

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MOTOROLA MOBILITY LLC,
Petitioner,

v.

LUMINTEC, LLC,
Patent Owner.

IPR2022-00430
Patent 8,724,983 B2

Before JAMES J. MAYBERRY, JOHN A. HUDALLA, and
SHARON FENICK, *Administrative Patent Judges*.

MAYBERRY, *Administrative Patent Judge*.

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

I. INTRODUCTION

A. *Background and Summary*

Motorola Mobility LLC (“Petitioner”) filed a Petition (“Pet.”) requesting *inter partes* review of claims 1–15 (the “Challenged Claims”) of U.S. Patent No. 8,724,983 B2 (Ex. 1001, the “’983 patent”). Paper 2. Lumintec, LLC (“Patent Owner”) did not file a preliminary response to the Petition.

We have authority to determine whether to institute an *inter partes* review. 35 U.S.C. § 314 (2018); 37 C.F.R. § 42.4(a) (2021) (permitting the Board to institute trial on behalf of the Director). To institute an *inter partes* review, we must determine that the information presented in the Petition shows “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). For the reasons set forth below, upon considering the present record, we institute an *inter partes* review.

B. *Real Parties-in-Interest*

Petitioner identifies itself as the real party-in-interest, and states that it “is a direct, wholly owned subsidiary of Motorola Mobility Holdings LLC, which is indirectly a wholly-owned subsidiary of Lenovo Group Ltd.” Pet. 2.

Patent Owner identifies itself as the real party-in-interest. Paper 4, 2.

C. *Related Matters*

The parties identify, as a matter related to the ’983 patent, ongoing litigation in the U.S. District Court for the Western District of Texas, in a

case styled *Lumintec, LLC v. Motorola Mobility, LLC*, No. 6:21-cv-00402-ADA, filed on April 23, 2021.¹ Pet. 2; Paper 4, 2.

D. The '983 Patent

The '983 patent, titled “Flash Structure for the Camera Function of a Handheld Electronic Device,” issued May 13, 2014, from an application filed November 10, 2012. Ex. 1001, codes (54), (45), (22). The invention of the '983 patent relates to “a flash structure for the camera function of a handheld electronic device” and includes “a plurality of light emitting elements around the camera lens coupled with a ring-shaped or arc-shaped light diffuser so as to render[] supplemental lighting uniform.” *Id.* at 1:18–20, 2:30–35.

We reproduce Figure 2 from the '983 patent below.

¹ This litigation is currently stayed pending a Motion to Dismiss.

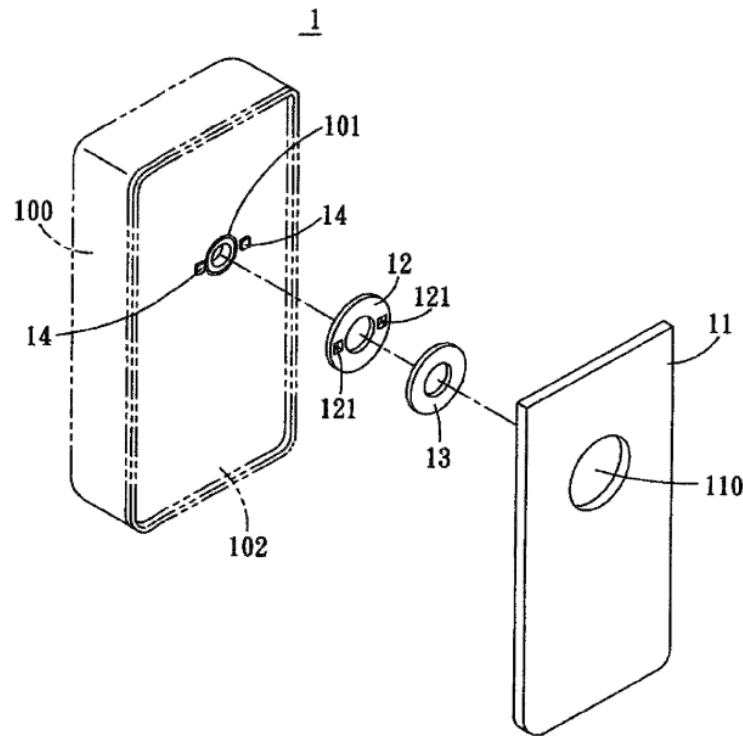


Fig.2

Figure 2 depicts “an exploded view of the flash structure for the camera function of a handheld electronic device.” Ex. 1001, 2:45–46. Handheld device 1 can be embodied as “a mobile phone, smartphone or digital camera,” and includes camera module 101 having a fixed or interchangeable lens. *Id.* at 3:19–25. The flash structure for handheld device 1 includes outer cover 11, annular reflector 12, light diffuser 13, and light-emitting elements 14. *Id.* at 3:26–28. Outer cover 11 includes through-hole 110 that “corresponds to an area that covers the camera lens of camera module 101 and light diffuser 13.” *Id.* at 3:28–33. Annular reflector 12 “is embedded on motherboard 102” of device 1, is “situated around camera module 101,” and includes “through-slot 121.” *Id.* at 3:36–39. Light diffuser 13 is outside of annular reflector 12 and light-

emitting element 14 and is around the lens. *Id.* at 3:39–41. Light-emitting element 14 is embedded in through-slot 121 of annular reflector 12 and is electrically connected to motherboard 102. *Id.* at 3:42–45.

The '983 patent explains that the annular arrangement of elements “enables adjustment to the number and pattern of arrangement of the fixed light-emitting elements and enables uniform light diffusion,” which in turn “increases luminance during picture taking, video taping and real-time imaging, thereby enhancing the picture, video and real-time image quality,” using a simple construction leading to reduced cost and enhanced practicality. *Id.* at 4:21–31.

E. Challenged Claims

The Petition challenges claims 1–15. Pet. 4. Claims 1 and 9 are independent. Claim 1 is representative and is reproduced below.

1. A flash structure for a handheld electronic device having a camera module, comprising:

an outer cover, having a through-hole, adapted for disposing on a baseboard of the handheld electronic device where the camera module is located thereat and is electrically connected to the baseboard;

an annular reflector, having a ring-shape, embedded on the baseboard of the handheld electronic device and situated around the camera module at a position that a camera lens of the camera module is located at a center of said annular reflector, wherein said annular reflector further has at least a through-slot provided thereat;

at least a fixed light-emitting element being embedded in said through-slot of said annular reflector, wherein said fixed light-emitting element is positioned around the camera lens and electrically connected to the baseboard of the handheld electronic device; and

at least a light diffuser provided on said annular reflector and situated outside said fixed light-emitting element to encircle

around the camera lens of the camera module, wherein said light diffuser is located within said through-hole of said outer cover.

Ex. 1001, 4:48–5:2. Independent claim 9 differs from claim 1 by further requiring a baseboard and a camera module electrically connected to the baseboard and including a camera lens. *Id.* at 5:26–6:14. Claim 2 depends from claim 1 and claims 3–8 depend from claim 2. *Id.* at 5:3–25. Each of claims 10–15 depends from claim 9. *Id.* at 6:15–35.

F. Prior Art and Asserted Grounds

Petitioner asserts that the Challenged Claims are unpatentable based on three grounds:

Claims Challenged	35 U.S.C. §	References²/Basis
1–6, 9–13	103(a) ³	Altek ⁴
7, 8, 14, 15	103(a)	Altek, Sharp, ⁵
1–15	103(a)	Google, ⁶ Altek

Petitioner relies on the declaration testimony of Dr. Jose Sasian (Ex. 1003) in support of these grounds.

² Petitioner refers to each reference by its assignee, and we keep this nomenclature for consistency.

³ The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284, 287–88 (2011), amended 35 U.S.C. § 103, effective March 16, 2013. Because the '983 patent was issued on an application filed before this date, the pre-AIA version of § 103 applies. Ex. 1001, code (22).

⁴ Li, CN 201269941Y, published July 8, 2009 (Ex. 1006, assigned to Altek Corporation Ltd., hereinafter, “Altek”). We refer to the certified English translation of Altek (Ex. 1007).

⁵ Mather et al., GB 2475705 A, published June 1, 2011 (Ex. 1009, assigned to Sharp Kabushiki Kaisha, hereinafter “Sharp”).

⁶ Han, US 8,743,275 B1, issued June 3, 2014 (Ex. 1010, assigned to Google Inc., hereinafter, “Google”).

The following subsections provide brief descriptions of the asserted prior art references.

1. Altek (Ex. 1007)

Altek is a Chinese Utility Model Specification titled “A lens ring structure with a flash lamp” that was published July 8, 2009. Ex. 1007, codes (19), (12), (54), (45). We reproduce Altek’s Figure 1 below.

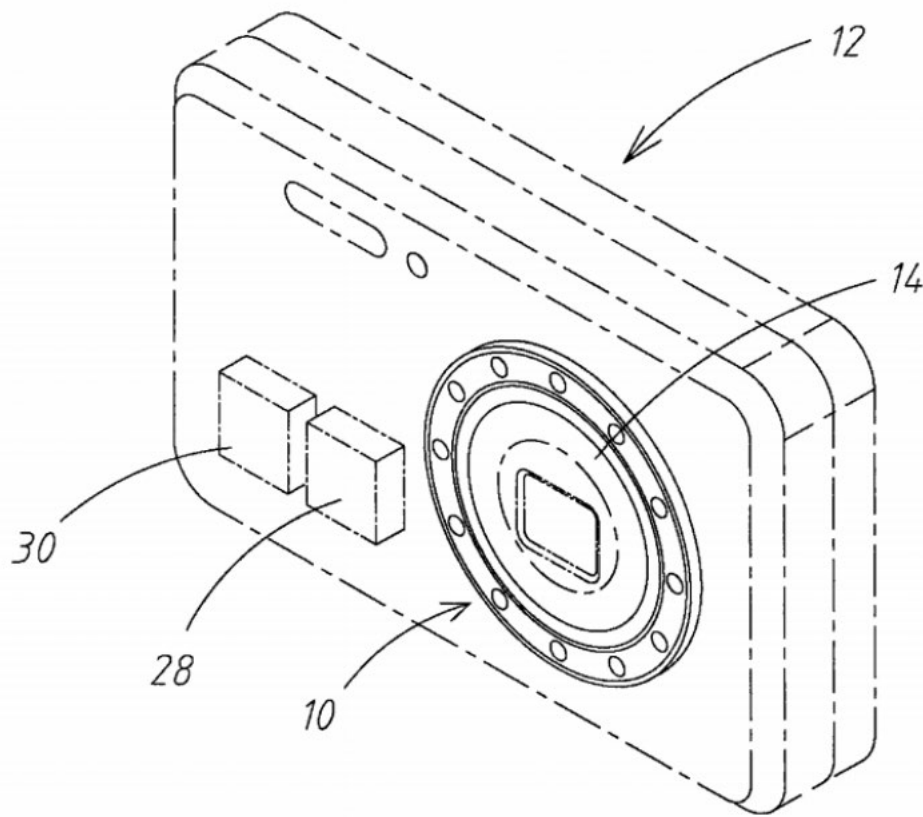


Fig. 1

Figure 1 is “a perspective schematic diagram of the lens ring structure with a flash lamp of [Altek] installed in a digital camera.” Ex. 1007, 5:15–16. As seen from Figure 1, Altek’s exemplary camera 12 includes lens 14 and lens ring 10 with a flash lamp around the lens. *Id.* at 5:15–16.

We reproduce Altek’s Figure 2 below.

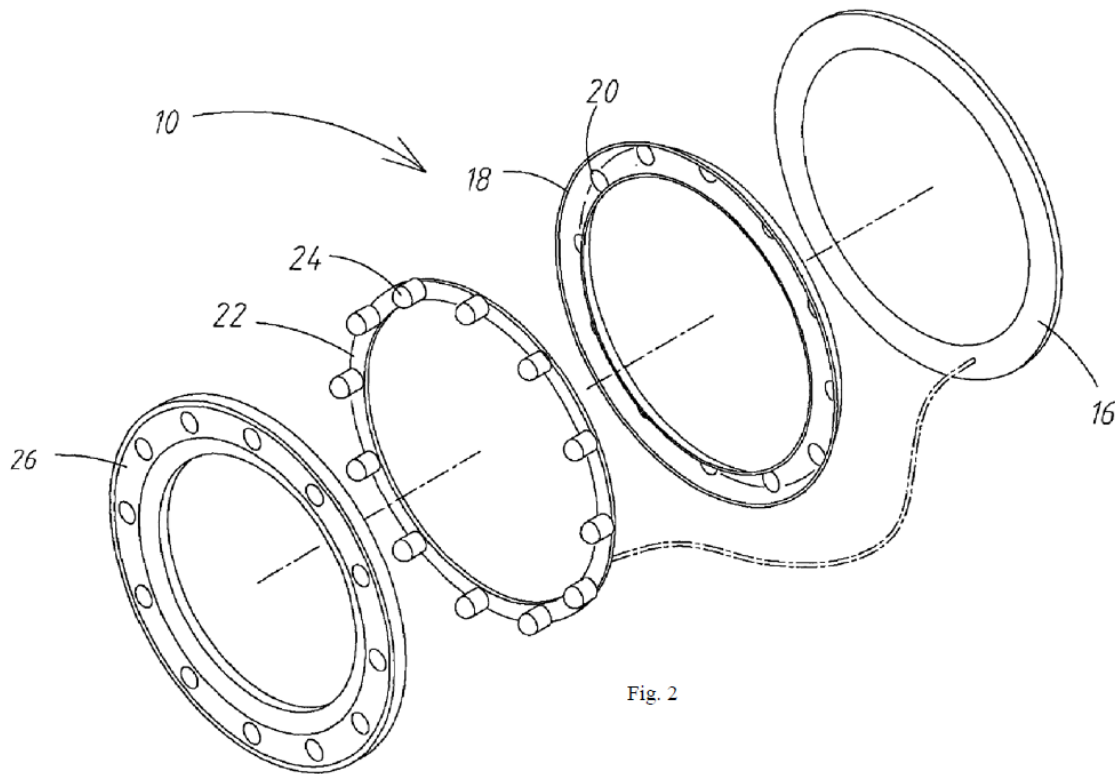


Fig. 2

Figure 2 depicts “an exploded schematic diagram of the lens ring with a flash lamp” Ex. 1007, 5:17. Lens ring 10 with flash lamp includes annular driving circuit board 16, and annular concave reflector 18 above driving circuit board 16 and having through-holes 20. *Id.* at 6:15–19. LED fixing seat 22 is on annular concave reflector 18, and a plurality of LEDs 24 are mounted on LED fixing base 22, with their top ends exposed from the surface of camera 12, and their bottom ends electrically connected to driving circuit board 16 via through-holes 20. *Id.* at 6:19–22; *see also id.* at Fig. 4 (depicting LED 24 passing through the reflector and connecting to circuit board 16). Annular transparent lampshade 26 covers concave reflector 18, LED fixing seat 22, and LEDs 24. *Id.* at 6:22–23. Driving circuit board 16 is electrically connected to LED circuit system 28 and power supply system 30 “to drive the LED 24 to provide a flash function when taking pictures.” *Id.* at 6:26–28.

2. *Sharp (Ex. 1009)*

Sharp, titled “A Camera Flash,” is a U.K. Patent Application that published June 1, 2011. Ex. 1009, codes (54), (12), (43). Sharp is directed to “camera flashes for flash photography . . . on mobile devices.” *Id.* at 1:4–5. Sharp discloses that the camera flash includes a light guide that extracts light through a surface and LED light sources that light into the light guide. *Id.* at code (57).

We reproduce Sharp’s Figure 3a below.

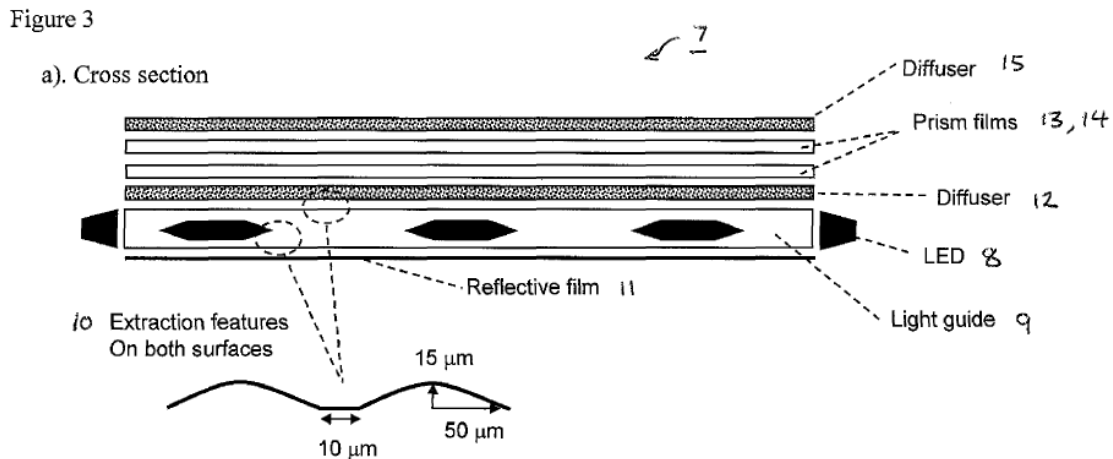


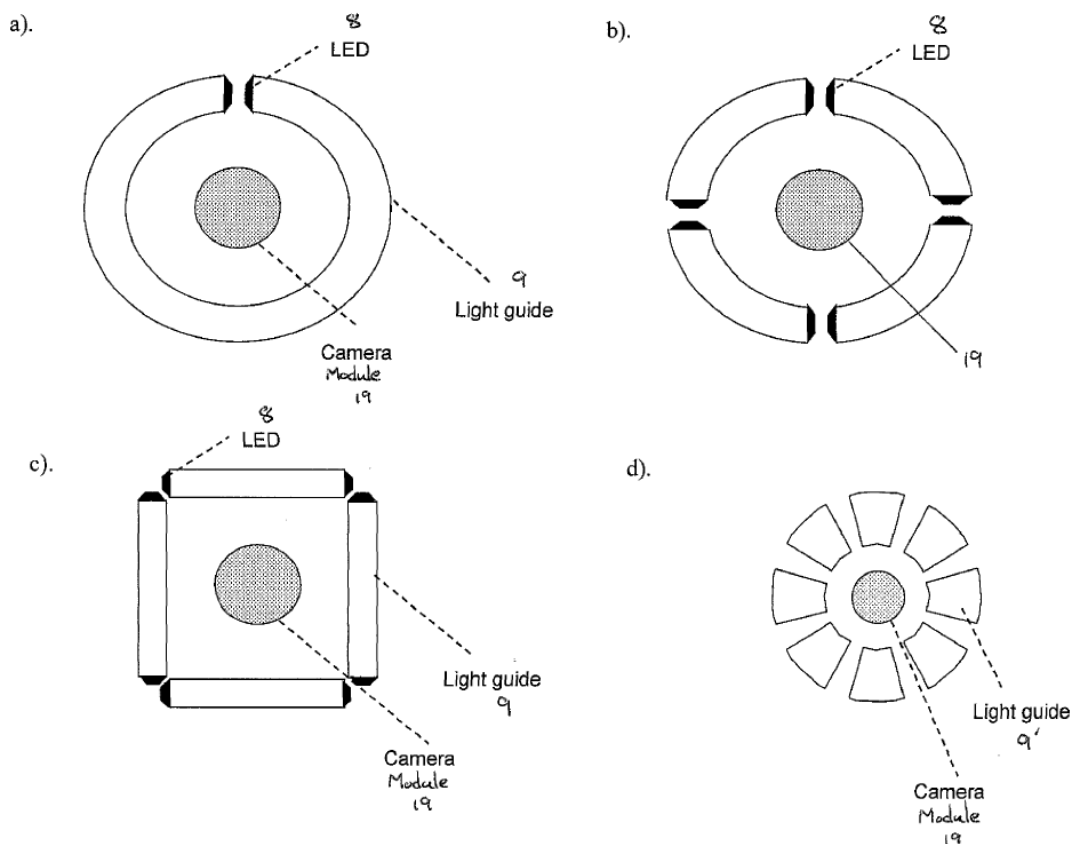
Figure 3a depicts a cross-sectional view of a camera flash. Ex. 1009, 16:17⁷. As seen in Figure 3a, camera flash 7 includes light sources 8 that may be LEDs arranged to emit light into an edge face of light guide (or waveguide) 9. *Id.* at 16:20–22. At least one major surface, and as depicted in Figure 3a, both major surface of light guide 9 have light extraction features 10 “for extracting light that is propagating within the light[]guide 9.” *Id.* at 16:22–24. In Figure 3(a) the upper major surface of

⁷ When citing to Exhibit 1009, we reference the exhibit page number, as provided by Petitioner, and a line number. We use this format because Petitioner cites to the exhibit page number when citing Sharp.

light guide 9 is the output face, and reflective film 11, or other reflector, is placed behind light guide 9 so that any light extracted from the light guide through the lower major surface “is not lost but is returned to the light[]guide.” *Id.* at 16:24–28. Camera flash 7 also includes optical elements, such as diffuser 12, one or more prism films 13, 14, and diffuser 15, that are placed over the output face of the light guide. *Id.* at 16:30–31. Sharp explains that a plurality of light sources are arranged around light guide 9 “[t]o ensure that light is emitted from the light[]guide 9 with a reasonably even intensity” and that suitable drive circuitry drives the light sources to “emit a pulse of light so that the camera flash produces a ‘flash.’” *Id.* at 16: 33–37.

We reproduce Sharp’s Figures 7a)–7d) below.

Figure 7



Figures 7a) to 7d) show examples of extended source flash designs made possible by the use of waveguide technology. Ex. 1009, 16:7–8. The figures show light guide 9 of camera flash 7 completely or partially surrounding camera module 19, “with the light[]guide being positioned in/on the body of the mobile telephone.” *Id.* at 19:14–18. According to Sharp, “[t]he flash could be made to form the shape of a ring (figures 7(a), 7(b)), a square (figure 7(c)), or any other desired shape such as a sun (figure 7(d)).” *Id.* at 19:22–23. Sharp explains that in Figure 7d) there would a separate light source for each light guide segment 9' and the light sources would be arranged between camera module 19 and light guide segments 9' to direct light away from camera module 19 towards the light guide segments. *Id.* at 19:24–27.

3. *Google (Ex. 1010)*

Google, titled “Mobile Communication Device with Multiple Flashpoints,” is a U.S. patent that issued on June 3, 2014. Ex. 1010, codes (54), (45). Google “relates to flash mechanisms for digital cameras that are incorporated into mobile communication devices such as smartphones and tablet computers.” *Id.* at 1:15–17.

We reproduce Figure 1A of Google below.

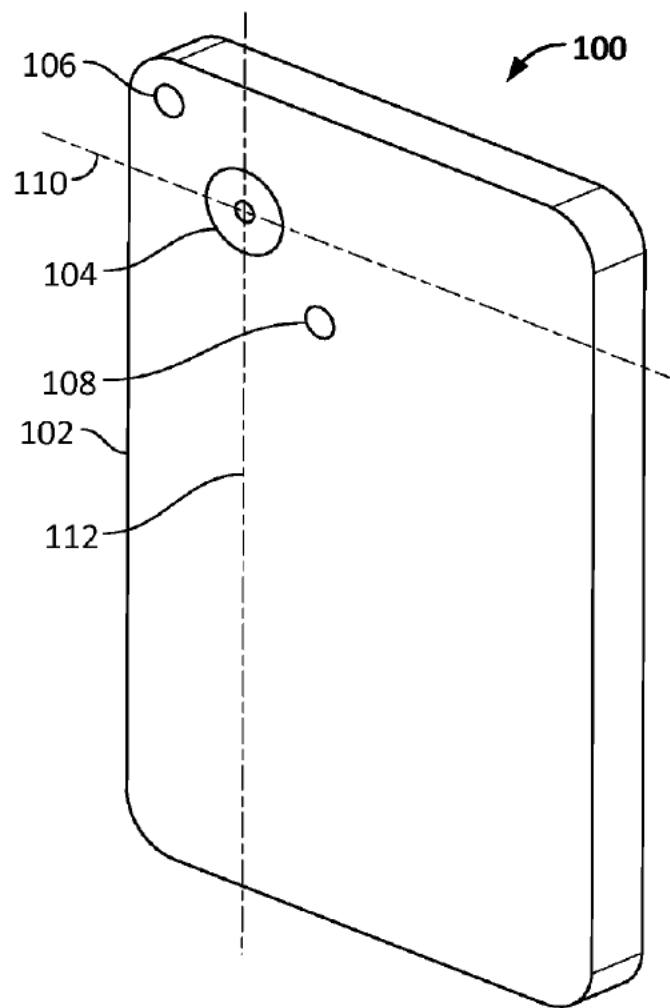


FIG. 1A

Figure 1A shows an exemplary mobile device having a first flash configuration. Ex. 1010, 3:30–31. Google’s Figure 1A depicts smartphone 102 having “apertures . . . provided for a camera lens 104, and for camera flashes 106 and 108. The flashes 106 and 108 may take the form of light emitting diodes (LEDs) that have flat surfaces to stick through the apertures and that sit essentially flush with an outside surface of the housing.” *Id.* at 4:42–46. Google explains that the LEDs may be bare outside the housing or may include a protective, transparent covers, and may

be arranged radially around a centerpoint of the camera lens. *Id.* at 4:46–48, 5:14–18.

We reproduce Figure 1(c) below.

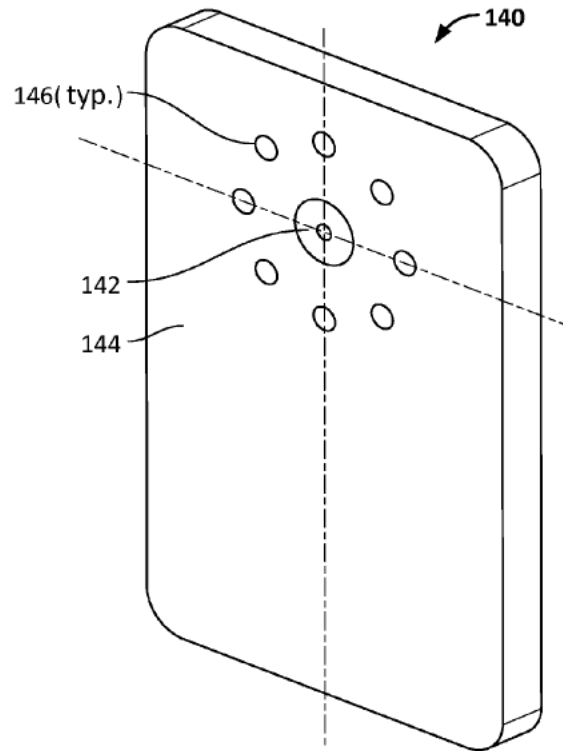


FIG. 1C

Figure 1C shows a lens and flash configuration on back side 144 of camera phone system 140. Ex. 1010, 6:21–22. In particular, Figure 1C depicts “eight separate flashes 146 [] located in a radial array around, and at equal distances from, the center of the lens 142.” *Id.* at 6:24–26. Google explains that “[l]ight is provided [in] a symmetric manner from eight different points around the lens 142 so as to provide a more complete and blanketed lighting effect for an object that is subject to being captured by a camera in smartphone 144.” *Id.* at 6:26–30. According to Google, a light diffuser such as “a lightly smoked colorless plastic” that diffuses light may

be used to form a ring of light “around the lens[] when a photo is snapped.”
Id. at 7:46–53, Fig. 1E (depicting an exemplary diffuser arrangement).

II. ANALYSIS OF PETITIONER’S CHALLENGES

A. *Applicable Law*

Petitioner’s asserted grounds of unpatentability are based on obviousness under 35 U.S.C. § 103.

Section 103(a) forbids issuance of a patent when “the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.”

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) when available, objective evidence, such as commercial success, long felt but unsolved needs, and failure of others. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

“[O]bviousness must be determined in light of *all the facts*, and . . . a given course of action often has simultaneous advantages and disadvantages, and this does not necessarily obviate motivation to combine” teachings from multiple references. *Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006) (emphasis added); *see also PAR Pharm., Inc. v. TWI Pharms., Inc.*, 773 F.3d 1186, 1196 (Fed. Cir. 2014) (“The presence or absence of a motivation to combine references in an obviousness determination is a pure question of fact.”).

B. Level of Ordinary Skill in the Art

The level of skill in the art is “a prism or lens” through which we view the prior art and the claimed invention. *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001). Petitioner contends that a person having ordinary skill in the art “would have [had] at least an undergraduate degree in optical engineering or a similar field (e.g., electrical engineering, physics, etc.), and three to five years of industry experience in the fields of optics, imaging, and illumination systems.” Pet. 6. Petitioner adds that the person “would have had familiarity with photographic optics and with opto-electronic devices” and that “[l]ack of work experience could have been remedied by additional education, and vice versa.” *Id.* Petitioner bases these contentions on declaration testimony from Dr. Sasian. *Id.* (referencing Ex. 1003 ¶¶ 32–33).

For the purposes of this Decision, we apply Petitioner’s definition of the level of ordinary skill in the art. We determine, preliminarily, that this definition is compatible with the prior art of record and the skill reflected in the Specification of the ’983 patent, based on our review of the limited record. We note, however, that Petitioner’s definition of the level of ordinary skill represents a high, narrowly-focused skill level, and the parties may wish to further develop the record regarding the level of ordinary skill during trial.

C. Claim Construction

In *inter partes* reviews, we interpret a claim “using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b).” 37 C.F.R. § 42.100(b). Under this standard, we construe the claim “in accordance with the ordinary and

customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.” *Id.*

Petitioner states that, “the Board does not need to construe any claim term for purposes of evaluating the prior art in this Petition.” Pet. 6.

Patent Owner did not file a preliminary response.

We determine that we need not expressly construe any claim terms to resolve the parties’ disputes on the current record. *See Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (“The Board is required to construe ‘only those terms that . . . are in controversy, and only to the extent necessary to resolve the controversy.’”)(quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)). To the extent that the scope of any particular claim term requires discussion, however, we provide it in our assessment of the challenges, which we turn to next.

D. Ground 1: Claims 1–6 and 9–13 as unpatentable over Altek and the knowledge of one of ordinary skill in the art

Petitioner contends that claims 1–6 and 9–13 are unpatentable over Altek and the knowledge of one of ordinary skill in the art. Pet. 4, 25–48. Below, we discuss the scope and content of the prior art and any differences between the prior art and claimed subject matter, on a limitation-by-limitation basis. As we previously indicated, Patent Owner did not file a preliminary response addressing Petitioner’s contentions.

1. Independent claim 1

a) Preamble

The preamble of claim 1 recites “[a] flash structure for a handheld electronic device having a camera module.” Ex. 1001, 4:48–49. Petitioner contends that Altek teaches a flash structure for a handheld electronic device having a camera module. Pet. 26 (referencing Ex. 1007, 6–7, Figs. 1–3, 6;

Ex. 1003 ¶¶ 58–60, 80); *see, e.g.*, Ex. 1007, 6:26–28 (“[T]he driving circuit board 16 of the lens ring 10 with a flash lamp is electrically connected to an LED circuit system 28 and a power supply system 30 to drive the LED 24 to provide a flash function when taking pictures.”).

Upon review of the information in the Petition and corresponding evidence, we determine Petitioner has made a sufficient showing, at this stage of the proceeding, that Altek teaches the subject matter of the preamble of claim 1. In view of this determination, we need not resolve, at this stage of the proceeding, whether the preamble is limiting.

b) Outer cover

Claim 1 also recites “an outer cover, having a through-hole, adapted for disposing on a baseboard of the handheld electronic device where the camera module is located thereat and is electrically connected to the baseboard.” Ex. 1001, 4:50–53. Petitioner contends that Altek teaches that camera 12 includes an outer cover, including a through-hole for a camera module. Pet. 27 (referencing Ex. 1007, 6–7, Figs. 1–3, 6; Ex. 1003 ¶¶ 29, 68–74, 80). Petitioner also contends that “Altek further discloses a driving circuit board 16, which a person of ordinary skill in the art would understand is the baseboard or at least is a portion of the baseboard.” *Id.* at 28 (referencing Ex. 1003 ¶¶ 68–74). According to Petitioner, “[a] person of ordinary skill in the art would [have] recognize[d] that the camera module is electrically connected to a baseboard of the camera,” because “the camera module is controlled by a microcontroller, such as a processor, that controls the capture and storage functionality of the camera, and that all of these devices would be interconnected via a baseboard, such as a motherboard.” *Id.* (referencing Ex. 1003 ¶¶ 71–74).

Petitioner adds that “[a] person of ordinary skill in the art would [have] recognize[d] that the motherboard is positioned within the outer cover of the device . . . and . . . provides structural support for the internal components, such as the motherboard, and thus the outer cover would be coupled to the motherboard.” Pet. 28 (referencing Ex. 1003 ¶¶ 71–73).

Upon review of the information in the Petition and corresponding evidence, we determine Petitioner has made a sufficient showing, at this stage of the proceeding, that Altek teaches the subject matter of the recited outer cover of claim 1.

c) Annular reflector

Claim 1 also recites

an annular reflector, having a ring-shape, embedded on the baseboard of the handheld electronic device and situated around the camera module at a position that a camera lens of the camera module is located at a center of said annular reflector, wherein said annular reflector further has at least a through-slot provided thereat.

Ex. 1001, 4:54–59. Petitioner contends that “Altek discloses an annular reflector (‘annular concave reflector 18’), which has a ring shape and includes through-holes 20.” Pet. 29 (quoting Ex. 1007, 6:17); *see also id.* at 5–7, Figs. 1–4, 6; Ex. 1003 ¶¶ 29, 30, 42, 47, 48, 61–63, 68–74, 80.

Petitioner also contends that “annular concave reflector 18 is situated around the camera module at a position that a camera lens of the camera module is located at a center of the annular reflector.” *Id.* at 30 (referencing Ex. 1007, Fig. 1; Ex. 1003 ¶¶ 61, 62). Petitioner explains that a person of ordinary skill in the art would have recognized that Altek’s annular reflector is embedded on the circuit board, because “circuit board 16 [is] positioned directly next to annular concave reflector 18, with no intervening parts or

components.” *Id.* at 30–31 (referencing Ex. 1007, Fig. 2; Ex. 1003 ¶¶ 63–74); *see also id.* at 31–32 (explaining how Patent Owner interpreted the “embedded on” language in its infringement contentions in the parallel district court litigation).

Upon review of the information in the Petition and corresponding evidence, we determine Petitioner has made a sufficient showing, at this stage of the proceeding, that Altek teaches the subject matter of the annular reflector of claim 1.

d) Light-emitting element

Claim 1 also recites, “at least a fixed light-emitting element being embedded in said through-slot of said annular reflector, wherein said fixed light-emitting element is positioned around the camera lens and electrically connected to the baseboard of the handheld electronic device.” Ex. 1001, 4:60–64. Petitioner contends that “Altek discloses a plurality of light emitting elements (LEDs 24) embedded in through-holes 20 of the annular concave reflector 18.” Pet. 32–33 (referencing Ex. 1007, 6–7, Figs. 1–4, 6; Ex. 1003 ¶¶ 29, 30, 43, 60–62, 68–80). Petitioner also contends that Figure 1 of Altek depicts the plurality of LEDs 24 “positioned around the camera lens.” *Id.* at 33 (referencing Ex. 1007, Fig. 1; Ex. 1003 ¶¶ 60–62).

According to Petitioner, a person of ordinary skill in the art would have understood that Altek’s “LEDs are electrically connected to a baseboard (motherboard),” because Altek’s Figure 2 “shows the circuit board 16 and an electrical connection connecting circuit board to the plurality of LEDs 24.” *Id.* at 34 (referencing Ex. 1007, Fig. 2; Ex. 1003 ¶¶ 68–79). Petitioner adds that Altek’s Figure 4 also “shows LEDs 24 including connections that pass through the annular reflector to the circuit board 16.” *Id.* at 34–35 (referencing Ex. 1007, Fig. 4; Ex. 1003 ¶ 68).

Upon review of the information in the Petition and corresponding evidence, we determine Petitioner has made a sufficient showing, at this stage of the proceeding, that Altek teaches the subject matter of the light-emitting element of claim 1.

e) Light diffuser

Finally, claim 1 recites “at least a light diffuser provided on said annular reflector and situated outside said fixed light-emitting element to encircle around the camera lens of the camera module, wherein said light diffuser is located within said through-hole of said outer cover.” Ex. 1001, 4:65–5:2. Petitioner contends that because Altek’s annular lampshade 26 “is a transparent annular lampshade made of polycarbonate (PC) or polymethyl methacrylate (PMMA),” and because these “materials act as light diffusers,” Altek teaches the recited diffuser. Pet. 36 (referencing Ex. 1007, p. 6; Ex. 1003 ¶ 87). According to Petitioner, Altek’s Figures 1 and 4 depict “annular lampshade 26 is positioned around the camera lens of the camera module and located within said through-hole of the outer cover of camera 12.” *Id.* at 37–38 (referencing Ex. 1007, Figs. 1, 4; Ex. 1003 ¶¶ 64, 67).

Upon review of the information in the Petition and corresponding evidence, we determine Petitioner has made a sufficient showing, at this stage of the proceeding, that Altek teaches the subject matter of the light diffuser of claim 1.

f) Conclusion

For the reasons discussed above, we determine, on the current record, that the information presented in the Petition shows a reasonable likelihood that claim 1 is unpatentable under 35 U.S.C. § 103 over Altek and the knowledge of one of ordinary skill in the art.

2. *Dependent claims 2–6*

Petitioner contends that dependent claims 2–6 are unpatentable as obvious over Altek and the knowledge of one of ordinary skill in the art. Pet. 38–41. Petitioner has demonstrated a reasonable likelihood of success in proving that at least one claim of the ’983 patent is unpatentable, so we will be instituting on all challenges raised in the Petition. *See SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348, 1354, 1359–60 (2018); *see also PGS Geophysical AS v. Iancu*, 891 F.3d 1354, 1360 (Fed. Cir. 2018) (interpreting the statute to require “a simple yes-or-no institution choice respecting a petition, embracing all challenges included in the petition”); Patent Trial and Appeal Board Consolidated Trial Practice Guide 64 (Nov. 2019) (“The Board will not institute on fewer than all claims or all challenges in a petition.”), *available at* <https://www.uspto.gov/TrialPracticeGuideConsolidated> (“CTPG”).

Additionally, we have reviewed Petitioner’s contentions and citations to the evidence and determine that Petitioner has made a sufficient showing, on the current record, that dependent claims 2–6 are unpatentable under 35 U.S.C. § 103 over Altek and the knowledge of one of ordinary skill in the art.

3. *Independent Claim 9*

Preamble

The preamble of claim 9 recites “[a] handheld electronic device with camera function.” Ex. 1001, 5:26. Petitioner contends that “Altek[’s] Figure 1 shows a handheld electronic device (camera 12).” Pet. 42 (referencing Ex. 1007, 6–7, Figs. 1–4, 6; Ex. 1003 ¶¶ 58–60).

Upon review of the information in the Petition and corresponding evidence, we determine Petitioner has made a sufficient showing, at this

stage of the proceeding, that Altek teaches the subject matter of the preamble of claim 9. In view of this determination, we need not resolve, at this stage of the proceeding, whether the preamble is limiting.

a) Baseboard

Claim 9 also recites “a baseboard.” Ex. 1001, 5:28. Petitioner contends that a person of ordinary skill in the art would understand that Altek’s camera 12 “includes a microcontroller, such as a processor, that controls the capture and storage functionality of the camera, and that all of these devices would be interconnected via a baseboard, such as a motherboard.” Pet. 42 (referencing Ex. 1007, 6–7, Figs. 1–4, 6; Ex. 1003 ¶¶ 28–30, 69–74, 80); *see also id.* at 45–46 (explaining how Patent Owner interpreted the “baseboard” limitation in its infringement contentions in the parallel district court litigation).

Upon review of the information in the Petition and corresponding evidence, we determine Petitioner has made a sufficient showing, at this stage of the proceeding, that Altek teaches the subject matter of the baseboard of claim 9.

b) Camera module

Claim 9 also recites “a camera module located at and electrically connected to said baseboard, wherein said camera module has a camera lens.” Ex. 1001, 5:29–31. Petitioner contends that “a person of ordinary skill in the art would [have] recognize[d] that [Altek’s] camera module is controlled by a microcontroller, such as a processor, that controls the capture and storage functionality of the camera, and that all of these devices would be interconnected via a baseboard, such as a motherboard.” Pet. 43 (referencing Ex. 1007, 6–7, Figs. 1–4, 6; Ex. 1003 ¶¶ 58–61, 69–74, 80).

Petitioner adds that Altek’s Figure 1 shows that “camera 12 includes a lens 14.” *Id.* (referencing Ex. 1007, Fig. 1; Ex. 1003 ¶¶ 58–61).

Upon review of the information in the Petition and corresponding evidence, we determine Petitioner has made a sufficient showing, at this stage of the proceeding, that Altek teaches the subject matter of the camera module of claim 9.

c) Flash structure

Claim 9 also recites “a flash structure.” Ex. 1001, 5:32. Petitioner contends that Altek meets this limitation because Altek’s Figure 1 shows that camera 12 includes “lens ring 10 (flash structure) around the lens 14 of the camera 12. The lens ring includes a plurality of LEDs for providing a flash function.” Pet. 44 (referencing Ex. 1007, p. 6; Ex. 1003 ¶¶ 58–61).

Upon review of the information in the Petition and corresponding evidence, we determine Petitioner has made a sufficient showing, at this stage of the proceeding, that Altek teaches the subject matter of the flash structure of claim 9.

d) Outer cover

Claim 9 also recites “an outer cover, having a through-hole, coupled on said baseboard.” Ex. 1001, 5:33–34. Petitioner contends that Altek’s “camera 12 includes an outer cover, including a through-hole including a camera module.” Pet. 44 (referencing Ex. 1007, 6–7, Figs. 1–4, 6; Ex. 1003 ¶¶ 29, 30, 58–61, 69–75, 80). According to Petitioner, a person of ordinary skill in the art would have understood that Altek’s “camera module is controlled by a microcontroller, such as a processor, that controls the capture and storage functionality of the camera, and that all of these devices would be interconnected via a baseboard, such as a motherboard.” *Id.* at 45.

Petitioner adds that “[a] person of ordinary skill in the art would [have]

recognize[d] that the motherboard is positioned within the outer cover of the camera 12 (e.g., the housing of the camera) and further that the outer cover provides structural support for the internal components and thus those components are coupled on the outer cover.” *Id.* (referencing Ex. 1003 ¶¶ 71–73).

Upon review of the information in the Petition and corresponding evidence, we determine Petitioner has made a sufficient showing, at this stage of the proceeding, that Altek teaches the subject matter of the outer cover of claim 9.

e) Annular reflector

Claim 9 also recites

an annular reflector, having a ring-shape, embedded on the baseboard of the handheld electronic device and situated around said camera module at a position that said camera lens of said camera module is located at a center of said annular reflector, wherein said annular reflector further has at least a through-slot provided thereat.

Ex. 1001, 5:35–6:4. Petitioner relies on the discussion of the annular reflector for claim 1 set forth in Section II.D.1.c. Pet. 46.

Upon review of the information in the Petition and corresponding evidence, we determine Petitioner has made a sufficient showing, at this stage of the proceeding, that Altek teaches the subject matter of the annular reflector of claim 9.

f) Light-emitting element

Claim 9 also recites “at least a fixed light-emitting element being embedded in said through-slot of said annular reflector, wherein said fixed light-emitting element is positioned around said camera lens and electrically connected to said base board.” Ex. 1001, 6:5–9. Petitioner relies on the

discussion of the light-emitting element for claim 1 set forth in Section II.D.1.d. Pet. 46.

Upon review of the information in the Petition and corresponding evidence, we determine Petitioner has made a sufficient showing, at this stage of the proceeding, that Altek teaches the subject matter of the light-emitting element of claim 9.

g) Light diffuser

Finally, claim 9 recites “at least a light diffuser provided on said annular reflector and situated outside said fixed light-emitting element to encircle around said camera lens of said camera module, wherein said light diffuser is located within said through-hole of said outer cover.” Ex. 1001, 6:10–14. Petitioner relies on the discussion of the light diffuser for claim 1 set forth in Section II.D.1.e. Pet. 46.

Upon review of the information in the Petition and corresponding evidence, we determine Petitioner has made a sufficient showing, at this stage of the proceeding, that Altek teaches the subject matter of the light diffuser of claim 9.

h) Conclusion

For the reasons discussed above, we determine, on the current record, that the information presented in the Petition shows a reasonable likelihood that claim 9 is unpatentable under 35 U.S.C. § 103 over Altek and the knowledge of one of ordinary skill in the art.

4. Dependent claims 10–13

Petitioner contends that dependent claims 10–13 are unpatentable as obvious over Altek and the knowledge of one of ordinary skill in the art. Pet. 47–48. We have reviewed Petitioner’s contentions and citations to the evidence and determine that Petitioner has made a sufficient showing, on the

current record, that dependent claims 10–13 are unpatentable under 35 U.S.C. § 103 over Altek and the knowledge of one of ordinary skill in the art.

E. Ground 2: Claims 7, 8, 14, and 15 as unpatentable over Altek, Sharp, and the knowledge of one of ordinary skill in the art

Petitioner contends that claims 7, 8, 14, and 15 are unpatentable over Altek, Sharp, and the knowledge of one of ordinary skill in the art. Pet. 4, 48–53. As we discussed above, because we are instituting trial in this proceeding, we will be instituting on all challenges. Still, we have reviewed Petitioner’s contentions and citations to the evidence and determine that Petitioner has made a sufficient showing, on the current record, that dependent claims 7, 8, 14, and 15 are unpatentable under 35 U.S.C. § 103 over Altek, Sharp, and the knowledge of one of ordinary skill in the art.

In an effort to provide useful information at this stage, we address below whether a person having ordinary skill in the art would have had reason to combine the teachings of Altek and Sharp, and would have had a reasonable expectation of success in making the combination.

Petitioner contends that “Altek and Sharp are both in a common field of endeavor—circular lighting structures using LEDs to provide flash functionality for handheld devices including camera functionality.” Pet. 22 (referencing Ex. 1003 ¶ 82). Petitioner contends that “a person of ordinary skill in the art would [have] recognize[d] that [Altek’s] lampshade is a light diffuser,” but that it is not “in multiple pieces in a circular arrangement.” *Id.* at 22–23 (referencing Ex. 1003 ¶ 65).

Petitioner reasons that “a person of ordinary skill in the art would have been motivated to modify Altek’s annular lampshade 26 based upon Sharp’s light guide and diffuser configuration to place the annular

lampshade in two or more pieces in a circular configuration.” Pet. 23 (citing Ex. 1003 ¶ 89). According to Petitioner, an artisan of ordinary skill would have made the modification “because including the annular lampshade in two or more pieces provides multiple lighting points, saves material, and provides additional locations for mechanically coupling the lampshade to the body of the mobile device, and further enables the designer to control the visual appearance of the camera.” *Id.* (referencing Ex. 1003 ¶¶ 89–90). Petitioner contends that the modification would have been “a known improvement as shown by Sharp, and doing so would modify Altek’s similar device in the same way with predictable results.” *Id.* (referencing MPEP 2143(C); *KSR*, 550 U.S. at 415–21; Ex. 1003 ¶¶ 89–90).

Upon review of the information in the Petition, we determine Petitioner has made a threshold showing, sufficient for purposes of institution, that a person having ordinary skill in the art would have had reason to combine the teachings of Altek and Sharp, with a reasonable expectation of success in achieving the claimed subject matter. We also preliminarily determine that Petitioner’s reasoning is sufficiently supported, on the current record, by the testimony of Petitioner’s declarant. *See KSR Int’l Co.*, 550 U.S. at 418 (stating that, to facilitate the analysis of an obviousness position, the proponent should provide “some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness”).

“The presence or absence of a motivation to combine references in an obviousness determination is a pure question of fact.” *PAR Pharm., Inc.*, 773 F.3d at 1196 (citation omitted). Also, “[t]he presence or absence of a reasonable expectation of success is . . . a question of fact.” *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1366 (Fed. Cir. 2016).

We understand that these inquiries are highly fact-driven, and each inquiry will benefit from a complete record developed at trial, including cross-examination of the parties' declarants, so that we may fully assess the benefits, both lost and gained, of the proposed modification. *See, e.g., Winner Int'l Royalty Corp. v. Wang*, 202 F.3d 1340, 1349 n.8 (Fed. Cir. 2000) ("The fact that the motivating benefit comes at the expense of another benefit, however, should not nullify its use as a basis to modify the disclosure of one reference with the teachings of another. Instead, the benefits, both lost and gained, should be weighed against one another.").

F. Ground 3: Claims 1–15 as unpatentable over Google and Altek

Petitioner contends that the combination of Google and Altek renders obvious claims 1–15. Pet. 4, 53–80.

As we discussed above, because we are instituting trial in this proceeding, we will be instituting on all challenges. In an effort to provide useful information at this stage, we address below whether a person having ordinary skill in the art would have had reason to combine the teachings of Google and Altek, and would have had a reasonable expectation of success in making the combination. We also address below Petitioner's analysis of the "light diffuser" limitations of independent claims 1 and 9.

a) Motivation to combine and reasonable expectation of success

Petitioner contends that "Google and Altek are both in a common field of endeavor—circular lighting structures using LEDs to provide flash functionality for handheld devices that include cameras." Pet. 24–25 (referencing Ex. 1003 ¶ 98). Petitioner contends that although Google's LEDs do not include a reflector, Altek's "annular concave reflector 18 [] includes through-holes 20 through which a plurality of LEDs 24 project." *Id.* at 25.

Petitioner reasons that a person of ordinary skill in the art would have modified “Google’s LED structure to include a reflector with through-holes for the LEDs, such as the annular reflector of Altek, in order to improve light efficiency and enhance light output by using reflection.” Pet. 25 (referencing Ex. 1003 ¶¶ 98–103). Petitioner adds that such a modification is consistent with “Google’s description of using mirrors to reflect and direct light.” *Id.* (referencing Ex. 1010, 8:6–12). According to Petitioner, the modification is “nothing more than modifying a device using known technology to yield a predictable result.” *Id.* (referencing MPEP 2143(C); *KSR*, 550 U.S. at 415–21; Ex. 1003 ¶¶ 98–103).

Upon review of the information in the Petition, we determine Petitioner has made a threshold showing, sufficient for purposes of institution, that a person having ordinary skill in the art would have had reason to combine the teachings of Google and Altek, with a reasonable expectation of success in achieving the claimed subject matter. We also preliminarily determine that Petitioner’s reasoning is sufficiently supported, on the current record, by the testimony of Petitioner’s declarant.

b) Light diffuser

We also take this opportunity to address a potential weakness in Petitioner’s position with respect to the “light diffuser” limitations of independent claims 1 and 9. Claim 1 recites “at least a light diffuser provided on said annular reflector and situated outside said fixed light-emitting element to encircle around the camera lens of the camera module, wherein said light diffuser is located within said through-hole of said outer cover.” Ex. 1001, 4:65–5:2. Similarly, claim 9 recites “at least a light diffuser provided on said annular reflector and situated outside said fixed light-emitting element to encircle around said camera lens of said camera

module, wherein said light diffuser is located within said through-hole of said outer cover.” *Id.* at 6:10–14.

Petitioner contends that Google teaches, in its embodiment of Figure 1E, diffuser 174, which “may be made of a lightly smoked colorless plastic that is able to diffuse light generated at its center by light source 176 further out toward its ends.” Pet. 65 (quoting Ex. 1010, 7:49–52); *see also* Pet. 78 (directing us to the analysis of the diffuser limitation of claim 1 in its contentions for claim 9 under Ground 3). Petitioner adds that Google teaches that its LEDs sit flush with the outer surface of the housing, covered by diffusers 174. *Id.* at 65–66 (referencing Ex. 1010, 4:43–49).

Petitioner also contends that Altek teaches that its lampshade 26 is “‘within said through-hole of said outer cover’ and on the annular reflector 22.” Pet. 66. Petitioner also contends that Google teaches a camera lens and flashes located at separate apertures in the outer cover. *See id.* at 62, 65–66.

We do not discern, on the current record, Petitioner’s position as to how the combination of Google and Altek discloses a light diffuser located within the through-hole of the outer cover that includes the camera module, as is apparently required at least by claim 1⁸. Also, we note that Petitioner addresses reasons for modifying Google to include Altek’s reflector

⁸ Claim 1 expressly requires “an outer cover, having a through-hole, . . . where the camera module is located,” and the light diffuser to be “located within said through-hole.” Ex. 1001, 4:50–52, 5:2–3. Claim 9 does not specify a location of the camera module with respect to the recited through-hole in the outer cover, but does require the “light diffuser [be] located within said through-hole of said outer cover.” *Id.* at 6:13–14. As such, it seems that claim 9 is broader in that it would allow the light diffuser to be positioned in a through-hole in the outer cover different from the camera module.

(Pet. 25), but does not address any reason for modifying Google to include a diffuser that is located within the through-hole of the outer cover that includes the camera module. *Cf.* Ex. 1010, Fig. 1E (showing lens 178 in a through-hole in the out cover, and the LEDs and diffusers in separate through-holes); Ex. 1001, 4:48–5:2 (reciting claim 1 and requiring the light diffuser to be located within “said through-hole,” which refers back to the through-hole in the outer cover at which the camera module is located).

III. CONCLUSION

Based on the information presented, we determine Petitioner has established a reasonable likelihood that it would prevail with respect to at least one of the Challenged Claims. Accordingly, we institute an *inter partes* review on all challenges.

IV. ORDER

In consideration of the foregoing, it is hereby

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review is instituted as to claims 1–15 of U.S. Patent No. 8,724,983 B2 with respect to all grounds of unpatentability presented in the Petition;

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, which commences on the entry date of this Order.

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