

# United States Court of Appeals for the Federal Circuit

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**SMARTREND MANUFACTURING GROUP (SMG),  
INC.,**  
*Plaintiff-Appellee*

v.

**OPTI-LUXX INC.,**  
*Defendant-Appellant*

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2024-1616, 2024-1650

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Appeals from the United States District Court for the  
Western District of Michigan in Nos. 1:21-cv-01009-HYJ-  
RSK, 1:22-cv-00915-HYJ-RSK, Judge Hala Y. Jarbou.

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Decided: November 13, 2025

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Before DYK, LINN, and STARK, *Circuit Judges*.

DYK, *Circuit Judge*.

Smartrend Manufacturing Group (SMG), Inc. (“Smartrend”) brought suit against Opti-Luxx Inc. (“Opti-Luxx”) for infringement of two patents: U.S. Design Patent No. D932,930 (the “D930 patent”) and U.S. Patent No. 11,348,491 (the “491 patent”). After trial, the jury found that Opti-Luxx infringed both patents. The district court denied Opti-Luxx’s motion for judgment as a matter of law (“JMOL”) and issued a permanent injunction. Opti-Luxx appeals.

With respect to the D930 patent, we conclude that Opti-Luxx forfeited its objection to Smartrend’s expert testimony on infringement, but we conclude that the district court erred in its construction of the term “transparency,” and that a new trial is necessary. With respect to the ’491 patent, we conclude that JMOL should have been granted because no reasonable jury could have found infringement under the doctrine of equivalents. Accordingly, we reverse the judgment of infringement with regard to the ’491 patent, vacate the judgment as to the D930 patent, and remand for a new trial on the issue of infringement of the D930 patent. We also vacate the injunction.

#### BACKGROUND

This case involves two patents that are directed to an illuminated school bus sign. Opti-Luxx’s product (the “accused product”) is a single-piece illuminated school bus sign made up of a rigid plastic tub housing, an LED light board, and a yellow lens with black lettering. The plastic housing operates as the accused product’s frame and is not separable from the rest of the sign. According to Opti-Luxx, the black lettering on the accused product is totally opaque and the yellow lens is translucent such that light can pass through, but the LED light board behind it is not clearly visible.

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### I. THE D930 PATENT

The D930 patent claims “[t]he ornamental design for an LED light panel, as shown and described.” J.A. 5557. In the description, the D930 patent indicates that “oblique shading lines visible in the front and perspective views denote transparency.” *Id.* The D930 patent contains 10 figures, three of which are shown below:



FIG. 1



FIG. 2

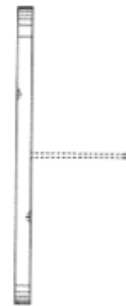


FIG. 3

J.A. 5559.

Over Opti-Luxx’s objection, the district court construed the D930 patent claim term “transparency” to mean both

“transparent” and “translucent.” The jury was instructed that “[t]he Court has found the word transparency to mean both transparent and translucent. You must use this interpretation of the oblique lines when you consider infringement of the D930 design patent claim.” See Trial Tr. vol. 3, 648:13–18, *Smartrend Mfg. Grp. (SMG), Inc. v. Opti-Luxx Inc.*, Nos. 1:21-cv-1009, 1:22-cv-915 (W.D. Mich. Nov. 29, 2023).

At trial, in support of its infringement theory, Smartrend moved to recognize Mr. York as an expert in “LED lighting and illuminated signage.” J.A. 1697 ll. 20–22. Then, when Mr. York was admitted as an expert witness, Opti-Luxx did not object. When Mr. York began testifying as to the perspective of an ordinary observer with regard to the D930 patent, Opti-Luxx objected to his testimony based on his purported lack of qualifications. The district court overruled this objection, and the jury subsequently found infringement.

## II. THE ’491 PATENT

Claim 1 of the ’491 patent is the only independent claim of the patent and recites:

1. An illuminated school bus sign for direct mounting on a school bus, the sign comprising:
  - opaque lettering positioned on or over a front surface of a translucent panel;
  - an opaque rear panel situated opposite to the translucent panel in spaced relation therefrom to define a space therebetween;
  - a light source comprising a plurality of LEDs positioned in the space adjacent to the rear panel and pointing towards a front of the sign;
  - and

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frame surrounding a perimeter of the translucent panel and forming a perimeter of the sign for mounting the sign to the school bus,

wherein the translucent panel is spaced by a spacer from the LEDs thereby creating a gap between the LEDs and the translucent panel,

wherein the spacer surrounds the LEDs and supports a rear surface of the translucent panel along the entire perimeter of the translucent panel, and

wherein the entire perimeter of the translucent panel is sealed in a weather-tight manner by a weather-tight seal between the translucent panel and the spacer.

'491 patent, col. 22 l. 51–col. 23 l. 6.

The district court construed the claim term “frame” to be “a separate and distinct” component. J.A. 77. The district court based its construction on the intrinsic evidence in the patent’s specification. Because the accused product does not have a separate frame, the district court granted summary judgment as to literal infringement but denied summary judgment as to doctrine of equivalents infringement. The trial proceeded under a theory of doctrine of equivalents infringement as to this claim limitation.

At trial, Mr. York testified that the accused product’s integrated frame performed the same function as the ’491 patent’s claimed frame because it “forms a perimeter of the sign for mounting to the school bus,” J.A. 1736 ll. 15–20, even though he conceded that it did not perform other functions discussed in the patent. Opti-Luxx argued that this concession was fatal to Smartrend’s doctrine of equivalents theory of infringement because the accused product’s frame did not perform the required functions. The district court rejected this contention and determined that

the required function was an issue of fact for the jury rather than for the court to decide. The jury found infringement and subsequently the district court denied Opti-Luxx's motion for JMOL with regard to the '491 patent.

Opti-Luxx timely appeals. We have jurisdiction under 28 U.S.C § 1295(a)(1).

### DISCUSSION

With respect to the D930 patent, Opti-Luxx argues that the district court erred in construing the term “transparency” and in admitting Mr. York's testimony as to the perspective of an ordinary observer. With respect to the '491 patent, Opti-Luxx argues that the court erred in denying Opti-Luxx's motion for JMOL because no reasonable juror could have found that the accused product performed the functions disclosed in the patent specification. Smartrend argues that we can affirm the judgment of infringement by rejecting the district court's construction of “frame” and finding literal infringement of the '491 patent by the accused product.

#### I. THE D930 PATENT

##### A. EXPERT TESTIMONY

Opti-Luxx objects to the admission of Mr. York's expert testimony regarding infringement of the D930 patent. We review a district court's admission of an expert witness for abuse of discretion. *Sundance, Inc. v. DeMonte Fabricating Ltd.*, 550 F.3d 1356, 1360 (Fed. Cir. 2008). To prove design patent infringement, a patentee must demonstrate that the accused product “embod[ies] the patented design or any colorable imitation thereof.” *Egyptian Goddess, Inc. v. Swisa, Inc.*, 543 F.3d 665, 678 (Fed. Cir. 2008) (en banc) (quoting *Goodyear Tire & Rubber Co. v. Hercules Tire & Rubber Co.*, 162 F.3d 1113, 1116–17 (Fed. Cir. 1998)). Whether a product infringes a design patent hinges on whether an ordinary observer would consider the two designs to be substantially the same. *Top Brand LLC v. Cozy Comfort*

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Co., 143 F.4th 1349, 1358 (Fed. Cir. 2025) (quoting *Gorham Co. v. White*, 81 U.S. 511, 528 (1871)). An ordinary observer is the principal purchaser of a particular product. *Arminak & Assocs. v. Saint-Gobain Calmar, Inc.*, 501 F.3d 1314, 1322 (Fed. Cir. 2007) (quoting *Gorham*, 81 U.S. at 528), *abrogated on other grounds by*, *Egyptian Goddess*, 543 F.3d 665. At trial, Mr. York testified that an ordinary observer for the purposes of the D930 patent is a school bus dealer or the person making the purchasing decision for a school district's school bus fleet, a definition that the parties do not contest on appeal. For the purposes of Opti-Luxx's motions, the district court "consider[ed] the school district as the ordinary observer." J.A. 52.

Although expert testimony is not always required to elucidate the perspective of an ordinary observer, *see Braun Inc. v. Dynamics Corp. of Am.*, 975 F.2d 815, 821 (Fed. Cir. 1992), it is of course permitted if the intrinsic evidence does not resolve the interpretive question, and Smartrend chose to present expert testimony on the ordinary observer's perspective. Mr. York conceded that he is not an ordinary observer himself, nor has he worked with ordinary observers before. However, Mr. York did testify that he had experience working in the automotive and transportation industries, was familiar with the relevant regulations that applied to school buses, and was an expert in lighting systems and signage.

We have not yet had the occasion to decide what exactly qualifies an expert witness to testify as to the perspective of the ordinary observer. In the utility patent context, an expert witness may testify as to the perspective of a person of ordinary skill in the art ("POSA") even if the expert possesses extraordinary skill. *See FastShip, LLC v. United States*, 968 F.3d 1335, 1340 (Fed. Cir. 2020) ("An attack [on an expert] on the grounds that he is not a person of ordinary skill in the art is meritless." (alteration in original; internal quotation marks omitted)). However, for such an extraordinary expert's testimony to be relevant, the expert

must establish familiarity with the perspective of a POSA. *See Ruiz v. A.B. Chance Co.*, 234 F.3d 654, 667 (Fed. Cir. 2000) (remanding where it was unclear whether a highly qualified expert’s testimony was relevant to the perspective of a POSA); *see also Kyocera Senco Indus. Tools Inc. v. Int’l Trade Comm’n*, 22 F.4th 1369, 1376–77 (Fed. Cir. 2022) (“To offer expert testimony from the perspective of a skilled artisan in a patent case—like for claim construction, validity, or infringement—a witness must at least have ordinary skill in the art. Without that skill, the witness’ opinions are neither relevant nor reliable.”); Robert A. Matthews, Jr., *Annotated Patent Digest* § 44.66 (“Even though experts may be of extraordinary skill, generally their opinions have relevance only if the opinions show the understanding of one of ordinary skill, not the personal understanding of the expert.”). It seems logical that these same principles will apply in a design patent context—such that expert witnesses may possess knowledge beyond that of ordinary observers yet still testify as to the perspective of an ordinary observer, provided the expert can establish familiarity with that perspective.

We need not decide this today because the district court correctly determined that Opti-Luxx forfeited its objection to Mr. York’s testimony. Well before the time of the voir dire, Mr. York had described his proposed testimony in his expert report, including his analysis of the ordinary observer’s perspective. The report ultimately concluded that “an ordinary observer, giving the attention a purchaser of signs usually gives, would consider the [accused product] as a whole to be substantially similar in appearance as the claimed design.” J.A. 547. When Smartrend moved to admit Mr. York as an expert witness, Opti-Luxx did not object. Because Opti-Luxx had knowledge of Mr. York’s anticipated testimony on the ordinary observer’s perspective, if Opti-Luxx wished to prevent the testimony, it was required to object that Mr. York was not qualified to testify to that perspective before the district court ruled on his



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qualifications. The district court did not err in allowing his testimony.

#### B. CLAIM CONSTRUCTION OF “TRANSPARENCY”

Opti-Luxx also argues that the district court applied an erroneous claim construction to the D930 patent. We review a district court’s claim construction based on intrinsic evidence de novo and any underlying factual findings based on extrinsic evidence for clear error. *Apple Inc. v. Wi-LAN Inc.*, 25 F.4th 960, 967 (Fed. Cir. 2022). Design patents are directed towards new, original and ornamental designs. 35 U.S.C. § 171(a). As opposed to a utility patent, which protects the functional aspects of an invention, a design patent protects “the ornamental or aesthetic features of a design.” *Carman Indus., Inc. v. Wahl*, 724 F.2d 932, 939 n.13 (Fed. Cir. 1983); *accord Sport Dimension, Inc. v. Coleman Co.*, 820 F.3d 1316, 1320 (Fed. Cir. 2016). “Design patents are given narrow scope.” *Top Brand*, 143 F.4th at 1358.

A patented design may be claimed “as shown” or “as shown and described.” 37 C.F.R. § 1.153(a). “[A]s a rule[,] the illustration in the drawing views is its own best description.” Manual of Patent Examining Procedure (“MPEP”) § 1503.01(II). Nevertheless, the MPEP states that it is permissible for a patent applicant to use the description to set forth “the appearance of portions of the claimed design which are not illustrated in the drawing disclosure.” *Id.* § 1503.01(II)(A)(1). Where a design is claimed “as shown and described”—as in the case of the D930 patent—then the patent’s scope of protection is limited by the drawings and accompanying description in the patent. *See Curver Lux., SARL v. Home Expressions Inc.*, 938 F.3d 1334, 1340–41 (Fed. Cir. 2019) (noting that 37 C.F.R. § 1.153(a) “permits claim language, not just illustration alone” to identify the claimed article). The D930 patent claims its design “as shown and described,” the description being the inclusion of the reference to “transparency.” J.A. 5557.

On summary judgment, the district court determined that “transparency” was “capable of being synonymous with translucency.” J.A. 51. As noted earlier, the jury was instructed, “[t]he Court has found the word transparency to mean both transparent and translucent. You must use this interpretation of the oblique lines when you consider infringement of the D930 design patent claim.” Trial Tr. vol. 3, 648:13–18, *Smartrend*, Nos. 1:21-cv-1009, 1:22-cv-915 (W.D. Mich. Nov. 29, 2023).

The district court’s construction was erroneous. Determining the correct construction must begin with consideration of the intrinsic evidence, which here includes the important fact that the design claimed is “as shown and described” in the specification, indicating to a POSA that the scope of the claim is limited by both the drawings and the accompanying description. *See Curver Lux.*, 938 F.3d at 1340–41. Here, the drawings use oblique shading—which a POSA would know, from the MPEP, might “show transparent, translucent and highly polished or reflective surfaces,” MPEP § 1503.02(II)—which the description then expressly narrows, stating the D930 patent’s “oblique shading lines visible in the front and perspective views denote transparency.” J.A. 5557. The claims, here, are limited to surfaces that possess transparency. Transparency is not synonymous with translucency and does not mean both transparent and translucent.

In holding that “transparency” includes “translucent,” the district court erred, requiring a new trial as to infringement. *Smartrend* appears to contend that on remand there will be further claim construction necessary as to the meaning of “transparency.” While the district court may consider extrinsic evidence, such as the testimony of an expert witness, any testimony that is “at odds with . . . the written record of the patent,” should be afforded no weight. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1318 (Fed. Cir. 2005) (en banc) (quoting *Key Pharms. v. Hercon Lab’ys Corp.*, 161 F.3d 709, 716 (Fed. Cir. 1998)).

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There is no contention that the patent claims or specification here disclaim the plain and ordinary meaning of “transparency” or that the patentee acted as a lexicographer. Under these circumstances, the jury must apply the plain and ordinary meaning of the term. *Thorner v. Sony Comput. Ent. Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012). Extrinsic evidence may not be used to arrive at a construction that is contrary to the plain and ordinary meaning.

It appears that Smartrend contends that the term “transparency” has a special plain and ordinary meaning in the art of light emitting devices. On remand, it will be appropriate for the district court to determine whether such an art-specific meaning of the term has been established such that the jury should be instructed as to such a meaning. But in this respect, we caution that “conclusory” testimony by experts unsupported by reliable extrinsic material—such as special-purpose dictionaries or other objective evidence—is insufficient. *See Phillips*, 415 F.3d at 1318; *see also Network Com., Inc. v. Microsoft Corp.*, 422 F.3d 1353, 1361 (Fed. Cir. 2005) (disregarding expert testimony because the expert “does not support his conclusion with any references to industry publications or other independent sources”); *Wireless Agents LLC v. Sony Ericsson Mobile Commc’ns AB*, 189 F. App’x 965, 968 (Fed. Cir. 2006) (“We find that the expert’s statement is conclusory and is unsupported by reference to any contemporaneous document and therefore of no value in our claim construction analysis.”).

Because the district court erred in its claim construction, we reverse the district court’s construction—which was that “the word transparency . . . mean[s] both transparent and translucent”—vacate the judgment of infringement as to the D930 patent, and remand to the district court for further proceedings.

## II. THE '491 PATENT

### A. CLAIM CONSTRUCTION OF “FRAME”

Smartrend contends that the district court erred in its claim construction of the term “frame” in the '491 patent. The district court construed the claim term “frame” to mean “a separate, distinct component” from the remainder of the sign, J.A. 77, and so instructed the jury, Trial Tr. vol. 3, 643:12–14, *Smartrend*, Nos. 1:21-cv-1009, 1:22-cv-915 (W.D. Mich. Nov. 29, 2023) (“I’ve determined that the word frame is to be accorded its plain and ordinary meaning but is also construed to be a separate and distinct component.”). As the district court relied solely on intrinsic evidence in construing “frame,” we review this claim construction de novo. *See Cal. Inst. of Tech. v. Broadcom Ltd.*, 25 F.4th 976, 985 (Fed. Cir. 2022).

The court has the responsibility to interpret and construe a utility patent, defining the scope of its claims. *E.g.*, *Markman v. Westview*, 517 U.S. 370, 372 (1996). Claims are construed based on the “ordinary and customary meaning” that the term would have to a POSA at the time of the invention. *Phillips*, 415 F.3d at 1312–13 (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)). This meaning is read both in the context of the claim itself and “in the context of the entire patent, including the specification.” *Id.* at 1313.

The district court correctly determined that the specification of the '491 patent indicates that a “frame” is a separate and distinct component from the rest of the sign. *See Poly-Am., L.P. v. API Indus., Inc.*, 839 F.3d 1131, 1137 (Fed. Cir. 2016) (affirming district court’s narrow construction of claim based on “clear and unequivocal” intrinsic evidence). The specification “repeatedly, consistently, and exclusively,” *see In re Abbott Diabetes Care Inc.*, 696 F.3d 1142, 1150 (Fed. Cir. 2012) (quoting *Irdeto Access, Inc. v. Echostar Satellite Corp.*, 383 F.3d 1295, 1300 (Fed. Cir. 2004)), refers to a “separate” mounting frame, *see*

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'491 patent, col. 2 ll. 5, 43; *id.* col. 4 l. 48; *id.* col. 7 l. 51; *id.* col. 11 l. 41; *id.* col. 21 ll. 49–62, and also references a “frameless” sign or “replaceable lens,” *see id.* col. 6 l. 15; *id.* col. 7, ll. 43, 50, 56; *id.* col. 18 ll. 16, 46–50.

As we discuss later in more detail, the patent also describes functions of the claimed invention that cannot be performed by a sign with an integrated frame. The patent specification describes how the frame is “configured to removably receive the sign,” ’491 patent, col. 2 ll. 6–7, so that “service or replacement of the sign can be performed without having to remove the entire installation” from the vehicle, *id.* col. 11 ll. 11–13, and a vehicle manufacturer could easily insert customized signage into mounted frames, *id.* col. 11 ll. 41–67.

We agree with the district court that the term “frame” in the context of the ’491 patent refers to a frame that is separate and distinct from the sign panel. In our review, “nothing suggests . . . that the claimed [device] can include” signs with integrated frames and “[i]nstead, [the] patent[] consistently show[s] the opposite.” *See Abbott Diabetes*, 696 F.3d at 1150. We accordingly reject Smartrend’s argument that the district court erred in its claim construction and that we can affirm the judgment of infringement by finding literal infringement of the ’491 patent.

#### B. DOCTRINE OF EQUIVALENTS INFRINGEMENT

Opti-Luxx argues that the district court erred in failing to grant JMOL on the issue of doctrine of equivalents infringement. “The doctrine of equivalents prevents an accused infringer from avoiding infringement by changing only minor or insubstantial details of a claimed invention while retaining their essential functionality.” *Sage Prods., Inc. v. Devon Indus., Inc.*, 126 F.3d 1420, 1424 (Fed. Cir. 1997); *accord Eli Lilly & Co. v. Hospira, Inc.*, 933 F.3d 1320, 1335 (Fed. Cir. 2019). Under this theory, “a product or process that does not literally infringe upon the express terms of a patent claim may nonetheless be found to

infringe if there is equivalence between the elements of the accused product or process and the claimed elements of the patented invention.” *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1016 (Fed. Cir. 2006) (internal quotation marks omitted) (quoting *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 21 (1997)).

Although there are two different ways that this Court has phrased the equivalence test, each articulation “aim[s] to investigate the same ‘essential inquiry.’” *NexStep, Inc. v. Comcast Cable Commc’ns, LLC*, 119 F.4th 1355, 1370 (Fed. Cir. 2024) (quoting *Warner-Jenkinson*, 520 U.S. at 40). Doctrine of equivalents infringement is found when the “differences between the claimed invention and the accused device or process are ‘insubstantial.’” *Tex. Instruments Inc. v. Cypress Semiconductor Corp.*, 90 F.3d 1558, 1563–64 (Fed. Cir. 1996). The function-way-result test asks whether the accused product “performs substantially the same function in substantially the same way to obtain the same result.” *Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, 339 U.S. 605, 608 (1950). Both parties here agree that a function-way-result framework is an appropriate articulation of the equivalence test in this case. Under the function-way-result test, for a patentee to prevail, the patentee must demonstrate equivalence as to each claimed element of the patented invention, *Lockheed Martin Corp. v. Space Sys./Loral, Inc.*, 324 F.3d 1308, 1321 (Fed. Cir. 2003), with particularized testimony and linking argument, *VLSI Tech. LLC v. Intel Corp.*, 87 F.4th 1332, 1343 (Fed. Cir. 2023).

We review the denial of a motion for JMOL de novo. *Bettcher Indus. v. Bunzl USA, Inc.*, 661 F.3d 629, 638 (Fed. Cir. 2011) (applying Sixth Circuit law). JMOL is appropriate if no reasonable, properly instructed jury could have found equivalence between each claimed element and the accused product’s corresponding feature. *Lab’y Corp. of Am. Holdings v. Qiagen Scis., LLC*, 148 F.4th 1350, 1361

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(Fed. Cir. 2025). In undertaking this analysis, we must take the evidence in the light most favorable to the non-moving party, here Smartrend. *See Sundance*, 550 F.3d at 1365 (applying Sixth Circuit law).

Whether an accused product performs the same function as the function disclosed in the patent is a question of fact. *Intendis GmbH v. Glenmark Pharms. Inc., USA*, 822 F.3d 1355, 1362 (Fed. Cir. 2016). We have held “that the function-way-result test focuses on ‘an examination of the claim and the explanation of it found in the written description of the patent.’” *Stumbo v. Eastman Outdoors*, 508 F.3d 1358, 1364–65 (Fed. Cir. 2007) (quoting *AquaTex Indus., Inc. v. Techniche Sols.*, 479 F.3d 1320, 1326 (Fed. Cir. 2007)). In determining the function disclosed in the patent, “a patent’s disclosure is relevant and can at times be dispositive.” *Intendis*, 822 F.3d at 1362. Thus, the intrinsic evidence in a patent may establish the function of a claimed element. For example, in *Hill-Rom Co. Inc. v. Kinetic Concepts, Inc.*, we looked to the specification to define the function of a claim element (a “cushion”) and concluded that the specification “clearly teaches that one of the major objectives of the cushions recited in the claims is to provide support for the patient.” 209 F.3d 1337, 1341 (Fed. Cir. 2000). Because the accused product in question did not perform that function, the district court properly found that there was no infringement under the doctrine of equivalents. *Id.* at 1343.

If a patent is “silent” as to the function, way, or result of a claim limitation, “we should turn to the ordinarily skilled artisan.” *Intendis*, 822 F.3d at 1362 (quoting *Stumbo*, 508 F.3d at 1364–65). In this case, the patent was not silent as to the function of the separate and distinct frame. Indeed, the claim language expressly claims a “frame surrounding a perimeter of the translucent panel and forming a perimeter of the sign for mounting the sign to the school bus.” ’491 patent, claim 1. Further, as the district court acknowledged, the specification of the

'491 patent “extols the virtues of its separate mounting frame.” J.A. 75. For example, because the frame is “configured to removably receive the sign,” ’491 patent, col. 2 ll. 6–7, “service or replacement of the sign can be performed without having to remove the entire installation” from a vehicle, *id.* col. 11 ll. 11–13. This way, “[s]igns may therefore be replaced in the event of failure, or can be swapped out for signs with different school bus indicia in the event of an intended service type change from school bus to activity bus . . . or in the event that the bus is being transferred to a service area with different language requirements.” *Id.* col. 11 ll. 30–35. The signage inserts can then be reused “without the indirectly-mounted sign having been marred by any drilled holes or other defects that would otherwise be introduced by direct-mounting techniques.” *Id.* col. 11 ll. 35–40. Having a separate frame also allows a manufacturer to efficiently customize a vehicle for a customer by pre-fabricating various signs that can be easily inserted into mounted frames. *Id.* col. 11 ll. 41–67. None of these functions can be performed by a sign with an integrated frame.

Smartrend points to one sentence in the ’491 patent to assert that the patent contemplates frame embodiments where the frame is “permanently affixed” to the sign. Appellee’s Br. 39–40. The specification states that “[i]n some embodiments, the frame may be a single piece frame whereby the sign is enclosed by means of intentional deformation of the frame (crimping, stamping, pressing, etc.).” ’491 patent, col. 15 ll. 6–9. It is not clear that this sentence discloses a version of the sign where the frame is “permanently affixed,” Appellee’s Br. 42. Even if we assumed that this sentence disclosed an embodiment of the frame that *eventually* became permanently affixed, it would still perform the function of allowing a manufacturer to easily customize vehicles for sale because the frame would have to be sealed around a selected sign panel. As the district court



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noted,<sup>1</sup> this sentence still clearly envisions a system with a sign and frame that are separate components.<sup>2</sup> The specification established the function of the separate frame.

The testimony of Mr. York (Smartrend’s expert) cannot contradict the patent’s description of the function. Mr. York testified that the accused product’s integrated frame “performs exactly the same function” as the ’491 patent’s claimed frame, in the same way, to achieve the same result, because it analogously performs the functions of “[s]urrounding” the sign and “form[ing] a perimeter of the sign for mounting to the school bus.” J.A. 1736 ll. 15–25; *accord* J.A. 1739 l. 19–1740 l. 3 (“It just does the same thing. It gets the same result. It gets the job done in the same way.”). As we have explained, however, the function of the frame—which the district court properly construed as being required to be separate and distinct from the remainder of the sign—is far more than just “surrounding” and “mounting.” On cross examination, Mr. York admitted

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<sup>1</sup> In considering whether this section of the specification disclosed an integrated, rather than separate frame, the district court noted that such a reading would “weaken[] the claimed benefit of the separate mounting frame structure by presumably making it more difficult to remove the sign assembly from the mount.” J.A. 76.

<sup>2</sup> Smartrend also points out that the specification states, “Other embodiments that are within the present disclosure include a mounting frame that uses double side adhesive, glue, fasteners and other suitable mounting means.” ’491 patent, col. 18 ll. 36–38. But in context, this refers to how the frame attaches to a vehicle, not how it encloses the sign within the frame. The preceding sentence makes this clear. *Id.* col. 18 ll. 33–36 (“[I]n some embodiments, the mounting frame may be a frame *for mounting on the internal or external surfaces of a vehicle window using suction cups.*” (emphasis added)).

that the accused product does not allow for the frame to removably receive the sign or enable a manufacturer to easily customize vehicles with different signage. *See* J.A. 1831 ll. 13–16; J.A. 1832 ll. 16–23 (“It’s not capable of doing that.”).

The undisputed evidence shows that the accused device does not perform the required functions. The patent indicates that the claimed invention can “removably receive the sign” so that the signs can be exchanged, customized, or serviced without removing the entire installation. *See* ’491 patent, col. 2 ll. 6–10. Smartrend’s expert witness, Mr. York, conceded that the accused product is “not capable of doing that.” J.A. 1831 l. 13–1832 l. 23. Therefore, no reasonable jury could have found that the accused product infringed the ’491 patent. We reverse the denial of JMOL as to the finding of infringement of the ’491 patent.

#### CONCLUSION

For the foregoing reasons, we vacate the judgment of infringement of the D930 patent and remand for further proceedings consistent with this opinion. We reverse the district court’s denial of JMOL as to the ’491 patent. The injunction is vacated.

#### **REVERSED-IN-PART, VACATED-IN-PART, AND REMANDED**

#### COSTS

Costs to Opti-Luxx.