NOTE: This disposition is nonprecedential.

United States Court of Appeals for the Federal Circuit

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

v.

INFOBIONIC, INC.,
Defendant-Cross-Appellant

2020-2123, 2020-2150

Appeals from the United States District Court for the District of Massachusetts in No. 1:15-cv-11803-IT, Judge Indira Talwani.

Decided: October 29, 2021

FRANK A. DECOSTA, III, Finnegan, Henderson, Farabow, Garrett & Dunner, LLP, Washington, DC, argued for plaintiffs-appellants. Also represented by ALIZA GEORGE CARRANO.

CHARLES SANDERS, Latham & Watkins LLP, Boston, MA, argued for defendant-cross-appellant. Also represented by CHRISTOPHER HENRY; GABRIEL K. BELL, DIANE GHRIST, MAXIMILIAN A. GRANT, Washington, DC.

Before LOURIE, DYK, and O'MALLEY, *Circuit Judges*.

LOURIE, *Circuit Judge*.

CardioNet, LLC and Braemar Manufacturing, LLC (collectively, "CardioNet") appeal from the decision of the United States District Court for the District of Massachusetts granting summary judgment that InfoBionic did not infringe claims 1–2, 8, 11–12, and 20–21 of U.S. Patent 7,099,715 ("the '715 patent"). *CardioNet, LLC v. InfoBionic, Inc.*, No. 1:15-CV-11803-IT, 2020 WL 4559934 (D. Mass. June 22, 2020) ("*Summary Judgment Decision*"). InfoBionic cross-appeals from the district court's decision that the asserted claims of CardioNet's '715 patent are not ineligible for patent under 35 U.S.C. § 101. *CardioNet, LLC v. InfoBionic, Inc.*, No. 1:15-CV-11803-IT, 2017 WL 1788650 (D. Mass. May 4, 2017) ("*Validity Decision*").

Because we conclude that the '715 patent claims subject matter ineligible for patent, we *vacate* the district court's decision granting summary judgment of noninfringement. We *remand* for the entry of judgment of no liability on the ground that the district court should have granted InfoBionic's motion for judgment on the pleadings as to unpatentability.

BACKGROUND

CardioNet owns the '715 patent, which is directed to an improved heart monitoring device. Heart monitoring devices measure the heart's activity using an electrocardiogram ("ECG"). '715 patent at col. 1 ll. 17–25. The ECG plots the heart's electrical signals as different waveforms on a graph, including the P wave, the R wave, and the T wave. *Id.* at col. 1 ll. 21–23, col. 3 ll. 61–65. The P wave corresponds to atrial depolarization. The R wave corresponds to ventricular depolarization. The T wave corresponds to ventricular repolarization and relaxation. A

doctor can measure a person's heart rate by calculating the distance between consecutive R waves. *Id.* at col. 3 ll. 34–39.

According to the '715 patent, existing heart monitoring devices could be error prone. For example, the specification explains that in a normal heartbeat, the R wave is taller than the T wave (shown in figure 3 below). *Id.* at col. 3 ll. 61–65. However, some patients have "abnormal[ly]" tall T waves (shown in figure 4 below). *Id.* at col. 3 ll. 65–67. As a result, the ECG may mistakenly classify them as R waves. *Id.* at col. 3 ll. 52–67. Because of that misclassification, the ECG reports an inaccurately high heart rate. *Id.* at col. 3 ll. 55–60.

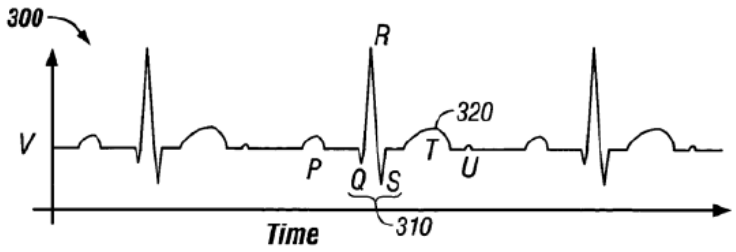

FIG. 3

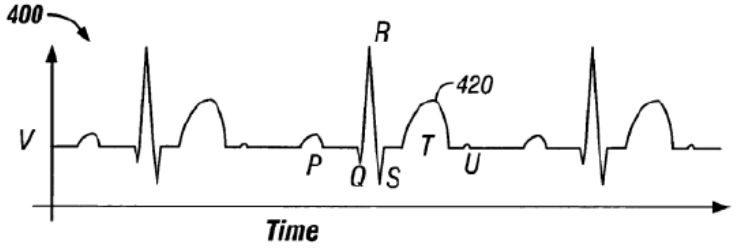

FIG. 4

'715 patent at figs. 3–4.

The '715 patent invention purports to address such errors by disclosing a heart monitoring device with an allegedly inventive feature: a T wave filter. The T wave filter

"reduce[s] the amplitude of T waves, while preserving or slightly increasing the amplitude of R waves," thereby improving the ECG's classification accuracy. *Id.* at col. 3 ll. 52–60, col. 4 ll. 5–8. Of relevance to this appeal, the T wave filter may not always be "activated." Rather, the heart monitoring device first sends the ECG data to a monitoring station. *Id.* at col. 4 ll. 51–60. At the monitoring station, a human operator can decide to activate the filter upon observing abnormally tall T waves. *Id.* at col. 4 l. 61–col. 5 l. 1. To activate the filter, the operator sends a message to the monitoring apparatus. *Id.*

The '715 patent consists of three independent claims that are relevant to this appeal, claims 1, 11, and 20. Independent claim 1 recites a machine-implemented method of using the T wave filter. It reads as follows:

> 1. A *machine-implemented method* comprising:
>
> identifying heart beats in a sensed cardiac signal;
>
> *activating a frequency domain T wave filter*, used in said identifying heart beats, in response to a message from a monitoring station generated at least in part based upon discovery of a predetermined characteristic in the sensed cardiac signal; and
>
> outputting information corresponding to the identified heart beats to a communications channel of a distributed cardiac activity monitoring system.

Id. at col. 6 ll. 27–36; J.A. 52 (certificate of correction) (emphases added).

Independent claim 11 recites a system claim:

> 11. A distributed *cardiac activity monitoring system* comprising:
>
> a monitoring apparatus including a communications interface, a real-time QRS detector, a

> frequency domain T wave filter, and a selector that *activates the T wave filter* with respect to the real-time QRS detector in response to a message, wherein the activated frequency domain T wave filter preprocesses a cardiac signal provided to the realtime QRS detector; and
>
> a monitoring station that communicatively couples with the monitoring apparatus via the communications interface and transmits the message to the monitoring apparatus to activate the frequency domain T wave filter based at least in part upon a predetermined criteria.

Id. at col. 7 ll. 4–18; J.A. 52 (certificate of correction) (emphases added).

Claim 20 is an apparatus claim. The district court focused on claim 20, and we shall as well. It reads as follows:

> 20. A *cardiac monitoring* apparatus comprising:
>
> a communications interface;
>
> a real-time heart beat detector;
>
> a frequency domain T wave filter; and
>
> a selector that *activates the frequency domain T wave filte*r with respect to the real-time heart beat detector in response to a message, wherein the activated frequency domain T wave filter preprocesses a cardiac signal provided to the real-time heart beat detector.

Id. at col. 7 ll. 45–53; J.A. 52 (certificate of correction) (emphases added).

In 2016, a competitor of CardioNet, InfoBionic, marketed its own cardiac monitoring device, the "MoMe® Kardia system." J.A. 4414–15. CardioNet alleged that the device had a T wave filter. Subsequently, it sued InfoBionic, asserting that the MoMe® Kardia system (second

generation) infringes claims 1–2, 8, 11–12, and 20–21 of the '715 patent. J.A. 948, 4436–37. In response, InfoBionic moved for judgment on the pleadings that the asserted claims of the '715 patent are ineligible for patent under § 101. J.A. 773.

The district court denied InfoBionic's motion, holding that the asserted claims of the '715 patent are not ineligible under § 101. The court analyzed the claims under the Supreme Court's two-step *Alice* framework for determining patent eligibility. At step one, it determined that claim 20 is directed to the abstract idea of "filtering raw cardiogram data to optimize its output." *Validity Decision*, 2017 WL 1788650, at *10. However, at step two, it determined that claim 20 recites an inventive concept sufficient to transform the abstract idea into patent-eligible subject matter. The court reasoned that, because claim 20 is "tied to a machine," it satisfies "the machine-or-transformation test" and thus "fall[s] within the ambit of Section 101." *Id.* at *11.[1] As a result, it denied InfoBionic's motion for judgment on the pleadings. *Id.*

Subsequently, CardioNet proceeded to litigate its infringement claim. InfoBionic moved for summary judgment of noninfringement. The district court granted that motion. *Summary Judgment Decision*, 2020 WL 4559934, at *8–10. The court first found that CardioNet failed to supplement its infringement contentions in a timely manner, effectively "hid[ing] the ball" from InfoBionic. *Id.* at *5–10; J.A. 8962–63. Consequently, it precluded CardioNet from relying on several of its infringement theories. *Summary Judgment Decision*, 2020 WL 4559934, at *8–10. After excluding that evidence, the court concluded that

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[1] The district court's reference to claim 9 in the "Inventive Concept" section of its opinion should have referred to claim 20. *Validity Decision*, 2017 WL 1788650, at *10–11.

there was no genuine dispute regarding noninfringement and InfoBionic was entitled to judgment as a matter of law. *Id.*

CardioNet appealed the district court's decision granting summary judgment. InfoBionic cross-appealed the court's denial of its motion for judgment on the pleadings. We have jurisdiction under 28 U.S.C. § 1295(a)(1).

DISCUSSION

On appeal, CardioNet asserts that the district court erred in granting summary judgment of noninfringement in favor of InfoBionic. In turn, InfoBionic argues in a cross-appeal that the court erred in holding that the asserted claims of the '715 patent are not ineligible for patent under § 101. We turn first to InfoBionic's argument regarding § 101.

I.

Section 101

We review a district court's denial of judgment on the pleadings under Federal Rule of Civil Procedure 12(c) according to the law of the regional circuit. *Allergan, Inc. v. Athena Cosmetics, Inc.*, 640 F.3d 1377, 1380 (Fed. Cir. 2011) (citing *Imation Corp. v. Koninklijke Philips Elecs. N.V.*, 586 F.3d 980, 985 (Fed. Cir. 2009)). The First Circuit reviews an order denying a judgment on the pleadings de novo, "accept[ing] the truth of all well-pleaded facts and draw[ing] all reasonable inferences therefrom in the pleader's favor." *Shay v. Walters*, 702 F.3d 76, 79 (1st Cir. 2012) (quoting *Grajales v. P.R. Ports Auth.*, 682 F.3d 40, 44 (1st Cir. 2012)).

Patent eligibility under § 101 is an issue of law that may contain underlying issues of fact. *See Berkheimer v. HP Inc.*, 881 F.3d 1360, 1365 (Fed. Cir. 2018). We review the district court's ultimate conclusion on patent eligibility de novo. *Id.* To determine whether a patent claims eligible

subject matter, we follow the Supreme Court's familiar two-step framework. *See Alice Corp. v. CLS Bank Int'l*, 573 U.S. 208, 217 (2014); *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 70–73 (2012). First, we determine whether the claims are directed to a law of nature, natural phenomenon, or abstract idea. *See Alice*, 573 U.S. at 217. If so, we proceed to the second step and determine whether the claims nonetheless include an "inventive concept" sufficient to "'transform the nature of the claim' into a patent-eligible application." *Id.* (quoting *Mayo*, 566 U.S. at 72, 78). To recite an "inventive concept" at step two, a patent must do more than recite an abstract idea "while adding the words 'apply it.'" *Id.* at 221 (quoting *Mayo*, 566 U.S. at 72). Moreover, "simply appending conventional steps, specified at a high level of generality, to laws of nature, natural phenomena, and abstract ideas cannot make those laws, phenomena, and ideas patentable." *Mayo*, 566 U.S. at 82.

Alice Step One

At step one, InfoBionic argues that claim 20 is directed to the abstract idea of filtering data. It further asserts that the T wave filter performs a simple mathematical function—reducing the T wave's amplitude—which cannot confer eligibility. CardioNet responds that claim 20 is not directed to an abstract idea, but, rather, to an improvement in cardiac monitoring technology.

We agree with InfoBionic. As the claim language and the specification make clear, the invention is directed to the abstract idea of filtering patient heartbeat signals to increase accuracy. '715 patent at col. 3 ll. 58–60, col. 4 ll. 35–36. Specifically, claim 20 focuses on selectively "activat[ing]" the "T wave filter" to "preprocess[] a cardiac signal." *Id.* at col. 7 ll. 45–53. Similarly, the specification explains that the very purpose of the invention centers on using the T wave filter to filter data. *See id.* at Abstract, col. 3 ll. 52–col. 4 ll. 67. But, at bottom, filtering the data

requires only basic mathematical calculations, such as "decompos[ing] a T wave into its constituent frequencies and multipl[ying] them by a filter frequency response." Appellant's Reply and Resp. Br. 49 (citing '715 patent at col. 4 ll. 19–36). And such calculations, even if "[g]roundbreaking," are still directed to an abstract idea. *SAP Am., Inc. v. InvestPic, LLC*, 898 F.3d 1161, 1163 (Fed. Cir. 2018) (citing *Ass'n for Molecular Pathology v. Myriad Genetics, Inc.*, 569 U.S. 576, 591 (2013)).

CardioNet makes several additional arguments in support of its assertion that claim 20 is not directed to an abstract idea. Those arguments are all unpersuasive.

First, CardioNet contends that claim 20 is necessarily tied to a "specific improvement" in cardiac monitoring technology because, without the claimed T wave filter, the ECG may mistakenly classify the T waves as R waves. Appellant's Reply and Resp. Br. 42–43. We are unpersuaded by that argument. To qualify as "a patent-eligible improvement," the invention must be directed to a specific improvement in the computer's functionality, not simply to use of the computer "as a tool" to implement an abstract idea. *Customedia Techs., LLC v. Dish Network Corp.*, 951 F.3d 1359, 1363–1364 (Fed. Cir. 2020). Here, the invention falls into the latter category. It focuses on using a general-purpose computer to carry out the abstract idea of filtering data. *See* '715 patent at col. 3 ll. 52–60, col. 4 ll. 19–36, col. 5, ll. 34–38.

In addition, claim 20 supplies no specific way to collect and process the data or to implement the T wave filter. Nor does it specify *how* to determine when to activate the T wave filter. Rather, it leaves that decision to the operator. *See id.* at col. 4 ll. 61–65. Indeed, even the district court recognized that the claim language was problematic for CardioNet's eligibility argument. Specifically, when analyzing the parties' dispute regarding infringement, the court briefly revisited its earlier conclusion that the

asserted claims are not ineligible under § 101. *Summary Judgment Decision*, 2020 WL 4559934, at *9–10. It observed that, when making its infringement argument, CardioNet had emphasized the operator's role in activating the T wave filter, but that, problematically, when making its eligibility argument (at an earlier stage in the proceedings), it had downplayed that aspect of the claim. *Id.* The court strongly hinted that, had it been aware of the significance of the operator's mental process to the claimed invention at the pleadings stage, it would have considered holding the claims ineligible under § 101. J.A. 8963–72, 8985 (oral argument proceedings). The district court's subsequent analysis regarding § 101 supports our ultimate conclusion here.

Second, CardioNet emphasizes that the T wave filter can calculate mathematical functions that a human cannot mentally perform. As support for its argument, it points to the district court's finding that the T wave filter "*diminish*[*es*] the intensity of [the] T wave while *preserving* or *amplifying* the R wave," which a human cannot "manually" calculate. *Validity Decision*, 2017 WL 1788650, at *10 (emphases in original). CardioNet's argument misses the mark. "[T]he inability for the human mind to perform each claim step does not alone confer patentability." *FairWarning IP, LLC v. Iatric Sys.*, 839 F.3d 1089, 1098 (Fed. Cir. 2016). Consequently, even assuming that only a computer can perform the calculations, CardioNet's argument is unpersuasive; the T wave filter's mathematical function alone does not make the claims any less abstract.

Third, CardioNet asserts that claim 20 is similar to the claims that we held to be nonabstract in *CardioNet, LLC v. InfoBionic, Inc.*, 955 F.3d 1358 (Fed. Cir. 2020). We disagree. That case (involving the same parties here) concerned a patent with claims to a system that detects different types of cardiac arrythmias by measuring heartbeat variability. *Id.* at 1362. Importantly, we observed that there was no intrinsic evidence that the claimed

technique had ever been used. *Id.* at 1370–71. Here, however, as explained below, InfoBionic points to evidence that the use of a filter to perform mathematical functions was not a new activity. In fact, during oral argument, CardioNet admitted that "T wave filters, as a general proposition, existed" prior to the patent (although later, it unpersuasively argued that the filter had not been used in the same specific "way" recited in the '715 patent). *See* Oral Argument (20–2123) at 31:20–33:00.

Additionally, CardioNet's argument is particularly unpersuasive given that there is another case (also involving the same parties) with claims much more similar to the ones at issue here: *CardioNet, LLC v. InfoBionic, Inc.*, 816 F. App'x 471 (Fed. Cir. 2020). In that case, we held that claims to a system for "presenting information relating to heart data" are ineligible for patent under § 101. *Id.* at 472. The relevant claims recite a monitoring system and monitoring station that: (1) identify heartbeat anomalies, (2) cross-check the results with a human operator, and (3) display the data. *Id.* Ultimately, we held that the claims are directed to the abstract concept of "collecting, analyzing, and displaying data" in order to perform the "longstanding practice" of "spot-checking systems for quality control." *Id.* at 475–77. Our holding in that case is directly applicable here. Specifically, claim 20 is directed to the abstract concept of collecting, analyzing, and displaying data while using a T wave filter.

Having concluded that claim 20 is directed to an abstract idea, as did the district court, we next consider whether it recites an inventive concept at step two.

Alice Step Two

At step two, InfoBionic argues that the district court erred in holding that claim 20 recites an inventive concept sufficient to transform the nature of the claim into patent-eligible subject matter. According to InfoBionic, claim 20 merely employs conventional computer components to

carry out an abstract idea. CardioNet responds that the T wave filter was "an innovative" and nonconventional solution to a key problem: measuring the heart rate of patients with tall T waves. Appellant's Reply and Resp. Br. 46–47. Moreover, according to CardioNet, the district court's conclusion that claim 20 satisfies the "machine-or-transformation test" is "unassailable." *Id.* It further asserts that claim 20 is akin to the claims we held to be nonabstract in *CardioNet, LLC v. InfoBionic, Inc.*, 955 F.3d 1358 (Fed. Cir. 2020).

We agree with InfoBionic that the district court erred in holding that claim 20 recites an inventive concept.

First, we are unpersuaded by CardioNet's argument that the invention consists of "more" than conventional components performing basic functions. As InfoBionic points out, although CardioNet emphasizes that the T wave filter was "innovative," the '715 patent cites references that contradict that argument. For example, one cited patent describes a "filter" that "accentuates the R-wave and attenuates the effect of the T-wave because the T-wave is a low frequency, far field signal." *See* '715 patent at references cited; U.S. Patent 6,834,204 at col. 5 ll. 23–32, col. 6 ll. 13–15. And regardless, even accepting CardioNet's argument that the T wave filter's function was innovative, "[a] claim for a new abstract idea," here, a mathematical calculation, "is still an abstract idea." *SAP*, 898 F.3d at 1163 (quoting *Synopsys, Inc. v. Mentor Graphics Corp.*, 839 F.3d 1138, 1151 (Fed. Cir. 2016)). Aside from the T wave filter, the specification explains that the other claimed components are conventional. For example, it discloses that the "monitoring apparatus," which collects the data, "can be implemented using" a "commercially available" device. '715 patent at col. 2 ll. 1–36. It then states that the collected data is analyzed using "suitable processors," including "general . . . purpose microprocessors." *Id.* at col. 5 ll. 58–59. Additionally, according to the specification, "[t]he systems and techniques . . . can be

implemented" using "computer hardware, firmware, [or] software." *Id.* at col. 5 ll. 34–46.

Second, we disagree with the district court's determination that claim 20 recites an inventive concept because it satisfies the machine-or-transformation test. "[S]atisfying the machine-or-transformation test, by itself, is not sufficient to render a claim patent-eligible" because not all "transformations or machine implementations infuse an otherwise ineligible claim with an 'inventive concept.'" *Solutran, Inc. v. Elavon, Inc.*, 931 F.3d 1161, 1169 (Fed. Cir. 2019) (citing *DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245, 1256 (Fed. Cir. 2014)). Indeed, the Supreme Court itself held in *Bilski* that the machine-or-transformation test is a "useful and important clue" for determining patent eligibility, but not dispositive. *Bilski v. Kappos*, 561 U.S. 593, 604 (2010). Here, although claim 20 is technically tied to a machine (a cardiac apparatus) its ultimate focus is to "preprocess[] a cardiac signal" using a "T wave filter," which, as explained above, is an abstract idea. '715 patent at col. 7 ll. 45–54; J.A. 52 (certificate of correction). To the extent that formulating a claim in the form of an apparatus insulates it from an ineligibility attack if it only recites conventional components for performing an abstract idea, the Supreme Court has closed that door, at least for now.

Third, we are unpersuaded by CardioNet's step two arguments relying on *CardioNet, LLC v. InfoBionic, Inc.*, 955 F.3d 1358 (Fed. Cir. 2020). In that case, we did not reach step two because we held that the claims are not ineligible for patent under § 101 at step one. *Id.* at 1371. Additionally, the facts in *CardioNet, LLC v. InfoBionic, Inc.*, 816 F. App'x 471 (Fed. Cir. 2020) are much more similar to those at issue here. There, we explained that the abstract concept of "collecting, analyzing, and displaying data" in order to perform the "longstanding practice" of "spot-checking systems for quality control" was implemented using "conventional technology," including a monitoring system and

a monitoring station. *Id.* at 475–77. Likewise, here, claim 20 recites conventional components (a monitoring apparatus and monitoring station) performing the same type of conventional functions: collecting data, analyzing it with the T wave filter's mathematical calculations, and displaying it on the monitoring station. '715 patent at col. 2 ll. 1–48; col. 4 ll. 19–36.

Finally, we conclude that the remaining claims are directed to substantially similar subject matter as claim 20 and are therefore ineligible under § 101. For example, the two other asserted independent claims are materially the same as claim 20 but recite transmitting the command to activate the T wave filter based on predetermined characteristics (claim 1) or predetermined criteria (claim 11) of the patient's heartbeat. '715 patent at col. 6 ll. 27–36, col. 7 ll. 4–18. CardioNet does not explain how a doctor's decision to activate the T wave filter based upon certain features (i.e., a tall T wave) is anything more than an abstract idea. Similarly, dependent claim 2 recites identifying heartbeats based on R waves. *Id.* at col. 6 ll. 37–39. But the specification itself describes that concept as well known. *Id.* at col. 1 ll. 17–21. Dependent claims 8, 12, and 21 recite using "wireless communications." *Id.* at col. 6 ll. 60–62; col. 7 ll. 19–20, 54–56. That limitation constitutes conventional activity that does not change the claims' central focus on filtering.

Accordingly, we conclude that the patent does not recite an inventive concept sufficient to transform the asserted claims into patent-eligible subject matter.

II

Noninfringement

CardioNet asserts that the district court erred in granting summary judgment of noninfringement in favor of InfoBionic. However, because we conclude that the asserted claims of the '715 patent are ineligible for patent under

§ 101, we do not reach CardioNet's argument. That issue is moot. *See TypeRight Keyboard Corp. v. Microsoft Corp.*, 374 F.3d 1151, 1157 (Fed. Cir. 2004) (a "judgment of invalidity necessarily moots the issue of infringement" (citing *Sandt Tech., Ltd. v. Resco Metal & Plastics Corp.*, 264 F.3d 1344, 1356 (Fed. Cir. 2001))).

CONCLUSION

We have considered CardioNet's remaining arguments but find them unpersuasive. For the foregoing reasons, we *vacate* the district court's decision granting summary judgment of noninfringement. We *remand* for the entry of judgment of no liability for InfoBionic on the ground that the district court should have granted the motion for judgment on the pleadings as to unpatentability.

VACATED AND REMANDED

COSTS

Costs to cross-appellant.