

United States Court of Appeals for the Federal Circuit

BIOSIG INSTRUMENTS, INC.,
Plaintiff-Appellant,

v.

NAUTILUS, INC.,
Defendant-Appellee.

2012-1289

Appeal from the United States District Court for the Southern District of New York in No. 10-CV-7722, Judge Alvin K. Hellerstein.

Decided: April 26, 2013

MICHAEL J. BONELLA, Kessler Topaz Meltzer & Check LLP, of Radnor, Pennsylvania, argued for plaintiff-appellant. With him on the brief was PAUL B. MILCETIC. Of counsel were TODD KUPSTAS and JENNA PELLECCIA.

JAMES E. GERINGER, Klarquist Sparkman, LLP, of Portland, Oregon, argued for defendant-appellee. With him on the brief were JOHN D. VANDENBERG and PHILIP WARRICK.

Before NEWMAN, SCHALL, and WALLACH, *Circuit Judges*.

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

Concurring opinion filed by *Circuit Judge* SCHALL.

WALLACH, *Circuit Judge*.

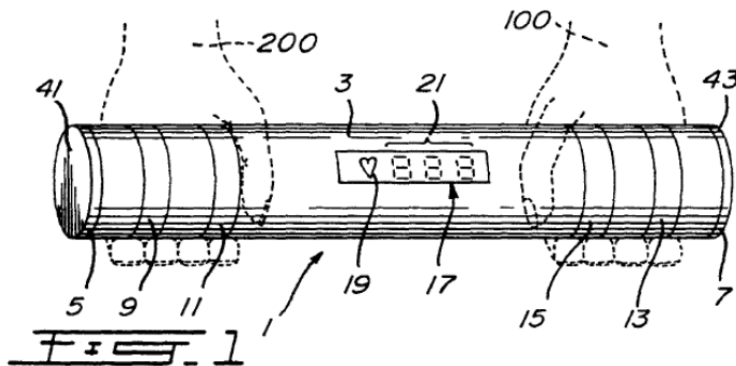
Biosig Instruments, Inc. (“Biosig”) is the assignee of U.S. Patent No. 5,337,753 (“the ’753 patent”), which is directed to a heart rate monitor associated with an exercise apparatus and/or exercise procedures. Biosig brought a patent infringement action against Nautilus, Inc. (“Nautilus”) in district court alleging that Nautilus infringed claims 1 and 11 of the ’753 patent. After claim construction, Nautilus filed a motion for summary judgment seeking, in relevant portion, to have the ’753 patent held invalid for indefiniteness. The district court granted Nautilus’s motion, and Biosig appealed. Because the claims at issue are not invalid for indefiniteness, the district court’s decision is reversed and remanded for further proceedings.

BACKGROUND

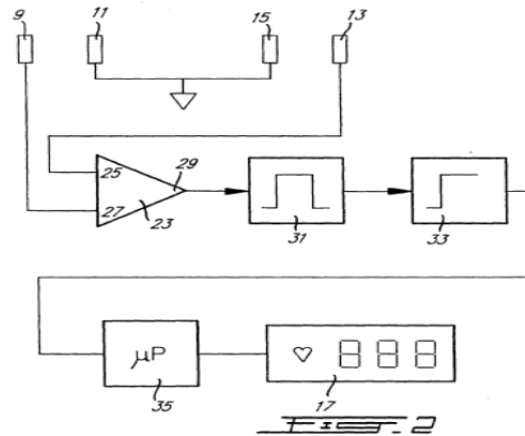
I.

The ’753 patent is directed to a heart rate monitor that purports to improve upon the prior art by effectively eliminating noise signals during the process of detecting a user’s heart rate. ’753 patent col. 1 ll. 5–10. According to the patent, prior art monitors did not eliminate signals given off by skeletal muscles (“electromyogram” or “EMG” signals), which are brought about when users move their arms or squeeze the monitor with their fingers. *Id.* col. 1 ll. 19–22. Because EMG signals are of the same frequency range as electrical signals generated by the heart (“electrocardiograph” or “ECG” signals), EMG signals can mask ECG signals rendering heart rate determination while exercising difficult. *Id.* col. 1 ll. 22–25.

The '753 patent discloses an apparatus preferably mounted on exercise equipment that measures heart rates by, *inter alia*, processing ECG signals from which EMG signals are substantially removed. *Id.* col. 1. ll. 36–41. The claimed heart rate monitor consists of an elongate hollow cylindrical member that houses electronic circuitry as illustrated below:



'753 patent fig. 1. A user's left and right hands—100 and 200—each contact one of the “live” electrodes—9 and 13—and one of the “common” electrodes—11 and 15—on either end of the cylindrical member 3. *Id.* col. 2 ll. 50–64, col. 3 ll. 26–31. The electronic circuitry includes a difference amplifier 23, which is connected to the live electrodes 9 and 13. *Id.* col. 3 ll. 7–10. The common electrodes 11 and 15 are connected to each other and to a point of common potential, for example, a common ground. *Id.* col. 3 ll. 5–7. An illustration of the circuitry is shown below:



'753 patent fig. 2. Inputs 25 and 27 are of opposite polarity. *Id.* col. 3 ll. 10–13. As the EMG signals and other noise signals are of substantially equal amplitude and phase, they cancel each other out in the difference amplifier to provide a substantially zero output of EMG and other noise signals. *Id.* col. 3 ll. 33–43. In contrast, ECG signals, being of opposite phase, will be added and therefore further amplified in the difference amplifier so that the output of the difference amplifier is substantially due to the ECG signals only. *Id.* col. 3 ll. 44–50.

Claim 1 is representative and recites, in relevant part:

1. A heart rate monitor for use by a user in association with exercise apparatus and/or exercise procedures, comprising:

an elongate member;

electronic circuitry including a difference amplifier having a first input terminal of a first polarity and a second input terminal of a second polarity opposite to said first polarity;

said elongate member comprising a first half and a second half;

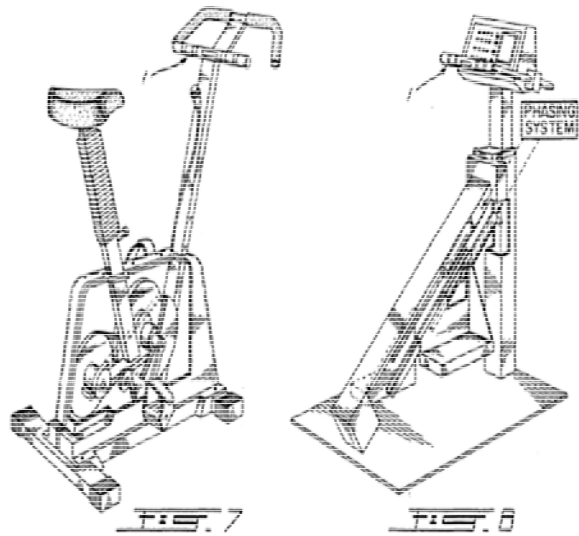
a first live electrode and a first common electrode mounted on said first half in *spaced relationship* with each other;

a second live electrode and a second common electrode mounted on said second half in *spaced relationship* with each other;

said first and second common electrodes being connected to each other and to a point of common potential

'753 patent col. 5 ll. 17–36 (emphases added). In addition to the capability of substantially removing EMG signals, claim 1 recites a monitor, a means for measuring time intervals between heart pulses, and a means for calculating the heart rate of a user using the measured time intervals. *See id.* col. 5 l. 37–col. 6 l. 15.

Asserted–dependent claim 11 further specifies that the claimed “elongate member” is “mounted on an exercise apparatus.” *Id.* col. 7 ll. 17–20. Figures 7 and 8 are illustrative of a heart rate monitor mounted on a bicycle and a stair-climbing exercise machine:



Id. figs. 7–8.

II.

The dispute between the parties has been ongoing for years, stemming from the late 1990s when Biosig was in discussions with Nautilus’s predecessor Stairmaster Company regarding Biosig’s patented technology. Despite these discussions, Stairmaster Company, and later Nautilus, began selling exercise equipment that Biosig alleges infringes its patented technology. These accused products consist of heart rate monitors mounted on exercise equipment.

Biosig sued Nautilus for infringing the ’753 patent in August 2004 (“2004 Action”). During the pendency of that litigation, Nautilus twice sought *ex parte* reexamination of the ’753 patent from the United States Patent and Trademark Office (“PTO”). The first reexamination request was based primarily on U.S. Patent No. 4,444,200

(“Fujisaki”).¹ The PTO granted Nautilus’s request, and in April 2009, the PTO issued an office action rejecting, *inter alia*, claim 1 as anticipated by Fujisaki and claim 11 as obvious over Fujisaki in view of other prior art references. After Biosig filed its response to this PTO office action, Nautilus requested a second reexamination of the ’753 patent, again, citing Fujisaki as the primary reference. The PTO granted Nautilus’s second request for reexamination, and the two reexamination proceedings were consolidated in December 2009. The PTO ultimately concluded these reexamination proceedings in June 2010 and confirmed the patentability of the ’753 patent without amendment. During the pendency of this reexamination proceeding, the parties voluntarily dismissed without prejudice the claims and counterclaims of the 2004 Action.

Upon conclusion of the reexamination proceeding, Biosig re-instituted a patent infringement action against Nautilus on October 8, 2010. On August 11, 2011, the district court conducted a *Markman* hearing, and on September 29, 2011, issued its order construing certain

¹ Fujisaki relates to a system for measuring heart pulse rate, and more particularly, to “a heart pulse rate measuring system having a pair of grip sensors adapted to be gripped with both hands for sensing heart pulse signals.” Fujisaki, col. 1 ll. 5–9. “Each of the grip sensors is composed of two conductive cylindrical electrodes arranged in an axially aligned relationship and electrically insulated from each other.” *Id.* col 1 ll. 45–48. “The electric circuit includes a differential amplifier having inputs from the grip sensors for amplifying the difference between the heart pulse signals” *Id.* col. 1 ll. 48–51.

disputed claim terms.² On November 10, 2011, Nautilus moved under Federal Rule of Civil Procedure 56 seeking summary judgment on two issues: infringement and invalidity for indefiniteness.

On February 22, 2012, the district court held a hearing on Nautilus's motion for summary judgment. As to the issue of infringement, the district court denied Nautilus's motion as premature because the parties had yet to undertake significant discovery. Summ. J. Hr'g Tr. 5:23–6:2, *Biosig Instruments, Inc. v. Nautilus, Inc.*, No. 10–CV–7722 (S.D.N.Y. Feb. 22, 2012), ECF No. 58 (“Summ. J.

² Even though the district court issued a claim construction order, which included a construction of the disputed term, “spaced relationship,” the record reflects the district court nonetheless determined that “space relationship” was ambiguous, and therefore, found Biosig's contentions pertaining to this term unpersuasive. J.A. 1391:15–21 (August 11, 2011 *Markman* Hearing) (“And we are going on to say, the spaced relationship arises from trial and error placements of the two electrodes on the cylindrical bar. Once placed they're in a space relationship. That spaced relationship must be greater than the width of each electrode. *What I've done will confuse the jury and it may set up Mr. Milcetic for a ruling of invalidity. Fair warning.*”) (emphasis added); J.A. 2819:16–2820:1 (February 22, 2012 Summary Judgment Hearing) (“THE COURT: *So he said a space[d] relationship can be anything. It could be this or it could be something else.* MR. GERINGER: And, your Honor, at the time, it was Mr. Bonella's colleague, I believe, Mr. Milcetic, but *your Honor warned them that you didn't want them to fall into a trap.* THE COURT: Right. MR. GERINGER: *That construing it in a way that embraces ambiguity could lead to invalidity through vagueness.* THE COURT: *And now you're trying to take advantage of that right now.*”) (emphases added).

Hr’g Tr.”). On invalidity, the district court granted Nautilus’s motion, holding that the ’753 patent’s “spaced relationship” term as recited in claim 1 was indefinite as a matter of law. Summ. J. Hr’g Tr. 51:21–52:1.

After the parties completed summary judgment briefing but before the hearing, Nautilus filed a third request for reexamination of the ’753 patent on January 25, 2012, and again, Nautilus cited Fujisaki as a primary prior art reference. This time, on February 17, 2012, the PTO denied Nautilus’s request, finding that there were no substantial new questions of patentability raised by the request. Biosig was notified of the PTO’s denial of Nautilus’s third reexamination request after the district court’s summary judgment hearing and decision. In light of this new fact, Biosig moved for reconsideration of the district court’s decision granting Nautilus’s motion for summary judgment of invalidity, which the district court denied on June 12, 2012. Biosig timely appeals. We have jurisdiction pursuant to 28 U.S.C. § 1295(a)(1).

DISCUSSION

I.

This court reviews the district court’s grant or denial of motions for summary judgment under the law of the regional circuit. *MicroStrategy Inc. v. Bus. Objects, S.A.*, 429 F.3d 1344, 1349 (Fed. Cir. 2005). The Second Circuit reviews *de novo* a district court’s grant of a motion for summary judgment. *Kuebel v. Black & Decker Inc.*, 643 F.3d 352, 358 (2d Cir. 2011). Summary judgment motions may be granted only where “there is no genuine dispute as to any material fact and the movant is entitled to judgment as a matter of law.” Fed. R. Civ. P. 56(a). In making this determination, a court must “draw all reasonable inferences in favor of the nonmoving party, and it may not make credibility determinations or weigh the evidence.” *Reeves v. Sanderson Plumbing Prods., Inc.*, 530 U.S. 133, 150 (2000).

II.

The sole issue presented to this court is whether the district court erred in holding that the asserted claims of the '753 patent is invalid for indefiniteness as a matter of law. In particular, the district court held that “spaced relationship” as recited in claim 1 and referring to the spacing between the common and live electrodes was not distinctly and particularly claimed in the patent in violation of 35 U.S.C. § 112, ¶ 2.³

Indefiniteness is a legal issue this court reviews without deference. *Star Scientific, Inc. v. R.J. Reynolds Tobacco Co.*, 655 F.3d 1364, 1373 (Fed. Cir. 2011) (“*Star Scientific II*”). Section 112, ¶ 2, requires that the specification of a patent “conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.” “Because claims delineate the patentee’s right to exclude, the patent statute requires that the scope of the claims be sufficiently definite to inform the public of the bounds of the protected invention, *i.e.*, what subject matter is covered by the exclusive rights of the patent.” *Halliburton Energy Servs., Inc. v. M-I LLC*, 514 F.3d 1244, 1249 (Fed. Cir. 2008).

A claim is indefinite only when it is “not amenable to construction” or “insolubly ambiguous.” *Datamize, LLC v. Plumtree Software, Inc.*, 417 F.3d 1342, 1347 (Fed. Cir. 2005) (internal quotations and citations omitted). “In and of itself, a reduction of the meaning of a claim term into words is not dispositive of whether the term is definite . . .

³ Paragraph 2 of 35 U.S.C. § 112 was replaced with newly designated § 112(b) when § 4(c) of the Leahy–Smith America Invents Act (“AIA”), Pub. L. No. 112–29, took effect on September 16, 2012. Nevertheless, the pre-AIA version of § 112 applies because the '753 patent issued prior to that date.

. And if reasonable efforts at claim construction result in a definition that does not provide sufficient particularity and clarity to inform skilled artisans of the bounds of the claim, the claim is insolubly ambiguous and invalid for indefiniteness.” *Star Scientific, Inc. v. R.J. Reynolds Tobacco Co.*, 537 F.3d 1357, 1371 (Fed. Cir. 2008) (“*Star Scientific I*”) (citations omitted). “Thus, a construed claim can be indefinite if the construction remains insolubly ambiguous” *Star Scientific II*, 655 F.3d at 1373; see also *Exxon Research & Eng’g Co. v. United States*, 265 F.3d 1371, 1377–79 (Fed. Cir. 2001) (accepting the district court’s claim construction and separately undertaking an analysis of the claims at issue to determine indefiniteness); *Union Pac. Res. Co. v. Chesapeake Energy Corp.*, 236 F.3d 684, 689–90, 692 (Fed. Cir. 2001) (same); *Minn. Min. and Mfg. Co. v. Johnson & Johnson Orthopaedics, Inc.*, 976 F.2d 1559, 1567 (Fed. Cir. 1992) (same).

General principles of claim construction apply when determining indefiniteness. *Enzo Biochem, Inc. v. Applera Corp.*, 599 F.3d 1325, 1332–33 (Fed. Cir. 2010). We therefore primarily consider the intrinsic evidence consisting of the claim language, the specification, and the prosecution history. *Id.* In addition, similar to claim construction, courts may consider certain extrinsic evidence in resolving disputes regarding indefiniteness. *Exxon Research & Eng’g Co.*, 265 F.3d at 1376 (citing *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1454 (Fed. Cir. 1998) (en banc)); see also *Verve, LLC v. Crane Cams, Inc.*, 311 F.3d 1116, 1119–20 (Fed. Cir. 2002) (recognizing that guidance as to measurement of a term of degree can come from the intrinsic record or from the knowledge of a person of ordinary skill in the art); *Bancorp Servs., L.L.C. v. Hartford Life Ins. Co.*, 359 F.3d 1367, 1375–76 (Fed. Cir. 2004) (finding evidence not publicly available at the time of the invention may nonetheless be probative to show that the term was in use and had a discernible meaning to at least some persons practicing in the field).

In doing so, the court is not weighing evidence or making factual findings, but rather, looking to extrinsic evidence as part of the normal course of engaging in construction of the patent. *Exxon*, 265 F.3d at 1376 (citing *Cybor*, 138 F.3d at 1454).

When a “word of degree” is used, the court must determine whether the patent provides “some standard for measuring that degree.” *Seattle Box Co., Inc. v. Indus. Crating & Packing, Inc.*, 731 F.2d 818, 826 (Fed. Cir. 1984). Similarly, when a claim limitation is defined in “purely functional terms,” a determination of whether the limitation is sufficiently definite is “highly dependent on context (*e.g.*, the disclosure in the specification and the knowledge of a person of ordinary skill in the relevant art . . .).” *Halliburton*, 514 F.3d at 1255.

III.

The disputed term “spaced relationship” does not suffer from indefiniteness. Because the term was amenable to construction, indefiniteness here would require a showing that a person of ordinary skill would find “spaced relationship” to be insolubly ambiguous—that it fails to provide sufficient clarity delineating the bounds of the claim to one skilled in the art. In this case, a skilled artisan would find such boundaries provided in the intrinsic evidence.

The district court construed “spaced relationship” to mean that “there is a defined relationship between the live electrode and the common electrode on one side of the cylindrical bar and the same or a different defined relationship between the live electrode and the common electrode on the other side of the cylindrical bar.” Summ. J. Hr’g Tr. 10:16–22. Notwithstanding that this disputed term was amenable to construction, the district court determined that the term was indefinite. Specifically, the district court stated that “a spaced relationship did not tell me or anyone what precisely the space should be

Not even any parameters as to what the space should be . . . Nor whether the spaced relationship on the left side should be the same as the spaced relationship on the right side.” Summ. J. Hr’g Tr. 23:3–11.

Turning to the intrinsic evidence, the district court is correct that the specification of the ’753 patent does not specifically define “spaced relationship” with actual parameters, *e.g.*, that the space between the live and common electrodes is one inch. Nevertheless, the ’753 patent’s claim language, specification, and the figures illustrating the “spaced relationship” between the live and common electrodes are telling and provide sufficient clarity to skilled artisans as to the bounds of this disputed term. For example, on the one hand, the distance between the live electrode and the common electrode cannot be greater than the width of a user’s hands because claim 1 requires the live and common electrodes to independently detect electrical signals at two distinct points of a hand. On the other hand, it is not feasible that the distance between the live and common electrodes be infinitesimally small, effectively merging the live and common electrodes into a single electrode with one detection point. *See* ’753 patent col. 3 ll. 26–31 (describing how each hand is placed over the live and common electrodes so that they are “in physical and electrical contact with both electrodes.”). Thus, the ’753 patent discloses certain inherent parameters of the claimed apparatus, which to a skilled artisan may be sufficient to understand the metes and bounds of “spaced relationship.”

The functionality of the claimed heart rate monitor as recited in claim 1, described in the specification, and which provided the basis for overcoming the PTO’s office action rejections during the reexamination, sheds further light on the meaning of “spaced relationship.” Specifically, claim 1 provides, in part:

whereby, a first electromyogram signal will be detected between said first live electrode and said first common electrode, and a second electromyogram signal, of substantially equal magnitude and phase to said first electromyogram signal will be detected between said second live electrode and said second common electrode; so that, when said first electromyogram signal is applied to said first terminal and said second electromyogram signal is applied to said second terminal, the first and second electromyogram signals will be subtracted from each other to produce a substantially zero electromyogram signal at the output of said difference amplifier

'753 patent col. 5 ll. 48–61. This “whereby” clause describes the function of substantially removing EMG signals that necessarily follows from the previously recited structure consisting of the elongate member, the live electrode, and the common electrode. *Id.* col. 5 ll. 42–47. Importantly, the EMG signal is detected between the live and common electrodes, which are in “spaced relationship” with each other. Even more significantly, the PTO examiner found this function to be “crucial” as a reason for overcoming the cited prior art and confirming the patentability of the asserted claims upon reexamination. J.A. 139–46. Thus, the recitation of this function in claim 1 is highly relevant in ascertaining the proper bounds of the “spaced relationship” between the live and common electrodes. *See Hoffer v. Microsoft Corp.*, 405 F.3d 1326, 1329 (Fed. Cir. 2005) (per curiam) (“[W]hen the ‘whereby’ clause states a condition that is material to patentability, it cannot be ignored in order to change the substance of the invention.”).

The specification also describes, in part, the electrodes’ “spaced relationship” in terms of their corresponding function of detecting distinct electrical signals, whereby EMG signals are substantially removed in the

difference amplifier so that the output of the difference amplifier substantially consists only of the ECG signal. *See, e.g.*, '753 patent col. 1 ll. 53–58, col. 2 ll. 12–19. According to Biosig, when configuring the claimed heart rate monitor, skilled artisans can determine the “spaced relationship” between live and common electrodes by calculating the point in which EMG signals are substantially removed.

During reexamination, Biosig presented evidence in support of this position in a declaration by the inventor, Mr. Gregory Lekhtman, which was submitted in response to a PTO office action. *See 01 Communique Lab., Inc. v. LogMeIn, Inc.*, 687 F.3d 1292, 1298 (Fed. Cir. 2012) (considering statements made during reexamination as intrinsic evidence for purposes of claim construction). His declaration was based largely on tests he performed to show the effects of electrode configuration on EMG signals measured in the palms of the users' hands. In particular, he represented that the strength of an EMG signal measurement is proportional to the space between the active and ground electrode and the size of the electrodes. J.A. 194–95. He further declared that it was common knowledge for skilled artisans in 1992 that EMG potentials on each hand would be different, and that the '753 patent requires a configuration of the detectors that produce equal EMG signals from the left and right hands. J.A. 200. This equalization or balancing, according to Mr. Lekhtman, is achieved by detecting EMG signals on the left and right palms, which are delivered to a differential amplifier in the EMG measuring device. Available design variables are then adjusted until the differential output is minimized, *i.e.*, close to zero, and the ECG to EMG ratio is determined to be sufficient for an accurate heart rate determination. J.A. 200–01. Mr. Lekhtman explained that some of these design variables in producing a balanced detection of EMG signals include spacing, size, shape and materials of the electrodes. Moreover, Mr.

Lekhtman represented that a common analog oscilloscope available in 1992 would have been used by those skilled in the art to measure the signals and to determine the best ECG/EMG ratio. J.A. 210–11.

For comparison, Mr. Lekhtman tested the circuitry as recited in the '753 patent and the circuitry as recited in Fujisaki, the prior art cited during reexamination. Mr. Lekhtman's test results indicated that an ECG/EMG ratio "in the range of about 3–10 would be manifested at the output of the differential amplifier" of the '753 patent as having substantially zero influence from the EMG signal. J.A. 213; 343. Conversely, an ECG/EMG ratio of about 1 or less, as generated by the circuitry claimed in the Fujisaki patent, was found to be masking the ECG signal and thus requiring further filtering after the differential amplifier. J.A. 213.

Mr. Lekhtman also described Dr. Henrietta Galiana's test results of a laboratory mock-up of the claimed apparatus—results prepared in the course of the 2004 Action at the district court against Nautilus. J.A. 204–05; 1029–56. Her test results and corresponding report supported Mr. Lekhtman's statements and demonstrated that two detected EMG signals on opposite hands can indeed have substantially the same amplitude and phase, and that a difference amplifier will then reduce those EMG signals to substantially zero. J.A. 205; 1048–54.

Finally, extrinsic evidence underscores the intrinsic evidence. In particular, Biosig submitted a declaration of yet another expert, Dr. George Yanulis, in support of its opposition to Nautilus's summary judgment motion in the underlying district court litigation, which confirmed Mr. Lekhtman's and Dr. Galiana's test results and reports. J.A. 1670.

In summary, the claims provide inherent parameters sufficient for a skilled artisan to understand the bounds of "spaced relationship." In addition, a skilled artisan could

apply a test and determine the “spaced relationship” as pertaining to the function of substantially removing EMG signals. Indeed, the test would have included a standard oscilloscope connected to both the inputs and outputs of the differential amplifier to view the signal wave forms and to measure signal characteristics. With this test, configurations could have been determined by analyzing the differential amplifier input and output signals for detecting EMG and ECG signals and observing the substantial removal of EMG signals from ECG signals while simulating an exercise. These parameters constitute the metes and bounds of “spaced relationship” as articulated in the ’753 patent. Nothing more rigorous is required under § 112, ¶ 2.

The district court nonetheless held Biosig had not articulated with specificity the dimensions or other parameters characterizing the space between the electrodes: “It should be half inch, one inch, two inches, three inches. What is the space[d] relationship?” Summ. J. Hr’g Tr. 35:7–8. The district court likewise stated that the ’753 patent failed to disclose the “composition of the handle” and whether the electrodes were “between the two middle fingers, the outer first and fourth finger, the thumb underneath and the fingers on top? Where is the spaced relationship?” Summ. J. Hr’g Tr. 38:16–24. The district court also questioned whether having “small” hands as opposed to “large” hands would affect the “spaced relationship” between the live and common electrodes. Summ. J. Hr’g Tr. 40:2–6. Moreover, the district court found nothing in evidence that provided how a skilled artisan would have determined the appropriate parameters yielding the necessary “spaced relationship” as recited by the ’753 patent: “[W]hat [the expert] says is that through trial and error, which he doesn’t describe, one can find a spaced relationship. That may be. But there’s no description.” Summ. J. Hr’g Tr. 39:6–8. These inquiries however

miss the mark in this instance because they do not support an indefiniteness analysis.

To begin, we have not insisted that claims be plain on their face in order to avoid a determination of invalidity for indefiniteness. *Exxon*, 265 F.3d at 1375. “If the meaning of the claim is discernible, even though the task may be formidable and the conclusion may be one over which reasonable persons will disagree, we have held the claim sufficiently clear to avoid invalidity on indefiniteness grounds.” *Id.* In addition, “[p]rovided that the claims are enabled, and no undue experimentation is required, the fact that some experimentation may be necessary to determine the scope of the claims does not render the claims indefinite.” *Id.* at 1379. When relevant values can be obtained, § 112 ¶ 2 is satisfied. *Marley Mouldings Ltd. v. Mikron Indus., Inc.*, 417 F.3d 1356, 1360–61 (Fed. Cir. 2005) (“Although the district court was concerned that the claims encompass a range of volumes and thereby also of weights, § 112 ¶2 is satisfied when the relevant values can be ‘calculated or measured.’”) (citation omitted). By embracing this standard, “we accord respect to the statutory presumption of patent validity, and we protect the inventive contribution of patentees, even when the drafting of their patents has been less than ideal.” *Exxon*, 265 F.3d at 1375 (internal citations omitted); see *Morton Int’l, Inc. v. Cardinal Chem. Co.*, 5 F.3d 1464, 1470, 1472 (Fed. Cir. 1993) (citing 35 U.S.C. § 282). Therefore, objections relating to the mere fact that there may be some need for experimentation to determine the scope of the claims carry little weight.

Likewise, the district court’s objections to the claims as written do not support imprecision of the claims. Rather, the objections are based on the premise that the ’753 patent does not include disclosure sufficiently commensurate with the scope of the claims. These objections, if relevant, provide grounds for invalidity under § 112, ¶ 1

and not § 112, ¶ 2.⁴ As this court has explained:

A patent claim to a fishing pole would not be invalid on indefiniteness grounds if it contained a limitation requiring that the pole be “at least three feet long,” even though a 50 foot long fishing pole would not be very practical. By the same token, there is nothing indefinite about the claim language at issue in this case simply because it covers some embodiments that may be inoperable.

Exxon, 265 F.3d at 1382; *Personalized Media Commc’ns, LLC v. Int’l Trade Comm’n*, 161 F.3d 696, 706 (Fed. Cir. 1998) (rejecting expert testimony stating generally that a “digital detector” was not adequately disclosed in the patent and could not be built by those of ordinary skill as relevant only to the sufficiency of the written description to enable the practice of the invention of the claims); *Miles Labs., Inc., v. Shandon, Inc.*, 997 F.2d 870, 875, (Fed. Cir. 1993) (same). Breadth is not indefiniteness. *SmithKline Beecham Corp. v. Apotex Corp.*, 403 F.3d 1331, 1340–41 (Fed. Cir. 2005). Hence, inquiries as to the size of the users’ hands, placement of fingers, and the “composition of the handle” may be relevant, if at all, to issues that relate to enablement under § 112, ¶ 1, not indefiniteness under § 112, ¶ 2, because they are directed to the operability of varying embodiments of the claimed heart rate monitor, not to the precision of the claims at

⁴ 35 U.S.C. § 112, ¶ 1 generally relates to the sufficiency of the written descriptions of patents, including enablement, and states in relevant part: “The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains . . . to make and use the same”

issue. Accordingly, these objections do not address the inherent parameters set forth in the intrinsic evidence.

Still, Nautilus seeks support in *Halliburton*. In *Halliburton*, the invention at issue was a “fragile gel” that was used in drilling. 514 F.3d at 1246–47. This court found that the patent-at-issue did not disclose how the claimed “fragile gel” performed differently than the disclosed prior art, such as “how much more quickly the gels broke when stress was imposed, or how much more quickly the gels reformed when stress was removed.” *Halliburton*, 514 F.3d at 1253. *Halliburton*’s failure to distinguish the fragileness of the drilling fluids of the invention from the close prior art, according to this court, was fatal because it did not limit on what was invented beyond the prior art. *Id.* For example, the court noted that the fluids of the invention may provide less resistance to shearing (*i.e.*, break more quickly) than the prior art fluids, but the degree of improved speed, the court said, remained ambiguous. *Id.* Thus, this court held that it was unclear whether a skilled artisan would have interpreted this claim as having an upper bound of fragility. *Id.*

Halliburton is distinguishable. Here, the claimed apparatus has inherent parameters where the “spaced relationship” cannot be larger than the width of a user’s hand. Additionally, it has been shown that skilled artisans can readily ascertain the bounds of the “spaced relationship” through tests using standard equipment. Thus, the “upper bound” that was lacking in *Halliburton* is found here. As a result, *Halliburton* fails to support Nautilus.

Rather, this case is analogous to *Star Scientific II*. There, the disputed term was “controlled environment” as applied to the practice of tobacco curing and “whether a person of ordinary skill would know how to establish a controlled environment to perform the claimed method.” *Star Scientific II*, 655 F.3d at 1373-74. This court held

that the fact that the patents-at-issue did not give exact numbers measuring humidity, temperature, and airflow in a conventional curing barn was not dispositive. *Id.* at 1374. On the contrary, this court found there was evidence showing that “a person of skill in the art of tobacco curing would possess adequate understanding to manipulate these variables to create a controlled environment.” *Id.* Further, because conventional curing varied depending on the conditions for each cure, specific numerical values were found not necessary for one skilled in the art to implement conventional curing. *Id.* Hence, “controlled environment” was held not insolubly ambiguous.

Like *Star Scientific II*, the record shows that the variables here, including the spacing, size, shape, and material affecting the “spaced relationship” between the electrodes, can be determined by those skilled in the art. Thus, “spaced relationship” cannot be said to be insolubly ambiguous.

IV.

Contrary to the district court’s decision and to Nautilus’s contention on appeal, this court’s jurisprudence does not proscribe drafting or defining claims in relation to their functions. *Moore U.S.A., Inc. v. Standard Register Co.*, 229 F.3d 1091, 1111 (Fed. Cir. 2000) (“We note that there is nothing wrong with defining the dimensions of a device in terms of the environment in which it is to be used.”); *see also Vizio, Inc. v. Int’l Trade Comm’n*, 605 F.3d 1330, 1340 (Fed. Cir. 2010) (“[T]he ‘for decoding’ language . . . is properly construed as a limitation, and not merely statement of purpose or intended use for the invention, because ‘decoding’ is the essence or a fundamental characteristic of the claimed invention.”). That is, “claims are not necessarily indefinite for using functional language.” *Microprocessor Enhancement Corp. v. Texas Instruments Inc.*, 520 F.3d 1367, 1375 (Fed. Cir. 2008). Indeed, functional language in a means-plus-function

format is explicitly authorized by statute. 35 U.S.C. § 112, ¶6. Functional language may also be used to limit the claims without having the means-plus-function format. *Microprocessor Enhancement Corp.*, 520 F.3d at 1375.

Yet, the district court found the evidence consisting of test results and their corresponding references to “substantial removal of EMG signals” conclusory because, according to the court, Biosig failed to show how it conducted its tests that allegedly illustrate a “spaced relationship” between the electrodes and the substantial removal of EMG signals. In particular, the district court found fault with the experts’ references to the function of the claim term only, and it ultimately held that “this is all a description of the desired result and not a description of any invention . . . and, therefore, violates the requirement of specificity in Section 112.” Summ. J. Hr’g Tr. 42:25–43:4.

Courts often refer to the context in which the patented invention is claimed to ascertain its scope. *Medrad, Inc. v. MRI Devices Corp.*, 401 F.3d 1313, 1319 (Fed. Cir. 2005) (“It is therefore entirely proper to consider the functions of an invention in seeking to determine the meaning of particular claim language.”). Hence, to determine the proper meaning of “spaced relationship,” we must refer to “spaced relationship” in the context of the intrinsic evidence, including the claim language, specification, and prosecution history. The district court viewed “spaced relationship” in a vacuum by choosing to turn a blind eye to the functional aspects of claim 1, *e.g.*, how “spaced relationship” contributes to the removal of noise signals, such as EMG signals, and the overall capabilities of the claimed heart rate monitor. However, without context, it would be impossible to ascertain “what the inventors actually invented and intended to envelop with the claim,” *Renishaw PLC v. Marposs Societa’ per Azioni*, 158 F.3d 1243, 1250 (Fed. Cir. 1998), and to examine the patent from the perspective of a person skilled in the art,

e.g., *Tegal Corp. v. Tokyo Electron Am., Inc.*, 257 F.3d 1331, 1342 (Fed. Cir. 2001). Thus, to the extent the district court failed to consider Biosig’s evidence based on its reasoning that the evidence spoke only to the “function of the claim,” this was error.

Nautilus makes a related contention that the claims at issue are invalid as they impermissibly claim both an apparatus and a method of use. Specifically, Nautilus contends that claim 1 recites a heart rate monitor and a required step that a user holds the monitor. According to Nautilus, it is unclear whether the alleged infringement occurs when one makes a heart rate monitor having the recited structural elements, or whether infringement allegedly occurs when the user actually holds the handle and contacts the electrodes. This contention is unpersuasive.

The ’753 patent recites apparatus claims with functional limitations that describe the capability of substantially removing EMG signals. *See, e.g.*, ’753 patent col. 5 l. 16–col. 6 l. 15. Indeed, claim 1 of the ’753 patent is clearly limited to a heart rate monitor possessing the recited structure that is capable of substantially removing EMG signals. It is not indefinite. Accordingly, this case fails to invoke our decision in *IPXL Holdings, LLC v. Amazon.com, Inc.*, 430 F.3d 1377 (Fed. Cir. 2005) (holding claims at issue as indefinite because they simultaneously claimed an apparatus and method steps).

CONCLUSION

The only issue on this appeal is the summary judgment of indefiniteness. Other aspects of the defense of patent invalidity, although raised in the district court, are not before us, and may be considered on remand. We reverse the district court’s invalidity determination and remand for further proceedings.

REVERSED AND REMANDED

**United States Court of Appeals
for the Federal Circuit**

BIOSIG INSTRUMENTS, INC.,
Plaintiff-Appellant,

v.

NAUTILUS, INC.,
Defendant-Appellee.

2012-1289

Appeal from the United States District Court for the Southern District of New York in No. 10-CV-7722, Judge Alvin K. Hellerstein.

SCHALL, *Circuit Judge, concurring.*

I join the court's reversal of the judgment on appeal and its remand of the case for further proceedings. I write separately, however, because, while I agree with the court that the district court erred in holding claims 1 and 11 of the '753 patent invalid by reason of indefiniteness, I would rest that ruling on a more limited analysis. I therefore respectfully concur.

In Part II of the Discussion section of its opinion, the court correctly sets forth our law on indefiniteness. In short, a claim is indefinite (1) when it is not amenable to construction or (2) when, even if it can be construed, "the construction remains insolubly ambiguous, meaning it fails to provide sufficient clarity [delineating the metes]

and bounds of the claim to one of skill in the art,” *Star Scientific, Inc. v. R.J. Reynolds Tobacco Co.*, 655 F.3d 1364, 1373 (Fed. Cir. 2011). See *Datamize, LLC v. Plumtree Software, Inc.*, 417 F.3d 1342, 1347 (Fed. Cir. 2005) (“Only claims ‘not amenable to construction’ or ‘insolubly ambiguous’ are indefinite.”); see also *Star Scientific, Inc. v. R.J. Reynolds Tobacco Co.*, 537 F.3d 1357, 1371 (Fed. Cir. 2008) (“In and of itself, a reduction of the meaning of a claim term into words is not dispositive of whether the term is definite And if reasonable efforts at claim construction result in a definition that does not provide sufficient particularity and clarity to inform skilled artisans of the bounds of the claim, the claim is insolubly ambiguous and invalid for indefiniteness.”) (internal citations omitted). As the court concludes, neither of these two grounds for indefiniteness exists in this case.

First, the “spaced relationship” limitation plainly was amenable to construction. The district court construed the two recitations of “in spaced relationship with each other” in claim 1 to mean that “there is a defined relationship between the live electrode and the common electrode on one side of the cylindrical bar and the same or a different defined relationship between the live electrode and the common electrode on the other side of the cylindrical bar.” See *Biosig Instruments, Inc. v. Nautilus, Inc.*, No. 10-cv-7722, slip op. at 3 (S.D.N.Y. Sept. 29, 2011) (Dkt. 32, “Summary Order Memorializing Court’s Patent Claim Term Constructions After a *Markman* Hearing”). Neither Biosig nor Nautilus disputes that the district court did, in fact, construe the “spaced relationship” limitation.

Second, the court’s construction provided sufficient clarity to one of skill in the art as to the metes and bounds of the “spaced relationship” limitation. Put most simply, the district court construed that limitation to require “defined relationships,” between the live electrode and the

common electrode on each side of the cylindrical bar.¹ What that construction means is that, on each side of the cylindrical bar, there is a fixed spatial relationship between the live electrode and the common electrode. And the court correctly states that the intrinsic evidence relating to the '753 patent “discloses certain inherent parameters of the claimed apparatus, which to a skilled artisan may be sufficient to understand the metes and bounds of ‘spaced relationship’.” See Majority Op. at 13. In my view, along with the court’s subsequent rejection of Nautilus’s reliance on *Halliburton Energy Services, Inc. v. M-I LLC*, 514 F.3d 1244 (Fed. Cir. 2008); and *IPXL Holdings, L.L.C. v. Amazon.com, Inc.*, 430 F. 3d 1377 (Fed. Cir. 2005), that is all that is needed to put this case to rest.

My concern with the balance of the court’s analysis is that it presumes a functional linkage between the “spaced relationship” limitation and the removal of EMG signals. In other words, the analysis proceeds as if the “spaced relationship” limitation itself—rather than other limitations of claim 1—included a functional requirement to remove EMG signals. See Majority Op. at 16–17 (“[A] skilled artisan could apply a test and determine the ‘spaced relationship’ as pertaining to the function of substantially removing EMG signals.”); *id.* at 13 (“The functionality of the claimed heart rate monitor as recited in claim 1, described in the specification, and which provided the basis for overcoming the PTO’s office action rejections during reexamination, sheds further light on the meaning of ‘spaced relationship.’”). Indeed, the parties to this appeal and the district court seem to presume the same. The language of the “spaced relationship”

¹ Although this construction may be seen as broad, as the court notes, “[b]readth is not indefiniteness.” See Majority Op. at 19 (citing *SmithKline Beecham Corp. v. Apotex Corp.*, 403 F.3d 1331, 1340–41 (Fed. Cir. 2005)).

limitation, however, does not contain a functional requirement:

a first live electrode and a first common electrode mounted on said first half in spaced relationship with each other;

a second live electrode and a second common electrode mounted on said second half in spaced relationship with each other

'753 patent col. 5 ll. 28–33. In addition, as seen above, the district court's construction of the "spaced relationship" limitation does not include any functional language related to the removal of EMG signals, and Nautilus has not conditionally cross-appealed that construction.

In my view, we should not address a functional limitation included neither in the "spaced relationship" limitation itself nor in the district court's construction of that limitation. By allowing the functional limitation of EMG removal from elsewhere in claim 1 to color our analysis of the definiteness of the "spaced relationship" limitation, it seems to me we address an issue that is not currently before us.