

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

HISENSE USA CORPORATION,
Petitioner,

v.

BRIGHTPLUS VENTURES LLC,
Patent Owner.

IPR2023-01411
Patent 7,872,705 B2

Before STACEY G. WHITE, KEVIN C. TROCK, and
JOHN D. HAMANN, *Administrative Patent Judges*.

HAMANN, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

Hisense USA Corporation (“Petitioner”) filed a petition for *inter partes* review of claims 1, 2, 5, 6, 9, 11, 13, 14, 16, 17, 22, 28, 29, and 31–34 (“the challenged claims”) of U.S. Patent No. 7,872,705 B2 (Ex. 1001, “the ’705 patent”). Paper 1 (“Pet.”). Brightplus Ventures LLC (“Patent Owner”) filed a Preliminary Response. Paper 6 (“Prelim. Resp.”).

Institution of an *inter partes* review is authorized by statute when “the information presented in the petition . . . and any response . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a) (2018); *see* 37 C.F.R. § 42.108 (2023). Upon consideration of the papers, we conclude that the information presented shows that there is a reasonable likelihood that Petitioner would prevail in establishing the unpatentability of at least one challenged claim of the ’705 patent.

A. *Real Parties-in-Interest*

The parties identify themselves as real parties-in-interest. Pet. 1; Paper 4, 2. In addition, Petitioner states that it “is a subsidiary of Hisense Group,” and that “[o]ther privies or real parties in interest include companies within the Hisense Group, including Hisense International (Hong Kong) America Investment Co., Ltd.; Hisense Group Holdings Co., Ltd.; Hisense Visual Technology Co., Ltd.; Hisense International (HK) Co., Ltd.; Hisense International Co., Ltd.; [and] TVS REGZA Corporation.” Pet. 1.

B. *Related Matter*

The parties identify *Hisense USA Corp. v. Brightplus Ventures LLC*, No. 1:22-cv-02774 (N.D. Ga.), as a matter that may affect, or be affected by, a decision in this proceeding. Pet. 1; Paper 4, 2.

C. The Challenged Patent

The '705 patent relates to liquid crystal displays (LCDs) “having enhanced lighting uniformity.” Ex. 1001, 1:6–8. “LCDs typically include an array of pixels arranged in front of a light source, lighting panel, or reflector.” *Id.* at 1:19–20. More specifically, “[a] transmissive LCD is lit by a backlight, in an arrangement where the pixels are arranged in front of a light source and light from the light source is transmitted through the pixels to the front of the LCD or the viewing area, resulting in a ‘lit’ pixel.” *Id.* at 1:25–29.

“Light sources for backlighting may include . . . light emitting diodes (LEDs),” and “may be traditional or side view LEDs.” *Id.* at 1:29–34, 1:37–39. “A side view LED is a packaged LED that emits light parallel to the plane of the surface to which the package is mounted.” *Id.* at 1:40–42. “Compared to traditional LED packages, side view LED packages are thinner and typically less expensive to manufacture,” but they “have limited current handling capabilities, thus limiting their emissions.” *Id.* at 1:42–44, 1:46–48.

According to the '705 patent, “[c]urrent LED lighting techniques for transmissive LCDs include either direct backlighting or backlighting by edge illumination.” *Id.* at 1:54–56. “While a backlight will light the pixels from the backside, that light may come from directly behind the center of the pixels (direct backlighting) or from behind the sides of the pixels (backlighting by edge illumination).” *Id.* at 1:56–59. In addition, “[b]acklighting of transmissive LCDs may utilize a waveguide to spread the light to an entire LCD panel, with such waveguide having a single entry for light and transmitting the light by internal reflection to be spread over a desired area.” *Id.* at 1:66–2:3.

The '705 patent teaches that for traditional direct backlighting, an LED package “must operate at high power and be very thick if utilized without a waveguide” “[i]n order to light the entire screen.” *Id.* at 2:28–30. “With regard to edge illumination, in which a waveguide is used to spread the light emission of a side view LED package disposed on an edge of the LCD, the resulting screen size is limited.” *Id.* at 2:39–42. “As a result of the lower light emission, and the single entry for light in the waveguide, one or more portions (i.e., typically the center) of a side view LED-lighted LCD screen may not be lit if the screen is relatively large in size.” *Id.* at 2:45–49.

In response, the '705 patent teaches embodiments to address the above limitations. *See id.* at 2:53–58. In particular, the '705 patent teaches that “[e]mbodiments of [its] invention include single waveguides having multiple light entry regions for receiving light from locations other than, and/or in addition to, a single edge of the waveguide.” *Id.* at 5:19–22.

Figure 4, shown below, illustrates an embodiment of the '705 patent.

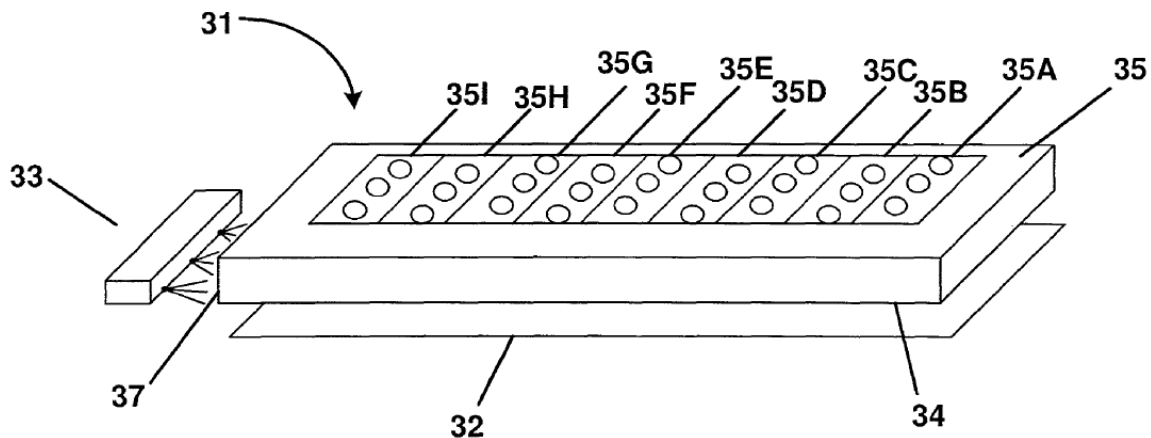


FIG. 4

Figure 4 “is a schematic perspective view illustration of an exemplary LCD system including a waveguide element subject to both backlighting by a

plurality of LEDs arranged in strips behind the LCD screen, and side backlighting by a plurality of LEDs arranged in strips along at least one side edge of the system according to one embodiment of the invention.” *Id.* at 4:11–17. As illustrated, exemplary LCD system 31 “includes a LCD panel 32, a waveguide element 34, a first light source 33 optically coupled to an edge 37 of the waveguide element 34, and additional light sources 3[5]A–3[5]I optically coupled to the back side 35 of the waveguide element 34.” *Id.* at 13:10–16.

D. The Challenged Claims

Petitioner challenges claims 1, 2, 5, 6, 9, 11, 13, 14, 16, 17, 22, 28, 29, and 31–34 in this proceeding. Claim 1 is the only independent claim. Claim 1 is illustrative of the challenged claims and is reproduced below:

1. A liquid crystal display (LCD) system comprising:
 - a) a LCD panel;
 - b) at least one waveguide element comprising a plurality of light entry regions;
 - c) a first light-emitting source comprising a first plurality of LEDs arranged in a first strip and positioned to emit light into the at least one waveguide element at a first light entry region of the plurality of light entry regions;
 - d) a second light-emitting source comprising a second plurality of LEDs arranged in a second strip and positioned to emit light into the at least one waveguide element at a second light entry region of the plurality of light entry regions; and
 - e) a common control circuit in electrical communication with at least one of the first plurality of LEDs and the second plurality of LEDs.

Ex. 1001, 13:33–48.

E. Asserted Grounds of Unpatentability

Petitioner asserts that the challenged claims of the ’705 patent are unpatentable based on the following grounds:

Claim(s) Challenged	35 U.S.C. § ¹	Reference(s)/Basis ²
1, 2, 5, 6, 9, 11, 13, 14, 16, 17, 22, 28, 29, 31–34	103(a)	Johnson ³
1, 2, 5, 11, 13, 14, 16, 17, 32, 34	103(a)	Suzuki ⁴
32, 33	103(a)	Johnson, Fine ⁵
6, 22, 28, 29, 32, 34	103(a)	Suzuki, Fine

Pet. 4–5, 15–70. Petitioner submits in support of its arguments the Declaration of P. Morgan Pattison, Ph.D. (Ex. 1003). Patent Owner submits in support of its arguments the Declaration of William Bohannon (Ex. 2001).

II. LEVEL OF ORDINARY SKILL IN THE ART

To determine whether an invention would have been obvious at the time it was made, we consider the level of ordinary skill in the pertinent art at the time of the invention. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). In assessing the level of ordinary skill in the art, various factors may be considered, including the “type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field.” *In re GPAC, Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995)

¹ The Leahy-Smith America Invents Act (“AIA”) included revisions to 35 U.S.C. § 103 that became effective on March 16, 2013. Because the ’705 patent issued from an application filed before March 16, 2013, we apply the pre-AIA version of the statutory basis for unpatentability.

² Petitioner also lists for each asserted ground the knowledge of one of ordinary skill in the art. Pet. 4–5. Such listing is unnecessary as we already consider such knowledge as part of our obviousness analysis. *See Randall Mfg. v. Rea*, 733 F.3d 1355, 1362–63 (Fed. Cir. 2013).

³ US 6,608,614 B1, issued Aug. 19, 2003 (Ex. 1005, “Johnson”).

⁴ US 2006/0220040 A1, published Oct. 5, 2006 (Ex. 1006, “Suzuki”).

⁵ US 8,128,272 B2, issued Mar. 6, 2012 (Ex. 1007, “Fine”).

(citing *Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955, 962–63 (Fed. Cir. 1986)). “[O]ne or more factors may predominate.” *Id.*

Petitioner argues that one of ordinary skill in the art for the ’705 patent “would have had at least a graduate degree in mechanical engineering, physics, materials science, electrical engineering, or a related discipline, coupled with at least four years’ experience in designing backlighting systems for displays; the level of ordinary skill in the art is approximate and additional education could make up for a lack of experience or vice-versa.” Pet. 8–9; Ex. 1003 ¶ 26.

Patent Owner argues that one of ordinary skill in the art for the ’705 patent “would have (a) a Bachelor’s of Science degree in a technical field and at least four years of experience in the field of design and/or manufacture of display systems; (b) a Master’s of Science degree in a technical field and at least two years of experience in the field of design and/or manufacture of display systems; or (c) a PhD in a technical field relating to the design and/or manufacture of display systems.” Prelim. Resp. 4; Ex. 2001 ¶ 35. Patent Owner adds that “[a]dditional graduate education could substitute for professional experience, or significant experience in the field could substitute for formal education.” Prelim. Resp. 4; Ex. 2001 ¶ 35.

The parties’ dispute regarding the level of ordinary skill in the art does not substantively impact our analysis for purposes of institution. Rather, we find in applying either parties’ definition for what comprises the level of ordinary skill in the art that Petitioner shows that there is a reasonable likelihood that it would prevail in proving the unpatentability of the challenged claims. At this stage of the proceeding, however, we adopt Petitioner’s proposed definition of the level of skill for one of ordinary skill in the art. Pet. 8–9. This definition for the level of ordinary skill is

consistent with the '705 patent and the asserted prior art, and we apply it in our analysis below.

During trial, and in accordance with our Rules, the parties should address what substantive effect, if any, different proposed definitions for the level of ordinary skill in the art have on analyzing what the prior art teaches or in otherwise evaluating unpatentability of the challenged claims.

III. CLAIM CONSTRUCTION

Because the Petition was filed after November 13, 2018, we apply the same claim construction standard that would be used in a civil action under 35 U.S.C. § 282(b), following the standard articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). 37 C.F.R. § 42.100(b); 83 Fed. Reg. 51,340, 51,340–41, 51,343 (Oct. 11, 2018). In applying such standard, claim terms generally are given their ordinary and customary meaning, as would be understood by a person of ordinary skill in the art, at the time of the invention and in the context of the entire patent disclosure. *Phillips*, 415 F.3d at 1312–13. “In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence.” *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312–17).

Here, the parties agree that no claim terms require construction. Pet. 9; Prelim. Resp. 4–5. Thus, for purposes of our Decision on Institution, we need not provide an express construction of any claim term. *See, e.g., Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)) (“[W]e need only construe terms ‘that

are in controversy, and only to the extent necessary to resolve the controversy.’’).

IV. PRINCIPLES OF LAW

A claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time of the invention to a person having ordinary skill in the art. *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence of non-obviousness, if present.⁶ *See Graham*, 383 U.S. at 17–18. When evaluating a claim for obviousness, we also must “determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *KSR*, 550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

V. ALLEGED OBVIOUSNESS OVER JOHNSON

Petitioner argues that Johnson renders claims 1, 2, 5, 6, 9, 11, 13, 14, 16, 17, 22, 28, 29, and 31–34 obvious. Pet. 15–40. For the reasons that follow, we determine that Petitioner establishes a reasonable likelihood that it would prevail in showing that Johnson renders at least one of these claims obvious.

⁶ Patent Owner does not present arguments or evidence of such objective evidence of non-obviousness. *See generally* Prelim. Resp.

A. Summary of Johnson

Johnson relates to an LED-based backlight for an LCD. Ex. 1005, 1:6–8. More specifically, Johnson provides a backlight for an LCD, where “[t]he backlight includes a first LED array that provides light with a first chromaticity and a second LED array that provides light with a second chromaticity.” *Id.* at 1:66–2:2. Johnson teaches “combin[ing] the light from the first LED array and the second LED array and direct[ing] the combined light toward the liquid crystal display.” *Id.* at 2:2–5. In addition, Johnson teaches having “[a] control system [that] is operationally connected to the second LED array,” to “adjust[] the brightness of at least one LED in the second LED array, thereby adjusting the chromaticity of the combined light.” *Id.* at 2:5–8.

B. Challenged Claim 1

1. Liquid Crystal Display System

Claim 1’s preamble recites “[a] liquid crystal display (LCD) system.” Ex. 1001, 13:33. At this stage, we agree with Petitioner and find that Johnson teaches claim 1’s preamble. Pet. 15. More specifically, we find that Johnson’s teachings “relate[] to displays, and more particularly, to an LED-based backlight for a liquid-crystal display (LCD).” Ex. 1005, 1:7–9; *see also id.* at 1:66–67 (teaching that Johnson “provides a backlight for a liquid-crystal display”).

After reviewing Petitioner’s arguments and evidence, which are not addressed by Patent Owner at this stage of the proceeding, we are persuaded that Petitioner demonstrates, for purposes of this institution decision, that Johnson teaches claim 1’s preamble. In light of our finding, we need not, and thus do not, reach whether claim 1’s preamble is limiting.

2. *LCD Panel*

Claim 1 further recites “a LCD panel.” Ex. 1001, 13:34. At this stage of the proceeding, we agree with Petitioner and find that Johnson teaches this limitation. Pet. 15–16.

In particular, at this stage, we find that Johnson teaches an LCD stack, which is backlit by a backlight assembly. Ex. 1005, 2:49–52, Fig. 2. And, at this stage, we find persuasive Dr. Pattison’s testimony that “a person of ordinary skill in the art would understand that an LCD stack is an LCD panel.” Ex. 1003 ¶ 40. We find that this testimony is consistent with Johnson and the ’705 patent’s teachings. *Compare id.*, with Ex. 1005, 1:5–2:24 and Ex. 1001, 2:22–25.

After reviewing Petitioner’s arguments and evidence, which are not addressed by Patent Owner at this stage of the proceeding, we are persuaded that Petitioner demonstrates, for purposes of this institution decision, that Johnson teaches this limitation.

3. *At Least One Waveguide*

Claim 1 further recites “at least one waveguide element comprising a plurality of light entry regions.” Ex. 1001, 13:35–36. At this stage of the proceeding, we agree with Petitioner and find that Johnson teaches this limitation. Pet. 17.

In particular, at this stage, we find that Johnson teaches such a waveguide element. *See* Ex. 1005, 2:64–67, Fig. 2. Johnson teaches, for example, a “[w]aveguide 20 [that] is made of a generally planar material[, and] that is designed to accept light from one or more light sources and uniformly deliver the light to LCD stack 12.” *Id.* at 2:64–67.

In addition, Johnson describes that the waveguide comprises a plurality of light entry regions, including an edge surface 28a as well as a

first major surface 22. *Id.* at 3:24–27 (“In operation, white light from first LED array 16 enters waveguide 20 through first major surface 22, and colored light from second LED array 30 enters waveguide 20 through edge surface 28.”).

After reviewing Petitioner’s arguments and evidence, which are not addressed by Patent Owner at this stage of the proceeding, we are persuaded that Petitioner demonstrates, for purposes of this institution decision, that Johnson teaches this limitation.

4. First Light-Emitting Source

Claim 1 further recites “a first light-emitting source comprising a first plurality of LEDs arranged in a first strip and positioned to emit light into the at least one waveguide element at a first light entry region of the plurality of light entry regions.” Ex. 1001, 13:37–40. At this stage, we agree with Petitioner and find that Johnson teaches this limitation. Pet. 17–18.

In particular, at this stage, we agree with Petitioner and find that Johnson teaches a plurality of LEDs 18 in an LED array 16 arranged in a strip (e.g., a row). *See, e.g.*, Ex. 1005, Figs. 1–2; Pet. 17. Petitioner’s annotation of Johnson’s Figure 1, shown below, illustrates this finding. Pet. 18.

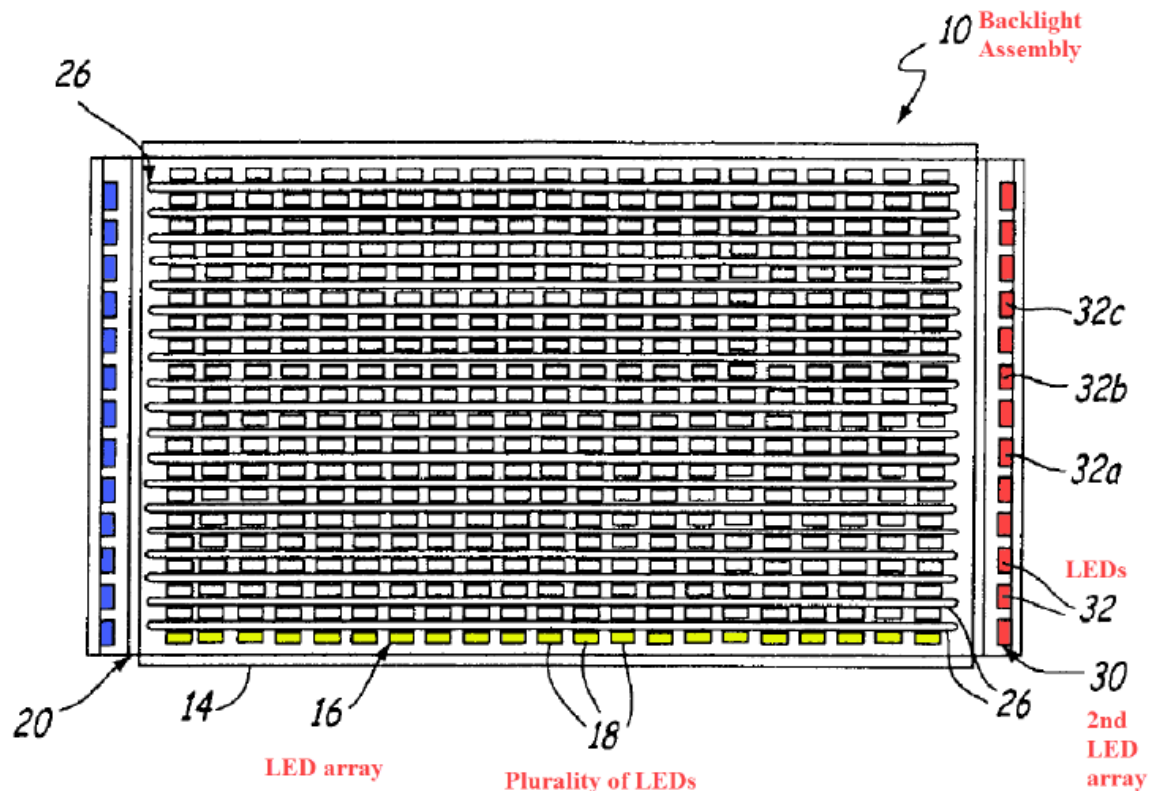


Fig. 1

Figure 1 “is a top plan view of an LCD backlight assembly according to” Johnson’s teachings. Ex. 1005, 2:34–35. As illustrated, “[b]acklight assembly 10 includes a base 14 that has a principal or first LED array 16 disposed thereon.” *Id.* at 2:54–56. “First LED array 16 is comprised of a plurality of LEDs 18,” and “is designed to provide the substantial majority of the light required for” the LCD stack. *Id.* at 2:56–60. “Waveguide 20 is disposed between base 14 and LCD stack 12” (not shown). *Id.* at 2:63–64. In relevant part, Petitioner annotated Figure 1 by (i) coloring in yellow the bottom row of LEDs 18 of LED array 16, and (ii) labeling reference numeral 16 as “LED array” and 18 as “Plurality of LEDs.” Pet. 18.

At this stage, we agree with Petitioner and find that one of ordinary skill in the art would have understood that a row of the LEDs (such as the

bottom row) in the LED array is arranged in a strip. Ex. 1003 ¶ 51; Pet. 17. The '705 patent broadly describes a strip in the context of a suitable configuration for the LEDs. Ex. 1001, 11:46–67. For example, the '705 patent provides the following:

A single light source may comprise a plurality of LEDs. The LEDs of such a plurality of LEDs may be arranged in any suitable configuration, whether to enable convenient manufacture, to maximize light emitted into the light entry regions of the at least one waveguide element, or both. Exemplary arrangements include multiple LED packages arranged in a strip, or a single LED package containing multiple LEDs arranged in a strip. Such a strip may contain two or more LEDs or LED packages.

Id. at 11:46–54. In addition, the '705 patent further states that “multiple strips may be connected to one another in any suitable orientation, such as in an end-to-end orientation, or in a side-to-side orientation, in order to yield a single composite light source to emit light into the waveguide element.” *Id.* at 11:59–63. Accordingly, we view Johnson’s array as comprising a plurality of strips (e.g., rows) in a side-to-side orientation, which is consistent with the plain and ordinary meaning of strip. Ex. 1005, Fig. 1.

On this record, we find unavailing Patent Owner’s argument that “Johnson does not teach or suggest that LED array 16 is a single strip,” but rather teaches that LED array 16 comprises all of the rows of LEDs on the substrate. Prelim. Resp. 9–10 (citing Ex. 1005, 2:54–57, Fig. 1; Ex. 2001 ¶¶ 54–56). Patent Owner views Johnson’s teachings too narrowly by focusing on all of the rows of the array. *See EWP Corp. v. Reliance Universal Inc.*, 755 F.2d 898, 907 (Fed. Cir. 1985) (“A reference must be considered for everything it *teaches* by way of technology and is not limited to the particular *invention* it is describing and attempting to protect.”).

Moreover, as we discuss above, the '705 patent explains that “multiple strips may be connected to one another . . . in a side-to-side orientation, in order to yield a single composite light source,” which is akin to an array. *Id.* at 11:59–63.

We also agree with Petitioner and find that Johnson teaches that LED array 16 (including its bottom row) is positioned to emit light into waveguide 20 through a first light entry region (i.e., first major surface 22). Ex. 1005, 3:25–26, Figs. 1–2; Pet. 18.

In sum, at this stage, we find that Johnson teaches this limitation.

5. Second Light-Emitting Source

Claim 1 further recites “a second light-emitting source comprising a second plurality of LEDs arranged in a second strip and positioned to emit light into the at least one waveguide element at a second light entry region of the plurality of light entry regions.” Ex. 1001, 13:41–45. At this stage, we agree with Petitioner and find that Johnson teaches this limitation. Pet. 19.

In particular, we agree with Petitioner and find that Johnson teaches a plurality of LEDs 32 in a second array (a strip) provided adjacent to edge surface 28a of waveguide 20. *See* Ex. 1005, 3:14–24, Figs. 1–2. LED array 30 is positioned to emit light into waveguide 20 through a second light entry region (edge surface 28). *Id.* at 3:25–33, Figs. 1–2.

After reviewing Petitioner’s arguments and evidence, which are not addressed by Patent Owner at this stage of the proceeding, we are persuaded that Petitioner demonstrates, for purposes of this institution decision, that Johnson teaches this limitation.

6. Common Control Circuit

Claim 1 further recites “a common control circuit in electrical communication with at least one of the first plurality of LEDs and the

second plurality of LEDs.” Ex. 1001, 13:46–48. At this stage, we agree with Petitioner and find that Johnson teaches this limitation. Pet. 19–20.

In particular, we agree with Petitioner and find that Johnson teaches a common control circuit (control system 40), including a processor 44b and controller 44, that is in electrical communication (via conductive lines 46) with the first plurality of LEDs (LEDs 18 in bottom row of LED array 16) and the second plurality of LEDs (LEDs 32 in second LED array 30). Ex. 1005, 3:43–47; Fig. 3. Moreover, Johnson teaches that the control circuit electrically communicates commands to vary the power supplied to the LEDs. *Id.* at 3:66–4:6.

At this stage, we find unavailing Patent Owner’s argument that Johnson’s control system 40 “is not equivalent to the common control circuit as disclosed in the ’705 [p]atent.” Prelim. Resp. 11 (citing Ex. 2001 ¶¶ 57–58). In particular, Patent Owner argues that “[a]s taught in the ’705 patent, a common control circuit is a means to vary the power supplied to the LEDs as well as the intensity and wavelength of the emitted light.” *Id.* at 12. But, the language of the limitation does not include the requirements Patent Owner lists. Accordingly, we find unavailing Patent Owner’s arguments which seek to add additional requirements to the claim language. *See In re Self*, 671 F.2d 1344, 1348 (CCPA 1982) (stating limitations not appearing in the claims cannot be relied upon for patentability); *see also Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1346–47 (Fed. Cir. 2015) (quoting *Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1328 (Fed. Cir. 2002)) (cautioning “against limiting the claimed invention to preferred embodiments or specific examples in the specification”). To the extent that Patent Owner believes that limitations from the Specification should be included in the construction of “common control circuit,” Patent Owner

should provide factual and legal support for such during trial, in accordance with our Rules.

7. Summary

In summary, based on the current record, and for purposes of this institution decision, we determine that Petitioner shows a reasonable likelihood that it would prevail in showing that claim 1 would have been obvious to one of ordinary skill in the art in view of Johnson.

C. Challenged Claims 2, 5, 6, 11, 13, 14, 16, 17, 22, 28, 29, and 31–34

At this stage, Patent Owner does not address separately Petitioner’s arguments and evidence as to how Johnson teaches claims 2, 5, 6, 11, 13, 14, 16, 17, 22, 28, 29, and 31–34. *See* Prelim. Resp. 14–15. We find Petitioner’s showing for these claims sufficient for institution. Pet. 20–25, 28–40.

D. Challenged Claim 9

Claim 9 recites “[t]he LCD system of claim 1, wherein each LED of the first plurality of LEDs and second plurality of LEDs is adapted to output substantially the same wavelength.” Ex. 1001, 14:10–12. At this stage, we find Petitioner’s showing for claim 9 sufficient for institution. Pet. 31–33.

In particular, we agree with Petitioner’s arguments that incorporate alternative showings for the first and second light-emitting sources. First, we agree with Petitioner and find that Johnson’s Figure 1 “illustrates numerous linear arrangements (rows) of LEDs 18 in a first LED array 16 . . . that emits white or near-white light,” and that one of ordinary skill in the art would have understood that “each row of LED array 16 is a plurality of LEDs.” Pet. 27–28 (citing Ex. 1005, Fig. 1; Ex. 1003 ¶ 53). We find persuasive Dr. Pattison’s testimony that one of ordinary skill in the art would

have understood that for a first LED array 16 to emit white light, having each LED in that set emit white light. Ex. 1003 ¶ 65.

Second, we also agree with Petitioner’s argument that Johnson teaches a plurality of LEDs emitting light into the edge surface 28a of waveguide 20 and a plurality of LEDs emitting light into edge surface 28b, and that those LEDs may have the same chromaticity (color) output. Ex. 1005, Figs. 1–2, 6:15–17. Put differently, we agree that Johnson teaches to one of ordinary skill in the art for each of these LEDs, have substantially the same wavelength. Ex. 1003 ¶ 67; Pet. 27.

Moreover, at this stage, we find that Petitioner’s reasoning concerning its showing for claim 1 also encompasses these configurations of first and second light-emitting sources and their communication with the common control circuit. *See supra* Section V.B.4–6. And we find unavailing Patent Owner’s argument that Johnson’s teaching regarding the plurality of LEDs adjacent to faces 28a and 28b refers to different LEDs in the same array, and thus “does not teach or suggest that each LED in both the ‘first plurality of LEDs and second plurality of LEDs’ would output substantially the same wavelength.” Prelim. Resp. 14 (citing Ex. 1005, 6:9–17). That Johnson refers to the plurality of LEDs adjacent face 28a and the plurality of LEDs adjacent face 28b as part of the same array does not change that Johnson teaches that these separate strips of LEDs (i.e., first and second light-emitting sources) can have the same color.

In sum, at this stage, we find Petitioner’s showing for claim 9 sufficient.

VI. ALLEGED OBVIOUSNESS OVER SUZUKI

Petitioner argues that Suzuki renders claims 1, 2, 5, 11, 13, 14, 16, 17, 32, and 34 obvious. Pet. 41–56. Petitioner already has demonstrated a

reasonable likelihood of success in proving that at least one claim of the '705 patent would have been obvious. In order to provide guidance to the parties, however, we address the issues in dispute for this ground. *See* Consolidated Trial Practice Guide November 2019⁷ (“CTPG”) 6 (“If a trial is instituted, the Board generally will provide analysis of the strengths and weaknesses of all challenges in the petition in order to provide guidance to the parties for the upcoming trial.”).

A. Summary of Suzuki

Suzuki “relates to a surface illuminator utilizing an array of discrete light sources and a liquid crystal display having the same.” Ex. 1006 ¶ 2. More specifically, Suzuki teaches a LCD having a surface illuminator, where “[a] reflective surface for reflecting light in a light guide region of a light guide extends from an end of a light entrance surface through which light enters the light guide region.” *Id.* at code (57). “An LED light source serving as an array of discrete light sources is constituted by a red emission LED, a green emission LED, a blue emission LED, and another green emission LED provided alternately and discretely along the light entrance surface.” *Id.* “A red LED serving as an end light source provided at the end of the LED light source on the side of an end of a reflective surface is disposed such that about one half of an emitting region of the same is obscured by the reflective surface to prevent about one half of the quantity of light emitted from entering the light guide region.” *Id.*

⁷ Available at <https://www.uspto.gov/TrialPracticeGuideConsolidated>.

B. Disputed Issues

1. Challenged Claim 1's Common Control Circuit

Patent Owner disputes Petitioner's showing that Suzuki teaches "a common control circuit in electrical communication with at least one of the first plurality of LEDs and the second plurality of LEDs," as recited in claim 1. Prelim. Resp. 16–18. More specifically, Patent Owner argues that Petitioner incorrectly contends that Suzuki teaches "a driving circuit which can 'vary the current supplied to the LEDs,'" but Suzuki instead teaches "means for modulating the amount of light that is reflected off of reflective surfaces 13L and 13R." *Id.* at 17–18 (citing Pet. 46; Ex. 1006 ¶¶ 46–47, Fig. 4; Ex. 2001 ¶ 64). Patent Owner adds that "[t]he language from Suzuki . . . makes it clear that Suzuki did not intend to vary the intensity of the emission of light from the light sources." *Id.* at 18 (citing Ex. 1006 ¶ 44).

We find these arguments unavailing. Rather, we find Suzuki teaches that the LEDs 7R and 8R are in electrical communication with the LED driving circuit (common control circuit), which is the extent of what the claim requires. Ex. 1006 ¶ 44, Fig. 4. We also find Patent Owner's arguments directed to aspects of a specific embodiment of the common control circuit in the '705 patent inapposite. Prelim. Resp. 17–18. The proper focus is on the language of the claim. *See In re Self*, 671 F.2d at 1348; *Williamson*, 792 F.3d at 1346–47.

2. Challenged Claim 5

Claim 5 recites "[t]he LCD system of claim 1, wherein any of the first light-emitting source and the second light-emitting source comprises a plurality of LEDs adapted to emit any of white light and single color light." Ex. 1001, 13:64–67. At this stage, we find Petitioner's showing for claim 5 sufficient for institution. Pet. 48–49.

In particular, we agree with Petitioner that Suzuki teaches that the 7R LEDs (a plurality of LEDs for first light-emitting source) on the 12T light entrance surface emit one color (red). Ex. 1006 ¶¶ 10, 40, Figs. 4, 6; Ex. 1003 ¶ 63. We find unavailing Patent Owner’s argument to the contrary as it contradicts Suzuki’s above teachings. Prelim. Resp. 19–20 (citing Ex. 2001 ¶ 67).

3. *Challenged Claim 11*

Claim 11 recites “[t]he LCD system of claim 1, further comprising a common control circuit in electrical communication with each LED of at least one of the first plurality of LEDs and the second plurality of LEDs.” Ex. 1001, 14:16–19. At this stage, we find Petitioner’s showing for claim 11 sufficient for institution. Pet. 49–50.

In particular, we agree with Petitioner and find that Suzuki teaches that for “a general LED driving circuit . . . , the end light source LEDs 8R may be made to emit light in a quantity smaller than that emitted by the other LEDs 7R by a predetermined amount by supplying the end light source LEDs 8R with a current smaller than a current supplied to the LEDs 7R by a predetermined amount.” *Id.*

At this stage, we find unavailing Patent Owner’s argument that “Suzuki does not teach a common control circuit in electrical communication with each LED of at least one of the first plurality of LEDs and the second plurality of LEDs.” Prelim. Resp. 21 (citing Ex. 2001 ¶ 70). This argument is incorrectly premised on Petitioner contending that the first light-emitting source comprises “LED light sources 15’ [top row]” and the second light-emitting light source comprises “LED light sources 15 [bottom row].” Prelim. Resp. 21 n.5 (citing Pet. 44–45). In fact, Petitioner identifies for the first light-emitting source Suzuki’s “LED light sources 15 *with LEDs*

7 (*in red*),” and for the second light-emitting source Suzuki’s “LED light sources 15 *with LEDs 7 (in blue)*.” Pet. 44–45 (emphases added).

4. *Challenged Claim 34*

Claim 34 recites “[t]he LCD system of claim 1, further comprising a third light-emitting source positioned to emit light into the at least one waveguide element.” Ex. 1001, 16:16–18. At this stage, we find Petitioner’s showing for claim 34 sufficient for institution. Pet. 55–56.

In particular, we agree with Petitioner and find that Suzuki teaches that “LED light sources 15, which are arrays of discrete light sources, are provided on the light entrance surfaces 12 of the light guide 11,” and that “[t]he LED light sources 15 are formed by alternately and discretely arranging plural types of LEDs 7 emitting beams of light having different emission wavelength spectra along the light entrance surfaces 12.” Ex. 1005 ¶ 27; *see also id.* ¶ 30, Fig. 4; Pet. 55. We find persuasive Dr. Pattison’s testimony that one of ordinary skill in the art would have considered each set 10 of LEDs as a light emitting source. Ex. 1003 ¶ 81. Accordingly, Suzuki teaches at least three light-emitting sources positioned to emit light into the light entry surfaces 12B, 12T of lightguide 11.

At this stage, we find unavailing Patent Owner’s arguments that Petitioner’s showing is insufficient. Prelim. Resp. 22. These arguments are incorrectly premised on specific structures from embodiments of the ’705 patent, rather than the requirements of the claim language. *See In re Self*, 671 F.2d at 1348; *Williamson*, 792 F.3d at 1346–47. Moreover, Patent Owner posits that adding a third light emitting source to Suzuki would result in a specific structure, but this proffered structure is different than what Suzuki’s Figure 4 teaches, upon which Petitioner relies. *Compare* Prelim.

Resp. 22, *with* Pet. 55. Accordingly, we also find these arguments from Patent Owner inapposite.

VII. ALLEGED OBVIOUSNESS OVER JOHNSON AND FINE

Petitioner argues that the combination of Johnson and Fine renders claims 32 and 33 obvious. Pet. 56–59. At this stage, Patent Owner does not address separately Petitioner’s arguments and evidence as to how this combination teaches these claims. *See* Prelim. Resp. 23. We have reviewed Petitioner’s arguments and evidence regarding claims 32 and 33 for this ground, and, on the current record, we find them persuasive for purposes of institution.

VIII. ALLEGED OBVIOUSNESS OVER SUZUKI AND FINE

Petitioner argues that the combination of Suzuki and Fine renders claims 6, 22, 28, 29, 32, and 34 obvious. Pet. 60–70. In order to provide guidance to the parties, we address the disputed issues for this ground. CTPG 6.

A. *Summary of Fine*

Fine relates to artificial illumination that is capable of providing light at any intensity profile and any color profile, including uniform white light. Ex. 1007, 1:16–20. More specifically, Fine teaches an illumination apparatus, which comprises at least one light emitting source embedded in a waveguide material. *Id.* at code (57). “The waveguide material is capable of propagating light generated by light emitting source(s), such that at least a portion of the light is diffused within the waveguide material and exits through at least a portion of its surface.” *Id.*

B. Disputed Issues

1. Combining Suzuki and Fine

Based on the current record, we agree with Petitioner and find that one of ordinary skill in the art “would have been motivated to modify the backlighting systems described in Suzuki to comprise the illumination apparatus described in Fine.” Pet. 60. In particular, we agree with Petitioner and find that one of ordinary skill in the art would have been motivated to make the combination to “achieve a vast range of color reproducibility.” Pet. 61; Ex. 1006 ¶ 5; Ex. 1007, 1:16–20; Ex. 1003 ¶ 94. We also find persuasive for institution Dr. Pattison’s testimony that one of ordinary skill in the art would have known that Suzuki and Fine describe methods for improving color uniformity, and “would have been motivated to use the improvements described within Fine to improve the color uniformity of the lighting system described in Suzuki.” Ex. 1003 ¶ 95. In fact, Fine expressly states that its teachings “can be incorporated in a passive display device.” Ex. 1007, 5:22–23.

We also agree with Petitioner and find that one of ordinary skill in the art would have had a reasonable expectation of success in combining Suzuki and Fine’s teachings in the manner done so by Petitioner. Pet. 61. We do not find that making such a combination would have been uniquely challenging or difficult for one of ordinary skill in the art. *See Leapfrog Enterprises, Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1162 (Fed. Cir. 2007) (citing *KSR*, 550 U.S. at 419–20) (finding that obviousness was supported because there was no evidence that making the combination was uniquely challenging or difficult for one of ordinary skill in the art).

Accordingly, at this stage, we find that Petitioner has provided sufficiently articulated reasoning with rational underpinning to support

combining Suzuki and Fine in the manner Petitioner proposes. *See In re Kahn*, 441 F.3d at 988; *see also Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1374 (Fed. Cir. 2019) (“A motivation to combine may be found ‘explicitly or implicitly in market forces; design incentives; . . . and the background knowledge, creativity, and common sense of the person of ordinary skill.’”) (quoting *ZUP, LLC v. Nash Mfg., Inc.*, 896 F.3d 1365, 1371 (Fed. Cir. 2018)).

At this stage, we find unavailing Patent Owner’s arguments relating to Suzuki teaching edge lighting, and Fine teaching positioning LEDs “both around the periphery of a waveguide and embedded in the waveguide.” Prelim. Resp. 24–25. For example, Patent Owner argues that “[e]mbedding light emitting elements in the light guide 11 of Suzuki would interfere with the operation of dots 24 which act to scatter light.” *Id.* at 26 (citing Ex. 2001 ¶ 76). Patent Owner adds that “it is unclear from the Petition how such electrical connections would be made if light emitting elements were to be embedded in the light guide of Suzuki as the electrical lines would have to run through the reflectors 20 of Suzuki.” *Id.* Moreover, according to Patent Owner, “a system such as the one proposed by Petitioner would function less well than either of the two as they are described in their respective specifications,” and thus, one of ordinary skill in the art “would not be motivated to combine Suzuki and Fine.” *Id.* (citing Ex. 2001 ¶¶ 74–76).

These arguments are akin to arguing that Suzuki and Fine’s teachings cannot be physically combined, which is an improper focus for determining whether the claim would have been rendered obvious by the prior art as a whole. *See Allied Erecting & Dismantling Co. v. Genesis Attachments, LLC*, 825 F.3d 1373, 1381 (Fed. Cir. 2016) (quoting *In re Sneed*, 710 F.2d 1544, 1550 (Fed. Cir. 1983)); *see also id.* (quoting *In re Etter*, 756 F.2d 852,

859 (Fed. Cir. 1985) (en banc)) (“Etter’s assertions that Azure cannot be incorporated in Ambrosio are basically irrelevant, the criterion being not whether the references could be physically combined but whether the claimed inventions are rendered obvious by the teachings of the prior art as a whole.”). Rather, at this stage, we find that one of ordinary skill in the art would have “be[en] able to fit the teachings of [Suzuki and Fine] . . . together like pieces of a puzzle” because the skilled artisan is “a person of ordinary creativity, not an automaton.” *KSR*, 550 U.S. at 420–21.

We also find unavailing Patent Owner’s arguments concerning Suzuki and Fine not being in the same field of endeavor. Prelim. Resp. 23–25. The proper focus is whether Suzuki and Fine are within the field of endeavor of the ’705 patent. *See Corephotonics, Ltd. v. Apple Inc.*, 84 F.4th 990, 1007 (Fed. Cir. 2023) (noting that prior art must be in the same field of endeavor as the challenged patent). We agree with Petitioner that each of Suzuki and Fine relate to backlighting for LCDs, which corresponds to the ’705 patent’s broad field of endeavor of LCDs having enhanced lighting uniformity. Pet. 61 (citing Ex. 1006 ¶ 4; Ex. 1007, 3:65–4:8, 5:37–40); Ex. 1001, 1:6–8.

2. *Challenged Claim 6*

Claim 6 recites “[t]he LCD system of claim 5, wherein any of the first light-emitting source and the second light-emitting source comprises a plurality of direct LEDs.” Ex. 1001, 14:1–3. At this stage, we find Petitioner’s showing for claim 6 sufficient for institution. Pet. 62–64.

We find unavailing Patent Owner’s argument that one of ordinary skill in the art would not have been motivated to add direct LEDs embedded in the waveguide taught in Fine to the edge lighting teachings of Suzuki because “[t]his would be redundant and create unnecessary expense.” Prelim. Resp. 26–27 (citing Ex. 2001 ¶ 77). The proper focus is whether the

combination provides a suitable option. *See Intel Corp. v. PACT XPP Schweiz AG*, 61 F.4th 1373, 1380 (Fed. Cir. 2023) (holding the Board erred by concluding there was no reason to combine in part because the base reference “already addresses” a problem); *id.* at 1381 (finding that a petitioner is not required to show that the combination would be an improvement, but only that it was a suitable option).

3. *Challenged Claim 22*

Claim 22 recites “[t]he LCD system of claim 1, wherein any of the first light-emitting source and the second light-emitting source is optically coupled to a back portion of the at least one waveguide element.” Ex. 1001, 14:57–60. At this stage, we find Petitioner’s showing for claim 22 sufficient for institution. Pet. 64–66.

Patent Owner argues that “Fine does not disclose light emitting sources optically coupled to the back portion of a waveguide element within the meaning of the ’705 patent.” Prelim. Resp. 28. More specifically, Patent Owner argues that the ’705 patent uses the term as follows: “a front portion of a waveguide is optically coupled to transmit light to a LCD panel or screen.” *Id.* at 29 (quoting Ex. 1001, 6:57–59). Patent Owner argues that “[t]his language shows that the ’705 [p]atent does not include ‘embedded’ within the definition of ‘optically coupled’ as it would be absurd and unproductive to embed a waveguide into an LCD panel.” *Id.* (citing Ex. 2001 ¶ 84).

We find these arguments unavailing as Patent Owner does not explain how the cited portion of the Specification serves to narrow the term “optically coupled.” *See Williamson*, 792 F.3d at 1346–47 (cautioning “against limiting the claimed invention to preferred embodiments or specific examples in the specification”). To the extent that Patent Owner believes

that “optically coupled” should be narrowed from its plain and ordinary meaning, Patent Owner should provide detailed factual and legal support for such during trial, in accordance with our Rules.

We also find unavailing Patent Owner’s argument that combining Suzuki and Fine to teach this claim “would change the entire system of Suzuki and would require a completely distinct light guide not disclosed of in either Suzuki or Fine.” Prelim. Resp. 29 (citing Ex. 2001 ¶ 85). We view this as arguing that Suzuki and Fine’s teachings cannot be physically combined, which is the incorrect focus. *See Allied Erecting*, 825 F.3d at 1381; *KSR*, 550 U.S. at 420–21.

4. *Challenged Claim 28*

Claim 28 recites “[t]he LCD system of claim 1, wherein any of the first light emitting source and the second light-emitting source is disposed along a center region of the LCD system behind the LCD panel, and is positioned to emit light into a back side of the at least one waveguide element.” Ex. 1001, 15:15–19. At this stage, we find Petitioner’s showing for claim 28 sufficient for institution. Pet. 66–67.

In particular, we agree with Petitioner and find that Fine teaches having “light sources throughout the waveguide 14, including the center region, emitting light into the back side of waveguide 14.” Pet. 66 (citing Ex. 1007, 12:50–52, Fig. 1c). Moreover, Fine teaches that LEDs 12 “can be embedded in the bulk of waveguide material 14 or near surface 18.” Ex. 1007, 13:66–67. Accordingly, we agree with Petitioner and find that “Suzuki’s device modified by Fine’s teachings would account for LEDs 12 optically coupled to the back portion 18 of a waveguide element 14.” Pet. 66–67.

At this stage, we find unavailing Patent Owner’s arguments that Fine teaches “that the light sources are not provided outside of the back surface of the light guide, but rather embedded in the lightguide,” and that “[t]he light source cannot emit light into a surface that it is mounted above.” Prelim. Resp. 30 (citing Ex. 1007, Figs. 2a–2b). Rather, Fine also teaches that the LEDs “can be . . . near surface 18,” which allows for the LEDs to be positioned to emit light *into* the back side of the waveguide element.

IX. CONCLUSION

For the foregoing reasons, we determine that Petitioner has demonstrated that there is a reasonable likelihood that it would prevail in proving the unpatentability of at least one of the challenged claims of the ’705 patent. We thus institute an *inter partes* review of all of the challenged claims of the ’705 patent on all grounds asserted in the Petition. *See* 37 C.F.R. § 42.108(a).

Any findings or conclusions in this Decision are made only for the purposes of institution and are not dispositive of any issue. We have not made a final determination with respect to the patentability of any challenged claim. Our final determination will be based on the record as fully developed during trial, including any evidence or argument timely presented by the parties under our Rules.

X. ORDER

In consideration of the foregoing, it is hereby

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review of the ’705 patent is instituted on all of the challenged claims and all grounds asserted in the Petition; and

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial; the trial commences on the entry date of this Decision.

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