United States Court of Appeals for the Federal Circuit

TRACKTIME, LLC,
Plaintiff-Appellant

v.

AMAZON.COM SERVICES LLC, AUDIBLE, INC.,
Defendants-Appellees

2024-1102

Appeal from the United States District Court for the District of Delaware in No. 1:18-cv-01518-MN, Judge Maryellen Noreika.

Decided: July 2, 2026

ROBERT GREENSPOON, Dunlap Bennett & Ludwig PLLC, Chicago, IL, argued for plaintiff-appellant. Also represented by WILLIAM W. FLACHSBART.

J. DAVID HADDEN, Fenwick & West LLP, Mountain View, CA, argued for defendants-appellees. Also represented by RAVI RAGAVENDRA RANGANATH, SAINA S. SHAMILOV; TODD RICHARD GREGORIAN, San Francisco, CA; MELANIE LYNE MAYER, JONATHAN THOMAS MCMICHAEL, Seattle, WA.

Before PROST and TARANTO, *Circuit Judges*, and KOVNER, *District Judge*.[1]

TARANTO, *Circuit Judge*.

TrackTime, LLC owns U.S. Patent Nos. 8,856,638 and 8,862,978, which it asserted against Amazon.com Services LLC and several other entities (collectively, Amazon) in an infringement action it filed in the United States District Court for the District of Delaware. TrackTime's patents claim methods and systems for use on a mobile device to navigate within a multimedia file by using a time-correlated transcript. For the '978 patent, the district court construed two limitations of the asserted claims—reciting, for mobile devices, "executable program code configured to facilitate annotation" and "executable program code configured to synchronously play . . . multimedia"—as means-plus-function claim terms subject to 35 U.S.C. § 112(f), and it then held the asserted claims invalid for indefiniteness because the patent's written description has inadequate disclosure of structure corresponding to those terms. *TrackTime, LLC v. Amazon.com, Inc.*, No. 18-cv-1518, 2021 WL 2823163, at *5–8 (D. Del. July 7, 2021) (*Claim Construction Order*). For the '638 patent, the only claim now at issue is claim 9, which a jury found to be invalid and also not infringed, and the district court denied post-trial motions to set aside the verdict. *TrackTime, LLC v. Amazon.com, Inc.*, No. 18-cv-1518, 2024 WL 4300101, at *3–14 (D. Del. Sept. 26, 2024) (*JMOL Decision*). TrackTime appeals.

Regarding the '978 patent, TrackTime argues that the disputed "executable program code" limitations should not be treated as § 112(f) means-plus-function terms under the

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[1] Honorable Rachel P. Kovner, District Judge, United States District Court for the Eastern District of New York, sitting by designation.

approach set forth in our decision in *Dyfan, LLC v. Target Corp.*, 28 F.4th 1360 (Fed. Cir. 2022), which issued after the district court ruled on the matter in this case. We agree to this extent: Further analysis of the issue is warranted in light of our intervening precedent. Because the needed analysis may benefit from new factual as well as legal submissions, we vacate the district court's indefiniteness ruling and remand for further proceedings to determine whether § 112(f) applies (and, if so, is satisfied).

Regarding the '638 patent, TrackTime challenges the judgment on the verdict on several grounds. We affirm the judgment of invalidity under 35 U.S.C. § 102 for anticipation. We need not address TrackTime's other challenges.

I

A

The '978 and '638 patents share a specification in all respects material here. Unless otherwise indicated, we cite only the '978 patent's specification.

The specification addresses navigating, on a mobile device, through multimedia files containing audible words. *See* '978 patent, col. 3, line 54, through col. 4, line 5. For a given multimedia file, the specification describes creating a "synchronization index," *i.e.*, a transcript indicating, by an accompanying time specification, "when a word or range of words is audible in the multimedia." *Id.*, col. 3, lines 54–63. The index makes possible "tap-to-jump" functionality (TrackTime Opening Br. at 2): When a synchronization index is displayed on a user's touch-sensitive mobile device, the user can tap a portion of the text to play the corresponding portion of the multimedia file. '978 patent, col. 1, lines 58–62; col. 33, lines 47–53; col. 40, lines 20–27. The user also can annotate the synchronization index (*e.g.*, with color-coded highlighting or the user's comments) and can then share the annotated synchronization index with

others. *Id.*, col. 64, lines 42–53; *see also id.*, col. 49, lines 12–38.

The specification discloses that "transcript management utilities" existed in the prior art, *id.*, col. 6, lines 1–14, and that there were known methods for making synchronization indices, *id.*, col. 8, lines 5–15, for using the index to navigate to a position in a multimedia file and playing the located content, *id.*, col. 8, lines 47–61, and for annotating transcripts, *id.*, col. 6, lines 38–55. But the specification identifies two limitations of the prior-art methods: First, "some transcript management utilities" could only "operate on a full version of Microsoft Windows," which the specification calls "unsuitable for mobile computing devices," *id.*, col. 6, lines 11–17; second, the functions of creating a synchronization index, annotating it, and using it to navigate multimedia, among others, were scattered across "disparate software applications," *id.*, col. 8, lines 15–22; *see id.*, col. 11, lines 39–57.

The specification proposes to "solve . . . these shortcomings" by providing a "synchronization index and software suited for use on a mobile computing device" facilitating "convenient navigation" and "annotation," among other capabilities. *Id.*, col. 11, lines 15–38; *see id.*, col. 3, line 54, through col. 4, line 5. In one embodiment of the assertedly inventive system, a mobile computing device communicates with a web application for transcript management. *See id.*, col. 27, lines 19–40. The web application includes several kinds of "logic," including "annotation and edit logic" and "video, display, and playlist logic." *Id.*, col. 27, lines 27–35; *id.*, fig. 6. The mobile computing device, in turn, has its own software (including "logic") for communicating with the web application, synchronously playing multimedia with a scrolling transcript, navigating by using the transcript, and annotating the transcript, among other functions. *See id.*, col. 32, line 37, through col. 38, line 59.

The claims most relevant to this appeal are claims 1 and 2 of the '978 patent and claim 9 of the '638 patent. Claims 1 and 2 of the '978 patent are shown here:

> 1. A method for social networking with a mobile computing device comprising:
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> providing for use on a mobile computing device a synchronization index, wherein said synchronization index is associated to multimedia, wherein the synchronization index comprises an electronic transcript that indicates text corresponding to audio from the multimedia, and wherein the synchronization index indicates respective times within the multimedia corresponding to when a word or range of words is audible in the multimedia;
>
> providing mobile computing device software, wherein said mobile computing device software comprises executable program code configured to receive the synchronization index, and wherein said text is able to be displayed other than as a web page,
>
> wherein said mobile computing device comprises a viewing screen and a touch-sensitive input interface,
>
> wherein said viewing screen is able to display multimedia and text from said synchronization index,
>
> wherein performing a user's selected gesture on a portion of said viewing screen corresponding to a portion of said text is recognized by said touch-sensitive input interface to facilitate annotation of a portion of said synchronization index, and
>
> wherein **said mobile computing device software comprises executable program code configured to facilitate annotation of a portion of said synchronization index responsive**

> **to user input received by the mobile computing device;** and
>
> communicating said annotation for subsequent retrieval on a second computing device via a network.
>
> 2. The method of claim 1, wherein **said mobile computing device software comprises executable program code configured to synchronously play said associated multimedia with said synchronization index other than as part of a web page.**

Id., col. 64, lines 23–57 (emphases added).

Claim 9 of the '638 patent is reproduced here:

> 9. A method for a multimedia seek sequence using a synchronization index and a mobile computing device comprising the steps:
>
> displaying on a mobile computing device text from a synchronization index, wherein said synchronization index comprises respective times within multimedia corresponding to a word or range of words and wherein said text is displayed other than as a web page;
>
> wherein said mobile computing device comprises a viewing screen and a touch-sensitive input interface;
>
> receiving information indicating a user's selected mobile computing device touch-sensitive input interface gesture performed on a portion of said viewing screen corresponding to a word, or range of words, from said synchronization index, wherein said gesture is recognized by said touch-sensitive input interface;
>
> performing a data lookup using said synchronization index, wherein said synchronization index is

> referenced to provide data for a time location t1 that corresponds to said word or range of words selected by the recognized gesture; and
>
> seeking on said mobile computing device multimedia corresponding to said synchronization index, and if found, accessing multimedia at t1.

'638 patent, col. 65, lines 44–67.

B

TrackTime sued Amazon for infringement of the '638 and '978 patents in the District of Delaware in October 2018. *See* J.A. 235. Amazon, as now relevant, contended that the asserted claims (claims 1–10, all of which depend on claim 1) of the '978 patent were invalid for indefiniteness, J.A. 1378–84, 1398–99, and that claim 9 of the '638 patent was invalid for anticipation by a reference called LiveNote, *see* J.A. 5381.

1

The district court conducted claim-construction proceedings that led to a holding of invalidity of the asserted claims of the '978 patent in July 2021. *Claim Construction Order*, at *1. Amazon argued invalidity for indefiniteness in two steps. First, Amazon argued, the two "executable program code" limitations highlighted above—the mobile-device code "configured to facilitate annotation of a portion of [the] synchronization index" (claim 1) and "configured to synchronously play . . . multimedia" (claim 2)—were means-plus-function claim terms under 35 U.S.C. § 112(f).[2]

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[2] The applications that issued as the patents here were both filed on December 6, 2013. J.A. 59, 142. The Leahy-Smith America Invents Act (AIA) amended § 112 with respect to "'any patent application that is filed on or after' September 16, 2012." *D Three Enterprises, LLC v. SunModo Corp.*, 890 F.3d 1042, 1045 n.4 (Fed. Cir. 2018)

Second, Amazon added, indefiniteness followed because the specification did not disclose corresponding structure for the claimed functions, as required for a § 112(f) term. *See* J.A. 1379–84, 1398–99. In support, Amazon cited the declaration of its expert, Dr. Dan Schonfeld, who stated that the terms "do not inform a [relevant artisan] what the underlying algorithms or instructions are" for the claimed code and that the inclusion of a "mobile computing device" in the claim did not "provide any additional details . . . about the structure performing the recited [ ] function[s]." J.A. 1478; *see* J.A. 1482; J.A. 1379, 1398. TrackTime replied that the terms were not governed by § 112(f), because, according to TrackTime's expert, Dr. Maneesh Agrawala, the terms would have been understood by relevant artisans at the time of the invention to refer to specific types of code within existing programs, including, for example, the LiveNote program alleged by Amazon to be anticipatory. *See* J.A. 1385–89, 1400–01 (citing J.A. 1635–44). TrackTime also argued that the specification's disclosures of numerous subsidiary functions of the annotation and synchronous-play logic described the operation of the claimed code with enough specificity that the claims conveyed adequate structure to relevant artisans. J.A. 1389–91, 1402–03.

The district court, in a July 2021 order, agreed with Amazon that the "executable program code" limitations are means-plus-function terms and that the specification lacks adequate disclosure of corresponding structure, so held the claims invalid for indefiniteness. *Claim Construction Order*, at *5–8. As to whether § 112(f) applied at all, the district court recognized that, because "means" is not used in the claims, it presumed that § 112(f) did not apply, but the

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(quoting Pub. L. No. 112-29, § 4(c), 125 Stat. 284, 296–97 (2011)). Post-AIA § 112(f) therefore applies here, not its pre-AIA predecessor (35 U.S.C. § 112 ¶ 6 (2008)), though no material difference has been identified in this case.

court held that the presumption was rebutted. In particular, the term "executable program code" (and, similarly, the "logic" referred to in the specification), the district court reasoned, is merely "generic," rather than indicating sufficiently specific structure, and although the specification refers to prior-art programs, it "does not state that these prior art software applications contain the claimed executable program code." *Id.*, at *5–6. Having held § 112(f) to be applicable, the district court then concluded that the specification lacks sufficient disclosure of an "algorithm or procedure that explains how" the executable program code accomplishes the claimed functions. *Id.*, at *7. Accordingly, it held the claims invalid. *See id.*, at *8.

2

TrackTime tried its case of infringement of the '638 patent to a jury in September 2023. J.A. 265–66. Although TrackTime pressed claims 1 and 9, the present appeal relates only to claim 9. *See JMOL Decision*, at *1 & n.1, *3 & n.3; TrackTime Opening Br. at 3. Amazon disputed infringement and also pressed invalidity assertions, invoking ineligibility, 35 U.S.C. § 101, anticipation, § 102, obviousness, § 103, and inadequacy of written-description support, § 112(a). *See* J.A. 5379–83.

The jury rejected the written-description challenge but otherwise agreed with Amazon on claim 9—finding no infringement, anticipation by each of three references, obviousness in light of one of those references, and ineligibility. J.A. 5379–83. As most relevant now, the jury was presented with evidence about LiveNote, a commercial program that is described in three Amazon trial exhibits: a written installation guide, tutorial, and user guide. *See* J.A. 8611–9105. The LiveNote user guide describes the program as "enabl[ing a user] to organize, view, search, and annotate transcripts," and it highlights two "new features for tablet PCs," including the ability to "use [a] tablet pen to write a note" in an "annotate dialog box" when

"using[ ] . . . a tablet PC." J.A. 8758, 8762, 8906 (capitalization altered). Dr. Schonfeld testified based on the user guide that "[y]ou can use LiveNote with a desktop PC . . ., but you can also use it with . . . a tablet PC [and] if it's a tablet PC, the document makes clear that you can tap on the tablet and use it just like any other tablet, instead of clicking." J.A. 6145. Dr. Agrawala disagreed, opining that the LiveNote user guide had no disclosure of claim 9's "gesture" for navigating a transcript, instead disclosing the use of a tablet "just to annotate." J.A. 6377–78. At trial, TrackTime moved for judgment as a matter of law (JMOL) of infringement and no invalidity as to claim 9, which motion the district court denied. Trial Transcript, *Tracktime v. Amazon.com, Inc.*, No. 18-cv-1518, ECF No. 320 at 904, 926–27 (D. Del. Oct. 12, 2023). The jury found, among other things, that claim 9 was anticipated by LiveNote. J.A. 5381.

Following the jury's verdict, TrackTime renewed its motion for JMOL and moved for a new trial. J.A. 6631–56. Regarding LiveNote, TrackTime argued that it was entitled to judgment of no anticipation because "[t]he evidence showed that LiveNote only discloses a tablet PC for . . . text annotations . . ., not to navigate multimedia and not using human touch gestures," and it "indisputably used a big desktop CPU, with [Microsoft] Windows, for its playback operations, not a mobile device." J.A. 6643–44. "For the same reasons," TrackTime contended, it should at least receive a new trial because the verdict went "against the great weight of the evidence." J.A. 6646 (capitalization altered).

In September 2024, the district court denied the post-trial motions. As to anticipation by LiveNote, the court concluded that the LiveNote exhibits and Dr. Schonfeld's testimony "directly contradict[ed] [TrackTime's] position" and that the jury could have "reasonably concluded that LiveNote anticipated" based on that evidence. *JMOL*

Decision, at *7. It rejected the clear-weight argument for a new trial "substantially for the same reason[ ]." *Id.*, at *8.

Thereafter the district court dismissed with prejudice TrackTime's infringement suit as to claims 2–8 and 10–20 of the '638 patent, which had not been discussed at trial, J.A. 31, and entered final judgment of noninfringement and invalidity of '638 claims 1 and 9. J.A. 32–33. The earlier *Claim Construction Order* holding claims 1 and 2 of the '978 patent invalid for indefiniteness merged into that final judgment. *See* Fed. R. App. P. 3(c)(4). TrackTime timely appealed. We have jurisdiction under 28 U.S.C. § 1295(a)(1).

II

TrackTime challenges the judgment of the district court with respect to both patents. A determination that a claim term invokes § 112(f) is a claim-construction issue that we resolve without deference except to the extent that the district court made legally pertinent findings of fact based on extrinsic evidence, which we review for clear error. *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1346 (Fed. Cir. 2015). We review the district court's denial of JMOL here without deference, following the law of the district court's regional circuit, the Third Circuit. *Amgen Inc. v. Hospira, Inc.*, 944 F.3d 1327, 1333 (Fed. Cir. 2019) (reviewing District of Delaware decision). When only evidentiary sufficiency is at issue, JMOL is to be denied if there is "enough evidence from which a jury reasonably could" have found as it did. *Secretary, United States Department of Labor v. East Penn Manufacturing Co.*, 123 F.4th 643, 650–51 (3d Cir. 2024) (internal quotation marks and citation omitted). We review the district court's denial of a new trial for abuse of discretion. *Amgen*, 944 F.3d at 1333 (citing Third Circuit authority).

A

TrackTime urges us to reverse the district court's indefiniteness ruling on the '978 patent, arguing that the "executable program code" limitations are not subject to § 112(f) and, even if they are, the specification discloses the required corresponding structure that carries out the claim-specified functions. We reach only the first part of that submission. On the record and arguments presented to us, we are not persuaded to hold, as TrackTime urges, that the contested terms are outside § 112(f). We are persuaded, however, that the district court's analysis, especially in light of our intervening *Dyfan* decision, was insufficient to support the conclusion that the contested terms come within § 112(f). We therefore vacate the district court's indefiniteness ruling and remand for a new determination about the § 112(f) status of the "executable program code" limitations, with proceedings appropriate to making that new determination.

1

Under § 112(f), as relevant here, a claim element "may be expressed as a means . . . for performing a specified function without the recital of structure . . . in support thereof," and if the claim element is so written, it "shall be construed to cover the corresponding structure . . . described in the specification and equivalents thereof."[3] If a

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[3] The full language is: "An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof." In this case, the parties do not rely on the language of "step" or the corresponding word "acts" for the claim elements at issue—referring to "executable program

claim element is subject to § 112(f), *i.e.*, expressed in that form, we search the specification for corresponding structure, and if sufficient structure is missing, the claim is indefinite. *Williamson*, 792 F.3d at 1351–52.

Our focus here is on the first step of that inquiry, which examines whether a claim phrase ("claim element") is a means-plus-function phrase, *i.e.*, "expressed as a means . . . for performing a specified function without the recital of structure . . . in support thereof." The question is one of claim construction. *Id.* at 1346; *see Dyfan*, 28 F.4th at 1365–66; *TEK Global, S.R.L v. Sealant Systems International, Inc.*, 920 F.3d 777, 785 (Fed. Cir. 2019). Specifically, whether the words used themselves "recit[e]" structure for performing the recited function(s) turns on the meaning of those words in context, which can be informed not just by the intrinsic evidence but also by evidence of extra-patent usage in the relevant field (extrinsic evidence)—the latter presenting an underlying issue of fact for the court. *See Dyfan*, 28 F.4th at 1366; *Inventio AG v. ThyssenKrupp Elevator Americas Corp.*, 649 F.3d 1350, 1357 (Fed. Cir. 2011). The proponent of the means-plus-function construction has the burden to establish that the phrase is subject to § 112(f), and where the claim construction involves an underlying fact issue, the fact must be proved by a preponderance of the evidence. *See Dyfan*, 28 F.4th at 1367; *Advanced Ground Information Systems, Inc. v. Life360, Inc.*, 830 F.3d 1341, 1347 (Fed. Cir. 2016) (both citing *Apex Inc. v. Raritan Computer Inc.*, 325 F.3d 1364, 1372 (Fed. Cir. 2003)).

Whether a claim phrase uses the word "means" does not decisively determine whether the phrase is covered by § 112(f), but we have established presumptions to frame

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code"—and they likewise do not rely on the word "material." We therefore focus on the statutory language about "means" and "structure," as have the parties.

the analysis. Whereas a claim phrase that uses "means" is presumptively covered by § 112(f), a claim phrase that does not use the word "means"—as is true in the present case—is presumptively *not* expressed in means-plus-function form. *Williamson*, 792 F.3d at 1348 (en banc in relevant part). Importantly, the presumption relevant here is rebuttable, *i.e.*, a claim phrase that does not use "means" may nonetheless, when properly understood, be shown to be one "for performing a specified function without the recital of structure . . . in support thereof." 35 U.S.C. § 112(f).

Reflecting the language of the statute, our precedents direct inquiry to whether the claim phrase "recites 'function without reciting sufficient structure for performing that function.'" *Williamson*, 792 F.3d at 1348 (quoting *Watts v. XL Systems, Inc.*, 232 F.3d 877, 880 (Fed. Cir. 2000)). One way to establish that condition is to show that the phrase "refers only to a general category of whatever may perform specified functions," *Robert Bosch, LLC v. Snap-On Inc.*, 769 F.3d 1094, 1099 (Fed. Cir. 2014); *see Egenera, Inc. v. Cisco Systems, Inc.*, 972 F.3d 1367, 1374 (Fed. Cir. 2020), as when the relevant non-function term in the phrase is as devoid of specificity of structure as the word "means" (hence is, in that way, a "nonce" term)—as can be true of, *e.g.*, "module," "mechanism," "element," or "device" if viewed in isolation, *Williamson*, 792 F.3d at 1350; *see MTD Products Inc. v. Iancu*, 933 F.3d 1336, 1341 (Fed. Cir. 2019); *Robert Bosch*, 769 F.3d at 1099; *Massachusetts Institute of Technology & Electronics for Imaging, Inc. v. Abacus Software*, 462 F.3d 1344, 1354 (Fed. Cir. 2006). But the standard is not so limited. "The question is not whether a claim term recites *any* structure but whether it recites *sufficient* structure—a claim term is subject to § 112(f) if it recites 'function without reciting sufficient structure *for performing that function*.'" *Egenera*, 972 F.3d at 1374 (quoting *Williamson*, 792 F.3d at 1348); *see also Sage Products, Inc v. Devon Industries, Inc.*, 126 F.3d 1420, 1427–28 (Fed. Cir. 1997) (stating that a phrase is outside

§ 112(f) if it recites enough matter "within the claim itself to perform entirely the recited function"). In answering that question, due effect must be given to the distinction between "function" and "structure" on which § 112(f) is expressly built.

This inquiry usefully begins with parsing of the claim phrase—identifying the portion that recites the function(s) and the non-function term (a word or group of words) reciting what performs the function(s). *See Wenger Manufacturing v. Coating Machine Systems, Inc.*, 239 F.3d 1225, 1232–33 (Fed. Cir. 2001). Of significance here, correct identification of the claimed function(s) is necessary not only to determine what structures to look for in the specification if § 112(f) applies, *id.* at 1233, but also to determine whether § 112(f) applies in the first place. The search for corresponding structure and the determination whether § 112(f) applies, though "distinct," are "inherently related." *Apple Inc. v. Motorola, Inc.*, 757 F.3d 1286, 1296 (Fed. Cir. 2014). The identity of a claimed function logically bears on whether the claim recites enough structure to avoid § 112(f), because that part of the inquiry asks whether the relevant non-function term in the claim identifies "sufficient structure for performing [the claimed] function," *Williamson*, 792 F.3d at 1348 (citation omitted). *See also Egenera*, 972 F.3d at 1374 (rejecting idea that "any" or "some" structure, divorced from claimed functions, was sufficient); *Dyfan*, 28 F.4th at 1368 (looking to "availability of off-the-shelf code *to perform the recited claim functions*" to determine that term "code" was not governed by § 112 ¶ 6 (emphasis added)).

Whether the non-function term (here, "executable program code") identifies sufficient structure has two aspects that are of particular importance for the present case. First: We have often asked whether the non-function term would be understood by relevant artisans to name something identified by structural (not just functional) properties at all (a necessary predicate to being a structure that

suffices for the claimed function(s)). *Dyfan*, 28 F.4th at 1365–66; *Williamson*, 792 F.3d at 1348, 1351. The non-function term (a word or group of words) may identify structure because the term is "generally known in the art" as the name for structure. *Apple*, 757 F.3d at 1299; *see Williamson*, 792 F.3d at 1348, 1351. Accordingly, "a critical question is whether 'the claim term is used in common parlance or by persons of skill in the pertinent art to designate structure.'" *MTD Products*, 933 F.3d at 1341 (quoting *Skky, Inc v. MindGeek, s.a.r.l.*, 859 F.3d 1014, 1019 (Fed. Cir. 2017)); *see*, *e.g.*, *Rembrandt Data Technologies, LP v. AOL, LLC*, 641 F.3d 1331, 1341 (Fed. Cir. 2011) ("fractional rate encoding means" not a means-plus-function term because "self-descriptive" to relevant artisan and "used in publications and published patents"). That can be so, we have recognized, even if the name was derived from or reflects a function. *Lighting World, Inc v. Birchwood Lighting, Inc.*, 382 F.3d 1354, 1359–60 (Fed. Cir. 2004); *see*, *e.g.*, *Greenberg v. Ethicon Endo-Surgery, Inc.*, 91 F.3d 1580, 1583 (Fed. Cir. 1996) (construing "detent mechanism" as not governed by § 112 ¶ 6 and comparing terms like "screwdriver" and "container"); *Rembrandt*, 641 F.3d at 1341 ("fractional rate encoding means"); *Personalized Media Communications, LLC v. International Trade Commission*, 161 F.3d 696, 704–05 (Fed. Cir. 1998) ("detector"). Similarly, a claim term need not "call to mind a single well-defined structure" as long as it is "reasonably well understood" to refer to a class of structures identified by something beyond its function of producing a general result. *Greenberg*, 91 F.3d at 1583; *Apple*, 757 F.3d at 1300.

Second: Not just extra-patent usage in the field on its own, but, consistent with the importance of context to claim construction generally, the claim language may suffice to make clear whether certain claim words name sufficient structure in the understanding of the relevant artisan. Thus, we have recognized that even if a non-function term would be non-structural "in a vacuum," surrounding claim

language can establish that the non-function term is understood by a relevant artisan as having a particular structure. *Dyfan*, 28 F.4th at 1370; *see MTD Products*, 933 F.3d at 1341–42; *TEK Global, S.R.L. v. Sealant Systems International, Inc.*, 920 F.3d 777, 785–86 (Fed. Cir. 2019); *Zeroclick, LLC v. Apple Inc.*, 891 F.3d 1003, 1008 (Fed. Cir. 2018); *Inventio*, 649 F.3d at 1358–59; *Linear Technology Corp. v. Impala Linear Corp*, 379 F.3d 1311, 1320 (Fed. Cir. 2004); *see also Apple*, 757 F.3d at 1299–301 (explaining that a specification may define a claim term). In a phrase referring to a computer process, this may occur where the claim makes clear (expressly or implicitly) that the non-function term calls for a particular "operation," which "is more than just its function; it is how the function is achieved in the context of the invention." *Apple*, 757 F.3d at 1299; *see also Dyfan*, 28 F.4th at 1366 (quoting *Apple*, 757 F.3d at 1299); *Inventio*, 649 F.3d at 1358.

The function-operation distinction warrants particular attention in the software context, which is at issue here, because a non-functional term referring to code "is partly defined by its function." *Dyfan*, 28 F.4th at 1368. Consistent with the required structure/function statutory distinction, our cases reflect the significance in this context of the degree of generality of the claimed "function(s)" and the presence or absence in the claim of what relevant artisans would understand to disclose "how" the function is performed, going beyond calling for a functional result. *Compare Egenera*, 972 F.3d at 1374–75 (holding "logic to modify" governed by § 112(f) where there was "no structural limitation to the 'inputs, outputs, connections, and operation'"), *and Robert Bosch*, 769 F.3d at 1099–100 (holding § 112(f) applicable to term "device" where function was highly general ("program recognition"), claim "d[id] nothing more than identify functions for the 'device' to perform," and specification was "silent about any interaction between the 'program recognition device' and other components"), *and Williamson*, 792 F.3d at 1351 (holding "distributed

learning control module" subject to § 112 ¶ 6 where "certain inputs and outputs" were described only at "a very high level" and claim lacked description of "interact[ion] with other components . . . that might inform the structural character of the limitation"), *with Apple*, 757 F.3d at 1301 (holding that term "heuristic" was not governed by § 112 ¶ 6 where the "claim language and specification disclose[d] the heuristics' operation within the context of the invention, including the inputs, outputs, and how certain outputs are achieved"), *and Dyfan*, 28 F.4th at 1367–68 (holding term "code" not subject to § 112(f) "when coupled with language describing its operation," *e.g.*, claimed steps of detecting movement, receiving information, and displaying information, which "connotes structure").

2

Our body of case law implementing the structure/function principle built into § 112(f), especially as illuminated by *Dyfan*, calls for analysis of this case that goes beyond what has already been done by the parties and the district court as the case comes to us. It is true, as the district court said, that a "definition of 'executable program'" to mean a "'program that is ready to run on a given computer' . . . gives no indication that 'executable program code' is a specific code with definite structure." *Claim Construction Order*, at *5–6. It is also true that even if the "executable program code" limitations refer to "logic," the term "logic" "[b]y itself" is similarly unstructured and generic. *Id.*, at *6. But additional analysis is needed.

Further attention to the character of the claimed functions is required for a sound determination whether the claims' recitation of annotation or synchronous-play functionality (though on their face seemingly more about user-desired results than technological means to achieve them) provides adequate structure even if "executable program code" standing alone does not. *See Dyfan*, 28 F.4th at 1368–69 (stressing need to "[r]eview[ ] the alleged means-

plus-function limitation *in full*" and analyze whether "the recitation of the code['s] . . . *operation* would have connoted structure to" relevant artisans (emphases added)). In addition, although expert declarations were submitted, they may not have been focused on the full scope of the issue, and in any event, the district court did not find facts based on that evidence. *See Claim Construction Order*, at *5 (mentioning expert evidence only in passing). Instead, it appears that the district court resolved the issue on the intrinsic record, but without conducting the inquiry into extra-patent usage that can be essential to determining whether an alleged means-plus-function phrase, including the recitation of the claimed function, names or describes at least a class of structures sufficient to perform the function. *See Dyfan*, 28 F.4th at 1366–68.

Amazon urges us to uphold the district court's decision, citing *Robert Bosch* and *Egenera*, but there is more analysis to be done for how those decisions, together with *Dyfan*, properly apply here. In *Robert Bosch*, we determined that the term "program recognition device" was subject to § 112 ¶ 6 because, looking to both the claim language and the specification, the claim "d[id] *nothing more than* identify functions for the 'device' to perform." 769 F.3d at 1099–100 (emphasis added); *see id.* at 1099 ("[A]ll of the proffered citations from the specification *merely* explain [the term's] function." (emphasis added)). In *Egenera*, we focused on whether there was recited structure for "the claimed functions," rejecting the idea that the term "logic" was not subject to § 112(f) simply because it denoted "some possible structure" in the form of "software, firmware, or circuitry." 972 F.3d at 1374.

TrackTime does not argue that the phrase "executable program code" avoids § 112(f) because it connotes any structure at all, but that the recitation of "'executable program code' that is 'configured' to perform specific operations" would be understood, "read as a whole, to refer to 'well-understood' code for performing those operations."

TrackTime Opening Br. at 20; J.A. 1386–87, 1389–91, 1400–03 (arguing same to district court). It provided examples from the prior art that, according to TrackTime, would have been understood to be the referred-to structure. *E.g.*, J.A. 1636. That argument may well be wrong, but the district court should have explained why the pertinent evidence requires the conclusion that a relevant artisan would not so understand the disputed terms before holding that § 112(f) applies. Accordingly, we vacate the determination that the "executable program code" terms are invalid for indefiniteness.

On remand, the focus of the § 112(f) analysis should be on whether the disputed limitations, read in full and in context, recite enough structure to perform the claimed functions. *See Dyfan*, 28 F.4th at 1368–69; *Williamson*, 792 F.3d at 1348. Here, the relevant claimed functions are annotation and synchronous play (1) on a mobile computing device and (2) integrable with the other functionality described in the claims.[4] That the code runs on a mobile device is the natural import of the claims' references to "mobile computing device software." '978 patent, col. 64, lines 47–51 (annotation function); col. 64, lines 54–57 (synchronous-play function). And the ordinary meaning of a claim to a single element having multiple features is that a single instance of the element must meet each limitation. *See In re Varma*, 816 F.3d 1352, 1363 (Fed. Cir. 2016) ("For a dog owner to have 'a dog that rolls over and fetches sticks,' it does not suffice that he have two dogs, each able to perform just one of the tasks."). The claim language that

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[4] We note that, because the asserted '978 claims all incorporate claim 1's disputed annotation limitation, it would not be necessary to reach the synchronous-play limitation were the district court to again decide on remand that the annotation limitation is an indefinite means-plus-function term.

here requires the annotation, synchronous-play, and other functions to be carried out by the same "software" communicates that the code referred to must be capable of being implemented with code that performs the other claimed functions. Our reading of the claim language is confirmed by the specification, because mobile-device implementation and integrability are the key assertedly inventive features of the disclosure; the specification distinguishes prior-art software "unsuitable for mobile computing devices," asserting that mobile computing devices "cannot run [certain existing] transcript management utilities," *id.*, col. 1, lines 55–58, and purports to solve the problem of "disparate software applications," *id.*, col. 8, lines 15–22; *see id.*, col. 11, lines 46–50.

The parties' arguments to date have not been focused on whether the claims reveal structure for those precise functions. In light of that fact, and of the foregoing elaboration of the required § 112(f) analysis, it may be appropriate and helpful to the court for the parties to have a new opportunity to present arguments and evidence directed to the correct questions. We leave that determination to the district court's sound discretion, but, however the court proceeds, certain aspects of the record appear to warrant closer attention now that the relevant functions have been pinpointed.

The '978 patent's claims, taken alone, do not recite a description of the code's operations sufficient to define structure. For claim 1's annotation function, mere "user input" is recited, '978 patent, col. 64, line 50, and for claim 2's synchronous-play function, not even that much is present. *See Egenera*, 972 F.3d at 1374 (inquiring whether the claims provide structure by describing "inputs, outputs, connections, and operation" of "logic"). But the specification requires more attention, to consider passages that provide some details, *see*, *e.g.*, '978 patent, col. 33, lines 11–12; col. 33, lines 21–32; col. 33, lines 47–50; col. 34, lines 44–46; col. 34, lines 60–62, and whether such details are

properly understood to limit the meaning of the claim language at issue.

Additionally, more attention must be paid to whether the "executable program code" limitations, for the functions stated above, were generally known in the art at the time of the invention as names for known code. *See Williamson*, 792 F.3d at 1348. Extrinsic evidence may be particularly useful in determining whether that is so, if it is placed in dispute. *See Inventio*, 649 F.3d at 1357; *Dyfan*, 28 F.4th at 1366. But we do not read the existing expert evidence to which the parties refer us as directly addressing the question. *See* J.A. 1478 (Schonfeld declaration, opining on bare terms "executable" and "program code"); J.A. 1635–38 (Agrawala declaration, identifying examples of code for annotation but not stating whether identified code is mobile device software); J.A. 1640–44 (similar for synchronous-play code). We also cannot exclude the possibility that either "executable program code" limitation might yet be held on the intrinsic evidence alone to be a means-plus-function term. It has, for example, been intimated in this court (though hardly explained) that either the specification or the prosecution history of the '978 patent disclaims the prior art code that TrackTime points to as the sufficiently identified structure. *See* Amazon Br. at 56, 61; Oral Arg. at 12:42–13:31 (Amazon's counsel arguing that specification demonstrates that "[claimed] mobile computing device software did not exist"), https://www.cafc.uscourts.gov/oral-arguments/24-1102_05082026.mp3. If the district court, after considering the relevant intrinsic evidence, determines that it is not necessary to reach extrinsic sources, it should explain why the intrinsic record resolves the § 112(f) question to the degree of clarity required. *See*, *e.g.*, *Williamson*, 792 F.3d at 1351 (reasoning that a "fact [attested in an expert declaration] cannot create structure where none otherwise is disclosed [by the claims]"); *Diebold Nixdorf, Inc. v. International Trade Commission*, 899 F.3d 1291, 1299–300 (Fed. Cir. 2018) (explaining that "in

appropriate cases, a party advocating [for a § 112(f) construction] can overcome the presumption against its application solely by reference to evidence intrinsic to the patent").

B

1

Regarding the '638 patent, TrackTime contends that it was entitled to judgment as a matter of law that Amazon infringes claim 9 because there was insufficient evidence to find otherwise. TrackTime Opening Br. at 25–51. The jury's special verdict provides six independent bases for the determination that Amazon is not liable for infringement. *See* J.A. 5378–83. We focus on only one ground, anticipation of claim 9 by LiveNote, for which we determine the record contains sufficient support. It is therefore unnecessary for us to decide the merits of TrackTime's remaining arguments for reversing the denial of JMOL.

TrackTime argues that there was insufficient evidence for the jury to find that LiveNote anticipates '638 claim 9 because (1) LiveNote does not disclose "performing a data lookup"; (2) LiveNote does not disclose the claimed "mobile computing device"; and (3) LiveNote does not disclose a "touch-sensitive input interface," which TrackTime says requires sensitivity to "human touch gestures." TrackTime Opening Br. at 44–46. These arguments are without merit.

TrackTime wholly fails to explain why the jury was not permitted to find that LiveNote discloses performing a data lookup. Moreover, that argument was not presented to the district court, *see* J.A. 6643–44; *JMOL Decision*, at *7–8, so TrackTime has forfeited it. *See Fresenius USA, Inc. v. Baxter International, Inc.*, 582 F.3d 1288, 1295–96 (Fed. Cir. 2009).

As for the "mobile computing device" limitation, the LiveNote user guide expressly discloses using the program on a "tablet PC," J.A. 8762, 8906, which is one example

given by the '638 patent itself of a "mobile computing device," '638 patent, col. 18, lines 19–21 ("[T]he term mobile computing device may be used interchangeably with the term tablet computer[.]"); *see id.*, col. 12, line 18; col. 18, line 4. TrackTime's understanding of the LiveNote tablet disclosure as relating only to an annotation function, and not to navigating a transcript using a mobile device, is merely one possible interpretation of the evidence, and TrackTime cites nothing in the LiveNote exhibits that says that less than the full suite of the program's features is available on tablet PCs to support its position. *See* TrackTime Opening Br. at 45–46 (citing only Dr. Agrawala's testimony, J.A. 6377–78, for this understanding). TrackTime's interpretation was also contradicted by Dr. Schonfeld's testimony, which the jury was permitted to credit. J.A. 6145 ("You can use LiveNote . . . with something called a tablet PC . . . [and] the [user guide] makes clear that you can tap on the tablet . . . instead of clicking[.]"); *see* J.A. 6145–46, 6151, 6321–22. The LiveNote user guide's tablet-computer disclosure and the testimony of Amazon's expert were sufficient evidence from which a jury could reasonably find that LiveNote discloses the claimed mobile computing device.

Regarding the "touch-sensitive input interface" limitation, the LiveNote user guide expressly discloses using a tablet pen for some of the program's functionality, J.A. 8762, 8906, and the jury heard expert testimony that all of LiveNote's disclosures would thus have been understood by a relevant artisan to be operable on a touchscreen device "with a pen or a finger," J.A. 6148–49; *see* J.A.6151, 6321–22. There is therefore no merit to TrackTime's contention that LiveNote does not disclose transcript navigation by human touch gestures; the jury was entitled to credit Dr. Schonfeld's contrary testimony. Moreover, TrackTime did not seek a construction that would limit the claimed "touch-sensitive input interface" to human touch, *see Claim Construction Order*, at *1, and the jury could reasonably

find that LiveNote's express disclosure of an interface operable with a tablet pen comes within the ordinary meaning of "touch-sensitive input interface." *See Akamai Technologies, Inc. v. MediaPointe, Inc.*, 159 F.4th 1370, 1380 (Fed. Cir. 2025). For these reasons there was sufficient evidence to find that LiveNote discloses claim 9's touch-sensitive input interface. We therefore uphold the finding of anticipation by LiveNote, and that is enough to reject TrackTime's challenge to the denial of JMOL.

2

TrackTime also argues in the alternative that, even if it was not entitled to JMOL, the jury's finding of anticipation by LiveNote was contrary to the "clear weight of the evidence" such that TrackTime should have been granted a new trial. TrackTime Opening Br. at 55. We do not agree.

The Third Circuit will find an abuse of discretion in refusing to grant a new trial when a verdict "cries out to be overturned" or "shocks [the] conscience." *Leonard v. Stemtech International Inc*, 834 F.3d 376, 386 (3d Cir. 2016) (citations omitted). TrackTime's arguments on this score consist of a single sentence citing the same testimony of Dr. Agrawala that is the basis of TrackTime's JMOL challenge with respect to anticipation by LiveNote. The LiveNote user guide alone provides significant support for the jury's anticipation verdict, because its disclosures of tablet PCs, without disclosing that the program's functionality is in any way constrained when run on a tablet, strongly imply that all of the manual's disclosures apply equally to tablet PCs. *See* J.A. 8762, 8906. And Dr. Schonfeld testified to the same effect. J.A. 6145–46. TrackTime thus, at most, identifies a run-of-the-mill contest between experts that was within the competence of the jury to resolve. The district court did not abuse its discretion in determining that such evidence does not show that the verdict was so deeply flawed that a new trial was

warranted. *See Leonard*, 834 F.3d at 386. We thus affirm the district court's denial of a new trial. TrackTime's other arguments for a new trial do not implicate the anticipation ground on which we affirm the denial of judgment as a matter of law, so we need not and do not reach them.

III

We have considered the parties' remaining arguments and find them unpersuasive. For the foregoing reasons, we vacate the district court's judgment of invalidity of the asserted claims of the '978 patent and remand for further proceedings consistent with this opinion. As to the '638 patent, we affirm the district court's denial of JMOL and its refusal to grant a new trial.

The parties shall bear their own costs.

AFFIRMED IN PART, VACATED IN PART, AND REMANDED