

# United States Court of Appeals for the Federal Circuit

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**IRONBURG INVENTIONS LTD.,**  
*Plaintiff-Cross-Appellant*

v.

**VALVE CORPORATION,**  
*Defendant-Appellant*

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2021-2296, 2021-2297, 2022-1070

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Appeals from the United States District Court for the Western District of Washington in No. 2:17-cv-01182-TSZ, Senior Judge Thomas S. Zilly.

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Decided: April 3, 2023

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GREGORY S. TAMKIN, Dorsey & Whitney LLP, Denver, CO, argued for plaintiff-cross-appellant. Also represented by ANDREA AHN WECHTER; FORREST KWAHADA TAH-DOOAHNIPPAH, Minneapolis, MN; ROBERT DAVID BECKER, Manatt, Phelps & Phillips, LLP, San Francisco, CA; BENJAMIN G. SHATZ, Los Angeles, CA.

SHARON A. ISRAEL, Shook, Hardy & Bacon, LLP, Houston, TX, argued for defendant-appellant. Also represented by KYLE E. FRIESEN; PATRICK A. LUJIN, MARK SCHAFFER, BASIL TRENT WEBB, Kansas City, MO; REYNALDO BARCELO, Barcelo, Harrison & Walker, LLP, Newport Beach, CA.

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Before LOURIE, CLEVINGER, and STARK, *Circuit Judges*.

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

Dissenting opinion filed by *Circuit Judge* CLEVINGER.

STARK, *Circuit Judge*.

In 2015, Ironburg Inventions Ltd. (“Ironburg”) sued Valve Corporation (“Valve”) for infringing U.S. Patent No. 8,641,525 (the “525 patent”). In January 2021, after much pretrial litigation and a change of venue, a jury trial was held in the United States District Court for the Western District of Washington. Due to the global pandemic caused by the novel coronavirus, the trial proceeded virtually, with each juror attending trial remotely through videoconferencing technology. Before closing arguments, the parties and the district court agreed that each juror should have the accused product in hand, and that device – a hand held controller for playing video games – was mailed to each juror.

The multitude of issues presented in these cross-appeals does not, happily, include any challenge to the virtual nature or mechanics of the trial. Nevertheless, the reality of how the trial was conducted, and particularly the fact that the jurors were free to assess, through their own interactions with the accused device, whether a disputed claim limitation is met, is pertinent to at least one of the issues before us, so we mention the district court’s creative approach here at the outset.

Prior to trial, the district court rejected invalidity challenges based on the purported indefiniteness of several claim terms. It also held that Valve was estopped from pressing its prior-art-based invalidity defenses as a consequence of Valve’s partially instituted *inter partes* review

(“IPR”). Trial, therefore, proceeded only on infringement and damages issues.

The jury returned a verdict of willful infringement and assessed damages of over \$4 million. On post-trial motions, the district court denied Valve’s motion for judgment as a matter of law – which sought a judgment of non-infringement and, failing that, a judgment that infringement was not willful – and also for a new trial. The new trial request was based on the admission of testimony from Duncan Ironmonger, Ironburg’s inventor and corporate representative, and on the exclusion of testimony from Karl Quackenbush, Valve’s general counsel. The district court also denied Ironburg’s motion to enhance damages. Both parties appealed.

On appeal, we: (1) affirm the judgment that (a) “elongate member” is not indefinite, (b) “extends substantially the full distance between the top edge and the bottom edge” is not indefinite, (c) the claims are infringed, (d) the infringement was willful, (e) damages will not be enhanced, and (f) Valve is estopped from litigating the prior-art grounds on which IPR was requested but not instituted; and (2) vacate the district court’s conclusion that Valve is also estopped from litigating its later-discovered invalidity grounds and remand for further proceedings solely with respect to this issue.

I

A

Ironburg owns the ’525 patent, entitled “Controller for Video Game Console,” which is directed to “a hand held controller for a video game console” that “includes one or more additional controls located on the back of the controller in a position to be operated by the user’s [middle, ring, or little] fingers.” ’525 patent 1:49-58. This back control is described in the specification as “inherently resilient” and is “elongate in shape and substantially extend[s] in a

direction from the top edge to bottom edge of the controller.” *Id.* 3:34, 3:51-53.

Claim 1 is representative and is reproduced below, with the pertinent limitation highlighted:

A hand held controller for a game console comprising:

an outer case comprising a front, a back, a top edge, and a bottom edge, wherein the back of the controller is opposite the front of the controller and the top edge is opposite the bottom edge; and

a front control located on the front of the controller;

wherein the controller is shaped to be held in the hand of a user such that the user’s thumb is positioned to operate the front control; and

a first back control and a second back control, each back control being located on the back of the controller and each back control *including an elongate member that extends substantially the full distance between the top edge and the bottom edge and is inherently resilient and flexible.*

*Id.* cl. 1 (emphasis added).

## B

Ironburg accused Valve’s Steam Controller, a video game controller for PC gaming, of infringing claims 2, 4, 7, 9, 10, and 11 of the ’525 patent. The back of the Steam Controller has two grip buttons. In development, the Steam Controller went through a series of prototypes (pictured below), including the Chell and Dog prototypes, which were publicly disclosed.



Back of the Chell prototype (Appx13889).



Back of the Dog prototype (Appx13904).

After the '525 patent issued, Ironburg sent a letter notifying Valve of the patent and Valve's potential infringement, pointing to the Chell prototype and also noting that "current or future products that incorporate similar features" might also infringe. Appx13517-19. Karl Quackenbush, Valve's general counsel, responded to the letter by participating in several phone calls with Ironburg's representatives. Valve then began selling the final version of the Steam Controller, which is depicted below, in November 2015.



Back of the final Steam Controller (Appx13882).

Ironburg sued Valve in the Northern District of Georgia on December 3, 2015. Valve then filed a petition with the United States Patent and Trademark Office (“PTO”), which partially instituted an IPR on September 27, 2016, as was permitted prior to the Supreme Court’s decision in *SAS Institute Inc. v. Iancu*, 138 S. Ct. 1348 (2018). The Patent Trial and Appeal Board (“PTAB” or “Board”) instituted the IPR on three grounds, but declined to institute on two other grounds (the “Non-Instituted Grounds”). The Board then issued its Final Written Decision on September 22, 2017, cancelling claims 1, 6, 13, 14, 16, 17, 19, and 20 of the ’525 patent. Valve did not seek a remand pursuant to SAS, which would have allowed the Board to consider the Non-Instituted Grounds.

In August 2017, while the IPR was pending, the case was transferred to the Western District of Washington, and that court adopted many of the Board’s claim constructions. Prior to trial, Ironburg moved for an order applying IPR estoppel, pursuant to 35 U.S.C. § 315(e)(2), to: (1) the Non-Instituted Grounds and (2) the invalidity grounds Valve discovered based on a third party’s IPR petition that was filed after Valve’s own IPR petition (the “Non-Petitioned Grounds”). The district court granted the estoppel motion in full. The case went to trial over Zoom for five days, and on February 1, 2021, the jury returned a verdict

finding that Valve willfully infringed claims 2, 4, 7, 9, 10, and 11 of the '525 patent and awarded \$4,019,533.93 in damages. Following trial, the district court denied Valve's motions for judgment as a matter of law or alternatively a new trial and also denied Ironburg's motion for enhanced damages. The parties timely appealed. We have jurisdiction pursuant to 28 U.S.C. § 1295(a)(1).

## II

Valve makes the following arguments on appeal: (a) the asserted claims of the '525 patent are invalid as indefinite; (b) the trial record did not contain sufficient evidence to support a finding of infringement or, alternatively, Valve is entitled to a new trial on infringement because the district court erroneously permitted a co-inventor of the '525 patent to provide opinion testimony on infringement while excluding proffered testimony from Valve's general counsel; (c) the district court erred by denying as moot Valve's motion for judgment as a matter of law that any infringement was not willful; and (d) Valve should not have been estopped from asserting any of the prior art grounds it sought to press against the validity of the '525 patent. On cross-appeal, Ironburg argues that the district court abused its discretion in denying its motion for enhanced damages. We address each of these issues in turn, affirming the district court on all points except with respect to estoppel of the Non-Petitioned Grounds, as to which we vacate and remand for further proceedings.

## A

Valve argues that the district court erred in concluding that two claim terms in the '525 patent were not indefinite. In Valve's view, Ironburg's asserted claims are all invalid based on the indefiniteness of "elongate member" and "substantially the full distance between the top edge and the bottom edge."

“We review a determination of indefiniteness *de novo*. Determinations about governing legal standards and about intrinsic evidence are reviewed *de novo*, and any factual findings about extrinsic evidence relevant to the question . . . are reviewed for clear error.” *BASF Corp. v. Johnson Matthey Inc.*, 875 F.3d 1360, 1365 (Fed. Cir. 2017). A patent is indefinite “if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention.” *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014). This standard “mandates clarity, while recognizing that absolute precision is unattainable.” *Id.* at 910. Words of degree are not “inherently indefinite,” but “the court must determine whether the patent provides some standard for measuring that degree.” *Biosig Instruments, Inc. v. Nautilus, Inc.*, 783 F.3d 1374, 1378 (Fed. Cir. 2015) (internal quotation marks omitted). “Moreover, any fact critical to a holding on indefiniteness . . . must be proven by the challenger by clear and convincing evidence.” *Grace Instrument Indus., LLC v. Chandler Instruments Co.*, 57 F.4th 1001, 1008 (Fed. Cir. 2023) (internal quotation marks omitted).

Applying *de novo* review, we agree with the district court that neither of the challenged terms is indefinite.

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The parties and the district court agreed that an elongate shape must be longer than it is wide. Appellant Br. at 29-30; Appellee Br. at 26; Appx11 (elongate member is “notably long in comparison to its width”). Valve contends, nonetheless, that “elongate member” is indefinite due to the patent’s lack of objective guidance as to how much longer than wider the member must be in order to be “elongate.” Appellant Br. at 29-31. Such numerical precision is not always required, even when using a term of degree. *See Exmark Mfg. Co. v. Briggs & Stratton Power Prods. Grp.*,



879 F.3d 1332, 1346 (Fed. Cir. 2018); *see also Sonix Tech. Co. v. Publ'ns Int'l, Ltd.*, 844 F.3d 1370, 1377 (Fed. Cir. 2017) (“[A] patentee need not define his invention with mathematical precision.”) (internal quotation marks omitted). Here, notwithstanding the lack of such precision in the patent, the record does not contain clear and convincing evidence that a person of ordinary skill in the art would fail to be reasonably certain whether a member is elongate or not. To the contrary, the patent provides sufficient guidance to give one of ordinary skill reasonable certainty as to the scope of the claims.

In particular, the specification states that “[t]he paddles 11 are elongate in shape and substantially extend in a direction from the top edge to the bottom edge of the controller 10.” ’525 patent 3:51-53. The specification continues:

This elongate shape allows a user to engage the paddles with any of the middle, ring, or little finger; it also provides that different users having different size hands can engage with the paddles in a comfortable position thereby reducing the effects of prolonged or repeated use such as repetitive strain injury.

*Id.* 3:56-61.

In this way, the specification instructs a person of ordinary skill in the art that the “elongate member” on the back of the controller must substantially extend from the top to bottom edge of the controller such that users of varying hand sizes may engage the paddle with their third, fourth, and fifth fingers. The patent expressly discloses an embodiment, Figure 2 (shown below), which depicts how paddles (item 11 in the figure) may constitute elongate members. From all this intrinsic evidence, as well as the undisputed requirement that the length be greater than the width, one of ordinary skill would understand that for members to be

elongate, as the claims require, they must be sufficiently long to permit a wide range of people, having very different sized hands, to operate the member.

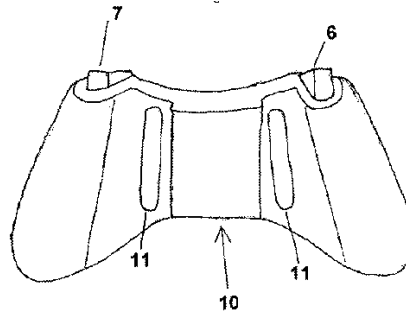


Figure 2

'525 patent fig. 2.

As the district court did, we find further support for our conclusion, that a person of ordinary skill would be able to reasonably ascertain the scope of the “elongate member” in the context of the '525 patent’s claims, in prior cases in which we have rejected indefiniteness challenges to similar claim terms. *See, e.g., Exmark*, 879 F.3d at 1345-47 (upholding “elongated and substantially straight” baffle as definite); *Biosig*, 783 F.3d at 1382-84 (finding “spaced relationship,” in claim which also required “elongate member,” correlated with width of user’s hand and not proven indefinite); *see also generally Hologic, Inc. v. SenoRx, Inc.*, 639 F.3d 1329 (Fed. Cir. 2011) (involving claim requiring “elongate member” in patent for balloon-expandable coronary stent); *Thomas & Betts Corp. v. Litton Sys. Inc.*, 720 F.2d 1572 (Fed. Cir. 1983) (involving claim requiring “elongate member” in patent for electrical connecting device).

Valve’s arguments do not persuade us to reach a different conclusion. Valve asserts that Ironburg’s expert’s trial testimony that an elongate member is “notably longer than [it is] wide,” Appx11784, was contradicted by a portion of Ironburg’s closing statement, in which counsel told the jury that “elongate member” imposes “no width requirement,”

Appx12112. Valve did not make this argument to the district court, and it is forfeited. *See In re Google Tech. Holdings LLC*, 980 F.3d 858, 862 (Fed. Cir. 2020) (“[F]orfeiture is the failure to make the timely assertion of a right.”) (internal quotation marks omitted).

Valve also insists that if “elongate member” is not indefinite, then the district court needed to construe it. The district court, after identifying examples of cases involving patent claims containing “elongate member” limitations that were not held to be indefinite, and explaining that “the patent[] use[s] the word ‘elongate’ in its usual sense, as a modifier indicating that an element is ‘notably long in comparison to its width,’” stated “[t]he term ‘elongate member’ means what it says” and gave the term its plain and ordinary meaning. Appx9-11, 15; *see also* Appx49. It also rejected Valve’s proposed construction – “distinct slender object having a length much greater than a maximum width” – because it “improperly import[ed] limitations (distinct, slender, much greater than a maximum) into the claims.” Appx15. On *de novo* review, we agree with the district court’s determinations on these points. *See Summit 6, LLC v. Samsung Elecs. Co.*, 802 F.3d 1283, 1291 (Fed. Cir. 2015) (“Because the plain and ordinary meaning of the disputed claim language is clear, the district court did not err by declining to construe the claim term.”); *ActiveVideo Networks, Inc. v. Verizon Commc’ns, Inc.*, 694 F.3d 1312, 1326 (Fed. Cir. 2012) (“ActiveVideo’s proposed construction erroneously reads limitations into the claims and the district court properly rejected that construction and resolved the dispute between the parties.”).

Finally, the parties argue over whether additional objective guidance as to the meaning of “elongate member” is provided in the prosecution history, especially the patent

applicant's discussion of the Ogata reference.<sup>1</sup> We agree with Ironburg that Ogata provides some additional data to a person of ordinary skill, at minimum confirming that an "elongate member" in the context of the '525 patent cannot be circular. In any event, even if Valve were correct that a skilled artisan would find nothing meaningful in the prosecution history, our conclusion would remain that Valve has nevertheless failed to prove the claim is indefinite.

## 2

Valve's second indefiniteness challenge is to the claim term "substantially the full distance between the top and bottom edge." This term is closely related to the "elongate member" term; it is the "elongate member" that must extend "substantially the full distance between the top edge and the bottom edge." '525 patent cl. 1. On this term, we again agree with the district court and conclude that Valve has failed to prove indefiniteness.<sup>2</sup>

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<sup>1</sup> The Ogata reference is U.S. Patent No. 6,394,609.

<sup>2</sup> While the district court labeled the section in which it resolved this indefiniteness dispute "Substantially," Appx11, it is clear that it understood the dispute to be about the alleged indefiniteness of the full claim term: "substantially the full distance between the top edge and the bottom edge." In the first sentence of its discussion, the court repeated the entire challenged claim term and expressly held that it "is likewise not indefinite." Appx11; *see also* Appx4-5 (stating that Valve contends "the . . . fourth . . . disputed claim term[] [is] indefinite" and identifying such fourth term as "substantially the full distance between the top edge and the bottom edge"). Later in its analysis, the court explained that "the elongate members, which extend 'substantially the full distance' between the top and bottom edges of the controller case, can be calibrated by a skilled

The intrinsic evidence permits a person of ordinary skill in the art to understand the scope of the term with reasonable certainty. In particular, the specification depicts an embodiment, in Figure 1, in which “[t]here is a left trigger 6, a right trigger 7, a left bumper 8, and a right bumper 9 located on the top edge of the controller 1.” ’525 patent 1:27-29.

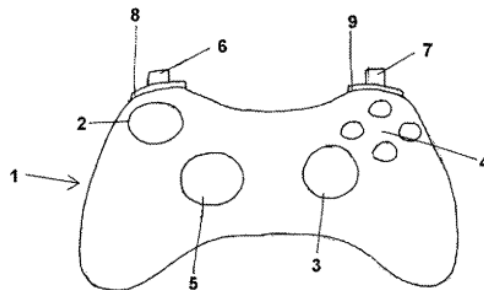


Figure 1

*Id.* Fig. 1. The patent then states that “the top edge is opposite the bottom edge.” *Id.* cl. 1; *see also id.* Fig. 2 (showing exemplary embodiment). All this guidance reasonably informs a person of ordinary skill in the art that the “full

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artisan to suit the average span of a human hand,” connecting its reasoning for finding no indefiniteness with the full term that Valve was challenging. Appx12. In the absence of any clear indication that the district court misapprehended or overlooked the full scope of Valve’s indefiniteness contention, we must presume that the court considered, and here rejected, all of it. *See Novartis AG v. Torrent Pharms. Ltd.*, 853 F.3d 1316, 1328 (Fed. Cir. 2017) (“[T]his court has said on multiple occasions that failure to explicitly discuss every issue or every piece of evidence does not alone establish that the tribunal did not consider it.”).

distance” is the entirety of the length between the top edge and the bottom edge directly opposite it.

As the district court further explained, “[w]ith respect to the rear controls, the word ‘substantially’ is reasonably precise, given that the purpose of the elongate shape is to allow ‘a user to engage the paddles with any of the middle, ring, or little finger.’” Appx11 (quoting ’525 patent 3:56-58). We agree with the district court that, just as in *Biosig*, where we concluded that an ordinarily skilled artisan would understand that “the term ‘spaced relationship’ correlated with the width of a user’s hand,” Appx11 (citing 783 F.3d at 1383), here such an artisan “can . . . calibrate[]” the elongate member “to suit the average span of a human hand.” Appx11-12. The need to meet the purpose of the claimed invention, which here is to allow users of various hand sizes to operate the back controls on a hand held game controller, helps inform one of ordinary skill’s understanding of the scope of the claims with reasonable certainty. Those embodiments that allow the claim’s purpose to be effectuated are within the scope of the claims, while those that do not are not.

Similar reasoning recently led us to vacate a district court holding that claims directed to an “enlarged chamber” in a patent for a liquid pressurized viscometer in connection with oil drilling were indefinite. *See Grace Instrument*, 57 F.4th at 1012. We concluded in *Grace* that “the intrinsic record provides an objective boundary for a skilled artisan – i.e., the ‘enlarged chamber’ must be large enough to prevent, during elevated pressurization, commingling of sample and pressurization fluids in the lower measurement zone.” *Id.* at 1010. “Thus, in the context of this patent, ‘enlarged chamber’ does not require that chamber to be *larger than* some baseline object; rather it must be *large enough* to accomplish a particular function.” *Id.* at 1009. The indefiniteness challenge in *Grace* was unsuccessful because a person of ordinary skill in the art would

know when a chamber is large enough to accomplish the function identified in the patent. Likewise, here, a person of ordinary skill in the art would know that an elongate member extends substantially the full distance between the top and bottom edge of a controller when the elongate member is long enough for different-sized hands to engage with the member using a middle, ring, or little finger.

At trial, Ironburg's expert, Mr. Garry Kitchen, explained just that, testifying:

[T]his positioning and shape of the back controls is specifically so someone with different length fingers, whether it be a child or an adult, and different size hands can wrap their hand around the controller and always have the end of their fingers laying on the control. Obviously if it was just a button and it was not substantially the distance between the top edge and the bottom edge, the fingers, depending on the length of them, may not land on the button.

Appx11767. Mr. Kitchen added that “[t]his is specifically designed to be easy for the user to use because it covers that range behind the fingers.” Appx11768; *see also generally Guangdong Alison Hi-Tech Co. v. Int’l Trade Comm’n*, 936 F.3d 1353, 1362 (“[T]he degree of precision necessary [for a term of degree] is a function of the nature of the subject matter.”) (internal quotation marks omitted).<sup>3</sup>

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<sup>3</sup> Further support for our conclusion is found in the fact that the PTAB was able to construe the claim term without any indication the parties (or their experts) had any difficulty discerning the meaning of the term. Specifically, the Board construed “substantially the full distance between the top edge and the bottom edge” as “largely but

Valve compares the '525 patent claims to claims we held indefinite in *Dow Chemical Co. v. Nova Chemicals Corp.*, 803 F.3d 620 (Fed. Cir. 2015), and *Teva Pharmaceuticals USA, Inc. v. Sandoz, Inc.*, 789 F.3d 1335 (Fed. Cir. 2015). In *Dow*, 803 F.3d at 634-35, we found indefiniteness because the patent failed to teach how the “slope of strain hardening” should be measured. The evidence revealed at least three different methods to measure the slope (the 10% secant method, final slope method, and most linear method) and the patentee’s expert created a fourth method for his analysis. *See id.* at 633-34. We held that “the existence of multiple methods leading to different results without guidance in the patent or the prosecution history as to which method should be used renders the claims indefinite.” *Id.* at 634. Similarly, in *Teva*, 789 F.3d at 1344-45, we concluded that “molecular weight” was indefinite because the intrinsic evidence did not teach which one of three measurements,  $M_p$ ,  $M_n$ , and,  $M_w$ , was most appropriate yet the different techniques produced different results. *See* 789 F.3d at 1341 (“The parties agree that ‘molecular weight’ could refer to  $M_p$ ,  $M_w$ , or  $M_n$ . And they agree that each of these measures is calculated in a different way and would typically yield a different result for a given polymer sample.”).

We are not persuaded by this comparison.<sup>4</sup> As we explained in *Presidio Components, Inc. v. American Technical*

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not necessarily the entire distance between the top and the bottom edges,” a construction the district court later adopted as well. Appx11.

<sup>4</sup> Valve did not cite *Dow* or *Teva* to the district court, so, understandably, that court did not consider the impact of these cases. Less understandable is why Ironburg did not address them in its brief to us, as Valve featured *Dow* and *Teva* in its opening brief. Neither party’s briefing



*Ceramics Corp.*, 875 F.3d 1369, 1377 (Fed. Cir. 2017), what rendered the claims in *Dow* and *Teva* indefinite was that “the challenger ha[d] shown that there were competing existing methodologies that reached different results, and the patent failed to describe which of the multiple methods to use.” Here, by contrast, both parties’ experts agreed on and used the same measurement methodology – which was simply to find the distance between two points. That is, unlike the parties in *Dow* and *Teva*, the disagreement between Ironburg and Valve is about the application of an agreed-upon, straightforward methodology.

While *Dow* found indefinite claims of a patent that failed to teach with reasonable certainty “*how* the ‘slope of strain hardening’ should be measured,” 803 F.3d at 633 (emphasis added), our case presents no dispute as to *how* the “full distance” (or “substantially the full distance”) is to be measured. Valve’s argument, instead, is that one of skill in the art would not know *where* to measure. In Valve’s view, while the “top edge” may be reasonably ascertainable, skilled artisans would not know where to locate the “bottom edge.” This is a dispute about *application* of an agreed-upon measurement technique. In the context of the case before us, this dispute gives rise to a question of infringement, because the parties disagree as to *where* to apply their agreed-upon measurement technique to Valve’s accused product. The parties’ dispute in this case does not, however, constitute clear and convincing evidence of lack of reasonable certainty as to claim scope, given what we have identified in the specification and given the skilled artisan’s understanding of the need to meet the purpose of

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failures absolve us of our obligation to apply our binding precedent. Ironburg does not argue that Valve forfeited its opportunity to rely on *Dow* and *Teva*, and Ironburg’s own decision not to brief these cases cannot be read as a concession that they are indistinguishable.

the invention (i.e., to allow users of various hand sizes to operate the back controls on a hand held game controller). *See generally Presidio*, 875 F.3d at 1377 (“[E]ven where the claims require a particular test result, there may be (and often are) disputes between the parties as to the proper application of the test methodology in the circumstances of an individual case. But those disputes are disputes about whether there is infringement, not disputes about whether the patent claims are indefinite.”).

Valve devotes a sizeable portion of its briefing to describing how the parties’ infringement experts espoused different views on the location of the top and bottom edge, and how far an elongate member must stretch to extend “substantially the full distance.” Ironburg correctly responds that reasonable disputes over infringement do not make a patent claim indefinite. *See Appellee Br.* at 36-37 (“In every case where the parties contest infringement, they will have *some* dispute as to how to apply the claim language to the accused device. This does not mean that every patent is indefinite [except where] infringement is indisputable. . . . [T]o accept Valve’s argument would allow an infringer to manufacture indefiniteness by simply hiring an expert willing to disagree with the patentee’s infringement analysis.”). That the jury could have credited Valve’s expert and found that the Steam Controller does not have elongate members stretching “substantially the full distance from the top edge to the bottom edge,” but alternatively was free to (and did) credit Ironburg’s contrary position, does not render the claim indefinite. *See SmithKline Beecham Corp. v. Apotex Corp.*, 403 F.3d 1331, 1340-41 (Fed. Cir. 2005) (“The test for indefiniteness does not depend on a potential infringer’s ability to ascertain the nature of its own accused product to determine infringement, but instead on whether the claim delineates to a skilled artisan the bounds of the invention.”). Instead, it simply means the parties here had a genuine dispute on the material question of infringement.

The dissent contends we are disrupting settled law by “artificially bifurcating the ‘how’ and ‘where’” of measurement and are doing so “in order to remove the ‘where’ question from the assessment of indefiniteness.” Dissent at 6. This is a misreading of our analysis, which is consistent with precedent for the reasons we have explained. As the dissent elsewhere acknowledges, the distinction between “how” and “where” is not our creation and has been recognized in our cases at least since *Dow*. *Id.* at 5 (“*Dow* makes clear that the indefiniteness of measurement claims can involve both ‘how’ to measure (i.e., the means for making the measurement) and ‘where’ along an item to be measured to apply the ‘how’ means.”). And our decision today does not establish *per se* rules that teaching “how” to measure necessarily renders a claim definite or that questions of “where” are always issues of infringement.

Instead, our holding today is, necessarily, bound to the record before us, which is one on which Valve has failed to prove, by the requisite clear and convincing evidence, that one of skill in the art would lack reasonable certainty as to claim scope. One weakness in Valve’s showing – and a principal distinction from *Dow* and *Teva* – is that here the parties agree on *how* to measure distance between two points and disagree as to *where* to find those two points. This is essentially the opposite of *Dow*, where we assumed the patentee was correct as to *where* to take the pertinent measurement (at the maximum value of the slope of the hardening curve) but invalidated the claims due to the uncertainty as to *how* to measure. Moreover, as we have explained, the ’525 patent provides a person of skill in the art some guidance as to where to measure, including in figures identifying exemplary top and bottom edges and in the requirements that embodying paddles extend sufficiently far to allow “a user to engage the paddles with any of the middle, ring, or little finger” and enable “different users having different size hands [to] engage with the paddles in a comfortable position.” ’525 patent 3:56-60.

Accordingly, we affirm the district court's conclusion that the claims are not indefinite.

## B

The district court correctly denied Valve's motions for judgment as a matter of law and for a new trial. The jury had substantial evidence to conclude that the Steam Controller's elongate members are "inherently resilient and flexible" – which is the only claim limitation Valve challenges on appeal – and the district court did not abuse its discretion in its evidentiary rulings with respect to Mr. Ironmonger or Mr. Quackenbush.

We review decisions on motions for judgment as a matter of law, motions for a new trial, and evidentiary rulings under the law of the regional circuit. *See InTouch Techs., Inc. v. VGO Commc'ns, Inc.*, 751 F.3d 1327, 1338 (Fed. Cir. 2014). "Under Ninth Circuit law, when reviewing the denial of a renewed motion for JMOL [i.e., judgment as a matter of law], [t]he test is whether the evidence, construed in the light most favorable to the nonmoving party, permits only one reasonable conclusion, and that conclusion is contrary to that of the jury." *Id.* (quoting *White v. Ford Motor Co.*, 312 F.3d 998, 1010 (9th Cir. 2002)). The Ninth Circuit reviews the denial of a new trial motion and evidentiary rulings for abuse of discretion. *See id.* at 1339 (citing *Molski v. M.J. Cable, Inc.*, 481 F.3d 724, 728 (9th Cir. 2007); *United States v. Wiggan*, 700 F.3d 1204, 1210 (9th Cir. 2012)). Infringement is a question of fact that we review for substantial evidence when tried to a jury. *See ACCO Brands, Inc. v. ABA Locks Mfr. Co.*, 501 F.3d 1307, 1311 (Fed. Cir. 2007). Applying these standards, we affirm the district court on each of the infringement-related issues.

To infringe the asserted claims, the Steam Controller must have an "elongate member" that is "inherently

resilient and flexible.” The district court, following the PTAB, construed “inherently resilient and flexible” as “the member may be bent or flexed by a load, for example, the force exerted by a user’s finger, and will then return to the unloaded position.” Appx128-29. While Valve insists the jury lacked substantial evidence that its accused device satisfies this claim limitation, we disagree.

The evidence the jury was free to credit, and on which it could base its finding of infringement, begins with the patent and the Steam Controller itself. “Each juror received a Steam Controller via overnight delivery and had access to the accused device during closing arguments and deliberations.” Appx44. Neither party objected to the provision of an accused device to each juror as part of the remote trial and neither party proposed that jurors be instructed they could not base their infringement decision on their own perception of the device. To the contrary, both parties emphasized to the jury the simplicity of the technology and Valve, especially, encouraged jurors to decide the case based solely on their review of the patent and the device they held in their hands. *See, e.g.*, Appx11396 (Valve informing jury during opening statement it could make every necessary decision “with just two pieces of evidence:” the ’525 patent and Steam Controller); Appx12017 (Ironburg beginning closing argument by noting jurors had received accused device, adding “[y]ou’re probably going to want to have the controller out and in your hand. The issues in this case are simple, . . . but now that you have the controller, you’re probably going to be asking yourself: Why was this so difficult? Because it’s really pretty easy.”). In his closing argument, Valve’s counsel told jurors “there are two pieces of essential evidence. The patent and the controller. Everything that you need to do at the end of this trial you can do with these two things.” Appx12149. He urged the jury to “ignore the distractions in this case” and focus on “the ball. The Steam Controller is the ball. This

should be your singular focus through your deliberations.” *Id.* During closing, Valve invited the jurors to “pull out your Steam Controller, again.” Appx12157.

Valve identifies no reason why jurors would have been unable to determine for themselves whether the alleged “elongate members” in the Steam Controller “may be bent or flexed by” the jurors pressing on the device itself, and then evaluating whether it “returns” to its original “unloaded position.” Given our record, this undertaking would have provided substantial evidence to support a verdict finding infringement. Thus, we agree with the district court that “expert testimony was not necessary; the technology at issue was easily understandable. . . . [T]he jury could therefore have reached its decision on infringement by ignoring all of the expert testimony and focusing solely on the patent and the accused device.” Appx50 (internal quotation marks and citations omitted).

Of course, the record contains additional evidence of infringement, including expert testimony. The jury heard testimony from Ironburg’s expert, Mr. Kitchen, who explained his opinion as to why the Steam Controller infringed. *See* Appx11761-72. For instance, Mr. Kitchen testified that the elongate members he identified on the Steam Controller have ribbing on the back panel that strengthens the plastic and makes the button feel “firm,” and also that the ribbing tapers down so that “when you press the button, . . . your pressing can flex the button, . . . leaving the thin plastic to be able to be flexible.” Appx11762. While the jury also heard from Valve’s non-infringement expert, Mr. Dezmelyk, *see* Appx11982-88, it is presumed to have found Mr. Kitchen more credible and persuasive, as it was permitted to do. *See, e.g., Ericsson, Inc. v. D-Link Sys., Inc.*, 773 F.3d 1201, 1224-25 (Fed. Cir. 2014) (“Both parties presented expert testimony . . . and we see no reason why the jury was not entitled to credit [plaintiff’s] evidence over [defendant’s] evidence.”). In this

regard, it is worth noting that Valve chose to barely cross-examine Mr. Kitchen, asking him only four questions, none of which related to the substance of his infringement opinion. Appx11808-10.

Duncan Ironmonger, a co-inventor of the '525 patent, also testified. We address his testimony in more detail just below. For purposes of Valve's motion for judgment as a matter of law concerning infringement, all that we need to say about Mr. Ironmonger's testimony is that it could have provided additional support for the jury's finding of infringement, although there is also sufficient evidence to support the verdict even without considering it.

Hence, we affirm the district court's denial of Valve's motion with respect to infringement.

2

Valve moves for a new trial on infringement based on: (1) the district court's admission of what Valve characterizes as unqualified expert opinion testimony from Ironburg's corporate representative, Mr. Ironmonger, who is also a co-inventor on the '525 patent-in-suit, and (2) the exclusion of testimony Valve sought to admit through its own corporate representative, Karl Quackenbush, who serves as its general counsel. We find no abuse of discretion in either of these evidentiary rulings.

On direct examination, Ironburg's counsel asked Mr. Ironmonger why Ironburg sent its pre-suit letter, dated December 3, 2015, to Valve. Mr. Ironmonger responded by explaining how he and his colleagues had, after the '525 patent was issued, waited to receive a Steam Controller, which his team then evaluated and determined infringed the Ironburg patent. Appx11529-30. There was no objection from Valve to this testimony. In response to a subsequent question, Mr. Ironburg answered that the Steam Controller has "two paddles that obviously are flexible" and

a button underneath the paddles – and at that point Valve objected, stating that “[t]he witness is providing expert testimony, opinion testimony.” *Id.* at 11530. The district court overruled the objection and Mr. Ironmonger proceeded to offer additional testimony, including that he thought the claim elements were met and that the final version of the Steam Controller “infringed still on our patent.” *Id.* at 11532.<sup>5</sup>

The testimony about which Valve complains all came in the context of Mr. Ironmonger describing Ironburg’s December 3, 2015 letter to Mr. Quackenbush, accusing the Steam Controller of infringing the ’525 patent. The district court overruled Valve’s objection because, as it later explained, “Ironmonger did not provide lay opinions about infringement, but rather explained why plaintiff’s attorney, at Mr. Ironmonger’s behest, sent a cease-and-desist letter to defendant.” Appx61. This was fact, not expert testimony, and the district court was free to exercise its discretion to treat it as relevant to Ironburg’s willfulness claim and, therefore, admissible.

We recognize that after Valve’s objection was overruled, Mr. Ironmonger proceeded to provide more testimony, which ultimately stretched to two pages of the trial transcript, stating his opinion that certain elements of the ’525 patent’s claims are met by the Steam Controller. Appx11530-32. Even assuming this strayed into the realm of undisclosed expert opinion, Valve has failed to show that any error in admitting it was prejudicial, given all the other

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<sup>5</sup> On cross-examination, defense counsel attempted to undermine whatever weight the jury might accord to Mr. Ironmonger’s testimony, getting him to agree that he is not a patent lawyer, has no specialized training in patents, and must consult a patent lawyer when he has a question regarding infringement. *See* Appx11549.



evidence of infringement the jury had before it, and given that the jury had already heard, without objection, Mr. Ironmonger's general opinion that the Steam Controller infringed.

In seeking a new trial, Valve relies heavily on *HVLPO2, LLC v. Oxygen Frog, LLC*, 949 F.3d 685 (Fed. Cir. 2020), in which we found a district court abused its discretion by permitting a non-expert to testify on issues of validity. *HVLPO2* is not analogous, however, as there the witness was directly asked for his opinion on a disputed patent issue (obviousness). *See id.* at 689. Here, Mr. Ironmonger was not asked for an opinion on infringement, nor was there any objection from Valve when he opined generally that he believed the Steam Controller infringed; his testimony, instead, was directed to proving Valve's knowledge of the patent, the course of the parties' interactions, and his own decision-making process, all of which were probative of Ironburg's willful infringement claim. Moreover, and importantly, "any error was harmless because it was 'more probable than not that the . . . admission of the [Ironmonger] evidence did not affect the jury's verdict.'" *Hardeman v. Monsanto Co.*, 997 F.3d 941, 968 (9th Cir. 2021).

For all of these reasons, there was no abuse of discretion in admitting Mr. Ironmonger's testimony and, even if there was, any error was harmless, as the jury had substantial evidence to support a verdict of infringement even without considering this testimony.

We reach the same conclusions with respect to the district court's exclusion of certain testimony Valve sought to offer through Mr. Quackenbush. The district court did not abuse its discretion and its decision does not warrant a new trial.

Valve initially proffered that it intended to have Mr. Quackenbush testify as to his own opinion on infringement.

Because, however, Valve had not permitted him to testify about this topic during his deposition, instead asserting attorney-client privilege, the district court granted Ironburg's motion *in limine* to exclude this testimony. Valve then revised its proffer of what it would seek to elicit from Mr. Quackenbush at trial and he was permitted to testify consistent with that revision.

The district court did not abuse its discretion in precluding Valve from presenting evidence at trial on a topic for which it did not provide discovery. *See Energy Heating, LLC v. Heat On-The-Fly, LLC*, 889 F.3d 1291, 1303 (Fed. Cir. 2018) (“The attorney-client privilege cannot be used as both a sword and a shield.”); *see also Chevron Corp. v. Pennzoil Co.*, 974 F.2d 1156, 1162 (9th Cir. 1992) (same). In *Energy Heating*, 889 F.3d at 1303, we held that the district court did not abuse its discretion by excluding witness testimony at trial after the proponent of the testimony had prohibited the same witness from providing such testimony at his deposition, instead asserting privilege. *Id.* (stating party “cannot have it both ways”). It follows, and we hold, it was not an abuse of discretion to deny the new trial Valve sought on the basis of the excluded evidence.

Moreover, if any error had occurred in connection with Mr. Quackenbush's testimony, it did not prejudice Valve. Mr. Quackenbush was permitted to present part of Valve's non-infringement defense, which was that Ironburg's letter attacked the Chell prototype and by the time Valve received the letter, Valve was “past that design, and that was not the design anymore. And so the claims about the Chell controller weren't really relevant anymore.” Appx11643-44. Valve makes no persuasive showing that admission of the excluded portion of Mr. Quackenbush's testimony would have affected the jury's verdict. *See Unicolors, Inc. v. H&M Hennes & Mauritz, L.P.*, 52 F.4th 1054, 1063 (9th Cir. 2022) (“Such [evidentiary] rulings will be reversed only if the error more likely than not affected the verdict.”).

Valve also argues it should get a new trial because Ironburg’s counsel observed in closing argument that the jury had never heard Mr. Quackenbush “say to anyone, ‘We don’t infringe.’” Appx12193. We disagree. As the district court pointed out, Valve “did not contemporaneously object” to this statement “and it never requested a limiting instruction.” Appx63; *see also* Appx12193. Valve has not identified a meritorious basis for relief.

Thus, we affirm the district court’s denial of Valve’s motion for a new trial.

## 3

Valve also moved for judgment as a matter of law that any infringement was not willful or, in the alternative, for a new trial on willfulness. The district court erroneously struck this motion as moot, reasoning that because it was not going to exercise its discretion to enhance infringement damages, it did not matter whether the willfulness judgment remained or not. Willfulness and enhancement are separate issues, *see Halo Elecs., Inc. v. Pulse Elecs., Inc.*, 579 U.S. 93, 106 (2016) (explaining enhanced damages “should generally be reserved for egregious cases typified by willful misconduct” and need not follow automatically from “a finding of egregious misconduct”); *SRI Int’l, Inc. v. Cisco Sys., Inc.*, 14 F.4th 1323, 1330 (Fed. Cir. 2021) (distinguishing standards for enhancement and willfulness), and a finding of willful infringement may have collateral consequences even for a party not ordered to pay enhanced damages, such as reputational injuries and possible non-dischargeability of debts in bankruptcy, *see In re Trantham*, 304 B.R. 298, 305-06 (B.A.P. 6th Cir. 2004). Valve should have been provided a ruling on the merits of its motion.

Nevertheless, the district court’s error is harmless. *See generally* 28 U.S.C. § 2111 (“On the hearing of any appeal or writ of certiorari in any case, the court shall give

judgment after an examination of the record without regard to errors or defects which do not affect the substantial rights of the parties.”); *Tex. Advanced Optoelectronic Sols. v. Renesas Elecs. Am., Inc.*, 895 F.3d 1304, 1316 (Fed. Cir. 2018) (“Harmless-error review is a flexible one in which we determine whether the error is harmless through the case specific application of judgment, based on examination of the record.”) (internal quotation marks and alterations omitted). Valve does not seek remand for the district court to conduct any further review on the issue of willfulness; it seeks only reversal. Accordingly, both parties’ arguments are devoted entirely to the merits of the evidence for or against willfulness. In these circumstances, it is proper for us to follow the parties’ lead and assess whether there is substantial evidence of record to support the finding of willful infringement. *See Orion Tech., Inc. v. United States*, 704 F.3d 1344, 1350 (Fed. Cir. 2013) (“An appellate court can affirm a decision of the trial court upon any ground supported by the record.”); *Singleton v. Wulff*, 428 U.S. 106, 121 (1976) (“[T]here are circumstances in which a federal appellate court is justified in resolving an issue not passed on below, as where the proper resolution is beyond any doubt.”). There is.

To prevail on its claim for willful infringement, Ironburg was required to prove, by a preponderance of the evidence, that Valve knew of the ’525 patent and then engaged in “deliberate or intentional infringement.” *SRI Int’l*, 14 F.4th at 1330. Cognizant of these required elements, the parties stipulated that Valve had notice of the patent – since Ironburg, “through its counsel, sent [Valve] a letter dated March 7, 2014, and provided [Valve] with notice of the ’525 patent,” Appx11168 – and agreed to the court instructing the jury that it needed to determine whether Valve acted with “deliberate or reckless disregard of plaintiff’s patent rights,” Appx12094. The jury heard Mr. Quackenbush’s admission that he never provided the ’525

patent to Valve's designers, a point which the designers confirmed in their testimony, and learned that Valve did not attempt to design around the patent. Appx11602-03, 11632-33, 11702. All of this provided the jury with substantial evidence to support a finding that Valve "recklessly" disregarded Ironburg's patent rights and, therefore, willfully infringed.<sup>6</sup>

Thus, we affirm the district court's denial of Valve's motion and its entry of judgment of willful infringement.

### C

Valve identified four grounds for invalidity, all of which the district court ruled Valve was estopped from litigating. Appx24-30. On appeal, Valve argues that it could not reasonably have raised either the Non-Instituted Grounds (the Enright-Tosaki-Ono and the Tosaki-Jimakos grounds) or the Non-Petitioned Grounds (the Kotkin and the Willner-Koji-Raymond grounds) in the IPR.<sup>7</sup> Interpretation of

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<sup>6</sup> "A jury is presumed to follow jury instructions." *Omega Pats., LLC v. CalAmp Corp.*, 13 F.4th 1361, 1372 (Fed. Cir. 2021) (internal quotation marks omitted).

<sup>7</sup> The prior art references making up these combinations are: U.S. Pub. 2010/0073283 ("Enright"); U.S. Patent No. 5,989,123 ("Tosaki"); U.S. Pub. 2001/0025778 ("Ono"); Jimakos Sn, *Rapid Fire Mod for Wireless Xbox 360 Controller, Step by Step Tutorial with Pictures*, (July 9, 2008), <http://forums.xbox-scene.com/index.php?/topic/643928rapid-fire-mod-forwireless-xbox-360-controller/page-23> (posts 341 to 346) ("Jimakos"); U.S. Pub. 2010/0298053 ("Kotkin"); U.S. Patent No. 6,760,013 ("Willner"); Japanese Patent Appl. No. JP-A H10-020951 ("Koji"); and U.S. Patent No. 5,773,769 ("Raymond."). Contrary to Ironburg's contention, the estoppel issue is not moot with respect to claims 12 and 15 of the '525 patent, as Valve filed counterclaims for a

the IPR estoppel statute, an issue unique to patent law, is a question of law we review *de novo* applying Federal Circuit law. See *Click-to-Call Techs. LP v. Ingenio, Inc.*, 45 F.4th 1363, 1367 (Fed. Cir. 2022); *Pharmacia & Upjohn Co. v. Mylan Pharms., Inc.*, 170 F.3d 1373, 1381 n.4 (Fed. Cir. 1999). Undertaking this review, we affirm the district court with respect to estoppel of the Non-Instituted Grounds but vacate and remand with respect to estoppel of the Non-Petitioned Grounds.

The estoppel statute provides:

(2) Civil actions and other proceedings. The petitioner in an inter partes review of a claim in a patent under this chapter that results in a final written decision under section 318(a), or the real party in interest or privy of the petitioner, may not assert either in a civil action arising in whole or in part under section 1338 of title 28 or in a proceeding before the International Trade Commission under section 337 of the Tariff Act of 1930 that the claim is invalid on *any ground that the petitioner raised or reasonably could have raised* during that inter partes review.

35 U.S.C. § 315(e)(2) (emphasis added). We now consider the application of this statutory language to the Non-Instituted Grounds and the Non-Petitioned Grounds.

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judgment that these claims are invalid. See Appx1250-51; see also *Fort James Corp. v. Solo Cup Co.*, 412 F.3d 1340, 1341 (Fed. Cir. 2005) (“A counterclaim questioning the validity or enforceability of a patent raises issues beyond the initial claim for infringement that are not disposed of by a decision for non-infringement.”).

We have previously held that “[t]o give effect to the language ‘reasonably could have raised,’ as used in § 315(e)(2), ‘estoppel applies not just to claims and grounds asserted in the petition and instituted for consideration by the Board, but to all grounds not stated in the petition but which reasonably could have been asserted against the claims included in the petition.’” *Click-to-Call*, 45 F.4th at 1370 (quoting *Cal. Inst. of Tech. v. Broadcom Ltd.*, 25 F.4th 976, 991 (Fed. Cir. 2022)). “[T]he petition, not the institution decision” “defines the scope of the IPR” litigation. *Id.* at 1369. The Non-Instituted Grounds were explicitly contained in the petition. They were “raised . . . during the inter partes review.” 35 U.S.C. § 315(e)(2). Contrary to Valve’s argument that an IPR does not begin until institution, we have concluded that “[g]iven the statutory interpretation in *SAS [Institute, Inc. v. Iancu]*, 138 S. Ct. 1348 (2018), any ground that could have been raised in a petition is a ground that could have been reasonably raised ‘during inter parties review.’” *Cal. Inst. of Tech.*, 25 F.4th at 990. Thus, Valve is estopped from litigating the Non-Instituted Grounds.

As Valve acknowledges, it had the opportunity, following the Supreme Court’s issuance of its decision in *SAS*, which held that the PTO may institute on all or none of the claims challenged in a petition but could not grant a partial institution, to seek remand of its IPR to the Board. Valve chose not to pursue this course. Valve’s “choice to leave unremedied the Board’s mistake does not shield it from estoppel . . . [with respect to the grounds] it included in its IPR petition.” *Click-to-Call*, 45 F.4th at 1370.

Thus, we affirm the district court’s estoppel determination with respect to the Non-Instituted Grounds.<sup>8</sup>

2

We turn now to the district court’s decision to estop Valve from asserting the Non-Petitioned Grounds. Because the district court improperly placed the burden of proof on Valve, to show that it could *not* “reasonably . . . have raised” the Non-Petitioned Grounds in its petition, when instead the burden of proof rests with Ironburg to prove that these *were* grounds Valve “reasonably could have raised” during the IPR, we vacate and remand for further proceedings.

We have not fully addressed the standards by which a determination is to be made as to what invalidity grounds not presented in a petition are estopped pursuant to § 315(e)(2). In this challenging context, the district court looked to other district courts that have confronted the issue. The district court agreed with those courts that have concluded that an IPR petition “reasonably could have raised” any grounds that “a skilled searcher conducting a diligent search reasonably could have been expected to discover.” Appx27 (citing *SiOnyx, LLC v. Hamamatsu Photonics K.K.*, 330 F. Supp. 3d 574, 602 (D. Mass. 2018)); see also *Clearlamp, LLC v. LKQ Corp.*, 2016 WL 4734389, at \*8 (N.D. Ill. 2016) (stating and rejecting proposition that

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<sup>8</sup> Valve’s heavy reliance on *Shaw Industries Group, Inc. v. Automated Creel Systems, Inc.*, 817 F.3d 1293 (Fed. Cir. 2016), is unavailing, as we recently overruled *Shaw*. See *Cal. Inst. of Tech.*, 25 F.4th at 991 (explaining *Shaw* “rests on the [flawed] assumption that the Board need not institute on all grounds” stated in petition).



“[c]urrent law . . . is amenable to the interpretation that litigants are estopped from raising any issue . . . , even if only a scorched-earth search around the world would have uncovered the prior art in question”). As these cases demonstrate, the “skilled searcher” standard is consistent with the statutory requirement that a petitioner be estopped from asserting “any ground that the petitioner . . . *reasonably* could have raised during . . . inter partes review.” § 315(e)(2) (emphasis added). Both parties before us agree we should apply this standard here, *see* Appellant Br. at 60; Appellee Br. at 50-51, and we do so. *See generally Cal. Inst. of Tech.*, 25 F.4th at 990 (“[A]ny ground that *could have been raised in a petition* is a ground that could have been reasonably raised ‘during inter partes review.’”) (emphasis added). Accordingly, we hold that, provided the other conditions of the statute are satisfied, § 315(e)(2) estops a petitioner as to invalidity grounds a skilled searcher conducting a diligent search reasonably could have been expected to discover, as these are grounds that the petitioner “reasonably could have raised” in its petition.

The district court did not explicitly address which party has the burden to prove what a skilled searcher conducting a diligent search reasonably could, or could not, have been expected to discover. Implicit in the district court’s reasoning, however, is the view that the burden of proof rests on Valve, as the party challenging the patent’s validity.

Ironburg’s evidence consisted of pointing to the face of the ’525 patent, which listed Willner as a prior art reference, and to a January 3, 2018 IPR directed to Ironburg’s ’525 patent, filed by a third-party entity, Collective Minds. The Collective Minds petition listed Willner-Koji-Raymond and, separately, Kotkin, as its grounds for invalidity. In response to Ironburg’s contentions, Valve produced evidence of its own search, which did not uncover Kotkin, Koji, and Raymond, and tried to show the court that its search

was, nevertheless, reasonably diligent. Valve further observed that the record is silent as to the level of diligence Collective Minds undertook in finding its references. As Valve explained, Collective Minds may have used “many other possible ways . . . that have nothing to do with what a skilled searcher would have found” and Ironburg had not proven otherwise. Appx8447.

After reviewing this record, the district court concluded that “Valve has offered no evidence concerning the degree of difficulty involved in locating the prior art references at issue.” Appx28-30; *see also id.* at 29 (faulting Valve’s “lack of information concerning how Collective Minds” discovered references). It then held this hole in the record against Valve, relying on it as the basis to find Valve estopped from pressing the Non-Petitioned Grounds. In this way, it is plain that the district court was imposing the burden of proof on Valve.

The district court’s estoppel conclusion rests, however, on an assumption, not yet proven on the record, that the prior art search undertaken by Collective Minds was only “reasonably” diligent and did not involve extraordinary measures. If Collective Minds employed “scorched earth” tactics to find the references making up the Non-Petitioned Grounds, then its experience may be irrelevant to a determination of what would have been discovered by an ordinarily skilled searcher acting with merely reasonable diligence.

Valve challenges the district court’s reasoning, pointing us to other district courts that have placed the estoppel burden of proof solely on the patent owner, as the party seeking to benefit from an assertion of estoppel. *See Clearlamp*, 2016 WL 4734389, at \*9 (“It is the proponent of an estoppel argument that bears the burden.”); *Pavo Sols. LLC v. Kingston Tech. Co.*, 2020 WL 1049911, at \*4 (C.D. Cal. 2020) (same); *Innovative Memory Sys., Inc. v. Micron*

*Tech., Inc.*, 2022 WL 4548644, at \*3 (D. Del. 2022) (parties agreeing that burden is on patentee asserting estoppel). We agree with Valve and now hold that the burden of proving, by a preponderance of the evidence, that a skilled searcher exercising reasonable diligence would have identified an invalidity ground rests on the patent holder, as the party asserting and seeking to benefit from the affirmative defense of IPR estoppel. Our holding is consistent with the general practice that a party asserting an affirmative defense bears the burden to prove it. *See, e.g., K-Mart Corp. v. Oriental Plaza, Inc.*, 875 F.2d 907, 912 (1st Cir. 1989) (“The party asserting the estoppel has the burden of proving it.”); *United States v. Asmar*, 827 F.2d 907, 912 (3d Cir. 1987) (same); *Kennedy v. United States*, 965 F.2d 413, 417 (7th Cir. 1992) (same); *Van Antwerp v. United States*, 92 F.2d 871, 875 (9th Cir. 1937) (same); *see also Fuji Photo Film Co. v. Int’l Trade Comm’n*, 474 F.3d 1281, 1293 (Fed. Cir. 2007) (placing burden on party asserting affirmative defense of repair); *Titan Tire Corp. v. Case New Holland, Inc.*, 566 F.3d 1372, 1376 (Fed. Cir. 2009) (placing burden on alleged infringer who raises affirmative defense of invalidity).

Ironburg cites no persuasive basis for us to depart from this approach here. Ironburg relies on one district court’s view that while the “initial burden to assert estoppel should be on the party seeking to invoke it,” thereafter “the burden shifts to the responding party.” *See Palomar Techs., Inc. v. MRSI Sys., LLC*, 2020 WL 2115625, at \*4 (D. Mass. 2020). Ironburg’s principal contention is that the burden of proof should not rest on the patent owner because often the patent challenger will aim to protect details of its search efforts by asserting attorney-client privilege relating to its undertaking. While district courts may encounter privilege issues, this would not be out of the ordinary for patent litigation and, in all events, the district court can resolve such issues and can factor such resolution

into any findings that must be made with respect to estoppel. The inquiry into what a skilled and diligent searcher would reasonably have discovered is ultimately concerned with what the searcher of ordinary skill *would* find through reasonable diligence and not what an actual researcher in fact *did* find through whatever level of diligence she exercised.

Accordingly, the burden is on Ironburg to prove, by a preponderance of the evidence, that a skilled searcher conducting a diligent search reasonably would have been expected to discover the Willner-Koji-Raymond and Kotkin grounds for invalidating claims of the '525 patent. Because the district court did not place this burden on Ironburg, but instead on Valve, we will vacate and remand for the district court to determine whether Ironburg can meet its burden.

The relief we are granting is consistent with that which Valve seeks in its briefing to us: that we vacate and remand for further proceedings on whether Valve should be estopped with respect to the Non-Petitioned Grounds. While Valve specifically asks for a “trial,” it will be for the district court to determine if a trial is needed or whether the dispute is amenable to resolution via case-dispositive motions or some other mechanism.<sup>9</sup> We also leave it to the district court, in the first instance, to address related issues that may arise, such as whether to reopen the record and permit

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<sup>9</sup> Ironburg argues that Valve waived the right to ask for a trial on issues relating to estoppel. *See* Appellee Br. at 49 n. 3. This is incorrect. Valve expressly asked for a trial, in the event the district court did not agree that Valve’s own evidence showed a reasonable search would not have yielded the non-petitioned grounds. *See* Appx1301, 8448; *see also* Appellant Resp. & Reply Br. at 43.

discovery, the relevance of Valve's own search efforts, and how to handle any attorney-client privilege disputes.

## D

### III

Finally, we address Ironburg's cross-appeal, which asks us to award Ironburg enhanced damages for Valve's willful infringement. We review a district court's decision regarding enhanced damages for an abuse of discretion. *See Halo*, 579 U.S. at 107.

"Enhanced damages are generally only appropriate in egregious cases of misconduct, such as willful, wanton, or malicious behavior," "[b]ut an award of enhanced damages does not necessarily flow from a willfulness finding." *Presidio Components*, 875 F.3d at 1382. "In determining whether enhanced damages are appropriate, courts should consider the overall circumstances of the case." *Id.*

The district court did not abuse its discretion in declining to grant enhanced damages. There is nothing unreasonable in the district court's finding that this a "garden variety" case of infringement and that there was no evidence of copying, notwithstanding the jury's finding of willfulness, which could have been based on evidence other than copying. Appx48. For example, consistent with the court's instructions, the jury could have predicated its finding of willful infringement on "deliberate or reckless disregard of plaintiff's patent rights," Appx12094 (jury instructions), without necessarily finding that Valve copied Ironburg's patent claims. The jury might, for instance, have concluded that Mr. Quackenbush's decision to not notify Valve's designers and engineers of Ironburg's patent was reckless, and therefore that Valve's infringement was willful. The jury could have found Valve did not copy, but was reckless in not trying to avoid copying, and, based on the court's instructions, nevertheless still found Valve's

infringement was willful. *See generally Presidio Components*, 875 F.3d at 1382 (concluding that district court did not abuse discretion in declining to enhance damages after jury's willfulness finding).

Nor did the district court abuse its discretion in finding, as further reason not to enhance, that the only patent claim Ironburg alleged Valve infringed prior to suit was later cancelled by the PTAB in the IPR. Appx47 (“[T]he Court takes into account that Claim 1 of the ’525 Patent has been declared invalid by the PTAB, and thus, the features that plaintiff accuses defendant of intentionally copying and/or making ‘no attempt to design around,’ namely the two back controls comprised of elongate members, are not themselves protected by the ’525 Patent.”) (internal citation omitted). It was not clear error to accept the testimony of Valve’s designer that he only learned of Ironburg’s patent at his deposition, nor was it an abuse of discretion to conclude therefrom that “[t]he record does not support a conclusion that defendant pirated plaintiff’s invention.” Appx47. Further, the record establishes that, for whatever reason, Valve’s development process following receipt of Ironburg’s pre-suit letter evolved away from the Chell prototype on which Ironburg had based its allegations. *See id.*

In sum, there was no abuse of discretion in the district court’s consideration of the totality of the circumstances and denial of enhanced damages. We affirm this part of the district court’s judgment.

#### IV

We have considered the parties’ remaining arguments and find them unpersuasive. Thus, for the foregoing reasons, we affirm the judgment that (1) the asserted claims are not invalid as indefinite, (2) Valve willfully infringed, (3) no enhanced damages are warranted, and (4) Valve is estopped from asserting the Non-Instituted Grounds. We vacate and remand for proceedings consistent with this

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opinion with respect to whether Valve is estopped from litigating any of the Non-Petitioned Grounds.

**AFFIRMED-IN-PART, VACATED-IN-PART, AND  
REMANDED**

**COSTS**

Costs awarded to Ironburg.

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

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**IRONBURG INVENTIONS LTD.,**  
*Plaintiff-Cross-Appellant*

v.

**VALVE CORPORATION,**  
*Defendant-Appellant*

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2021-2296, 2021-2297, 2022-1070

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Appeals from the United States District Court for the Western District of Washington in No. 2:17-cv-01182-TSZ, Senior Judge Thomas S. Zilly.

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CLEVENGER, *Circuit Judge*, dissenting.

The Supreme Court held in *Nautilus, Inc. v. Biosig Instruments, Inc.* that to satisfy the definiteness requirement of 35 U.S.C. §112, “a patent’s claims, viewed in light of the specification and prosecution history, [must] inform those skilled in the art about the scope of the invention with reasonable certainty.” 572 U.S. 898, 910 (2014). The definiteness analysis “entails a delicate balance” that “must take into account the inherent limitations of language” and allow for “[s]ome modicum of uncertainty,” but must also “be precise enough to afford clear notice of what is claimed, thereby apprising the public of what is still open to them.” *Id.* at 909.



The claims in this case require two back controls, each with “an elongate member that extends substantially the full distance between the top edge and the bottom edge” of the handheld controller. An ordinary artisan desiring to produce a non-infringing handheld controller with back controls including elongate members (as in Ironburg’s patent) needs to design a device with an elongate member that does *not* run substantially the full distance from the top edge to the bottom edge of the controller. To make the “full distance” measurement, the artisan needs to know from the patent *where* along the top edge to start the measurement, and *where* along the bottom edge to complete the measurement. The ’525 patent specification teaches the artisan where to find the claimed top edge—it is where certain controls are mounted. But, the artisan still needs to know where along the top edge the key measurement will start, and the specification provides no such guidance. And unlike for the top edge, neither the claims nor the specification give any specific indication of where the claimed bottom edge of the controller is. One could argue that the drawings teach an artisan how to identify the bottom edge of the claimed device (i.e., the edge opposite the top edge), but the artisan is then faced with the same basic dilemma: where along the bottom edge does the key measurement end? A picture is worth a thousand words, as Figure 2 of the patent demonstrates:

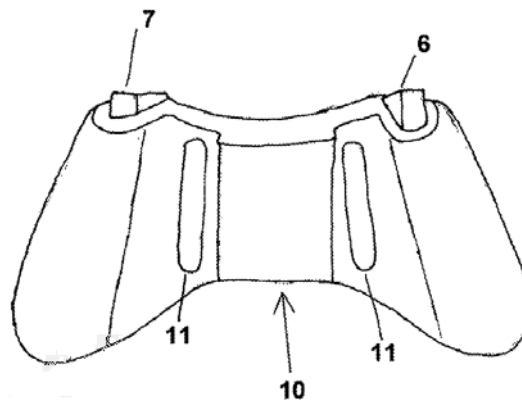


Figure 2

The figure begs the question where an ordinary artisan or would-be competitor of Ironburg should identify the relevant points of measurement on the top and bottom edges of his handheld controller to know if his device infringes the '525 patent. Whether an accused device meets the claimed distance surely depends on which points along the top and bottom edges are chosen for the required measurement. The policy purpose of the definiteness requirement is to give a competitor at least a fair chance of avoiding infringement. Sometimes, an invention cannot be described with perfect clarity, and Section 112 cuts some slack for such inventions (e.g., inherent limitations of language). But in this case Ironburg should get no slack: nothing about the English language or the relevant art prevented the patentee from clearly stating where along his top and bottom edges he required his “full distance” measurement to be made.

Before the district court, Valve argued that “an elongate member that extends substantially the full distance between the top edge and the bottom edge” is indefinite because, *inter alia*, a person of ordinary skill in the art “would not be able to determine or measure that distance with reasonable certainty.” J.A. 3892 (D.I. 161 at 17); *see also* J.A. 4232 (D.I. 167 at 9).<sup>1</sup> Specifically, Valve explained to the district court that a person of ordinary skill “would not know with reasonable certainty where or how to measure the ‘distance’ between the ‘top edge’ and ‘bottom edge’ of the controller” because “the specification provides no guidance regarding where along those edges the ‘distance’ measurement should be made.” J.A. 3887 (D.I. 161 at 12). Valve characterized this lapse as a “significant source of

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<sup>1</sup> “J.A.” citations herein refer to the parties’ joint appendix. “D.I.” parentheticals have been included to show the district court docket number where helpful for reference.

uncertainty” given that “the distance varies considerably depending on where the measurement is taken.” *Id.* Valve noted, for example, that “[t]he distance from the trigger on the ‘top edge’ to the tip of the handle on the ‘bottom edge’ is much greater than if the measurement is taken near the paddles, which in turn is greater than a measurement taken near the center of the controller.” *Id.* at 3887-88 (D.I. 161 at 12-13). Not surprisingly, Ironburg offered no explanation to the district court of how a person of ordinary skill would know, from the claims or specification of the ’525 patent, how to measure the distance between the top and bottom edge of an accused controller.

The district court held *ipse dixit* that Valve did not carry its burden to show that the claim term “substantially the full distance between the top edge and the bottom edge” is indefinite. J.A. 8. But the district court did not mention Valve’s specific indefiniteness argument or offer any rationale for its holding. Noticeably absent from the district court opinion is any explanation about how an ordinary artisan would know with reasonable certainty from the patent how to satisfy the required measurement. *See, e.g.*, J.A. 11-12.

The majority claims to find a rationale in the district court opinion; see its footnote 2. Majority Opinion, p. 12 n.2. The first 11 lines of the footnote merely recite the district court’s holding that the claim is not indefinite, which is not a rationale. The majority then notes that the district court concluded that the patent is definite about the length of the elongate members, which can be measured relative to the average span of a human hand, and also stated that the elongate members extend substantially the full distance between the top and bottom edges of the controller. But the district court could not know that the elongate members extend that full distance unless it knows what the full distance is, which in turn requires knowing the points for measurement. The district court overlooked Valve’s argument that the patent fails to provide

reasonable certainty about how to measure the top to bottom distance. The majority's attempt to find a convincing rationale for the district court's holding is unavailing.

This court has a stable body of law that tests the indefiniteness of claims that require measurements: if a claim demands a measurement but the patent lacks reasonable certainty in sufficiently teaching how to make the measurement, the claim is indefinite. *See Dow Chemical Co. v. Nova Chemicals Corp.*, 803 F.3d 620 (Fed. Cir. 2015); *Teva Pharmaceuticals USA, Inc. v. Sandoz, Inc.*, 789 F.3d 1335 (Fed. Cir. 2015).

*Dow* makes clear that the indefiniteness of measurement claims can involve both “how” to measure (i.e., the means for making the measurement) and “where” along an item to be measured to apply the “how” means. 803 F.3d at 633. This is so, because the patent in *Dow* was challenged as indefinite for failure to provide reasonable certainty on both a “how” question (i.e., which means for testing “slope of strain hardening” to employ) and a “where” question (i.e., where along a stress/strain curve to make the measurement). *Id.*<sup>2</sup> As the majority notes, the patent was held indefinite on the “how” question because it

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<sup>2</sup> *Dow* included a third indefiniteness challenge, which was the lack of clear teaching about which units—whether a type of metric, English, or some other unit—should be used to measure if the “slope of strain hardening coefficient [was] greater than or equal to 1.3” as required by the claims, assuming one of the various possible testing means were used at one of the various possible testing locations. *See* 803 F.3d at 624 nn.2-3, 633 n.8. The *Dow* decision did not treat the third indefiniteness question as just one of infringement; instead, it declined to reach the indefiniteness challenge as unnecessary because it had already held the patent indefinite on “how” to make the required measurement alone. *See id.* at 633 n.8.

did not specify which of many possible measurement means should be used. *Id.* at 634-35. But the patent was not held indefinite on the “where” question, because each of the measurement means were ultimately applied at the same place, “at the end of the curve where the maximum slope is located.” *Id.* at 633. The bottom line in *Dow* was that a person of ordinary skill knew where to take the claimed measurement but did not know which measuring means to use. Most notably, the court in *Dow* did not hold that the “where” question is just a question of infringement and not a part of the indefiniteness analysis. In short, *Dow* recognizes that a measurement claim can be indefinite either for failure to specify a test, or for failure to sufficiently specify how to use a specified test (e.g., “where” to use it), or for both. Today, the majority unsettles this stable law by artificially bifurcating the “how” and “where” of Ironburg’s measurement claims in order to remove the “where” question from the assessment of indefiniteness.<sup>3</sup>

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<sup>3</sup> The majority’s attempt to find definiteness about “where” to measure in the ’525 patent’s teaching about the size of the elongate members (*see* Majority Opinion, p. 15 ll. 2-7, p. 19 ll. 29-37) essentially repeats the district court’s equally flawed reasoning, explained above. And the majority’s reliance on dicta in *Presidio Components, Inc. v. American Technical Ceramics Corp.*, to make the “where” indefiniteness question just a mere question of infringement is unavailing. Majority Opinion, p. 18. (citing *Presidio Components, Inc. v. Am. Tech. Ceramics Corp.*, 875 F.3d 1369, 1377 (Fed. Cir. 2017)). Nothing in the *Presidio* opinion explains why the indefiniteness question in that case produced a “where” question or suggests why the “where” question in this case must be treated solely as a matter of infringement. A quotation of dicta from the *Presidio* opinion is being asked to do a mountain of incorrect work here.

One need look no further than the experts' own testimony in this case to understand that, here, the majority's distinction between the "where" and the "how" of a measurement method is a false one. Because the '525 patent's drafters chose not to include any guidance on how (i.e., including where) to measure the claimed "full distance," both experts had no choice but to invent their own arbitrary methods of identifying points on the top edge and bottom edge of a handheld controller and measure the distance between them. The majority is simply wrong that "both parties' experts agreed on and used the same measurement methodology – which was simply to find the distance between two points." *See* Majority Opinion, p. 17. Rather, the parties' experts arrived at two different methods that could yield different answers on infringement for the same device—and in fact did for the accused product.

Specifically, Valve's expert testified that "he measured the claimed 'distance' 'in a place that is related to where the [elongate member] is on the back'" of the device and arrived at 2.6 inches. Appellant's Corrected Principal Br. at 36 (quoting J.A. 11980). He used the "center line" of the elongate member as an "axis" and measured the distance between the point where this axis intersected the top edge and the point where it intersected the bottom edge.<sup>4</sup> *See id.* at 36-37 (citing J.A. 11976-77). His method required disassembling a physical controller to account for—at least to some extent—any three-dimensional curvature in its back surface (like that in the back surface of the accused

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<sup>4</sup> Valve's expert's noninfringement report includes a detailed explanation of his three-step method for measuring the claimed "full distance," exceeding that in his trial testimony or Valve's principal appeal brief. It specifically notes multiple instances where, to arrive at any measurement at all, he needed to make assumptions to compensate for the '525 patent's lack of guidance. *See* J.A. 6211-14.

product). *See* J.A. 6213-14, 11976-78 (“[S]ometimes when we have a complicated three-dimensional shape, it’s hard to measure. It’s not like a flat bookcase, or something, where we can lay a ruler along it and know how big it is.”). Ironburg’s expert had, by contrast, measured the claimed “full distance” between two other points on the top edge and bottom edge “that have no relationship to the location or orientation of the elongate members.” Appellant’s Corrected Principal Br. at 37. Specifically, he appears to have used an image of a controller to measure the distance between “the bottom of the top edge and the top of the bottom edge” in only two dimensions. *See id.* at 38 (citing J.A. 11764-65, 9071).<sup>5</sup>

The two methods led to patently different results when applied to the accused “elongate member” of the accused product. Valve’s method, which accounted for the shape and location of the accused elongate member, resulted in the accused elongate member extending only 53% of the “full distance” of 2.60 inches. J.A. 6220-21, 11978-81. But, with Ironburg’s method, the identical elongate member was seen to extend *more than* (i.e., over 100% of) the “full distance.” J.A. 11764-66. Thus, even though Ironburg’s expert did not provide a numerical value for his identified “full distance,” given the relationship of the competing “full distances” to the same elongate member, Ironburg’s “full distance” is necessarily less than Valve’s 2.60 inches. This

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<sup>5</sup> This is Valve’s description of Ironburg’s expert’s measurement, but it does not appear to be in dispute. Ironburg’s expert testified at trial that the “full distance” stretched from “the bottom of the top edge of the controller” to the “bottom edge of the controller.” J.A. 11764. And in its rebuttal appeal brief, Ironburg suggested its expert measured “from the top of the ‘bottom edge’” rather than from a lower point on the bottom edge, unlike Valve’s expert. *See* Cross-Appellant’s Principal Br. at 34.

is because Ironburg's expert identified the "full distance" as the distance between the bottom of the top edge and the top of the bottom edge in two dimensions, i.e., the shortest possible distance between the two edges, without regard to the shape or location of the elongate member or the three-dimensional curvature of the back surface of the accused product. *See* J.A. 11764-65, 9071; Cross-Appellant's Principal Br. at 34. In other words, the ambiguity of the '525 patent allowed Ironburg's expert to identify the shortest possible "full distance," which was less than even its accused elongate member, while simultaneously allowing Valve's expert to measure a different "full distance" that was longer than Ironburg's identified elongate member.

The definiteness requirement is meant to guard against precisely this sort of uncertainty in the scope of a patent's claims. Importantly, *Dow* recognized that claims may be "even more clearly indefinite" where a patent's lack of guidance allows a party's expert to develop a new method of measurement for the particular case rather than use an established one. 803 F.3d at 635; *see also id.* at 633-34. Such clearly happened in this case. As *Dow* recognizes and this case proves, both the "how" and "where" matter in a measurement-claim indefiniteness analysis. But for the majority's artificial distinction between the two considerations, and the improper relegation of the "where" question to an infringement inquiry, there is no defense to Valve's indefiniteness challenge.

The majority concedes that a proper indefiniteness inquiry for measurement claims can include questions of "where" measurements are taken, and, correspondingly, that not all "where" questions are just infringement questions. But the majority fails to explain why the "where" issue in this case falls out of the indefiniteness inquiry and into an infringement concern. With respect, I dissent from the majority's conclusion that the '525 patent is not indefinite.