

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner,

v.

MASIMO CORPORATION,
Patent Owner.

IPR2022-01299
U.S. Patent 7,761,127

DECLARATION OF MOHAMED DIAB

1. I, Mohamed Diab, am making this declaration at the request of Patent Owner Masimo Corporation (“Masimo”) in the matter of the *Inter Partes* Review No. IPR2022-01299 of U.S. Patent No. 7,761,127 (“the ’127 patent”). I understand that Apple submitted the ’127 patent as Exhibit 1001 in these proceedings. The ’127 patent describes and claims the invention that came out of our development of a sensor capable of noninvasively measuring carboxyhemoglobin. I understand that this declaration is being submitted in this proceeding as Exhibit 2102.

2. I gave deposition and hearing testimony in an ITC Investigation in which Masimo asserts the ’127 patent and other patents against Apple. My testimony in this declaration is similar to my testimony in the ITC Investigation.

3. I started as an engineer at Masimo. My current position at Masimo is fellow scientist. I started working at Masimo in 1989 and have worked there ever since.

4. In 1986, I graduated from Cal State Fullerton with a Bachelor of Science degree in electrical engineering with an emphasis on computer engineering.

5. In the 1990s, I and the other engineers at Masimo were working on our first pulse oximeter. I was involved in the hardware design, the sensor design, and the algorithm design. The algorithm takes the signal from the sensor and calculates pulse rate, oxygen saturation, and other parameters.

6. A pulse oximeter is a device that noninvasively measures physiological parameters in a patient's blood by transmitting light into a tissue site (such as a finger) and measuring the light after it has passed through the tissue. Figure 1 of the '127 patent depicts a pulse oximeter with a sensor attached to a patient's finger.

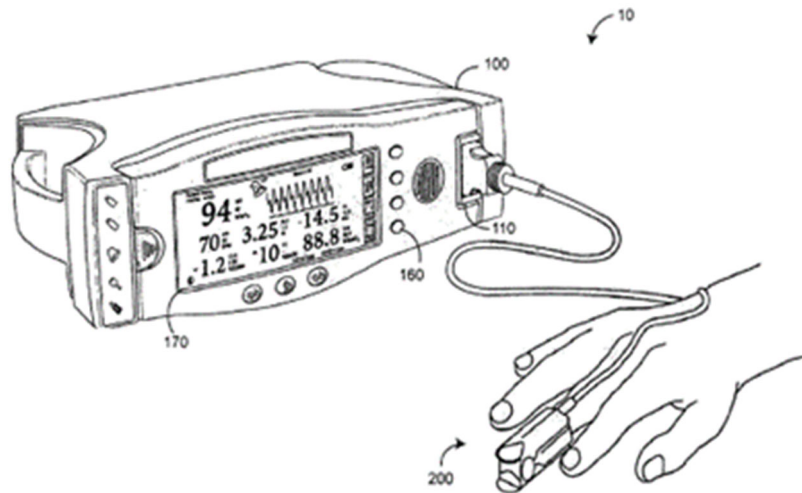
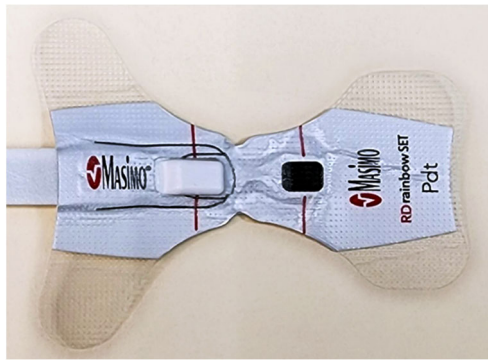
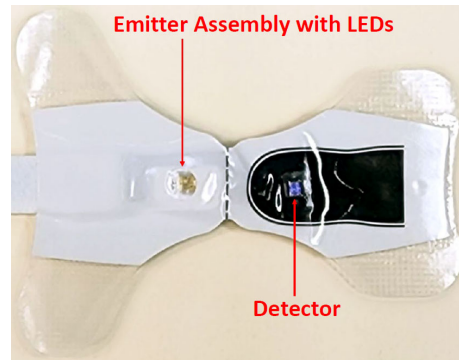


FIG. 1

7. In a typical pulse oximeter, the sensor that attaches to a patient's finger contains: (1) two light sources, generally light-emitting diodes (LEDs), and (2) a light detector (generally a photodetector). Top and bottom views of a representative Masimo rainbow® sensor are shown below.



Top view



Bottom view

8. Oxygen saturation (“SpO₂”) is a parameter measured noninvasively by pulse oximeters. For an oxygen-saturation measurement, the LEDs typically transmit red and infrared light into the patient’s finger. Some of the transmitted light is absorbed by the tissue and pulsating blood flow in the finger. Bright red oxygenated blood absorbs light differently than blue-green tinted deoxygenated blood. The light detector measures the intensity of the light (i.e., amplitude) from both wavelengths after it passes through the tissue. The ratio of the amplitude of the measured pulsating intensity of the light detected at the red wavelength compared to light detected at the infrared wavelength indicates the level of oxygen saturation. Pulse oximeters typically have a calibration curve or lookup table that correlates ratios of red to infrared wavelengths to SpO₂ values. This curve reflects empirical data of ratios to invasively measured oxygen saturation values determined with a blood draw. Accurate measurements of saturation require the calibration curve to correspond to the actual LED wavelengths during operation of the sensor.

9. Masimo has become a leading innovator in pulse oximeters that measure oxygen saturation. I and other engineers at Masimo are inventors on hundreds of patents for oxygen-saturation measurement using pulse oximeters. For example, we were the first to develop pulse oximeters that could accurately measure oxygen saturation while a patient is moving.

10. Masimo's pulse-oximetry algorithms were already extremely accurate in measuring oxygen saturation before the '127 patent invention.

11. In about 2001, we started a project at Masimo to work on noninvasively measuring carboxyhemoglobin and other parameters within the hemoglobin species. The parameters within the hemoglobin species include oxyhemoglobin (blood oxygen saturation), carboxyhemoglobin, methemoglobin, and total hemoglobin. These parameters are much more difficult to measure noninvasively than the parameters traditionally measured by pulse oximetry.

12. When carbon monoxide binds with hemoglobin, it displaces the oxygen and will not let the oxygen bind with hemoglobin for many hours to come. Thus, it turns the hemoglobin into a dysfunctional hemoglobin, causing carbon monoxide poisoning.

13. Firefighters are exposed to carbon monoxide and, thus, can suffer from carbon monoxide poisoning. People that are exposed to furnaces or similar appliances lacking good combustion can also get carbon monoxide poisoning.

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.