

United States Court of Appeals for the Federal Circuit

**CARDIONET, LLC, BRAEMAR MANUFACTURING,
LLC,**
Plaintiffs-Appellants

v.

INFOBIONIC, INC,
Defendant-Appellee

2019-1149

Appeal from the United States District Court for the
District of Massachusetts in No. 1:17-cv-10445-IT, Judge
Indira Talwani.

Decided: April 17, 2020

CHING-LEE FUKUDA, Sidley Austin LLP, New York, NY,
argued for plaintiffs-appellants. Also represented by
BRADFORD J. BADKE, TODD MATTHEW SIMPSON; NATHAN A.
GREENBLATT, Palo Alto, CA.

GABRIEL BELL, Latham & Watkins LLP, Washington,
DC, argued for defendant-appellee. Also represented by
MAXIMILIAN A. GRANT; CHARLES SANDERS, Boston, MA.

Before DYK, PLAGER, and STOLL, *Circuit Judges*.

Opinion for the court filed by *Circuit Judge* STOLL.

Opinion dissenting in part and concurring in the result
filed by *Circuit Judge* DYK.

STOLL, *Circuit Judge*.

CardioNet, LLC and Braemar Manufacturing, LLC (collectively, “CardioNet”) appeal the district court’s dismissal of their patent infringement complaint against InfoBionic, Inc. The district court held that the asserted claims of CardioNet’s U.S. Patent No. 7,941,207 are ineligible under 35 U.S.C. § 101, and therefore the complaint failed to state a claim under Federal Rule of Civil Procedure 12(b)(6). We conclude instead that the asserted claims of the ’207 patent are directed to a patent-eligible improvement to cardiac monitoring technology and are not directed to an abstract idea. Accordingly, we reverse the district court and remand for further proceedings.

BACKGROUND

I

Anomalies in the electrical activity of a patient’s heart can indicate the presence of certain physiological conditions ranging from benign to life-threatening. Among those conditions are various different types of cardiac arrhythmias (abnormal heart rhythms), including atrial fibrillation, atrial flutter, normal sinus rhythm irregularity, irregularity from various types of heart blocks, irregularity associated with premature ventricular contractions, and ventricular tachycardia.

Atrial fibrillation and atrial flutter involve “the loss of synchrony between the atria and the ventricles” of the heart. ’207 patent col. 1 ll. 24–25, 34–35. A patient may experience “short” or “sustained” episodes of atrial fibrillation or atrial flutter. Short episodes “generally include between two and 20 [heart]beats and may or may not have clinical significan[ce].” *Id.* at col. 5 ll. 33–35. By contrast,

sustained episodes “generally include more than 20 beats and may have relatively greater clinical significance.” *Id.* at col. 5 ll. 35–37. Atrial fibrillation “can lead to irregular ventricular beating as well as blood stagnation and clotting in the atria.” *Id.* at col. 1 ll. 27–28. Both atrial fibrillation and atrial flutter are “associated with stroke, congestive heart failure, and cardiomyopathy.” *Id.* at col. 1 ll. 31–32, 40–42.

Ventricular tachycardia, or V-TACH, is another form of cardiac arrhythmia and is characterized by “a rapid succession of ventricular contractions (e.g., between 140 and 220 per minute) generally caused by an abnormal focus of electrical activity in a ventricle.” *Id.* at col. 9 ll. 41–44. Ventricular beats “are irregular beats that interrupt the normal heart rhythm” and that “may be precipitated by factors such as alcohol, tobacco, caffeine, and stress.” *Id.* at col. 9 ll. 10–12, 19–20. The “occurrence of ventricular beats can be used to identify ventricular tachycardia (e.g., when there are three or more consecutive ventricular beats).” *Id.* at col. 9 ll. 16–19. V-TACH “can last from a few seconds to several days and can be caused by serious heart conditions such as a myocardial infarction.” *Id.* at col. 9 ll. 44–46.

The '207 patent is titled “Cardiac Monitoring” and claims priority to an application filed on January 21, 2004. The '207 patent describes cardiac monitoring systems and techniques for detecting and distinguishing atrial fibrillation and atrial flutter from other various forms of cardiac arrhythmia. Electrical signals of the heart can be measured by placing electrodes on a patient’s skin. *Id.* at col. 1 ll. 17–20, col. 5 ll. 1–7. The patent teaches that its systems and techniques determine the beat-to-beat variability in heart rate over a series of successive heartbeats. Specifically, they determine the variability in heart rate “over a series of between 20 and 200 of the recent R to R intervals,” or the timing between “R-waves.” *Id.* at col. 2 ll. 4–6, 47–49. An R-wave is the peak of what is referred to as the “QRS

complex” of an electrocardiogram signal, as illustrated in Figure 2 below. The QRS complexes (items 215, 220, and 225 of Figure 2) of the signal correspond to the contractions of the ventricles. *Id.* at col. 4 ll. 53–58.

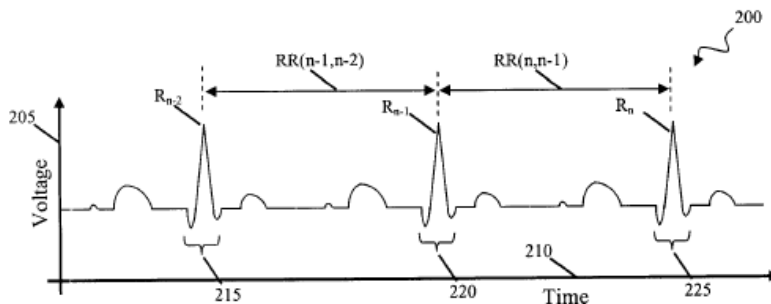


FIG. 2

Id. Fig. 2. A schematic of the '207 patent's cardiac monitoring system is shown below in Figure 8:

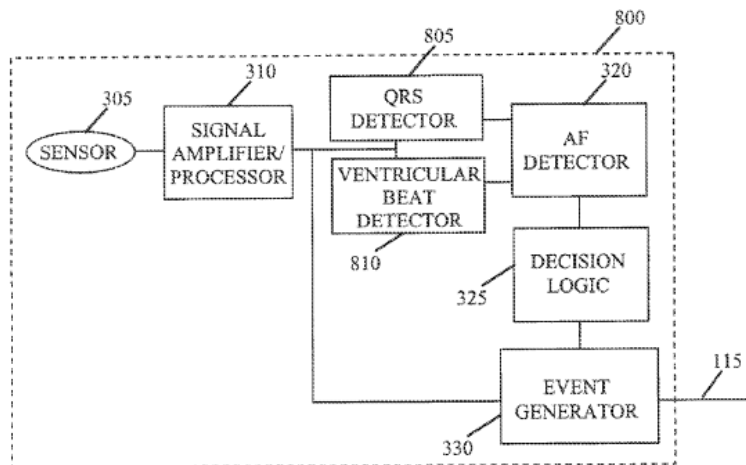


FIG. 8

Id. Fig. 8. The written description explains that in detecting atrial fibrillation and atrial flutter, the systems and techniques include accounting for the presence of irregular ventricular beats, which are “negatively indicative” of atrial fibrillation and atrial flutter. *Id.* at col. 1 ll. 61–65, col. 2 ll. 53–61. The patent recognizes that the “occurrence of ventricular beats is generally unrelated to” atrial

fibrillation and atrial flutter, whereas it is indicative of V-TACH. *Id.* at col. 9 ll. 15–19. The patent’s systems and techniques also analyze information regarding the time period between ventricular contractions (i.e., the R to R interval) to detect atrial fibrillation and atrial flutter using non-linear statistical approaches. *Id.* at col. 1 ll. 49–54, col. 5 ll. 40–44. Figure 10 depicts an embodiment of the ’207 patent’s system employing these techniques:

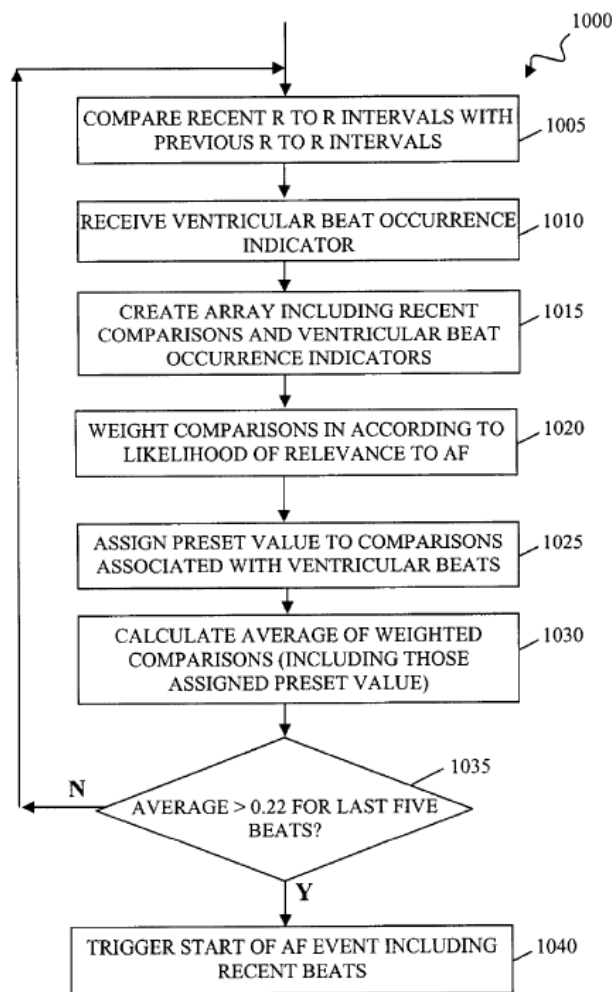


FIG. 10

Id. Fig. 10.

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