

# EXHIBIT 11

**Exhibit 11: Infringement of U.S. Patent No. 9,572,499 by Apple Watch<sup>1</sup>**

Apple Watch	
Claim	Apple Watch
1.P A method of determining a presence of an arrhythmia of a first user, said method comprising	<p>The Accused Products perform a method of determining a presence of an arrhythmia of a first user.</p> <p>The Accused Products are systems for determining the presence of an arrhythmia. For example, Apple’s document “Using Apple Watch for Arrhythmia Detection” states that, “Apple Watch customers have access to two software as medical device features to detect heart arrhythmias such as atrial fibrillation.” <a href="https://www.apple.com/healthcare/docs/site/Apple_Watch_Arrhythmia_Detection.pdf">https://www.apple.com/healthcare/docs/site/Apple_Watch_Arrhythmia_Detection.pdf</a>.</p>
1.1 sensing a heart rate of said first user with a heart rate sensor coupled to said first user;	<p>The Accused Products sense a heart rate of said first user with a heart rate sensor coupled to said first user. For example, The Apple Watch Series 6 Technical Specifications mention a “third-generation optical heart sensor.” <a href="https://support.apple.com/kb/SP826?locale=en_IN">https://support.apple.com/kb/SP826?locale=en_IN</a>. As Apple Support explains, “The optical heart sensor in Apple Watch uses what is known as photoplethysmography.” <a href="https://support.apple.com/en-us/HT204666">https://support.apple.com/en-us/HT204666</a>. This photoplethysmography sensor is a heart rate sensor.</p>
	<p>As Apple states, “By flashing its LED lights hundreds of times per second, Apple Watch can calculate the number of times the heart beats each minute — your heart rate.” <i>Id.</i></p>
	<p>The sensor is coupled to the user because it is on the back of the watch and makes contact with the user’s wrist. Apple’s documentation shows that the LED and photodiodes that comprise the PPG sensor are located on the</p>

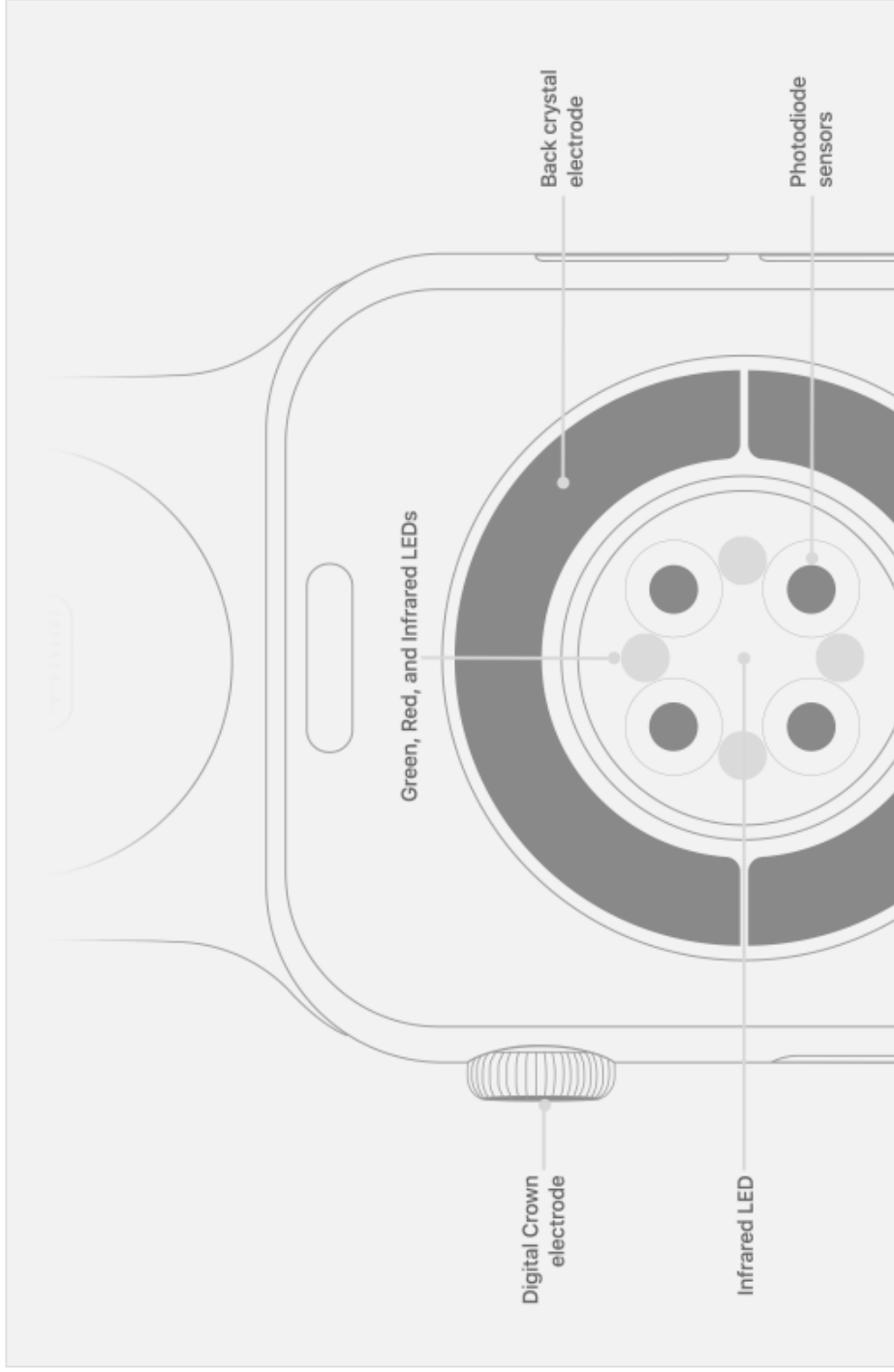
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<sup>1</sup> This chart describes infringement by the Apple Watch Series 6, an exemplary Accused Product. The Accused Products include the Apple Watch Series 6, the Apple Watch Series 5, and the Apple Watch Series 4. The infringement analysis in this chart is preliminary and AliveCor’s investigation into Respondent’s infringement is ongoing. AliveCor reserves the right to provide additional theories under which Respondent’s products infringe this patent.

**Claim**


**Apple Watch**

back of the Apple Watch. <https://support.apple.com/en-us/HT204666>.



1.2 transmitting said heart rate of said first user to a mobile computing device, wherein said mobile

The Accused Products transmit the rate of said first user to a mobile computing device, wherein said mobile computing device is configured to sense an electrocardiogram. For example, Apple's documentation states,

Apple Watch	
<p>Claim</p> <p>computing device is configured to sense an electrocardiogram;</p>	 <h2 style="text-align: center;">How to check your heart rate</h2> <p style="text-align: center;">You can check your heart rate any time using the Heart Rate app. Open the app, then wait for Apple Watch to measure your heart rate. You can also view <a href="https://support.apple.com/en-us/HT204666">https://support.apple.com/en-us/HT204666</a>.</p> <p>The Accused Products are configured to sense an electrocardiogram of the user. As Apple states, “The ECG app can record your heartbeat and rhythm using the electrical heart sensor on Apple Watch Series 4, Series 5, or Series 6 and then check the recording for atrial fibrillation (AFib), a form of irregular rhythm.” <a href="https://support.apple.com/en-us/HT208955">https://support.apple.com/en-us/HT208955</a>.</p>
<p>1.3 determining, using said mobile computing device, a heart rate variability of said first user based on said heart rate of said first user;</p>	<p>The Accused Products determine, using said mobile computing device, a heart rate variability of said first user based on said heart rate of said first user.</p> <p>Apple states that “By flashing its LED lights hundreds of times per second, Apple Watch can calculate the number of times the heart beats each minute — your heart rate.” <a href="https://support.apple.com/en-us/HT204666">https://support.apple.com/en-us/HT204666</a>. The PPG sensor is also used to calculate “heart rate variability” by “captur[ing] a tachogram—a plot of the time between heartbeats—every two to four hours.” <a href="https://www.apple.com/healthcare/docs/site/Apple_Watch_Arrhythmia_Detection.pdf">https://www.apple.com/healthcare/docs/site/Apple_Watch_Arrhythmia_Detection.pdf</a>.</p>
<p>1.4 sensing an activity level of said first user with a motion sensor;</p>	<p>The Accused Products sense the activity level of the user with a motion sensor. For example, the Apple Watch Series 6 contains an accelerometer and gyroscope that are both used to measure the user’s motion and activity. <a href="https://support.apple.com/en-us/HT204666">https://support.apple.com/en-us/HT204666</a>. In its guidance to its developers, Apple also states that a developer “can use motion data” from the Apple Watch’s accelerometer and gyroscope to “use motion data to gauge the wearer’s activity level and track specific types of movement, such as arm movements made during a workout.” <a href="https://developer.apple.com/design/human-interface-guidelines/watches/interaction/accelerometer-and-gyroscope/">https://developer.apple.com/design/human-interface-guidelines/watches/interaction/accelerometer-and-gyroscope/</a>.</p>
<p>1.5 comparing, using said mobile computing device,</p>	<p>The Accused Products compare, using said mobile computing device, said heart rate variability of said first user to said activity level of said first user.</p>

<b>Apple Watch</b>	
<b>Claim</b>	<p>Apple states that “By flashing its LED lights hundreds of times per second, Apple Watch can calculate the number of times the heart beats each minute — your heart rate.” <a href="https://support.apple.com/en-us/HT204666">https://support.apple.com/en-us/HT204666</a>. The PPG sensor is also used to calculate “heart rate variability” by “captur[ing] a tachogram—a plot of the time between heartbeats—every two to four hours.” <a href="https://www.apple.com/healthcare/docs/site/Apple_Watch_Arrhythmia_Detection.pdf">https://www.apple.com/healthcare/docs/site/Apple_Watch_Arrhythmia_Detection.pdf</a>.</p> <p>The Apple Watch’s memory also contains instructions to sense the activity level of the user and feed the data to the processor. In its guidance to its developers, Apple also states that a developer “can use motion data” from the Apple Watch’s accelerometer and gyroscope to “gauge the wearer’s activity level.” <a href="https://developer.apple.com/design/interface-guidelines/watches/interaction/accelerometer-and-gyroscope/">https://developer.apple.com/design/interface-guidelines/watches/interaction/accelerometer-and-gyroscope/</a>.</p> <p>“The irregular rhythm notification feature on your Apple Watch will occasionally look at your heartbeat to check for an irregular rhythm that might be suggestive of atrial fibrillation (AFib).” <a href="https://support.apple.com/en-us/HT208931">https://support.apple.com/en-us/HT208931</a>.</p> <p>The Accused Products alert the user to sense an electrocardiogram of said first user, using said mobile computing device, in response to an irregularity in said heart rate variability of said first user.</p> <p>“The irregular rhythm notification feature on your Apple Watch will occasionally look at your heartbeat to check for an irregular rhythm that might be suggestive of atrial fibrillation (AFib).” <a href="https://support.apple.com/en-us/HT208931">https://support.apple.com/en-us/HT208931</a>. “You can take an ECG at any time, when you’re feeling symptoms such as a rapid or skipped heartbeat, when you have other general concerns about your heart health, or when you receive an irregular rhythm notification.” <a href="https://support.apple.com/en-us/HT208955">https://support.apple.com/en-us/HT208955</a>. From Apple’s de novo classification request to the FDA regarding its irregular rhythm notification: <b>Labeling is also required to help the user interpret the results they receive. Here, the labeling specifically states that the feature is not intended to replace traditional methods of diagnosis and that diagnosis for AF should still be done by ECG confirmation.</b> <a href="https://www.accessdata.fda.gov/cdrh_docs/reviews/DEN180042.pdf">https://www.accessdata.fda.gov/cdrh_docs/reviews/DEN180042.pdf</a>.</p>
1.6 alerting said first user to sense an electrocardiogram of said first user, using said mobile computing device, in response to an irregularity in said heart rate variability of said first user.	
11.P A system for determining the presence of an arrhythmia of a	<p>The Accused Products are systems for determining the presence of an arrhythmia of a first user. For example, Apple’s document “Using Apple Watch for Arrhythmia Detection” states that, “Apple Watch customers have access to two software as medical device features to detect heart arrhythmias such as atrial fibrillation.” <a href="https://www.apple.com/healthcare/docs/site/Apple_Watch_Arrhythmia_Detection.pdf">https://www.apple.com/healthcare/docs/site/Apple_Watch_Arrhythmia_Detection.pdf</a>.</p>

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