

NOTE: This disposition is nonprecedential.

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

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**LIGHTING BALLAST CONTROL LLC,**  
*Plaintiff-Appellee,*

v.

**PHILIPS ELECTRONICS NORTH AMERICA  
CORPORATION,**  
*Defendant,*

AND

**UNIVERSAL LIGHTING TECHNOLOGIES, INC.,**  
*Defendant-Appellant.*

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2012-1014

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Appeal from the United States District Court for  
the Northern District of Texas in case no. 09-CV-0029,  
Judge Reed O'Connor.

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Decided: January 2, 2013

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JONATHAN T. SUDER, Friedman, Suder & Cooke, of  
Fort Worth, Texas, argued for plaintiff-appellee. With him  
on the brief was ROBERT P. GREENSPOON, Flachsbart &  
Greenspoon, LLC, of Chicago, Illinois.

STEVEN J. ROUTH, Orrick, Herrington & Sutcliffe LLP, of Washington, DC, argued for defendant-appellant. With him on the brief were STEN A. JENSON, JOHN R. INGE, T. VANN PEARCE, JR., and DIANA M. SZEGO.

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Before RADER, *Chief Judge*, O'MALLEY and REYNA, *Circuit Judges*.

REYNA, *Circuit Judge*

Lighting Ballast Control LLC (“Lighting Ballast”) sued Universal Lighting Technologies, Inc. (“ULT”) for infringement of U.S. Patent No. 5,436,529 (the ’529 Patent). The patented technology relates to control and protection circuits for electronic lighting ballasts commonly used in fluorescent lighting. The district court construed the term “voltage source means” as a means-plus-function limitation under 35 U.S.C. § 112, ¶ 6. *Lighting Ballast Control, LLC v. Philips Elecs. N. Am. Corp.*, 2010 U.S. Dist. LEXIS 127409, \*26–41 (N.D. Tex. Dec. 2, 2010). Following a jury verdict in favor of Lighting Ballast, the district court entered final judgment of infringement and validity with respect to independent claim 1 and its dependent claims 2 and 5.

Because we find that the term “voltage source means” in the claims of the ’529 Patent is a means-plus-function limitation under § 112, ¶ 6, and because we find in the specification no corresponding structure, we hold the claims invalid for indefiniteness and reverse the judgment of the district court.

## I. PATENTED TECHNOLOGY

High levels of electric current are required to start a fluorescent lamp. As a result, a fluorescent lamp fixture typically includes an electronic ballast to regulate current flow. The electronic ballast helps maintain a current level

high enough to start the lamp while simultaneously preventing current from reaching destructive levels. When a lamp is removed from its holders or when a filament is broken, current provided by the ballast suddenly ceases to flow through the lamp and dissipates back into the ballast circuitry. The dissipating current can destroy the ballast and create an electric shock hazard for someone servicing the lamp.

The '529 Patent discloses an electronic ballast with a number of improvements over the prior art, including an ability to shield itself from destructive levels of current when a lamp is removed or becomes defective. '529 Patent col. 2 ll. 39–47. Claim 1 recites,

An energy conversion device employing an oscillating resonant converter producing oscillations, having DC input terminals producing a control signal and adapted to power at least one gas discharge lamp having heatable filaments, the device comprising:

*voltage source means* providing a constant or variable magnitude DC voltage between the DC input terminals;

output terminals connected to the filaments of the gas discharge lamp;

control means capable of receiving control signals from the DC input terminals and from the resonant converter, and operable to effectively initiate the oscillations, and to effectively stop the oscillations of the converter; and direct current blocking means coupled to the output terminals and operable to stop flow of the control signal from the DC input terminals, whenever at least one gas discharge lamp is removed from the output terminals or is defective.

*Id.* col. 11 ll. 49–68 (emphasis added). The “control means” and the “direct current blocking means” correspond generally to circuits designed to prevent current from dissipating into the ballast circuitry when a lamp is removed or defective. *See, e.g., id.* col. 7 l. 45 to col. 8 l. 45. These two elements appear to be central features of the invention. *See* Joint App. 8147 (applicant describing the “particular arrangement of control means and direct current blocking means” as a key feature in a Response to the PTO). The “voltage source means” provides the device with useable DC voltage. *See id.*

## II. TRIAL PROCEEDINGS

On motion for summary judgment, ULT argued that “voltage source means” is a means-plus-function limitation and that the claims are invalid under 35 U.S.C. § 112, ¶ 2, because the specification fails to disclose any structure capable of providing DC voltage to the device. The district court initially agreed with ULT’s assertion and found the asserted claims invalid for indefiniteness. *Lighting Ballast Control, LLC v. Philips Elecs. North Am. Corp.*, 2010 U.S. Dist. LEXIS 85570, \*29–31 (N.D. Tex. Aug. 19, 2010).

On motion for reconsideration, the district court reversed its indefiniteness decision because its initial construction of “voltage source means” “exalted form over substance and disregarded the knowledge of a person of ordinary skill in the art.” *Lighting Ballast Control, LLC v. Philips Elecs. N. Am. Corp.*, 2010 U.S. Dist. LEXIS 127409, at \*38 (N.D. Tex. Dec. 2, 2010). The court cited testimony from an expert for Lighting Ballast, Dr. Roberts, and the inventor, Andrew Bobel, both of whom testified that one of skill in the art would understand the claimed “voltage source means” to correspond to a rectifier (which converts AC to DC) or other structure capable of supplying useable voltage to the device. The district court thus found that means-plus-function claiming did not

apply and construed the limitation according to its “ordinary meaning in the art.” The court found that, according to the limitation’s ordinary meaning, the claimed “voltage source means” corresponds to a class of structures: a rectifier for common applications in which the claimed device is used with an AC power line; and a battery or the like for less commonly used applications in which a DC power line is used.

ULT again moved for summary judgment, renewing its argument that the term “voltage source means” invokes means-plus-function claiming and is indefinite. The district court responded that it had “twice addressed this limitation” and declined “to address the same issue a third time.” Joint App. 62. At the close of evidence, ULT moved for judgment as a matter of law (“JMOL”) under FRCP 50(a), but did not continue to dispute the court’s construction of “voltage source means.” The court denied ULT’s JMOL motion. The district court stated in its jury charge that the term “voltage source means” refers to “a rectifier.” ULT did not object to this aspect of the jury charge. After the jury found claim 1 and its dependent claims 2 and 5 valid and infringed, ULT renewed its JMOL motion under FRCP 50(b) but did not press its argument regarding the court’s construction of “voltage source means.” The district court denied ULT’s JMOL motion and entered final judgment in favor of Lighting Ballast.

ULT appeals. We have jurisdiction pursuant to 28 U.S.C. § 1295(a)(1).

### III. WAIVER

We first address whether ULT waived the right to dispute the district court’s construction of the term “voltage source means.” Lighting Ballast argues that ULT waived its argument by failing to raise the argument in a JMOL motion during trial or in a renewed JMOL motion after the jury verdict, and by failing to object to the jury

instructions regarding the “voltage source means” limitation.

To determine whether a party waived a defense, we look to law of the applicable regional circuit, which in this case is the Fifth Circuit. See *Ultra-Precision Mfg. v. Ford Motor Co.*, 411 F.3d 1369, 1376 (Fed. Cir. 2005). In the Fifth Circuit, “[i]t is a well-settled rule of law that an appeal from a final judgment raises all antecedent issues previously decided.” *Exxon Corp. v. St. Paul Fire & Marine Ins. Co.*, 129 F.3d 781, 784 (5th Cir. 1997). “[O]nce a final judgment is entered, all earlier non-final orders affecting that judgment may properly be appealed.” *Id.* Thus, “a party may obtain review of prejudicial adverse interlocutory rulings upon his appeal from adverse final judgment, at which time the interlocutory rulings (nonreviewable until then) are regarded as merged into the final judgment terminating the action.” *Dickinson v. Auto Center Mfg. Co.*, 733 F.2d 1092, 1102 (5th Cir. 1983).

This is not a situation where a party has failed to raise an issue before the trial court that it seeks to have us review on appeal. ULT twice moved for summary judgment and argued its proposed construction of “voltage source means.” In response to ULT’s second motion for summary judgment, the district court denied the motion and ruled that it would not “address the issue a third time,” at which point the dispute surrounding the “voltage source means” became fully litigated. The district court’s final claim construction and indefiniteness ruling concerned only questions of law. See *Biomedino, LLC v. Waters Techs. Corp.*, 490 F.3d 946, 949 (Fed. Cir. 2007) (noting that an indefiniteness determination, like claim construction, is a question of law). Thus, the district court’s interlocutory ruling regarding the “voltage source means” merged into the final judgment terminating the action. See *Dickinson*, 733 F.2d at 1102.

Once ULT's position regarding the "voltage source means" was made clear to the district court, ULT was not required to renew its arguments during jury instructions. See *O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1359 (Fed. Cir. 2008) ("When the claim construction is resolved pre-trial, and the patentee presented the same position in the [pre-trial] proceeding as is now pressed, a further objection to the district court's pre-trial ruling may indeed have been not only futile but unnecessary."). As a result, we find that ULT preserved its claim construction and indefiniteness argument with respect to "voltage source means" and that the issue is properly raised on appeal.

#### IV. MEANS-PLUS-FUNCTION CLAIMING

Means-plus-function limitations are governed by 35 U.S.C. § 112, ¶ 6, which allows a patentee to express a claimed element as a "means or step for performing a specified function without the recital of structure, material, or acts in support thereof." Such an element "shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof." § 112, ¶ 6. The statute thus establishes a *quid pro quo* whereby a patentee may conveniently claim an element using a generic "means" for performing a function, provided the patentee's specification discloses structure capable of performing that function. *Atmel Corp. v. Info. Storage Devices, Inc.*, 198 F.3d 1374, 1381 (Fed. Cir. 1999). Whether a claim limitation invokes means-plus-function claiming under § 112, ¶ 6, is a matter of claim construction and therefore a question of law that we review without deference. See *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1454–55 (Fed. Cir. 1998) (en banc).

Our first step in analyzing a means-plus-function limitation is to determine whether § 112, ¶ 6, applies. *Kemco Sales, Inc. v. Control Papers Co.*, 208 F.3d 1352, 1361 (Fed. Cir. 2000). We start by considering whether

the limitation includes the word “means,” “as the terms ‘means’ and ‘means for’ have become closely associated with means-plus-function claiming.” *Inventio AG v. Thyssenkrupp Elevator Ams. Corp.*, 649 F.3d 1350, 1356 (Fed. Cir. 2011). The word “means” triggers a presumption that “the inventor used this term advisedly to invoke [means-plus-function claiming].” *York Prods., Inc. v. Central Tractor*, 99 F.3d 1568, 1574 (Fed. Cir. 1996) (citation omitted).

The presumption triggered by use of the word “means” may be rebutted if the claim itself recites sufficient structure for performing the function. See *Cole v. Kimberly-Clark Corp.*, 102 F.3d 524, 531 (Fed. Cir. 1996). In *Cole*, for example, we construed a claim directed to removable training pants for toddlers. 102 F.3d at 529. The claim recited a “perforation means extending from the leg band means to the waist band means through the outer impermeable layer means for tearing the outer impermeable layer means for removing the training brief in case of an accident by the user.” *Id.* at 530. We held that the term “perforation means” did not invoke means-plus-function claiming because the claim described not only the structure for performing the tearing function (“perforation”) but also the structure’s location (extending from the leg band to the waist band) and extent (extending through the outer impermeable layer). *Id.* at 531. “An element with such a detailed recitation of its structure, as opposed to its function, cannot meet the requirements of [§ 112, ¶ 6].” *Id.*

By contrast, when a term only indicates what the recited means “*does*, not what it *is* structurally,” the claim is properly construed under § 112, ¶ 6. *Laitram Corp. v. Rexnord, Inc.*, 939 F.2d 1533, 1536 (Fed. Cir. 1991). For example, in *Biomedino*, we construed the phrase “control means for automatically operating said valving.” 490 F.3d at 949. We held that the term “control” failed to convey sufficient structure to rebut the presumption that



means-plus-function claiming applied because “control’ is simply an adjective describing ‘means’: it is not a structure or material capable of performing the identified function.” *Id.* at 950.

Here, because claim 1 of the ’529 Patent recites a “voltage source *means*,” we start from the presumption that means-plus-function claiming under § 112, ¶ 6, applies. The claim goes on to recite the corresponding function: “providing a constant or variable magnitude DC voltage between the DC input terminals.” The term “voltage source” implies that voltage is provided, but the claim only sets out an indication of what the element “*does*, not what it *is* structurally.” *Laitram*, 939 F.2d at 1536. The recited function implies no more structure than the term “voltage source” itself. While “DC input terminals” is a structural term, the input terminals receive rather than provide DC voltage. Thus, the claim does not contain structural language that is sufficient to remove “voltage source means” from the reach of § 112, ¶ 6.

In some circumstances, expert testimony may be probative of whether a claim term itself corresponds to sufficiently definite structure. In *Rembrandt Data Techs., LP v. AOL*, for example, we relied on expert testimony to confirm that the terms “fractional rate encoding” and “trellis rate encoding” were commonly used in publications to identify *defined* algorithms (i.e., structure) known in the art. 641 F.3d 1331, 1340–41 (Fed. Cir. 2001). Because the terms were “self-descriptive,” we held that the terms “fractional rate encoding means” and “trellis encoding means” were not governed by § 112, ¶ 6, notwithstanding the word “means.” *Id.* at 1340–41.

Lighting Ballast relies on expert testimony to support its argument that “voltage source means” *implies* structure and, as a result, means-plus-function claiming does not apply. Dr. Roberts, Lighting Ballast’s expert, testified

that “[t]he ‘voltage source’ limitation connotes, or suggests, to me, and would connote to anyone skilled in the art, the structure of a rectifier. . .” because “the only way for a [l]ighting [b]allast to convert AC (from a ‘power line source’ such as a wall outlet or other similar AC power source in a home or office) into DC (for use at the ‘DC supply voltage’) is through a rectifier.” Joint App. 21. Dr. Roberts also stated that a battery could be used as the “voltage source means” if a DC power source was used. *Id.* at 21–22.

Lighting Ballast’s expert testimony suggests that some structure for performing the recited function is implied, but it does not cure the absence of structural language in the claim itself. Nor does the testimony establish that the term “voltage source” was used synonymously with a defined class of structures at the time the invention was made, unlike the testimony in *Rembrandt*. See *id.* at 1341. In fact, Lighting Ballast’s record testimony suggests a lack of a defined class of structures. While a rectifier and a battery may be examples of structures that commonly perform the recited function, there are many other ways to provide DC voltage, including “generators” and “solar voltaic cells,” as Lighting Ballast’s expert admitted. Joint App. 1623.

Lighting Ballast points to case law in which this Court declined to apply means-plus-function claiming in view of expert testimony and other extrinsic evidence showing that certain claimed elements implied sufficient structure. In those cases, however, we started from the presumption that means-plus-function claiming did not apply because the claim limitations at issue did not include the word “means.” See *MIT v. Abacus Software*, 462 F.3d 1344, 1353 (Fed. Cir. 2006) (“The phrase ‘colorant selection mechanism’ is presumptively not subject to 112 ¶ 6 because it does not contain the term ‘means.’”); *Lighting World, Inc. v. Birchwood Lighting, Inc.*, 382 F.3d 1354, 1359 (Fed. Cir. 2004) (“Because the ‘connector

assembly' limitation does not contain the term 'means,' we begin with the presumption that section 112 ¶ 6 does not apply to that limitation."); *Apex Inc. v. Raritan Computer, Inc.*, 325 F.3d 1364, 1372 (Fed. Cir. 2003) ("As an initial matter, none of the claim limitations asserted by Raritan to be means-plus-function limitations contains the term 'means,' which, as noted, is central to the analysis."); *Greenberg v. Ethicon Endo-Surgery, Inc.*, 91 F.3d 1580, 1583 (Fed. Cir. 1996) (construing the term "detent mechanism"; "means" did not appear in the claim.). In this case, we start with the presumption that means-plus-function claiming does apply because the claim limitation includes the word "means." ULT failed to present sufficient evidence to overcome that presumption.

#### V. INDEFINITENESS

Once a court determines that a claim limitation invoked means-plus-function claiming under § 112, ¶ 6, construction of the limitation involves two steps. First, the court must identify the claimed function. *Applied Med. Res. Corp. v. U.S. Surgical Corp.*, 448 F.3d 1324, 1332 (Fed. Cir. 2006). Second, the court must identify the structure described in the specification that performs the claimed function. *Id.* Here, the parties do not dispute the district court's construction of the claimed function. The sole issue on appeal is whether the specification identifies sufficient structure to support the claimed function. We review a district court's identification of the structure corresponding to a means-plus-function limitation without deference. *JVW Enters., Inc. v. Interact Accessories, Inc.*, 424 F.3d 1324, 1329 (Fed. Cir. 2005).

A patentee may use a generic "means" expression to describe a claim element, but "the applicant must indicate in the specification what structure constitutes the means." *Biomedino*, 490 F.3d at 948. A patent must point out and distinctly claim the invention. *In re Donaldson Co.*, 16 F.3d 1189, 1195 (Fed. Cir. 1994) (en

banc). Failure to disclose adequate structure to support a generic “means” expression amounts to impermissible functional claiming. *Med. Instrumentation & Diagnostics Corp. v. Elekta AB*, 344 F.3d 1205, 1211 (Fed. Cir. 2003). If the patentee fails to disclose adequate structure, the claim is invalid as indefinite under 35 U.S.C. § 112, ¶ 2. *See In re Donaldson*, 16 F.3d at 1195.

We hold that the ’529 Patent fails to disclose structure capable of “providing a constant or variable magnitude DC voltage between the DC input terminals.” The specification does not refer to a rectifier or any other structure capable of converting AC supply voltage into useable DC voltage. Nor does the specification disclose structure capable of supplying useable DC voltage directly from a DC supply voltage. Rather, the ’529 Patent mentions drawing power from a power line source and DC supply voltages without specifying a capable structure or class of structures. *See, e.g.*, ’529 Patent col. 1 l. 56, col. 2 l. 8, col. 3 ll. 6–7.

As already noted, Lighting Ballast relies on expert testimony to support its contention that one skilled in the art would readily ascertain structures capable of performing the recited function. But “testimony of one of ordinary skill in the art cannot supplant the total absence of structure from the specification.” *Default Proof Credit Card Sys., Inc. v. Home Depot U.S.A., Inc.*, 412 F.3d 1291, 1302 (Fed. Cir. 2005). Lighting Ballast’s testimony merely demonstrates that several different structures could perform the recited function, namely, a rectifier, battery, solar cell, or generator. The possibility that an ordinarily skilled artisan could find a structure that would work does not satisfy the disclosure requirements of means-plus-function claiming under § 112. *Ergo Licensing, LLC v. CareFusion 303, Inc.*, 673 F.3d 1361, 1363–64 (Fed. Cir. 2012); *see also Blackboard, Inc. v. Desire2Learn Inc.*, 574 F.3d 1371, 1385 (Fed. Cir. 2009) (“That ordinary skilled artisans could carry out the recited function in a variety

of ways is precisely why claims written in ‘mean-plus-function’ form must disclose the particular structure that is used to perform the recited function.”).

Because we hold that the term “voltage source means” in claim 1 of the ’529 Patent invokes means-plus-function claiming under § 112, ¶ 6, and because we find in the specification no corresponding structure, we find the asserted claims invalid for indefiniteness under § 112, ¶ 2. We need not address the other issues raised by ULT. The judgment below is

**REVERSED**

**COSTS**

Each party shall bear its own costs.