

IPR2024-01357 / IPR2025-00260

U.S. Patent No. 8,604,678

"Wavelength Conversion Component with a Diffusing Layer"

Petitioners' Oral Hearing Presentation

Savant Technologies · LEDVANCE · Elong · Xiamen Longstar

February 26, 2026

Roadmap

I. Original Claims Are Obvious

Structure is undisputed, and every reference in the record confirms blue LEDs emit well above 440 nm

II. Claims 11–14 Are Obvious

Basin-2007 and Krummacher already disclose TiO₂ nanoparticles that produce blue-light scattering

III. Substitute Claims Are Obvious

The new limitations describe physics, and Petitioners' expert testimony is entirely unrebutted

IV. Substitute Claims Fail § 112

Claims dropped 'peak' from 'peak wavelength'; 20% floor has no disclosure; 'reduced by' has no measure

Blue-pumped white LEDs were the standard architecture

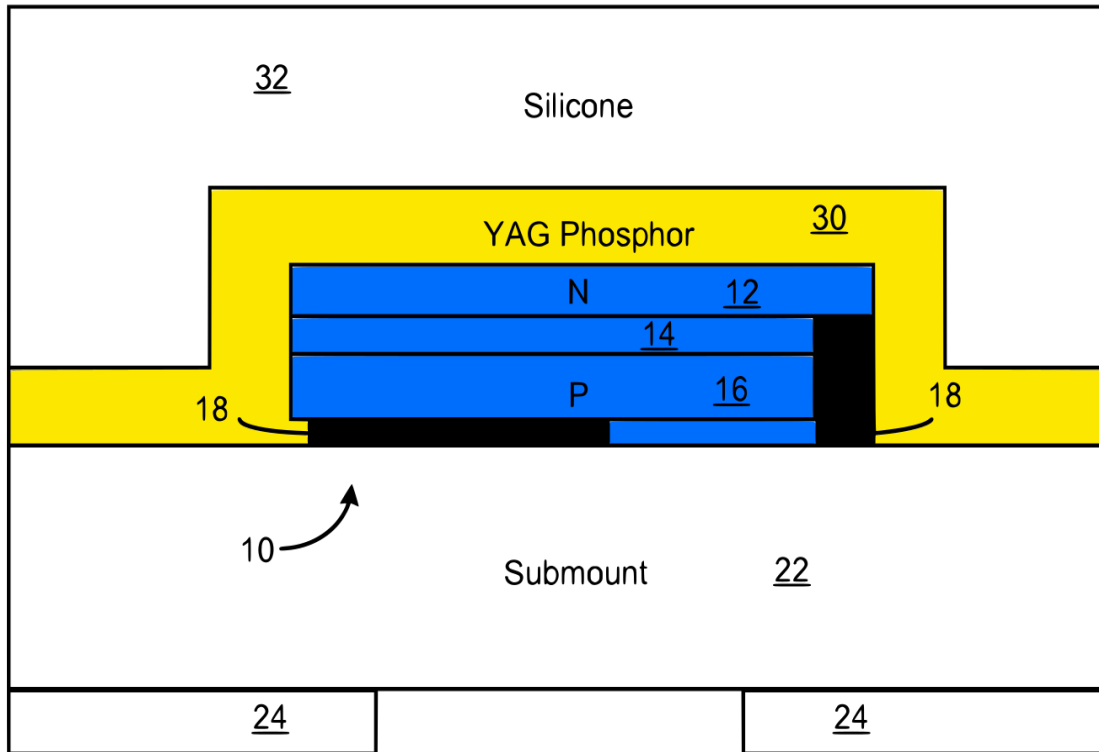


Fig. 1 (prior art)

EX1005 (Basin-2007), FIG. 1 (annotated)

- **Blue LED + phosphor layer:** the standard white LED architecture
- **White light when on, yellow appearance when off.** The phosphor is visible through the silicone

Pet. at 6-19 (IPR2024-01357); EX1005 (Basin-2007), FIG. 1 (annotated)

The prior art already disclosed a TiO₂ scattering layer

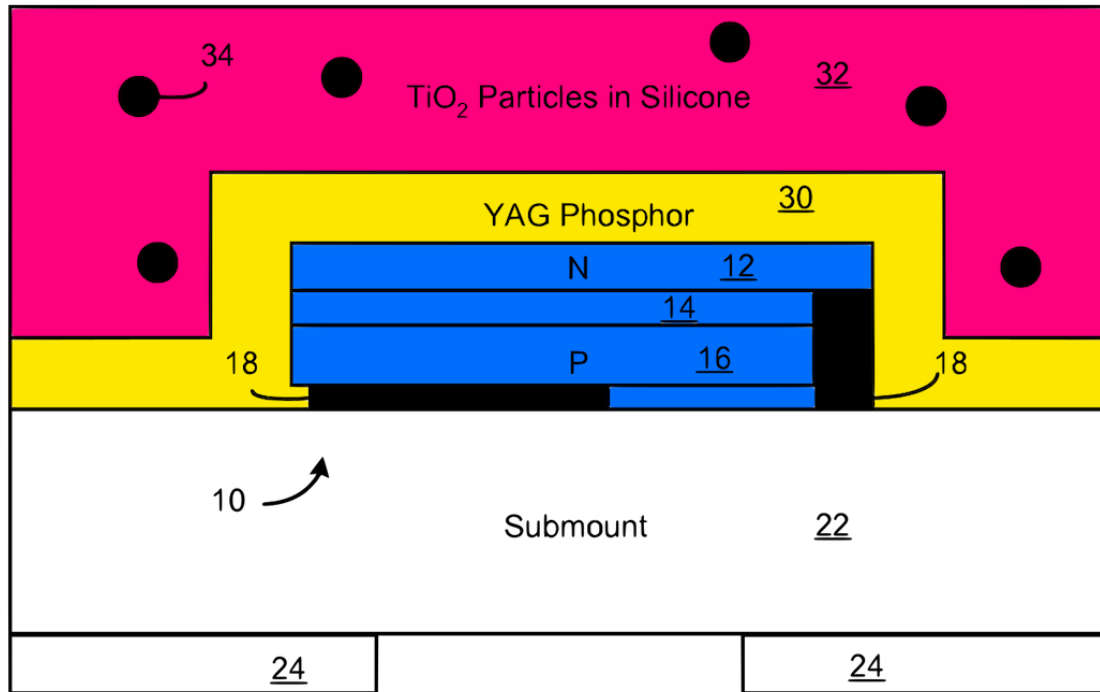


Fig. 2

“much whiter when LED is off”

Basin-2007, EX1005 ¶10

- ▶ FIG. 2 adds a scattering layer (element 32) above the phosphor (element 30)
- ▶ Scattering particles: TiO₂ described explicitly at EX1005 ¶32

Pet. at 10-12 (IPR2024-01357); EX1005 (Basin-2007), FIG. 2 (annotated), ¶¶10, 31-32

Consolidated Proceedings — What is before the Board

IPR2024-01357

Filed: August 26, 2024

Claims: 1–3, 6, 7, 9, 10, 16–21, 25, 26, 29

Grounds: Basin-2007 and Krummacher, each combined with secondary references.

IPR2025-00260

Filed: December 9, 2024

Claims: 11–14 (preferential scattering and particle size)

Grounds: Same primary references + Stokes for particle-size teaching.

Consolidated: The Board consolidated these proceedings upon institution of IPR2025-00260, Paper 17 at 8.

Motion to Amend: PO filed a Revised MTA (Paper 46) proposing substitute claims 30–49. Petitioners oppose (Paper 49).

Claims at Issue — Original and Substitute

Original Claims

Claim	What They Claim	
1, 19, 29	Independent	Phosphor layer + TiO ₂ diffusing layer; off-state white; ≥440 nm. Cl. 19 adds LED; Cl. 29 adds bulb
2–3, 6–7, 9–10, 16–18	Dependent (Cl. 1)	Layer contact, composition, deposition, TiO ₂
11–14	Dependent (Cl. 1)	Preferential scattering
20–21, 25–26	Dependent (Cl. 19)	Form factor, device details

Substitute Claims (MTA)

Claim	Substitutes For	
30–39	Cl. 1 and deps	Phosphor reduction
40–45	Cls. 19, 29, and deps	Preferential scattering
46–49	Cls. 11–14	Hybrid: phosphor reduction + preferential scattering

Person of Ordinary Skill in the Art

PO DOES NOT DISPUTE

A person with an undergraduate degree (B.S. or equivalent) in electrical engineering, materials science, physics, or a similar discipline, plus one to two years of experience in LED packaging design. More education could substitute for experience, and vice versa.

Pet. at 8–9 (IPR2024-01357); Pet. at 8–9 (IPR2025-00260); Paper 26 at 9.

I. Original Claims Are Obvious

Structure is undisputed, and every reference in the record confirms blue LEDs emit well above 440 nm

Independent Claim 19

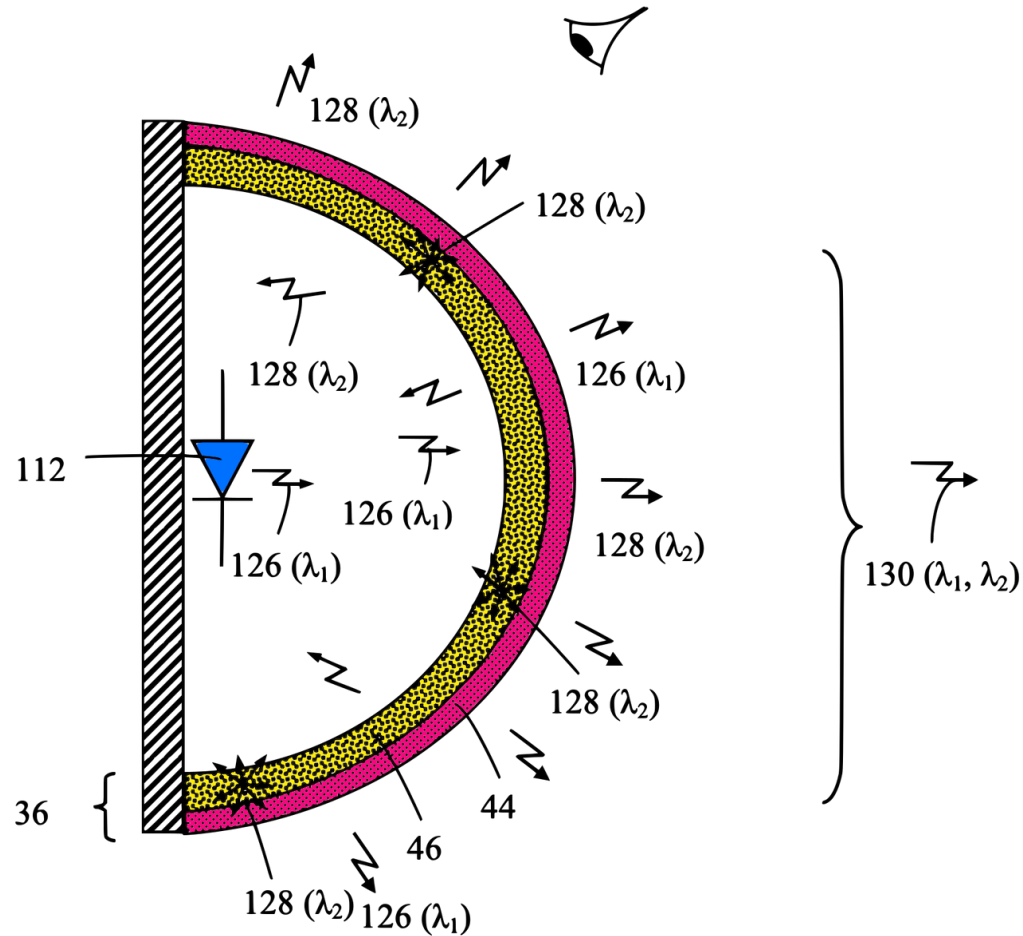


FIG. 17

19. A light emitting device, comprising:

at least one solid-state light emitter operable to generate excitation light; and

a wavelength conversion component comprising:

a wavelength conversion layer excitable by the excitation light, wherein the wavelength conversion layer comprises particles of at least one photoluminescence material; and

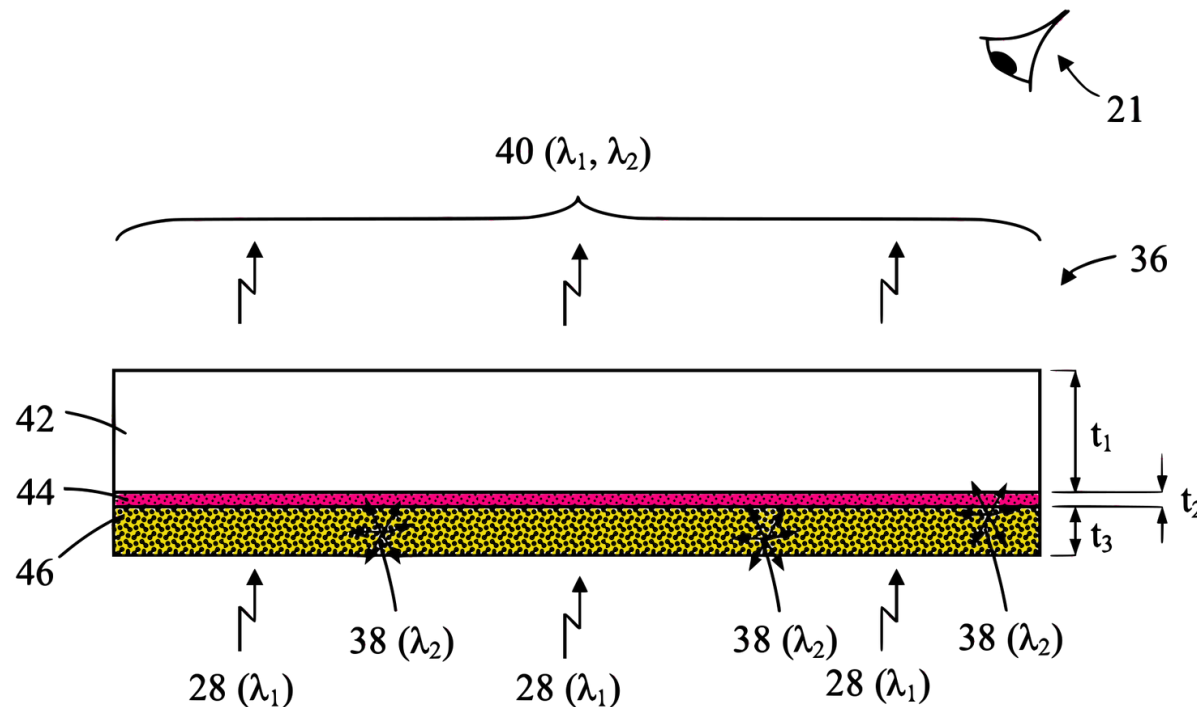
a light diffusing layer comprising particles of a light scattering material,

wherein the light diffusing layer improves an OFF state white appearance of the wavelength conversion component;

wherein the wavelength conversion component is configured such that in operation a portion of light comprising blue light having a wavelength of greater than or equal to 440 nm generated by the at least one solid-state light emitter is emitted through the wavelength conversion component to contribute to a final visible emission product.

EX1001, Fig. 17 (annotated), Cl. 19 (annotated)

Independent Claim 1



1. A wavelength conversion component for a light emitting device comprising:

a wavelength conversion layer comprising particles of at least one photoluminescence material; and

a light diffusing layer comprising particles of a light scattering material,

wherein the light diffusing layer improves an off-state white appearance of the wavelength conversion component;

wherein the wavelength conversion component is configured such that in operation a portion of excitation light comprising **blue light having a wavelength of greater than or equal to 440 nm** generated by the light emitting device is emitted through the wavelength conversion component to contribute to a final visible emission product.

EX1001, Fig. 2 (annotated), Cl. 1 (annotated)

Two references independently disclose every element

STRUCTURAL ELEMENTS UNDISPUTED

Basin-2007 (EX1005)

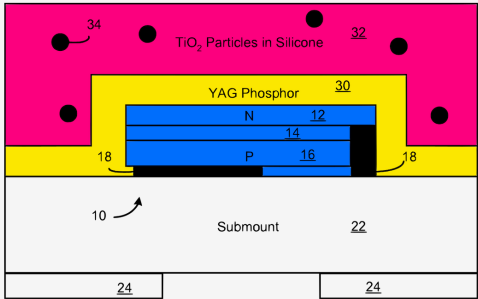
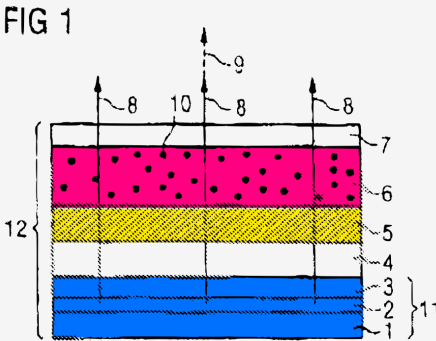


Fig. 2

Krummacher (EX1007)



Claim 19 Element	Basin-2007	Krummacher
Solid-state light emitter	✓	✓
Wavelength conversion layer	✓	✓
Light diffusing layer (TiO ₂)	✓	✓
Off-state white appearance	✓	✓

PO's entire defense rests on the wavelength of a conventional blue LED, not on any structural element.

Pet. at 11-13, 19-47 (IPR2024-01357); EX1005, FIG. 2 (annotated); EX1007, FIG. 1 (annotated)

Obviousness turns on one question: does a blue LED emit ≥ 440 nm?

≥ 440 nm added during prosecution to distinguish McNulty (UV-pumped LED).

440 nm divides two architectures:

- Blue-pumped (≥ 440 nm) — conventional
- UV-pumped (< 400 nm) — McNulty

EX1004 at 194–202

**Every reference
says yes.**

Conventional blue LEDs
peak at 450–470 nm —
well above 440.

Paper 26 at 30–47; EX1004 at 194–202

The '678 specification uses commercial blue LED

"The blue LEDs 24 can comprise 4.8 W Cetus™ C1109 chip on ceramic devices from Intematix Corporation ... in which each device comprises a ceramic packaged array of twelve 0.4 W GaN-based (gallium nitride-based) blue LED chips Each blue LED 24 is operable to generate blue light 28 having a peak wavelength λ_1 in a wavelength range 400 nm to 480 nm (typically 450 nm to 470 nm)."

EX1001, 7:14–26

A POSITA would understand blue LEDs emit >440 nm

Doolittle (EX1002 ¶ 121

Consistent with the state of the art as discussed above, including Shimizu, a POSA would understand that the blue light LEDs emitted from conventional white light LED light sources typically had wavelengths greater than 440 nm. Indeed, that is consistent with the wavelengths disclosed throughout the prior art for the blue light emitted by blue light LED chips.

Confirmed by the prior art (peak wavelengths)

Shimizu (EX1010): 450, 460, 470 nm

Ye et al. (EX1045): 450 nm

Basin-2005 (EX1006): 420–490 nm

DOE Report (EX1046): 450–470 nm

Stokes (EX1008): 450 or 480 nm

Smet et al. (EX1047): 460 nm

Van Woudenberg (EX1020): 430–480 nm

'678 Patent (EX1001, 7:19–24): 450–470 nm

Pet. at 24-25 (IPR2024-01357); Paper 40 at 13; EX1002 ¶121; EX1010; EX1006; EX1008; EX1020; EX1045; EX1046; EX1047; EX1001, 7:19–24

PO's expert cannot identify the wavelength of a blue LED

Q. In a typical device, an LED package that emits white light using a blue LED chip and a yellow phosphor, which wavelengths of blue light would typically be emitted by the blue LED?

A. I would not be able to answer that question with certainty because the description of blue depends to some degree on the context.

EX1048 at 51:5–52:20 (Schubert Deposition, Sept. 12, 2025)

Schubert's textbook: Blue LEDs emit at 455–490 nm

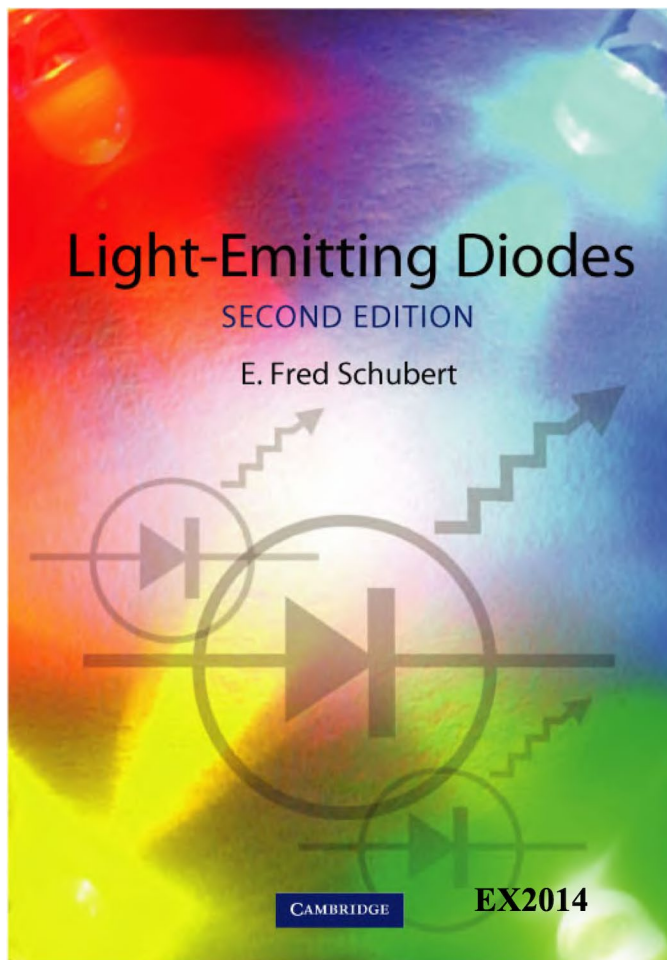


Table 16.5. Colors and associated typical LED peak wavelength ranges

Color	Wavelength
Ultraviolet	< 390 nm
Violet	390–455 nm
Blue	455–490 nm
Cyan	490–515 nm
Green	515–570 nm

Color	Wavelength
Yellow	570–600 nm
Amber	590–600 nm
Orange	600–625 nm
Red	625–720 nm
Infrared	> 720 nm

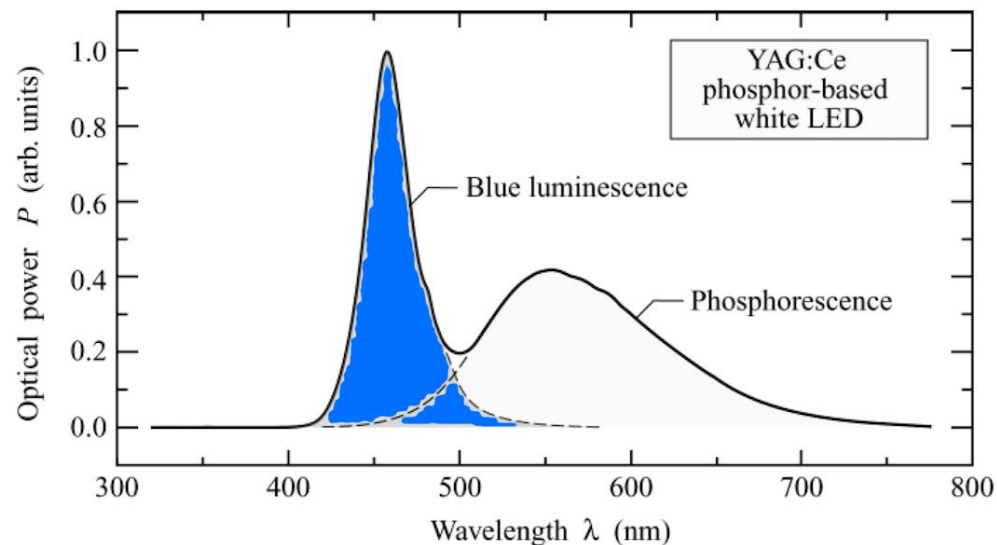


Fig. 21.8. Emission spectrum of a phosphor-based white LED manufactured by Nichia Corporation (Anan, Tokushima, Japan).

Paper 40 at 13-14; EX2014 at 284, Table 16.5 (annotated), 354, Fig. 21.8 (annotated)

Schubert's textbook: Blue-pumped LEDs outperform UV

EX2014 at 358-9 (Schubert Textbook, 2006)

"A fundamental drawback of UV pumped white LEDs is the energy loss (Stokes shift) incurred when converting UV light to white light. The potential luminous efficiency of UV-pumped phosphor white LEDs is lower than that of blue-pumped phosphor-based white LEDs."

EX2014 at 358-9; EX1048, 86:20–88:4

This is not a new ground

What the Petition said

"A POSA would have understood the blue light disclosed in Basin-2007 to include blue light with a wavelength greater than 440 nm. . . . Basin-2007 discloses that it is based on 'a conventional white light LED' light source including an LED chip that 'generates blue light.'"

Pet. at 23–24

What the secondary references do

Basin-2005, Shimizu, Stokes, and the '678 specification confirm what a POSITA already understood from the primary references. They do not supply a missing element.

Not a new ground

PO's Sur-Reply calls this a "new ground." (Paper 45 at 2-5.) It is not. The Petition stated Basin-2007 "does not specifically disclose" ≥ 440 nm and immediately cited Prof. Doolittle's testimony that a POSITA would understand "blue LED" to mean ≥ 440 nm. Pet. at 19, 23–24; EX1002 ¶ 121.

Pet. at 19, 23–24 (IPR2024-01357); EX1005 ¶¶ 21–22; EX1002 ¶ 121; Paper 45 at 11; Paper 40 at 8–9

Primary references disclose the structure

What PO argues

Grounds 1/3 (Paper 26 at 33): "These differences lead to diverging approaches to LED design and packaging."

Grounds 2/4 (Paper 26 at 38): "[N]either Petitioners' nor Prof. Doolittle have identified any motivation for their proposed Frankenstein combination of features from these three disparate references."

Wrong question. Petitioners do not propose combining a camera flash with a light bulb. Basin-2007 already discloses a blue LED, a YAG phosphor layer, and a TiO₂ scattering layer in one device (FIG. 2). So does Krummacher.

Why this fails

The off-state problem is universal: same phosphor produces the same yellow appearance regardless of form factor. The claims are not limited to any application. The law does not require bodily incorporation of one reference into another. *Allied Erecting*, 825 F.3d at 1381. The Board rejected this argument at institution. ID at 27–28.

Supporting authority

Requiring motivation to combine "each element of the claim—even those present together in a reference" improperly "dissects prior art references into collections of individual elements." *GE v. Raytheon*, 983 F.3d 1334, 1352 (Fed. Cir. 2020); see also *Guardant Health*, No. 24-1129, slip op. at 9 (Fed. Cir. Jan. 23, 2026).

Paper 26 at 33, 38; Paper 40 at 21–23; *Allied Erecting and Dismantling Co., Inc. v. Genesis Attachments, LLC*, 825 F.3d 1373, 1381 (Fed. Cir. June 15, 2016); Paper 17 at 26-29; *GE v. Raytheon*, 983 F.3d 1334, 1352 (Fed. Cir. 2020); see also *Guardant Health*, No. 24-1129, slip op. at 9 (Fed. Cir. Jan. 23, 2026)

Dependent claims follow the independents

PO DOES NOT DISPUTE

PO does not separately contest claims 2, 3, 6, 7, 9, 10, 16–18, 20, 21, 25, or 26.

If claims 1 and 19 are obvious, the dependent claims fall with them.

Paper 40 at 5–7

No objective evidence of nonobviousness

Chromalit XT (2012)

Named inventors' own commercial embodiment (EX1050, EX1051).

No evidence of commercial success.

Twelve-year gap

Filed 2010. Feit bulbs ~2022.

Any success is attributable to subsequent advancements in technology, not the claimed invention.

Anecdotal evidence

Instagram, Reddit, Home Depot Innovation Award from retail partner.

Not commensurate with the scope of the claimed invention.

***Fox Factory v. SRAM*, 944 F.3d 1366 at 1373: Objective indicia must be commensurate with the scope of claimed invention.**

Paper 40 at 24–25; EX1050; EX1051; EX1052; *Fox Factory v. SRAM, LLC*, 944 F.3d 1366, 1373 (Fed. Cir. Dec. 18, 2019)

II. Claims 11–14 Are Obvious

At the prior art's particle sizes, Basin-2007 and Krummacher already disclose TiO₂ nanoparticles that produce blue-light scattering

Claims 11–14 add only inherent physical properties

PHYSICS UNREBUTTED

What the claims require

Claim 11: Scatters excitation light $\geq 1.5\times$ more than phosphor-emitted light.

Claim 12: Scatters excitation light at least twice as much as phosphor-emitted light.

Claim 13: Further scattering refinements.

Claim 14: Average particle size less than 150 nm.

Why this is physics, not invention

Preferential scattering is wavelength-dependent Rayleigh/Mie scattering, a known physical property of nano-scale TiO_2 particles.

Basin-2007: Sub-micron TiO_2 particles, including at 0.25 micron (250 nm). EX1005, ¶32.

Krummacher: TiO_2 particles in 50–1000 nm range. EX1007, ¶39.

At these particle sizes, preferential blue-light scattering is inherent. PO does not dispute the physics.

Pet. at 21, 35–47 (IPR2025-00260); Paper 40 at 23-24; EX1005, ¶32; EX1007, ¶39; Paper 49 at 15–17

Preferential scattering was known

PHYSICS UNREBUTTED

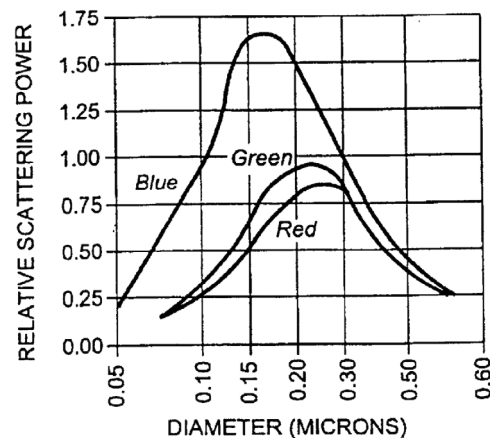
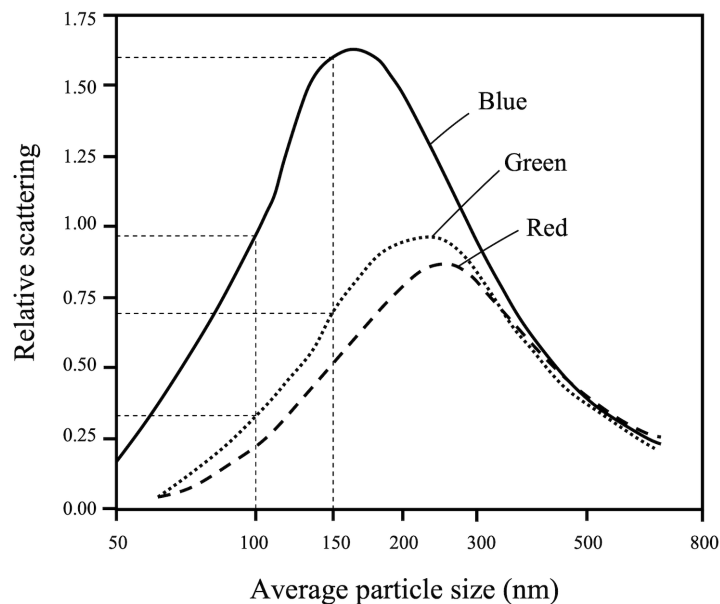


fig. 6
(PRIOR ART)

Figure 7. Relative Light Scattering Power versus Rutile Particle Size.

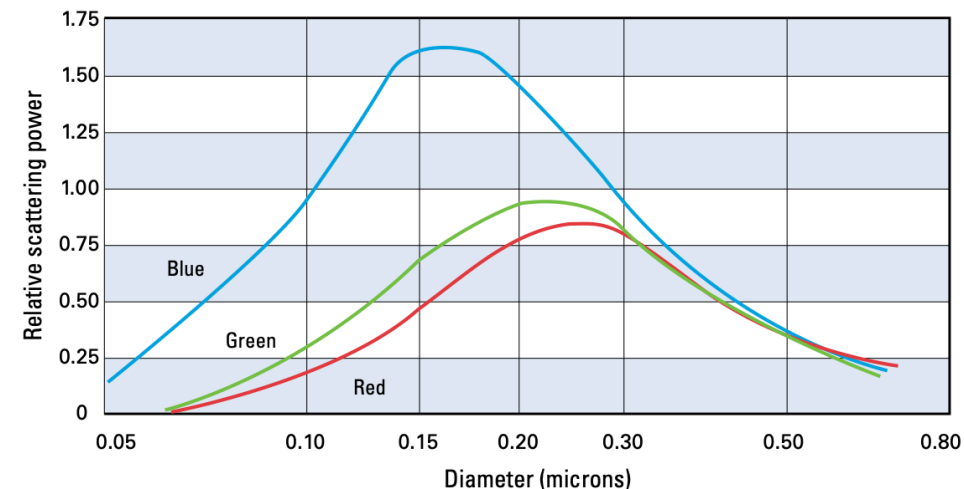


Figure 10 of the '678 was plagiarized; PO calls this “inflammatory and irrelevant” (Paper 34 at 22) but does not say it is incorrect

Paper 34 at 22; EX1005, ¶¶ 32, 46; EX1007, ¶39; EX1008, 7:1–26; EX1012

The prior art's particle sizes already produce preferential scattering

PHYSICS UNREBUTTED

Basin-2007 (EX1005)

¶32: TiO₂ at 0.25 micron (250 nm).
At 250 nm, scattering curve shows blue
>> yellow.
Preferential scattering inherent.

EX1005, ¶¶ 32, 46

Krummacher (EX1007)

¶39: 50–1000 nm range.
Encompasses 100–200 nm sweet spot.
Where preferential scattering
maximized.

EX1007, ¶39

Stokes (EX1008)

7:1–26: 100–200 nm TiO₂ particles.
≥50% greater scattering for blue
than yellow/red light.

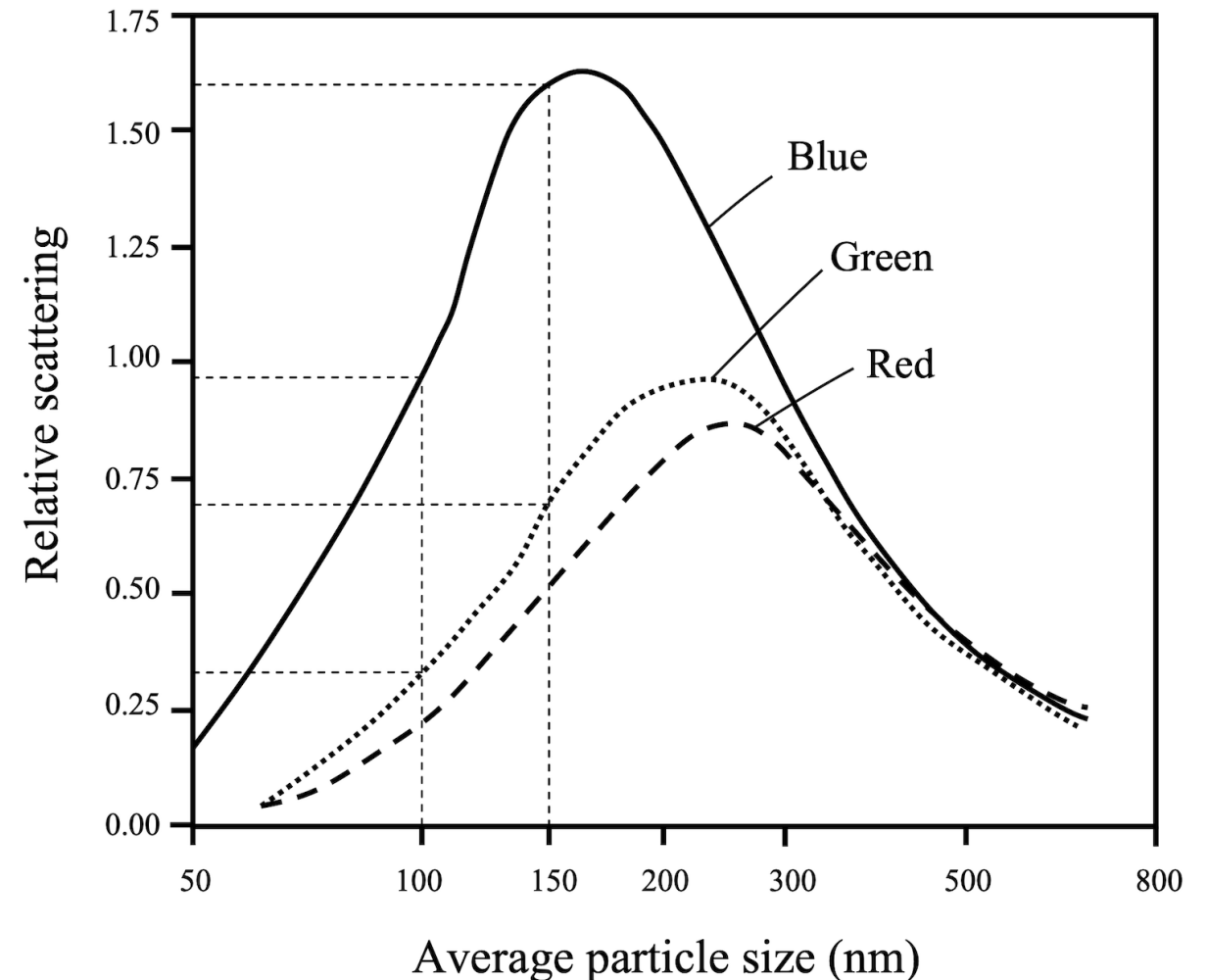
EX1008, 7:1–26; EX1012/EX1013

**Same material. Same particle sizes. Same physics. At these sizes,
preferential blue-light scattering is inherent.**

Pet. at 23-26, 37, 51 (IPR2025-00260); EX1005, ¶¶ 32, 46; EX1007, ¶39; EX1008, 7:1–26; EX1012; Paper 34 at 22

The prior art's particle sizes fall within the preferential-scattering range

Basin-2007's 250 nm and Stokes's 100–200 nm range both fall within the zone where TiO_2 preferentially scatters blue light. Krummacher's 50–1000 nm range encompasses this zone.



Pet. at 21-24, 35-39, 53-60 (IPR2025-00260); EX1001, FIG. 10, 11:65–12:8; EX1005, ¶132; EX1007, ¶139; EX1008, 7:1–26; Paper 49 at 15–16

Stokes is cited for particle sizes, not layer arrangement

What Stokes is cited for

Particle-size teaching: 100–200 nm TiO₂ preferentially scatters blue light. EX1008, 7:1–26.

NOT cited for layer arrangement.

Basin-2007 and Krummacher provide the device structure. Stokes confirms the physics.

What Petitioners do NOT propose

Adopting Stokes's layer arrangement (scattering layer below phosphor).

PO's objections—visual uniformity, component protection, thermal management—all go to Stokes's structure, not its particle-size teaching.

Stokes's criticism of a layer arrangement does not discourage using the particle sizes it expressly identifies as effective.

Stokes cannot teach away from a result the primary references already achieve

The physics

Basin-2007: 250 nm TiO₂ particles. EX1005, ¶32.
Krummacher: 50–1000 nm range. EX1007, ¶39.

At these sizes, preferential blue-light scattering already occurs.

The law

In re Fulton, 391 F.3d 1195, 1201 (Fed. Cir. 2004):
Must "criticize, discredit, or otherwise discourage."

Stokes criticizes a layer arrangement—not particle sizes.

Physical reality controls.

***Sigray v. Carl Zeiss X-Ray Microscopy, Inc.*, 137 F.4th 1372, slip op. at 12–13 (Fed. Cir. May 23, 2025)**

A reference's stated goal could not overcome the physical reality that the disclosed geometry necessarily produced the claimed result.

Paper 49 at 15–17; EX1005, ¶32; EX1007, ¶39; *In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. Dec. 2, 2004);
In re Gurley, 27 F.3d 551, 553 (Fed. Cir. June 15, 1994);
Sigray v. Carl Zeiss X-Ray Microscopy, Inc., 137 F.4th 1372, slip op. at 12–13 (Fed. Cir. May 23, 2025)

III. Substitute Claims Are Obvious

The new limitations describe physics, and Petitioners' expert testimony is entirely un rebutted

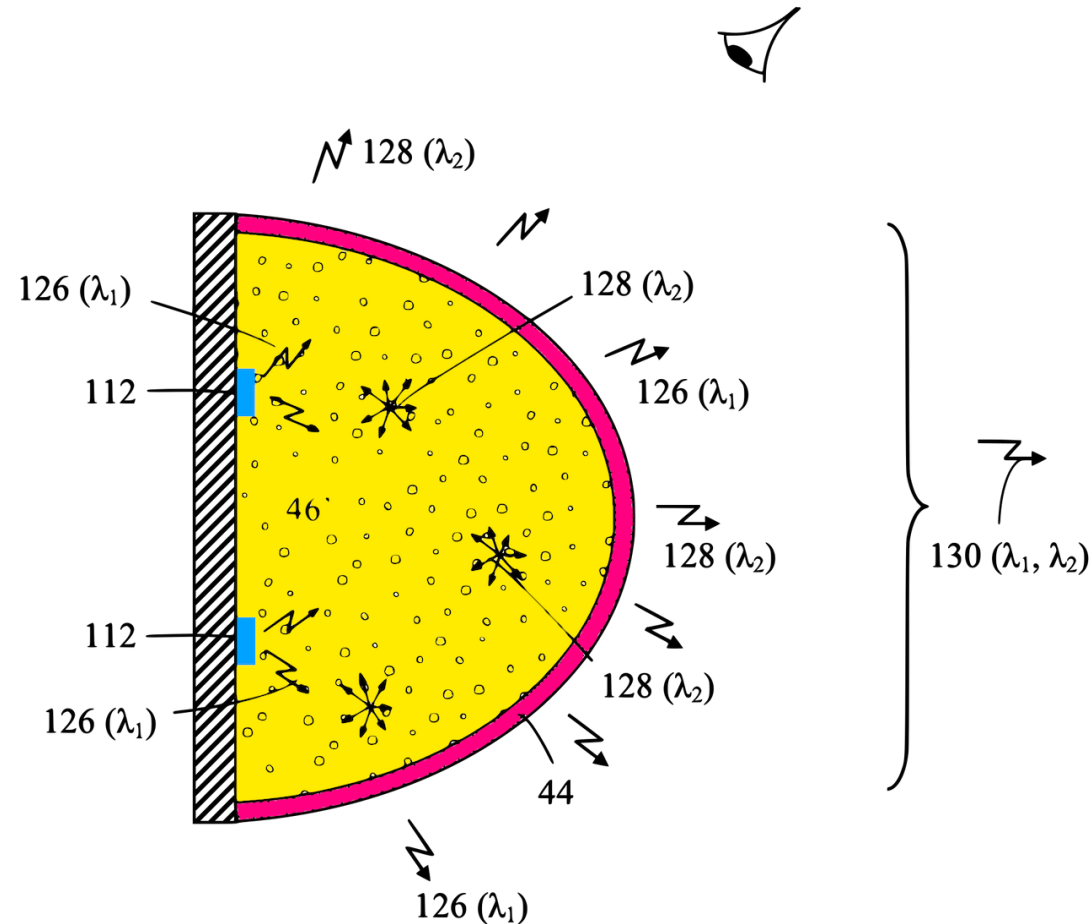
✓ Original

✓ 11-14

• MTA

§ 112

The substitute claims recite the natural results of the obvious structure



The new limitations do not save these claims. They recite the natural results of the obvious structure.

Add TiO_2 → reflects blue light back through phosphor → less phosphor needed. Use nano-scale TiO_2 → scatters blue more than yellow → preferential scattering.

FIG. 18

Pet. at 3 (IPR2024-01357); EX1001, Fig. 18 (annotated),
Paper 49 at 11; Pet. at 18–22 (IPR2025-00260)

Phosphor reduction is a natural consequence of the obvious structure

UNREBUTTED

Doolittle (EX1065, ¶¶ 11–15): TiO_2 reflects blue back → "light recycling" → less phosphor.

Vriens (EX1057)

"makes it possible to reduce phosphor grain density somewhat" 5:6–15.

Oh (EX1058)

"recycl[ing] unabsorbed transmitted blue" back into the phosphor. EX1058 at 1–3.

PO: Calls this "conclusory" (Paper 55 at 5–6)

But: PO never deposed Prof. Doolittle on his supplemental MTA declaration (EX1065) and offers no competing expert testimony.

EX1065, ¶¶ 11–15; EX1057, 5:6–15; EX1058; Paper 55 at 5–6; Paper 49 at 11–13

The specification itself treats phosphor reduction as inherent

“[T]he light diffusing layer increases the probability that a photon will result in the generation of photoluminescence light by directing light back into the wavelength conversion layer. Therefore, inclusion of a diffusing layer in direct contact with the wavelength conversion layer can reduce the quantity of phosphor material required to generate a given color emission product, e.g., by up to 40%.”

Argument

The patent treats phosphor reduction as a natural consequence of the structure, not a separate invention. The “up to 40%” figure is the only anchor for claim 31’s range.

EX1001, 3:21–32; Paper 49 at 11–13

Claim 31's 20–40% range is routine optimization, not invention

The prior art establishes the general relationship

Vriens: reflecting blue light back "make[s] it possible to reduce the phosphor grain density somewhat." EX1057, 5:6–15. Oh: "recycl[ing] unabsorbed transmitted blue" achieves same output with less phosphor. EX1058 at 1–3. Doolittle links this to the claimed structure. EX1065, ¶¶ 11–15. Discovering the optimum percentage is routine. In re Aller, 220 F.2d 454, 456 (CCPA 1955).

Neither endpoint has any significance

The specification anchors only the 40% ceiling ("up to 40%"). The 20% floor appears nowhere. Neither endpoint has disclosed technical significance.

Targeting a particular percentage does not confer patentability.

EX1057, 5:6–15; EX1058; Paper 49 at 13–14; *In re Aller*, 220 F.2d 454, 456 (CCPA 1955)

Preferential scattering in the substitute claims is obvious for the same reasons

Same analysis as Claims 11–14

Claims 40 and 45 add preferential-scattering limitations to the MTA's substitute claims.

Why the same result follows

Basin-2007 and Krummacher disclose the same TiO_2 particle sizes. The physics is identical. Stokes does not teach away. See Slides 25–27.

PO's teaching-away argument fails for the reasons already discussed.

Paper 49 at 15–17; Paper 42 at 29–31

The substitute claims recite physics, not patentable invention

Independent Claims 30, 40, 45 add two “new” limitations:

- Phosphor reduction (20–40%)
- Preferential scattering (blue > yellow)

Both are **inherent physical results** of adding a nano-scale TiO₂ diffusing layer to a phosphor-based LED. The specification treats them as automatic consequences of the structure, not separate innovations.

Dependent Claims 46–49 combine preferential scattering with phosphor reduction. No synergy — just stacking two predictable results of the same structure.

KSR: “The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” **550 U.S. 398 at 416.**

Paper 49 at 11–19; *KSR Intern. Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007); EX1001, 3:21–32, 11:65–12:12

IV. Substitute Claims Fail § 112

Claims dropped 'peak' from 'peak wavelength'; 20% floor has no disclosure;
'reduced by' has no measure

✓ Original

✓ 11-14

✓ MTA

• § 112

The claims drop 'peak' from 'peak wavelength'

What the specification says

EX1001, col. 7, ll. 19–26 — "peak wavelength λ_1
... typically 450 nm to 470 nm"

"peak" defines a specific set of LEDs.

What the claims say

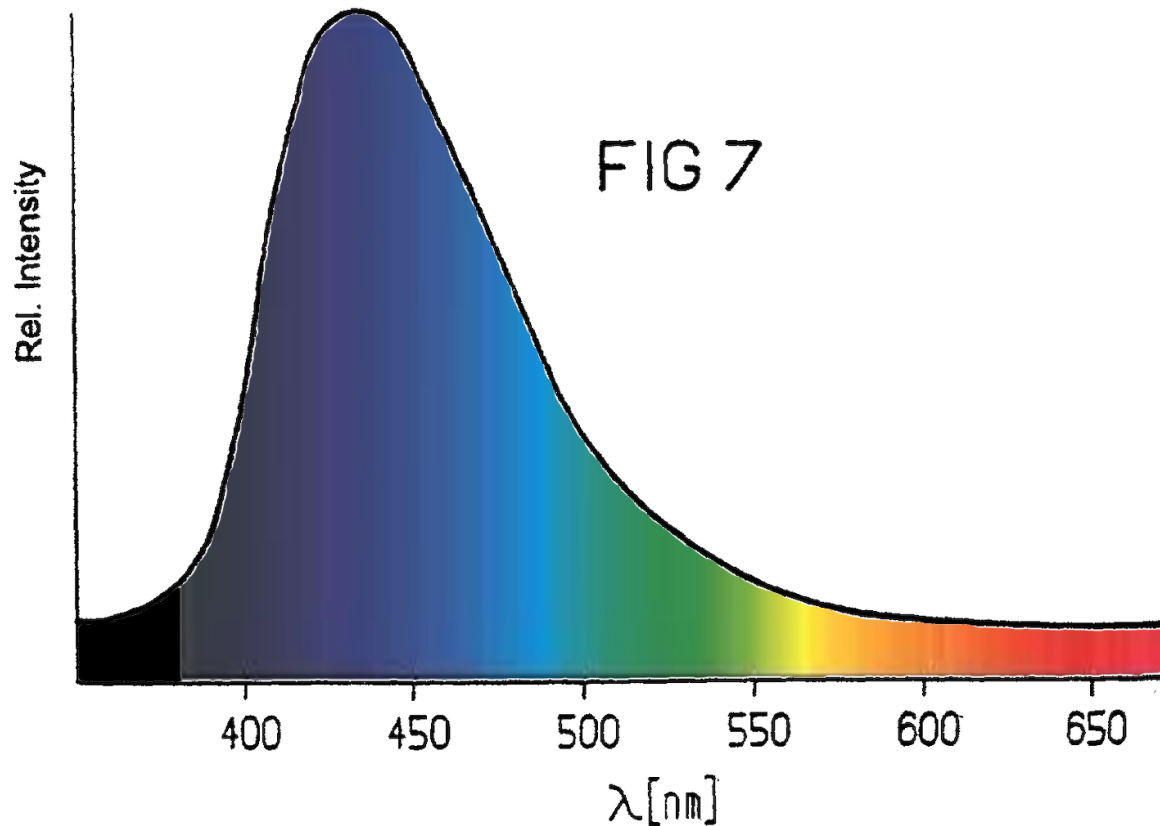
Substitute Claim 30 — "blue light having a
wavelength of between 450 nm and 470 nm"

No "peak" qualifier. Covers any light
in range.

"A wavelength between 450–470 nm" $\neq$ "peak wavelength between 450–470 nm"

Paper 49 at 6–7; EX1001, 7:19–26

Without 'peak,' the claims capture LEDs the spec never contemplated



LED peaking at 430nm still emits light in range
→ infringes. Spec describes only peak
wavelengths of 450–470nm. Claims broader
than spec.

PO's response

Argues the specification "expressly supports" this range,
but spec says "peak wavelength." Paper 55 at 3–4.

Paper 49 at 6–7; EX2004, Fig. 7 (annotated), ¶¶ 74, 106; Paper 55 at 3–4

The 450–470 nm range was never examined

The 450–470 nm range was introduced in the Revised MTA. No examiner has ever evaluated it.

PO argues

Examiner accepted original $\geq 440\text{nm}$ during prosecution. Paper 55 at 3–4.

Incorrect

$\geq 440\text{nm}$ was §102/103 amendment, no §112 analysis. EX1004 at 194. Examiner's silence on different limitation is not evidence.

Paper 49 at 6; EX1004 at 194–202; Paper 55 at 3–4

The 20% floor appears nowhere in the specification

No floor

"up to 40%" means any value up to 40%, nothing identifies 20% as threshold. EX1001, 3:29–32.

Wrong embodiment

25% and 33% come from Fig. 12 with particles mixed into phosphor layer, but the substitute claims require a separate layer “adjacent to” the wavelength conversion layer. *Indivior UK Limited v. Dr. Reddy’s Labs. S.A.*, 18 F.4th 1323, 1330–31; *In re Wertheim*, 541 F.2d 257, 262 (CCPA 1976).

Rai is distinguishable

Rai: both endpoints expressly disclosed in spec. 92 F.4th at 1088–89. Here: 20% floor appears nowhere.

Fig. 12 data (25%, 33%) is from wrong embodiment—Wertheim exception. *In re Wertheim*, 541 F.2d 257, 265 (CCPA 1976).

Paper 49 at 5–6; EX1001, 3:29–32; Paper 55 at 6–8;
Indivior UK Limited v. Dr. Reddy’s Labs. S.A., 18 F.4th 1323, 1330–31 (Fed. Cir. Nov. 24, 2021);
Rai Strategic Holdings, Inc. v. Philips Morris Products S.A., 92 F.4th 1085, 1088–89 (Fed. Cir. Feb. 9, 2024);
In re Wertheim, 541 F.2d 257, 262, 265 (CCPA 1976)

'Reduced by 20–40%' lacks a defined measure

The problem

"Quantity" could mean mass, volume, or particle count. Different percentage results. Spec gives no methodology. Paper 49 at 8–10.

PO position:

Argues Board rejected similar indefiniteness arguments about "average particle size." Paper 55 at 7.

Rebuttal:

"Average particle size" measures one parameter (size)—any standard technique works. "Reduced by 20–40%" compares two values using an undefined unit. Mass? Volume? Particle count? The unit itself is unspecified.

Legal Standard

Akamai Techs. Inc. v. MediaPointe, Inc., et al., 159 F.4th 1370, 1379, slip op. at 15 (Fed. Cir. Nov. 25, 2025)

"[W]hen 'multiple methods' for determining whether a claim limitation is met 'lead[] to different results without guidance ... as to which method should be used,' the claim is indefinite."

Paper 49 at 8–10; Paper 55 at 7;

Akamai Techs. Inc. v. MediaPointe, Inc., et al., 159 F.4th 1370, 1379, slip op. at 15 (Fed. Cir. Nov. 25, 2025)

Claim 31 defines structure by an operational result

UNREBUTTED

The problem

Claim 31 defines component by operational result. Manufacturer can't determine from structure alone if within range. Paper 49 at 10–11.

What testing requires

3 steps: build baseline, select undefined target, operate both and compare. But removing diffusing layer alters color emission.

Legal Standard

IPXL Holdings, L.L.C. v. Amazon.com, Inc., 430 F.3d 1377, 1383–84 (Fed. Cir. 2005)

Claims conflating apparatus with operational characteristics are indefinite.

Paper 49 at 10–11; *IPXL Holdings, L.L.C. v. Amazon.com, Inc.*, 430 F.3d 1377, 1383–84 (Fed. Cir. 2005)

The Board Should Find the Original and Substitute Claims Unpatentable



I Original Claims Are Obvious: Every structural element is disclosed; blue LEDs with peaks at 450–470 nm are conventional



II Claims 11–14 Are Obvious: Preferential scattering is inherent physics confirmed by three independent references



III Substitute Claims Are Obvious: Phosphor reduction is physics, not invention; Stokes does not teach away



IV Substitute Claims Fail § 112: No written description support; indefinite measurement methodology

Petitioners respectfully request the Board cancel claims 1–3, 6, 7, 9, 10–14, 16–21, 25, 26, 29 and deny the Motion to Amend.