination prior art elements according to known methods (wired communication with sensors and wired communication with sensors via sensor interfaces) to yield predictable results (the portable device of Goldberg would predictably receive signals from various sensors). EX1003, ¶ 140; *KSR*, 550 U.S. at 415-16.

b. Limitation 19(b)

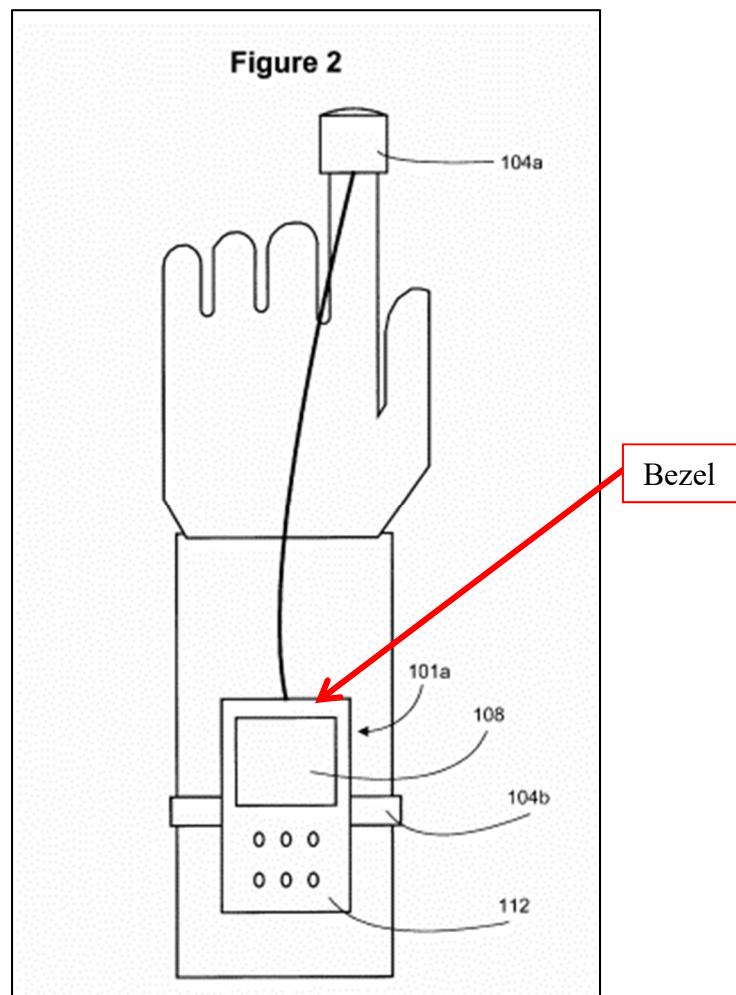
Money teaches a pulse oximetry sensor interface for receiving a signal from a pulse oximetry sensor, a blood pressure sensor interface for receiving a signal from a blood pressure sensor, and an ECG sensor interface for receiving a signal from an ECG sensor. EX1008, 5:28-44. Thus, Goldberg in view of Money teaches this claim limitation. EX1003, ¶ 141.

C. Ground 3: Claims 10-12 are unpatentable under 35 U.S.C. § 103(a) over Goldberg, Kiani, Money, and Estep

1. Dependent Claim 10

a. Limitation 10(a)

Goldberg teaches a display, and Goldberg teaches the housing has a border around the display. EX1005, FIG. 2. A PHOSITA would understand this border is a bezel because a bezel is simply a border around a screen. EX1003, ¶ 143.



EX1005, FIG. 2 (annotated).

To the extent Goldberg doesn't expressly teach a bezel, it would have been obvious to include a bezel around the display 108 of Goldberg in view of Estep. Estep teaches the displays around wearable devices include bezels. EX1009, 4:24-27, FIG. 3C. A PHOSTIA would have been motivated to include a bezel around the display of Goldberg to more securely hold the display 108 in place. *Id.*; EX1003, ¶¶ 144-145.

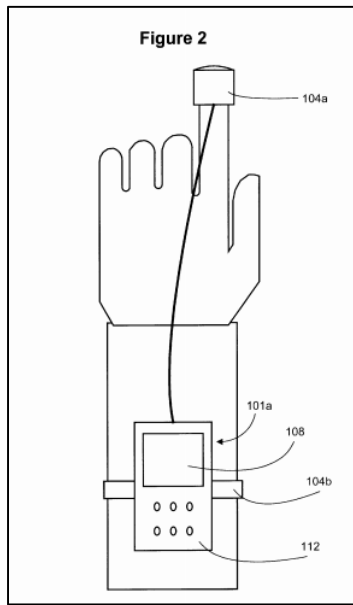
Like Kiani, Estep expressly teaches that which Goldberg implicitly teaches. *Preda*, 401 F.2d at 826; MPEP 2144.01. Alternatively, combining Goldberg and Estep represents a combination of prior art elements (displays and displays with a bezel) according to known methods to yield predictable results (displaying data). *KSR*, 550 U.S. at 415-16. Use of a bezel would also predictably secure the display in the housing. EX1009, 4:24-27, FIG. 3C; EX1003, ¶ 145.

b. Limitation 10(b)

See Section IX.A.6.c.

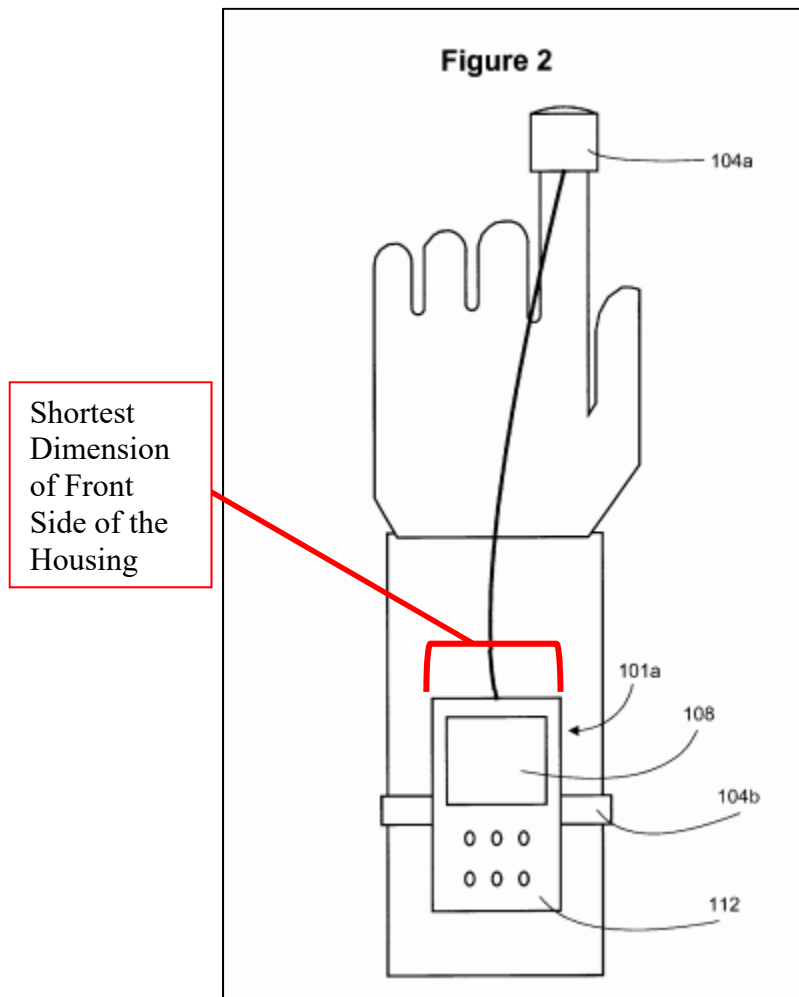
2. Dependent Claim 11

Goldberg illustrates the display as being centrally positioned on the housing. EX1005, FIG. 2; EX1003, ¶ 147.



3. Dependent Claim 12

Goldberg illustrates the display on the front side of the housing as covering most of the length of the shortest dimension (latitudinal) of the front side of the housing. EX1003, ¶ 148; *see* EX1005, FIG. 2 (annotated).



D. Ground 4: Claim 20 is unpatentable under 35 U.S.C. § 103(a) over Goldberg, Kiani, Money, Fujisaki, and Estep

1. Independent Claim 20

a. Limitation 20(a)

See Section IX.B.5.a.

b. Limitation 20(b)

Goldberg teaches a pulse oximetry sensor configured to wrap around a patient's finger. EX1005, 4:60-64, FIG. 2; EX1003, ¶ 151.

c. Limitation 20(c)

Goldberg teaches a pulse oximetry sensor that measures oxygen saturation while attached to a patient's finger. EX1005, 4:60-64, FIG. 2; EX1003, ¶ 152. To the extent Goldberg doesn't teach whether the pulse oximetry sensor includes a light emitter, it would have been obvious to use a light-based pulse oximetry sensor in view of Kiani. Kiani teaches pulse oximetry sensors include a light emitter to detect oxygen saturation by emitting light into finger tissue. EX1006, 1:15-23; EX1003, ¶ 153. It would have been obvious to modify Goldberg with Kiani because this modification represents a simple substitution of one known equivalent element (a pulse oximetry sensor) for another (a light-based pulse oximetry sensor) to yield predictable results (non-invasively measure oxygen saturation using light absorption differential). *KSR*, 550 U.S. at 415-16; EX1006, 1:22-2:23; EX1003, ¶ 154. A PHOSITA would have been motivated to use the light-based pulse oximetry sensor of Kiani so that oxygen saturation could be detected non-invasively. EX1006, 1:3-8; EX1003, ¶ 154.

d. Limitation 20(d)

Kiani teaches the pulse oximetry sensor includes a light detector configured to output a signal responsive to an amount of light attenuated by tissue. EX1006, 1:15-2:23; EX1003, ¶ 155.

e. Limitation 20(e)

Goldberg teaches the wired connection between the pulse oximetry sensor and the controller is a wire (i.e., cable) that conveys the pulse oximetry reading. EX1005, 4:19-29; EX1003, ¶ 156.

f. Limitation 20(f)

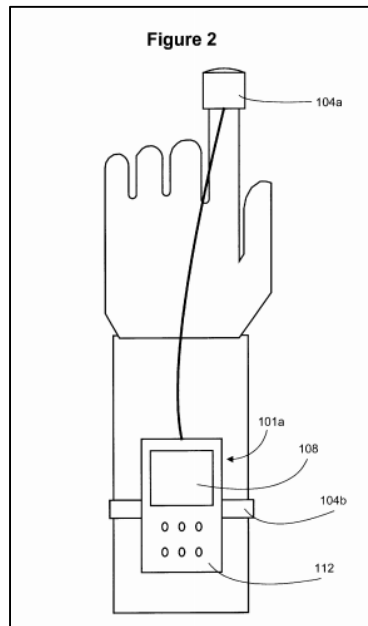
Goldberg teaches a blood pressure sensor that measures blood pressure. EX1005, 4:19-29, 4:64-67, FIG. 2; EX1003, ¶ 157.

g. Limitation 20(g)

Goldberg teaches a system having more than two sensors. EX1005, 4:19-29, 5:3-8; EX1003, ¶ 158. Goldberg teaches the third sensor can include either a temperature or respiration rate sensor. EX1005, 1:37-42, 4:50-5:8; EX1003, ¶ 158.

h. Limitation 20(h)

Goldberg teaches a housing secured/strapped to the patient's wrist or forearm. EX1005, 4:19-30, 4:57-60; EX1003, ¶ 159. As shown, the housing is sized and shaped to be secured to the patient's wrist. EX1005, FIG. 2.

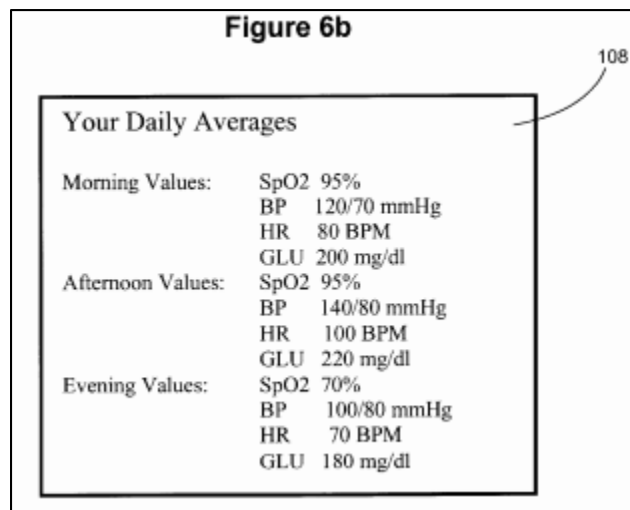


i. Limitation 20(i)

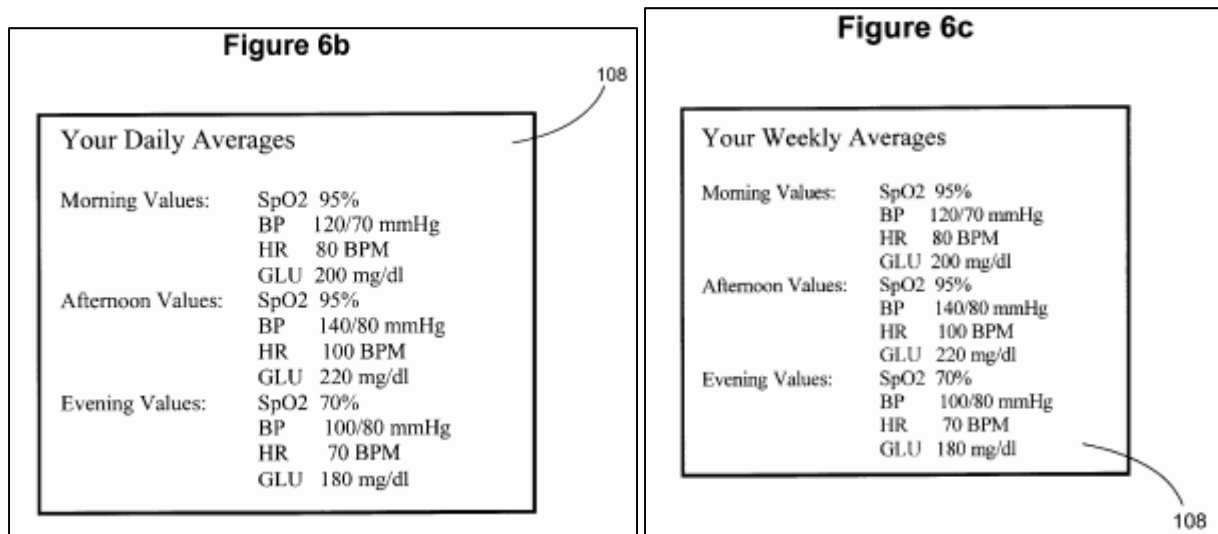
See Sections IX.B.5.d and IX.A.6.a-b.

j. Limitation 20(j)

Goldberg teaches a display positioned on a front side of the housing (opposite a back side) that displays one or more parameter measurements and is viewable by a user. *See* Sections IX.A.2.c and IX.B.5.j.

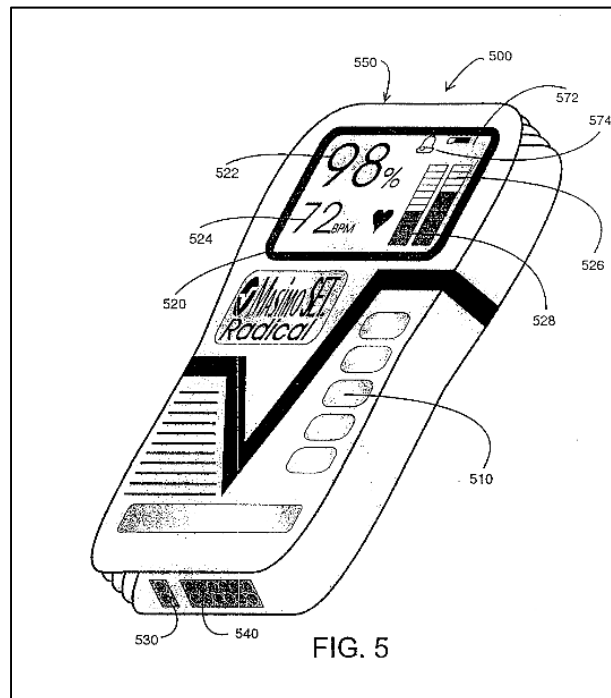


Additionally, the display displays status. EX1005, FIGs. 6B-C. Specifically, the display indicates whether it is displaying daily or weekly averages, thereby indicating the status of whether the device is operating in either a daily or weekly display mode. *Id.* A PHOSITA would understand these mode identifiers show a status of the portable device 100. *Id.*; EX1003, ¶ 162.



To the extent Goldberg doesn't use the word "status," Kiani teaches displaying "status" was conventional. For example, Kiani teaches a handheld unit 500 displays low battery and alarm enabled status indicators 572, 574. EX1006, 8:33-9-2. It would have been obvious to display the status indicators of Kiani on the display of Goldberg to indicate visually to a user various status information, such as whether an alarm is enabled and whether the portable monitor has a low battery. *Id.*; EX1003, ¶¶ 162-164. Modifying Goldberg with Kiani in this manner

would have predictably resulted in the Goldberg's display displaying additional status information. *Id.*



EX1006, FIG. 5.

k. Limitation 20(k)

See Sections IX.C.2-3.

l. Limitation 20(l)

See Sections IX.A.4-5 and IX.C.1.a.

m. Limitation 20(m)

Goldberg teaches user-actuable buttons for controlling the portable device.

EX1005, 5:36-53. For example, Goldberg teaches a display choice button 121 that

dictates an operational mode of the portable device, namely whether the portable device displays graphical or textual data. EX1005, 5:47-53; EX1003, ¶ 167.

n. Limitation 20(n)

See Sections IX.A.2.d and IX.B.5.e.

o. Limitation 20(o)

See Section IX.B.1.

p. Limitation 20(p)

See Sections IX.B.4 and IX.B.5.g.

q. Limitation 20(q)

See Section IX.A.6.c.

r. Limitation 20(r)

See Section IX.C.1.b.

s. Limitation 20(s)

Goldberg in view of Kiani and Money teaches this limitation. Kiani explains sensor ports are positioned on the housing of the UPO. EX1006, FIG. 5; EX1003, ¶ 173; *see also* Section IX.B.5.h.

t. Limitation 20(t)

Goldberg in view of Kiani and Money teaches this limitation. Kiani explains sensor ports are positioned on the housing of the UPO. EX1006, FIG. 5; EX1003, ¶ 174; *see also* Section IX.B.5.i.

u. Limitation 20(u)

Goldberg in view of Kiani and Money teaches a battery that powers the portable device. *See* Section IX.b.5.b. Also, Kiani expressly discloses the battery is rechargeable. EX1006, 5:21-22. It would have been obvious to use a rechargeable battery to prevent repeated discarding of used batteries. EX1003, ¶ 175.

v. Limitation 20(v)

Goldberg teaches a controller positioned within the housing. EX1005, 4:34-36, 4:57-60; EX1003, ¶ 176.

w. Limitation 20(w)

Goldberg teaches the controller receives signals from the pulse oximetry sensor. EX1005, 4:19-23, 4:62-64; EX1003, ¶ 177. Additionally, Goldberg would be modified by Money to include sensor interfaces for receiving and decoding sensor signals. *See* Section IX.B.11.a.

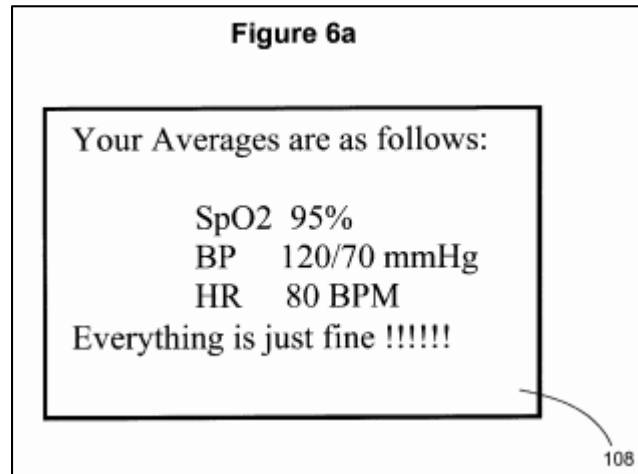
x. Limitation 20(x)

Goldberg in view of Kiani teaches the pulse oximetry sensor emits an analog signal. EX1003, ¶ 178; *see* Section IX.A.2.f.

y. Limitation 20(y)

Goldberg teaches the controller processes the signal from the pulse oximetry sensor to determine oxygen saturation and pulse rate. EX1005, 4:19-23, 4:50-55, FIGs. 6A-C; EX1003, ¶ 179.

FIG. 6A shows the display displays oxygen saturation and heart rate (pulse). EX1005, FIG. 6A. Goldberg teaches the controller derives pulse as well as oxygen saturation because both heart rate and oxygen saturation are displayed on the display. EX1005, FIGs. 6A-C; EX1003, ¶ 180.



Alternatively, Kiani explicitly explains conventional pulse oximetry sensors detect pulse and oxygen saturation simultaneously. EX1006, 6:7-10. Thus, even if Goldberg doesn't expressly teach the pulse oximetry sensor detects both oxygen saturation and pulse, Goldberg as modified by Kiani teaches a pulse oximetry sensor that detects both parameters. EX1003, ¶¶ 181-183. Therefore, Goldberg and Kiani teach or render obvious this limitation.

z. Limitation 20(z)

Goldberg in view of Kiani and Money teaches this limitation. *See* Section IX.B.8.a. Additionally, Goldberg as modified by Money would include sensor interfaces for receiving and decoding sensor signals. *See* Section IX.B.11.a.

aa. Limitation 20(aa)

Goldberg in view of Kiani and Money teaches this limitation. *See* Section IX.B.8.a. According to Goldberg, the third sensor could be either a temperature sensor or a respiration rate sensor. EX1005, 1:37-44, 4:19-23, 4:50-55, 5:1-8; EX1003, ¶ 185. Additionally, Goldberg as modified by Money would include sensor interfaces for receiving and decoding sensor signals. *See* Section IX.B.11.a.

bb. Limitation 20(bb)

Money teaches signals received via an RS232 port are digital signals. EX1008, 6:11-20, 13:24-32; EX1003, ¶ 186. It would have been obvious to modify Goldberg to communicate with a digital temperature sensor so Goldberg can communicate with “any type of physiological sensor,” including digital temperature sensors. EX1005, 5:6-8; *see also* Section IX.A.2.h. Indeed, transmitting any discrete physiological parameter would obviously have been transmitted digitally as a data packet. EX1003, ¶ 186; EX1008, 13:24-32.

Money teaches a method for receiving digital data from a sensor using data packets and using a digital protocol (such as RS232 – the standard for serial transmission of data). As taught by Money, it would have been obvious and within the ordinary skill of a PHOSITA to transmit data digitally via an RS232 serial connection. EX1003, ¶ 186; EX1008, 6:11-20, 13:24-32. Money teaches a pulse oximetry cuff transmits digital data, but any sensor measuring discrete data could

transmit data digitally. EX1003, ¶ 186; EX1008, 6:27-33. A temperature sensor would be an obvious choice to transmit digital data because a temperature sensor transmits discrete data (patient's temperature) and because Money teaches the temperature sensor reading gets digitized eventually. EX1008, 6:27-33, 10:67-11:5. Accordingly, providing digital temperature data is simply a design decision as to where temperature readings get converted into a digital value: either before being provided to a monitor or within the monitor. EX1003, ¶ 186; EX1008; 10:67-11:5. Either way, Money teaches the circuitry (EX1008, FIG. 5), protocols (e.g., RS232), and data transmission methods (data packets) necessary for a temperature sensor to provide data digitally to a monitor. Thus, modifying Goldberg with Money would have predictable resulted in the portable device of Goldberg receiving digital signals from a temperature sensor.

cc. Limitation 20(cc)

See Sections IX.B.5.j and IX.B.8.c.

dd. Limitation 20(dd)

Goldberg teaches the transmitter is positioned within the housing. EX1005, 4:40-42; EX1003, ¶ 188. *See* Section IX.B.5.k.

ee. Limitation 20(ee)

Goldberg in view of Kiani and Money teaches this limitation. Sections IX.B.5.k and IX.8.d. Goldberg further teaches the remote computer is configured

to display the received measurements from the portable device. EX1005, 6:29-31; EX1003, ¶ 189.

E. Ground 5: Claims 1-2 and 7-9 are unpatentable under 35 U.S.C. § 103(a) in view of Money, Akai, and Kiani

1. Obviousness in view of Money, Akai, and Kiani

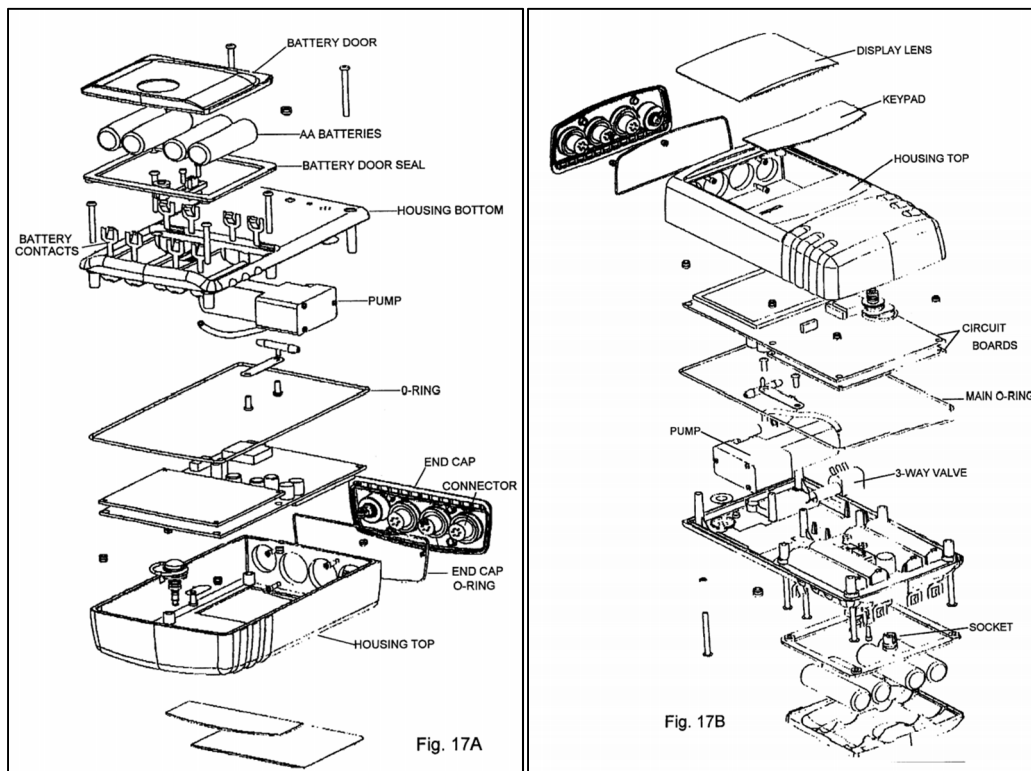
Money, Kiani, and Akai are all related to the same field (portable, wearable patient monitoring) and describe the same device: a portable medical monitor. EX1008, Abstract; EX1006, Abstract; EX1007, Abstract. Furthermore, Money, Kiani, and Akai all use portability to solve the same problem, namely, to portably monitor a patient. EX1008, 2:64-3:2; EX1006, 2:34-3:4; EX1007, 1:56-2:6; EX1003, ¶ 190; *Bigio*, 381 F.3d at 1325; MPEP 2141.01(a). Thus, Money, Kiani, and Akai are analogous art.

2. Independent Claim 1

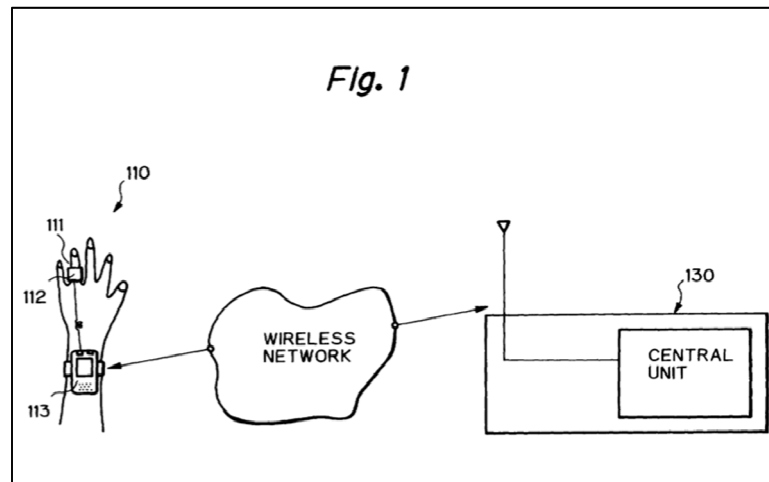
a. Limitation 1(a)

The preamble is entirely a statement of intended use and has no patentable weight. *Pitney Bowes*, 182 F.3d at 1305; Section IX.A.2.a.

To the extent the preamble is limiting, Money teaches a body-worn, medical monitoring device. EX1008, 5:3-10, FIGs. 17A-B. Money's housing illustrates sensor connectors (FIG. 17A – labeled “connector”), but Money doesn't expressly state whether port placement minimizes wiring, a point of basic geometry in any event. EX1008, 5:23-28, FIGs. 17A-B; EX1003, ¶¶ 192-193.



To the extent Money doesn't expressly state a medical monitoring device configured to minimize cable wiring by placement of sensor ports (a statement entirely of intended use), Akai teaches a body worn medical monitoring device to minimize cable wiring from a sensor by placement of one or more sensor communication ports. EX1007, 5:2-9, 6:10-14, FIG. 1; EX1003, ¶ 194. More specifically, Akai teaches a monitoring unit 113 strapped to a person's wrist or forearm, and the monitoring unit receives data from an SpO₂ sensor 112 (and other sensors in some embodiments). EX1007, 5:2-9, 6:10-14, 7:44-8:3, 8:14-33, 11:12-22, FIG. 1; EX1003, ¶ 194.



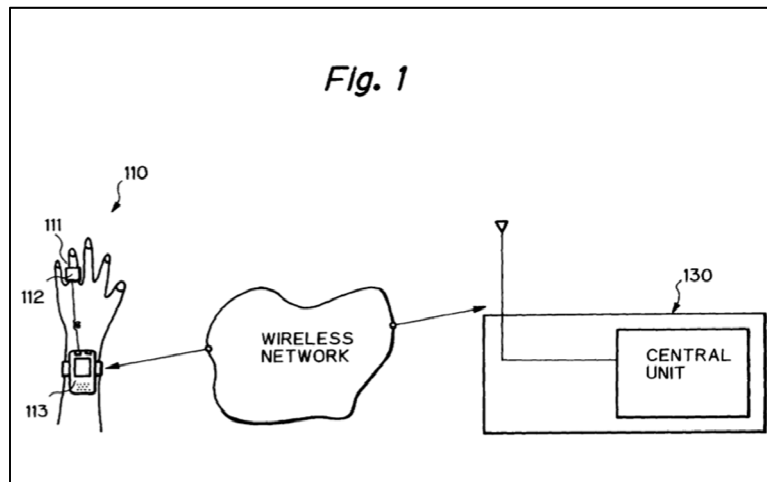
Additionally, Akai positions the wire between the pulse oximetry sensor and the housing at the closest possible location on the housing to the patient's hand, thereby minimizing the amount of wiring from the sensor to the housing. EX1007, 5:7-9, FIG. 1; EX1003, ¶ 194. As explained in more detail below (Section IX.E.2.d), a PHOSITA would understand Akai's wire electrically connects to the housing via a port, or it would have been obvious to include a port as part of this electrical connection in view of Kiani.

It would have been obvious to modify Money's housing according to Akai for two reasons. First, it would have been obvious to substitute the pulse oximetry cuff transducer 39 of Money with the light-based, finger-positioned pulse oximetry sensor taught by Akai. EX1008, 5:42-44; EX1007, 5:7-9, FIG. 1; EX1003, ¶ 195. A PHOSITA would have been motivated to substitute the cuff transducer of Money with a light-based SpO₂ sensor of Akai in order to predictably measure oxygen saturation non-invasively. EX1007, 8:26-33, 11:19-21; EX1003, ¶ 195. As

such, combining Money and Akai represents a simple substitution of one known, equivalent element (pulse oximetry cuff transducer) with another (light-based, pulse oximetry sensor positioned on a patient's finger) to obtain predictable results (measure oxygen saturation non-invasively).

After substituting a cumbersome pulse oximetry cuff transducer for a small, lightweight, light-based, pulse oximetry sensor, a PHOSITA would have been further motivated to position a port or connector configured to communicate with the finger-placed, pulse oximetry sensor closest to a patient's hand in order to minimize patient discomfort. EX1008, 3:3-6, 5:23-28; EX1007, 5:7-9, FIG. 1; EX1003, ¶ 196. Positioning a sensor port/connector at the closest point to the hand provides the most direct path to a pulse oximetry sensor when positioned on a patient's finger, reduces wiring, avoids wire tangling, and improves patient quality of life when wearing the device. *Id.*

Modifying Money in view of Akai would predictably move a connector port (if necessary) to a side of the housing that provides the most direct path to a pulse oximetry sensor when the housing is being worn by a patient and when the pulse oximetry sensor is placed on a patient's finger, similar to the configuration shown in FIG. 1 of Akai. EX1007, FIG. 1; EX1003, ¶ 196.



As such, further modifying Money and Akai uses a known technique (positioning a port on a housing such that a wire between the housing and a pulse oximetry sensor provides the most direct path to the sensor) to improve similar devices (similar wearable, medical monitoring devices) in the same way. *KSR*, 550 U.S. at 415-16; EX1003, ¶ 195.

Money in view of Akai and Kiani renders the preamble obvious.

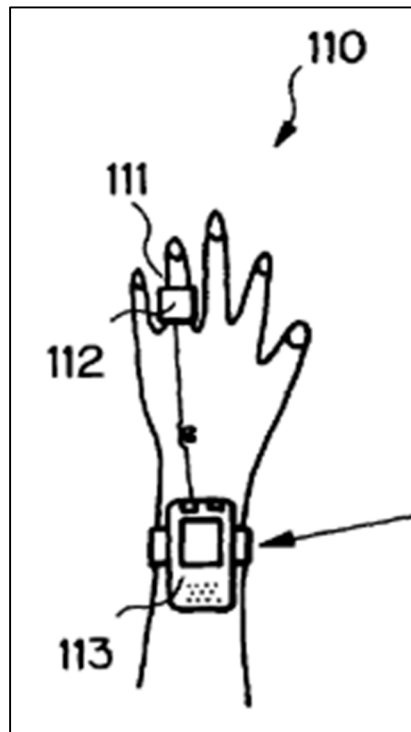
b. Limitation 1(b)

Money teaches a wearable housing 5. EX1003, ¶ 197; EX1008, 5:4-10.

Money teaches the housing's dimensions are three inches wide, six inches long, and one-inch thick. A PHOSITA would know a housing of this size would easily be worn on a patient's wrist. *Id.*

To the extent Money doesn't expressly teach how the housing is worn by a patient, Akai teaches a housing 113 secured/strapped to a person's (patient) wrist

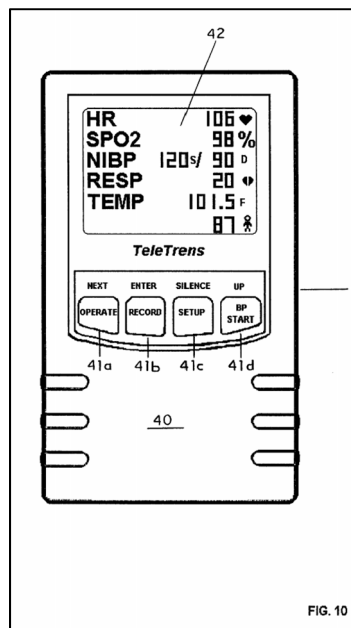
or forearm. EX1003, ¶ 198; EX1007, 5:10-14, 10:24-32. Akai illustrates the strap extending around the person's wrist. EX1007, FIG. 1.



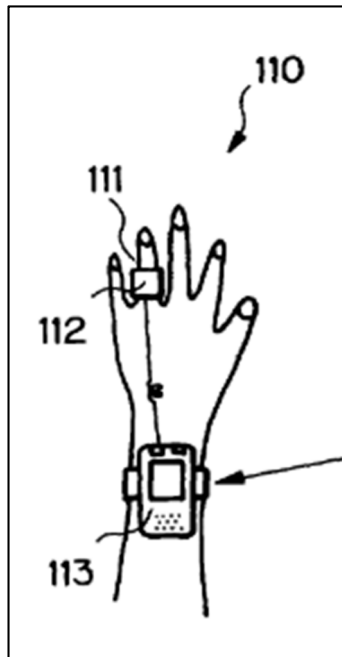
It would have been obvious to include a strap and mount the housing of Money to the patient's wrist in view of Akai. A strap is a purely conventional method for attaching a wearable device to a person, and wearable technology has been worn on wrists for over a hundred years (wrist watches). EX1007, FIG. 1; EX1003, ¶ 199. Thus, using a conventional strap to attach a wearable device to a patient's wrist is the work "not of innovation but of ordinary skill and common sense." *KSR*, 550 U.S. at 421; EX1003, ¶ 199.

c. Limitation 1(c)

Money teaches a display 42 that is configured to display physiological parameter values. EX1003, ¶ 200; EX1008, 6:27-33. Money teaches the display is positioned on a front panel 40 to be viewable to a user. EX1003, ¶ 201; EX1008, 6:24-27, FIG. 10.

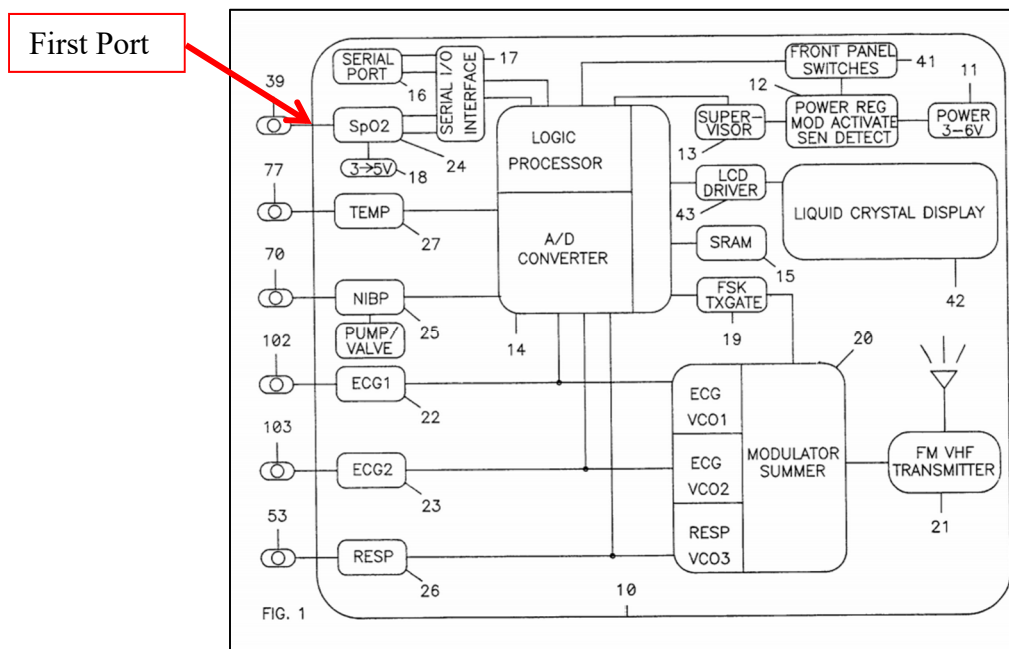


Furthermore, Akai illustrates a display 121 being visible when the housing is strapped to a patient's wrist, so Akai's display is positioned on a face of the housing opposite the strap and visible to a user. EX1007, FIG. 1; EX1003, ¶ 202. As explained above (Section IX.E.2.b), it would have been obvious to modify Money according to Akai's housing and strap configuration. EX1003, ¶ 203.



d. Limitation 1(d)

Money teaches a monitoring device that communicates with multiple sensors through sensor connectors (i.e., ports). EX1008, 5:23-28, FIG. 17A, FIG. 1 (annotated).



A PHOSITA would assume the wire shown above includes a port because ports are a common and typical electrical connection for a housing, especially in the medical filed where changing sensors efficiently is important. *Id.*; EX1003, ¶¶ 205-207.

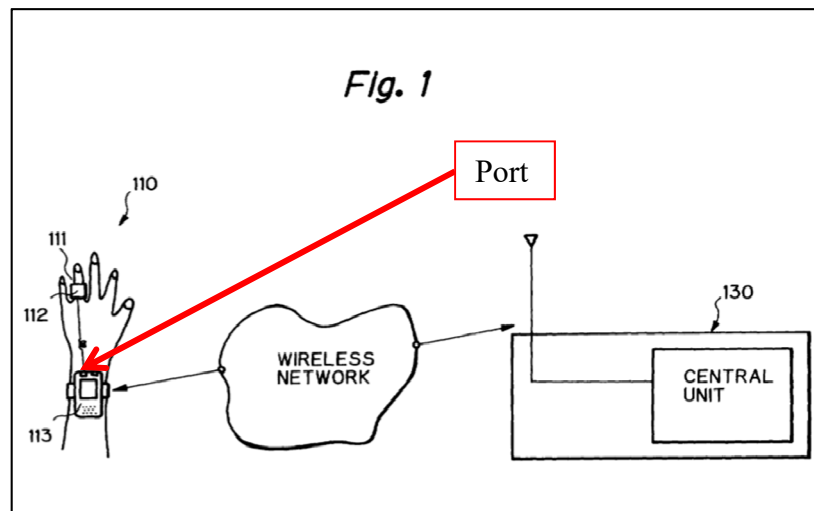
Therefore, Money teaches a sensor port. EX1003, ¶ 207.

To the extent Money doesn't explicitly recite a port, Kiani shows that sensor input ports were well-known. EX1006, 3:21-27, 8:31-9:2. As such, Kiani explicitly explains that which was implicitly known to a PHOSITA: that wired connections connect electrical devices via ports. *Id.*; EX1003, ¶ 208. It would have been obvious to include the port taught by Kiani to establish easy removal and replacement of the sensor and predictably resulted in a secure wired connection. EX1008, 12:36-40; EX1006, 2:34-3:4; EX1003, ¶ 208.

Particularly, in a medical context, hardwired sensors are undesirable.

EX1003, ¶ 208. *See* Section IX.A.2.d.

To the extent Money doesn't explicitly teach the placement of this port relative to a patient's hand, Akai teaches a pulse oximetry sensor connected to the measurement unit via a cable where the port is positioned on a side of the housing that faces a hand of the patient when the housing is mounted to the lower arm of the patient. EX1007, 5:14-19, FIG. 1; EX1003, ¶ 209. Because the first sensor port is positioned on this side, the first sensor port also faces the patient's hand.



It would have been obvious to modify Money's housing (if necessary) to have a wire configuration like Akai's. *See* Section IX.E.2.a; EX1003, ¶ 210.

e. Limitation 1(e)

Money teaches the first sensor port provides wired communication with a pulse oximetry sensor 39. EX1008, 5:23-28, 5:38-39; EX1003, ¶ 211.

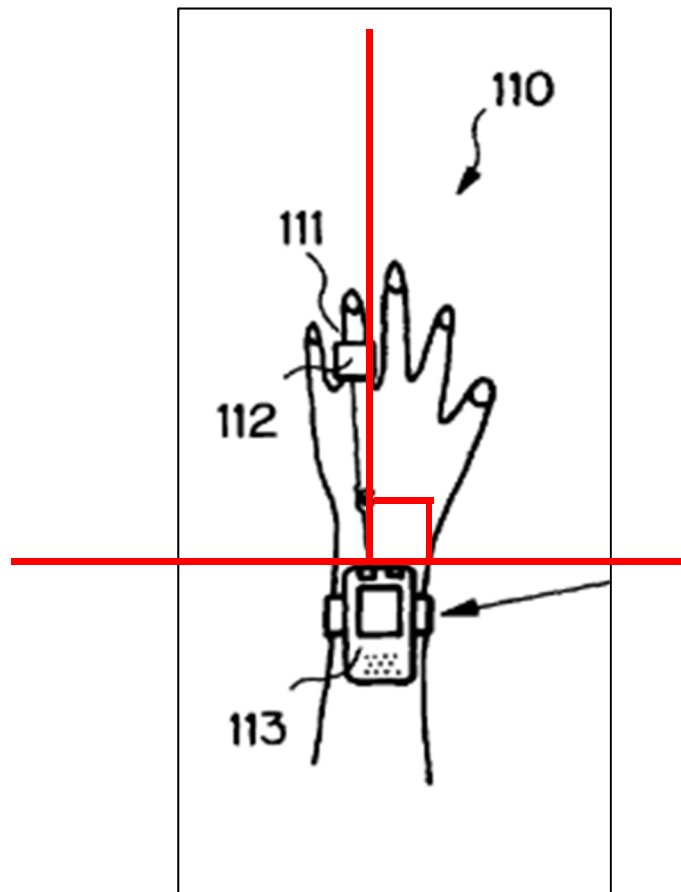
A PHOSITA would have been motivated to substitute the cuff transducer of Money with a light-based, finger-positioned, SpO₂ sensor of Akai in order to predictably measure pulse oximetry non-invasively. Section IX.E.2.a; EX1007, 8:26-33, 11:19-21. Once modified, the pulse oximetry sensor would attach to the patient's finger. EX1003, ¶¶ 211-212.

f. Limitation 1(f)

Akai teaches the signal from the SpO₂ sensor is analog. EX1003, ¶ 213; EX1007, 5:30-34. Indeed, Akai teaches the signal from the SpO₂ sensor is converted into a digital signal by an analog-to-digital converter before being provided to the CPU. *Id.* Thus, as modified, Money's housing would receive an analog signal from Akai's SpO₂ sensor.

g. Limitation 1(g)

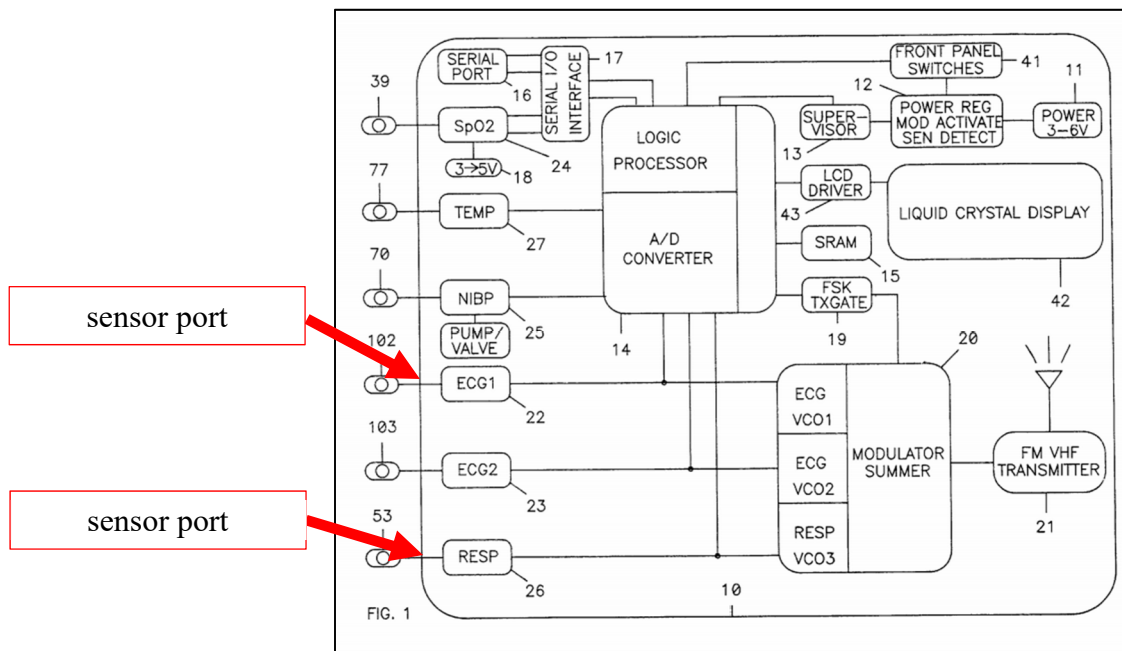
Akai illustrates the wire between the SpO₂ sensor 112 and the housing 113 extending toward the sensor 112 positioned on the patient's finger 111 from the first sensor port along a path substantially perpendicular to the first side (side facing the patient's hand) of the housing. EX1003, ¶¶ 214-216; EX1007, FIG. 1 (annotated).



h. Limitation 1(h)

Money teaches the processing unit 14 receives signals from five sensors.

EX1008, 5:23-51. Money further teaches each of these five sensors connects to the processor through a wired connection. EX1008, FIG. 1; EX1003, ¶ 217. Indeed, it was very common in the medical field to monitor multiple vital signs simultaneously. EX1008, 5:23-28; EX1007, 7:41-58, 11:12-22; EX1006, 1:9-11.



EX1007, FIG. 4A. (annotated), *see also* FIG. 17A.

Alternatively, as taught by Kiani, sensor ports (e.g., 530, 540, 550) positioned on a housing were conventional for wired connections. EX1006, 3:21-27, 8:31-9:2, FIG. 5. As such, Money as “modified” by Kiani would predictably include a plurality of ports configured to receive signals from the pulse sensor, body sensor, or ECG sensor via wired connections. EX1008, 5:23-51, FIG. 1; EX1003, ¶ 218. Also, including more than one port on a housing is merely an obvious duplication of parts. *Harza*, 274 F.2d 669; MPEP 2144.04(VI)(B).

Money’s monitor receives analog data from some sensors and digital data from other sensors. EX1003, ¶ 219; EX1008, 5:48-51, 7:4-8, 7:16-20, 7:58-62, 12:4-7, 13:24-32. Indeed, Money explains its system seeks to connect to a wide variety of devices, transmitting both analog and digital information. EX1008, 7:4-

8. Money even describes the power requirements and requisite circuitry to communicate with both signal types. *Id.* Thus, the system of Money would be fully capable of receiving analog data from the pulse oximetry sensor of Akai and digital signals from another sensor taught by Money. EX1003, ¶ 219; EX1008, 5:48-51, 7:4-8, 7:16-20, 7:58-62, 12:4-7, 13:24-32.

Money teaches the pulse oximetry cuff³ connects to the RS232 serial port and provides digital packets representing oxygen saturation values. EX1003, ¶ 219; EX1008, 6:27-33, 7:58-62, 12:4-7, 13:24-32. However, if Money were modified by Akai to include a light-based, analog SpO₂ sensor, then a PHOSITA would not have been motivated to connect Akai's analog SpO₂ sensor to the RS232 port because the analog SpO₂ sensor outputs continuous data. EX1003, ¶¶ 220, 224; EX1007, 5:30-34. Analog waveform data, like the data provided by an analog SpO₂ sensor, is less suited for digital transmission than discrete data. EX1003, ¶ 224; EX1008, 5:65-6:10. Thus, as modified by Akai, the SpO₂ sensor would not plug into the RS232 port.

³ Money teaches an outdated pulse oximetry cuff transducer that outputs discrete data (an oxygen saturation value) and does not output continuous waveform data. EX1008, 5:38-39, 5:65-6:2, 6:27-33. Thus, Kiani and Money teach different types of pulse oximetry sensors: one analog; one digital.

Money teaches that a dual-function RS232 port is preferable because then the RS232 port is efficiently in use: either communicating with an external terminal for debug purposes or receiving data from a sensor. EX1008, 6:11-20. Also, addition of a fifth analog port, in addition to the RS232 port, might affect Money's careful power management. EX1008, 7:4-22. Thus, a PHOSITA would have been motivated to continue efficient use of the RS232 port by modifying another sensor to transmit digital data after modifying the SpO₂ sensor to be an analog sensor in view of Akai. EX1003, ¶¶ 222-224; EX1008, 6:11-20, 13:24-32; Section IX.E.2.a. The most obvious candidate would be the temperature sensor because it is also a discrete sensor, and Money teaches temperature sensor readings are digitized anyway. EX1008, 10:59-11:5.

Thus, modifying Money in view of Akai would further motivate a PHOSITA to modify Money's temperature sensor to communicate via the RS232 port because otherwise the RS232 port would not serve the dual-purpose taught by Money. EX1003, ¶¶ 220-222; EX1008, 6:11-20. A PHOSITA would obviously move the temperature determining circuitry and the analog-to-digital conversion to the temperature sensor such that the temperature sensor outputted the digital temperature value to the RS232 port. EX1003, ¶¶ 221-222; EX1008, 10:59-11:5, 13:24-32. Such a modification would have been a use of a known technique (using an RS232 port to receive digital data from a sensor and connect to an external

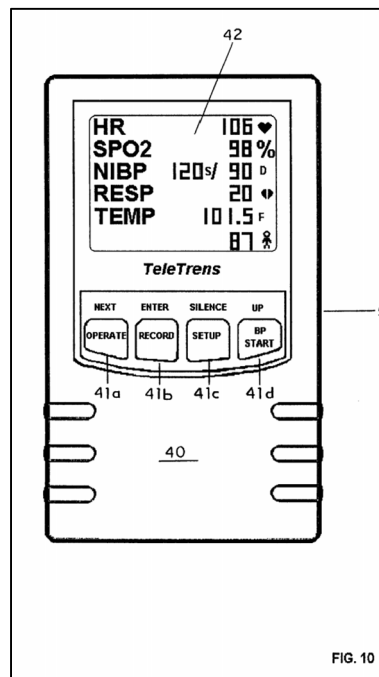
terminal) to improve similar devices (Money's monitor) in the same way (Money's RS232 port would continue to serve a dual function even after upgraded with a modern SpO₂ sensor). The modification would have predictably caused the monitor to receive digital temperature data via the RS232 port because Money's temperature digitizing circuitry would function in the exact same way regardless of location (inside or outside the monitor). EX1003, ¶¶ 222-223; EX1008, 10:59-11:5, 13:24-32.

i. Limitation 1(i)

Money teaches a processor that processes signals from the sensors. EX1003, ¶ 227; EX1008, 5:23-28, 7:53-57.

j. Limitation 1(j)

Money teaches the processor derives vital sign measurements and displays those measurements on the display. EX1003, ¶ 228; EX1008, 5:23-28, 6:21-37, 7:53-57. As shown, these vital sign measurements include SpO₂ and measurements from a plurality of other sensors (e.g., ECG, respiration rate). *Id.*



EX1008, FIG. 10.

k. Limitation 1(k)

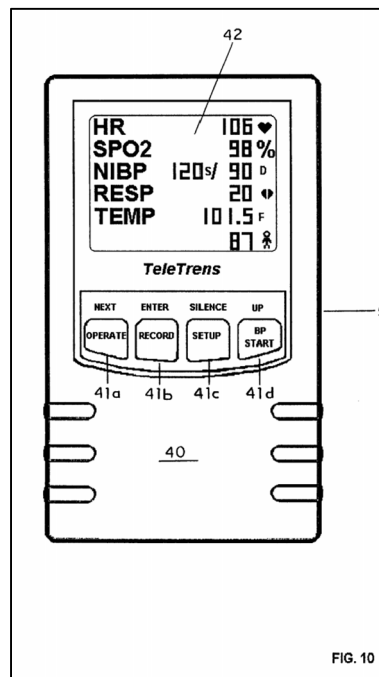
Money teaches that all measured parameters, including SpO₂, ECG, and respiration rate readings, are wirelessly transmitted to a central monitoring station. EX1008, Abstract, 3:24-26, 5:10-13, 5:23-28, 6:8-10, 10:12-35; EX1003, ¶ 229.

3. Dependent Claim 2

Akai teaches a pulse oximetry sensor including a wire that connects the pulse oximetry sensor to the CPU. EX1003, ¶¶ 230-231; EX1007, 5:14-19. Thus, Akai teaches a tail. *See* Section IX.A.3.

4. Dependent Claim 7

Money teaches a single display for displaying data. EX1008, 6:21-48; FIG. 10. A display is a user interface. *Id.*; EX1001, 14:12-13; EX1003, ¶ 232.



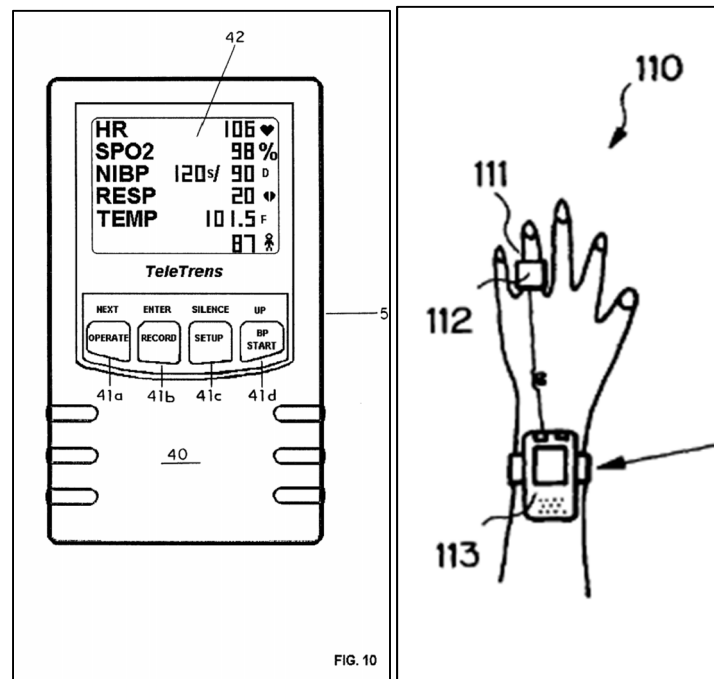
5. Dependent Claim 8

Money teaches a single display for displaying data. EX1003, ¶ 233; EX1008, 6:21-48, FIG. 10.

6. Dependent Claim 9

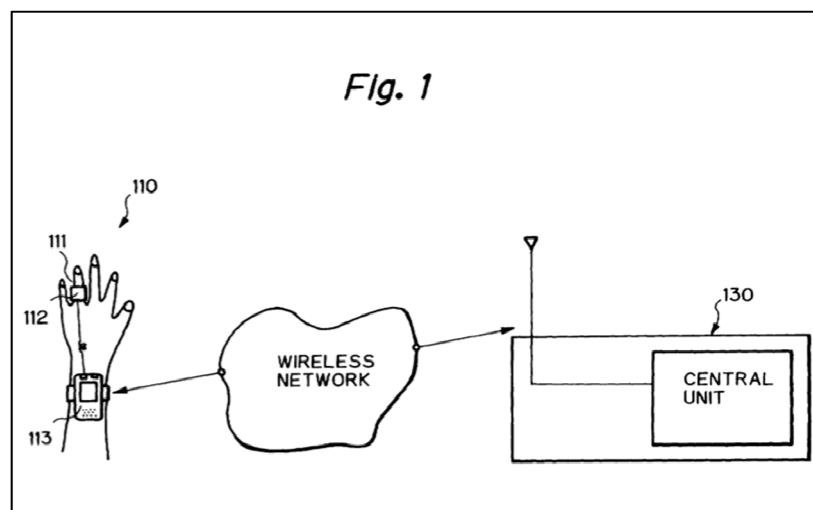
a. Limitation 9(a)

Money and Akai teach generally box-shaped housings 10 and 113 having six sides. EX1008, FIG. 10; EX1007, FIG. 1. Thus, Akai and Money teach a back side of the housing (not shown but facing into the patient's arm) opposite the face of the housing (where the display is positioned). *Id.*; EX1003, ¶ 234.



b. Limitation 9(b)

Akai teaches the measurement unit attaches to a person's wrist. EX1007, 7:44-46. In addition, FIG. 1 illustrates the measurement unit being positioned over the strap. EX1007, FIG. 1.



Because the housing can be seen positioned over the strap, the strap clearly mounts to the back side of the measurement unit. EX1007, FIG. 1; EX1003, ¶¶ 235-236. As seen, the strap is not covering the front side of the measurement unit because the display is not obstructed or covered by the strap. *Id.* Thus, Akai teaches and a PHOSITA would understand the strap is secured to the back side of the housing. EX1003, ¶ 236.

Even if Akai doesn't explicitly explain, in words, that the strap is secured to the back side of the housing, it would have been obvious to secure the illustrated strap to the back side of the housing because there are only a finite number (two) of identifiable places to mount a strap to Akai's housing 113: (1) mounting a strap to the back side of the housing or (2) mounting the strap to left and right sides of the housing. *KSR*, 550 U.S. at 421; EX1003, ¶ 237. The box-shaped housing shown by Akai only has six sides, and the strap cannot cover the display, lest the purpose of the display (to display data) would be defeated. EX1007, 5:51-55, FIG. 1; EX1003, ¶ 237. Nor can the strap mount to the top and bottom sides because the top side is blocked by the cable extending to the SpO₂ sensor and such an arrangement would not wrap around a person's wrist. EX1007, FIG. 1; EX1003, ¶ 237. With only two options, both of which would predictably secure the strap to the measurement unit for wrapping around a patient's wrist, mounting the strap to the back side of the measurement unit would be obvious to try, even though Akai

shows the strap as being attached to the back of the housing. *Id.* Therefore, this limitation is the work “not of innovation but of ordinary skill and common sense.” *KSR*, 550 U.S. at 421.

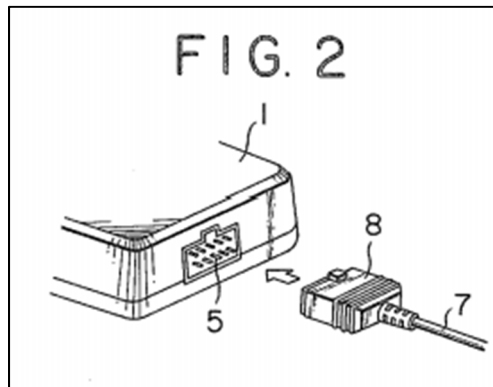
c. Limitation 9(c)

Akai teaches a three-dimensional housing and room on the first side (side facing the patient’s hand) for the wire from the pulse oximetry sensor to extend into the housing. EX1007, FIG. 1; EX1003, ¶ 239. Thus, Money in view of Akai illustrates and teaches this limitation. EX1003, ¶ 239.

F. Ground 6: Claims 3-6 and 13-19 are unpatentable under 35 U.S.C. § 103(a) in view of Money, Akai, Kiani, and Fujisaki

1. Dependent Claim 3

Money and Akai teach a wired connection between the wearable housing and the pulse oximetry sensor. EX1003, ¶ 241; EX1008, FIG. 1; EX1007, 5:14-19. To the extent Money and Akai do not expressly teach a cable is removable, it would have been obvious to make the cable removable from the first sensor port in view of Fujisaki. Fujisaki teaches removable wired connections. EX1016, 5:37-44, FIGs. 2, 6. Specifically, Fujisaki shows a wearable device having cable removably connected with a connector plug (i.e., port). *Id.*; EX1003, ¶ 242. This is particularly obvious and important in the medical field where medical staff must be able to change out sensors efficiently. EX1003, ¶ 243.

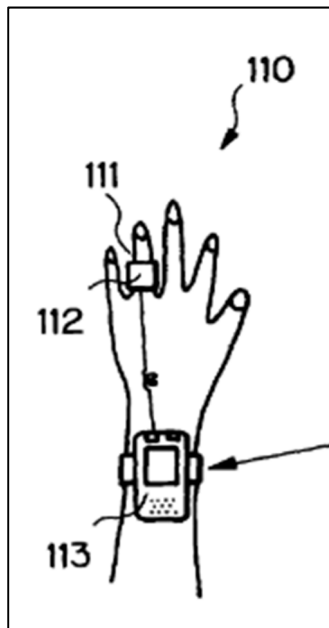


As taught by Fujisaki, a removable cable allows for replacement of a sensor with another sensor. EX1003, ¶ 244; EX1016, 5:37-44, FIGs. 2, 6. Fujisaki allows a port to communicate with a variety of different sensors. *Id.* Thus, a PHOSITA would combine the teachings of Money/Akai/Kiani with Fujisaki to build a set of medical sensors appropriate for a patient's condition. *Id.*

Alternatively, if a sensor was found to be faulty, and if the cable was removable, then a caregiver would unplug the faulty sensor and replace the sensor without replacing the entire monitor. EX1016, 5:37-44, FIGs. 2, 6; EX1003, ¶ 244. Under either scenario, a removable cable would predictably yield a device that can connect with a variety of devices or replace sensors without replacing the entire monitor 10. EX1003, ¶¶ 244-245.

2. Dependent Claim 4

Akai illustrates the length of the wire between the sensor and the housing corresponds to the length between the housing and the patient's finger. EX1007, 5:14-19, FIG. 1; EX1003, ¶ 246.

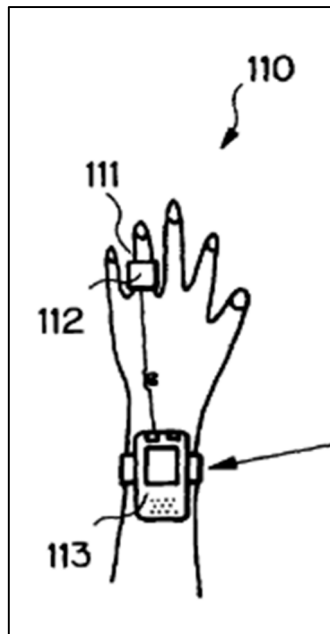


3. Dependent Claim 5

Akai illustrates the length of the wire between the sensor and the housing is appropriately sized based on the length between the side of the housing facing the patient's hand and the patient's finger. EX1007, 5:14-19, FIG. 1; EX1003, ¶ 247.

4. Dependent Claim 6

Akai illustrates the wired connection to the sensor runs partially along the backside of the person's hand to the finger where the sensor is attached. EX1007, 5:14-19, FIG. 1; EX1003, ¶ 248.



5. Independent Claim 13

a. Limitation 13(a)

To the extent the preamble is limiting, Money in view of Akai and Kiani renders the preamble obvious. *See* Section IX.E.2.a. Money teaches a battery powered monitor that wirelessly transmits measured parameters to a remote central monitoring station. EX1008, 5:10-13, 5:52-55; EX1003, ¶¶ 250-252. Thus, Money teaches a battery-powered medical monitoring device that provides on-patient and remote monitoring of physiological parameters. EX1003, ¶¶ 250-252.

b. Limitation 13(b)

Money teaches a battery configured to provide power to the monitoring device. EX1008, 5:52-55, 7:4-23, FIGs. 17A-B; EX1003, ¶ 253.

c. Limitation 13(c)

Money teaches a housing that houses the battery. EX1003, ¶ 254; EX1008, 7:4-23, FIGs. 17A-B.

d. Limitation 13(d)

Akai teaches the measurement unit attaches to a person's wrist via the illustrated strap. EX1007, 7:44-46, FIG. 1; EX1003, ¶ 255.

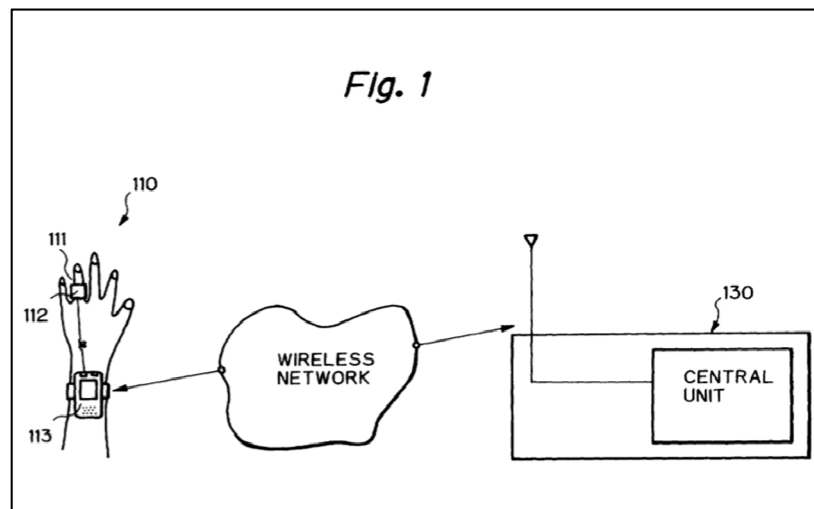


FIG. 1 also shows the strap mounts to the housing. It would have been obvious to modify the housing of Money according to the teachings of Akai, including the inclusion of a strap. EX1003, ¶ 255; Section IX.E.2.b.

e. Limitation 13(e)

Money in view of Akai and Kiani teaches this limitation. *See* Section IX.E.2.d. As shown in FIG. 1 of Akai, the wire from the SpO₂ sensor extends to the side of housing nearest to the patient's hand when the patient is wearing the portable device. EX1007, FIG. 1; EX1003, ¶¶ 204-210, 256.

f. Limitation 13(f)

Money in view of Akai and Kiani teaches a first communication port coupled with a cable and positioned on the first side of the case to provide a path from the first communications port to a patient's finger. EX1003, ¶¶ 204-210, 257; Section IX.3.2.e, Section IX.E.2.g.

Also, Akai teaches the pulse oximetry sensor is a “finger-type” sensor because it attaches to the patient's finger. EX1007, 5:7-9. It would have been obvious to substitute the finger-mounted SpO₂ sensor of Akai for the pulse oximetry transducer cuff taught by Money. EX1003, ¶ 258; Section IX.E.2.a.

Further, Akai illustrates a relatively taut wire between the first sensor port and the pulse oximetry sensor. EX1007, FIG. 1. Hence, the wire, as illustrated, would avoid tangling. *Id.*; EX1003, ¶ 259.

Finally, the cable between the sensor and the housing would be removable from the first port as modified by Fujisaki. Section IX.F.1; EX1016, 5:37-44, FIGs. 2, 6.

g. Limitation 13(g)

See Section IX.E.2.g.

h. Limitation 13(h)

See Section IX.E.2.h.

i. Limitation 13(i)

Money in view of Akai and Kiani teaches this limitation. *See* Section IX.E.2.h. Money also teaches a blood pressure sensor 70, so, for the purposes of claims 13-19, the blood pressure sensor shall be considered the third sensor arrangement, and the corresponding port as the third port. EX1008, 5:23-28, 5:42-44; EX1003, ¶¶ 217-219, 263.

j. Limitation 13(j)

Money in view of Akai and Kiani teaches this limitation. *See* Section IX.E.1.c. According to Money, the display displays real-time current physiological parameter values based on all connected sensors, including the pulse oximetry sensor. EX1008, 5:23-28, 5:38-41, 6:21-55, 11:31-34, 13:26-30; EX1003, ¶ 264.

k. Limitation 13(k)

Money teaches a transmitter 21 that wirelessly transmits physiological measurements, which include pulse oximetry readings received from a pulse oximetry sensor, to a central monitoring station. EX1008, 5:10-13, 5:23-28, 5:38-41, 3:24-29; EX1003, ¶ 265.

6. Dependent Claim 14

See Section IX.E.2.g.

7. Dependent Claim 15

a. Limitation 15(a)

See Section IX.E.2.i.

b. Limitation 15(b)

Money teaches the processing unit that processes signals from the pulse oximetry sensor. EX1008, 5:23-28, 7:49-52; EX1003, ¶ 268.

c. Limitation 15(c)

Money teaches the processing unit determines measurements of physiological parameters, including oxygen saturation measurements. EX1008, 5:23-28, 7:49-52, FIG. 10; EX1003, ¶ 269.

8. Dependent Claim 16

a. Limitation 16(a)

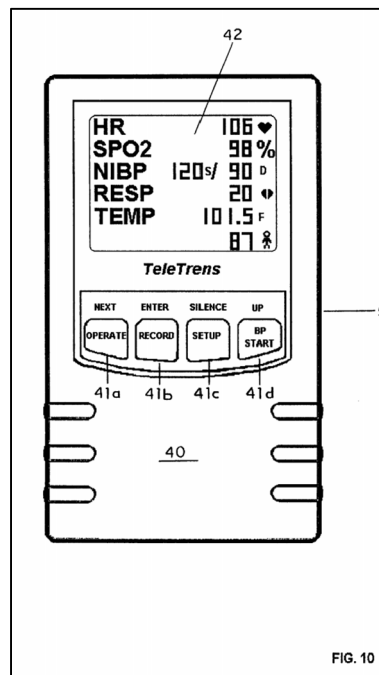
Money teaches a patient monitoring device that receives signals from five sensors, including an ECG sensor and a blood pressure sensor in addition to an SpO₂ sensor. EX1008, 2:64-3:2, 5:23-28; EX1003, ¶ 270.

b. Limitation 16(b)

Money teaches the processing unit that processes signals from the blood pressure sensor and the ECG sensor. EX1008, 5:23-28, 7:49-52; EX1003, ¶ 271.

c. Limitation 16(c)

Money teaches the processor displays real-time measurements from the blood pressure sensor and the ECG sensor. EX1008, 6:21-55, 5:65-6:2, 13:3-7; FIG. 10. EX1003, ¶ 272.

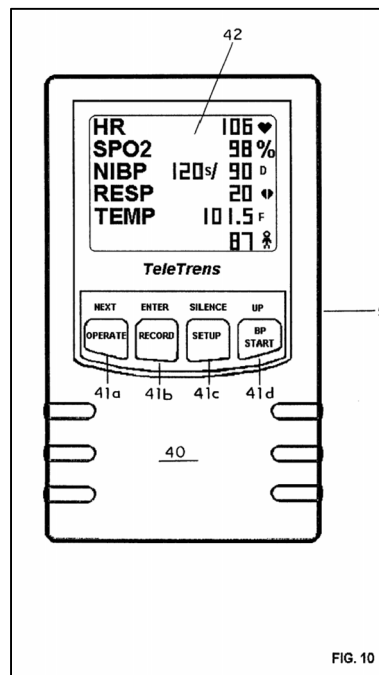


d. Limitation 16(d)

Money teaches the transmitter 21 wirelessly transmits physiological measurements to a central monitoring station that includes blood pressure and ECG readings received from the blood pressure sensor and the ECG sensor. EX1008, 5:10-13, 5:23-28, 5:38-41, 3:24-29; EX1003, ¶ 273.

9. Dependent Claim 17

Money teaches the display is positioned on a front, user-facing side of the case to enable a user to view measurements from all connected sensors based on signals received from the connected sensors. EX1008, 6:21-55, 5:65-6:2, 13:3-7, FIG. 10; EX1003, ¶¶ 274-275.



10. Dependent Claim 18

Money teaches a portable patient monitor that communicates with a blood pressure sensor and an ECG sensor. EX1008, 5:20-37, 5:42-44; EX1003, ¶ 276.

11. Dependent Claim 19

a. Limitation 19(a)

Money teaches sensor interfaces are circuits for connection between a device and sensors. EX1008, Abstract, 3:14-24. Additionally, Money teaches a respective interface is necessary for each connected sensor. EX1008, Abstract, 5:38-51. Thus, Money teaches three sensor interfaces 24, 25, 22/23. *Id.*; EX1003, ¶ 277.

b. Limitation 19(b)

Money teaches a pulse oximetry sensor interface for receiving a signal from a pulse oximetry sensor, a blood pressure sensor interface for receiving a signal

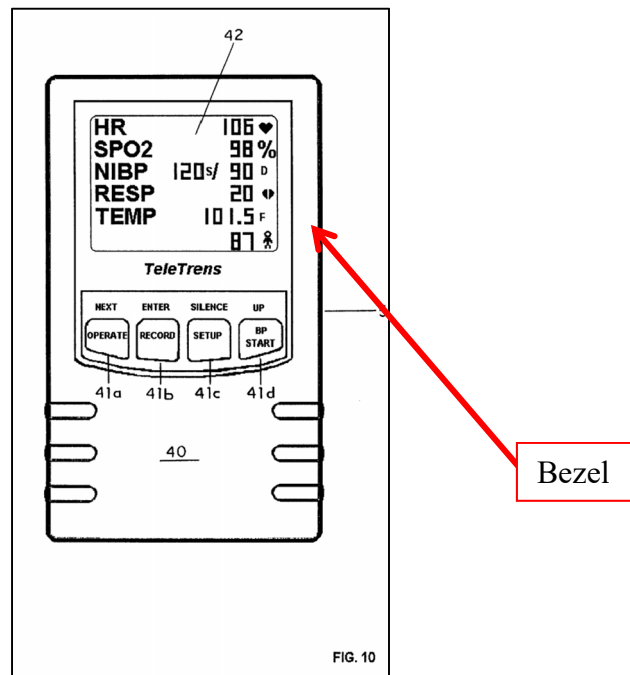
from a blood pressure sensor, and an ECG sensor interface for receiving a signal from an ECG sensor. EX1008, 5:28-44; EX1003, ¶ 278.

G. Ground 7: Claims 10-12 are unpatentable under 35 U.S.C. § 103(a) over Money, Akai, Kiani, and Estep

1. Dependent Claim 10

a. Limitation 10(a)

Money teaches a display, and Akai teaches the housing has a border around the display. EX1008, 6:21-37, FIG. 10; EX1007, FIG. 1. A PHOSITA would understand this border is a bezel because a bezel is simply a border around a screen. EX1003, ¶ 280.



EX1007, FIG. 10 (annotated).

To the extent Money doesn't expressly teach a bezel, it would have been obvious to include a bezel around the display of Money in view of Estep. Estep teaches a wearable device's display includes bezels. EX1009, 4:24-27, FIG. 3C. A PHOSTIA would have been motivated to include a bezel around the display of Money to more securely hold the display in place. EX1009, 4:24-27, FIG. 3C; EX1003, ¶¶ 281-282.

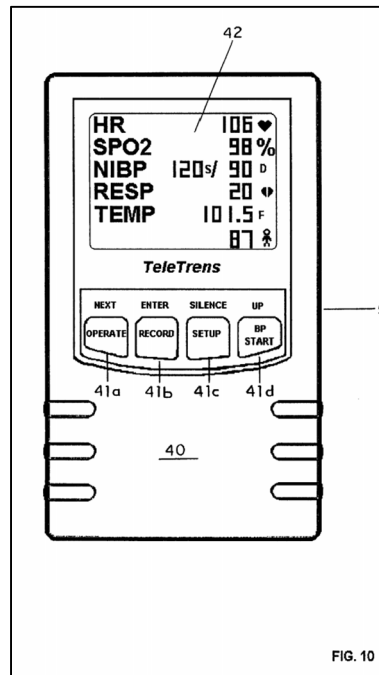
Estep expressly teaches that which Akai implicitly teaches. *Preda*, 401 F.2d at 826; MPEP 2144.01. Also, like Kiani, Estep teaches facts that are "capable of such instant and unquestionable demonstration as to defy dispute." *Knapp*, 296 F.2d 230. Alternatively, combining Akai and Estep represents a combination of prior art elements (displays and displays held in place by a bezel) according to known methods to yield predictable results. EX1003, ¶ 281; *KSR*, 550 U.S. at 415-16. Use of a bezel would predictably secure the display in the housing. EX1009, 4:24-27, FIG. 3C; EX1003, ¶ 282.

b. Limitation 10(b)

Money in view of Akai and Kiani teaches this limitation. EX1003, ¶ 283; Section IX.E.6.c.

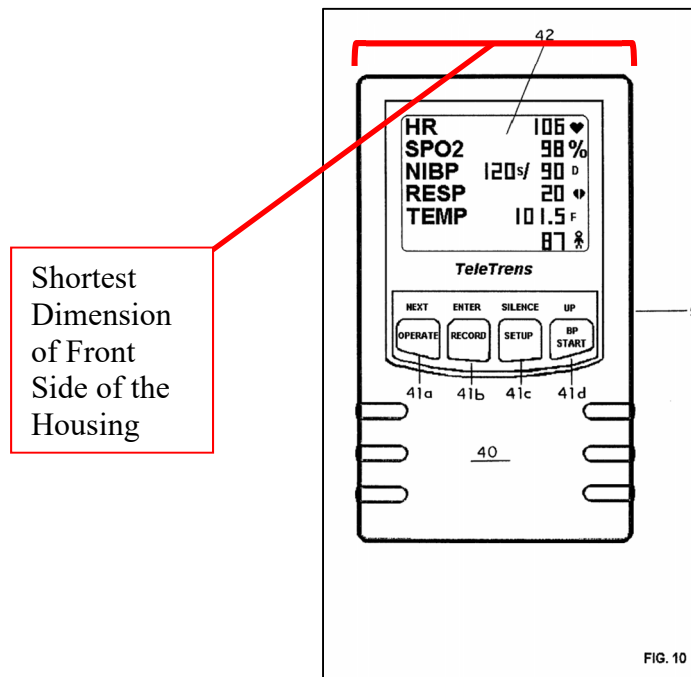
2. Dependent Claim 11

Money illustrates the display as being centrally positioned on the housing 5. EX1008, FIG. 10; EX1003, ¶ 284.



3. Dependent Claim 12

Money illustrates the display as being sized such that it covers most of the length of the shortest dimension (latitudinal length) of the front side of the housing. EX1003, ¶ 285; *see* FIG. 10 (annotated).



H. Ground 8: Claim 20 is unpatentable under 35 U.S.C. § 103(a) over Money, Akai, Kiani, Fujisaki, and Estep

1. Independent Claim 20

a. Limitation 20(a)

See Section IX.F.5.a.

b. Limitation 20(b)

Akai teaches and illustrates a pulse oximetry sensor 112 that wraps around a finger of the patient. EX1003, ¶ 288; EX1007, 4:43-45, 5:7-9, FIG. 1. It would have been obvious to substitute the finger-mounted SpO₂ sensor of Akai for the pulse oximetry transducer cuff taught by Akai. *See* Section IX.E.2.a.

c. Limitation 20(c)

Akai teaches the pulse oximetry sensor includes a light emitter 114 to emit light into the tissue of a patient's finger. EX1007, 5:20-26, 5:26-34, 11:19-21; EX1003, ¶ 289.

d. Limitation 20(d)

Akai teaches a light detector 116 that outputs a signal responsive to an amount of the light emitted by the emitter that attenuated through the tissue. EX1007, 5:20-40, 5:26-34, 11:19-21; EX1003, ¶ 290.

e. Limitation 20(e)

Akai teaches the wired connection between the SpO₂ sensor and the CPU is a cable. EX1007, 5:14-19; EX1003, ¶ 291.

f. Limitation 20(f)

Money teaches a portable patient monitoring device that includes a blood pressure sensor. EX1008, 5:23-28; EX1003, ¶ 292.

g. Limitation 20(g)

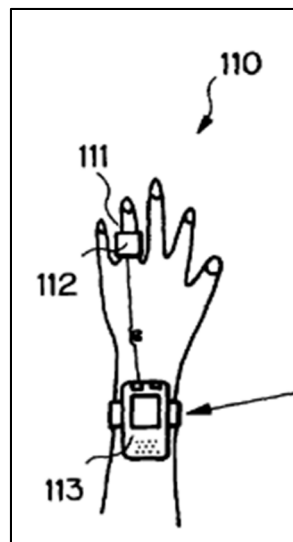
Money teaches a portable patient monitor that communicates with both a respiration rate sensor and a temperature sensor. EX1008, 5:23-28; EX1003, ¶ 293.

h. Limitation 20(h)

Money teaches a wearable housing. EX1008, 5:4-8; EX1003, ¶ 294. Money teaches the housing's dimensions are three inches wide, six inches long, and one-

inch thick. A housing having these dimensions is sized and shaped to be worn on a patient's lower arm. *Id.*

Alternatively, Akai teaches a housing that is secured/strapped to a person's (patient) wrist or forearm. EX1003, ¶¶ 194-196, 198-199, 294; EX1007, 5:10-14, 10:24-32, FIG. 1. As shown, the housing 113 is sized and shaped to be secured to the patient's wrist.

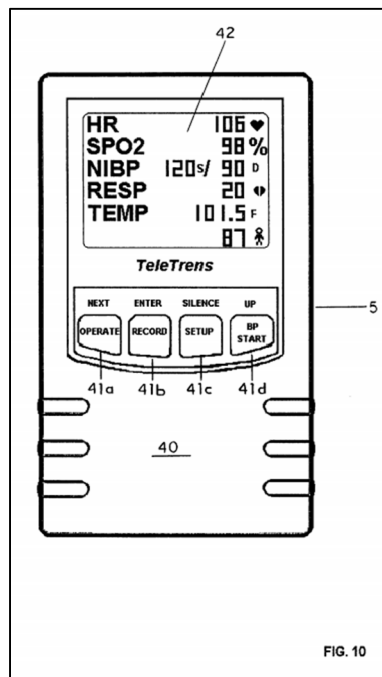


i. Limitation 20(i)

See Sections IX.F.5.d and IX.E.6.a-b.

j. Limitation 20(j)

Money teaches a display positioned on a front side of the housing that is opposite the back side of the housing displaying parameter measurements so as to be viewable to a user. Sections IX.E.2.c and IX.F.5.j; EX1008, FIG. 10; EX1003, ¶ 296.



Also, Money teaches the LCD can display status, such as displaying low battery or bad sensor connections. EX1008, 6:40-44; EX1003, ¶ 297.

k. Limitation 20(k)

See Sections IX.G.2-3.

l. Limitation 20(l)

See Sections IX.E.4-5 and IX.G.1.a.

m. Limitation 20(m)

Money teaches switches 41a-d (input mechanisms) that control operational modes of the device in response to a user pressing the switches. EX1008, 8:1-9. Money teaches these switches put the device into a calibrate mode and an alarm standby mode, among others. *Id.*; EX1003, ¶ 300.

n. Limitation 20(n)

See Sections IX.E.2.d and IX.F.5.e.

o. Limitation 20(o)

See Section IX.F.1.

p. Limitation 20(p)

See Sections IX.F.5.g and IX.F.4.

q. Limitation 20(q)

See Section IX.E.6.c.

r. Limitation 20(r)

See Section IX.G.1.b.

s. Limitation 20(s)

Money in view of Akai and Kiani teaches this limitation. *See* Section IX.F.5.h. Kiani teaches sensor ports are positioned on the housing of the UPO. EX1006, FIG. 5; EX1003, ¶ 306.

t. Limitation 20(t)

Money in view of Akai and Kiani teaches this limitation. *See* Section IX.F.5.i. Kiani teaches sensor ports are positioned on the housing of the UPO. EX1006, FIG. 5; EX1003, ¶ 307.

u. Limitation 20(u)

Money in view of Akai and Kiani teaches this limitation. *See* Section IX.F.5.b. Also, Kiani expressly discloses a rechargeable battery. EX1006, 5:21-22.

It would have been obvious to use a rechargeable battery to prevent repeated discarding of used batteries. EX1003, ¶ 308.

v. Limitation 20(v)

Money teaches a processing unit positioned within the housing. EX1008, 5:20-28, FIG. 1; EX1003, ¶ 309.

w. Limitation 20(w)

Money teaches the processor receives signals from the pulse oximetry sensor via a pulse oximetry sensor interface 24. EX1008, 5:23-28, 5:38-41, 8:20-27, FIG. 1; EX1003, ¶ 310.

x. Limitation 20(x)

Akai teaches the signal from the pulse oximetry sensor is analog. EX1007, 5:30-34; EX1003, ¶ 311.

y. Limitation 20(y)

Money teaches the processing unit that processes signals from the pulse oximetry sensor to determine oxygen saturation (SpO₂). EX1008, 5:23-28, 7:49-52. Money also teaches pulse rate is determined as well by the processor. EX1008, 5:23-28, 5:61-65. Money doesn't expressly teach whether the processor determines pulse rate based on a signal from the pulse oximetry sensor 39. EX1003, ¶¶ 312-314.

Nevertheless, Kiani explicitly explains conventional pulse oximetry sensors detect pulse and oxygen saturation simultaneously. EX1006, 6:7-9; EX1003, ¶¶ 313-314. Like Akai, Kiani teaches a light-based pulse oximetry sensor. EX1006, 1:15-2:23. Thus, it would have been obvious to modify the system of Money/Akai to derive both oxygen saturation and pulse rate from a signal received from the pulse oximetry sensor using fewer sensors to increase a patient's quality of life when wearing a monitoring device. EX1003, ¶ 315; EX1007, 3:4-6, 5:7-9, FIG. 1. Such a modification would have predictably resulted in a system that derives both pulse rate and oxygen saturation from one signal received from one sensor. EX1006, 6:7-9; EX1003, ¶ 316. As such, the modification of Money, Kiani, and Akai represents the use of a known technique (determining both pulse rate and oxygen saturation from one pulse oximetry signal) to improve similar devices (similar portable patient monitors) to obtain predictable results.

z. Limitation 20(z)

Money teaches a patient monitoring device 10 that receives a signal from the blood pressure sensor representative of the patient's blood pressure via the blood pressure sensor interface 25. EX1008, 2:64-3:2, 5:23-28, 5:42-44, 8:20-27; EX1003, ¶ 317.

aa. Limitation 20(aa)

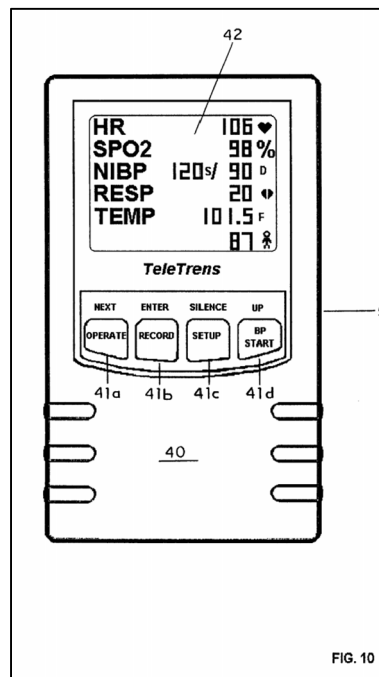
Money teaches a monitoring device that receives a signal from the temperature sensor representative of the patient's temperature via the temperature sensor interface 27. EX1008, 2:64-3:2, 5:23-28, 5:48-51, 10:60-11:5; EX1003, ¶ 318.

bb. Limitation 20(bb)

As modified by Kiani, the temperature sensor would be a digital signal. EX1008, 5:48-51, 7:4-8, 7:16-20, 7:58-62, 12:4-7, 10:60-11:5, 13:24-32; EX1003, ¶ 319; *See* Section IX.E.2.h.

cc. Limitation 20(cc)

Money teaches the processor displays real-time measurements from the pulse oximetry sensor, the blood pressure sensor, and the temperature sensor. EX1008, 6:21-55, 5:65-6:2; EX1003, ¶ 320.



EX1008, FIG. 10.

dd. Limitation 20(dd)

Money teaches an RF transmitter positioned with the housing. EX1008, 6:8-10; EX1003, ¶ 321.

ee. Limitation 20(ee)

Money teaches the transmitter 21 wirelessly transmits physiological measurements to a central monitoring station that includes pulse oximetry readings received from a pulse oximetry sensor 39, blood pressure readings from the blood pressure sensor 70, and respiration rate readings from the respiration rate sensor 53. EX1008, 5:10-13, 5:23-28, 5:38-51, 8:20-27, 3:24-29; EX1003, ¶¶ 265, 273.

Money doesn't expressly teach whether the central monitoring station is configured to display the measurements of parameters. However, there is nothing

non-obvious about a computer displaying data. EX1003, ¶ 323. For example, Akai teaches its central unit 215, which is completely analogous to Money's central monitoring station, displays data collected from remote measuring units. EX1007, 9:37-39, 9:45-50; EX1003, ¶ 323. It would have been obvious to display data on the central monitoring station of Money in view of Akai so that doctors and nurses can view the collected data. EX1003, ¶ 323.

X. CONCLUSION

Petitioner has demonstrated in this Petition that claims 1-20 of the '735 patent are unpatentable. Petitioner, therefore, respectfully requests institution of an *inter partes* review of the '735 patent and that claims 1-20 be cancelled.

Respectfully submitted,

Dated: May 18, 2020

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CERTIFICATION

The Petition excluding the caption, Table of Contents, Table of Exhibits, Mandatory Notices under 37 C.F.R. § 42.8, and this Certification contains 13,972 words.

Respectfully submitted,

Dated: May 18, 2020

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CERTIFICATE OF SERVICE

I hereby certify that on this 18th day of May 2020, the foregoing Petition for *inter partes* review and all Exhibits and other documents filed together with the Petition were served via Federal Express to the attorneys of record for the '735 patent at the following address:

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