

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO. LTD.,
Petitioner,

v.

LYNK LABS, INC.,
Patent Owner.

IPR2022-00051
Patent 10,492,251 B2

Before JON B. TORNQUIST, KEVIN C. TROCK, and
SCOTT RAEVSKY, *Administrative Patent Judges*.

TORNQUIST, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

A. *Background and Summary*

Samsung Electronics Co., Ltd. (“Petitioner”) filed a Petition (Paper 1, “Pet.”) requesting an *inter partes* review of claims 1 and 6 of U.S. Patent No. 10,492,251 B2 (Ex. 1001, “the ’251 patent”). Lynk Labs, Inc. (“Patent Owner”) filed a Preliminary Response to the Petition. Paper 7. With authorization, Petitioner subsequently filed a Preliminary Reply (Paper 11) and Patent Owner filed a Preliminary Sur-Reply (Paper 14) addressing discretionary denial pursuant to 35 U.S.C. § 325(d).

Upon review of the parties’ arguments and supporting evidence, we instituted review with respect to claims 1 and 6 of the ’251 patent. Paper 19 (“Institution Decision” or “Dec.”).

Patent Owner subsequently filed a Response (Paper 22, “PO Resp.”), to which Petitioner filed a Reply (Paper 27, “Pet. Reply”), and Patent Owner filed a Sur-Reply (Paper 29, “Sur-Reply”).

Petitioner relies, *inter alia*, upon the declaration of R. Jacob Baker, Ph.D. (Ex. 1002) and Patent Owner submits a declaration from Thomas L. Credelle (Ex. 2006).

An oral hearing was held on March 7, 2023, and a transcript of the hearing is included in the record (Paper 36, “Tr.”).

For the reasons that follow, we conclude that Petitioner has proven by a preponderance of the evidence that claims 1 and 6 of the ’251 patent are unpatentable.

B. *Real Parties-in-Interest*

Petitioner identifies itself and Samsung Electronics America, Inc. as the real parties-in-interest. Pet. 1.

Patent Owner identifies itself as the real party-in-interest. Paper 26, 1.

C. Related Matters

The parties identify *Samsung Electronics Co. v. Lynk Labs, Inc.*, No. 1:21-cv-02665 (N.D. Ill.) (consolidated with *Lynk Labs, Inc. v. Samsung Electronics Co., Ltd.*, No. 1:21-cv-05126 (N.D. Ill.)) and *Lynk Labs, Inc. v. Samsung Electronics Co.*, No. 1:21-cv-05021-MHC (N.D. Ga.) as related matters. Pet. 1; Paper 26, 1.

D. The '251 Patent

The '251 patent “relates to alternating current (‘AC’) driven LEDs, LED circuits, and AC drive circuits and methods.” Ex. 1001, 1:41–44. The '251 patent explains that LEDs “are intrinsically DC devices that only pass current in one polarity and historically have been driven by DC voltage sources using resistors, current regulators and voltage regulators to limit the voltage and current delivered to the LED.” *Id.* at 1:63–67. With proper considerations, however, the '251 patent reports that “LEDs may be driven more efficiently with AC than with DC drive schemes.” *Id.* at 2:3–4.

The '251 patent discloses various methods of driving LEDs, including the use of a single bridge rectifier to drive parallel LEDs, using a capacitor to smooth the AC waveform to reduce ripple and to protect the LEDs, and using various driver designs to provide a relatively constant or fixed voltage and frequency to LED circuits. *Id.* at 4:14–18, 4:22–24, 5:24–26.

E. Illustrative Claim

Petitioner challenges claims 1 and 6 of the '251 patent. Pet. 4. Claim 1, reproduced below, is illustrative of the challenged claims:

1. An LED lighting system comprising:
an LED driver having an input and an output, wherein the input is configured to receive an AC or DC voltage source, and wherein output provides an AC or DC voltage;

at least one LED circuit having a plurality of LEDs connected to the output of the LED driver, wherein the at least one LED circuit is mounted on a reflective substrate; and

a data receiver, wherein the data receiver can receive data from at least one of a transmission line or an antenna.

Ex. 1001, 25:17–27.

F. Prior Art and Asserted Grounds

Petitioner asserts that claims 1 and 6 are unpatentable on the following grounds (Pet. 4):

Claims Challenged	35 U.S.C. §¹	Reference(s)/Basis
1, 6	103	Birrell ² , Schultz ³
1, 6	103	Piepgras ⁴
1, 6	103	Harbers ⁵ , Schultz

II. ANALYSIS

A. Legal Standards

A patent 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 the

¹ The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284, 287–88 (2011), amended 35 U.S.C. §§ 102 and 103, effective March 16, 2013. Petitioner contends the pre-AIA versions of § 103 applies in this proceeding, and Patent Owner does not dispute Petitioner’s assertions. Pet. 4–5. Accordingly, on this record, we apply the pre-AIA version of § 103. *See* 35 U.S.C. § 100(i)(1)(B).

² AU Patent No. AU 2003100206 A4, issued July 17, 2003. Ex. 1005 (“Birrell”).

³ US Publication No. 2005/0116235 A1, published June 2, 2005. Ex. 1046 (“Schultz”).

⁴ US Publication No. 2003/0137258 A1, published July 24, 2003. Ex. 1030 (“Piepgras”).

⁵ US Publication No. 2011/0193484 A1, published August 11, 2011. Ex. 1006 (“Harbers”).

invention was made to a person having ordinary skill in the art to which said subject matter pertains. *See 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) if in the record, objective evidence of nonobviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

B. Level of Ordinary Skill in the Art

In determining the level of skill in the art, we consider the type of problems encountered in the art, the prior art solutions to those problems, the rapidity with which innovations are made, the sophistication of the technology, and the educational level of active workers in the field. *Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955, 962 (Fed. Cir. 1986).

Petitioner contends a person of ordinary skill in the art as of the priority date of the ’251 patent “would have had at least a bachelor’s degree in electrical engineering, computer engineering, computer science, physics, or the equivalent, and two or more years of experience with LED devices and/or related circuit design, or a related field.” Pet. 8–9 (citing Ex. 1002 ¶¶ 20–24).

For purposes of this proceeding, “Patent Owner does not dispute Petitioner’s definition of [a person of ordinary skill in the art].”
PO Resp. 14.

Upon review of the parties’ arguments, the prior art of record, and the ’251 patent, we adopt Petitioner’s undisputed level of ordinary skill in the art for purposes of this Decision.

C. *Claim Construction*

In this proceeding, the claims of the '251 patent are construed “using the same claim construction standard that would be used to construe the claim[s] in a civil action under 35 U.S.C. [§] 282(b).” 37 C.F.R.

§ 42.100(b). Under that standard, the words of a claim are generally given their “ordinary and customary meaning,” which is the meaning the term would have had to a person of ordinary skill at the time of the invention in the context of the entire patent including the specification. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (en banc).

Neither party contends that any terms of the '251 patent require express construction, with each party relying on the plain and ordinary meaning of each claim term. PO Resp. 13–14; Pet. Reply 1. Upon review of the parties' arguments and evidence, we agree that no claim terms require express construction for purposes of this Decision. *See 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) (“[O]nly those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy.”)).

D. *Claims 1 and 6 over Birrell and Schultz*

Petitioner contends the subject matter of claims 1 and 6 would have been obvious over the combined disclosures of Birrell and Schultz. Pet. 23–36.

1. *Birrell*

Birrell discloses “systems and methods for connecting electrical devices to power sources.” Ex. 1005, 2:3–5. Figure 1 of Birrell is reproduced below:

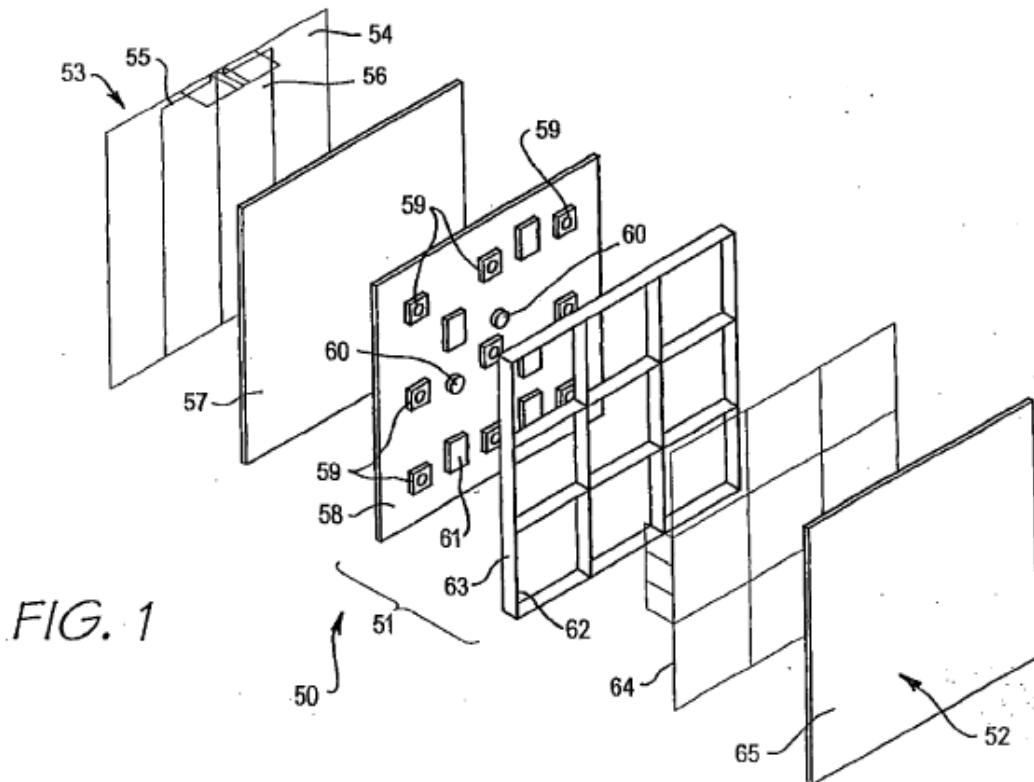


Figure 1 is an exploded view of a lighting tile for use in the lighting system of Birrell. *Id.* at 13:31–33. As shown in Figure 1, lighting tile 50 has “a thin body 51 having opposite first and second major surfaces” 52 and 53. *Id.* at 14:27–29. Back face 53 of body 51 includes metallized strips 55 and 56, which act as electrical coupling elements for tile 50 to “enable it to be capacitively coupled to a power source.” *Id.* at 14:31–37. Flexible magnetic sheet 57 provides an active magnetic force to secure the lighting tile to a magnetic receptive element. *Id.* at 15:5–8. Printed circuit board subassembly 58 supports LEDs 59 (which are set out in a 3 x 3 grid format), sensors 60, and microcontroller 61. *Id.* at 15:15–36. Circuit board 58 also supports power supply circuitry, such as bridge rectifiers, energy storage components, and data circuits that are used to modulate and demodulate signals. *Id.* at 16:6–10. Support frame 62 provides physical protection for the lighting components, and metallized polymer film 64 acts as a touch

sensor to enable lighting tile 50 to be controlled, as least to some extent, by human touch on first major surface 52 of the tile body. *Id.* at 16:11–21.

Figure 8 of Birrell is reproduced below:

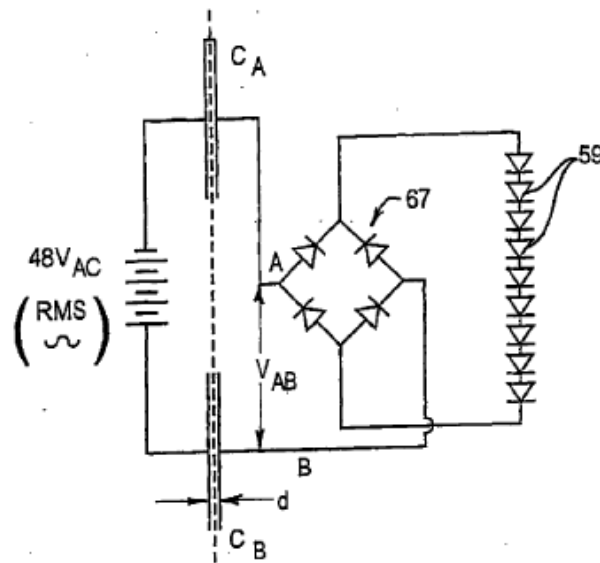


FIG 8

Figure 8 is a simplified circuit diagram of the lighting element of Birrell. *Id.* at 20:26–28. In the circuit depicted in Figure 8, a 48 Volt AC power supply is coupled to capacitors C_A and C_B and used to power LEDs 59. *Id.* at 20:26–28, 21:15–34. Diodes 67 are configured to form a bridge rectifier, ensuring “that light is emitted from the LEDs during both the positive and negative cycles of the AC power supply.” *Id.* at 19:1–7.

2. *Schultz*

Schultz discloses an illumination assembly. Ex. 1046, code (57).

Figure 1 of Schultz is reproduced below:

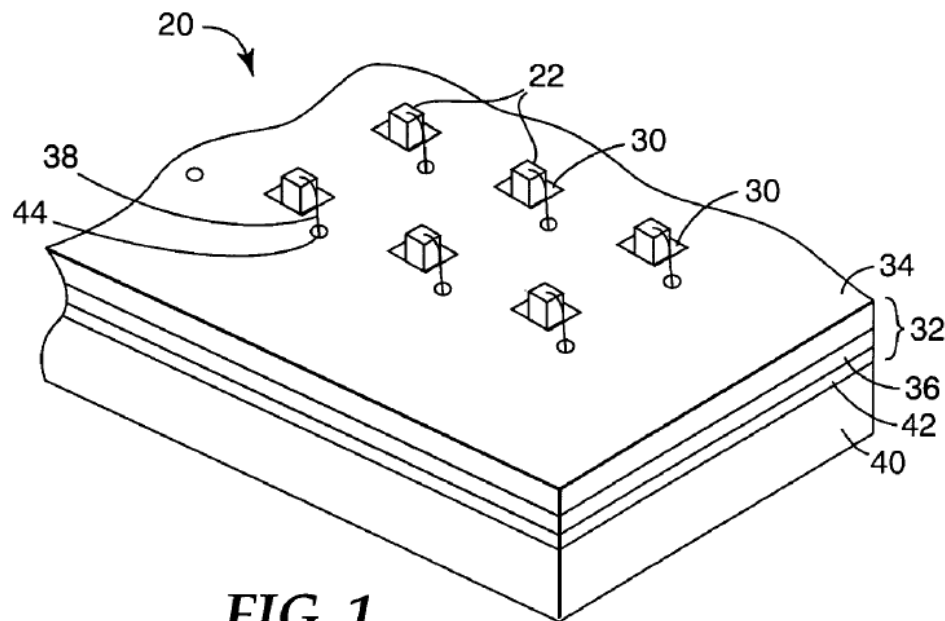


Figure 1 of Schultz is a schematic perspective view of one embodiment of an illumination assembly. *Id.* ¶ 13. As shown in Figure 1, illumination assembly 20 includes LED dies 22 disposed in an array and within vias 30 of substrate 32. *Id.* ¶¶ 28–29. Substrate 32 is comprised of electrically insulative dielectric layer 34, patterned conductive layer 36, and thermally conductive material 42, which separates substrate 32 from heat dissipation assembly 40. *Id.* ¶ 29.

Schultz explains that electrically insulative dielectric layer 34 may be comprised of any suitable material, including polyimide, polyester, polyethyleneterephthalate (PET), and a multilayer optical film (MOF). *Id.* ¶ 30. Electrically and thermally conductive layer 36 may be comprised of various materials, including copper, nickel, gold, aluminum, tin, lead, and combinations thereof. *Id.* ¶ 31.

Schultz notes that there exist “a wide variety of LED die arrays available on rigid,” “non-reflective circuit boards.” *Id.* ¶ 48. Schultz further notes that in these non-reflective circuit boards “[a]ny light from the LED

die that strikes the circuit board is unutilized due to absorption or scattering of the light.” *Id.* According to Schultz, “[b]y using reflective surfaced materials, such as a multilayered optical film, for the insulative layer 34 in the embodiments described herein, the light reflected from the attached LED dies has a higher probability of being reflected toward” a focusing element. *Id.* ¶ 49. In addition, by mounting the LED dies on a reflective, flexible circuit, “the utilization of the light” may be “improved.” *Id.* ¶ 48.

Figures 10A–C are reproduced below:

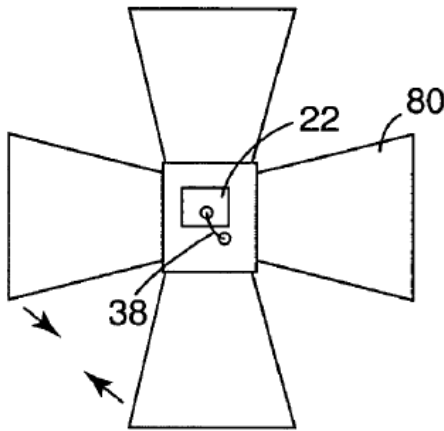


FIG. 10A

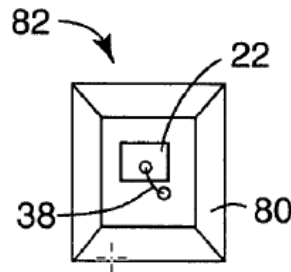


FIG. 10B

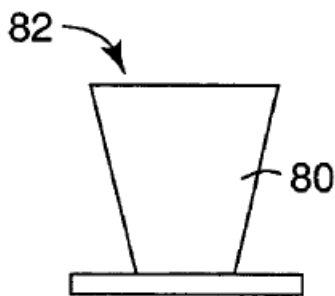


FIG. 10C

Figures 10A–10C schematically illustrate an embodiment of an illumination assembly using multilayer optical film. *Id.* ¶ 24. As illustrated in Figures 10A–C, LED die 22 can be attached to a planar MOF substrate and “[t]he

multilayer optical film 80 that surrounds the LED die 22 is then folded to create a reflective concentrator 82 around the LED die 22.” *Id.* ¶ 49.

3. *Analysis: Claim 1*

Petitioner persuasively demonstrates that Birrell discloses the majority of the limitations of claim 1, including an LED lighting system, an LED driver having an input from an AC voltage source and an output of a rectified DC voltage, an LED circuit having a plurality of LEDs connected to the output of the LED driver, and a data receiver that can receive data from a transmission line. Pet. 23–34. Petitioner concedes that Birrell does not expressly describe an LED circuit mounted on a reflective substrate, but contends that “the use of a reflective substrate to provide mechanical support for an array of LEDs was well known in the art,” and is expressly disclosed in Schultz. *Id.* at 28–29. Petitioner further contends that one of ordinary skill in the art would have sought to use a reflective substrate in Birrell in order to increase the optical efficiency of the lighting system. *Id.* at 30–31 (asserting that a reflective layer may be added to a non-reflective substrate or the substrate may be formed of a reflective material).

Patent Owner contends that the disclosures of Birrell and Schultz would not have rendered claim 1 obvious because: (a) the combination of Birrell and Schultz does not disclose “at least one LED circuit is mounted on a reflective substrate,” and (b) the Petition fails to show that a person of ordinary skill in the art would have arrived at the Birrell-Schultz combination. PO Resp. 44–62. We address these arguments in turn.

a) *“at least one LED circuit is mounted on a reflective substrate”*

The Petition contends that “the use of a reflective substrate to provide mechanical support for an array of LEDs was well known in the art.”

Pet. 29. In support of this proposition, the Petition points to Schultz's use of a substrate that is either made of a reflective material or laminated with such a material. *Id.* (citing Ex. 1046 ¶¶ 47–49). The Petition also points to US Patent Publication No. 2002/0021573 A1 (Zhang), published February 21, 2002, which discloses coating a layer of high reflection material on the surface of a circuit board to collect light from LEDs mounted thereon. *Id.*; Ex. 1022 ¶¶ 18, 34, 81, Fig. 2.1, codes (43), (57).

Patent Owner does not dispute that it was well known in the art to use a reflective substrate with an array of LEDs. Pet. Reply 2 n.1; Sur-Reply 11. Patent Owner argues instead that Schultz teaches a specific type of reflective material, in the form of a multilayer optical film (MOF) (or similar thin flexible substrates), that in each embodiment of Schultz is “folded or wrapped into ‘reflective concentrators’ placed around LEDs already mounted onto a substrate.” PO Resp. 44–46. According to Patent Owner, this type of folded, three-dimensional reflector “is not a planar structure on which LEDs and other circuit components, like the recited ‘LED driver’ are mounted.” *Id.* at 46 (asserting that “[a]pplying the teaching of Schultz to Birrell's PCB 58 yields a flat non-reflective, printed circuit board substrate . . . with each of the LEDs 59 being surrounded by a reflective concentrator as taught by Schultz”). Patent Owner further contends that even if the reflective flexible substrate of Schultz were added to Birrell without the concentrators, “it would not make the Birrell printed circuit board reflective since the reflector would be a separate substrate.” *Id.* at 47 (citing Ex. 2006 ¶ 70).

The first embodiment of Schultz, depicted in Figure 1, has a single substrate 32 that is composed of electrically insulative dielectric layer 34, conductive layer 36, and thermally conductive material 42. Ex. 1046 ¶ 29,

Fig. 1. Schultz discloses that the top layer of this substrate—electrically insulative dielectric layer 34—may be reflective. *Id.* ¶¶ 30, 47, 49, claim 3. Thus, we agree with Petitioner that one of ordinary skill in the art would have understood that substrate 32 of Schultz, as used in the embodiment of Figure 1, may be a planar, reflective substrate. Pet. Reply 3.

As noted by Patent Owner, in the embodiments depicted in Figures 10A–C, the reflective coating is folded and shaped to form non-planar reflectors. Ex. 1046 ¶ 49; PO Resp. 46; Sur-Reply 10–12. We agree with Petitioner, however, that the reflector embodiments depicted in Figures 10A–C are just one potential way of utilizing a reflective layer in Schultz, and that one of ordinary skill in the art would have understood that use of a reflective layer is contemplated, and would be beneficial in, the planar embodiments of Schultz, such as the planar embodiment depicted in Figure 1. Pet. Reply 2–3, 5; Ex. 1046 ¶ 49 (“By using reflective surfaced materials, such as a multilayered optical film, for the insulative layer 34 *in the embodiments described herein*, the light reflected from the attached LED dies has a higher probability of being reflected toward” a focusing element.) (emphasis added).

Finally, Patent Owner contends that “even if the Schultz reflective substrate 32 were added to Birrell without the concentrator portion taught by Schultz, it would not make the Birrell printed circuit board reflective since the reflector would be a separate substrate.” PO Resp. 47. This argument is not persuasive because, as is expressly disclosed in Schultz, a reflective coating or layer that is added to a substrate, such as the circuit board of Birrell, would render the substrate reflective. Ex. 1046 ¶ 49, Fig. 1 (disclosing a multi-layered substrate that includes a reflective film);

Ex. 1090, 19:25–21:24 (Mr. Credelle testifying that a substrate “could have a top layer that’s part of the substrate that’s reflective”).

In view of the foregoing, we determine that Birrell and Schultz, when viewed in light of the knowledge of one of ordinary skill in the art, teach or suggest mounting “at least one LED circuit” “on a reflective substrate,” as recited in claim 1 of the ’251 patent.

b) Reason to Combine

Petitioner contends that one of ordinary skill in the art would have sought to use a reflective coating in Birrell because “the use of a reflective substrate to provide mechanical support for an array of LEDs was well known in the art.” Pet. 29. Petitioner further contends that Schultz expressly discloses that reflective coatings are beneficial as they prevent light from an LED die being “unutilized due to absorption or scattering of the light.” *Id.* at 30 (quoting Ex. 1046 ¶ 48); Ex. 1046 ¶ 49 (Schultz explaining that “reflective surfaced materials” provide a “higher probability” that light reflected from the LEDs will reach the focusing element).

Petitioner further contends that one of ordinary skill in the art would have used a reflective substrate in Birrell in view of Birrell’s expressed desire for a uniform optical reflection to provide a uniform light source. Pet. 30 (citing Ex. 1002 ¶ 104; Ex. 1018, 6:6–18; Ex. 1022 ¶ 81; Ex. 1023, 16:16–45).

Petitioner contends that one of ordinary skill in the art would have had a reasonable expectation of success in using a reflective substrate in Birrell because this would have entailed “the use of known components and mounting techniques to produce the predictable result of an LED circuit that benefited from properties of reflective base structures, as suggested by Schultz and the knowledge of a [person of ordinary skill in the art].” *Id.* at 31.

Patent Owner contends that Petitioner's reasons to combine Birrell and Schultz fail for multiple reasons. First, Patent Owner contends that Schultz is specifically directed to improving light utilization through the use of "thin multilayer optical films deposited on a flexible substrate, not on rigid printed circuit boards like Birrell." PO Resp. 52–53 (citing Ex. 2006 ¶ 80; Ex. 2009, 182:7–183:3 (Baker deposition)). This argument is not persuasive because Birrell discloses that its lighting tile, which includes the substrate used to mount the LEDs, may be rigid or flexible. Ex. 1005, 11:4–6 (noting that the body of the lighting tile may "be rigid or flexible"), 15:15–18 (noting that the tile body includes the substrate that mounts the LEDs). In addition, Schultz contemplates both rigid and flexible substrates and the use of reflective coatings on either type of substrate. Ex. 1046 ¶¶ 12 ("In one embodiment, the substrate is flexible . . ."), 32 ("In one preferred embodiment according to the invention, substrate 32 is flexible and deformable."), claim 2 ("The illumination assembly of claim 1, wherein the substrate is flexible."), claim 3 (depending from claim 1, which encompasses substrates that are rigid or flexible, and further including a reflective insulating layer on the first side of the substrate). As such, one of ordinary skill in the art would have understood that Schultz's disclosures related to the use of a reflective substrate are applicable to the circuit board of Birrell, whether in its rigid or flexible configurations. Pet. Reply 8–9.

Moreover, Schultz contains both a generic teaching that reflective surfaced materials are beneficial in ensuring as much light as possible is utilized from the LEDs (Ex. 1046 ¶ 49), as well as a more specific teaching as to the benefit of mounting LEDs on a "reflective, flexible circuit" (*id.* ¶ 48). We credit the testimony of Dr. Baker that one of ordinary skill in the art, considering the generic and specific teachings of Schultz related to

reflective substrates, would have understood the benefit of using a reflective surface material on both rigid and flexible substrates. Ex. 1002 ¶ 103; Pet. Reply 11.

Second, Patent Owner contends that “[t]he purpose of using the flexible MOF in Schultz is to shape the film into parabolic or tubular shapes for focusing or directing light,” and one of ordinary skill in the art would not have sought to use such a film in place of Birrell’s printed circuit board because Birrell’s components, such as the microcontroller, require multilayer complex circuit boards. PO Resp. 53–55 (Ex. 1046 ¶¶ 48–49). According to Patent Owner, “Schultz is a thin flexible substrate with optical films on one side for reflection and conductive traces on the other for connecting LEDs,” and using Schultz’s thin MOF in place of Birrell’s rigid circuit board would create problems with the structural integrity of Birrell’s lighting tile 50. *Id.* at 55–56. For example, Patent Owner contends there would be no rigid support for LED packages 59, sensors 60, or microcontroller 51,” and the entire tile would “warp or deform” when attached and detached from the wall mount. *Id.* at 56 (citing Ex. 2006 ¶ 84).

Patent Owner’s arguments are not persuasive because, as noted above, Petitioner’s proposed combination does not require that the specific MOF of Schultz be used as the reflective substrate in Birrell, or that the reflective layer or coating be used as a single-layer substrate. Pet. 29–30; *see* Ex. 1046 ¶ 29 (explaining that the substrate of the embodiment depicted in Figure 1 of Schultz is composed of electrically insulative dielectric layer 34, patterned layer 36, and thermally conductive material 42). Rather, Petitioner contends that one of ordinary skill in the art would have sought to use any suitable reflective layer in Birrell, such as the well-known reflective substrates or coatings available in the art. Pet. 29–31.

Third, Patent Owner argues that Schultz relies upon wire bonded bare-die LEDs, which “are small and light weight,” whereas Birrell discloses “mounting components using through-hole mounting or soldered surface mount packages.” PO Resp. 57 (citing Ex. 1046 ¶¶ 40–45; Ex. 2006 ¶ 85). Patent Owner contends using Schultz’s MOF in Birrell would have been problematic because “Schultz’s MOF layer cannot support through-hole mounting of components,” it would be “extremely difficult to wire-bond” the large number of contacts used for microcontroller 61 of Birrell, and “there were no surface mount inductors available that could use Schultz’s wire-bond mounting.” *Id.* at 57–58. Patent Owner further contends that “it would be difficult for Schultz’s MOF film to support packaged LEDs and other integrated circuits (e.g., microcontrollers and sensors) as taught in Birrell because Schultz teaches that the thin optical film 34 is necessarily attached to a heat sink assembly 40 for support.” *Id.* at 58–59 (citing Ex. 2006 ¶ 87).

Patent Owner’s arguments related to the type of LED mounting used in Birrell and Schultz are not persuasive because they assume a bodily-incorporation of Schultz’s specific MOF reflective layer on, or in place of, Birrell’s circuit board. Pet. Reply 9. Bodily-incorporation is not required to prove obviousness, and the Petition never advocates for the use of Schultz’s specific reflective MOF layer in place of the printed circuit board of Birrell. *In re Mouttet*, 686 F.3d 1322, 1332 (Fed. Cir. 2012) (“It is well-established that a determination of obviousness based on teachings from multiple references does not require an actual, physical substitution of elements.”); Pet. 29–30. In any event, Petitioner persuasively demonstrates that flexible multilayer substrates that permit through-hole mounting were

known in the art and could be used in Birrell. Pet. Reply 9 (citing Ex. 1042, 39–40).

Finally, Patent Owner argues that the protruding elements of Birrell, such as control and sensing devices 60 and 61, “would not be covered with the reflective layer and would cause ‘dark spots’ to form in the vicinity of these components.” PO Resp. 59. According to Patent Owner, the purpose of Birrell’s lighting tile is to operate as a “uniform *diffused* light source,” and “[u]sing the MOF or silvered film of Schultz in Birrell would result in numerous point reflections of light from the LEDs and would provide less uniformity of light.” *Id.* at 61 (citing Ex. 1005, 12:30–33; Ex. 2006 ¶ 89).

Birrell discloses that “[v]arious applied optical methods may be employed within the body [of the lighting tile] to produce even diffused light output, [or] focused or directional light output as required.” Ex. 1005, 13:5–7. Birrell also discloses that the body of the lighting tile “may be constructed to display uneven light diffusion or focused characteristics to produce a range of lighting effects.” *Id.* at 11:14–17. Thus, we disagree with Patent Owner that Birrell is limited to one particular type or quality of light output. Moreover, as noted by Petitioner, Patent Owner does not explain how control and sensing devices 60 and 61 would protrude any further than LEDs 59 to cause “dark spots,” or why the embodiments of the ’251 patent would not suffer from this same issue when mounted on a reflective substrate. Pet. Reply 11; Ex. 1001, 15:23–29, Figs. 18, 63 (mounting resistors, capacitors, and/or a bridge rectifier, which are not described as being reflective, on the reflective circuit board). And, even if such “dark spots” would form in Birrell, we are not persuaded that such spots would have outweighed the significant benefits of using a reflective substrate for an LED circuit identified by Petitioner. Ex. 1005, 11:15–17

(noting that the lighting device of Birrell may be designed “to display uneven light diffusion”).

c) Conclusion: Claim 1

We have considered Petitioner’s arguments, as well as Dr. Baker’s supporting testimony, regarding the contested and uncontested limitations of claim 1 and find that Petitioner persuasively identifies where every limitation of claim 1 is taught or suggested in Birrell and Schultz. Petitioner also provides a persuasive explanation as to why one of ordinary skill in the art would have combined these references to arrive at the subject matter of claim 1 with a reasonable expectation of success. Accordingly, Petitioner demonstrates by a preponderance of the evidence that claim 1 of the ’251 patent would have been obvious over the combined teachings of Birrell and Schultz.

4. Analysis: Claim 6

Claim 6 depends from claim 1 and further requires “wherein the LED lighting system is dimmable in response to the data received.” Ex. 1001, 25:38–39. Petitioner contends that Birrell discloses that light levels may be controlled using wireless data communications. Pet. 34 (citing Ex. 1005, 8:4–30, 15:36–16:10; Ex. 1002 ¶ 95).

Patent Owner does not dispute that Birrell and Schultz, in combination, teach every limitation of claim 6, but contends Petitioner’s arguments with respect to claim 6 do not remedy the deficiencies identified by Patent Owner with respect to claim 1. PO Resp. 62.

Upon review of the parties’ arguments and evidence of record, we determine that Petitioner demonstrates by a preponderance of the evidence that claim 6 would have been obvious over Birrell and Schultz.

E. Claims 1 and 6 over Piepgras or Harbers and Schultz

Petitioner contends that the subject matter of claims 1 and 6 would have been obvious over the disclosures of Piepgras, or the combined disclosures of Harbers and Schultz. Pet. 4. In view of our determination that claims 1 and 6 are unpatentable as having been obvious over the combined disclosures of Birrell and Schultz, we do not address Petitioner's grounds based on Piepgras or Harbers and Schultz. *See SAS Inst. Inc. v. Iancu*, 138 S. Ct. 1348, 1359 (2018) (holding a petitioner "is entitled to a final written decision addressing all of the claims it has challenged"); *Boston Sci. Scimed, Inc. v. Cook Grp. Inc.*, 809 F. App'x 984, 990 (Fed. Cir. Apr. 30, 2020) (non-precedential) (recognizing that the "Board need not address issues that are not necessary to the resolution of the proceeding" and, thus, agreeing that the Board has "discretion to decline to decide additional instituted grounds once the petitioner has prevailed on all its challenged claims").

III. CONCLUSION⁶

In summary:

Claims	35 U.S.C. §	Reference(s)/Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1, 6	103	Birrell, Schultz	1, 6	
1, 6	103	Piepgras ⁷		
1, 6	103	Harbers, Schultz		
Overall Outcome			1, 6	

VI. ORDER

In consideration of the foregoing, it is hereby

ORDERED that claims 1 and 6 of the '251 patent are unpatentable;

and

FURTHER ORDERED that, because this is a Final Written Decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

⁶ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner's attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. See 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. See 37 C.F.R. § 42.8(a)(3), (b)(2).

⁷ As discussed above, we do not address Petitioner's grounds based on Piepgras or Harbers and Schultz.

IPR2022-00051
Patent 10,492,251 B2

For PETITIONER:

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