

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

HISENSE USA CORP.,

Petitioner,

v.

LIGHT GUIDE INNOVATIONS LLC,

Patent Owner.

Patent No. 7,936,415

Filing Date: January 18, 2008

Issue Date: May 3, 2011

Inventor: Jun Seok Park

Title: LIGHT SOURCE APPARATUS AND LIQUID CRYSTAL DISPLAY
HAVING THE SAME

PATENT OWNER'S PRELIMINARY RESPONSE

Case No. IPR2025-01537

TABLE OF CONTENTS

	Page(s)
I. INTRODUCTION	1
II. ARGUMENT.....	1
A. Ground 1 – Roberts Does Not Render Obvious “a plurality of connecting substrates connected to the connecting terminals of the module substrates”	1
B. Ground 3 – Roberts in View of Karlicek Does Not Render Obvious “a plurality of connecting substrates connected to the connecting terminals of the module substrates.”	3
C. Ground 4 is Deficient for the Same Reasons as Ground 3.....	10
D. Grounds 2 and 5-7 Are Deficient for the Same Reasons	11
III. CONCLUSION.....	12

TABLE OF AUTHORITIES

	Page(s)
Cases	
<i>Belden Inc. v. Berk-Tek LLC</i> , 805 F.3d 1064 (Fed. Cir. 2015)	7
<i>Harmonic Inc. v. Avid Tech., Inc.</i> , 815 F.3d 1356 (Fed. Cir. 2016)	3, 10
<i>Samsung Elecs. Co., v. Slyde Analytics, LLC</i> , IPR2024-00041, Paper 12 (P.T.A.B. Apr. 9, 2024)	3, 9
<i>Sisvel Int’l S.A. v. Sierra Wireless, Inc.</i> , 82 F.4th 1355 (Fed. Cir. 2023)	6
<i>Virtek Vision Int’l ULC v. Assembly Guidance Sys., Inc.</i> , 97 F.4th 882 (Fed. Cir. 2024)	8

LIST OF EXHIBITS

Exhibit No.	Description of Document
2001	Docket Control Order (Dkt. 31) in <i>Light Guide Innovations LLC v. Walmart Inc.</i> , Case No. 2-25-cv-00312-RWS-RSP (Lead Case); <i>Light Guide Innovations v. Hisense Co.</i> , Case No. 2:25-cv-00051-RWS-RSP (Member Case) dated August 4, 2025 (E.D. Tex.)
2002	Complaint for Patent Infringement (Dkt. 1) in <i>Light Guide Innovations v. Hisense Co.</i> , Case No. 2:25-cv-00051-RWS-RSP dated January 17, 2025 (E.D. Tex.)
2003	Hisense Defendants' Invalidity and Subject Matter Eligibility Contentions in <i>Light Guide Innovations LLC v. Walmart Inc.</i> , Case No. 2-25-cv-00312-RWS-RSP (Lead Case); <i>Light Guide Innovations v. Hisense Co.</i> , Case No. 2:25-cv-00051-RWS-RSP (Member Case) dated September 22, 2025

I. INTRODUCTION

On September 19, 2025, Hisense USA Corp. (“Petitioner”) submitted a Petition (Paper 1, “Petition” or “Pet.”) requesting *inter partes* review (“IPR”) of U.S. Patent No. 7,936,415 (Ex. 1001, the “’415 Patent”). The Declaration of Dr. Michael Krames (Ex. 1003) accompanied the Petition. On September 22, 2025, the Board issued a Notice of Filing Date Accorded for the Petition and set the time for filing patent owner’s preliminary response. Paper 4.

The Board should deny Hisense’s Petition because its prior art references fail to disclose or render obvious the claimed “connecting substrate,” and largely fail to address that term whatsoever. Hisense also fails to articulate any legitimate motivation to combine U.S. Patent Application Publication No. US 2007/0247414 to Roberts (Ex. 1004) and U.S. Patent Application Publication No. US 2003/0193789 to Karlicek (Ex. 1006), and the Petition further fails on that basis.

II. ARGUMENT

A. Ground 1 – Roberts Does Not Render Obvious “a plurality of connecting substrates connected to the connecting terminals of the module substrates”

In Ground 1, the Petition argues that asserted Claims 1-2, 7-8, and 11 are obvious over US2007/0247414 (Ex. 1004) (hereinafter “Roberts”). Petitioner concedes that Roberts does not expressly disclose “a plurality of connecting substrates connected to the connecting terminals of the module substrates”. Instead,

Petitioner asserts that this limitation is obvious over Roberts. But Petitioner fails to show, or even address, how Roberts' "edge connectors" comprise a "connecting *substrate*." Having entirely failed to address the claimed "connecting *substrate*," Petitioner cannot prevail in this proceeding and institution should be denied.

Petitioner argues that a POSITA would find it obvious to connect Roberts' "edge connectors 13" to terminals of the "tiles 10" which the Petition maps onto the claimed "connecting terminals of the module substrate." Pet. at 23. But while focusing on the requirement that the connections be to "the connecting terminals," (which Petitioner admits that Roberts does not expressly disclose), the Petition fails to address how those connectors are a claimed "connecting substrate." *Id.* The closest that the Petition comes to addressing this point is to conclusorily map the "edge connector 13," depicted in Roberts' Figure 5B as a mechanical connection onto the "connecting substrate" limitation, while citing to Roberts' general disclosure that the connector "may provide an electrical and/or mechanical connection between adjacent tiles 10." *Id.* (citing Roberts at (0082)). But nothing in the Petition attempts to explain how or why Roberts' connector is a "*substrate*." Having failed to address a limitation of the Challenged Claims, the Petition cannot show unpatentability and institution should be denied.

At best, Petitioner improperly reduces the claimed “substrate” to a nonce term, that would encompass any connector whatsoever. Petitioner fails to advance support for any such construction, and instead expressly states that “Petitioner does not believe any specific constructions are required at this time.” Pet. at 10. *See also Samsung Elecs. Co., v. Slyde Analytics, LLC*, IPR2024-00041, Paper 12 at 21 (P.T.A.B. Apr. 9, 2024) (“We decline to engage in such speculation, because it is ‘the *petitioner who has the burden* from the onset to show with particularity why the patent it challenges is unpatentable.’ Given the lack of any meaningful proposed claim construction for the claim 1 terms . . . Petitioner has not met its burden here.”) (citing *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016)). To the extent that Petitioner’s argument reflects an implicit claim construction reading “substrate” as a nonce term, Petitioner has failed to meet its burden, and institution should further be denied on that basis.

Because Hisense has failed to show that Roberts renders obvious the claimed “plurality of connecting substrates,” institution should be denied.

B. Ground 3 – Roberts in View of Karlicek Does Not Render Obvious “a plurality of connecting substrates connected to the connecting terminals of the module substrates.”

Ground three fails for two reasons. First, the Petition fails to articulate any legitimate motivation to combine Roberts and Karlicek to arrive at the claimed invention, particularly in the context of the “connecting substrate” and “termination

connecting substrate” limitations. Second, even in combination, the Petition fails to show that Karlicek’s “interconnect” is a claimed “connecting substrate.”

While Roberts and Karlicek both relate to LEDs at a high level, they have significant differences in their approaches and goals which Petitioner entirely fails to address, rendering its stated motivation to combine is conclusory at best. Roberts contemplates a solid state lighting system of the kind “used as direct illumination sources, for example, in architectural and/or accent lighting.” Roberts at [0002]. In contrast, Karlicek contemplates a specific arrangement of rhomboid modules in which LEDs “emitting in the red, green, and blue regions are preferably closely packed to form a color ‘pixel’ that blends the three colors.” Karlicek (Ex. 1006) at [0002]. Moreover, while both references arrangement their modules very differently. Roberts contemplates continuous rows of anodes and cathodes, and requires a “looback connector 35” to connect those anodes and cathodes.

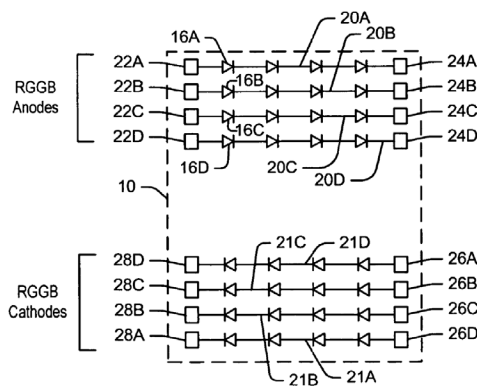


FIGURE 3

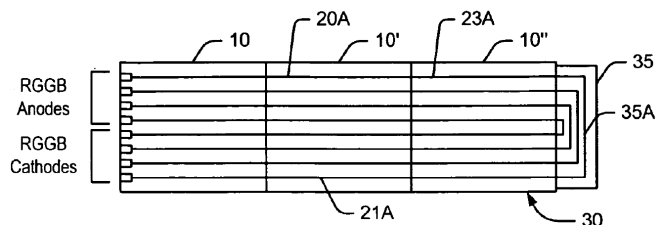
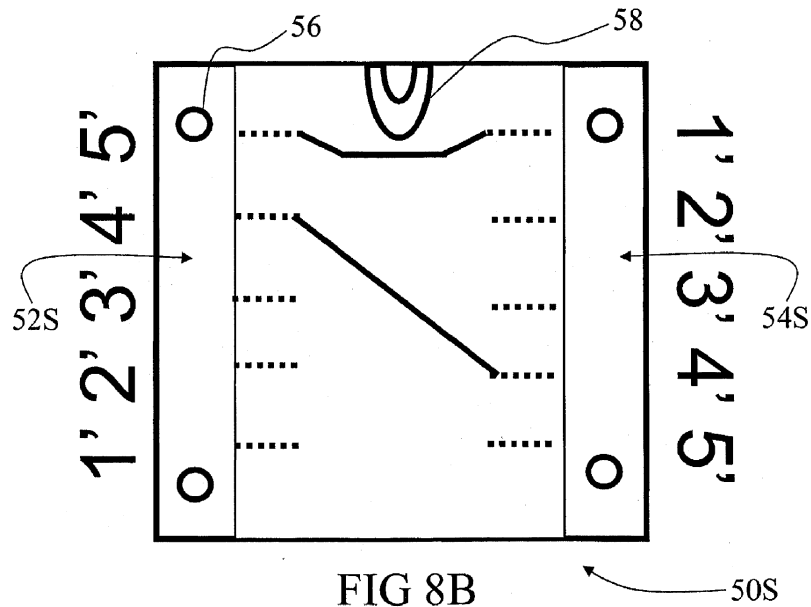
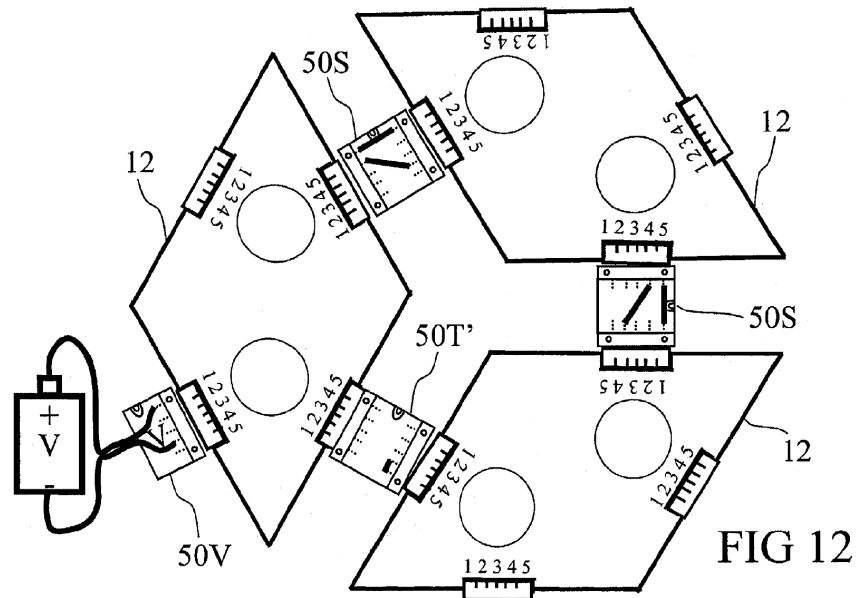


FIGURE 4A

Roberts, FIGS. 3 and 4A. In contrast, Karlicek’s “interconnects” have different

orders across substrates, and therefore use a crisscross pattern for ground continuity as shown below. Moreover, unlike Roberts' architecture which must end in a "loopback connector," Karlicek's "terminating element" is "completely electrically unconnected," or only connects a ground wire. Karlicek at [0064].



Petitioner does not address these differences and incompatibilities in Roberts' and Karlicek's approaches, and does not articulate any legitimate motivation to combine.

Petitioner instead relies largely on the legally insufficient premise that Roberts and Karlicek are analogous, while ignoring the significant differences in Roberts' intended use for illumination and Karlicek's intended use for forming pixels in a display. Petitioner argues (1) that both references pertain to LED modules with some form of connection and a power source (Pet. at 42-46); (2) that both references discuss substrates connected in series (*id.* at 46-47); and (3) that both references "employ[] intermediate edge connectors to facilitate electrical and mechanical interconnections" (*id.* at 47); (4) that "Karlicek provides a simple, modular solution for connecting a series of LED tiles to each other and to a power source, which aligns with Roberts' modular approach to preparing a lighting panel having multiple LED bars with any suitable number of lighting tiles." (*id.* at 48); and (5) that both references "facilitate independent control of different colored LED strings" (*id.* at 50). These arguments all boil down to an assertion that Roberts and Karlicek are in the same field, which is a requirement, but does not supply a motivation to combine references. *Sisvel Int'l S.A. v. Sierra Wireless, Inc.*, 82 F.4th 1355, 1364 (Fed. Cir. 2023) ("[A]ssertions that the references were analogous art, which, without more, is

an insufficient articulation for motivation to combine.”)

If Roberts already provides a complete solution (as Petitioner argues), there would be no reason for a POSITA to look to Karlicek at all. Indeed, the *only* area where Petitioner acknowledges *any* shortcoming in Roberts is its failure to disclose connections between its LED modules. Petitioner’s remaining arguments fail to articulate any legitimate reason why a POSITA would look to Karlicek to remedy this shortcoming. At most, these arguments suggest that a POSITA *could* have used Karlicek’s interconnects, but failed to identify any advantage based on which a POSITA *would* use them. *See Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1073 (Fed. Cir. 2015) (“[O]bviousness concerns whether a skilled artisan not only *could* have made but *would have been motivated to make* the combinations or modifications of prior art to arrive at the claimed invention.”). In particular, Petitioner argues that (1) Karlicek’s “standardized” interconnects and terminating elements would be advantageous to Roberts (Pet. at 51); (2) that Karlicek’s “substantially flat” interconnects would fit on Roberts’ modules; (3) that a POSITA “would have had a reasonable expectation of applying Karlicek’s substrate interconnection teachings to Roberts” based on “individual power/control of each LED string,” (*id.* at 52); and (4) that implementing Karlicek’s interconnects and terminating elements would “merely” require implementing a new “form factor and

with a wiring scheme that matched Roberts' LED bar requirements." Only Petitioner's point regarding "standardization" even approaches an actual benefit to a combination with Karlicek, but that argument makes no sense since such standardization would apply to *any* connection given Roberts' identical LED tiles.

Moreover, Petitioner's arguments are at best conclusory since they do not address the differences in Karlicek's and Roberts' interconnects, and do not address that Karlicek's terminating element does not include the "loopback" required by Roberts. Petitioner tacitly concedes this deficiency in acknowledging that any elements added from Karlicek would need a new form factor and wiring scheme (Pet. at 52), and fails to propose any wiring scheme that would allow Roberts to function in the absence of a loopback. The existence of an allegedly alternative "terminating" element in Karlicek is not sufficient to establish a motivation to combine, particularly when it would require an unspecified redesign to work with Roberts. *Virtek Vision Int'l ULC v. Assembly Guidance Sys., Inc.*, 97 F.4th 882, 886 (Fed. Cir. 2024) ("We conclude that the Board erred as a matter of law with regard to the motivation to combine. It does not suffice to meet the motivation to combine requirement to recognize that two alternative arrangements such as an angular direction system using a single camera and a 3D coordinate system using two cameras were both known in the art." Petitioner further fails to articulate any non-

hindsight reason that a POSITA would look to Karlicek in the first place, as opposed to any other reference, when it would require a new form factor and wiring scheme in any event.

Institution should therefore be denied based on the Petition's failure to articulate a legitimate motivation to combine Roberts and Karlicek.

The Petition further fails to show disclosure of the claimed "plurality of connecting substrates," even taking Roberts in view of Karlicek's disclosure. Instead, Petitioner doubles down on its unsupported construction that *all* connections are "substrates" by merit of being "physical structures/platforms upon which electrical interconnections between the conductors of adjacent module substrates are built or made." Pet. at 53. While Petitioner further argues that Karlicek's interconnects are "substantially flat" to the extent that the term "connecting substrate" is "construed to require a substantially flat surface," this argument is insufficient to carry Petitioner's burden, particularly in view of its affirmative position that the Challenged Claims do not require construction. Indeed, Hisense's failure closely mirrors that of the Petitioner in *Samsung Elecs. Co., v. Slyde Analytics, LLC*, IPR2024-00041. In that proceeding, the Board denied institution, finding that petitioner failed to meet its burden to propose a claim construction, while the claims required construction to adjudicate validity. *Id.*, Paper 12 at 16 ("We again

emphasize that “[i]n an [*inter partes* review], the *petitioner has the burden* from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic*, 815 F.3d at 1363 (emphasis added) . . . [N]either Petitioner nor [its expert] has proposed any claim construction. . . . However, on this record, we determine the claim 1 terms [] require explicit construction as a principal threshold issue in our institution decision. And Petitioner has not done so.”) Indeed, Petitioner highlights its failure to propose a construction in attempting to anticipate Patent Owner’s arguments. The Petition cannot meet its burden to show unpatentability when it fails to take a position on the meaning of “substrate,” instead conclusorily assuming that the term is satisfied by any connection.

Institution should further be denied on this basis.

C. Ground 4 is Deficient for the Same Reasons as Ground 3

Petitioner’s Ground 4 cites to the same deficient motivation to combine Roberts and Karlicek advanced in Ground 3 and fails for the same reasons. Petitioner’s addition of Liu to the proposed combination does not cure these defects.

Ground 4 further fails because it fails to show disclosure of the claimed connecting substrate. Petitioner’s argument is again identical to Ground 3, except for a generalized reference to Liu in addition to Karlicek. Pet. at 70. While Petitioner’s motivation to combine with Liu further references an “external connecting substrate,” citing back to § VIII.B.1, Petitioner does not attempt to map

this discussion to the “connecting substrate” of Claim 12. Instead, this argument appears directed to Petitioner’s arguments against an “external connecting substrate” recited in various dependent claims.

D. Grounds 2 and 5-7 Are Deficient for the Same Reasons

Each of the Petition’s remaining grounds suffers from the same deficiencies as Grounds 1 and 3, and should be denied on the same basis.

Ground 2 relies on the exact same arguments as Ground 1 over Roberts for the claimed “connecting substrate connected to the connecting terminal of the module substrate.” Pet. at 38.

Ground 5 challenges only Claim 9, which depends from Claim 1. While Ground 5 does not specify whether it relies on another preceding ground involving Roberts or Karlicek to challenge Claim 1, it necessarily suffers from the same deficiencies as Grounds 1 and/or 3.

Ground 6 challenges only Claim 10, which depends from Claim 1. While Ground 5 similarly fails to specify whether it relies on another preceding ground involving Roberts or Karlicek to challenge Claim 1, it necessarily suffers from the same deficiencies as Grounds 1 and/or 3.

Ground 7 challenges Claims 16-18, but cites back to the same arguments as Ground 1 for the claimed “connecting substrate which is connected to the first connecting terminal of a first end of the module substrate or the second end of the

module substrate,” and fails for the same reasons. While Ground 7 further cites to Ground 3 to the extent that the “connecting substrate” is “construed to require a substantially flat substrate,” that argument further suffers from the same defects as Ground 3. Ground 7’s reference to Liu and Hsiao is further unsupported in this context, as the Ground 3 argument on which it relies does not concern either reference.

III. CONCLUSION

As discussed above, Hisense’s combination fails to disclose or render obvious key limitations of the ’415 Patent, and therefore, does not anticipate or render obvious any claims. Institution should be denied.

Respectfully submitted,

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CERTIFICATE OF WORD COUNT

The undersigned hereby certifies that the portions of the above-captioned PATENT OWNER'S PRELIMINARY RESPONSE has 2,342 words in compliance with the 14,000 word limit set forth in 37 C.F.R. § 42.24. This word count was prepared using Microsoft Word for Office 365.

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CERTIFICATE OF SERVICE

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