NOTE: This disposition is nonprecedential.

United States Court of Appeals for the Federal Circuit

ERNIE BALL, INC.,
Plaintiff-Appellee,

v.

EARVANA, LLC,
Defendant-Appellant.

2012-1276

Appeal from the United States District Court for the Central District of California (Riverside) in No. 06-CV-0384, Judge Jacqueline H. Nguyen.

Decided: January 24, 2013

G. HENRY WELLES, Best Best & Krieger, LLP, of Indian Wells, California, for plaintiff-appellee. With him on the brief was KIRA L. KLATCHKO.

CHRISTIAN E. IVERSEN, of Paso Robles, California, for defendant-appellant.

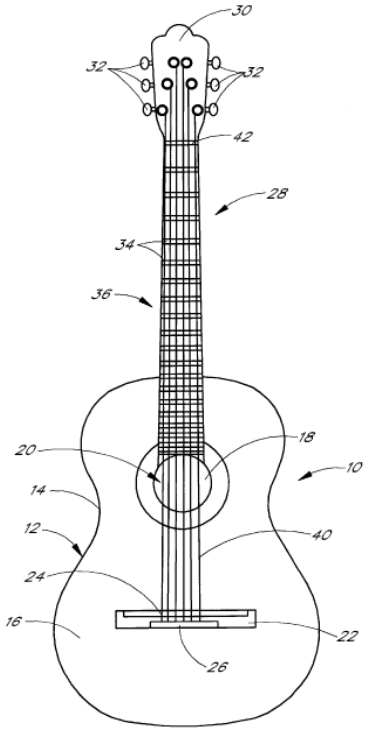
Before NEWMAN, LOURIE, and O'MALLEY, *Circuit Judges*.

LOURIE, *Circuit Judge*.

Defendant-Appellant Earvana, LLC ("Earvana") appeals from the final judgment of the United States District Court for the Central District of California holding U.S. Patent 6,433,264 (the "'264 patent"), assigned to Plaintiff-Appellee Ernie Ball, Inc. ("Ernie Ball"), valid and enforceable and holding Earvana liable for infringement. *Ernie Ball, Inc. v. Earvana, LLC*, No. 5:06-cv-00384-JHN-OPx, 2011 WL 201816, 2011 U.S. Dist. LEXIS 5831 (C.D. Cal. Jan. 21, 2011). Because we conclude that the asserted claims of the '264 patent are invalid under 35 U.S.C. § 112, we reverse.

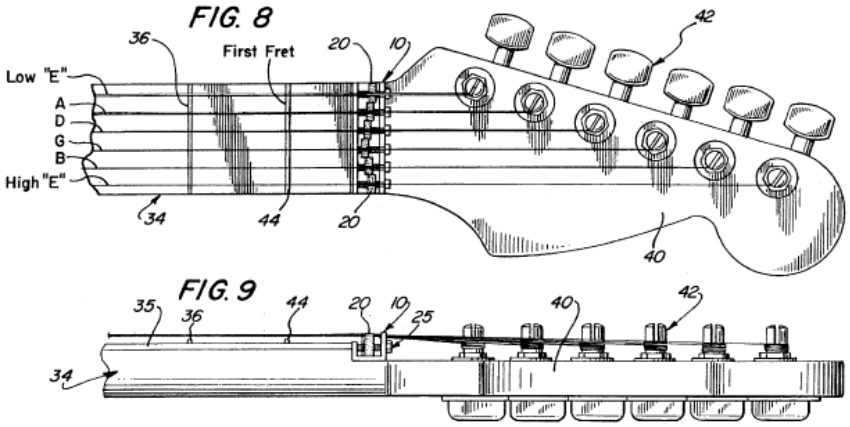
BACKGROUND

Ernie Ball and Earvana compete in the market for guitar parts designed to optimize the intonation along each of the instrument's strings. As depicted below, conventional guitars have a body (12), an elongated neck (28), a bridge (22), a nut (42), a series of frets (34) extending across the neck perpendicular to its length, and a number of strings (40) extending along the neck.



'264 patent fig. 1. The nut and the bridge each typically include slots or saddle positions for receiving each string, and those opposing saddle positions together define the effective length of each string. The strings are tuned to a desired pitch, which varies with the string's construction, diameter, tension, and length. Once the strings have been tuned, a user can derive various chords and notes by pressing the strings down at selected fret locations along the neck. Even after tuning, however, guitar players have recognized that the strings on a conventional guitar may not produce the correct intonation at each fret. Various technologies have been introduced to compensate for such tonal imperfections by varying the effective length of each string through adjustments to the position or configuration of the nut and/or the bridge. *See id.* col. 1 l. 11–col. 2 l. 43.

One such approach is disclosed in Earvana's U.S. Patent 5,481,956 (hereafter "LoJacono"),[1] relating to a compensated nut for achieving proper intonation along each string. Conventional guitar nuts have saddle positions disposed in a uniform linear arrangement running across the nut parallel to the frets. In contrast, LoJacono describes an adjustable compensated nut (10) that includes separate, independently adjustable saddle members (20) for each string, as below.



LoJacono figs. 8, 9. By adjusting the positions of the individual saddle members, the strings' upper termination points can be shifted toward or away from the bridge, thus slightly altering the effective playable length of each string and allowing the optimal intonation to be achieved and maintained. *See id.* col. 7 ll. 5–50. Furthermore, because the individual strings generally require different levels of compensation, LoJacono notes that the saddle members will assume an offset or undulating pattern, termed a "sinusoidal configuration," once they have been positioned using the disclosed tuning methods:

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[1] U.S. Patent 5,481,956 issued to Richard J. LoJacono and James D. Walseth on January 9, 1996.

> When all the guitar strings are properly tuned . . . *the saddle [members] will define a substantially sinusoidal configuration*, indicated by line A—A, positioned over the juxtaposed saddle nuts . . . . [T]he configuration of sinusoidal line A—A will change according to different designs of various name brand guitar and their associated types of guitar strings . . . .

Id. col. 8 ll. 3–10 (emphasis added); *see also id.* figs. 2 (showing exemplary line A—A), 7, 8 (showing additional adjusted configurations).

LoJacono also discloses the possibility of using fixed (non-adjustable) compensated nuts set to a predefined "sinusoidal configuration." *Id.* col. 8 ll.13–31. The specification cautions, however, that fixed compensated nuts would be compatible only with an intended combination of guitar model and string type and thus might be disfavored by users accustomed to switching between different guitar strings.

Approximately three years after the LoJacono patent issued, Ernie Ball filed U.S. Patent Application 09/199,747 (the "'747 application"), which became the '264 patent now before us on appeal. The '264 patent discloses and claims a fixed compensated nut (42) having a number of individual "intonation portions," such as cut-outs (64), provided in the front side (52) of the nut, as illustrated below.

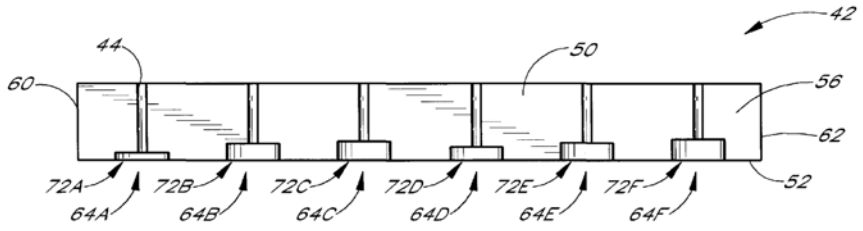

FIG. 2

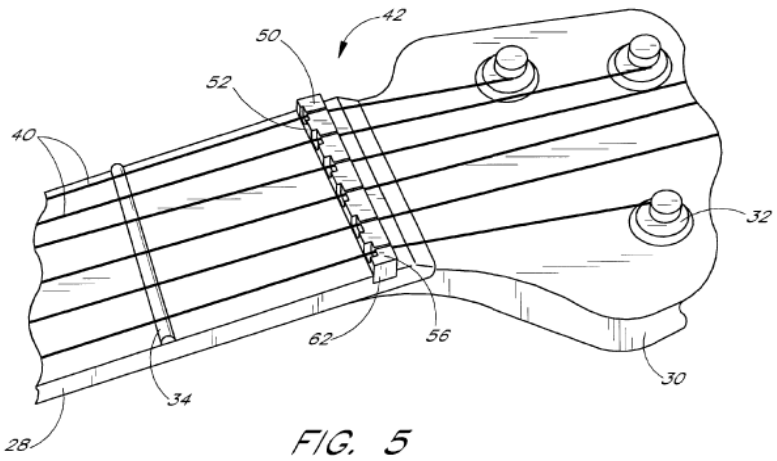

FIG. 5

'264 patent figs. 2, 5. The individual cut-outs "have generally the same configuration but different dimensions depending, for example, upon the desired pitch and intonation of the corresponding string." *Id.* col. 6 ll. 38–41. Like the adjustable saddle members disclosed by LoJacono, the varying depths of the cut-outs define the upper termination point and thus the effective length of each string. According to the '264 patent, however, the fixed design is comparatively "simple to manufacture because it consists of a single, solid component" and results in a more reliable instrument because it "does not require any adjustments and it does not go out of tune." *Id.* col. 3 ll. 36–43.

The '264 patent includes 29 claims directed to compensated nuts, stringed instruments containing compen-

sated nuts, and a method of making such instruments. For example, claim 1 recites:

> A compensated nut for a stringed instrument, the stringed instrument having one or more strings, a body and a neck, the nut comprising:
>
> an elongated body having a length sufficient to extend across at least a portion of the neck of the stringed instrument; and
>
> one or more fixed intonation portions on a front side of the elongated body, the intonation portions having different dimensions according to the desired pitch compensation for each string *and being configured such that a line extending through the one or more fixed intonation portions does not form a sinusoidal arc*.

Id. col. 9 ll. 44–55 (emphasis added). As originally filed, neither the written description nor the claims of the '747 application contained any mention of whether or not the intonation portions are arranged in a sinusoidal configuration. In fact, the word "sinusoidal" appears only once in the original '747 application (and only once in the written description of the corresponding '264 patent), in a brief description of the LoJacono reference as prior art. *See id.* col. 2 ll. 8–27 ("U.S. Patent No. 5,481,956 . . . discloses a guitar tuning apparatus . . . . [T]he nut has a sinusoidal configuration with a plurality of adjustable nut saddle members mounted in a nut frame."). Nevertheless, during prosecution all of the independent claims of the '747 application were amended to add limitations requiring that the intonation portions be provided in non-sinusoidal configurations in response to repeated obviousness rejections over LoJacono. The examiner allowed the claims as

amended, stating that "[t]he prior art does not teach the fixed intonations with different dimensions providing a line that does not form a sinusoid arc as recited by the applicant."

In 2006, Ernie Ball filed suit against Earvana alleging infringement of claims 1–4, 6–10, and 21–23 of the '264 patent and asserting state law claims for unfair competition. Earvana's answer raised 27 separate affirmative defenses and asserted counterclaims alleging noninfringement, unenforceability due to inequitable conduct, and invalidity under 35 U.S.C. §§ 102, 103, and 112.

The case was initially assigned to District Judge Florence-Marie Cooper, who granted partial summary judgment in favor of Ernie Ball, finding that Earvana had infringed the '264 patent and rejecting Earvana's counterclaims for invalidity and inequitable conduct. *Ernie Ball, Inc. v. Earvana, LLC*, No. 5:06-cv-00384-FMC-OPx (C.D. Cal. July 20, 2009), ECF No. 90 ("*Summary Judgment*"). Upon reconsideration, Judge Cooper modified her summary judgment order to permit Earvana's inequitable conduct counterclaim to be presented at trial. *Ernie Ball, Inc. v. Earvana, LLC*, No. 5:06-cv-00384-FMC-OPx (C.D. Cal. Sept. 16, 2009), ECF No. 96. While the case remained pending, Judge Cooper passed away on January 15, 2010, and the matter was reassigned to then-District Judge Jacqueline H. Nguyen.[2]

Adopting all prior rulings in the case, Judge Nguyen conducted a bench trial in November 2010 to resolve the issue of inequitable conduct along with Ernie Ball's

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[2] Judge Nguyen served as a District Judge from December 4, 2009, until May 14, 2012, when she assumed her current duties as a Circuit Judge on the United States Court of Appeals for the Ninth Circuit.

unfair competition claims. Following trial, the district court determined that (i) Earvana failed to establish that Ernie Ball engaged in inequitable conduct in obtaining the '264 patent, (ii) Ernie Ball was entitled to a reasonable royalty to compensate for Earvana's adjudged infringement of the '264 patent, and (iii) Earvana was not liable for unfair competition. *Ernie Ball, Inc. v. Earvana, LLC*, No. 5:06-cv-00384-JHN-OPx, 2010 U.S. Dist. LEXIS 123517 (C.D. Cal. Nov. 8, 2010). The district court subsequently awarded $165,016.80 in damages and permanently enjoined Earvana from further infringing the '264 patent. *Ernie Ball, Inc. v. Earvana, LLC*, No. 5:06-cv-00384-JHN-OPx (C.D. Cal. Jan. 25, 2011), ECF No. 138.

Earvana initially filed its appeal in the United States Court of Appeals for the Ninth Circuit, which concluded that this case "arises under patent law" and therefore lies outside of its appellate jurisdiction. *Ernie Ball, Inc. v. Earvana, LLC*, No. 11-55532 (9th Cir. Mar. 14, 2012). The Ninth Circuit transferred the appeal to this court, and we have jurisdiction pursuant to 28 U.S.C. § 1295(a)(1).

DISCUSSION

I.

On appeal, Earvana disputes various aspects of the district court's judgment, including its holdings on claim construction, validity, infringement, and inequitable conduct. Before addressing the merits, we must note that the parties make no more than passing reference to any particular claim, generically structuring their arguments on claim construction, infringement, and validity as if they applied to the '264 patent as a whole, rather than, as they must, to one or more of its discrete claims. *See, e.g.*, Appellant's Br. 29 ("[P]ursuant to 35 U.S.C. §§102, 103,

and 112, Ernie Ball's ['264] patent is invalid for several reasons . . . ."); *id.* at 31 ("[T]he [LoJacono] patent anticipates the configurations of the compensated nuts created by Ernie Ball . . . ."); Appellee's Br. 17 ("Earvana admitted it manufactured and sold compensated nuts that infringed upon all the elements of the '264 patent . . . ."). As is black letter law, the claims define the exclusive rights conferred by a patent, and the validity and infringement of those rights must be evaluated on a claim by claim basis. *E.g.*, *Amazon.com, Inc. v. Barnesandnoble.com, Inc.*, 239 F.3d 1343, 1351 (Fed. Cir. 2001); *SRI Int'l v. Matsushita Elec. Corp. of Am.*, 775 F.2d 1107, 1121 (Fed. Cir. 1985) (en banc).

Confronted by the same ambiguity, the district court appears to have treated claim 1 as representative of all of the asserted claims. *See Summary Judgment*, slip op. at 15. Neither party has criticized the district court's focus on claim 1, and we interpret their arguments on appeal as adopting that approach. *See* Appellee's Br. 18 (framing blanket claim construction arguments with reference to claim 1). Accordingly, we too will treat claim 1 of the '264 patent as representative of asserted claims 1–4, 6–10, and 21–23 for purposes of this appeal.

II.

Claim construction is a matter of law, reviewed *de novo* on appeal. *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1456 (Fed. Cir. 1998) (en banc). The parties to this case dispute the meaning of the term "sinusoidal" as used in the claims of the '264 patent—specifically, whether the intonation portions of the accused Earvana products are "configured such that a line extending through the one or more fixed intonation portions does not form a sinusoidal arc," *see* '264 patent col. 9 ll. 53–55, and whether the prior

art disclosures of LoJacono anticipate or render obvious the properly construed claims of the '264 patent.

The district court perceived the ordinary meaning of "sinusoidal" to indicate a configuration conforming to the shape of a sine wave or arc. Apparently finding no guidance in the '264 patent itself, the court turned to the prior art LoJacono patent for insight into the proper construction. The court noted a "significant possibility" that LoJacono could be read to use the term "sinusoidal" as "indicat[ing] any configuration not conforming to a straight line," but it concluded that, on balance, LoJacono supported interpreting the term "sinusoidal" in the claims of the '264 patent according to its more restrictive plain meaning. The district court therefore construed "sinusoidal" to mean "a configuration that strictly conforms to the shape of a sine wave or arc." *Summary Judgment*, slip op. at 10–14. Paradoxically, the district court's narrow construction of "sinusoidal" in view of the prior art had the practical effect of conferring expansive scope on Ernie Ball's overarching claims, which incorporate the term in a negative limitation (*i.e.*, the claims require configurations that are *not* sinusoidal). Accordingly, under the district court's construction, the asserted claims cover fixed compensated nuts having any configuration that does not strictly conform to the shape of a sine wave or arc.

Earvana, relying primarily on LoJacono, contends on appeal that "sinusoidal" should not be so narrowly construed and should instead encompass any non-linear arrangement of termination points that results from individually compensating each string. For its part, Ernie Ball acknowledges that the specification of the '264 patent does not explain what qualifies as a non-sinusoidal nut configuration but argues that one of ordinary skill in the

art would nonetheless understand the ordinary meaning of the term.

We conclude that the district court's construction of the term "sinusoidal" was correct. The plain meaning of "sinusoidal" connotes conformity with a mathematically defined curve derived from the trigonometric sine function,[3] and neither the specification nor the prosecution history of the '264 patent clearly sets forth a different definition. *See Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996) ("[W]ords in a claim are generally given their ordinary and customary meaning, [but] a patentee may choose to be his own lexicographer and use terms in a manner other than their ordinary meaning, as long as the special definition of the term is clearly stated in the patent specification or file history.").

The specification of the '264 patent provides little guidance. The word "sinusoidal" appears in the specification only once—in a passage describing the subject matter of the LoJacono patent. *See* '264 patent col. 2 l. 16. As for the prosecution history, the limitation excluding "sinusoidal" configurations from claim 1 was introduced by amendment after several years of prosecution and repeated rejections based on LoJacono. In comments accompanying the amendment, Ernie Ball argued that LoJacono disclosed compensated nuts having a sinusoidal configuration and "taught away from any fixed nut that was *not sinusoidal*" such as those specified in the amended claims of the '747 application. In essence, Ernie Ball equated "sinusoidal," as used in the amended claims, with "that

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[3] The sine function is commonly represented by the mathematical formula $y = A(\sin(Bx + C)) + D$, where the variables A, B, C, and D dictate the resulting curve's amplitude, frequency, phase shift, and vertical shift, respectively.

which is not disclosed by LoJacono," however understood. As the district court recognized, however, and despite Earvana's arguments to the contrary, LoJacono itself provides no clear definition of "sinusoidal" in the context of compensated guitar nuts.

Accordingly, we conclude that one of ordinary skill in the art reading the '264 patent in view of the relevant intrinsic record would rely on the term's ordinary meaning and would therefore understand the term "sinusoidal," as used in claim 1, to indicate "a configuration that strictly conforms to the shape of a sine wave or arc."

III.

Earvana argues that, even if the district court's construction of "sinusoidal" was correct, it does not infringe the claims of the '264 patent. We do not reach that issue, however, as, having examined the '264 patent, its claims, and its prosecution history in construing the contested claim term, we hold that the asserted claims are invalid as a matter of law for failure to satisfy the requirements of § 112.

Before the district court, Earvana consistently argued that "the '264 patent is invalid" pursuant to §§ 102, 103, and 112. Unfortunately, the dialogue on validity essentially ended there. The parties' submissions never evolved beyond the most barren generalities, characterized by cursory recitations of statutory bases for invalidity and untethered debate about the LoJacono reference. As a result, the arguments on both sides lacked fundamental details at every turn—for example, which claims were challenged under each section, which limitations of those claims were in dispute, and which specific provisions of § 112 were at issue, to name a few—leaving the district

court to guess at which of many possible validity issues were material to resolving the dispute.

The parties' lack of focus, not surprisingly, is reflected in the district court's judgment on invalidity; its entire analysis spans only a single paragraph:

> Defendant's invalidity counterclaim is premised upon its contention that [LoJacono] and '264 patent disclose the same invention, and because the [LoJacono] patent was issued first, the '264 patent should be invalidated for anticipation and obviousness pursuant to 35 U.S.C. § 102, 103, 112. However, as previously discussed in the Court's claim construction of "sinusoidal configuration," [LoJacono] and the '264 patent are distinct and cover different subject matter. [LoJacono's] specification and claims are limited to a guitar nut whose intonation portions have a defined sinusoidal configuration while the '264 patent's intonation portions do not form a sinusoidal arc. The Court therefore does not find Plaintiff's '264 patent to be invalid for anticipation or obviousness.

Summary Judgment, slip op. at 16. Notably, the district court's discussion fails even to address § 112, much less analyze the validity of any claim in view of that section's multiple substantive requirements. Given the uncomplicated subject matter of the instant patent and the prior art patent, however, it is clear from the record that the asserted claims fail the definiteness requirement of § 112, ¶ 2.[4]

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[4] 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. Because this case was

While Earvana has not specifically pointed to the definiteness requirement of § 112, ¶ 2, it did challenge the asserted claims as invalid under § 112 in the district court, and it maintains that assertion on appeal. The definiteness requirement "is drawn from the court's performance of its duty as the construer of patent claims." *Atmel Corp. v. Info. Storage Devices*, 198 F.3d 1374, 1378 (Fed. Cir. 1999); *see also Eplus, Inc. v. Lawson Software, Inc.*, 700 F.3d 509 (Fed. Cir. 2012) ("[I]ndefiniteness is a question of law and in effect part of claim construction."). "The reviewing tribunal must determine whether a person experienced in the field of the invention would understand the scope of the claim when read in light of the specification." *Energizer Holdings, Inc. v. Int'l Trade Comm'n*, 435 F.3d 1366, 1369 (Fed. Cir. 2006). We therefore address definiteness as a pure legal question where, as here, in discharging our "duty as the construer of patent claims" we reach the inescapable conclusion that the claims at issue cannot satisfy the definiteness standard.

Claim 1 requires "that a line extending through the one or more fixed intonation portions does not form a sinusoidal arc." '264 patent col. 9 ll. 53–55. While the district court reasonably interpreted the term "sinusoidal" according to its plain meaning as "a configuration that strictly conforms to the shape of a sine wave or arc," that construction does not resolve the fundamental problem facing anyone attempting to divine the very broad boundaries of claim 1: the intonation portions of any compensated nut represent only a handful of discrete points that cannot unambiguously define a single line extending therethrough. For example, even an embodiment dis-

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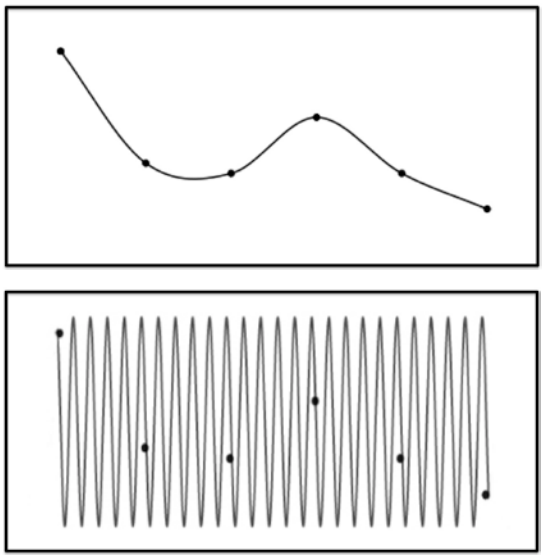
filed before that date, we will refer to the pre-AIA version of § 112.

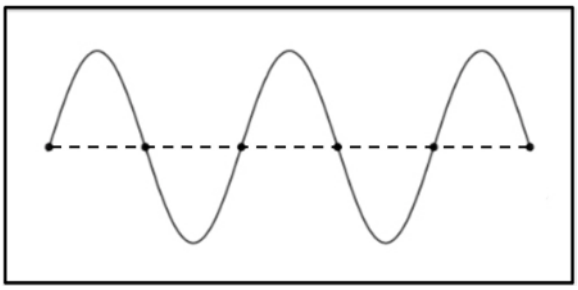
closed in the '264 patent[5] that Ernie Ball characterizes as having a "stair step or triangular wave configuration" within the scope of claim 1 could appear either to be infringing (*i.e.*, the line "does not form a sinusoidal arc") or noninfringing (*i.e.*, the line forms a sinusoidal arc) depending on which of the many possible lines through the intonation portions one chooses to draw. The first line depicted below is non-sinusoidal, whereas the second is sinusoidal:



As illustrated, the disclosed points can be connected using various undulating lines, including at least one sinusoidal line with a constant frequency and amplitude and at least one non-sinusoidal line without. Even intonation portions arranged in the simplest possible configuration—a

[5] The '264 patent discloses a fixed compensated nut for a six-string guitar, configured with the following compensation amounts for each string (in inches): 0.042, 0.020, 0.018, 0.029, 0.018, and 0.011. '264 patent col. 8 ll. 39–52.

straight line across the nut—could be connected using a sinusoidal or a non-sinusoidal line, as depicted below.



In short, it is impossible to tell based on the set of discrete points defined by the intonation portions of a given compensated guitar nut whether "a line" extending through those points does or does not form a sinusoidal arc because those points provide no information regarding the line's shape or position as it traverses the intervening spaces. As a result, the question whether a fixed compensated nut with any particular arrangement of intonation portions would infringe claim 1 of the '264 patent depends on which among a limitless number of possible lines extending through those intonation portions one has in mind at any given time. In other words, ascertaining the scope of claim 1 reduces to a matter of subjective perception.

"When faced with a purely subjective phrase . . . a court must determine whether the patent's specification supplies some standard for measuring the scope of the phrase." *Datamize, LLC v. Plumtree Software, Inc.*, 417 F.3d 1342, 1351 (Fed. Cir. 2005). Here, the '264 patent offers no objective way to discern the appropriate (sinusoidal or non-sinusoidal) line extending through the intonation portions of a nut for purposes of determining infringement. As in *Datamize*, claim 1 thus "fails to delineate the scope of the invention using language that adequately notifies the public of the patentee's right to

exclude." *Id.* at 1353. Accordingly, claim 1 is invalid for failure to satisfy § 112, ¶ 2. In addition, because the parties have treated claim 1 as representative of all of the asserted claims, and because each of those claims suffers from a similar lack of clarity, we conclude those claims are also invalid as indefinite.

CONCLUSION

Because we conclude that asserted claims 1–4, 6–10, and 21–23 of the '264 patent are invalid on grounds of indefiniteness, we need not reach the parties' remaining arguments concerning validity, inequitable conduct, infringement, or damages. For the foregoing reasons, we *reverse* the final judgment of the district court.

REVERSED