

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner,

v.

MASIMO CORPORATION,
Patent Owner.

Case IPR2024-00294
U.S. Patent 10,736,507

DECLARATION OF BILAL MUHSIN

I. INTRODUCTION

1. I, Bilal Muhsin, am the Chief Operating Officer of Masimo Corporation (“Masimo”). At the request of Masimo, I am submitting this declaration in *Inter Partes* Review number IPR2024-00294, which concerns U.S. Patent No. 10,736,507 (“the ’507 Patent”). I am an inventor of the ’507 Patent.

2. I understand that Masimo asserted the ’507 Patent against Apple in the United States District Court for the District of Delaware, Case No. 1:22-cv-01378-MN (“the Delaware Litigation”). I also understand that Apple subsequently petitioned for this *Inter Partes* Review, challenging the patentability of the ’507 Patent. I am submitting this declaration to provide details relating to creating a physical working embodiment of the inventions claimed in the ’507 Patent. I understand that this Declaration is being submitted by Masimo as Exhibit 2038 in the above-identified *Inter Partes* Review.

3. I joined Masimo in 1999 as associate software engineer. I progressed through roles from software engineer, senior software engineer, systems team manager, director of systems engineering, VP of systems engineering, VP of all engineering, and ultimately became the Chief Operating Offer of Masimo. I have extensive knowledge and decades of experience regarding Masimo’s pulse oximetry products and product development efforts.

II. CLAIMS 1 AND 13 OF THE '507 PATENT

4. I understand that the '507 Patent has two independent claims, Claims 1 and 13. Claim 1 recites:

1. A mobile pulse oximetry system for informing a user of mobile measurement of oxygen saturation ("SpO2"), the mobile pulse oximetry system comprising:

an SpO2 measurement system including:

an optical sensor configured to output one or more signals responsive to light from a light source attenuated by tissue of the user at a measurement site, said one or more signals responsive to an oxygen saturation of said tissue; and

a processing board in data communication with the optical sensor and a mobile computing device including a display and cellular communication, wherein the processing board is configured to:

receive said one or more signals from the optical sensor;

process said one or more signals to generate SpO2 measurement values; and

output the SpO2 measurement values to the mobile computing device; and

one or more hardware processors of the mobile computing device configured to execute an application, the application configured to execute commands to:

generate a graphical user interface having a plurality of display portions;

display, in at least one portion of the plurality of display portions, a representation of a physiological parameter of a plurality of physiological parameters comprising at least the SpO2 measurement values; and

display, in a different portion of the plurality of display portions, a plurality of user inputs configured to allow the user to interact with at least one of the plurality of display portions or the application;

wherein the processing of the one or more signals to generate SpO2 measurement values is performed only on the processing

board, thereby freeing up memory available to the mobile computing device; and
wherein the processing board is configured to draw power for operation from the mobile computing device.

'507 Patent, Claim 1.

5. Claim 13 recites:

13. A computer-implemented method of informing a user of mobile measurement of oxygen saturation ("SpO2"), the computer-implemented method comprising:

outputting, from an optical sensor of an SpO2 measurement system, one or more signals responsive to light from a light source attenuated by tissue of the user at a measurement site, said one or more signals responsive to an oxygen saturation of said tissue; and

via a processing board of the SpO2 measurement system, the processing board in data communication with the optical sensor and a mobile computing device including a display:

receiving said one or more signals from the optical sensor;

processing said one or more signals to generate the SpO2 measurement values; and

outputting the SpO2 measurement values to the mobile computing device; and

via an application configured to execute commands on the mobile computing device:

generating a graphical user interface having a plurality of display portions;

displaying, in at least one portion of the plurality of display portions, a representation of a physiological parameter of a plurality of physiological parameters comprising at least the SpO2 measurement values; and

displaying, in a different portion of the plurality of portions, a plurality of user inputs configured to allow the user to interact with at least one of the plurality of display portions or the application.

'507 Patent, Claim 13.

III. RELEVANT DEVELOPMENT WORK

6. I have personal knowledge of the development work completed by my co-inventors and me relevant to the '507 Patent claims. Specifically, I have two exhibits that illustrate our work..

7. First, I took a video that includes a demonstration of a prototype system (the "Prototype Video"), which I understand is being included as Exhibit 2039 in this proceeding. I remember taking this video in 2011. Also, I reviewed my files on the Masimo computer network and found that the Prototype Video included as Exhibit 2039 was last modified on August 31, 2011, and the prototype system it shows was created by that date at the latest. The Prototype Video shows a finger-clip non-invasive pulse oximetry sensor connected via cable to a processing module, with the processing module connected via cable with a 30-pin connector to an iPhone running an application we created, as shown below.

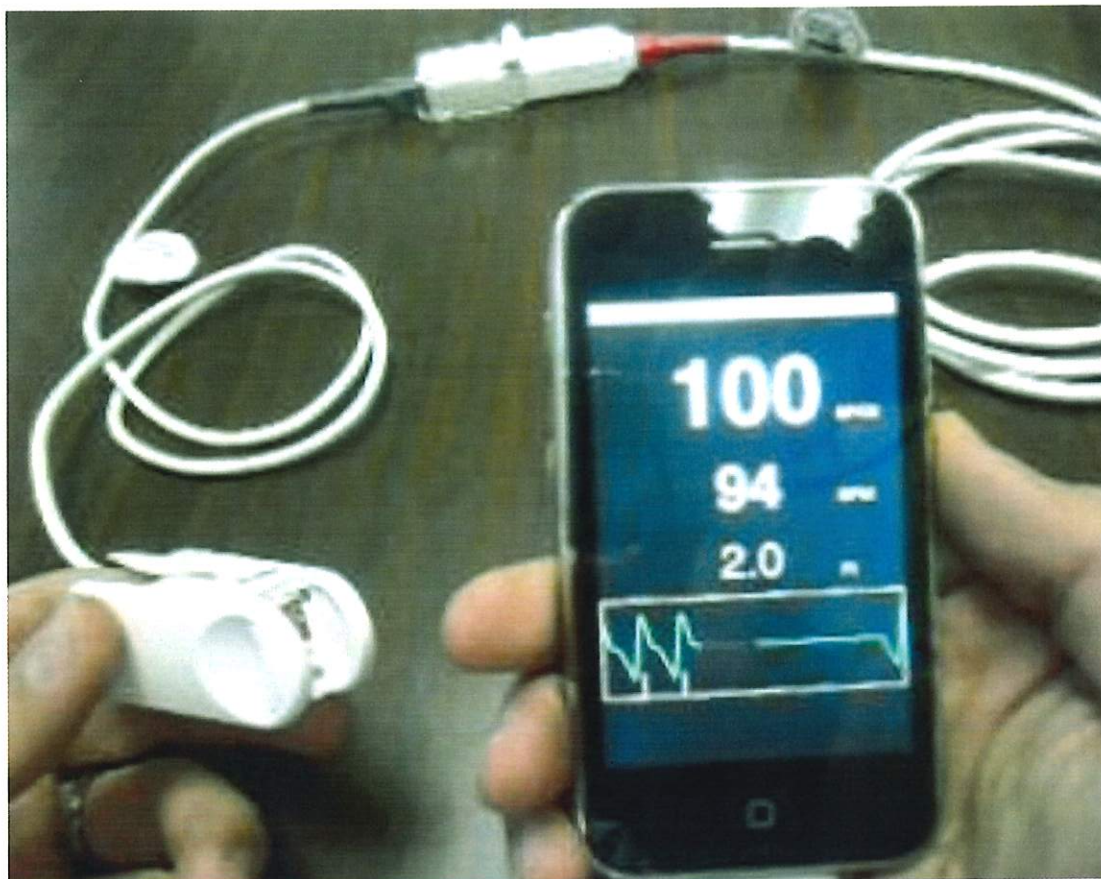


Exhibit 2039, 0:27. The processing module contained a processing board, specifically, the Masimo Low Power SET Board. The processing board of the processing module receives signals from the finger sensor, processes those signals to calculate several measurements. The processing module outputs the calculated measurements to an iPhone, which is running an application that we created. *Id.*, 0:23-0:39. The Prototype Video demonstrates our iPhone application displaying the received measurements, which are, from top to bottom, the oxygen saturation (“SpO2”), heart rate (“BPM”), perfusion index (“PI”), and PPG waveform of the user—in this case, me. *Id.*

8. Second, I found a document on the Masimo network that shows the user interface screens of the application that ran on the iPhone (the “User Interface Summary”), which I understand is being included as Exhibit 2040 in this proceeding. Specifically, the User Interface Summary shows the user interface screens for the prototype system’s mobile application. The application operated on the iPhone to generate a user interface that displayed measured values received from the processing module. I know from my files at Masimo that User Interface Summary of Exhibit 2040 was last modified on August 31, 2011, and that the mobile application having the user interface screens depicted in that document was created by that date at the latest.

9. I confirm from my personal knowledge that the physical working embodiment of the prototype system reflected in the Prototype Video, including the optical sensor, processing module, and iPhone application that generated the user interface screens shown in the Prototype Video and the User Interface Summary, had been created by me and my co-inventors by August 31, 2011 at the latest.

10. Additionally, the prototype system shown in the Prototype Video was promptly finalized and released as a commercial product in 2013. In January 2013, Masimo announced the commercialized version of the system, called Masimo iSpO2, and began selling the product later that year. Exhibit 2041. The Masimo

iSpO2 product was basically identical to the prototype system demonstrated in the Prototype Video, as shown in the following image of the iSpO2 product.



Exhibit 2042.

11. I worked on the Masimo Low Power SET Board, which is the processing board that was used in the processing module of the prototype system shown in the Prototype Video. That Masimo Low Power SET Board is capable of measuring through motion, and I know first-hand that it did so by August 31, 2011 as implemented in the processing module of the prototype system shown in the Prototype Video.

12. Consistent with the Prototype Video (e.g., Exhibit 2039, 0:18), and as I know from my personal knowledge, the finger sensor of the prototype system

contained red and infrared LEDs that were used to emit red and infrared LED into the finger of the user.

13. The finger sensor of the prototype system also contained a detector that received emitted light after it passed through (and was attenuated by) the user's finger. The detector of the sensor generated one or more signals based on the light it detected, and output those one or more signals to the processing module (specifically, the processing board in the processing module) through the cable connecting the sensor and processing module. Exhibit 2039, 0:30. Further, the prototype system's processing board used those signals from the detector to calculate the user's oxygen saturation (i.e., "SpO₂") and other parameters.

14. The one or more signals from detector of the prototype system's finger sensor are output through the cable, to the processing board in the processing module. The output of the processing board (calculated measurements of SpO₂ and the other parameters mentioned above) is then output through another cable to the mobile computing device (iPhone), which has a display as shown in the Prototype video. The processing board of the prototype system is therefore in data communication with both the optical sensor and a mobile computing device that has a display. The Prototype Video (for example at 0:30) the display of the mobile computing device (iPhone) displaying an SpO₂ measurement.

15. I confirm from my personal knowledge working on the prototype system that its processing board receives the one or more signals output by the detector of the finger sensor. The processing board receives said signals and calculates the measurements (including SpO₂, pulse rate, perfusion index, and the PPG waveform) that are ultimately displayed via the user interface of the application run on the iPhone. *See, e.g.*; Exhibit 2039, 0:31. The Prototype Video shows the data cable used for processing board to receive the one or more signals from the optical sensor. *Id.*, 0:01.

16. I assisted in the design, development, and testing of the system shown in the Prototype Video. I confirm from my personal knowledge that the prototype system's processing board used the one or more signals received from the finger-clip optical sensor to calculate the measurement values (SpO₂, pulse rate, perfusion index, PPG waveform), that were ultimately transmitted displayed via an application running on the connected iPhone. Measurement values were calculated only on the processing board, not on the iPhone, because the iPhone was only used to run our application and thereby display the already computed measurement values. Performing all of the signal processing with the processing board was a main purpose of the inventions in the '507 Patent, to reduce the computational load and battery drain on whatever device was used as the mobile computing device (e.g., an iPhone). I know first-hand that the prototype system shown in the Prototype Video

operated in this way, because our system used the processing board to calculate the SpO₂ and other measurement values that were ultimately displayed via our application on the iPhone.

17. I assisted in the design, development, and testing of the prototype system shown in the Prototype Video. The measurement values calculated by prototype system's processing board (i.e., SpO₂, pulse rate, perfusion index, and the PPG waveform) were output by the processing board through the data cable to the iPhone, where the measurements were displayed via our application running on that iPhone. Measurement values output by the prototype system's processing board (SpO₂, pulse rate, perfusion index, and the PPG waveform) were received by and displayed on the iPhone (specifically, our application running on the iPhone), as the Prototype Video demonstrates. Exhibit 2039, 0:30-0:40.

18. The Prototype Video shows our mobile application being run on the iPhone to create a graphical user interface that displayed the measured values received from the system's processing board. Exhibit 2039, 0:20-0:40. From my work designing, developing, and testing the prototype system shown in the Prototype Video, I know that the system used our mobile application that was run by the iPhone's processor to execute commands on the iPhone, including but not limited to displaying measured values on the iPhone's display (via our application).

19. The User Interface Summary shows the various user graphical user interface screens generated by the prototype system's "Mobile Application," which run on the iPhone. From my work designing, developing, and testing the system shown in the Prototype Video, I confirm that the system used a Mobile Application that was executed by the iPhone's processor to generate a graphical user interface that displayed measured values. I also confirm that the graphical user interface screens shown in the User Interface Summary accurately depict the user interface screens that my team had created for the mobile application of the prototype system by August 31, 2011 at the latest.

20. From my work designing, developing, and testing the system shown in the Prototype Video, I confirm that the graphical user interface screens shown in the User Interface Summary accurately depict the user interface screens that my team had created for the mobile application of the prototype system by August 31, 2011 at the latest.

21. The User Interface Summary shows how our mobile application operated on the iPhone of our prototype system to display various user interface screens on the iPhone by August 31, 2011 at the latest. From my work designing, developing, and testing the system shown in the Prototype Video, I confirm that we designed the buttons or icons along the bottom of the graphical user interface of our

application (e.g., “Home,” “Trends,” “Histogram,” “Log,” and “Settings”) to be tappable buttons/icons that users could, and did, use to interact with the application.

22. I assisted in the design, development, and testing of the system shown in the Prototype Video. I therefore confirm that the processing of signals output by the finger-clip sensor to generate measurement values of oxygen saturation, pulse rate, perfusion index, and the PPG waveform was performed solely on and by the processing board within the processing module. Further, because the prototype system relied solely on the processing board to receive signals from finger sensor and use those signals to calculate and output measurement values, memory on the mobile computing device (iPhone) that otherwise have would been used to store and process the signals was freed up. Performing all of the signal processing with the processing board was a main purpose of the inventions in the '507 Patent, and I know first-hand that the prototype system shown in the Prototype Video operated in this way. Moreover, because the prototype system operated in this way, the system put minimal burden on the iPhone and thus the iPhone could quickly open and easily and smoothly run our application to display measured values, as is reflected in the Prototype Video. Exhibit 2039, 0:19-0:44.

23. As shown in the Prototype Video, the finger-clip sensor was directly connected to the processing module (which contains the processing board), and the processing board was directly connected to the iPhone through a 30-pin connector.

Exhibit 2039. When the processing module was connected to the iPhone using the included 30-pin connector, the prototype system's finger sensor lit up for the first time because the iPhone powered the operation of both the finger sensor and the processing module. Exhibit 2039, 0:18. The prototype system did not become operational until the 30-pin connector was connected to the iPhone. *Id.* I assisted in the design, development, and testing of the system shown in the Prototype Video. I therefore confirm that the finger-clip sensor and processing board within the processing module had to, and did, draw power for their operation from the iPhone because the finger sensor and processing board did not have their own power source. Therefore, as shown in the Prototype Video, the iPhone powered the operation of the entire prototype system, including the finger sensor and processing board.

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I declare under penalty of perjury that the statements herein are true and correct to the best of my ability.

Dated: 10-7-24



Bilal Muhsin