

UNITED STATES PATENT AND TRADEMARK OFFICE

---

BEFORE THE PATENT TRIAL AND APPEAL BOARD

---

APPLE INC.,  
Petitioner,

v.

MASIMO CORPORATION,  
Patent Owner.

---

Case IPR2024-00290  
U.S. Patent 8,190,223

---

**DECLARATION OF R. JAMES DUCKWORTH, PHD**

I declare that all statements made herein on my own knowledge are true and that all statements made on information and belief are believed to be true, and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

I reserve the right to supplement my opinions in the future to respond to any arguments or positions Apple may raise, taking account of new information as it becomes available to me.

Dated: 3/28/2024



---

R. James Duckworth, Ph.D

## TABLE OF CONTENTS

|                                                     | Page No. |
|-----------------------------------------------------|----------|
| I. INTRODUCTION .....                               | 1        |
| II. INFORMATION AND MATERIALS CONSIDERED .....      | 1        |
| III. EXPERIENCE AND QUALIFICATIONS.....             | 4        |
| IV. APPLICABLE LEGAL STANDARDS.....                 | 12       |
| A. Claim Construction.....                          | 13       |
| B. Obviousness.....                                 | 13       |
| V. LEVEL OF ORDINARY SKILL IN THE RELEVANT ART..... | 17       |
| VI. CLAIM CONSTRUCTION .....                        | 19       |
| A. “measured value” .....                           | 20       |
| B. “blood parameter” .....                          | 21       |
| VII. SUMMARY OF OPINIONS.....                       | 21       |
| VIII. BACKGROUND OF THE TECHNOLOGY.....             | 22       |
| A. Technological Overview .....                     | 22       |
| B. ’223 Patent (EX1001).....                        | 23       |
| C. Apple’s Prior Art References .....               | 26       |
| 1. Naghavi (EX1005).....                            | 26       |
| 2. Hochstedler (EX1004) .....                       | 28       |
| 3. Burnes (EX1006) .....                            | 29       |

**TABLE OF CONTENTS**  
**(cont'd)**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Page No.</b> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| 4. Hayashi (EX1007).....                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 30              |
| 5. Mortz (EX1009).....                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 31              |
| IX. ANALYSIS.....                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 31              |
| A. Ground 1A: Naghavi combined with Hochstedler, and Burnes.....                                                                                                                                                                                                                                                                                                                                                                                                                             | 31              |
| 1. Apple Fails To Show That The References Or Their Combination Disclose “the display of one of the measured values of the first or second physiological parameter is replaced with the other of the measured values based on an occurrence of an event, the event being the measured value of one of the first or second physiological parameters approaching one or more threshold values indicative of a worsening state of a patient” (Claim 1 And Dependent Claims 2-4, 6, 11, 12)..... | 31              |
| a) Hochstedler does not disclose this limitation.....                                                                                                                                                                                                                                                                                                                                                                                                                                        | 32              |
| b) Naghavi does not disclose this limitation.....                                                                                                                                                                                                                                                                                                                                                                                                                                            | 36              |
| c) Burnes does not disclose this limitation.....                                                                                                                                                                                                                                                                                                                                                                                                                                             | 40              |
| d) The Combination of Hochstedler, Naghavi, and Burnes do not disclose this limitation.....                                                                                                                                                                                                                                                                                                                                                                                                  | 43              |

**TABLE OF CONTENTS**  
**(cont'd)**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>Page No.</b> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| 2. Apple Fails To Show That The References Or Their Combination Disclose “the common display area is configured to default to displaying one of the measured values of the first or second physiological parameters” (Dependent Claim 4).....                                                                                                                                                                                                                                           | 44              |
| 3. Apple Fails To Show That The References Or Their Combination Disclose “the common display area changes from displaying one of the measured values of the first or second physiological parameter to displaying the other of the measured values based on an occurrence of an event, the event being the measured value of one of the first or second physiological parameters approaching one or more threshold values indicative of a worsening state of a patient” (Claim 13)..... | 46              |
| 4. Apple Fails To Show That The References Or Their Combination Disclose “the common display area, the display of one of the measured values of the first or second physiological parameter is replaced with the other of the measured values of the first or second physiological parameters based on an occurrence of an event, the event being one of the measured values of the first or second physiological parameters alarming” (Claim 15 and Dependent Claims 16 and 17).....   | 47              |

**TABLE OF CONTENTS**  
**(cont'd)**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Page No.</b> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| 5. Apple Fails To Show That The References Or Their Combination Disclose “in the common display area, the display of one of the measured values of the first or second physiological parameters is replaced with the other of the measured values of the first or second physiological parameters automatically based on which is a more critical one of the measured values of the first or second physiological parameters” (Claim 18 and Dependent Claims 19 and 20)..... | 48              |
| 6. Apple Fails to Show That The References Or Their Combination Disclose “replacing the display of the measured value of the first physiological parameter with a display of a measured value of a second physiological parameter in the display location when a change in the measurement of the second physiological parameter indicates a worsening state of the patient” (Claim 21 and Dependent Claim 22).....                                                          | 49              |
| 7. Apple Fails To Show That The References Or Their Combination Disclose “measured value” As Construed By Apple In The Delaware Litigation (Claims 1, 13, 15, 18, 21 and Dependent Claims 4, 6, 11, 12, 14, 16, 17, 20) .....                                                                                                                                                                                                                                                | 50              |
| 8. POSITA Would Not Be Motivated To Combine Naghavi, Hochstetler, and Burnes .....                                                                                                                                                                                                                                                                                                                                                                                           | 51              |

**TABLE OF CONTENTS**  
**(cont'd)**

|                                                                                                                                                                                                                                                                                                                                      | <b>Page No.</b> |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| a) Apple Improperly Uses Hindsight Bias To Combine References To Create Features The References Do Not Disclose.....                                                                                                                                                                                                                 | 52              |
| b) POSITA Would Not Be Motivated To Implement Naghavi's Icons And Health Objects In Hochstedler's Display Layouts .....                                                                                                                                                                                                              | 53              |
| c) POSITA Would Not Be Motivated To Switch The Layout From One Parameter To Another Parameter When A Parameter Changes To Out Of Range Or Near Out Of Range .....                                                                                                                                                                    | 56              |
| B. Ground 1B: Naghavi combined with Hochstedler, Burnes, and Hayashi.....                                                                                                                                                                                                                                                            | 59              |
| 1. Apple Fails To Show That The References Or Their Combination Disclose Dependent Claim 19.....                                                                                                                                                                                                                                     | 59              |
| 2. Apple Fails To Show That The References Or Their Combination Disclose “the display of the measured value of the first blood parameter is replaced by the measured value of the second blood parameter when the second blood parameter passes an alarm threshold” (Claim 27 and Dependent Claims 32, 34, 36, 37, 42, 43, 44) ..... | 60              |

**TABLE OF CONTENTS**  
**(cont'd)**

|                                                                                                                                                                                                                                                                                                               | <b>Page No.</b> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| 3. Apple Fails to Show That The References Or Their Combination Disclose “the display also changes from displaying the measured value of the first blood parameter to displaying the measured value of the second blood parameter when the second blood parameter passes an alarm threshold” (Claim 28) ..... | 61              |
| 4. Apple Fails To Show That The References Or Their Combination Disclose “measured value” As Construed By Apple In The Delaware Litigation (Claims 27, 28 and Dependent Claims 19, 32, 34, 36, 37, 42, 43).....                                                                                               | 61              |
| 5. POSITA Would Not Be Motivated To Combine Naghavi, Hochstetler, Burnes, and Hayashi .....                                                                                                                                                                                                                   | 62              |
| C. Ground 1C: Naghavi combined with Hochstedler, Burnes, Hayashi, and Mortz.....                                                                                                                                                                                                                              | 63              |
| X. CONCLUSION.....                                                                                                                                                                                                                                                                                            | 64              |

## **I. INTRODUCTION**

1. I, R. James Duckworth, Ph.D have been retained by Knobbe, Martens, Olson & Bear, LLP, counsel for Petitioner Masimo Corporation (“Masimo”). I am making this declaration at the request of Masimo in the matters of *Inter Partes* Review of U.S. Patent No. 8,190,223 (“the ’223 Patent”) (“IPR2024-00290”) challenging Claims 1-4, 6, 11-22, 27-28, 32, 34, 36-37, and 42-44. I understand that Masimo has asserted the ’223 Patent against Petitioner in *Apple Inc. v. Masimo Corporation and Sound United, LLC*, U.S. District Court for the District of Delaware, Case No. 1:22-cv-01378-MN (“the Delaware Litigation”). I understand that this Declaration is being submitted as EX2002.

2. I am being compensated for my work in this matter at my standard hourly rate for expert consulting services. My compensation in no way depends on the outcome of this proceeding. I have no financial interest in any of the parties to these matters.

## **II. INFORMATION AND MATERIALS CONSIDERED**

3. I have been asked to provide technical expert opinions relating to the validity of the claims of the ’223 Patent. In conducting the analyses and forming the opinions set forth in this Declaration, I have reviewed and considered the ’223 Patent’s claims, specification, and file history. I have also reviewed and considered Apple’s petition for IPR2024-00290 (“the 290 Petition”), the prior art

references that Apple relies on, the declaration of Dr. Andrew Cockburn (EX1003), and all other exhibits that Apple attached to the 290 Petition.

4. I have also reviewed and considered at least the following materials in preparing this declaration.

| Exhibit No. | Description                                                                                                                                                                                                             |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1001        | U.S. Patent No. 8,190,223                                                                                                                                                                                               |
| 1002        | File History for U.S. Patent No. 8,190,223                                                                                                                                                                              |
| 1003        | December 12, 2023 Declaration of Dr. Cockburn                                                                                                                                                                           |
| 1004        | U.S. Patent No. 6,707,476                                                                                                                                                                                               |
| 1005        | U.S. Patent Pub. No. 2002/0184055                                                                                                                                                                                       |
| 1006        | U.S. Patent Pub. No. 2006/0064020                                                                                                                                                                                       |
| 1007        | U.S. Patent No. 6,151,518                                                                                                                                                                                               |
| 1009        | U.S. Patent No. 6,385,471                                                                                                                                                                                               |
| 2030        | Masimo Corp., Press Releases, 2005, <a href="http://www.masimo.com/news/2006.htm">http://www.masimo.com/news/2006.htm</a> , captured Oct. 30, 2009                                                                      |
| 2031        | Masimo Corp., Masimo rainbow® Pulse Co-Oximetry, <a href="https://professional.masimo.com/technology/co-oximetry/rainbow/">https://professional.masimo.com/technology/co-oximetry/rainbow/</a> , captured Mar. 20, 2024 |
| 2032        | Joint Claim Construction Brief Regarding Masimo Asserted Patents, No. 1:22-cv-01378, D.I. 295, Aug. 31, 2023, <i>Apple Inc. v. Masimo Corp.</i> (D. Del.)                                                               |

| <b>Exhibit No.</b> | <b>Description</b>                                                                                                                                                                                                             |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2033               | Jim Duckworth, “Integrated First Responder Location and Physiological Monitoring,” Presentation, 1st Invitational Workshop on Body Area Network Technology and Applications, Worcester Polytechnic Institute, Jun. 19-20, 2011 |
| 2034               | Yitzhak Mendelson, “Wearable Wireless Pulse Oximetry for Physiological Monitoring,” Presentation, PPL Workshop, Worcester Polytechnic Institute, Aug. 4 2008                                                                   |
| 2035               | Y. Mendelson, J. Duckworth, et al. “A Wearable Pulse Oximeter for Remote Physiological Monitoring,” Proceedings of the 28th IEEE EMBS Annual Int’l Conf., Aug. 30 - Sept. 3, 2006                                              |
| 2036               | U.S. Patent No. 6,091,530                                                                                                                                                                                                      |
| 2037               | U.S. Patent No. 6,075,755                                                                                                                                                                                                      |

To the extent not listed above, I have also reviewed any other materials I discuss or cite herein.

5. In preparing this Declaration, I have considered my own knowledge and experience, including my work in the fields of electrical and computer engineering; my experience teaching within those subjects; my experience working with others involved in those fields; and the materials identified herein. I understand my analyses and opinions, including my review of any materials cited herein, should be made from the perspective of a person of ordinary skill in the art related to the ’223 Patent at the relevant time (i.e., a “POSITA”). I understand the relevant time is March 1, 2005. Accordingly, my analyses and opinions are made from that relevant

perspective. My testimony herein refers to the knowledge of a POSITA as of March 1, 2005, unless indicated otherwise.

6. Any figures appearing in this Declaration were prepared with the assistance of counsel and reflect my understanding of the '223 Patent and the materials discussed herein.

### **III. EXPERIENCE AND QUALIFICATIONS**

7. My academic and professional background is in electrical and computer engineering. I obtained a Bachelor of Engineering degree in Electrical and Electronic Engineering from the University of Bradford, England and a Ph.D. Degree in Electrical and Electronic Engineering from the University of Nottingham, England. My Ph.D. thesis work concerned increasing the speed of data processing using multiple processing elements to complete computations in parallel and triggering computations based on the availability of data. After completing my Ph.D., I was a lecturer in the university's Computer Science Department for two years.

8. For more than 40 years, I have studied, designed, and worked in these fields. My experience includes over 35 years of teaching and research, including in the fields of pulse oximetry and other physiological monitoring technologies, low powered wireless sensor design, embedded system design, wearable technology, and indoor location tracking for first responders, among others.

9. I have been a professor of electrical and computer engineering at Worcester Polytechnic Institute (“WPI”) for over 35 years. I joined WPI in January 1987 as an Assistant Professor of Electrical Engineering and was an Associate Professor of Electrical and Computer Engineering from July 1991 to June 2021. Presently, I am a Professor Emeritus of Electrical and Computer Engineering at WPI.

10. More recently, my research work has centered on Precision Personnel Location (PPL) for First Responders. This project started as a result of a tragic incident in Worcester in 1999, when six firefighters lost their lives in a warehouse fire. The overall goal of the PPL project is to protect the lives of emergency responders and to enhance their ability to accomplish their missions through research and development of systems for personnel location and tracking, movements, physiological and environment status monitoring, and command and control. The PPL project brought together diverse technical capabilities from other centers and laboratories at WPI to address important problems for emergency responders, the most critical of which is precise location and path tracking for each person in a building.

11. From 2005 through 2008, I worked extensively with my colleague at WPI, Professor Yitzhak Mendelson, Ph.D., to research, publish papers about, design, and make, wearable pulse oximetry devices. In 2007, I formed a company with Professor Mendelson called Advanced Body Sensing to design and build small

battery-powered wearable pulse oximeter devices that could be mounted on the forehead with a strap. To meet these design goals, we had to develop a completely new device, as our prior work concerned prototype devices that required an external power supply and additional instrumentation to operate. Together, Professor Mendelson and I developed, along with a small team of engineers, a new housing, optical sensor, and associated electronics, including the design and programming of microprocessor and wireless transmission components. As part of this project, we conducted physiological monitoring, including heart rate, respiration rate, oxygen saturation level, skin and environment temperature, posture and activity level, and core body temperature, each of which were monitored on a display. EX2033 at 2.

12. Our design and development process led us to the final forehead-mounted pulse oximetry device shown below.



EX2033 at 24 (annotated).

13. Our final device design allowed for a number of vital signs to be measured including oxygen saturation ( $\text{SpO}_2$ ) and heart rate (HR). Our device had the potential for use in combat casualty care, such as for remote triage, and by first responders. It was used as part of the PPL project and by the United States Air Force.

14. One publication stemming from this work is titled “A Wearable Reflectance Pulse Oximeter for Remote Physiological Monitoring,” which published in 2006. I have included this publication as EX2035. As stated in the paper, our wearable Pulse Oximeter measured arterial oxygen saturation ( $\text{SpO}_2$ ) and utilized the principle of photoplethysmography: “Pulse oximetry also relies on the detection of photoplethysmographic (PPG) signals produced by variations in the quantity of arterial blood that is associated with periodic contractions and relaxations of the heart.” EX2035 at 1; *see also id.* at 2.

15. On August 4, 2008, Professor Mendelson presented on our Advanced Body Sensing work, including the above device, at an annual international technology conference held at WPI called the PPL Workshop. His presentation, titled “Wearable Wireless Pulse Oximetry for Physiological Monitoring,” is included as EX2034. As part of the presentation, Professor Mendelson provided visuals detailing the graphical user interface (GUI) that we developed in conjunction with a software engineer as part of our Advanced Body Sensing work. EX2034 at 24 and 25. As can be seen in this presentation, we developed a GUI which displayed graphical

representations of various parameters measured over a period of time, including heart rate, SpO<sub>2</sub>, and respiration rate. EX2034 at 25. The GUI also provided information about the system and pulse oximeter used. *Id.*



*Id.*

16. In 2011, I presented this work at the 1<sup>st</sup> Invitational Workshop on Body Area Network Technology and Applications. I have included the presentation as Exhibit 2033.

17. Due to a change in direction by the principals of the company, Advanced Body Sensing was closed in 2014.

18. For over 30 years, I developed and taught courses at WPI relevant to the technology disclosed in the '223 Patent. The classes I developed and taught included associated laboratory exercises and projects, which I also developed. As reflected in my curriculum vitae (EX2001), I developed and taught at least the following relevant courses: (1) Microprocessor System Design; (2) Modeling and synthesis of digital system using Verilog and VHDL; (3) VHDL for Modeling and Synthesis; (4) Computer System Design; (5) Multi-processor and Distributed Systems; (6) Advanced Computer System Design; and (7) Advanced Digital System Design with FPGAs. Many of these courses required students to design user interfaces to display the output from their projects.

19. In the course of my work at WPI, I have advised hundreds of engineering students in B.S. and M.S. programs and advised or co-advised approximately ten Ph.D. students that have completed Ph.D. degrees. Many of these student projects and research involved the design of user interfaces to display information related to the operation of the project.

20. Additionally, I have authored or co-authored dozens of technical papers in refereed journals and conference proceedings. I have also given many conference presentations in the fields I have taught, researched, and worked.

21. Aside from my work at WPI, I have years of experience working with portable, battery powered sensors. During leave in approximately 2000 from WPI, I

was the Vice President of Engineering for Adaptive Instruments. At Adaptive Instruments, I was responsible for designing and manufacturing a line of wireless industrial sensors for use in industrial process control, including the software development of user interfaces for the wireless sensors. As a consultant, I helped program a small, battery powered device that included a microcontroller and custom LCD and was used to count the number of times an inhaler had been used. Also as a consultant, I helped design and program a wrist-worn device that reminded the user throughout the day of the medications that needed to be taken. My work on the wrist-worn device led to the patent I obtained on a “Low Power Infrared Communication System,” U.S. Patent No. 6,091,530, included as EX2036. This wearable electronic device provided functionality on a display, contained a microcontroller to calculate and display messages, and incorporated buttons for user control. EX2036 at Abstract, 2:7–17.<sup>1</sup>

22. My technical work also contributed to features in the same device shown in U.S. Patent No. 6,075,755 titled “Medical Reminder System and Messaging Watch,” included as EX2037. As in my ’530 patent above, the device incorporated a display with watch functionality (LCD display 110), contained a microcontroller to

---

<sup>1</sup> Citations herein containing a colon (“:”) are to columns and lines, where available, or to pages and lines, where lines are numbered.

calculate and display medication reminder messages, and incorporated buttons (120, 122, 124, 126) for user control. EX2037 at 6:28–65. Figure 1 of the '755 Patent is shown below.

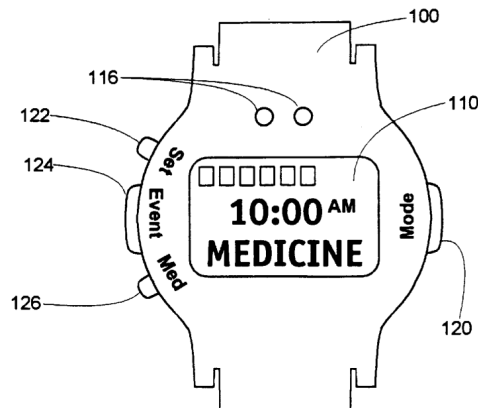


**Fig. 1**

EX2037, Fig. 1.

23. In addition to those listed above, I am a named co-inventor on several patents, including:

- a. U.S. Patent No. 7,292,189, issued in 2007, titled “Methods and Apparatus for High Resolution Positioning”
- b. U.S. Patent No. 9,476,963, issued in 2016, titled “Search and Rescue Method and System”
- c. U.S. Patent No. 9,658,309, issued in 2017, titled “Precision Location Method and System”; and

d. U.S. Patent No. 9,846,042, issued in 2017, titled “Gyroscope Assisted Scalable Visual Simultaneous Localization and Mapping.”

24. Above, I have provided a short summary of my education and experience that I believe is most relevant to the analyses and opinions I have expressed in this Declaration. A copy of my curriculum vitae, which describes in further detail my qualifications, responsibilities, employment history, honors, awards, professional associations, presentations, publications, and patents is included as EX2001.

#### **IV. APPLICABLE LEGAL STANDARDS**

25. I am an electrical and computer engineer by training and profession. The opinions I express in this Declaration involve the application of my knowledge and experience to the evaluation of the '223 Patent and certain prior art to the '223 Patent.

26. Although I have been involved as a technical expert in patent matters before, I am not an expert in patent law. Therefore, I have been advised of certain principles of patent law applicable in this matter, which I have used in arriving at my determinations and opinions. The paragraphs below express my understanding of the legal requirements I have used in forming my opinions.

**A. Claim Construction**

27. I understand that, in assessing the patentability of a patent claim, the Patent Office generally construes claim terms by giving them their ordinary and customary meaning, as they would have been understood by a POSITA at the time of the invention in view of the intrinsic record (patent specification and file history). However, I understand that the inventors may, in the patent specification, expressly define a claim term to have a meaning that differs from the term's ordinary and customary meaning. I also understand that the inventors may disavow or disclaim certain claim scope, thereby departing from the ordinary and customary meaning, when the intrinsic record demonstrates that a clear and unambiguous disavowal or disclaimer has occurred. I understand that extrinsic evidence, such as relevant technical literature and dictionaries, may be useful in ascertaining how a POSITA would have understood a claim term, but the intrinsic record is the primary source for determining the meaning of claim terms. For the purposes of this review, and to the extent necessary, I have interpreted each claim term in accordance with the principles set forth in this paragraph.

**B. Obviousness**

28. I understand that a claim is unpatentable as "obvious" under 35 U.S.C. § 103 if the claimed subject matter as a whole would have been obvious to a POSITA at the time of the invention. I also understand that an obviousness analysis takes into

account the following factors, which are sometimes referred to as the *Graham* factors: (1) the scope and content of the prior art, (2) the differences between the claimed subject matter and the prior art, (3) the level of ordinary skill in the art at the time of the invention, and (4) “objective indicia of non-obviousness,” also referred to as secondary considerations of non-obviousness. I understand that these objective indicia include considerations such as whether there was: (i) any unexpected result(s); (ii) skepticism of the invention; (iii) a teaching away from the invention; (iv) failure of others to find the solution(s) provided by the claimed invention; (v) copying by other companies; (vi) commercial success due to the merits of the claimed invention; (vii) praise by others for the invention; and (viii) a long-felt need in the industry for the claimed invention.

29. In determining the scope and content of the prior art, it is my understanding that a reference is considered appropriate prior art if it falls within the field of the inventor’s endeavor. In addition, a reference is appropriate prior art if it is reasonably pertinent to the particular problem with which the inventor was involved. A reference is reasonably pertinent if it logically would have commended itself to an inventor’s attention in considering his or her problem. If a reference relates to the same problem as the claimed invention, that supports use of the reference as prior art in an obviousness analysis.

30. To assess the differences between prior art and the claimed subject matter, it is my understanding that 35 U.S.C. § 103 requires the claimed invention to be considered as a whole. This “as a whole” assessment requires showing that a POSITA at the time of invention, confronted by the same problems as the inventor and with no knowledge of the claimed invention, would have selected the elements from the prior art and combined them in the claimed manner.

31. It is my further understanding that the Supreme Court has recognized several rationales for combining references or modifying a reference to show obviousness of claimed subject matter. Some of these rationales include: combining prior art elements according to known methods to yield predictable results; simple substitution of one known element for another to obtain predictable results; a predictable use of prior art elements according to their established functions; applying a known technique to a known device (method or product) ready for improvement to yield predictable results; choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; and some teaching, suggestion, or motivation that would have led a POSITA to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

32. I understand that the obviousness analysis must be performed from the perspective of a POSITA at the time of the alleged invention. I understand this requirement is to help avoid using impermissible hindsight in the analysis. I further

understand that the claims of the patent-at-issue must not be used to provide a road map for obviousness; instead, the claims would have been obvious only if a POSITA, without knowledge of the patent-at-issue, would have been motivated to combine the teachings of the prior art to arrive at the claimed invention and had a reasonable expectation of success in doing so.

33. I understand that an assessment of what a reference discloses or teaches—for purposes of an anticipation analysis or an obviousness analysis—must be conducted from the perspective of a POSITA at the time of the invention. In other words, a reference discloses or teaches a claim limitation if a POSITA would, at the relevant time, interpret the reference as expressly, implicitly, or inherently disclosing the claim limitation. I further understand that a reference does not need to use the exact language of the claim to disclose a claim limitation. I also understand that something is only “inherent in,” and therefore taught by the prior art if it necessarily flows from the explicit disclosure of the prior art. I understand the fact that a certain result or characteristic may be present in the prior art is not sufficient to establish inherency.

34. I understand that the obviousness analysis also must show that the prior art, taken as a whole, enables a POSITA to make and use the claimed invention.

35. Applying these legal standards to Claims 1-4, 6, 11-22, 27-28, 32, 34, 36-37, and 42-44 of the '223 Patent, I believe Claims 1-4, 6, 11-22, 27-28, 32, 34,

36-37, and 42-44 would not have been obvious to a POSITA based on the grounds asserted by Apple in its petition, as discussed below.

#### **V. LEVEL OF ORDINARY SKILL IN THE RELEVANT ART**

36. I understand that obviousness must be evaluated from the perspective of what would have been known or understood by a person of ordinary skill in the art (“POSITA”) at the time of the invention. I have been informed by counsel and understand that the priority date of the ’223 Patent is March 1, 2005. I understand that date to be the time of the invention for my analysis. I have been informed that the level of ordinary skill in the art may be determined by various factors including: (a) the type of problems encountered in the art, (b) prior art solutions to those problems, (c) the rapidity with which innovations are made, (d) the sophistication of the technology, and (e) the educational level of active workers in the field.

37. The field of art relevant to the ’223 Patent is multi-parameter patient monitors capable of determining multiple physiological parameters and display the monitored parameters. EX1001 at Abstract. A POSITA at the time of the ’223 Patent would be a person with a Bachelor of Science degree in an academic discipline emphasizing the design of software or user interfaces, in combination with training or at least one to two years of related work experience with the design of user interfaces. Alternatively, the person could have also had a Master of Science degree

in a relevant academic discipline with less than a year of related work experience in the same discipline.

38. A POSITA would also include persons with a working knowledge of physiological monitoring technologies and/or optical sensors used in physiological monitoring technologies. The person would have had a Bachelor of Science degree in an academic discipline emphasizing the design of electrical, computer, software, or optical technologies, in combination with training or at least one to two years of related work experience with capture and processing of data or information, or designing and using optical sensors or systems, including but not limited to physiological monitoring technologies. Alternatively, the person could have also had a Master of Science degree in a relevant academic discipline with less than a year of related work experience in the same discipline.

39. I understand that Apple has proposed a different level of skill in the art at the time of the invention of the '223 Patent, which is as follows:

[O]ne of ordinary skill in the art relating to, and at the time of, the invention of the '223 Patent would have had at least a bachelor's degree in computer science, computer engineering, electrical engineering, biomedical engineering, human-computer interaction, or a related field, and would have had at least two years of relevant work experience in the design and development of graphical user interfaces (GUIs), human-computer interfaces, or equivalents thereof. Less work experience may be compensated by a higher level of education and vice versa.

EX1003 at ¶ 22.

40. I understand that Apple does not contend that the level of skill in the art affects the patentability of the challenged claims. EX1003 ¶22. While the level of skill I identified above is more accurate, for at least the reasons set forth below, I agree that the claims' patentability is confirmed regardless of the level of skill.

41. I understand the capabilities of a POSITA as proposed by myself and Apple as of March 1, 2005. Indeed, I possessed at least those capabilities myself before, during, and after that time. As a professor of electrical and computer engineering for over three decades, I have taught many such persons and understand the level of knowledge and skill that persons with such academic experience would have possessed in March 2005. Through my education and decades of experience, such as teaching relevant engineering courses, I am familiar with what a POSITA would have understood in March 2005 and qualified to provide opinions from the perspective of a POSITA at the relevant time.

## **VI. CLAIM CONSTRUCTION**

42. The Board should give the claims their ordinary and customary meaning, consistent with the specification, as a POSITA would understand them. 37 C.F.R. § 42.100(b); *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005)(*en banc*). Before the District Court, Masimo explains that the claims have their ordinary and customary meaning and thus require no construction. EX2032, 5-7, 11-14, 16-

17, 22-23. I agree with Masimo and believe the claims should be given their ordinary and customary meaning.

43. Unlike Masimo, Apple presents inconsistent claim constructions in the parallel proceedings. Before the district court, Apple argues that the disputed terms below require express (and narrow) constructions: “measured value” as it appears in Claims 15, 21, 27, 28, 36, and 43 and “blood parameter” as it appears in Claims 27, 28, 34, 36, and 43. I address both terms below.

44. But here, Apple did not even mention those constructions. Rather, Apple now seeks broader claim scope to support the Petition’s patentability challenges by arguing “no express constructions are required.” Pet. at 3.

**A. “measured value”**

| <b>Masimo’s Claim Construction Proposal in Delaware Litigation</b> | <b>Apple’s Claim Construction Proposal in Delaware Litigation</b> |
|--------------------------------------------------------------------|-------------------------------------------------------------------|
| Plain and ordinary meaning                                         | concentration of a constituent in blood                           |

45. I reviewed Apple’s claim construction brief and support thereto in the Delaware litigation regarding the claim construction of “measured value.” I understand that in the Delaware Litigation, Apple proposed that the term “measured value” should be construed as “actual numeric value of a measurement.” EX2032 at 16. I understand that Apple argues that “displaying a measured value” means that “the ‘measured value’ displayed is the actual measured value of a parameter – not

merely a notification that a parameter is approaching or has passed a predetermined threshold or any other rough or indirect indication.” *Id.* at 17.

**B. “blood parameter”**

| <b>Masimo’s Claim Construction Proposal in Delaware Litigation</b> | <b>Apple’s Claim Construction Proposal in Delaware Litigation</b> |
|--------------------------------------------------------------------|-------------------------------------------------------------------|
| Plain and ordinary meaning                                         | actual numeric value of a measurement                             |

46. I reviewed Apple’s claim construction brief and support thereto in the Delaware litigation regarding the claim construction of “blood parameter.” I understand that in the Delaware Litigation, Apple proposed that the term “blood parameter” should be construed as “concentration of a constituent in blood.” EX2032 at 5. I understand that Apple takes the position that “blood parameter” refers to a “blood constituent” and “does not include all ‘physiological parameters,’ such as pulse rate or PPG waveform.” *Id.* at 8 (emphasis omitted).

**VII. SUMMARY OF OPINIONS**

47. I have conducted analyses leading to the opinions expressed in this Declaration. To summarize those opinions, it is my conclusion, from a technical point of view, that Claims 1-4, 6, 11-22, 27-28, 32, 34, 36-37, and 42-44 of the ’223 Patent would not have been obvious to a POSITA based on the grounds asserted by Apple in the 209 Petition.

48. It is my opinion that:

- (Ground 1A) Claims 1-4, 6, 11-18, and 20-22 would not have been obvious to a POSITA based on Naghavi, Hochstedler, and Burnes;
- (Ground 1B) Claims 19, 27-28, 32, 34, 36-37, and 42-43 would not have been obvious to a POSITA based on Naghavi, Hochstedler, Burnes, and Hayashi; and
- (Ground 1C) Claims 42-44 would not have been obvious to a POSITA based on Naghavi, Hochstedler, Burnes, Hayashi, and Mortz.

49. Below, I provide a detailed analyses supporting my opinions.

## **VIII. BACKGROUND OF THE TECHNOLOGY**

### **A. Technological Overview**

50. Masimo is a health technology and consumer electronics company that manufactures patient monitoring devices, particularly focusing on devices that non-invasively monitor physiological parameters, including pulse rate, arterial oxygen saturation, total hemoglobin, carboxyhemoglobin, and methemoglobin. Masimo has become known for its pulse oximeters which are capable of reading through motion-induced noise. EX1001 at 2:36-47.

51. Masimo's pulse oximeters have gained widespread acceptance in a variety of medical applications, including surgical wards, intensive care and neonatal units, general wards, home care, physical training, and other monitoring settings.

EX1001 at 2:36-47. Providing information about a person's monitored parameters is critical to providing good medical care.

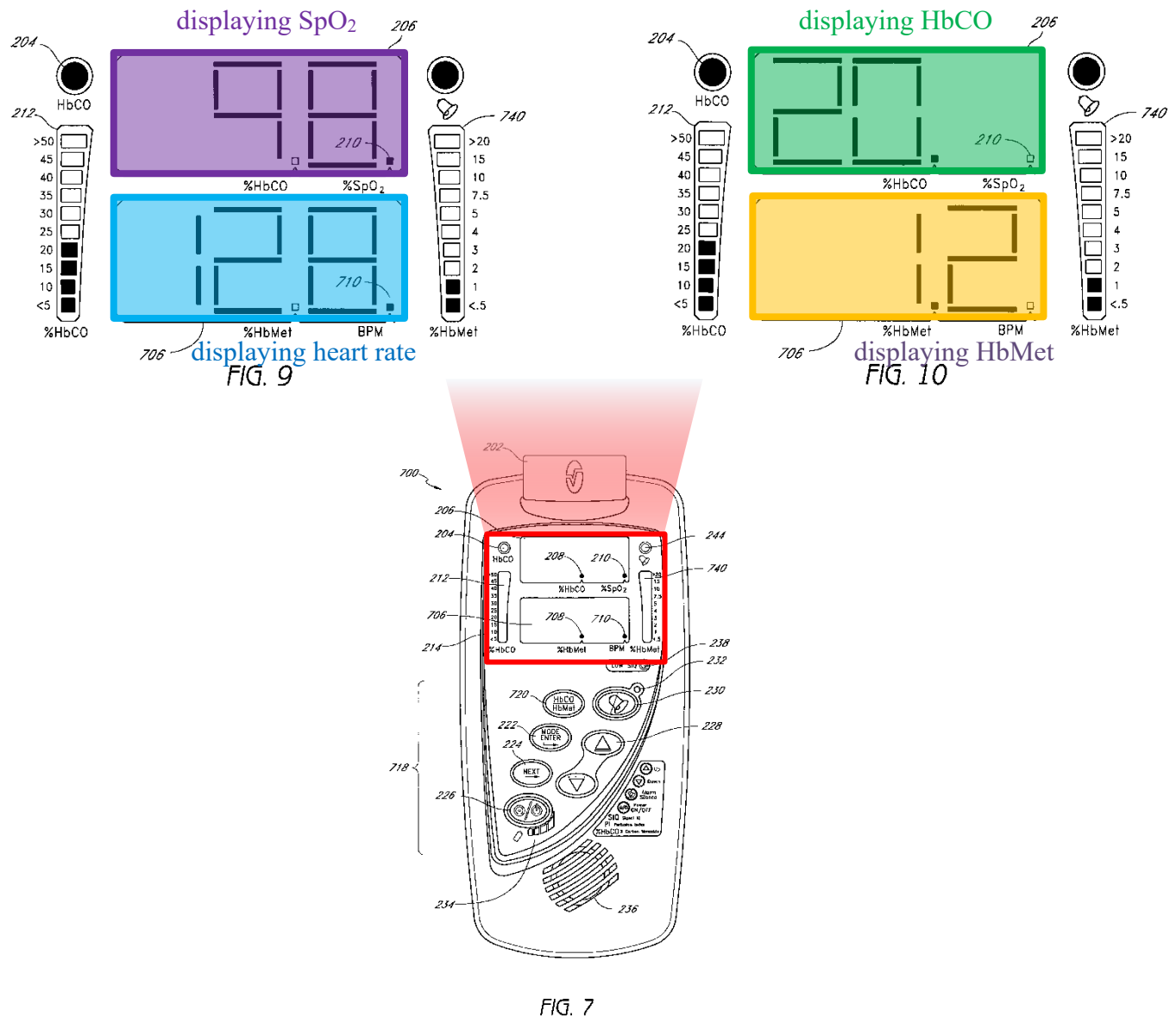
52. As technology continues to advance, more information becomes available. For example, in 2005, Masimo advanced patient care by releasing its rainbow® technology. EX2030 at 12-13. rainbow® technology uses “a sophisticated new sensor technology that employs eight wavelengths” of light to noninvasively measure parameters that were previously only available through invasive measurements. *Id.* When first released in 2005, rainbow® technology noninvasively measured carboxyhemoglobin (SpCO). *Id.* Today, rainbow® technology noninvasively measures even more parameters, including methemoglobin (SpMet) and total hemoglobin (SpHb). EX2031. I understand Masimo continues to use rainbow® technology in its devices.

**B. '223 Patent (EX1001)**

53. The '223 Patent is titled “Noninvasive Multi-Parameter Patient Monitor” and issued May 29, 2012. The '223 Patent claims priority to provisional application Nos. 60/657,281, 60/657,596, 60/657,268, and 60/657,759, each of which was filed on March 1, 2005. The '223 Patent discloses and claims improvements to displaying multiple physiological parameters when space is limited on a display. EX1001 at Abstract.

54. The '223 Patent explains that the monitored physiological parameters can include noninvasive measurements such as pulse rate, blood oxygen (SpO<sub>2</sub>), carbon monoxide saturation (HbCO), total hemoglobin (Hbt), methemoglobin (HbMet), and others. *Id.* at Abstract, 2:59-65. There “is a need to provide patient monitors capable of displaying multiple physiological parameters, other than or in addition to SpO<sub>2</sub>, plethysmograph waveforms, or pulse rates.” *Id.* at 2:52-54. The '223 Patent enables “more parameter data to be displayed than the available physical display area or real estate.” *Id.* at 3:12-14. For example, a monitor “may be displaying a first parameter, such as a plethysmograph, and upon determining measurements indicating that HbMet is trending toward an alarm condition, the monitor may automatically switch from displaying the first parameter to the alarming parameter, or in this case, a trend of the alarming parameter.” *Id.* at 5:20-25.

55. The '223 Patent also provides figures depicting replacing one physiological parameter with another. Figs. 9 and 10 are expanded versions of the display shown on the device depicted in Fig. 7. *Id.* at 16:35-36, 16:45-48, 16:59-61. As shown below, the device in Fig. 9 displays SpO<sub>2</sub> and heart rate. *Id.* at Fig. 9. These parameters are replaced in Figs. 10 with HbCO and HbMet, respectively. *Id.* at Fig. 10, 16:59-17:15.



*Id.* at Figs. 7, 9, 10.

56. I have reproduced Claim 1 of the '223 Patent below as an example claim. I have emphasized the claim language directed to replacing the value of one physiological parameter with another based on an event. For convenience, I have adopted Apple's labeling of the claim elements.

| Limitation | Claim Language                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [1pre]     | A patient monitor capable of measuring at least two physiological parameters,                                                                                                                                                                                                                                                                                                                                                         |
| [1a]       | the patient monitor comprising a display capable of displaying a measured value of a first physiological parameter of body tissue of a monitored patient in a first display area or displaying a measured value of a second physiological parameter of the body tissue in a second display area where the first display area and the second display area comprise at least some common display area capable of displaying information |
| [1b]       | wherein in the common display area, <i>the display of one of the measured values of the first or second physiological parameter is replaced with the other of the measured values based on an occurrence of an event,</i>                                                                                                                                                                                                             |
| [1c]       | <i>the event being the measured value of one of the first or second physiological parameters approaching one or more threshold values indicative of a worsening state of a patient.</i>                                                                                                                                                                                                                                               |

### C. Apple's Prior Art References

#### 1. Naghavi (EX1005)

57. U.S. Patent Pub. No. 2002/0184055 to Naghavi et al. is titled “System And Method For Healthcare Specific Operating System.” Naghavi describes a “personal healthcare management system 10, comprises components that work together to provide an out-of-hospital, affordable, real time, automated intelligent system for early managing and risk stratifying of patients 1 based on their symptoms, physiologic data (ECG, BP) and their past medical history.” EX1005 at ¶24. The personal healthcare management system 10 includes a computer 11 and one or more

home-based medical devices 20. *Id.* at ¶¶25-26. The medical devices 20 may comprise “electrocardiograph device, a blood pressure measurement device, thermometers, digital biochemical devices, glucometers, and physiological laboratory kits, digital biomechanical monitoring devices, peak-flow meter, and the like, or combinations thereof.” *Id.* at ¶32.

58. The personal healthcare management system 10 gathers information about the patient “such as past medical history, symptoms, risk factors, ECGs, and the like, and stores them in heartfolio database 30.” *Id.* at ¶41. The personal healthcare management system 10 “processes the current symptoms, past medical clinical information 30” of the patient and “dynamic physiologic data for risk stratification and management” to create an output. *Id.* at ¶44. Outputs can range from “simple patient advice to more sophisticated actions like activating an alarm system or informing health care provider automatically.” *Id.* at ¶45.

59. In the display of the personal healthcare management system 10, a patient can find items “in a single visual display of displayed items comprising menus, health objects, icons, and options.” *Id.* at ¶58. The icons and health objects on the display “may change in color, shape, order, or other mutable attribute according to different time schedules and severity or degree of some of findings, e.g. the shape, size, color, and relative position of each icon can change according to a current health status and health plan of patient 1.” *Id.* at ¶59.

**2. Hochstedler (EX1004)**

60. U.S. Patent No. 6,707,476 to Hochstedler is titled “Automatic Layout Selection For Information Monitoring System.” Hochstedler describes a graphical user interface (GUI) to display medical information. EX1004 at Abstract, 1:49-50. The GUI in Hochstedler describes a method to “automat[e] the change of the layout of a GUI.” *Id.* at 1:54-55. Hochstedler describes how it changes the layout of the GUI:

The system determines the active or currently used components of the current layout and monitors the system to detect changes in the system’s capabilities (e.g., an additional sensor is added) or changes in the system’s environment (e.g., a switch is made from one medical procedure to another). After detecting one or more changes in the system, the system reviews a group of available layouts and determines which, if any, more closely matches the system as changed. If an available layout more closely matches the changed system, then the system may implement an automatic change or switch of the layout or prompt the user to change the layout by presenting a selection of layout options.

*Id.* at 1:55-67.

61. Hochstedler further explains the type of changes: “an overall layout (a layout with multiple, and usually different components),” “a sub-layout (a more specialized version of an overall layout),” “waveform window (a component designed to illustrate waveforms),” or “a parameter block (a component designed to show non-waveform information).” *Id.* at 2:7-13.

**3. Burnes (EX1006)**

62. U.S. Patent Pub. No. 2006/0064020 to Burnes et al. is titled “Clinic Dashboard Monitor.” Burnes describes a “remote patient monitoring system” that “displays a summary table of categorized parameter values for multiple patients simultaneously.” EX1006 at Abstract. The system analyzes data received from various medical devices used to monitor patients. *Id.* at ¶31. The system displays summary parameter values for multiple patients simultaneously. *Id.* “The monitored parameters available for display will in part depend on the type of device the patient has and the particular monitoring features that are enabled.” *Id.* at ¶33. Various icons can be used to indicate the status of the patient or parameter, such as an exclamation point for an alert indicating a need for clinical attention, a solid circle as a warning symbol, and an “OK” as a normal symbol. *Id.* at ¶50. An example of a display in Burnes is shown below.

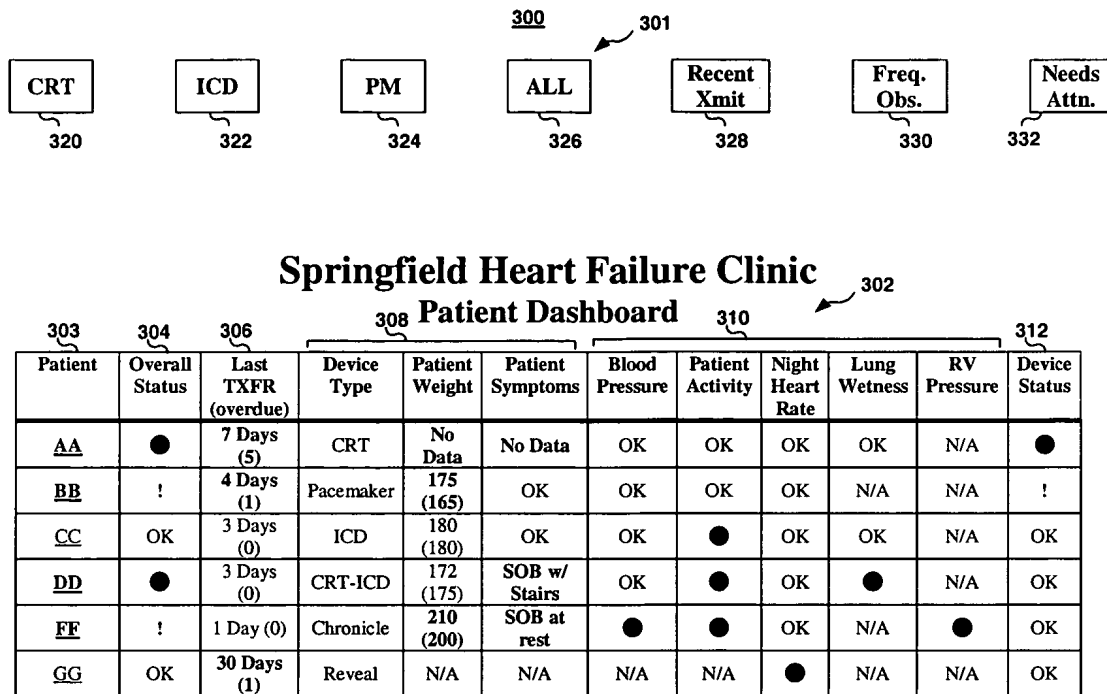


**FIG. 7**

*Id.* at Fig. 7.

#### 4. Hayashi (EX1007)

63. U.S. Patent No. 6,151,518 to Hayashi is titled “Instrument For Measuring Concentrations Of Constituent Parts Of Blood.” Hayashi describes a “blood-constituent concentration measuring instrument” which purports to optically measure the “concentrations of the constituent parts of blood.” EX1007 at 3:29-32. Blood constituents Hayashi purports to measure include “a hematocrit value, oxyhemoglobin concentration, deoxyhemoglobin concentration, carboxyhemoglobin concentration, methemoglobin concentration, and an optical path length change.” *Id.* at 6:33-37.

**5. Mortz (EX1009)**

64. U.S. Patent No. 6,385,471 to Mortz is titled “System For Pulse Oximetry Spo2 Determination.” Mortz describes a “system for noninvasively calculating the oxygenation of hemoglobin in arterial blood using a pulse oximeter.” EX1009 at 2:25-28. Mortz describes a pulse oximeter system that calculates pulse rate and oxygen saturation. *Id.* at 5:16-21.

**IX. ANALYSIS****A. Ground 1A: Naghavi combined with Hochstedler, and Burnes**

65. I understand that Apple argues that Claims 1-4, 6, 11-18, and 20-22 would have been obvious based on a combination of Naghavi, Hochstedler, and Burnes. Apple has not demonstrated that these claims would have been obvious over the proposed combination.

**1. Apple Fails To Show That The References Or Their Combination Disclose “the display of one of the measured values of the first or second physiological parameter is replaced with the other of the measured values based on an occurrence of an event, the event being the measured value of one of the first or second physiological parameters approaching one or more threshold values indicative of a worsening state of a patient” (Claim 1 And Dependent Claims 2-4, 6, 11, 12)**

66. Claim 1 requires “the display of one of the measured values of the first or second physiological parameter is replaced with the other of the measured values based on an occurrence of an event, the event being the measured value of one of the first or second physiological parameters approaching one or more threshold values

indicative of a worsening state of a patient.” Apple relies upon a combination of Naghavi, Hochstedler, and Burnes for this limitation. However, none of the references, alone or in combination, teach, suggest, or render obvious this limitation. Not only do the references not teach, suggest, or render obvious the limitation, but a POSITA would not be motivated to combine the references to arrive at the claimed invention as discussed below in Section IX.A.8.

**a) Hochstedler does not disclose this limitation**

67. Apple relies upon multiple display layouts depicted in figures from Hochstedler for this limitation. Pet. at 22-27. However, Hochstedler never discloses replacing one parameter for another parameter based on a parameter approaching a threshold value indicating a worsening state of the patient as required by Claim 1.

68. Apple relies upon two display layout changes in Hochstedler. The first display layout change Apple relies upon changes the display layout shown in Fig. 2 to the display layout shown in Fig. 9. Pet. at 23-26. These two display layouts are depicted below.

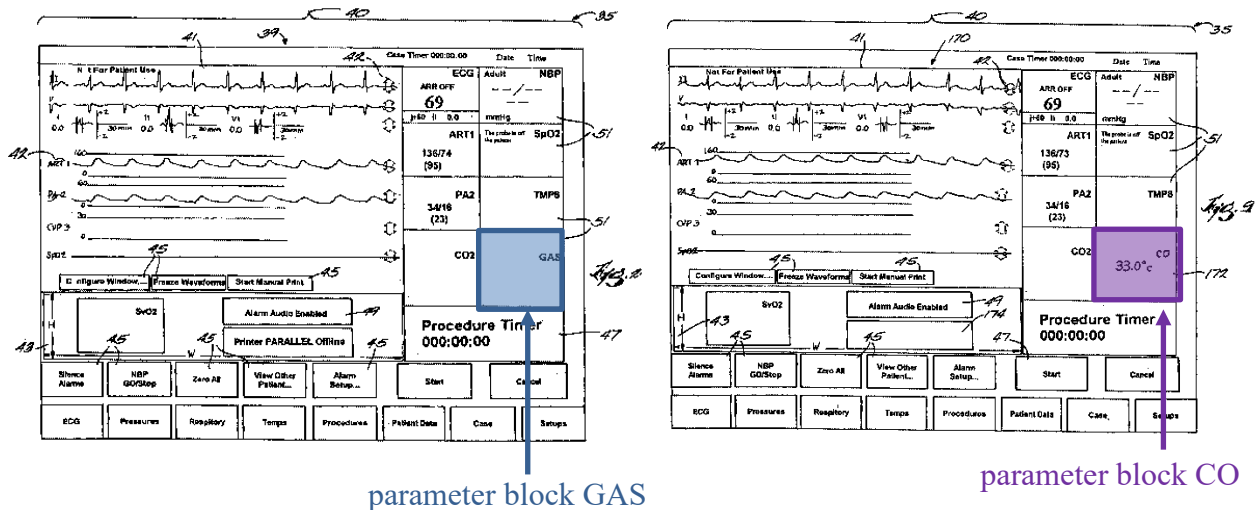


Fig. 2 → change in capabilities or environment of system → Fig. 9

EX1004 at Figs. 2, 9.

69. Hochstedler explains that it switches the layout in Fig. 2 to the layout in Fig. 9 upon a “change in the capabilities or environment of the system.” EX1004 at 5:24-25. A change in the “capabilities” of the system relates to a change in the type of sensor in the system, “e.g., a blood oxygen sensor is added.” *Id.* at 5:27-28. For this change, “the layout is modified so that information associated with the added or subtracted capability is displayed in the GUI.” *Id.* at 5:29-31. In other words, the first type of change is adding or removing different hardware sensors such that the system monitors different parameters.

70. A change in the “environment” of the system includes changes “such as a change of user, change in the phase of the case, change in the care unit in which the patient is monitored, change in the type of care unit in which the system 10 is

used, change in the type of medical procedure being carried out, or other similar change.” *Id.* at 5:32-36.

71. When a change in the “capabilities” or “environment” of the Hochstedler system occurs, the user is prompted with a dialog box as shown in Fig. 8 to switch to a new layout. *Id.* at 8:30-33; *see also id.* at 2:39-45. The user can accept or cancel the switch. *Id.* at 8:36-39.

72. This “layout change” relied upon by Apple never changes based on a parameter approaching a threshold value indicating a worsening state of the patient as required by Claim 1. Thus, the layout change from Fig. 2 to Fig. 9 occurs because of a change to the system or environment—e.g., the sensors changed so that the parameters being monitored removed “GAS” from the system in Fig. 2 and added “CO” in Fig. 9.

73. The second display “layout change” Apple relies upon in Hochstedler changes the display layout shown in Fig. 2 to the display layout shown in Fig. 13. *Pet.* at 23-24. These two display layouts are depicted below.

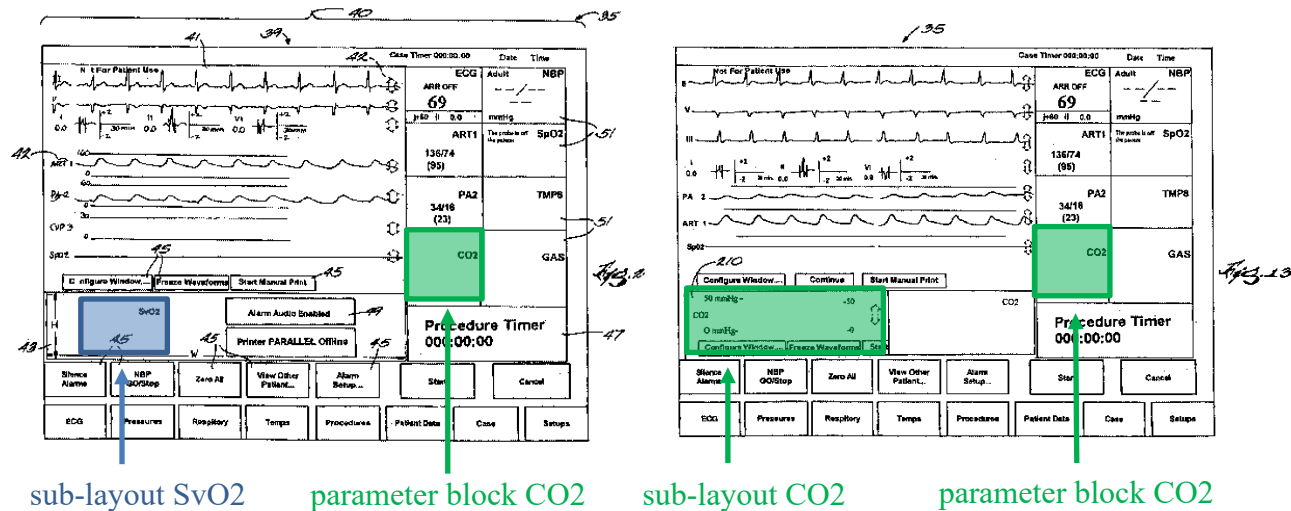
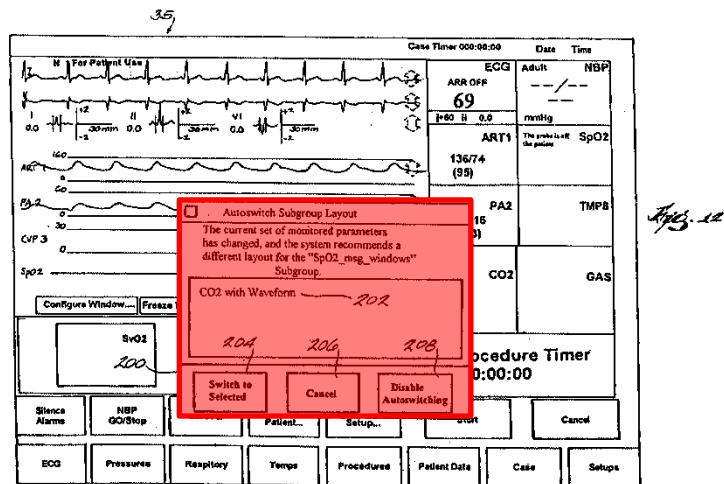


Fig. 2 → monitored parameters change → Fig. 13

EX1004 at Figs. 2, 13.

74. Hochstedler explains that it switches the layout in Fig. 2 to the layout in Fig. 13 upon a “parameter switch” for the parameter displayed in the sub-layout. *Id.* at 8:56-60. As shown in the dialog box in Fig. 12, the layout switched from Fig. 2 to Fig. 13 because the “current set of monitored parameters has changed.” *Id.* at Fig. 12. When a change in the monitored parameters occurs, the system provides a dialog box to the user to change the sub-layout as shown in purple in Fig. 12 below. *Id.* at 8:60-65, Fig. 12.



*Id.* at Fig. 12.

75. Similar to the change from Fig. 2 to Fig. 9, the change from Fig. 2 to Fig. 13 never changes the layout based on a parameter approaching a threshold value indicating a worsening state of the patient as required by Claim 1. Rather, the layout change from Fig. 2 to Fig. 13 illustrates a change in the parameter being monitored—removing an “SvO2” sensor.

76. Moreover, as shown above, the layouts in Figs. 2 and 13 both monitor CO2. Thus, removing SvO2 from the sub-layout in Fig. 2 to display CO2 in the sub-layout in Fig. 13 does not replace any monitored value as CO2 was already displayed in Fig. 2.

**b) Naghavi does not disclose this limitation**

77. Apple further argues that the combination discloses this limitation because the GUI changes in Naghavi are “triggered based on the ‘severity’ of ‘changes in [patient] health status’ related to the monitored parameters.” Pet. at 12.

But Naghavi does not disclose the claim limitation requiring “the display of one of the measured values of the first or second physiological parameter is replaced with the other of the measured values based on an occurrence of an event, the event being the measured value of one of the first or second physiological parameters approaching one or more threshold values indicative of a worsening state of a patient.”

78. Naghavi describes a “personal healthcare management system 10” that includes a computer 11 and one or more home-based medical devices 20. EX1005 at ¶¶24-26. The computer includes a GUI. *Id.* Fig. 1. While Naghavi describes changes that can be made to its GUI, none of those changes teach, suggest, or render obvious the claim limitation.

79. For example, Naghavi describes its GUI as follows:

Healthcare specific GUI 80 employs a unique and proprietary technique of arranging icons and menus in a display area such as display 8 (FIG. 1) and comprises health objects (not shown in the figures), i.e. healthcare-specific basic components based on healthcare related concepts. Healthcare specific ***GUI 80 dynamically changes*** and orders the display of icons, health objects, and menus ***according to a personal health condition and schedule***, presents a comprehensive healthcare information portal, presents a variety of disease specific healthcare applications, forms a visual and personal healthcare portal, and interactively guides patients 1 through a healthcare portal.

*Id.* at ¶57 (emphasis added).

***GUI 80 may further change*** and show different types of icons and health objects ***according to different diseases and/or other physical conditions*** of patient 1. The icons and health objects may change in color, shape, order, or other mutable attribute according to different time schedules and severity or degree of some of findings, e.g. the shape,

size, color, and relative position of each icon can change according to a current health status and health plan of patient 1.

*Id.* at ¶59 (emphasis added).

In a preferred embodiment, **GUI 80** is interactive and dynamic, and may ***automatically detect changes in health status and health plan*** for patient 1 and ***automatically react and rearrange the available options*** to best suit the condition of patient 1.

*Id.* at ¶63 (emphasis added).

Concurrently, specialized healthcare operating system 50 initializes GUI 80, where GUI 80 executes in computer 11 and interfaces to the predetermined set of basic input/output system routines. GUI 80 continually ***determines a status of a predefined health status condition*** of patient 1 at predetermined intervals. Using the status, ***GUI 80 mutates one or more desired mutable characteristics of a displayed graphic user interface element***.

*Id.* at ¶99 (emphasis added).

Additionally, using a health plan and schedule specific to patient 1, health-specific ***GUI 80 forms a health portal that provides patients with the health objects he needs to successfully follow his health plan*** and reach to his medical goals and milestones defined by physicians.

*Id.* at ¶100 (emphasis added).

80. Naghavi does not disclose replacing one measured value of a physiological parameter with another measured value of a physiological parameter on its display. As demonstrated in the excerpts above, Naghavi has a limited description of the information displayed on its GUI. Cockburn admits that the “particular implementation of the GUI ... is not specifically described by Naghavi.”

EX1003 at ¶36. Naghavi does not disclose that changing or replacing icons on the GUI relates to icons that are measured values of physiological parameters.

81. Moreover, Naghavi does not disclose, let alone suggest, that its system monitors physiological parameters that are not displayed on the GUI so that it would need to replace one parameter for another as required by the claim. In fact, Naghavi describes using a large display such as a computer, which has enough real estate to display the monitored parameters. *See* EX1005 at Fig. 1. In fact, Naghavi explains that its system uses an “easy-to-access” and “user friendly GUI” with “a *single* visual display of displayed items comprising menus, health objects, icons, and options.” *Id.* at ¶58. Thus, Naghavi confirms that it does not have monitored parameters that are not on its display. Thus, Naghavi does not teach, suggest, or render obvious replacing one physiological parameter with another physiological parameter on its display.

82. Moreover, Naghavi also does not teach, suggest, or render obvious replacing any measured values of physiological parameters based on physiological parameters approaching one or more threshold values indicative of a worsening state of a patient. Naghavi explains that its system can include “an alarm system” and a “notification message.” *Id.* at ¶¶45, 93. But Naghavi does not teach, suggest, or render obvious that its alarm or notification message replaces a measured value of a physiological parameter on the GUI with another. When Naghavi discusses changing icons in the GUI, the changes occur because of “a personal health condition and

schedule” (*id.* at ¶57) or “different diseases and/or other physical conditions” (*id.* at ¶59).

83. Thus, Naghavi does not teach, suggest, or render obvious “the display of one of the measured values of the first or second physiological parameter is replaced with the other of the measured values based on an occurrence of an event, the event being the measured value of one of the first or second physiological parameters approaching one or more threshold values indicative of a worsening state of a patient.”

c) **Burnes does not disclose this limitation**

84. Apple relies upon Burnes because it allegedly makes changes to its GUI “based on detected changes in patient condition.” Pet. at 10. But like Hochstedler and Naghavi, Burnes does not teach, suggest, or render obvious “the display of one of the measured values of the first or second physiological parameter is replaced with the other of the measured values based on an occurrence of an event, the event being the measured value of one of the first or second physiological parameters approaching one or more threshold values indicative of a worsening state of a patient” as required by Claim 1.

85. Burnes describes a “remote patient monitoring system” that includes a display. EX1006 at Abstract. The display includes “monitored parameters,” which depend on “the type of device the patient has and the particular monitoring features

that are enabled.” *Id.* at ¶33. The display depicts records “for multiple patients” simultaneously. *Id.* at ¶36. An example of a display from Burnes with multiple patient records is shown below.

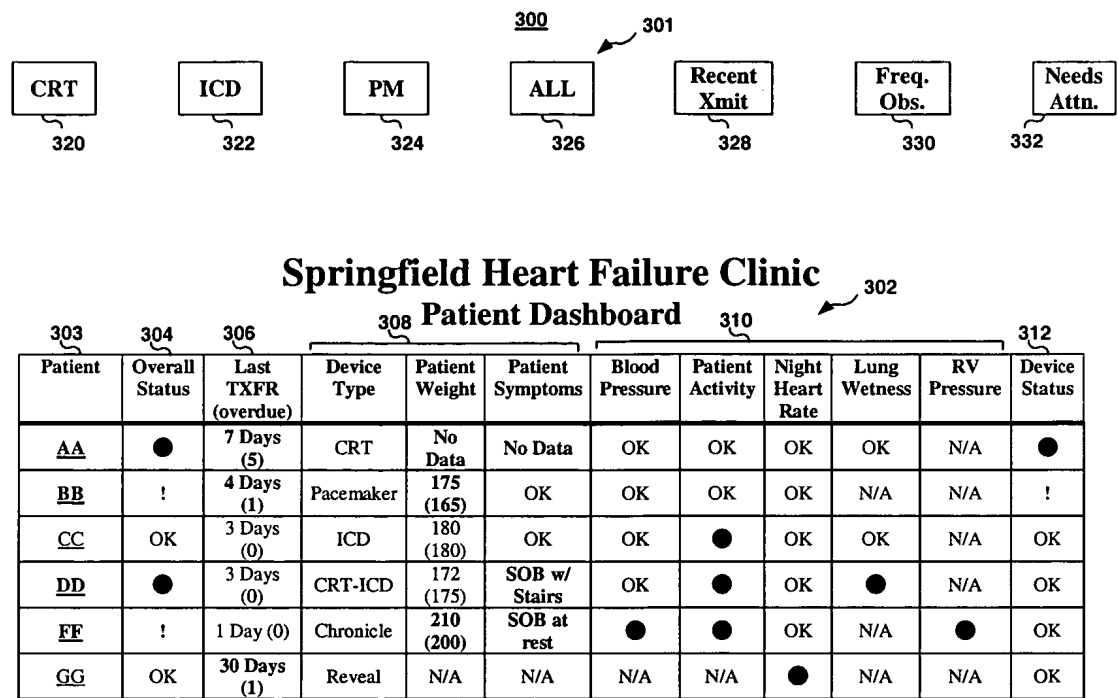


FIG. 7

*Id.* at Fig. 7.

86. Burnes explains that its system computes parameter values to be displayed and also categorizes the parameter values:

When new data is received by a central database at step 222, the corresponding patient record is updated at step 224, and *parameter values to be included in a summary display are computed* at step 226 using the new data. The *parameter values are then categorized* according to predefined thresholds or ranges. In this example, parameter values are categorized according to: 1) an “alarm” category, indicating the patient may require medical attention based on the parameter value;

2) a ***“warning” category***, indicating the patient may soon require medical attention based on the parameter value; and 3) a ***“normal” category***, indicating the parameter value is within an acceptable range and does not indicate a need for clinical attention.

*Id.* at ¶37 (emphasis added).

At step 230, any parameter values found to be ***“out of range” are formatted for display as an “alert” symbol*** which will be displayed as the parameter value in the summary display. Categorizing a parameter value in the “alert” category may trigger an alarm at the clinic, from the IMD and/or on the EMD. An alert notification may be sent to the clinic or clinician using a communication medium such as an email, a fax, a page or a phone call.

*Id.* at ¶38 (emphasis added).

At step 234, any parameter values found to be ***“near out of range” are assigned a “warning” symbol*** to be displayed as the parameter value in the summary display. A “warning” symbol indicates the patient may soon require medical attention based on the corresponding parameter value.

*Id.* at ¶39 (emphasis added).

***All remaining parameter values***, which are not found to be “out of range” or “near out of range,” ***are assigned a “normal” symbol*** at step 236. These parameter values do not indicate a need for clinical attention at the present time according to the category definitions.

*Id.* at ¶40 (emphasis added).

In the formatting scheme shown in FIG. 7, ***an exclamation point is used as an alert symbol*** indicating a need for clinical attention. ***A solid circle is used as a warning symbol***, and an ***“OK” is used as a normal symbol***.

*Id.* at ¶50 (emphasis added).

87. Thus, Burnes describes a system that displays parameter values or status symbols indicating the status of those parameter values. Burnes changes the

status symbol for the particular parameter as that parameter changes. Burnes never describes replacing one parameter value (or symbol as shown in Fig. 7 in Burnes) for a different parameter value (or symbol). Burnes also never teaches, suggests, or renders obvious replacing one parameter value (or symbol) for a second parameter when the second parameter is approaching one or more threshold values indicative of a worsening state of a patient.

d) **The Combination of Hochstedler, Naghavi, and Burnes do not disclose this limitation**

88. As described above, none of the references teach, suggest, or render obvious “the display of one of the measured values of the first or second physiological parameter is replaced with the other of the measured values based on an occurrence of an event, the event being the measured value of one of the first or second physiological parameters approaching one or more threshold values indicative of a worsening state of a patient” as required by Claim 1. Because none of the references teach, suggest, or render obvious this limitation, the combination also cannot teach, suggest, or render obvious this limitation. As discussed below in Section IX.A.8, a POSITA would not be motivated to combine these references to arrive at the claimed invention.

**2. Apple Fails To Show That The References Or Their Combination Disclose “the common display area is configured to default to displaying one of the measured values of the first or second physiological parameters” (Dependent Claim 4)**

89. Claim 4 requires “the common display area is configured to default to displaying one of the measured values of the first or second physiological parameters.” Apple relies upon Hochstedler for this limitation. Pet. at 32. However, Hochstedler does not teach, suggest, or render obvious this limitation.

90. Apple argues that Hochstedler “includes ‘a default selection button.’” Pet. at 32. Apple further argues that a POSITA would have understood or found it obvious that the “GUI has a default layout.” *Id.* However, Hochstedler does not teach, suggest, or render obvious a default layout. Hochstedler describes default *settings*, not default *layouts*:

When configuring the system 10, the user may specify that the ***system 10 does nothing in response to a system change*** (which is a ***default setting*** and referred to herein as Option 1).

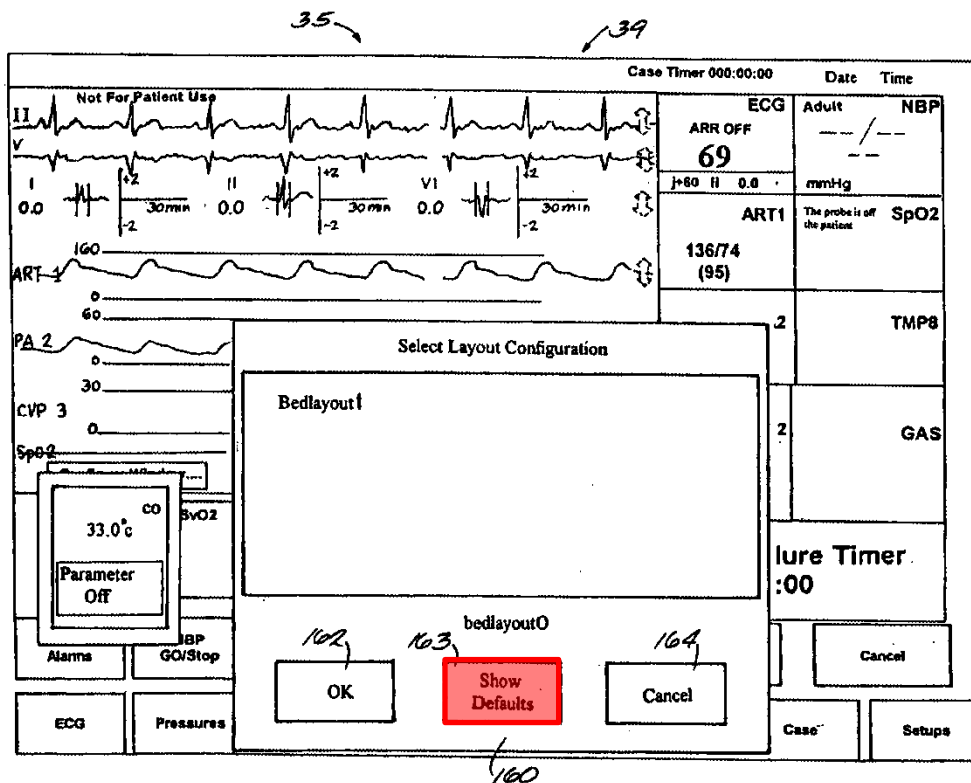
EX1004 at 5:39-42 (emphasis added).

While the weightings tab 85 provides a mechanism to adjust the weightings of components, the system 10 does not permit a user to remove any of the components from the selected layout using the weightings tab. If no global or group-wide weights have been assigned for the particular event being configured, the system 10 assigns ***default weights of “1” to every component in the layout***. The user may then specify or adjust each component’s weight.

*Id.* at 7:63-8:3 (emphasis added).

FIG. 8 illustrates an implementation of Option 3 where a pop-up list or dialog box 160 is presented to the user showing the user that the overall layout is about to be changed to a new bed layout, Bedlayout1. Generically, the layouts listed in the dialog box 160 and other choices listed in the dialog boxes discussed below are referred to as “selections.” The dialog box 160 includes an accept mechanism in the form of an OK button 162 to confirm the switch, *a default selection button 163*, and a CANCEL button 164 to cancel the layout switch.

*Id.* at 8:30-38 (emphasis added).



*Id.* at Fig. 8.

91. As shown in the excerpts above, Hochstedler describes default *settings*, not a default *layout*. For example, Hochstedler has default weights for different parameters and GUI components. *Id.* at 7:7-11. The weights are used in an algorithm based on the parameters being monitored by the system to select the “layout with the

highest weighted score.” *Id.* at 7:7-14. Hochstedler also describes that a default setting can include doing nothing to change the layout if the system changes, e.g. removing or adding a monitored parameter. *Id.* at 5:39-42. As shown in Fig. 8 above, a user can select the “Show Defaults” option on the GUI to view the system defaults. *Id.* at Fig. 8, 8:36-38. Hochstedler never teaches, suggests, or renders obvious a default *layout*.

92. Hochstedler also teaches away from using a default layout. Rather, Hochstedler’s system uses a weighted algorithm to dynamically recommend layouts based on the configuration of the system. *Id.* at 6:50-8:9. There is no default layout, but rather layouts that are selected based on the system arrangement and an algorithm. Hochstedler, therefore, does not teach, suggest, or render obvious “the common display area is configured to default to displaying one of the measured values of the first or second physiological parameters.”

**3. Apple Fails To Show That The References Or Their Combination Disclose “the common display area changes from displaying one of the measured values of the first or second physiological parameter to displaying the other of the measured values based on an occurrence of an event, the event being the measured value of one of the first or second physiological parameters approaching one or more threshold values indicative of a worsening state of a patient” (Claim 13)**

93. Claim 13 requires “the common display area changes from displaying one of the measured values of the first or second physiological parameter to

displaying the other of the measured values based on an occurrence of an event, the event being the measured value of one of the first or second physiological parameters approaching one or more threshold values indicative of a worsening state of a patient.” As in its arguments challenging Claim 1, Apple relies upon a combination of Naghavi, Hochstedler, and Burnes for Claim 13. Pet. at 35-36. For at least the reasons discussed above for Claim 1, Apple fails to show that any of the references or the combination teach, suggest, or render obvious this limitation in Claim 13. *See supra* Section IX.A.1.

**4. Apple Fails To Show That The References Or Their Combination Disclose “the common display area, the display of one of the measured values of the first or second physiological parameter is replaced with the other of the measured values of the first or second physiological parameters based on an occurrence of an event, the event being one of the measured values of the first or second physiological parameters alarming” (Claim 15 and Dependent Claims 16 and 17)**

94. Claim 15 requires “the common display area, the display of one of the measured values of the first or second physiological parameter is replaced with the other of the measured values of the first or second physiological parameters based on an occurrence of an event, the event being one of the measured values of the first or second physiological parameters alarming.” While Claims 1 and 13 require the event to be one of the parameters “approaching one or more threshold values indicative of a worsening state of a patient,” Claim 15 requires the parameter to be “alarming.”

95. As in its arguments challenging Claim 1, Apple relies upon a combination of Naghavi, Hochstedler, and Burnes for Claim 15. Pet. at 37-38. For at least the reasons discussed above for Claim 1, Apple fails to show that any of the references or the combination teach, suggest, or render obvious this limitation in Claim 15. *See supra* Section IX.A.1.

**5. Apple Fails To Show That The References Or Their Combination Disclose “in the common display area, the display of one of the measured values of the first or second physiological parameters is replaced with the other of the measured values of the first or second physiological parameters automatically based on which is a more critical one of the measured values of the first or second physiological parameters” (Claim 18 and Dependent Claims 19 and 20)**

96. Claim 18 requires “in the common display area, the display of one of the measured values of the first or second physiological parameters is replaced with the other of the measured values of the first or second physiological parameters automatically based on which is a more critical one of the measured values of the first or second physiological parameters.” While Claims 1 and 13 require the event to be one of the parameters “approaching one or more threshold values indicative of a worsening state of a patient,” and Claim 15 requires the parameter to be “alarming,” Claim 18 requires that the replacing occurs “based on which is a more critical” of the parameters.

97. As in its arguments challenging Claim 1, Apple relies upon a combination of Naghavi, Hochstedler, and Burnes for Claim 18. Pet. at 39. For at

least the reasons discussed above for Claim 1, Apple fails to show that any of the references or the combination teach, suggest, or render obvious this limitation in Claim 18. *See supra* Section IX.A.1.

98. Moreover, Apple also fails to show that the references or their combination teach, suggest, or render obvious replacing the parameter “based on which is a more critical” of the parameters. Apple argues that a “parameter (e.g., the second parameter) becoming (near) out of range indicates that the second parameter is a more critical one of the parameters, e.g., compared to a parameter that has not changed.” Pet. at 39 (citing EX1003 at ¶109) (emphasis omitted). However, none of the references teach, suggest, or render obvious a determination on which parameter is more “critical.” This is consistent with the references because the systems display all of the monitored parameters at the same time. There is no need to display one parameter that is more critical than any other parameter.

**6. Apple Fails to Show That The References Or Their Combination Disclose “replacing the display of the measured value of the first physiological parameter with a display of a measured value of a second physiological parameter in the display location when a change in the measurement of the second physiological parameter indicates a worsening state of the patient” (Claim 21 and Dependent Claim 22)**

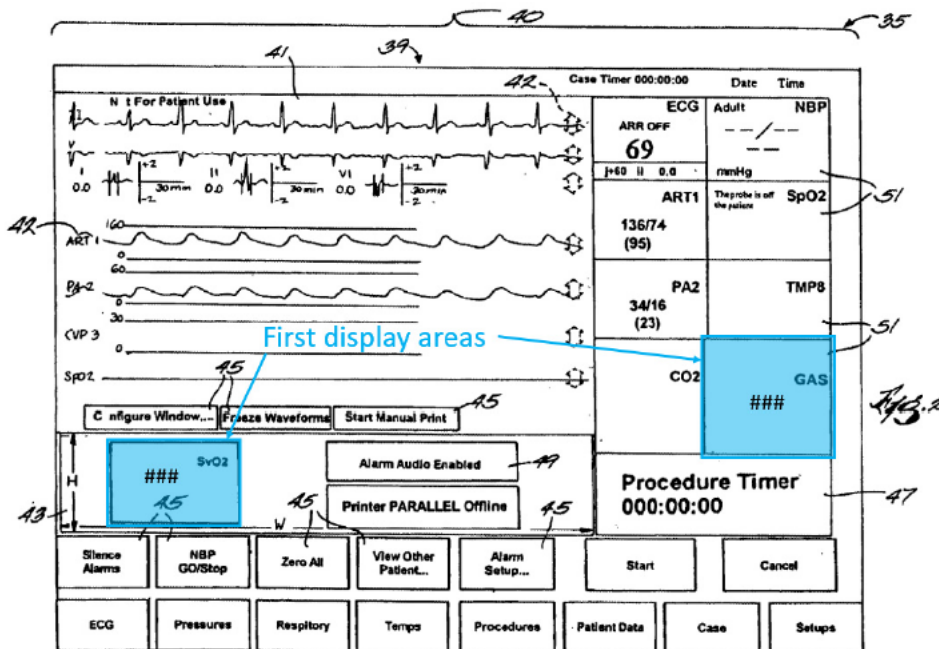
99. Claim 21 requires “replacing the display of the measured value of the first physiological parameter with a display of a measured value of a second physiological parameter in the display location when a change in the measurement of

the second physiological parameter indicates a worsening state of the patient.” As in its arguments challenging Claim 1, Apple relies upon a combination of Naghavi, Hochstedler, and Burnes for Claim 21. Pet. at 40-42. For at least the reasons discussed above for Claim 1, Apple fails to show that any of the references or the combination teach, suggest, or render obvious this limitation in Claim 18. *See supra* Section IX.A.1.

**7. Apple Fails To Show That The References Or Their Combination Disclose “measured value” As Construed By Apple In The Delaware Litigation (Claims 1, 13, 15, 18, 21 and Dependent Claims 4, 6, 11, 12, 14, 16, 17, 20)**

100. All of the claims that Apple challenges under Ground 1A (Claims 1, 13, 15, 18, and 21) recite “measured values.” I understand that in the Delaware Litigation, Apple argues that “measured value” should be construed as the “actual numeric value of a measurement,” where “the ‘measured value’ displayed is the actual measured value of a parameter – not merely a notification that a parameter is approaching or has passed a predetermined threshold or any other rough or indirect indication.” EX2032 at 16-17. Apple does not propose that construction in this IPR, but rather contends that no construction is required for any term. Pet. at 3. If Apple had applied the construction it proposed in the Delaware Litigation, Ground 1A does not teach, suggest, or render obvious displaying a “measured value” as required by the claims.

101. Apple relies upon figures in Hochstedler for displaying “measured values.” Apple admits that Hochstedler’s figures do “not illustrate values” in the parameter blocks it relies upon. Pet. at 21. Although not in the figures, Apple adds “###” to the Hochstedler figures to represent supposed “measured values.”



Pet. at 20. Thus, the description Apple relies upon in Hochstedler fails to teach, disclose a “measured value” that displays an “actual numeric value of a measurement.”

## 8. POSITA Would Not Be Motivated To Combine Naghavi, Hochstetler, and Burnes

102. Even though none of the references, Naghavi, Hochstetler, or Burnes, teach, suggest, or render obvious the claim limitations, Apple argues that the

*combination* of the system discloses the claim limitations. This argument fails for multiple reasons.

a) **Apple Improperly Uses Hindsight Bias To Combine References To Create Features The References Do Not Disclose**

103. As described above in Sections IX.A.1, none of the references teach, suggest, or render obvious replacing or changing a measured value of a first physiological parameter with a second measured value of a second physiological parameter. Not only do the references not disclose the replacing/changing required by the claims, they also do not disclose doing so because a physiological parameter is approaching one or more threshold values indicating a worsening state of the patient (Claims 1, 13, 21), alarming (Claim 15), more critical than another parameter (Claim 18), or passes an alarm threshold (Claims 27, 28).

104. Naghavi describes a patient monitoring system with a display to show health information of a patient. EX1005 at ¶¶24-26. Hochstedler describes a GUI that changes its layout when there is a change in capabilities of its system, such as removing or adding sensors, or a change in the environment, such as a different care unit. EX1004 at 5:24-38, 8:56-65. Burnes describes a display that depicts information about multiple patients simultaneously. EX1006 at Fig. 7, ¶¶37-40. None of these systems describe a system that is monitoring a parameter that is not displayed. Because none of the references teach, suggest, or render obvious that its

system is monitoring a parameter that is not displayed, there is no motivation for a POSITA to replace a measured value of a physiological parameter for another measured value of a physiological parameter. Because none of the references teach, suggest, or render obvious replacing one physiological parameter with another, the references also do not teach, suggest, or render obvious replacing physiological parameters when a parameter is approaching threshold values indicating a worsening state of the patient (Claims 1, 13, 21), alarming (Claim 15), more critical than another parameter (Claim 18), or passes an alarm threshold (Claims 27, 28).

105. Although none of the references teach, suggest, or render obvious the limitation, Apple improperly uses the claims as a roadmap to select quotes from the references to create a system that supposedly renders the '223 Patent claims obvious. By combining the references in a way to create features that are not individually present in the references, Apple reveals that its analysis is based on hindsight. In fact, because the features are not individually present in each reference, Apple's combination invents the features claimed in the '223 Patent.

**b) POSITA Would Not Be Motivated To Implement Naghavi's Icons And Health Objects In Hochstedler's Display Layouts**

106. Apple argues that a "POSITA would have been motivated to implement the display icons and health objects such as those described by Naghavi in layouts based on the teachings of Hochstedler—and specifically, to change those layouts

when the severity of a parameter changes.” EX1003 at ¶41; *see also* Pet. at 13. I disagree.

107. First, Hochstedler and Naghavi display all of the parameters that their systems monitor. Hochstedler explains that, when sensors are added or removed that are not on the display, Hochstedler changes the layout to reflect the change in monitored parameters. EX1004 at 5:27-31. Similarly, Naghavi explains that its system uses a large display such as a computer, which has enough real estate to display the monitored parameters in an “easy-to-access” and “user friendly GUI” with “a *single* visual display of displayed items comprising menus, health objects, icons, and options.” EX1005 at ¶58. Removing a displayed parameter would be counter to Naghavi’s system, which teaches displaying the parameters in a single, easy-to-access, user-friendly display.

108. Because all of the parameters being monitored are on the display in Hochstedler and Naghavi, a POSITA would not be motivated to change the layout because of the “severity” of parameter changes. Information about the severity of the parameter change will already be viewable to the user. As described in Naghavi and Hochstedler, the systems will alarm if needed. EX1004 at 4:1-3; EX1005 at ¶45.

109. Apple relies upon the following passage from Naghavi as support for changing the layout of Hochstedler:

The icons and health objects may *change in color, shape, order, or other mutable attribute* according to different time schedules and

*severity* or degree of some of findings, e.g. the *shape, size, color, and relative position of each icon can change* according to a current health status and health plan of patient 1.

EX1005 at ¶59 (emphasis added). But this passage does not support Apple’s proposed combination. Naghavi describes changing “icons and health objects” that are already present on the display. Naghavi does not describe adding an icon or health object that the system is monitoring, but not displaying. Rather, the changes Naghavi describes are to objects that are already present on the display, such as color, size, shape, order, relative position, or other mutable attribute. Changing the *order* or *relative position* can only be accomplished for icons and health objects that are already present on the display. This further supports that a POSITA would have no motivation to change the layout to replace a monitored parameter because all the monitored parameters in Naghavi and Hochstedler are already on the display.

110. Rather than providing a motivation to combine the references as proposed by Apple, Naghavi actually teaches away from combining the references in a way that some monitored parameters are not displayed. Naghavi describes an “easy-to-access” and “user friendly GUI” with “a *single* visual display of displayed items comprising menus, health objects, icons, and options.” *Id.* at ¶58 (emphasis added). A POSITA would not be motivated to combine Naghavi with the layouts in Hochstedler to remove monitored parameters from the display. This would

complicate the display and remove an advantage of Naghavi—a single visual display with all of the information.

c) **POSITA Would Not Be Motivated To Switch The Layout From One Parameter To Another Parameter When A Parameter Changes To Out Of Range Or Near Out Of Range**

111. Apple argues that a POSITA would have “been motivated to switch the layout responsive to a parameter value changing to become (near or) out of range, *e.g.*, based on Burnes.” Pet. at 14; EX1003 at ¶47. However, a POSITA would not be motivated to make this combination.

112. As discussed above, none of the references teach, suggest, or render obvious changing one layout to another layout when a parameter is approaching a threshold indicating a worsening state of the patient. *See supra* Section IX.A.1. Neither Hochstedler nor Naghavi disclose replacing parameters when a parameter is approaching a threshold indicating a worsening state of the patient. While Burnes describes changing icons based on when parameters are near or out of range, Burnes changes such icons for parameters that are already on the display. EX1006 at Fig. 7, ¶¶39-40, 49-50. For example, if a parameter changes from an “OK” status to a “warning” status, Burnes will change the “OK” symbol to a “solid circle.” *See* EX1006 at ¶¶37-40, 50. A POSITA would not be motivated to combine features that do not exist. Thus, the combination cannot exist if the elements are not present in the references to combine.

113. Second, Apple argues that its combination system “does not necessarily display all parameters on a single screen, at least in cases when more parameters are being monitored than there are spaces to display those parameters in the display layout.” EX1003 at ¶49. Apple further argues that a “POSITA would have recognized that not all parameters necessarily need to be displayed on a main (*e.g.*, default) layout. For instance, parameters that are less relevant to a patient’s condition or that are less likely to change in severity do not necessarily need to be constantly displayed.” EX1003 at ¶50. But as discussed above, none of the references Apple relies upon state that their systems monitor parameters that are not being displayed. In fact, the references teach the opposite.

114. For example, in Hochstedler, when the parameters that the system is monitoring changes, the system suggests a new layout to display the added parameters and remove any parameters that are no longer being monitored. EX1004 at 8:19-25, 8:56-65, Figs. 12, 13. Hochstedler explains that “as soon as the current layout set is missing one [of the current system parameters], the system will make a layout switch using one of the layout switch algorithms.” *Id.* at 8:23-25. Moreover, Naghavi explains that its system uses an “easy-to-access” and “user friendly GUI” with “a **single** visual display of displayed items comprising menus, health objects, icons, and options.” EX1005 at ¶58 (emphasis added). Thus, a POSITA would not be motivated to hide parameters away from clinicians when the references describe

displays that show the monitored parameters. Rather, a clinician would want to see the information about the patient in a single, easy-to-use display. As described in Hochstedler, a POSITA would understand the need to change the layout to match the monitored parameters, not hide parameters from view. The displays in Hochstedler, Naghavi, and Burnes are large displays that are not limited in available real estate. See EX1004 at Figs. 2, 9, 13; EX1005 at Fig. 1; EX1006 at Fig. 7.

115. Apple’s expert argues that “efficiently designed systems can ‘relieve the data analysis burden placed on the clinician while enabling the clinician to maintain thorough patient care.’” EX1003 ¶50. But a single, easy-to-use display with the monitored parameters as described in Hochstedler, Naghavi, and Burnes achieves the clinician’s goal of a large, “efficiently designed” system, without having to hide monitored parameters. In contrast, as shown above in Section VIII.B, the ’223 Patent addresses challenges presented by limited display real estate where not all monitored parameters can be displayed simultaneously. A POSITA did not face this challenge in Hochstedler, Naghavi, and Burnes. Thus, a POSITA is not motivated to replace one parameter with another parameter.

116. Apple also claims that a POSITA would be motivated to combine the references because:

[T]his combination is just the application of known techniques (specifically, changing a parameter display responsive to a change in parameter status) by an already-known system (specifically, a multiparameter monitoring and display system), and it yields predictable

results (specifically a multiparameter monitoring and display system in which the parameter display changes responsive to a change in the status of a parameter).

EX1003 at ¶51. But a POSITA cannot be motivated to combine features that do not exist. If the features do not exist in the references, then the feature is not “known.” Moreover, if the features do not exist, a POSITA cannot reach a “predictable result” of a multiparameter monitoring and display system in which the parameter display changes responsive to a change in the status of a parameter.

**B. Ground 1B: Naghavi combined with Hochstedler, Burnes, and Hayashi**

**1. Apple Fails To Show That The References Or Their Combination Disclose Dependent Claim 19**

117. Apple argues that Hayashi discloses the following limitation in Claim 19: “the first and second physiological parameters are determined using an output signal of a light sensitive detector capable of detecting light attenuated by the body tissue.” Pet. at 47-49. Claim 19 depends from Claim 18. As discussed above in Section IX.A.5, Naghavi, Hochstedler, and Burnes do not teach, suggest, or render obvious the limitation in Claim 18 requiring “in the common display area, the display of one of the measured values of the first or second physiological parameters is replaced with the other of the measured values of the first or second physiological parameters automatically based on which is a more critical one of the measured values of the first or second physiological parameters.” Apple does not argue that Hayashi supplies this missing claim limitation. *See* Pet., 47-49. Thus, for at least the

reasons discussed above for Claim 1, Apple fails to show that any of the references or the combination teach, suggest, or render obvious Claim 19. *See supra* Section IX.A.1.

**2. Apple Fails To Show That The References Or Their Combination Disclose “the display of the measured value of the first blood parameter is replaced by the measured value of the second blood parameter when the second blood parameter passes an alarm threshold” (Claim 27 and Dependent Claims 32, 34, 36, 37, 42, 43, 44)**

118. Apple argues that the combination of Naghavi, Hochstedler, Burnes, and Hayashi discloses Claim 27. Pet. at 49-56. Apple adds Hayashi to its combination for the following preamble and limitations in Claim 27: “determining a plurality of physiological parameters from an output signal of a light sensitive detector capable of detecting light attenuated by the body tissue” [27pre]; “blood parameter” [27a]; and “wherein the measured value of the first and second blood parameters are determined using an output signal of a noninvasive light sensitive detector capable of detecting light attenuated by the body tissue” [27d]. Pet. at 47-49. Apple does not argue that Hayashi discloses “the display of the measured value of the first blood parameter is replaced by the measured value of the second blood parameter when the second blood parameter passes an alarm threshold.” For at least the reasons discussed above for Claim 1, Apple fails to show that any of Naghavi, Hochstedler, Burnes, or their combination teach, suggest, or render obvious this limitation in Claim 27. *See supra* Section IX.A.1.

**3. Apple Fails to Show That The References Or Their Combination Disclose “the display also changes from displaying the measured value of the first blood parameter to displaying the measured value of the second blood parameter when the second blood parameter passes an alarm threshold” (Claim 28)**

119. Apple argues that the combination of Naghavi, Hochstedler, Burnes, and Hayashi discloses Claim 28. Pet. at 56-59. Apple adds Hayashi to its combination for the following preamble and limitations in Claim 28: “determining a plurality of physiological parameters from an output signal of a light sensitive detector capable of detecting light attenuated by the body tissue” [29pre]; “blood parameter” [28a]; “wherein the measured values of the first and second blood parameters are determined using an output signal of a noninvasive light sensitive detector capable of detecting light attenuated by the body tissue” [28d]. Pet. at 56-59. Apple does not argue that Hayashi discloses “the display of the measured value of the first blood parameter is replaced by the measured value of the second blood parameter when the second blood parameter passes an alarm threshold.” For at least the reasons discussed above for Claim 1, Apple fails to show that any of Naghavi, Hochstedler, Burnes, or their combination teach, suggest, or render obvious this limitation in Claim 28. *See supra* Section IX.A.1.

**4. Apple Fails To Show That The References Or Their Combination Disclose “measured value” As Construed By Apple**

**In The Delaware Litigation**  
**(Claims 27, 28 and Dependent Claims 19, 32, 34, 36, 37, 42, 43)**

120. As discussed above in Section IX.A.7, Naghavi, Hochstedler, and Burnes do not disclose displaying a “measured value” as construed by Apple in the Delaware Litigation to require an “actual numeric value of a measurement.” Apple does not argue that Hayashi supplies this missing claim element. *See id.* For at least the reasons discussed above for Claim 1, Apple fails to show that the figures Apple relies upon in Hochstedler display a “measured value” under Apple’s proposed construction in the Delaware Litigation. *See supra* Section IX.A.7.

**5. POSITA Would Not Be Motivated To Combine Naghavi, Hochstetler, Burnes, and Hayashi**

121. As discussed above, Apple adds Hayashi for claim limitations directed to noninvasive measurements. Apple does not argue that Hayashi discloses the replacing/changing limitation or that combining Hayashi with the other references would motivate a POSITA to create such limitation. Thus, for at least the reasons discussed above for Claim 1, Apple also fails to show that a POSITA would be motivated to combine Naghavi, Hochstedler, Burnes, and Hayashi to arrive at Claims 19, 27, 28, 32, 34, 36, 37, and 42-43. *See supra* Section IX.A.8.

C. **Ground 1C: Naghavi combined with Hochstedler, Burnes, Hayashi, and Mortz**

122. Apple argues that the combination of Naghavi, Hochstedler, Burnes, Hayashi, and Mortz discloses Claims 42-44.<sup>2</sup> Pet. at 72-75. Claims 42-44 depend from Claim 27. Apple adds Mortz for the dependent claim limitations in Claims 42-44. Pet. at 56-59. Apple does not argue that Mortz discloses “the display of the measured value of the first blood parameter is replaced by the measured value of the second blood parameter when the second blood parameter passes an alarm threshold,” as required in independent Claim 27. For at least the reasons discussed above in Sections IX.B.2, Naghavi, Hochstedler, Burnes, Hayashi, and Mortz do not teach, suggest, or render obvious the limitations in Claims 42-44.

123. Moreover, Apple does not argue that Mortz discloses “measured value.” Pet. at 72-75. Thus, for at least the reasons discussed above for Claim 1, Apple fails to show that any of the references or the combination teach, suggest, or

---

<sup>2</sup> While Apple lists Claim 32 in its heading and table of contents for Ground 1C (Pet. at i, 69), Apple does not address Claim 32 under Ground 1C in its Petition or Cockburn’s declaration. See Pet. at 69-75; EX1003 at ¶¶192-209. Thus, I understand that Apple is not maintaining Ground 1C for Claim 32.

render obvious “measured value” under Apple’s proposed claim construction in the Delaware Litigation. *See supra* Section IX.B.4.

124. As discussed above, Apple adds Mortz to supply dependent claim limitations. Apple does not argue that Mortz discloses the replacing limitation in Claim 27 or that combining Mortz with the other references would motivate a POSITA to create such limitation. Thus, for at least the reasons discussed above for Claim 1, Apple also fails to show that a POSITA would be motivated to combine Naghavi, Hochstedler, Burnes, Hayashi, and Mortz. *See supra* Section IX.A.8.

## **X. CONCLUSION**

125. For at least the foregoing reasons, it is my opinion that Apple fails to show that the challenged claims would have been obvious to a POSITA at the time of the invention of the ’223 Patent.