

BOE Tech. Group. Co., Ltd.

V.

Optronic Sciences LLC

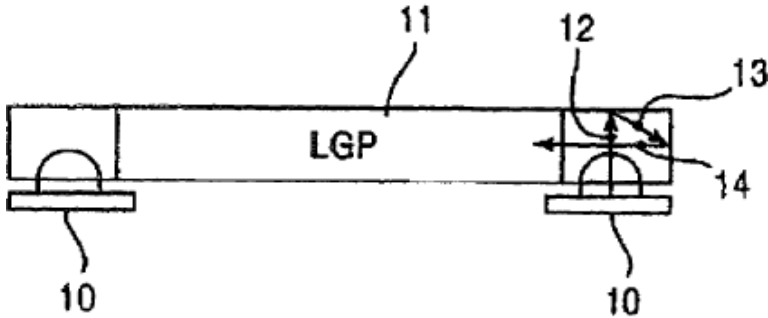
IPR2024-01130

Pat. 7,168,842

Patent Owner's Demonstrative Exhibits

Technology Background

Background: Patent 7,168,842

 US007168842B2	
(12) United States Patent Chou et al.	(10) Patent No.: US 7,168,842 B2 (45) Date of Patent: Jan. 30, 2007
(54) LIGHT EMITTING DIODE BACKLIGHT PACKAGE	(56) References Cited
(75) Inventors: Shen-hong Chou , Kaohsiung (TW); Hui-Kai Chou , Taipei (TW)	U.S. PATENT DOCUMENTS 5,381,309 A * 1/1995 Borchardt 362/612 6,508,564 B1 * 1/2003 Kuwabara et al. 362/612 2001/0030866 A1 * 10/2001 Hochstein 362/294 * cited by examiner
(73) Assignee: Au Optronics Corporation , Hsinchu (TW)	<i>Primary Examiner</i> —Stephen F Husar <i>Assistant Examiner</i> —Meghan K. Dunwiddie (74) <i>Attorney, Agent, or Firm</i> —Arent Fox PLLC
(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 120 days.	(57) ABSTRACT In a light emitting device including a transparent covering, a fastener having a vertical member and a horizontal member, a light-emitting chip disposed on one face of the vertical member and encased by the transparent covering, a circuit board disposed on one face of the horizontal member, at least one conductive means connecting the light-emitting chip to the circuit board, and at least one heat-dissipating plate perpendicularly disposed on the other face of the horizontal member, light may be emitted longitudinally along a light-guiding plate, thus optimizing the travel path of the emitted light, while maintaining a compact shape by enabling placement of the printed circuit board and heat dissipating plates away from a longitudinal axis of the light-guiding plate.
(21) Appl. No.: 11/000,372 (22) Filed: Dec. 1, 2004 (65) Prior Publication Data US 2006/0114693 A1 Jun. 1, 2006 (51) Int. Cl. F21V 7/04 (2006.01) (52) U.S. Cl. 362/631; 362/294; 362/373; 362/555; 362/612; 362/621; 362/800; 257/99 (58) Field of Classification Search 362/294, 362/373, 457, 458, 611–614, 621, 630, 631, 362/634, 800, 370, 555; 257/99 See application file for complete search history.	
9 Claims, 3 Drawing Sheets	
	

CONVENTIONAL ART

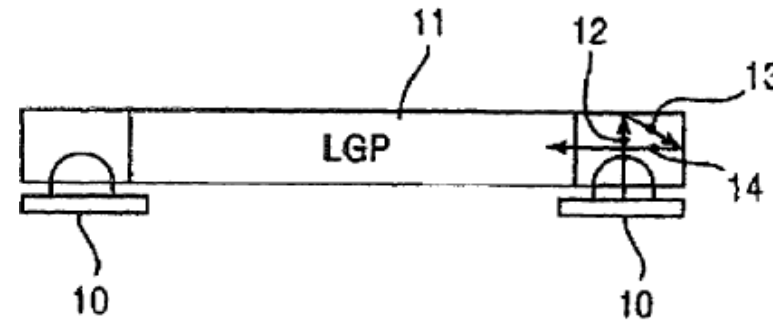
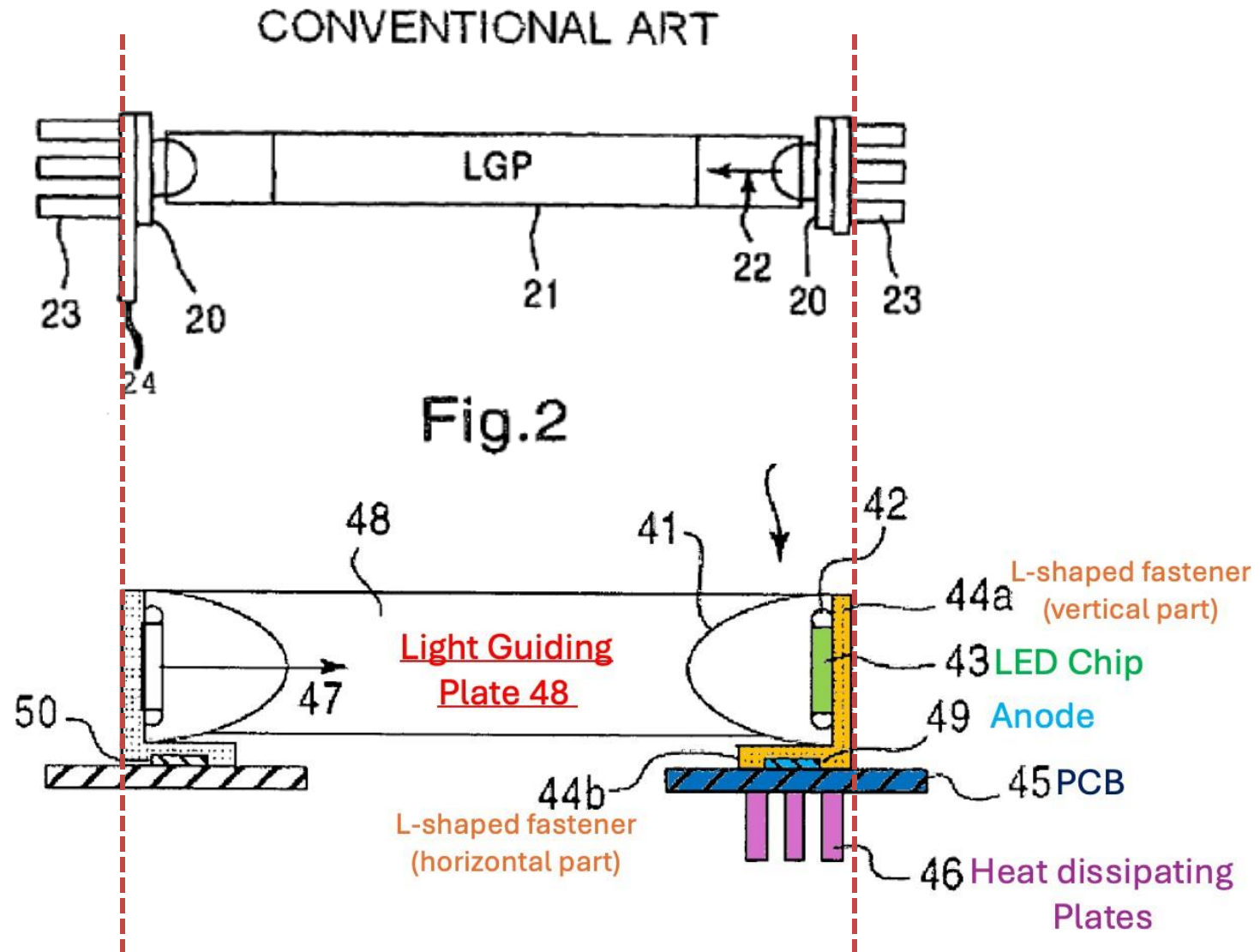
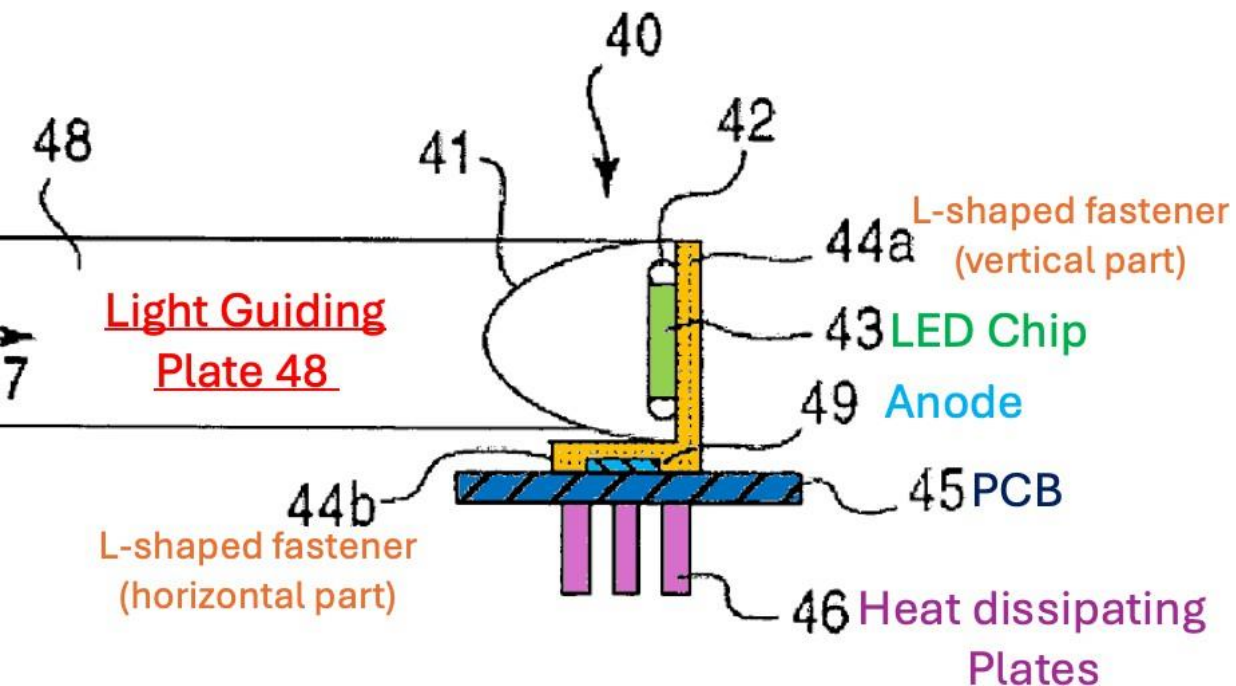


Fig. 1

Background: Patent 7,168,842



Background: Patent 7,168,842



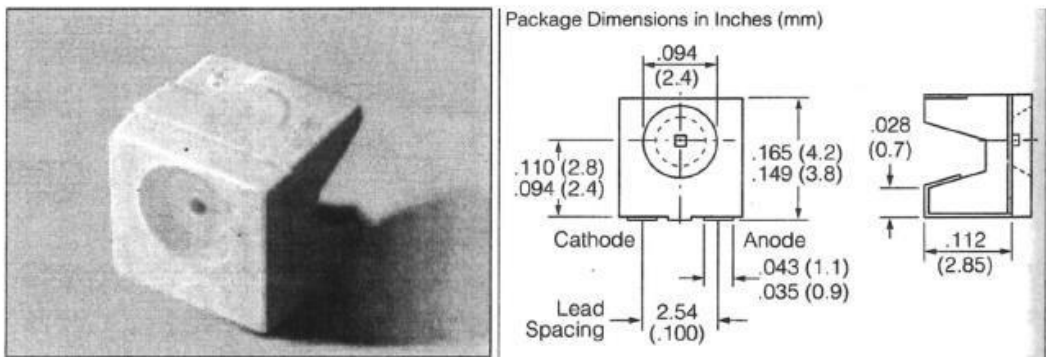
3. A backlight package comprising:

a **light guiding plate** having a first side;

a **first fastener** having a first portion and a second portion,
the first portion disposed adjacent to the first side of the light guiding plate, wherein the first portion and the second portion are arranged in a substantially perpendicular relationship to form a substantially L-shaped structure; and

a **light emitting device** disposed on the first portion of the first fastener for emitting a light toward the light guiding plate.

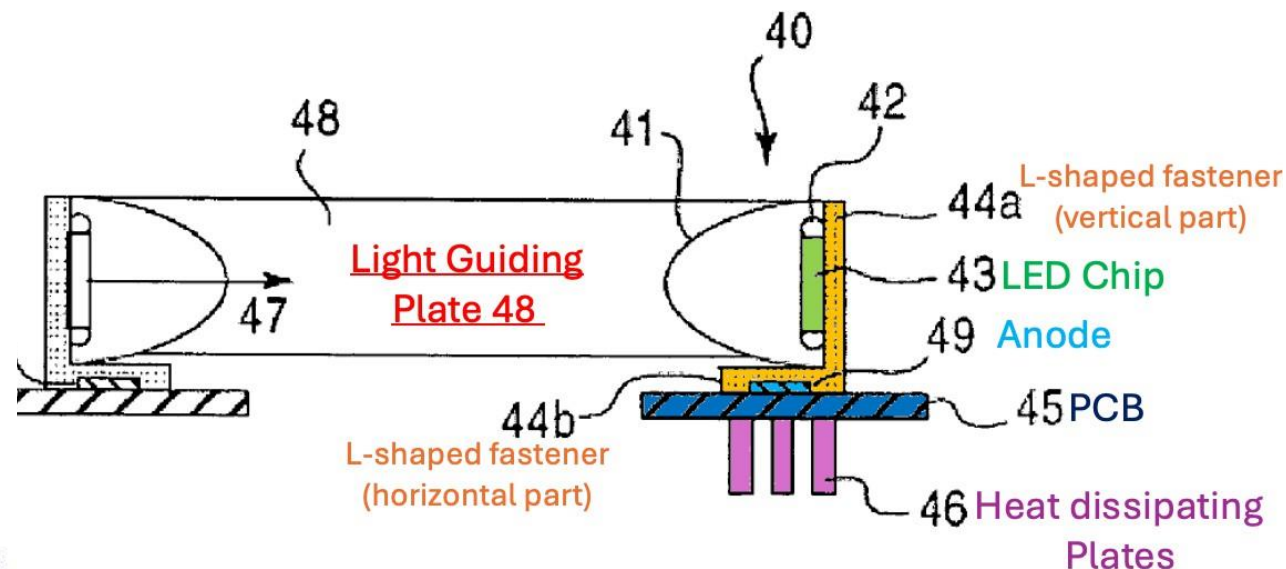
Background: Patent 7,168,842



Ex. 2013 at 30.

33. This general format of package remained in use throughout the 1990s and into the mid 2000-time frame.

Ex. 2020 (Bretschneider)
at 12–13

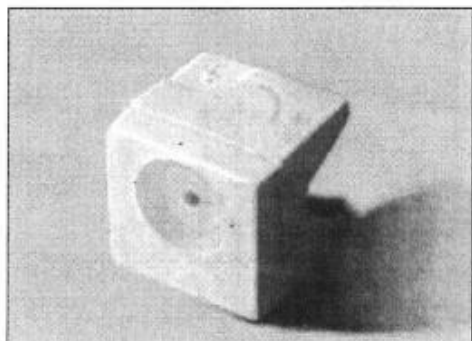


Ex. 1001 (annotated)

Background: Patent 7,168,842

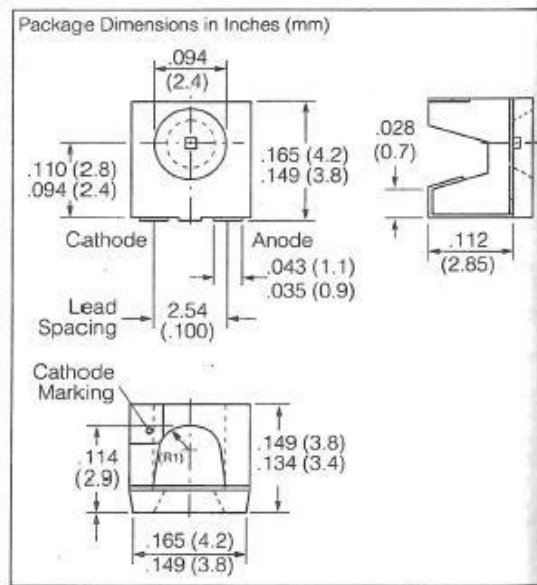
SIEMENS

SUPER-RED LSA670
ORANGE LOA670
YELLOW LYA670
GREEN LGA670
PURE GREEN LPA670
SMT-SIDELED®
Preliminary Data



FEATURES

- White Package
- Internal Reflector
- Wide Viewing Angle
- Ideal for Backlighting, Optical Coupling into Light Pipes and Lenses
- Colorless Clear Window
- Available on Tape and Reel (12 mm Tape)
- Load Dump Resistant acc. to DIN 40839



35. Throughout at least the 2000-time frame, market forces were pressuring the industry to create smaller form factors for LED backlights. This was driven by, for example, the desire to create thinner bezels on devices. The pressures posed significant engineering challenges, such as designing LED packages for backlights that achieved the desired form factor without losing the requirements of an LED system, such as thermal management and efficiency. Many in the field were searching for solutions, including a company called Nichia.

36. At the priority date of the '842 Patent, Nichia was, and still is, the largest LED company in the world, yet they did not find it obvious to design an LED package that allowed portions of the LED package structure to overlap the waveguide, thereby allowing a reduction in the longitudinal dimension of a backlit display as in the '842 Patent.

Dr. Baker is not a POSITA

Dr. Baker is Not a POSITA

A POSITA needs:

1. A relevant degree (undisputed)
2. At least one year of practical experience in design of LED packages for displays with backlights
3. At least one year of practical experience in design of thermal management systems for LEDs.

Dr. Baker has:

1. A relevant degree (undisputed)
2. Only experience using pre-packaged LEDs in non-backlit applications
3. No thermal management experience

POR at 4–5

A POSITA needs:

1. A relevant degree (undisputed)
2. **At least one year of practical experience in design of LED packages for displays with backlights**
3. At least one year of practical experience in design of thermal management systems for LEDs.

POR at 4–5

(12) **United States Patent** **Chou et al.**

(54) **LIGHT EMITTING DIODE BACKLIGHT PACKAGE**

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention generally relates to the packaging of light-emitting device backlights. In particular, the present invention relates to a light-emitting device backlight package which requires minimal space while producing maximum luminosity.

Ex. 1001

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3. At least one year of practical experience in design of thermal management systems for LEDs.

POR at 4–5

DESCRIPTION OF THE DRAWINGS

45 The above and other features and aspects of the present invention will become more apparent to those of ordinary skill in the art by describing in detail exemplary embodiments thereof with reference to the attached drawings in which:

FIG. 1 illustrates a conventional LED backlight package;

50 FIG. 2 illustrates a second conventional LED backlight package;

FIG. 3 illustrates a conventional LED module;

FIG. 4 illustrates a light emitting device backlight package according to an embodiment of embodiment of the present invention; and

55 FIG. 5 illustrates a light emitting device package according to an embodiment of the present invention.

Dr. Baker is Not a POSITA

A POSITA needs:

1. A relevant degree (undisputed)
2. **At least one year of practical experience in design of LED package for displays with backlights**
3. At least one year of practical experience in design of thermal management systems for LEDs.

POR at 4–5

3. A **backlight package** comprising:
a light guiding plate having a first side;
a first fastener having a first portion and a second portion, the first portion disposed adjacent to the first side of the light guiding plate, wherein the first portion and the second portion are arranged in a substantially perpendicular relationship to form a substantially L-shaped structure; and
a **light emitting device** disposed on the first portion of the first fastener for emitting a light toward the light guiding plate.

Ex. 1001

Optronic Sciences LLC, Ex. 2028
BCE Technology Group Co. Ltd. v. Optronic Sciences LLC, IPR2024-01130
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Dr. Baker lacks LED Package Design Experience in 2004

2013: Cirque, Inc. Consulting on the design of analog-to-digital interfaces for capacitive touch displays and pads.

Ex. 1021 (Baker CV)



The screenshot shows the Cirque website. At the top is the 'CIRQUE' logo with a red arrow pointing to the 'O', followed by 'INNOVATIVE TOUCH SOLUTIONS'. Below this is a navigation bar with links: Home, Solutions, Technologies, Touchpad Mouse, Developer Support, Company, and Contact Us. The main content area features a dark background with the text 'Secure Durable Advanced' and the 'GLIDETOUGH' logo. Below this, it says 'GlideTouch Point of Sale Panels From Cirque.' To the right is a photograph of a handheld device with a screen and a touchpad. At the bottom, there are two red arrow icons pointing to the text 'The Ultimate Point of Sale Touch Panel' and 'Solutions for PIN Entry Keypads'.

Ex. 2010

Dr. Baker lacks LED Package Design Experience in 2004

2013: Cirque, Inc. Consulting on the design of analog-to-digital interfaces for capacitive touch displays and pads.

Ex. 1021 (Baker CV)

Q So did your work for Cirque involve the design of LED packages?

A Well, to the extent LEDs were packaged in the display. But I didn't work on the actual mechanical design of the LED package. It was more making sure that my solutions didn't interfere with the package, that it could be fit in the package.

Ex. 2024 at 24:17–23

Dr. Baker lacks LED Package Design Experience in 2004

Q Are you familiar with the JEDEC or JEDEC reliability test for LEDs?

A Not right off the top of my head.

Ex. 2024 at 30:21–23

Dr. Baker lacks LED Package Design Experience in 2004

Q Have you ever designed an LED package?

A Yes.

Q When -- can you describe your LED package experience?

A Yes. I currently -- or more recently worked on the design of detectors. So I would design light sources for characterizing the detectors. For example, on Monday, I had a student defend his master's thesis and it was in the area of silicon-germanium SPADs, which are a type of detector used in a system using a scintillator and a radiation source. But yeah, I've designed all kinds of various optoelectronic things.

Do you have any experience designing LED packages in or around the 2004 time frame?

A Yes.

Q And what was that experience?

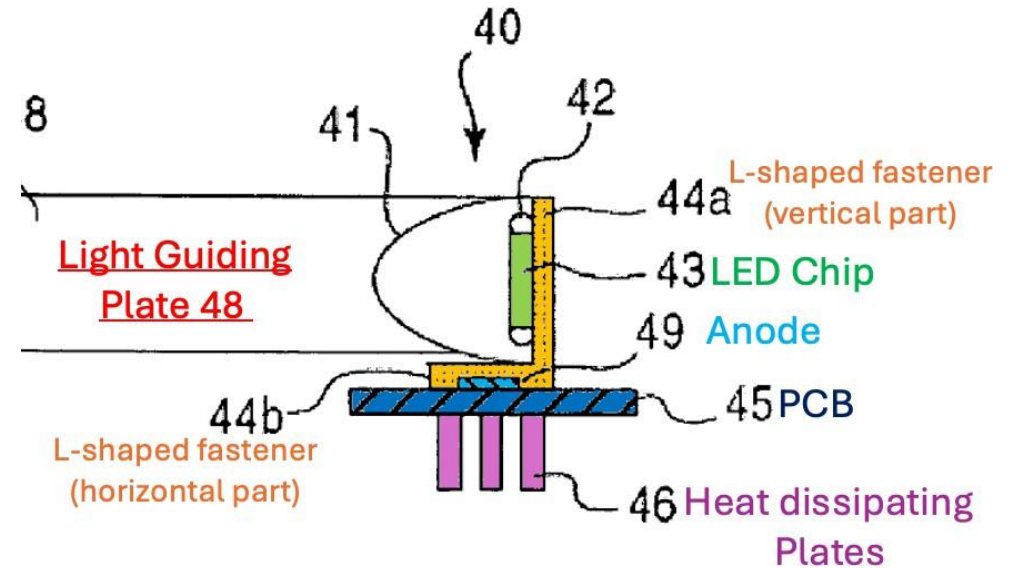
A Back in the '80s, I worked on the design of a touch screen, for example, which packaged infrared LEDs and infrared photodetectors in a grid around a CRT display. So when a user touched the display,

Dr. Baker lacks thermal experience for claims 6 and 9

A POSITA needs:

1. A relevant degree (undisputed)
2. At least one year of practical experience in design of LED packages for displays with backlights
3. **At least one year of practical experience in design of thermal management systems for LEDs.**

POR at 4–5



6. The backlight package as claimed in claim 3, further comprising a circuit board and a heat dissipating means, the circuit board connecting the second portion, and the heat dissipating means attached onto the surface of the circuit board for conducting a heat generated thereon.

Ex. 1001

Optronic Sciences LLC, Ex. 2028
BIO Technology Group Co. Ltd. v. Optronic Sciences LLC, IPR2024-01130
Page 17 of 74

Dr. Baker lacks thermal experience for claims 6 and 9

A POSITA needs:

1. A relevant degree (undisputed)
2. At least one year of practical experience in design of LED packages for displays with backlights
3. **At least one year of practical experience in design of thermal management systems for LEDs.**

POR at 4–5

Q So have you ever designed any sort of thermal management system ^{for} or an LED system?

A I don't remember. Maybe.

Q And do electrical engineers typically design heat sinks, or is that usually the subject of another discipline?

A Well, when I have something that's dissipating a lot of power I just buy the heat sink and then attach it with some thermally conducted grease to what I'm trying to cool off.

But I think if you're talking about the actual design of a specific heat sink, I would guess that's more of a mechanical engineer -- more a mechanical engineer design, like what's the thickness of the fins or the height of the fins or whatever. The scope of the '842 would be in my experience. You buy the heat sink to -- because they're needed in the system.

Optronic Sciences LLC, Ex. 2028
BOE Technology Group Co. Ltd. v. Optronic Sciences LLC, IPR2024-01130
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Ex. 2024 (Baker Tr.) at 27:4–21

Dr. Baker lacks thermal experience for claims 6 and 9

He incorrectly described convective heat transfer when referring to radiative heat transfer, and seemingly equated the two. Ex. 2024, 34:14-35:6.

He was not familiar with Fourier's law for calculating thermal conductivity. *Id.*, 36:7-9.

BY MR. KROEGER:

Q And are you familiar with convective heat transfer?

A Yeah, that's kind of what I mean by radiative, is convection, yeah.

Ex. 2020 (Bretschneider Decl.) at 38

Ex. 2024 (Baker Tr.) at 35:3-6

Dr. Baker lacks thermal experience for claims 6 and 9

He incorrectly described convective heat transfer when referring to radiative heat transfer, and seemingly equated the two. Ex. 2024, 34:14-35:6.

He was not familiar with Fourier's law for calculating thermal conductivity. *Id.*, 36:7-9.

Q Are you familiar with Fourier's law for calculating thermal conductivity?

A Not right off the top of my head.

Q Are you familiar with how you calculate convective heat transfer?

(Reporter clarification.)

MR. SAULNIER: Objection to form.

THE WITNESS: Yeah, I don't know what specifically you're talking about.

Ex. 2020 (Bretschneider
Decl.) at 38

Ex. 2024 (Baker Tr.) at 36:7-15

Claim Construction

District Court's Markman Order

Disputed Term	The Court's Construction
"substantially L-shaped structure" ('842 Patent, Claims 3, 7)	Plain and ordinary meaning
"the second portion extending above the light guiding plate" ('842 Patent, Claim 7)	Indefinite
"disposed above" ('509 Patent, Claim 1) "disposed at a side of" ('509 Patent, Claim 10)	Indefinite
"fastener" ('842 Patent, Claims 3, 7)	"a feature that attaches or holds something in place"

Ex. 2027 at 34

The Board Cannot Invalidate Claims 7 and 10

“Under § 103, the scope and content of the prior art are to be determined; **differences between the prior art and the claims at issue are to be ascertained**; and the level of ordinary skill in the pertinent art resolved.” *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17 (1966) (emphasis added).

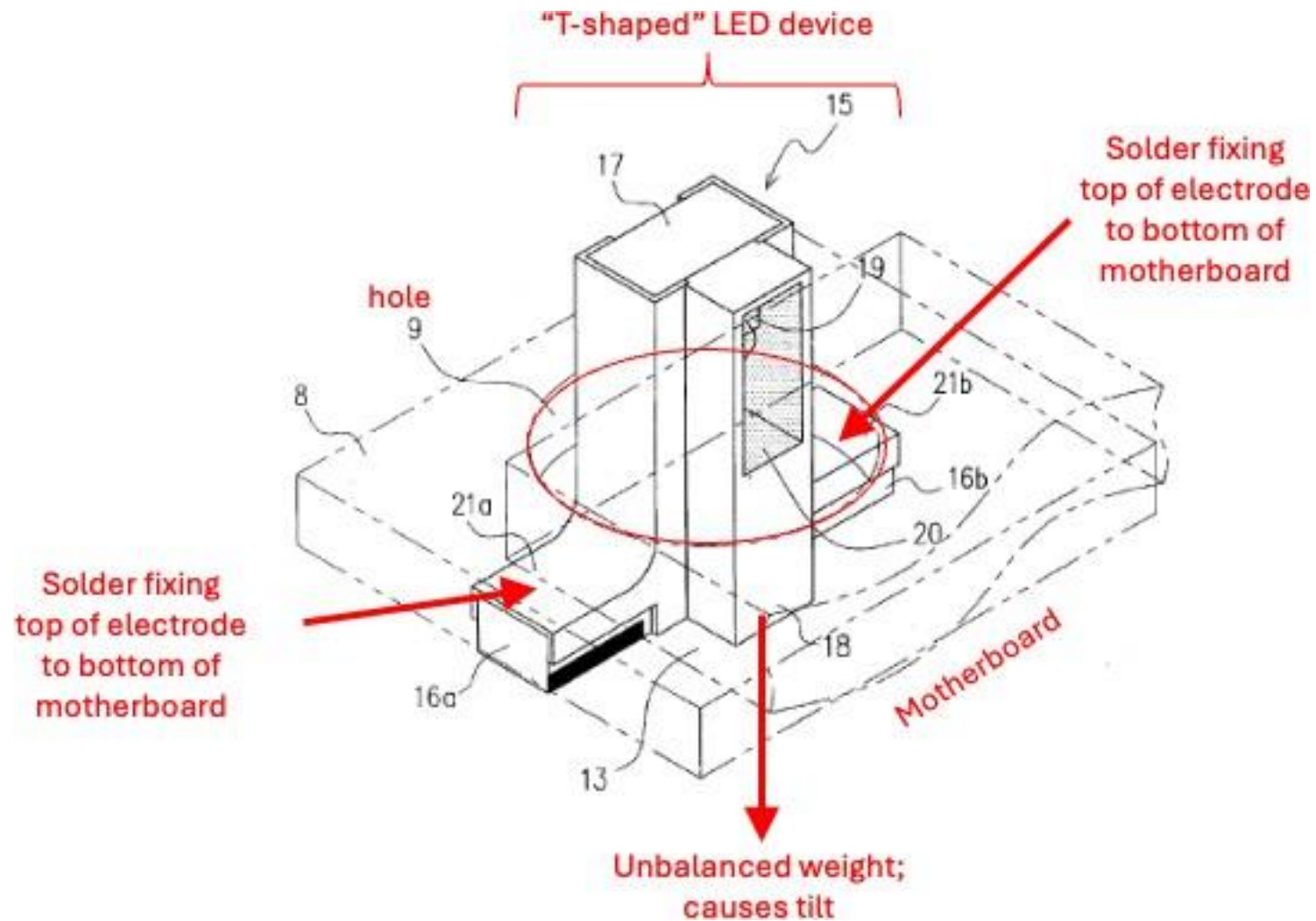
“Because ... we find claim 23 to be indefinite ... we are unable to determine the patentability of this claim under 35 U.S.C. § 103.” *See, e.g., Headbox, LLC v. Infinite Imagineering, Inc.*, IPR2014-00365, Paper 11 at 3, 13 (PTAB May 22, 2015) (“Accordingly, we are unable to determine the scope of this claim or the differences between the claim and the prior art, and thus are unable to determine whether the claim would have been obvious over Kuo, Awaba, and Liow.”)

35 USC § 311(b) Scope of Inter Partes Review:

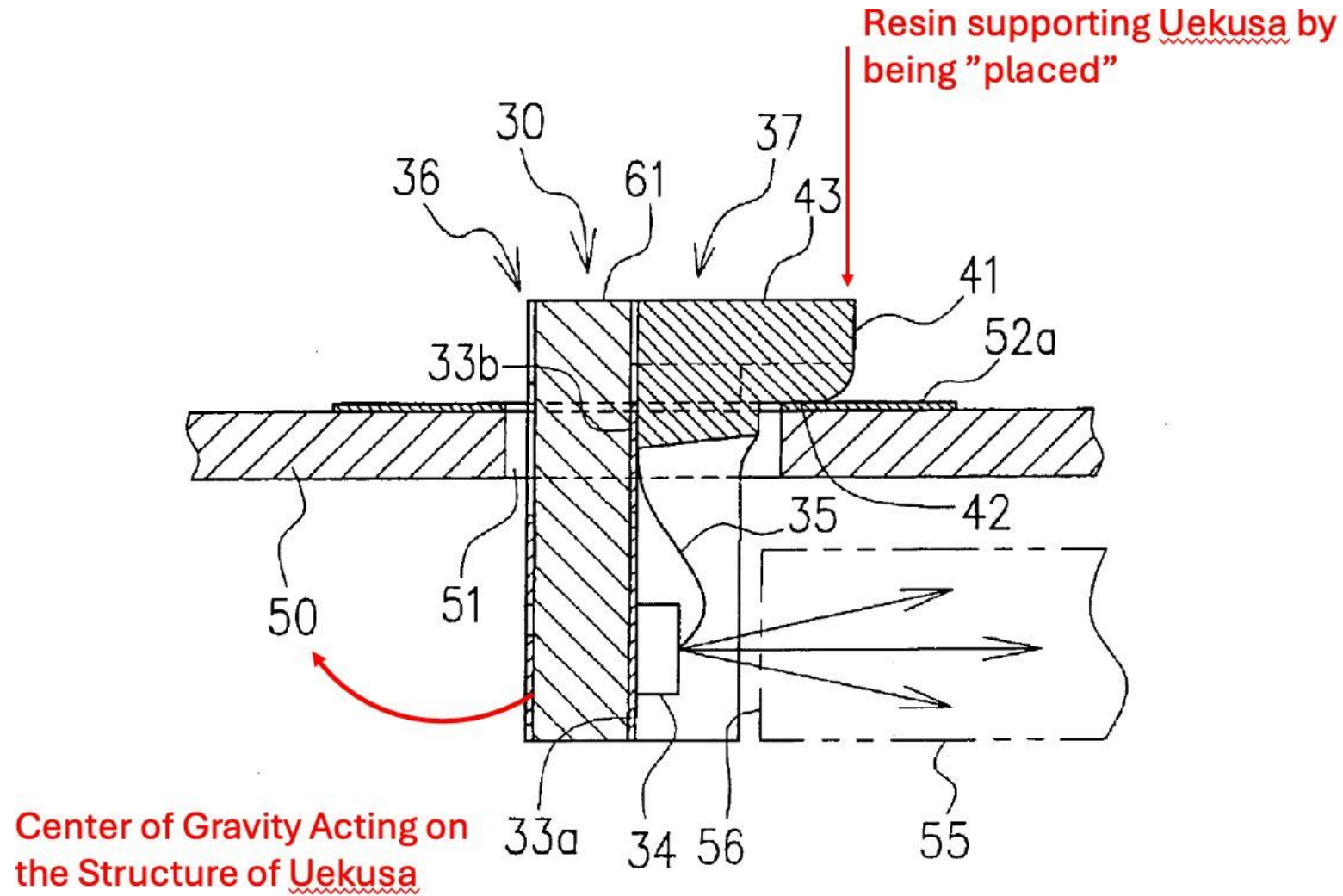
A petitioner in an inter partes review may request to cancel as unpatentable 1 or more claims of a patent only on a ground that could be raised under section 102 or 103 and only on the basis of prior art consisting of patents or printed publications.

Ground 1: Uekusa § 102, Claims 3, 5–9

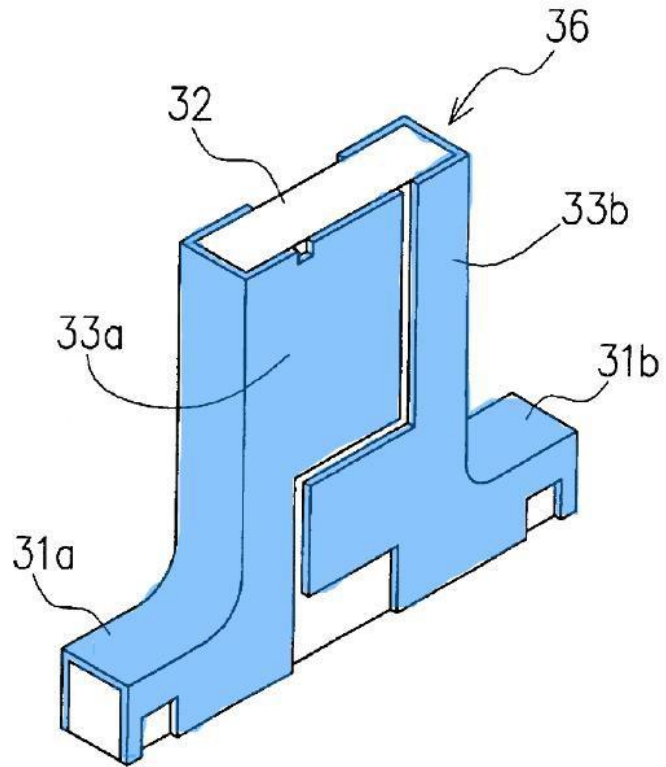
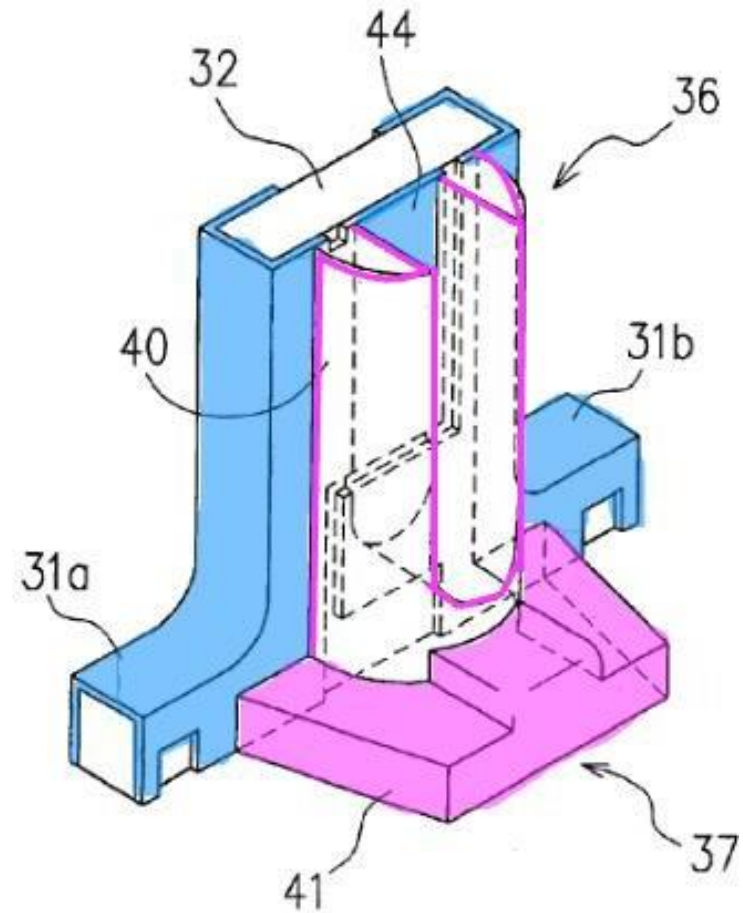
Uekusa's Design



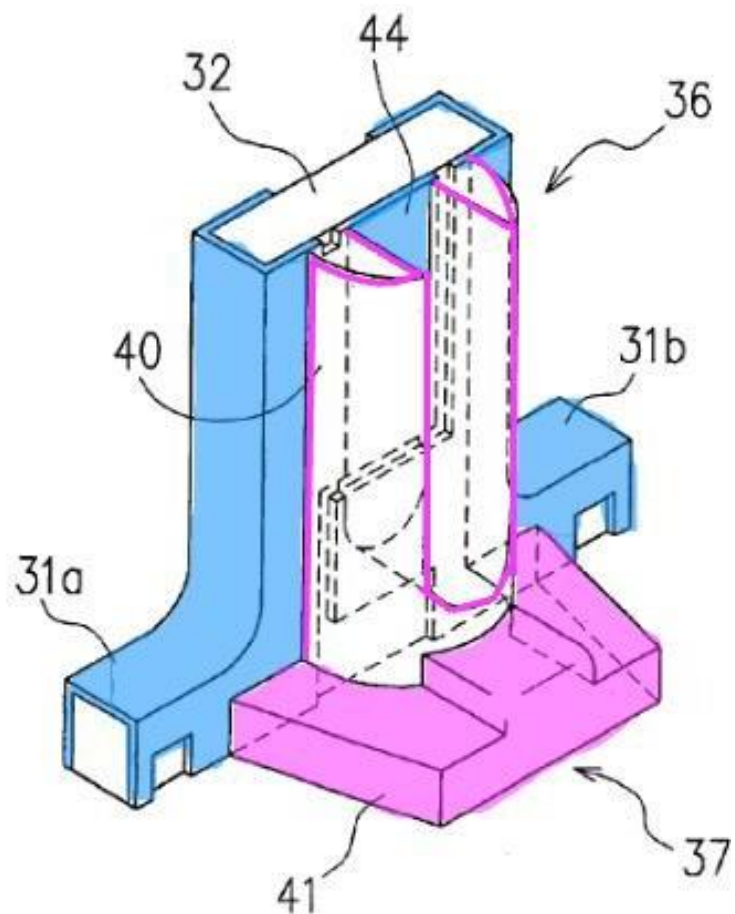
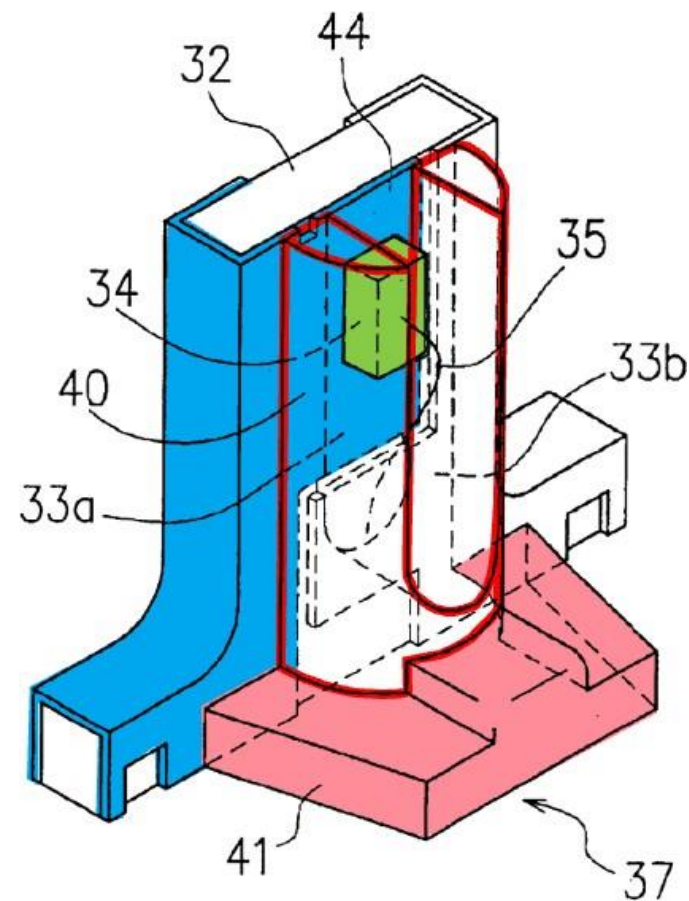
Uekusa's Design



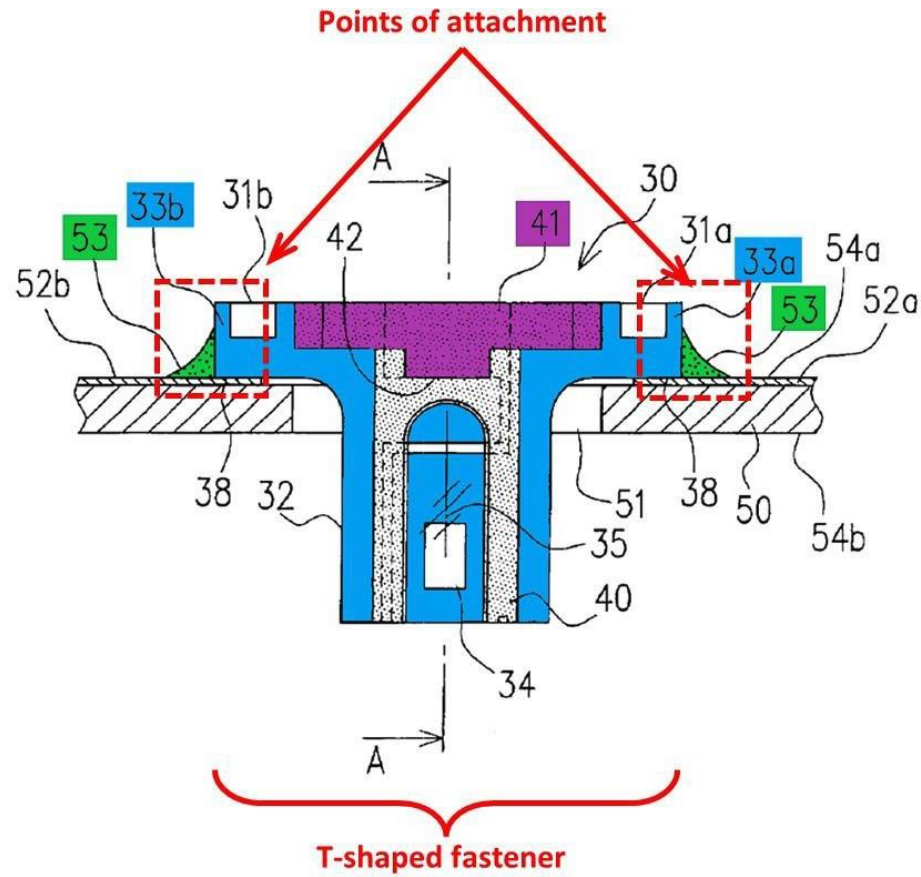
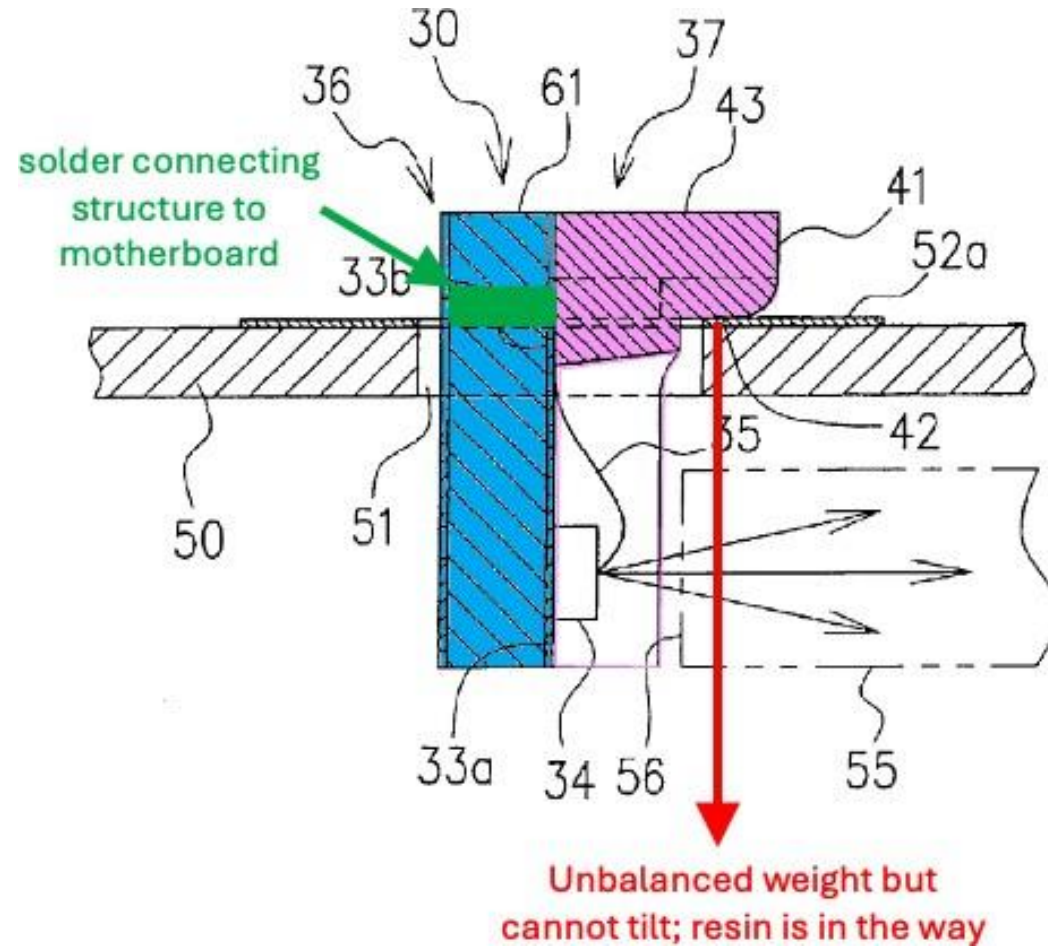
Uekusa's Design



Uekusa's Design



Uekusa's Design



Uekusa lacks the L-shaped fastener

“fastener” (’842 Patent, Claims 3, 7)	“a feature that attaches or holds something in place”
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Ex. 2027 at 34

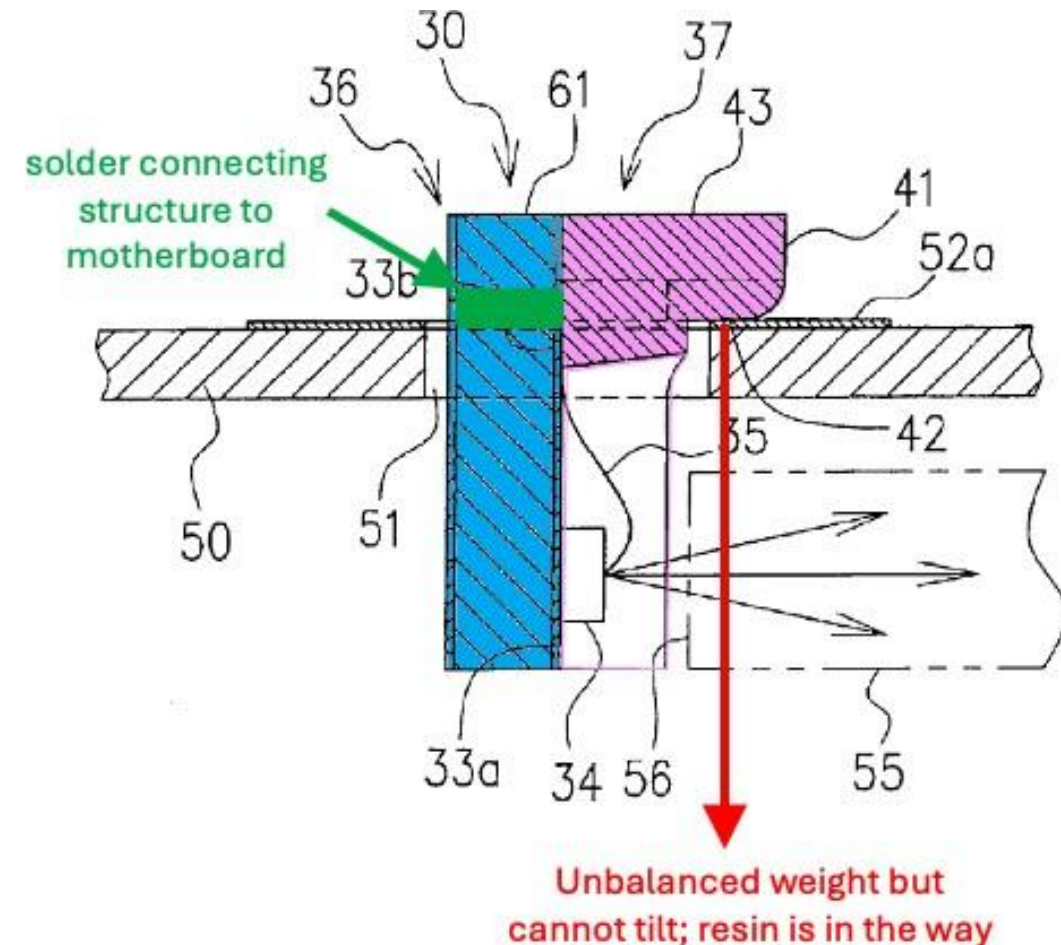
3. A backlight package comprising:

a light guiding plate having a first side;

a first fastener having a first portion and a second portion, the first portion disposed adjacent to the first side of the light guiding plate, wherein the first portion and the second portion are arranged in a substantially perpendicular relationship to form a substantially L-shaped structure; and

a light emitting device disposed on the first portion of the first **fastener** for emitting a light toward the light guiding plate.

5. The backlight package as claimed in claim 3, further comprising a circuit board and a conducting wire, the circuit board connecting the second portion, and the conducting wire electrically coupling the light emitting device to the circuit board.



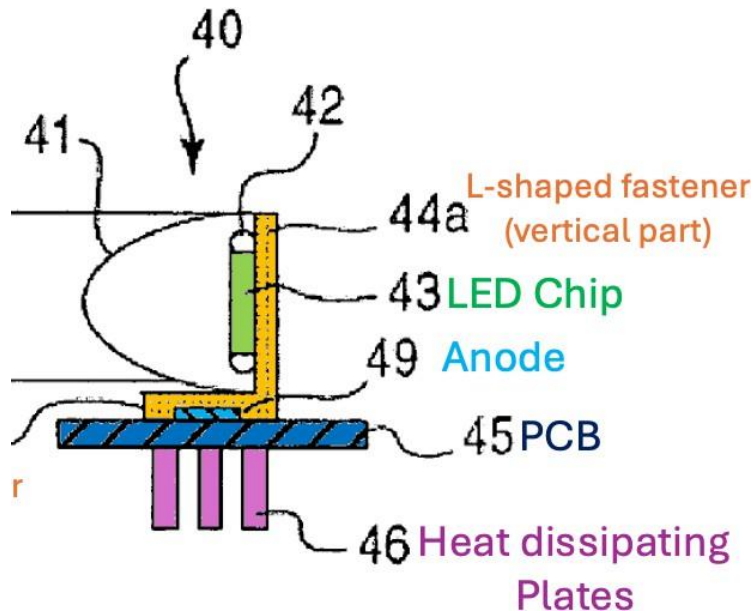
BOE Technology Group Co. Ltd. v. Optronic Sciences LLC, Ex. 2028
 BOE Technology Group Co. Ltd. v. Optronic Sciences LLC, IPR2024-01130
 (citing Ex. 1008 at Fig. 3)

Optronic Sciences LLC, Ex. 2028
 BOE Technology Group Co. Ltd. v. Optronic Sciences LLC, IPR2024-01130
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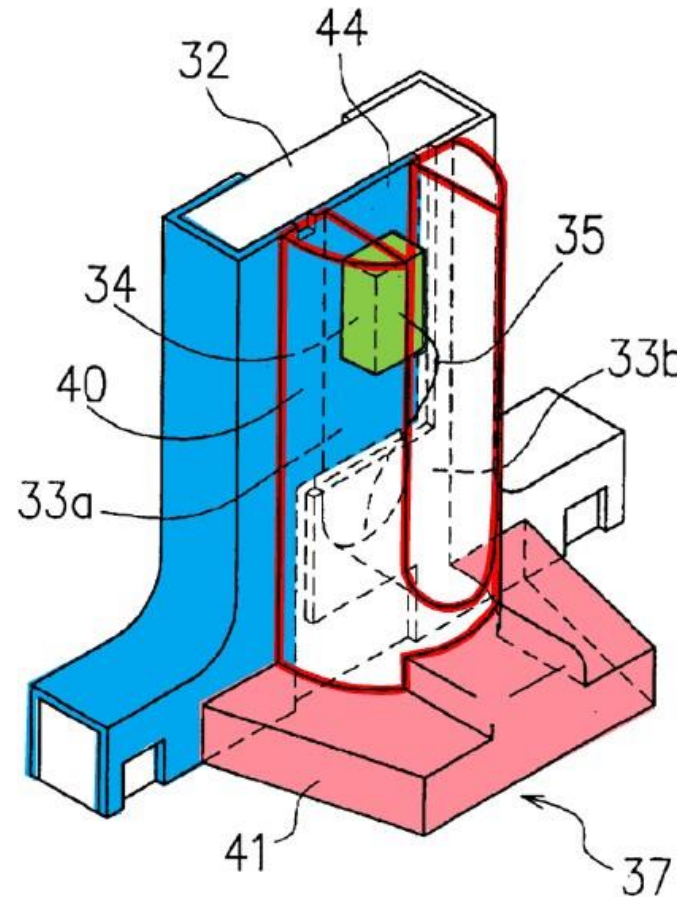
Uekusa lacks the L-shaped fastener

“fastener” (’842 Patent, Claims 3, 7)	“a feature that attaches or holds something in place”
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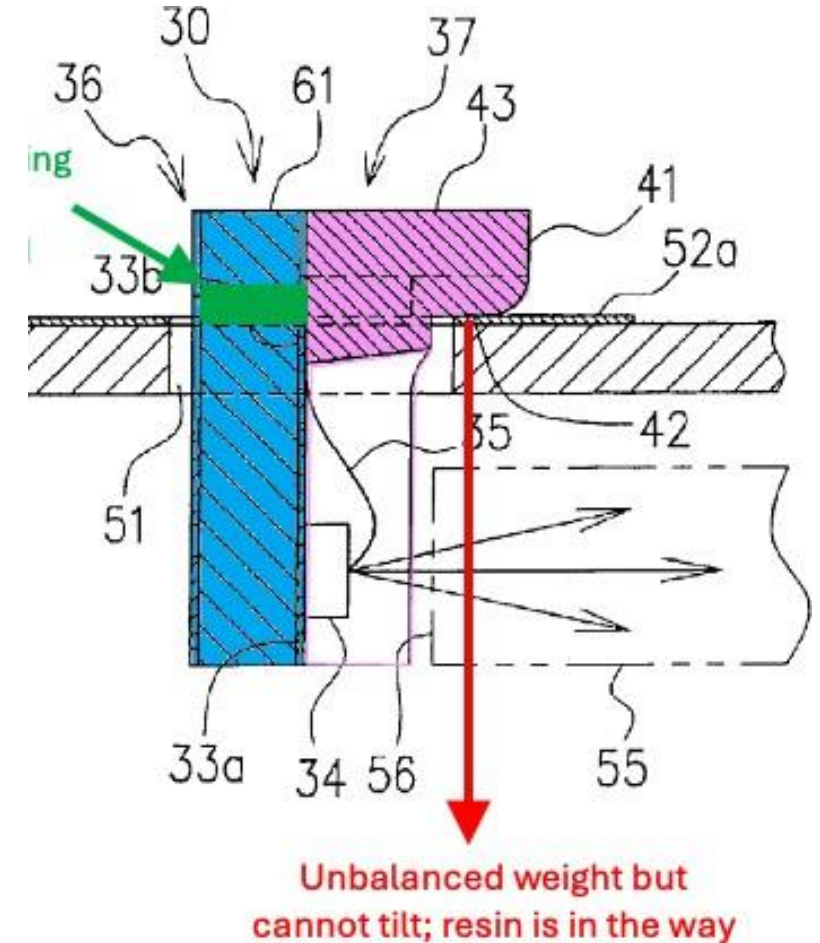
Ex. 2027 at 34



Ex. 1001 (annotated)



POR at 21 (citing Ex. 1008 at Fig. 7)



Optronic Sciences LLC, Ex. 2028
BOE Technology Group Co. Ltd. v. Optronic Sciences LLC, IPR2024-01130
POR at 30 (citing Ex. 1008 at Fig. 3) Page 31 of 74

Uekusa lacks the L-shaped fastener

“fastener” (’842 Patent, Claims 3, 7)	“a feature that attaches or holds something in place”
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Ex. 2027 at 34

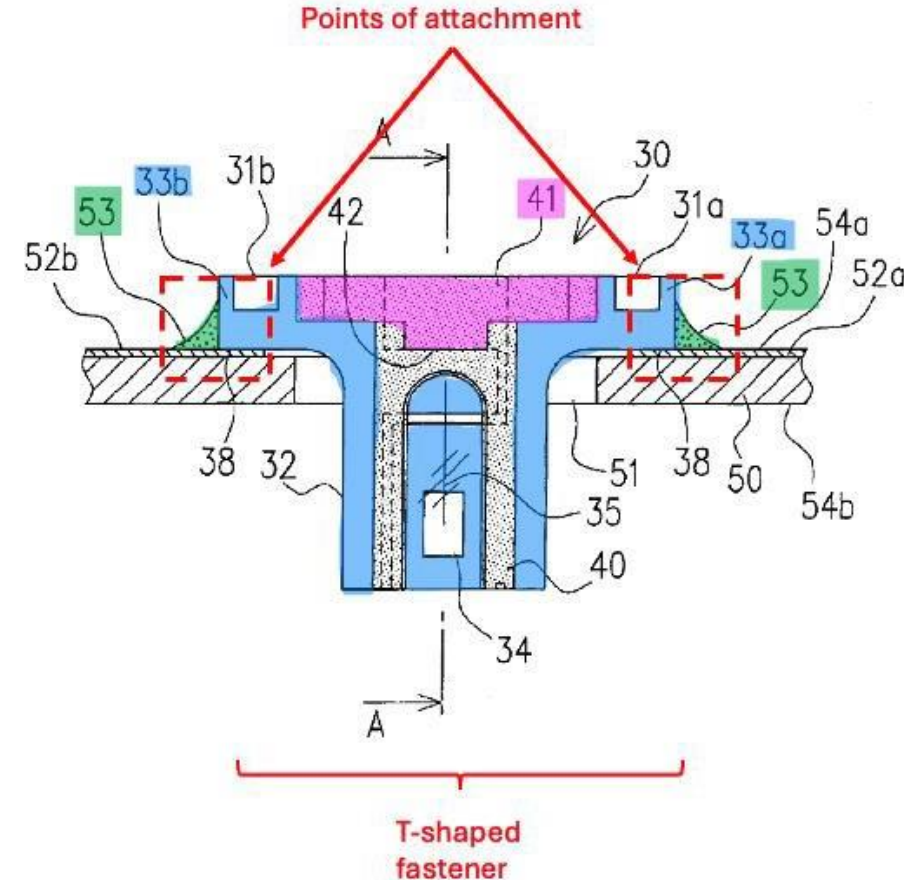
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a light guiding plate having a first side;

a first **fastener** having a first portion and a second portion, the first portion disposed adjacent to the first side of the light guiding plate, wherein the first portion and the second portion are arranged in a substantially perpendicular relationship to form a substantially L-shaped structure; and

a light emitting device disposed on the first portion of the first **fastener** for emitting a light toward the light guiding plate.

5. The backlight package as claimed in claim 3, further comprising a circuit board and a conducting wire, the circuit board **connecting** the second portion, and the conducting wire electrically coupling the light emitting device to the circuit board.

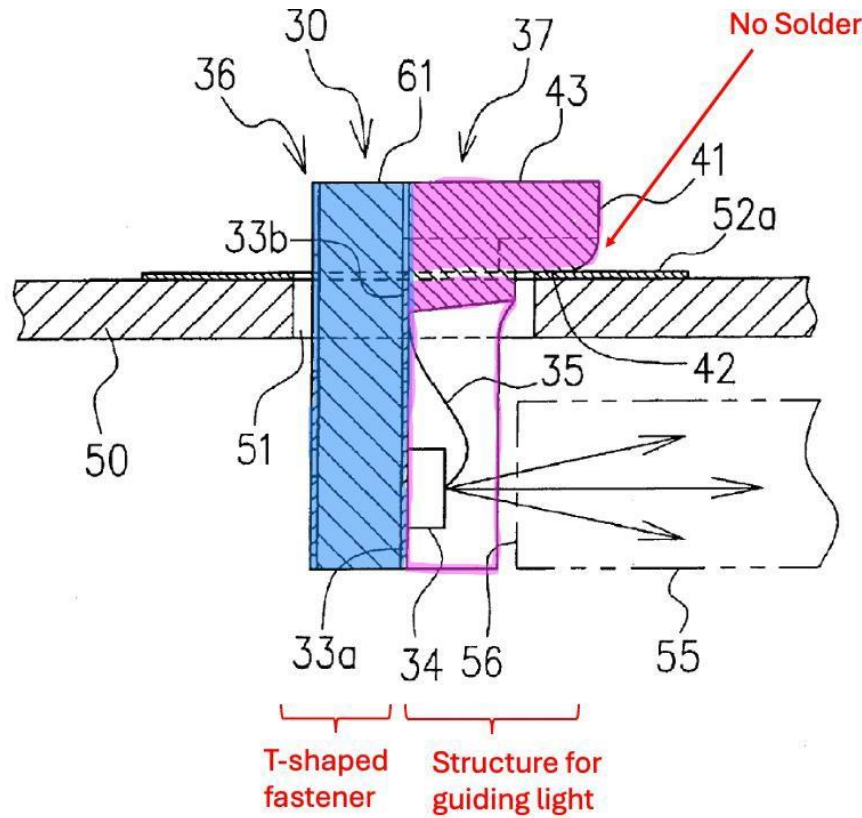
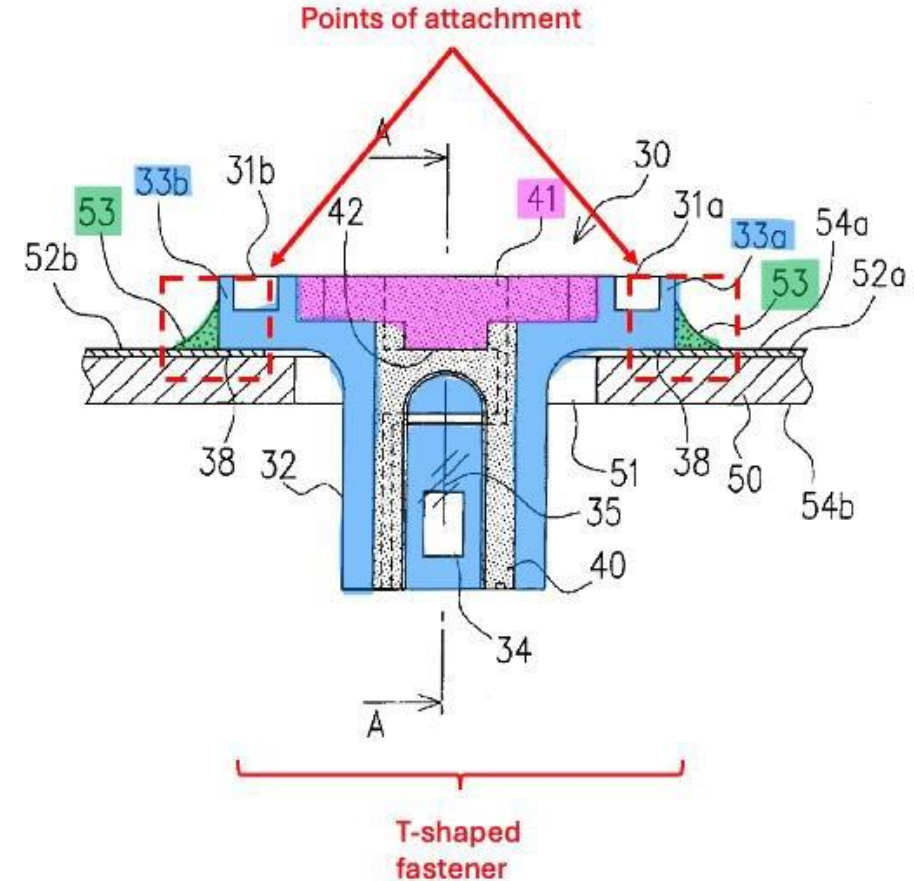


Uekusa lacks the L-shaped fastener

“fastener”
(’842 Patent, Claims 3, 7)

“a feature that attaches or holds something
in place”

Ex. 2027 at 34



POR at 29 (citing Ex. 1008 at Fig. 3)

POR at 28 (citing Ex. 1008 at Fig. 2)

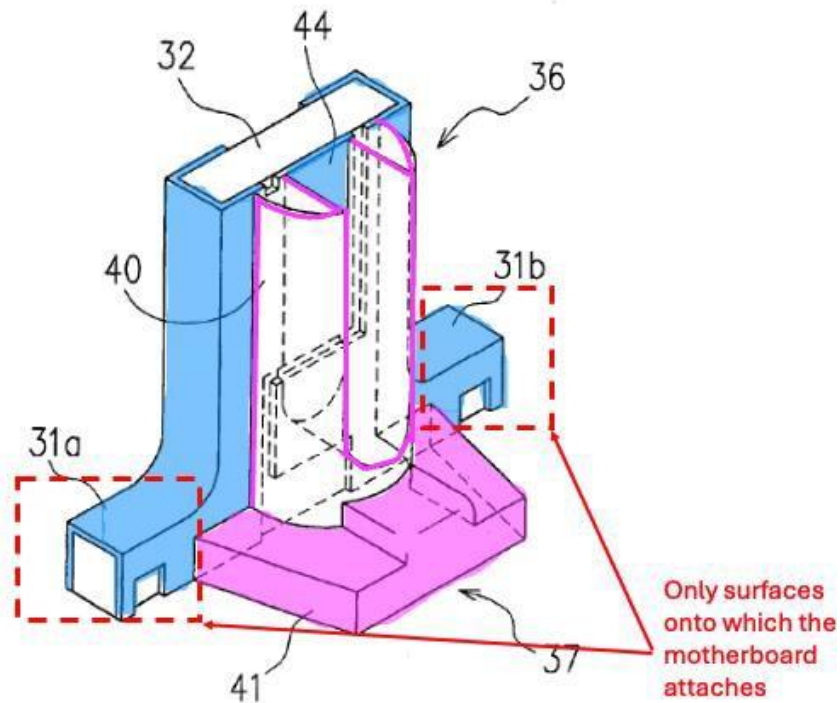
Optronic Sciences LLC, Ex. 2028
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Uekusa lacks the L-shaped fastener

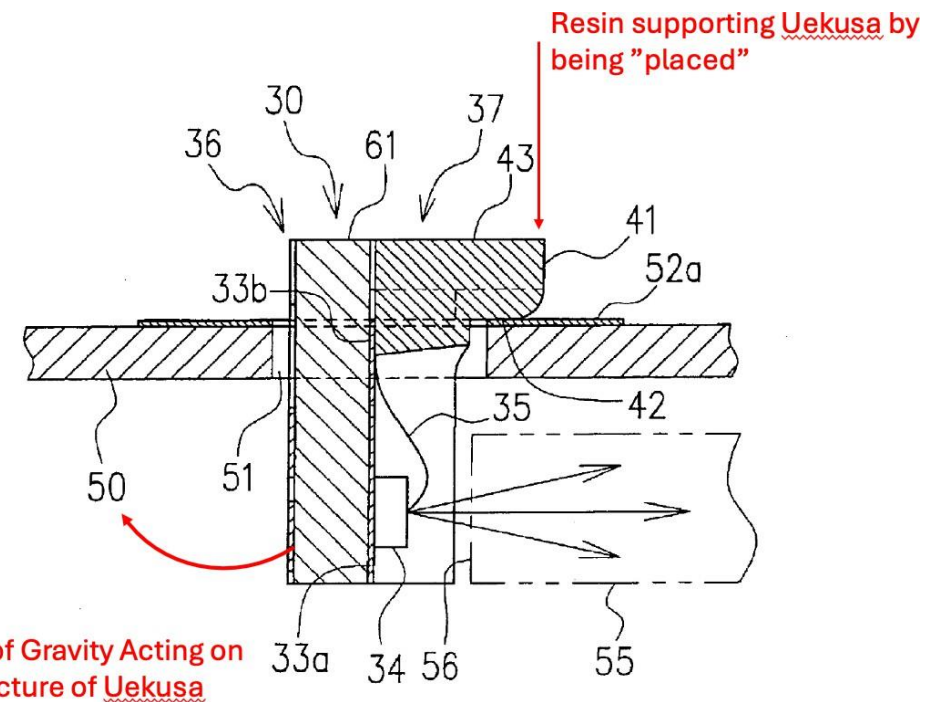
“fastener”
(’842 Patent, Claims 3, 7)

“a feature that attaches or holds something
in place”

Ex. 2027 at 34



POR at 31 (citing Ex. 1008 at Fig. 6)



POR at 30 (citing Ex. 1008 at Fig. 3)

Uekusa lacks the L-shaped fastener

35 To achieve the above first object, the light emitting diode according to the present invention comprises a generally T-shaped body section including base portions having mounted surfaces mounted on peripheral edges of a hole opened in a motherboard and an upright portion which rises from the base portions and which is inserted into the hole; a resin forming section including a non-translucent frame projecting from a front surface of the body section and an extension part which projects more forwardly than the frame from the body section and which has a mounted portion

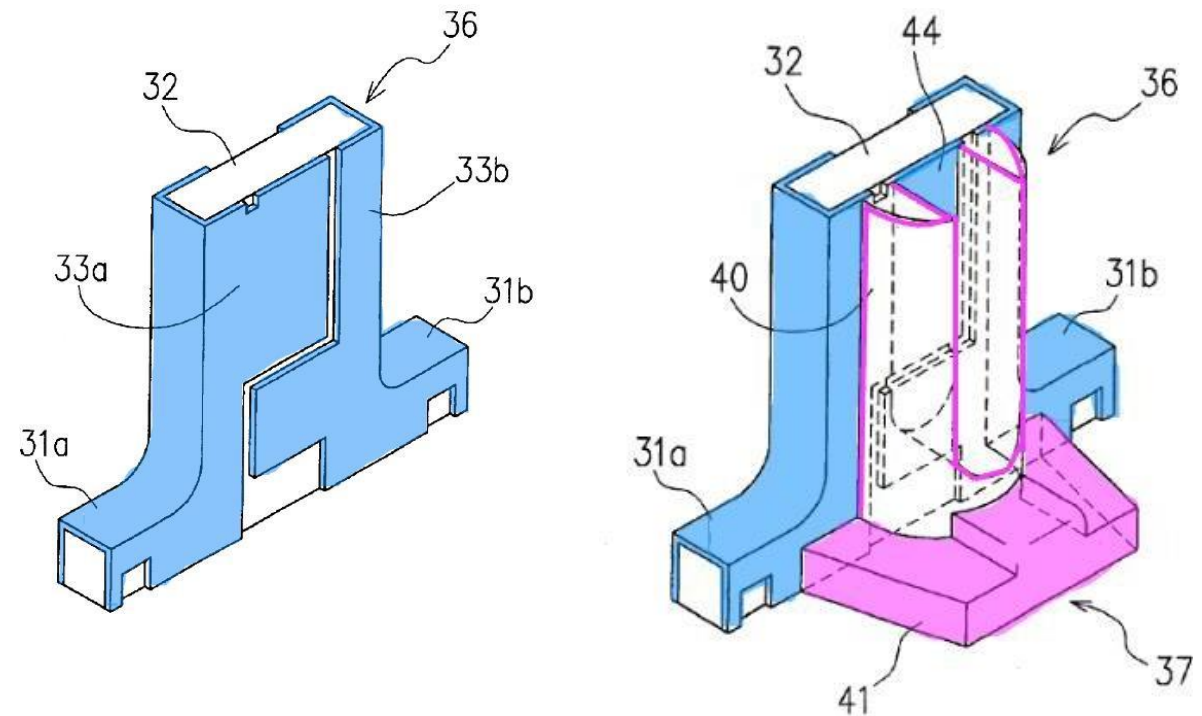
Ex. 1008 (Uekusa) at 2:35–37

4

wire 35 extending from the light emitting diode element 34 is connected with the other substrate electrode 33b by any means (see FIGS. 1 to 3).

On the other hand, the resin forming section 37 is composed of a generally U-shaped frame 40 formed on the front surface of the upright section 32 and a plate-shaped extension part 41 which is formed integrally with the frame 40 at a lower end thereof and which extends forwardly larger than the frame from the base portions 31a and 31b at an approximate center part thereof.

Ex. 1008 (Uekusa) at 4:4–10

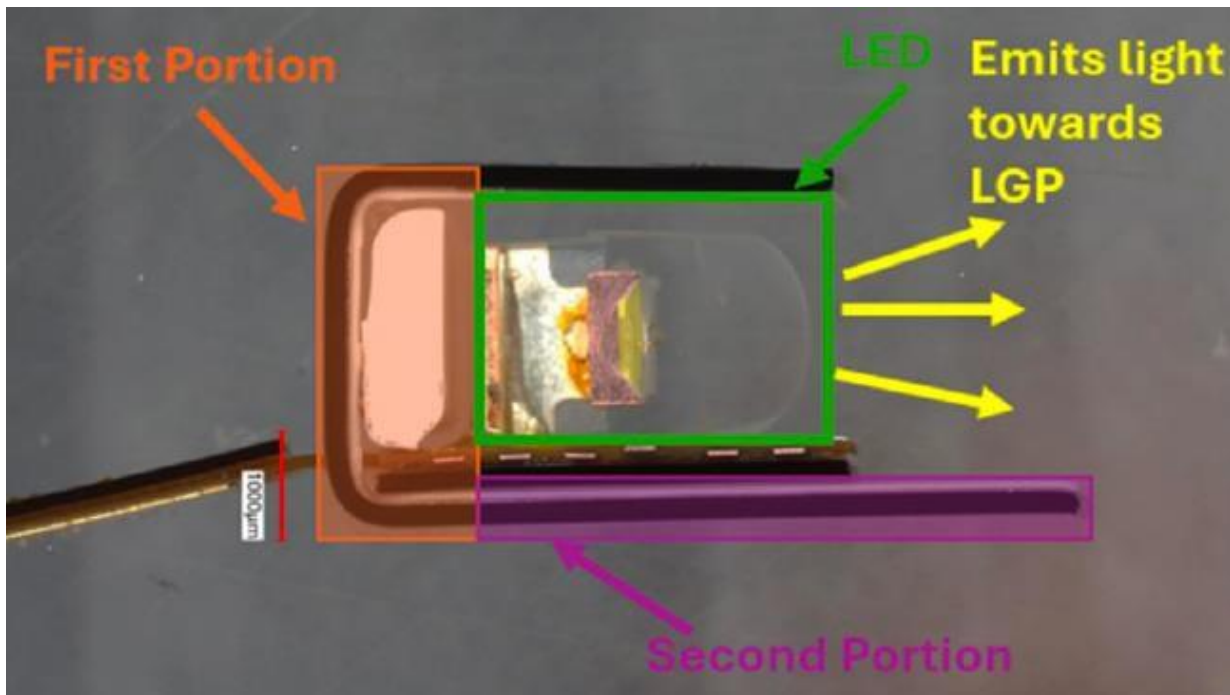
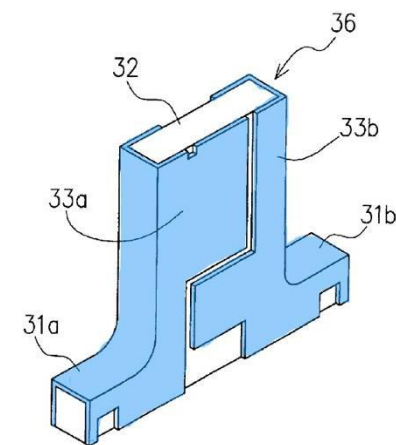
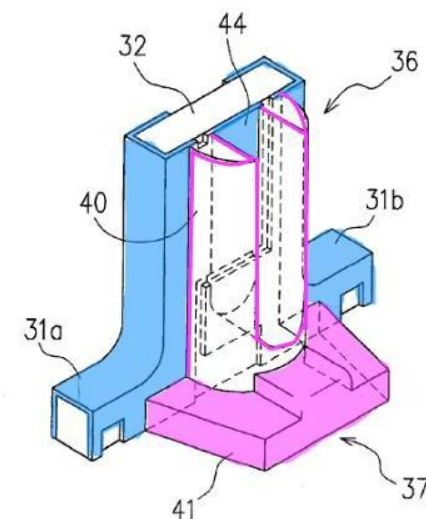


POR at 31 (citing Ex. 1008 at Figs. 5, 6)

Uekusa lacks the L-shaped fastener

190. Under BOE's proposed construction of substantially L-shaped structure of "Plain and ordinary meaning, i.e., shaped substantially like an L. Comprising does not operate to literally encompass other shapes" this limitation is not met because frame 8 **as a whole** is shaped like a sideways U or backwards C. It is not L-shaped.

Ex. 2026 (Baker) ¶¶ 172, 190



POR at 31 (citing Ex. 1008 at Figs. 5, 6)

Uekusa lacks “connecting” in claim 5

“fastener”
(’842 Patent, Claims 3, 7)

“a feature that attaches or holds something
in place”

Ex. 2027 at 34

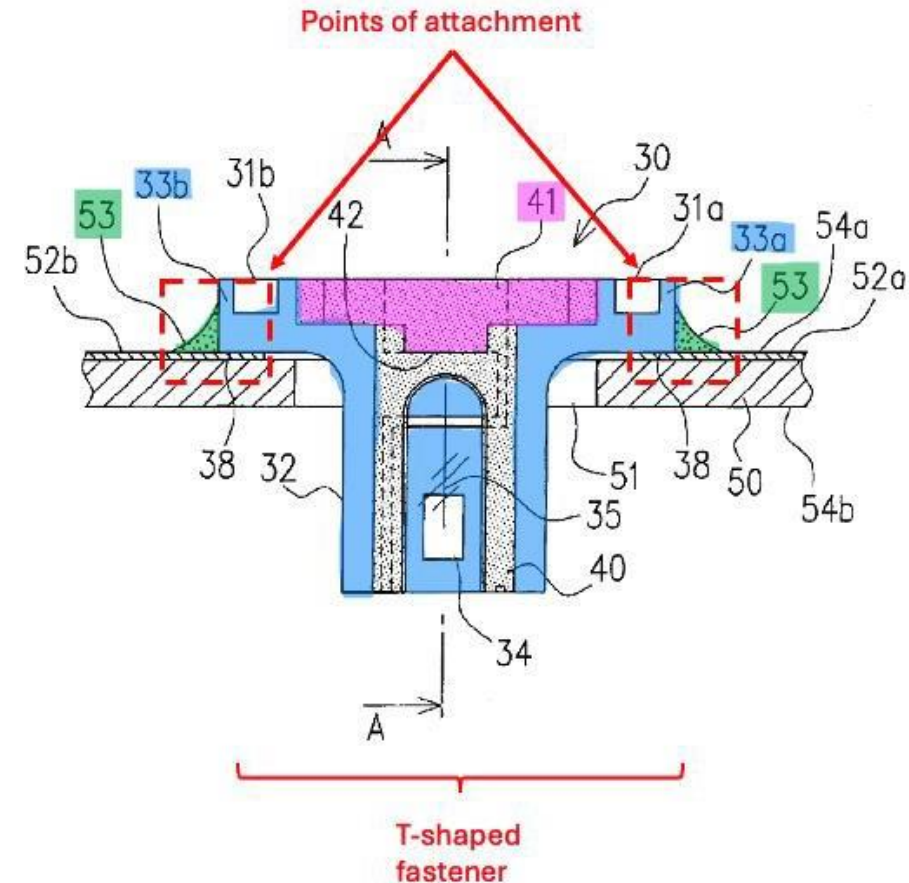
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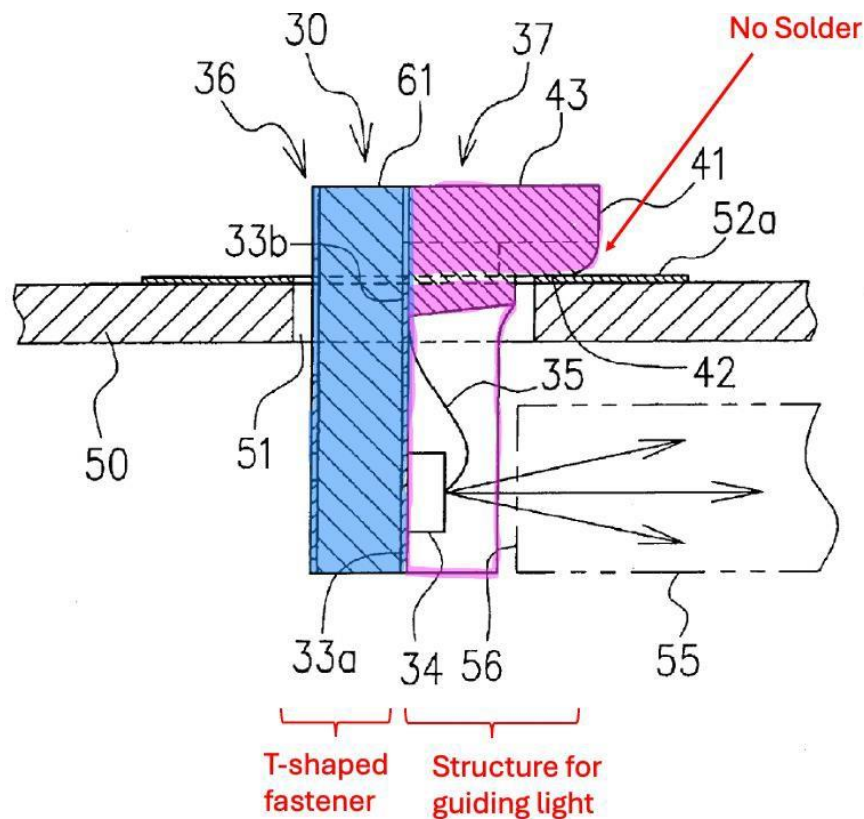
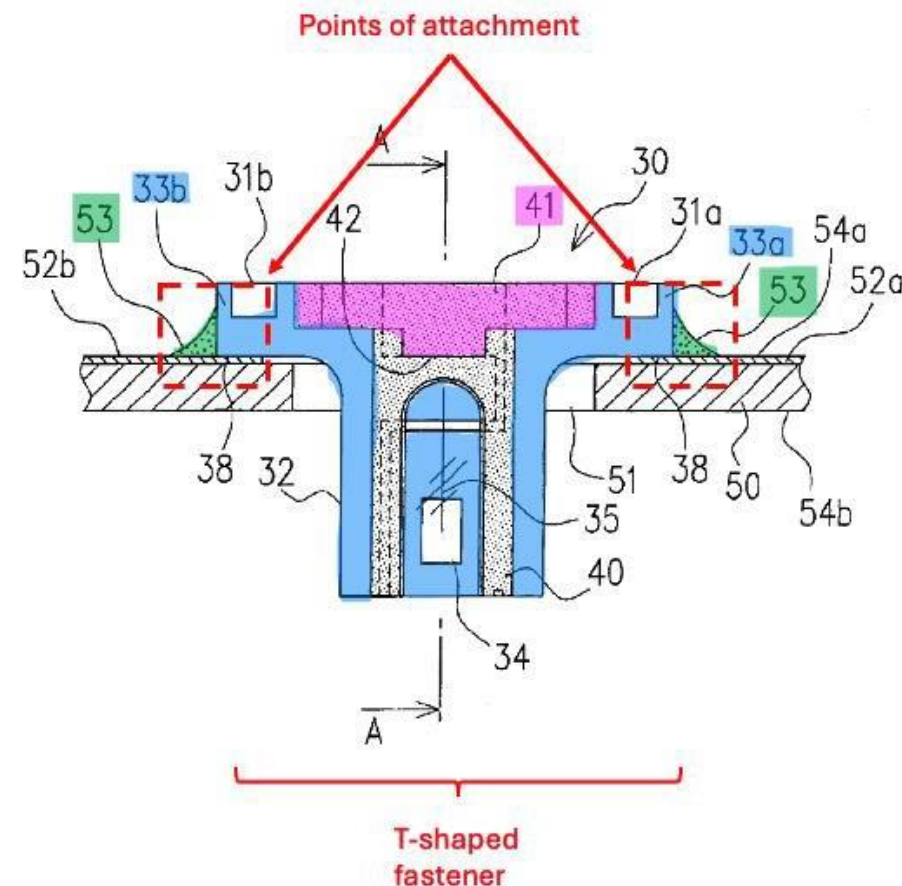


Uekusa lacks “connecting” in claim 5

“fastener”
(’842 Patent, Claims 3, 7)

“a feature that attaches or holds something
in place”

Ex. 2027 at 34



POR at 29 (citing Ex. 1008 at Fig. 3)

POR at 28 (citing Ex. 1008 at Fig. 2)

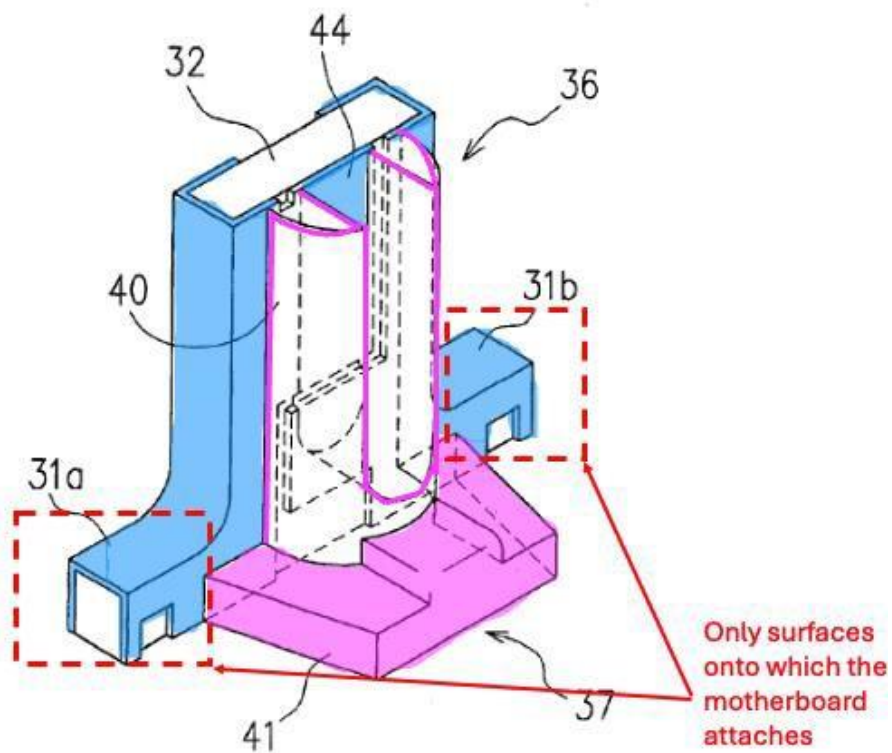
Optronic Sciences LLC, Ex. 2028
BOE Technology Group Co. Ltd. v. Optronic Sciences LLC, IPR2024-01130
Page 38 of 74

Uekusa lacks “connecting” in claim 5

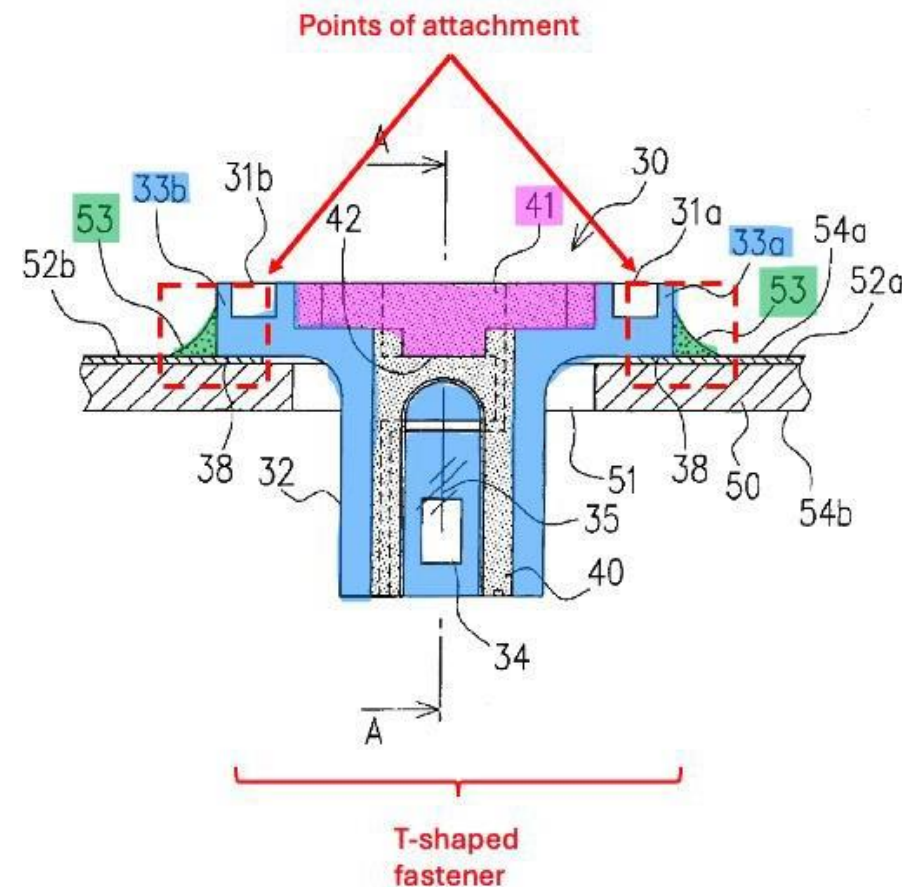
“fastener”
(’842 Patent, Claims 3, 7)

“a feature that attaches or holds something
in place”

Ex. 2027 at 34



POR at 29 (citing Ex. 1008 at Fig. 3)



POR at 28 (citing Ex. 1008 at Fig. 2)

Uekusa lacks “heat dissipating means” in claims 6 and 9

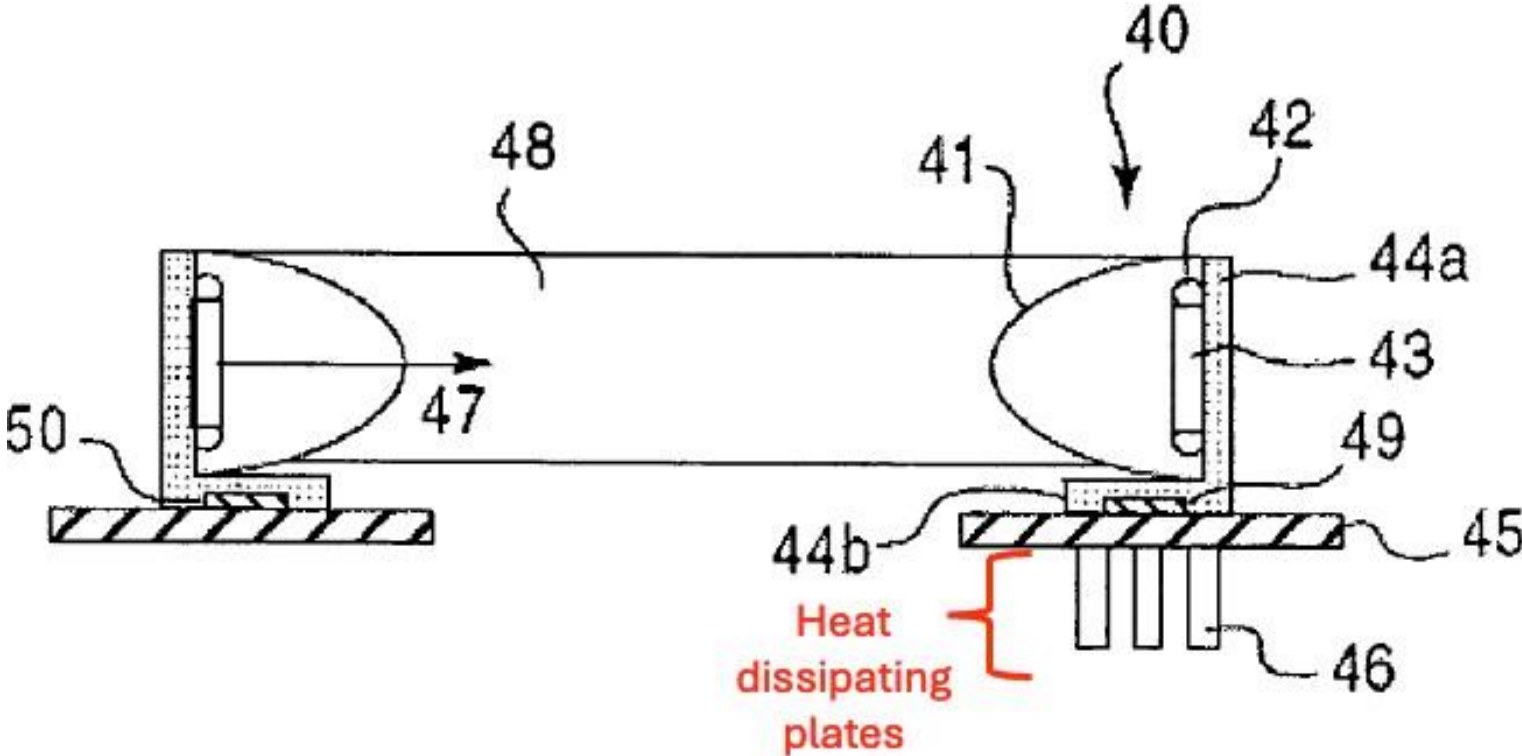


Fig.4

POR at 16

Uekusa lacks “heat dissipating means” in claims 6 and 9

This refers to structures like the heat dissipating plates 46; unnecessary to decide how many.

It is not anything capable of “conducting heat,” as literally every material in existence inherently conducts heat (at least poorly).

Petition at 6.

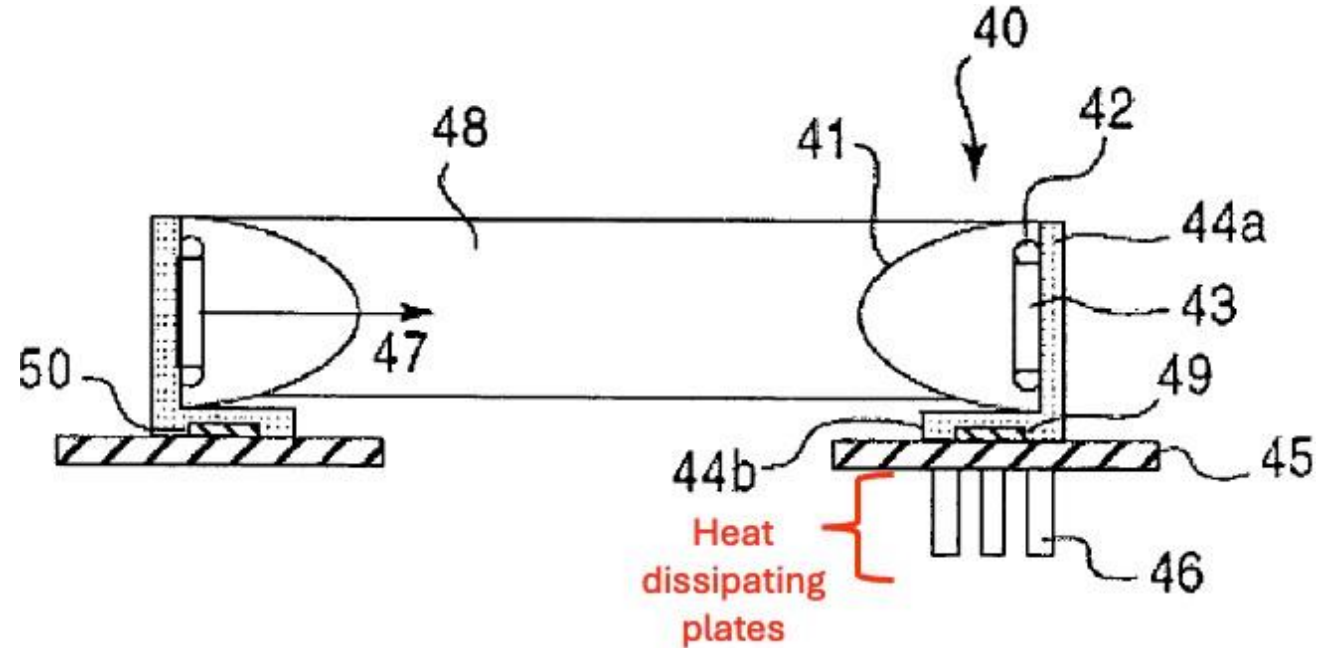


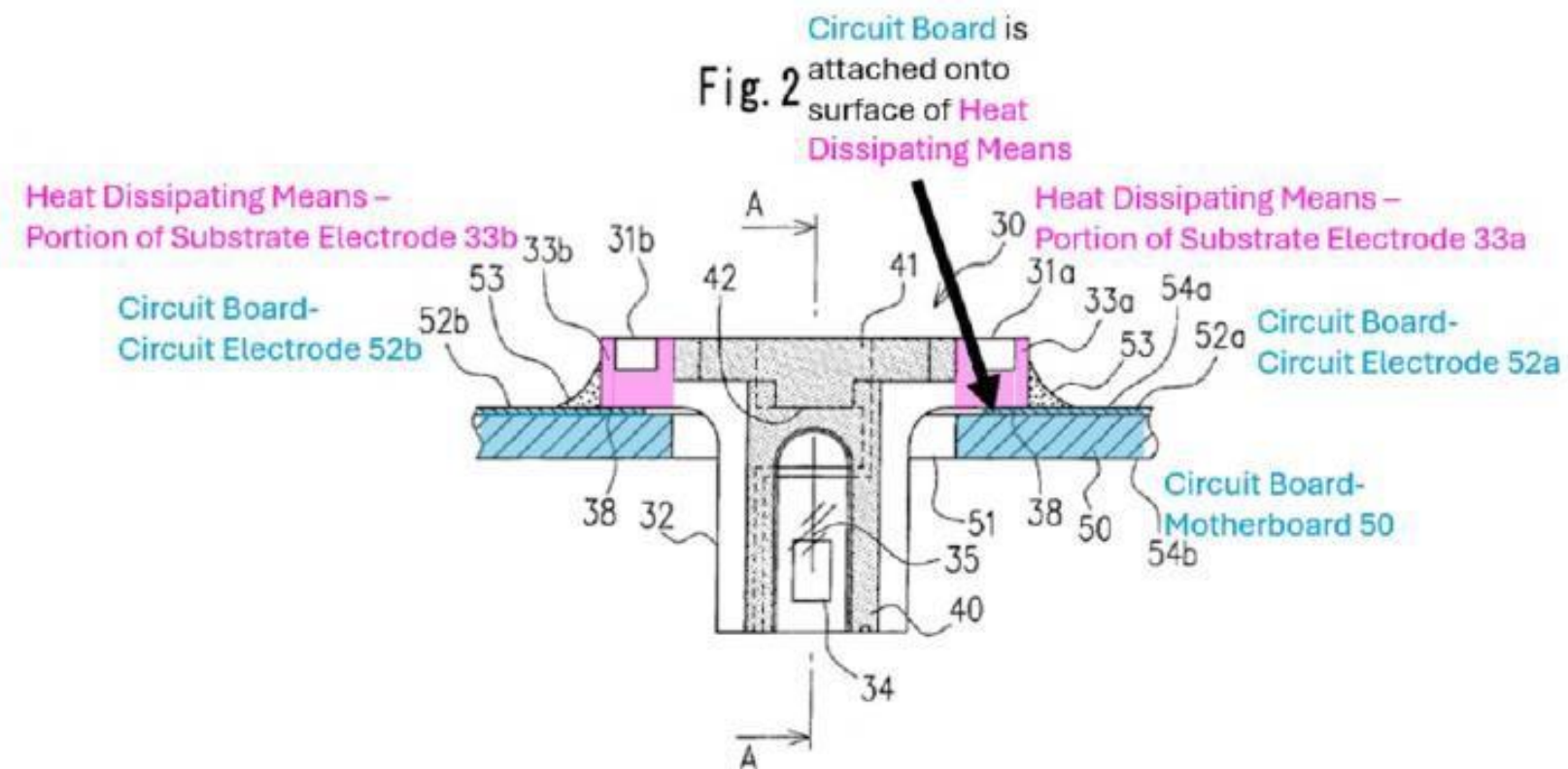
Fig.4

circuit board.” Any such conduction constitutes heat “dissipation.” The only structure disclosed and linked by the specification to perform that function is heat-dissipating plates 46 (plural). EX1001, Fig. 4, 2:9-11, 3:25-32, 3:51-58. Petitioner

Petition at 4

POR at 16

Uekusa lacks “heat dissipating means” in claims 6 and 9

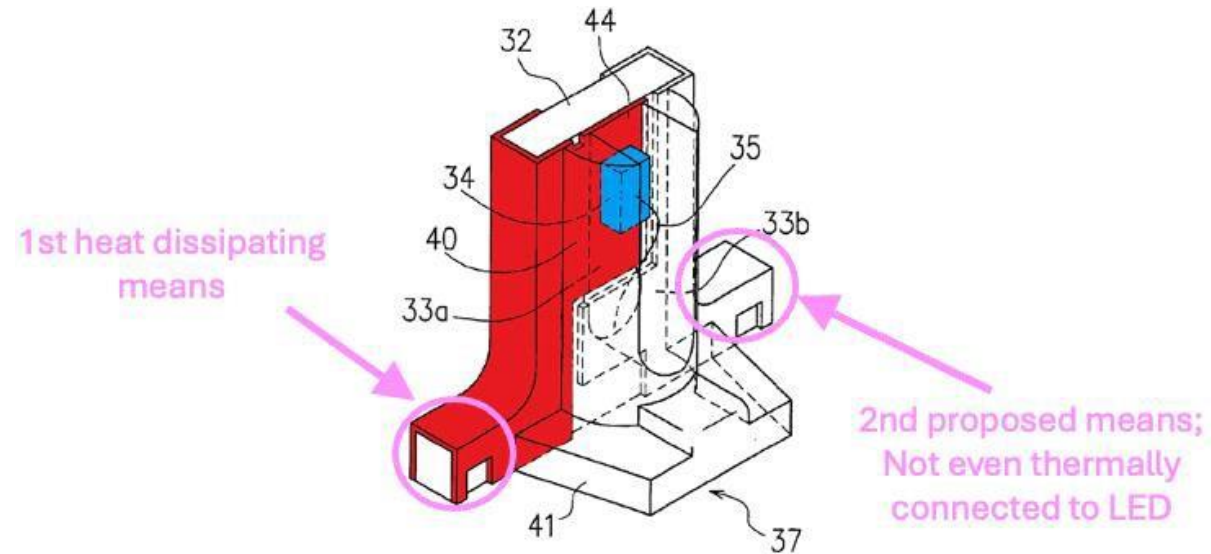


Petition at 25
relies on inherent heat conduction

Uekusa lacks “heat dissipating means” in claims 6 and 9

This appears to be based on Dr. Baker’s belief in an equivalency between electrical conductivity and thermal conductivity. See Ex. 1002, ¶ 107 (“A POSITA would have understood that substrate electrodes would be made of metal to conduct electricity to drive the LED 34, and so they also would inherently have conducted heat from any component they touched.”). Dr. Baker’s statement is only accurate in the non-limiting understanding of the claim term that every material in the universe can technically dissipate heat (even insulators). . . .

the metal itself used for the conductors may have a high thermal conductivity, but the cross-sectional area of the conductors is so small that the total heat transferred via conduction is minimal. . . .

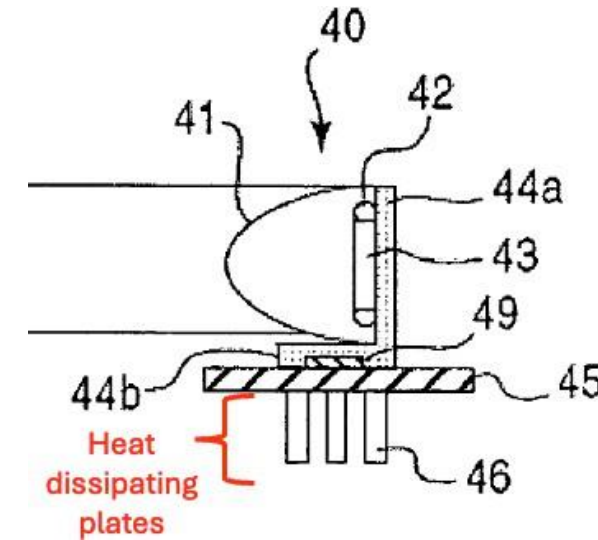


Uekusa lacks “heat dissipating means” in claims 6 and 9

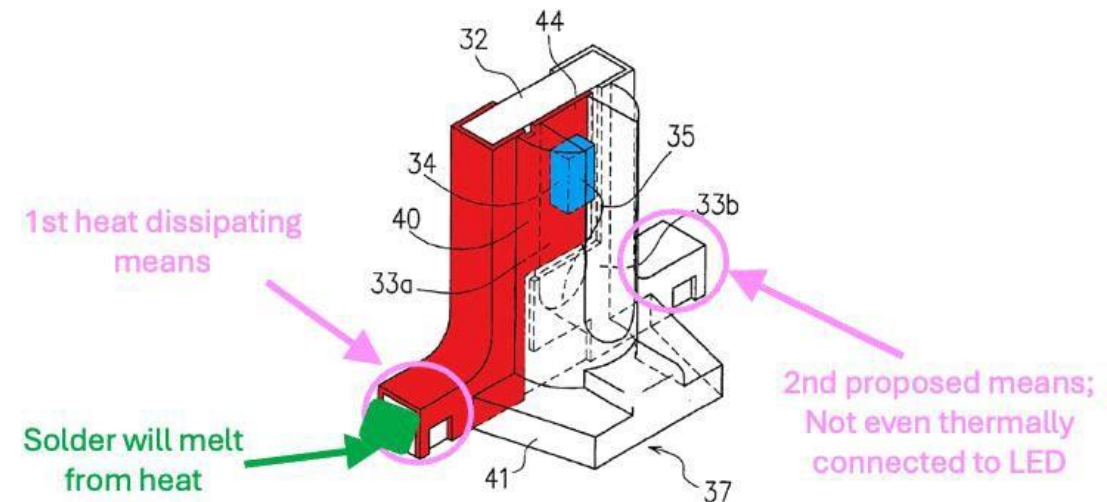
Therefore, the amount of heat conducted from the solder points to the resin is necessarily understood to be miniscule otherwise the resin and hence package would be damaged and become inoperable from overheating. . . .

The heat dissipating plates 46 shown in the '842 patent have spaces between them for airflow. A POSITA would know that the fins or plates should not contact thermal insulators (or else they would lose effectiveness) or materials that are easily damaged by heat (like resin, which can burn or melt).

Thus, a POSITA would have understood that the portions of Uekusa's structure identified by Dr. Baker are not a “heat dissipating means” and any attempt to map it as such is based on hindsight.

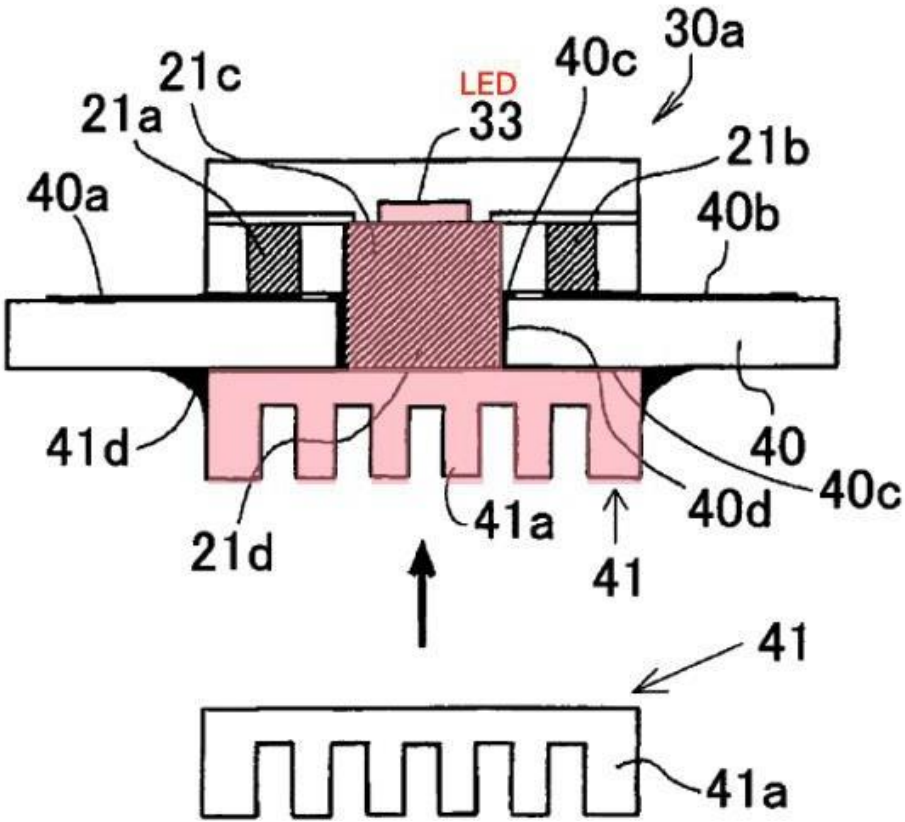


POR at 16



Ground 2: Uekusa & Isoda § 103, Claims 3, 5–9

FIG. 4



55 same level as the underside of the print substrate 40. As shown in FIG. 4, a cooling member 41 made of heat transmissive metal and having a plurality of cooling fins 41a is attached to the heat radiation pattern 40c on the underside of the print substrate and secured to the pattern 40c by a solder 41d.

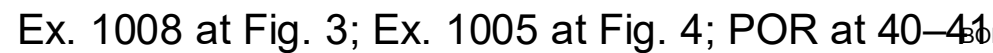
60 Thus, the LED 33 is thermally connected with the cooling member 41 through the exposed portion of the heat conductive member 21c, projection 21d, and heat radiation pattern 40c.

OpTronic Sciences LLC, Ex. 2028
BOE Technology Group Co. Ltd. v. OpTronic Sciences LLC, IPR2024-01130
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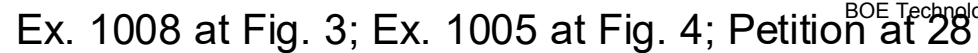


Demonstrative Exhibit — Not Evidence

Demonstrative Exhibit — Not Evidence



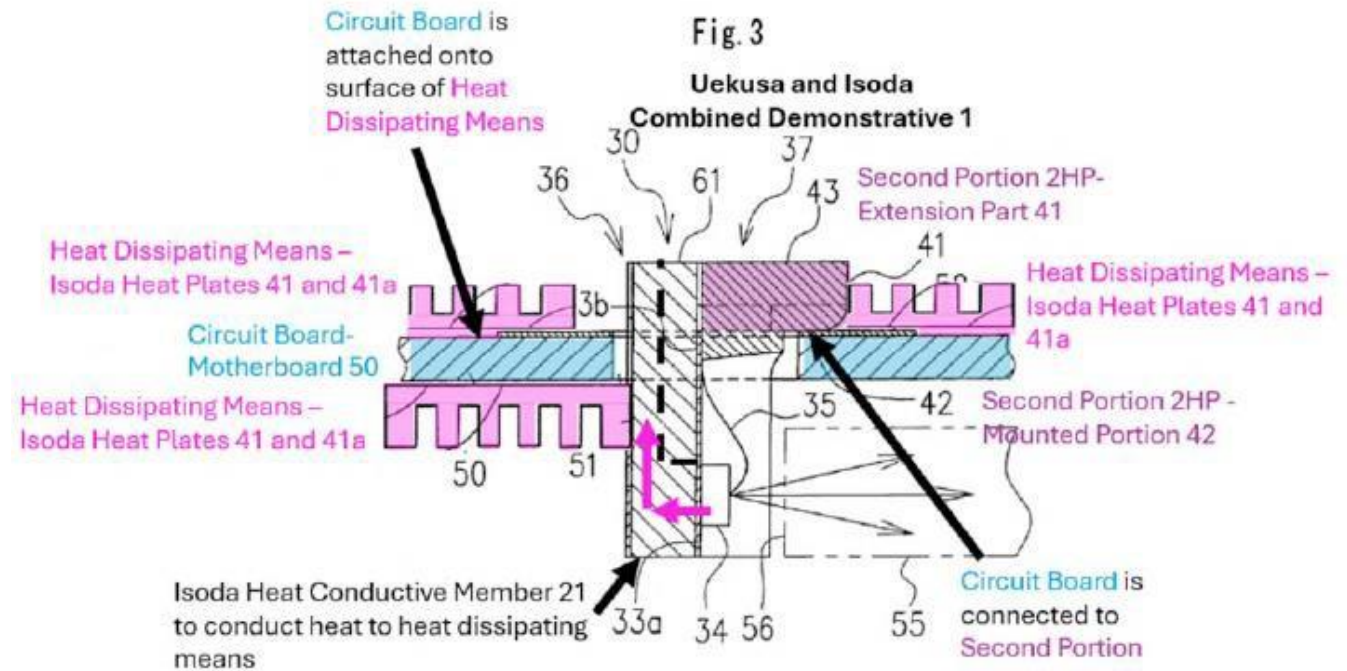
Demonstrative Exhibit — Not Evidence



The Only Logical, Non-Hindsight Combination

Therefore, heat emitted from the LED 3 scarcely transmitted to the print substrate 6. Consequently when a high current is applied to the LED in order to produce high brightness, the emitted heat becomes high temperature, which causes junctions in the LED to degrade, and the sealing member 5 to discolor which decreases the transparency of the member. Thus, the quality of the LED device largely reduces.”).

Ex. 2020 (Bretschneider) at 69



Petition at 28

Demonstrative Exhibit — Not Evidence

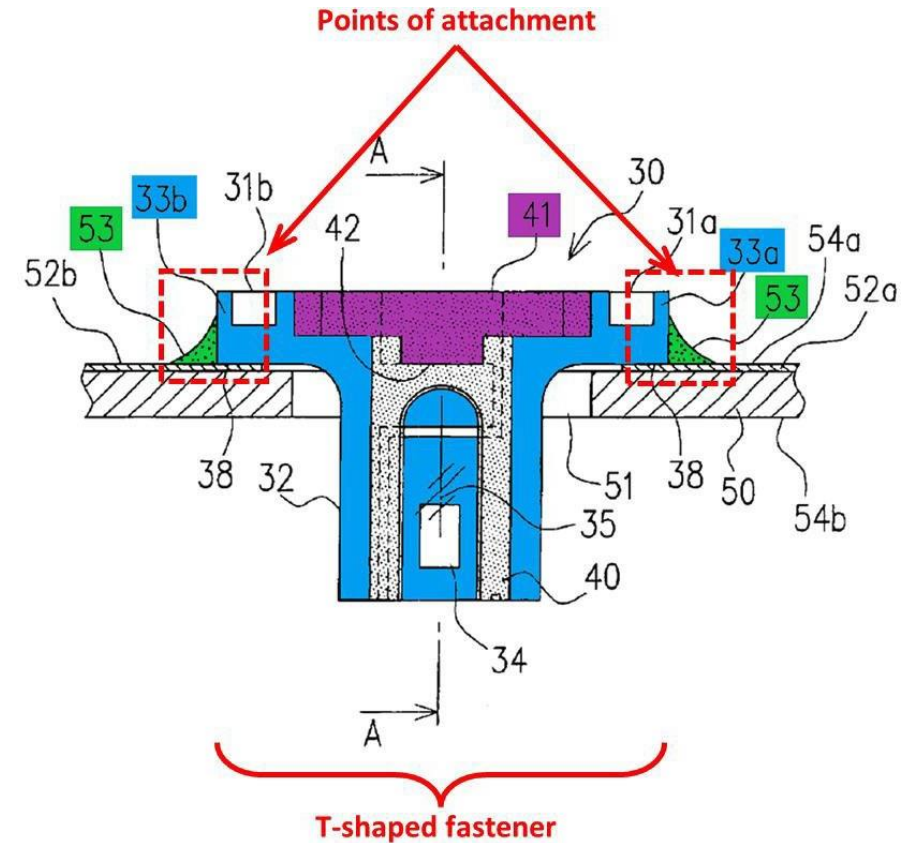
Ex. 1008 (Uekusa) Fig. 3

Ex. 1005 (Isoda) Fig. 8

The Only Logical, Non-Hindsight Combination

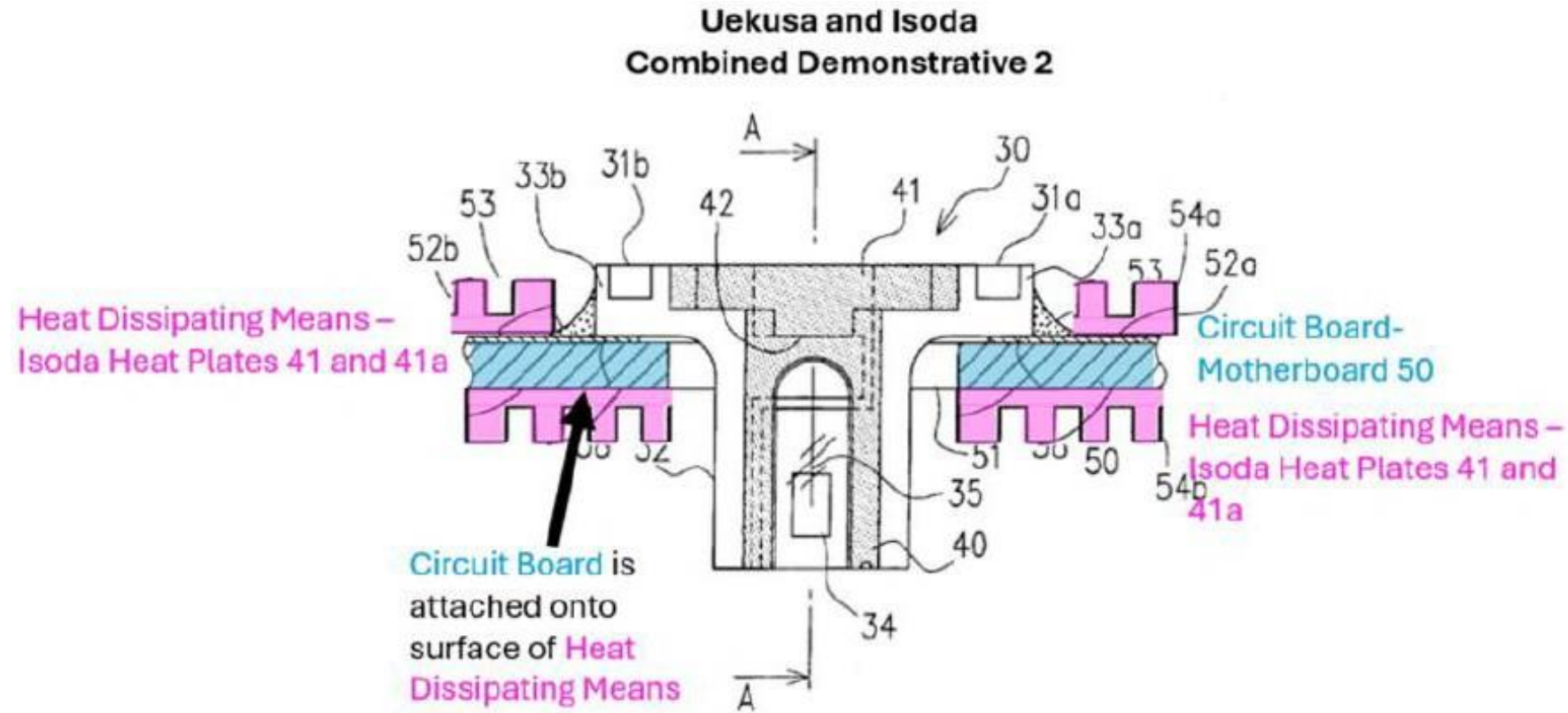


Ex. 2020 (Bretschneider) at 69



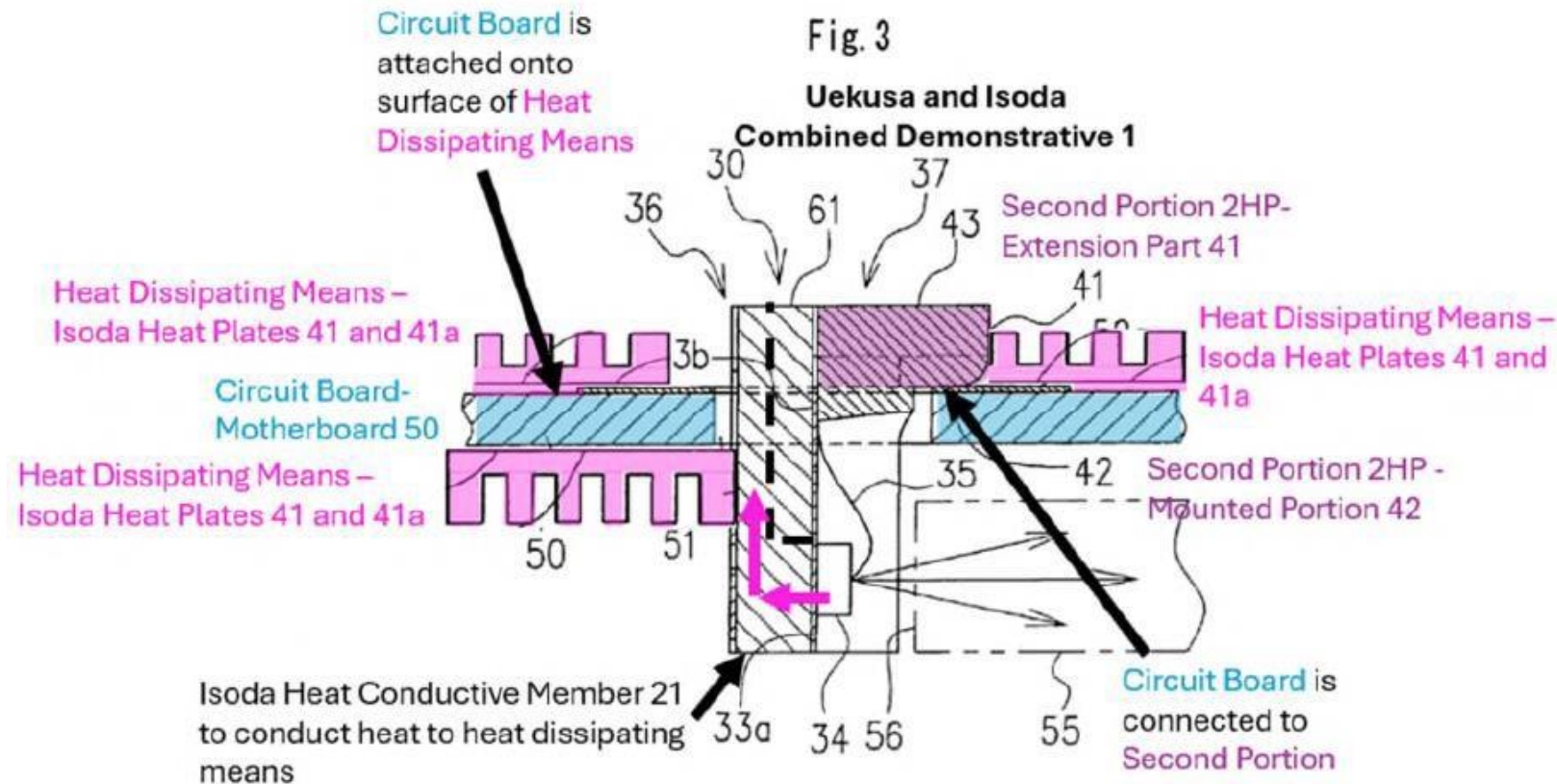
Ex. 2020 (Bretschneider at 55)

The Only Logical, Non-Hindsight Combination



Petition at 28

The Only Logical, Non-Hindsight Combination



Petition at 28

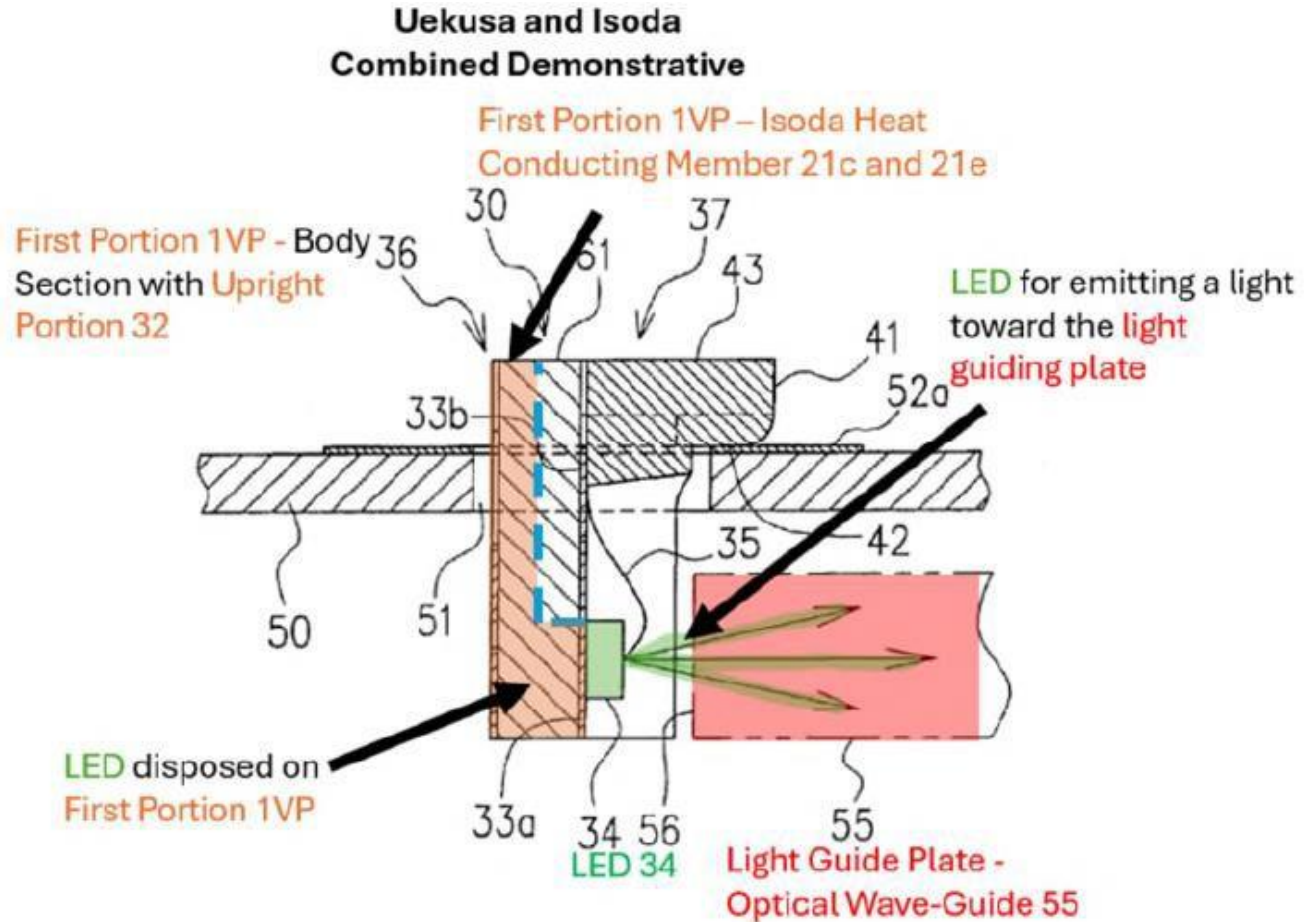
The Only Logical, Non-Hindsight Combination

156. Importantly, Isoda clarifies that the issue is use of so-called print substrates which are generally made of epoxy resin and have a low thermal conductivity, effectively trapping heat inside the device, which is why it proposes a direct connection between the LED and the heatsink with a thermally conductive material. *See* Ex. 1005, 1:57-67 (“Heat generated in the LED 14 is transmitted to the print substrate 16 through the conductive members 11a and 11b, so that the heat is efficiently radiated from the print substrate 16 if the substrate is made of a material having high heat conductivity. However, the print substrate 16 is generally made of cheap material such as an epoxy resin. As described above, the epoxy resin has low heat conductivity. Therefore, the heat is not sufficiently transmitted to the print substrate, thereby rising the temperature of the LED, and reducing the quality thereof.”). This is precisely the issue with Uekusa and a POSITA following the teachings of Isoda would abandon Uekusa, not modify Uekusa.

159. Even if a POSITA were to attempt to combine Uekusa and Isoda (despite difficulties in manufacturing and cost in putting a conductive member in half of Uekusa’s structure), the location of the heat sinks added by Dr. Baker are ridiculous and correspond almost precisely to the locations identified by Isoda as resulting in inefficient heat transfer. *See* Ex. 1005, 1:57-67. Such locations would

Ex. 2020 (Bretschneider)

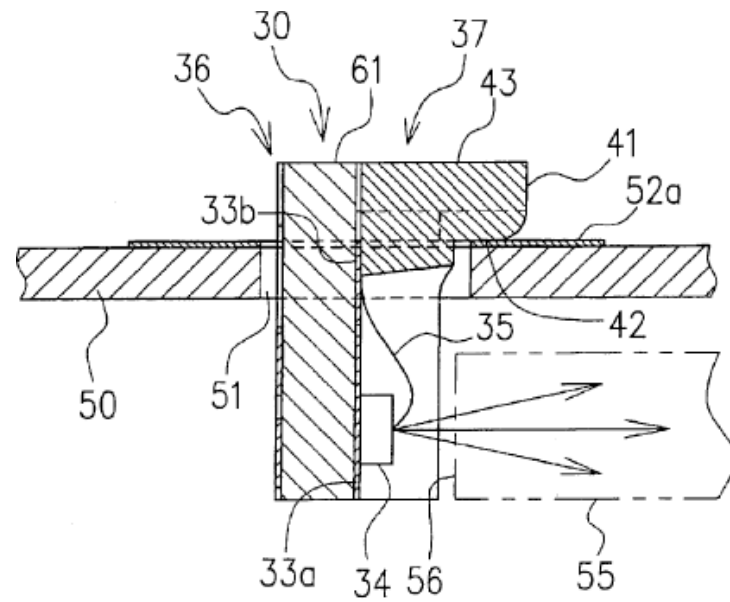
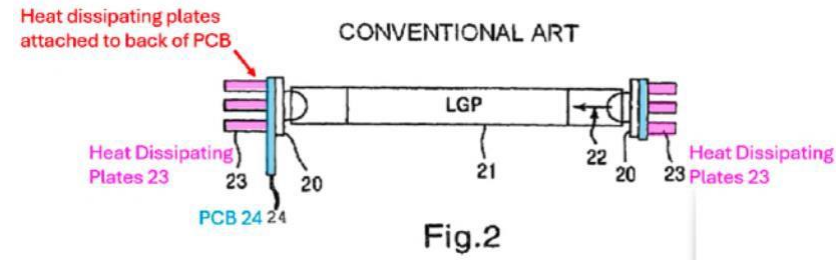
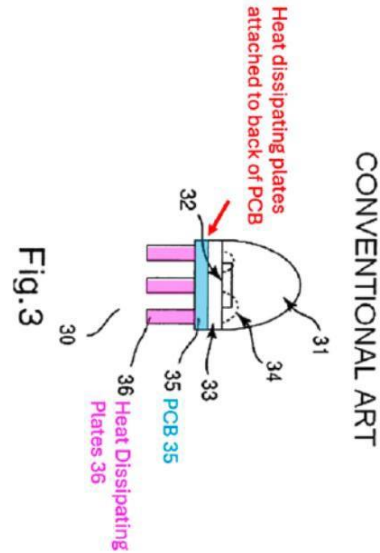
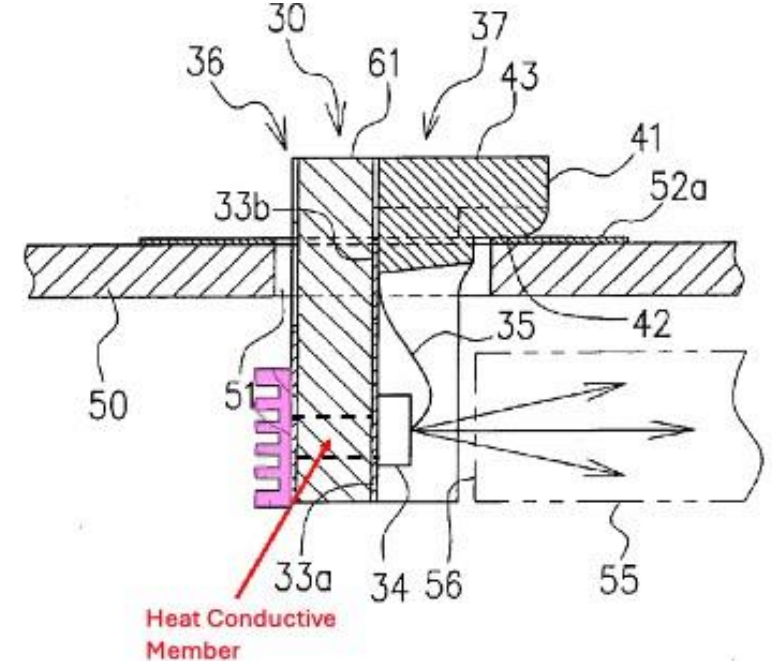
Still not an L-shaped fastener



Petition at 36

Ground 3: Uekusa & AAPA § 103, Claims 6 and 9

The Only Logical, Non-Hindsight Combination



Ex. 1008 (Uekusa) at Fig. 3; POR at 48–49 (citing Ex. 1001)

Optronic Sciences LLC, Ex. 2028
 DOE Technology Group Co. Ltd. v. Optronic Sciences LLC, IPR2024-01130
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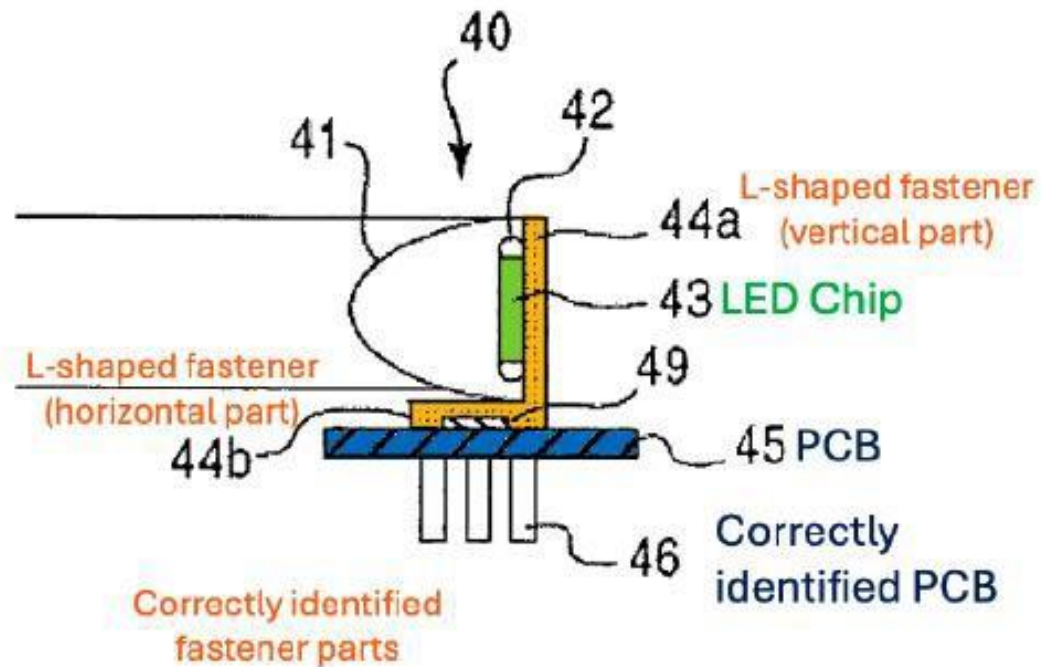
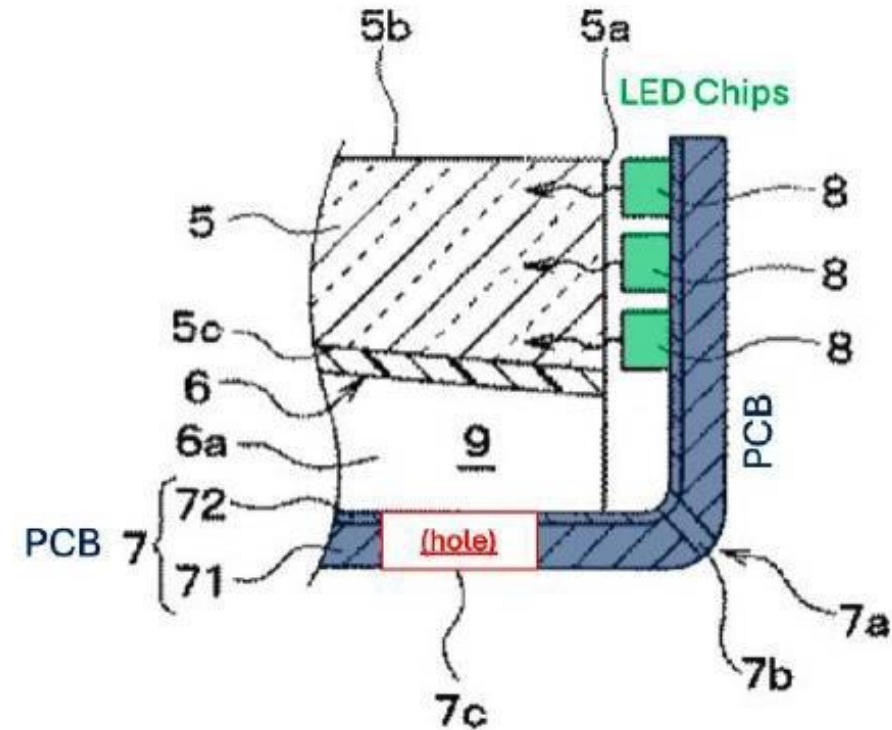
AAPA is not permitted

Section 311(b) states that a petitioner “may request to cancel as unpatentable” claims “only on the basis of prior art consisting of patents or printed publications.” This means that “the basis” of an IPR ground asserting unpatentability can “only” include “prior art consisting of patents or printed publications.” In *Qualcomm I*, we clarified that, according to the plain language of § 311(b), related case law, and a “natural reading” of the statute, AAPA is not a prior art patent or printed publication. 24 F.4th at 1373–75 (determining that AAPA “is not contained in a document that is a prior art patent or printed publication”). Thus, because the basis can only include prior art consisting of patents or printed publications, and because AAPA is not a prior art patent or printed publication (per *Qualcomm I*), it follows that the plain meaning of § 311(b) does not permit the basis to include AAPA.

Qualcomm Inc. v. Apple Inc., 134 F.4th 1355, 1364–65 (Fed. Cir. 2025)

Ground 4: Kurokawa § 102

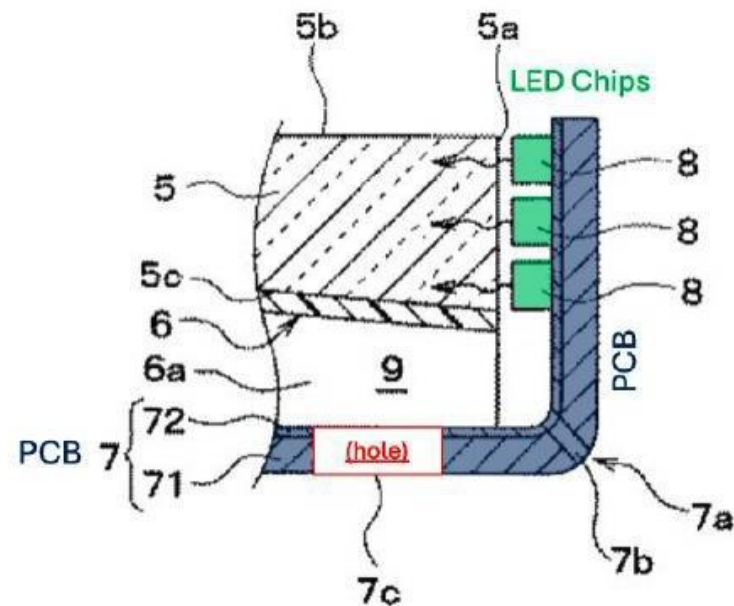
Kurokawa is Fundamentally Different



POR at 51; Ex. 1001 at Fig. 4; Ex. 1004 (Certified Translation) at Fig. 2

Optronic Sciences LLC, Ex. 2028
 Optronic Sciences LLC, IPR2024-01130
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Kurokawa is Fundamentally Different



[0010]

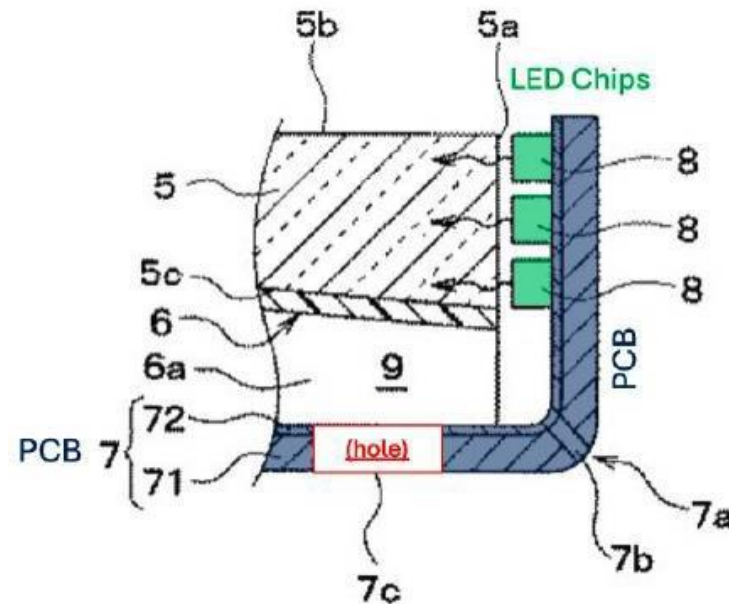
Because a metallic wiring board is used as the printed wiring board (7), the thermal conductivity of the printed wiring board (7) can be improved compared to that of a glass epoxy-based wiring board.

[0011]

By bending the printed wiring board (7) as described above, a heat dissipating area can be secured for the printed wiring board (7) while reducing the size of the lighting device, and inexpensive vertical light-emitting diodes (8) can be used.

Ex. 1004 (Certified Translation) at Fig. 2

Kurokawa is Fundamentally Different



As the printed wiring board (7), a metal-based wiring board based on a metal plate (71) is employed, and the printed wiring board (7) starts from a portion facing the side edge (5a) of the light guide plate (5). The light guide plate (5) is bent so as to extend to a portion facing the rear surface of the light guide plate (5).

[0010]

According to this, since a metal-based wiring board is used for the printed wiring board (7), the thermal conductivity of the printed wiring board (7) can be improved as compared with a glass epoxy base wiring board.

[0011]

Further, by bending the printed wiring board (7) as described above, it is possible to secure a large heat radiation area of the printed wiring board (7) while suppressing an increase in the size of the lighting device, and to reduce the cost of the light emitting diode (8). A vertical light emitting diode can be employed.

Ex. 2004 (Google Patents)

Claim Construction

3. A backlight package comprising:
 - a light guiding plate having a first side;
 - a first fastener having a first portion and a second portion, the first portion disposed adjacent to the first side of the light guiding plate, wherein the first portion and the second portion are arranged in a substantially perpendicular relationship to form a substantially L-shaped structure; and
 - a light emitting device disposed on the first portion of the first fastener for emitting a light toward the light guiding plate.
4. The backlight package as claimed in claim 3, wherein the second portion extends above the light guiding plate.
5. The backlight package as claimed in claim 3, further comprising a circuit board and a conducting wire, the circuit board connecting the second portion, and the conducting wire electrically coupling the light emitting device to the circuit board.

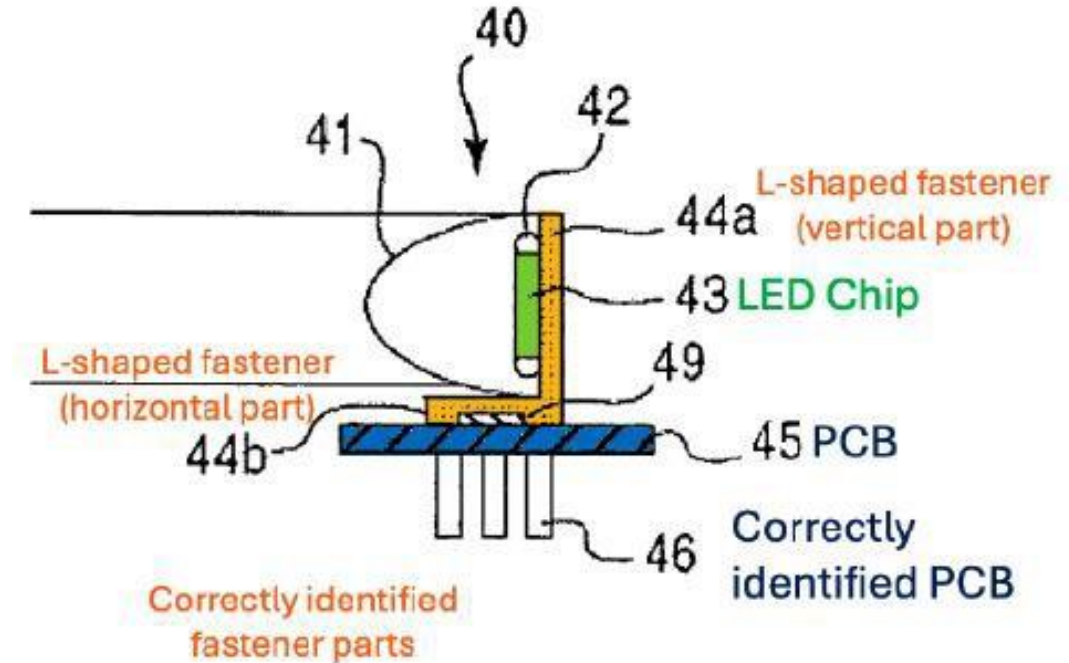


Fig. 4

Ex. 1001 at Claims, Fig. 4

LEDs not disposed on cover

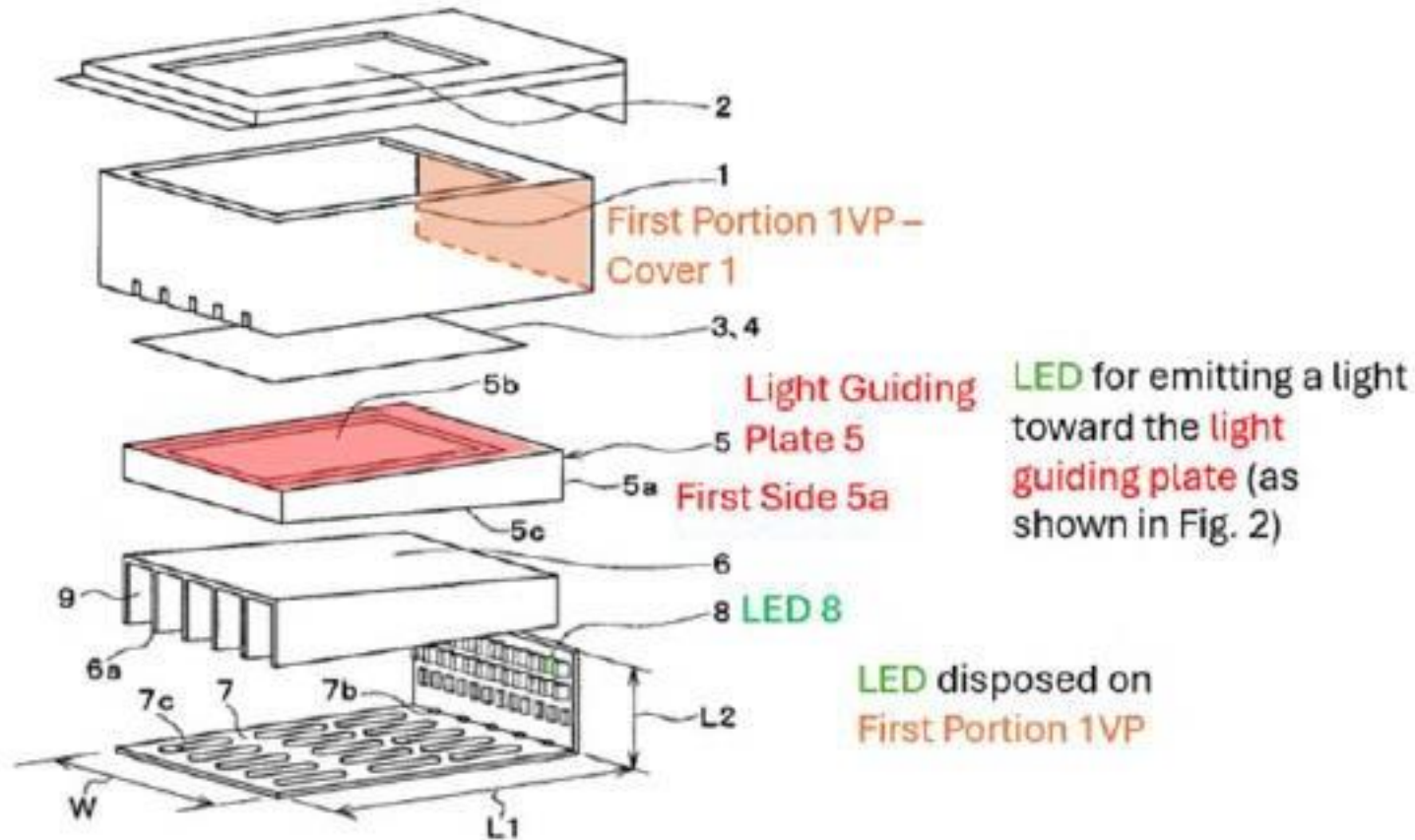
3. A backlight package comprising:
- a light guiding plate having a first side;
 - a first fastener having a first portion and a second portion, the first portion disposed adjacent to the first side of the light guiding plate, wherein the first portion and the second portion are arranged in a substantially perpendicular relationship to form a substantially L-shaped structure; and
 - a light emitting device disposed on the first portion of the first fastener for emitting a light toward the light guiding plate.

4. The backlight package as claimed in claim 3, wherein the second portion extends above the light guiding plate.

5. The backlight package as claimed in claim 3, further comprising a circuit board and a conducting wire, the circuit board connecting the second portion, and the conducting wire electrically coupling the light emitting device to the circuit board.

Ex. 1001 at Claim 3

【圖 1】



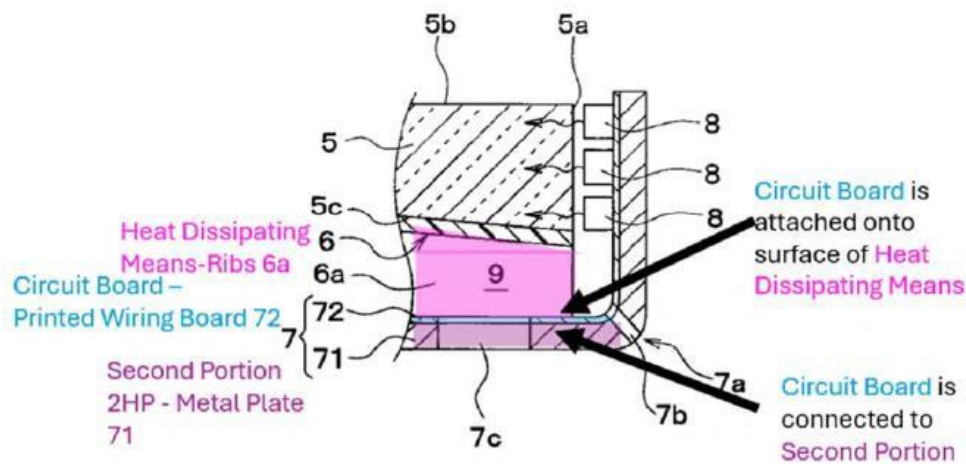
Petition at 55 (citing Ex. 1004 at Fig. 1)

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Ribs are not “heat dissipating means”

The alternative alternative theory, the Kurokawa Ribs 6a are the “heat dissipating means.” EX1002, ¶¶ 192-193; EX1031 ¶ 95.

【 図 2 】



Petition at 26

206. The most troubling aspect of Dr. Baker’s statement is the implication of heat dissipation space 9 being used as a heat sink. Ex. 1002, ¶190 (“A POSITA would have understood that the heat produced by those local heat sources will be sunk through the air space 9, board 72, and portion 2HP of metal plate 71.”). Neither would ribs 6a act as a heat dissipating means. *See* Petition, p. 65.

207. The propositions that ribs 6a and space 9 act as a heatsink is problematic because it would result in the transfer of heat *into* the device, *away* from the periphery which means that would result in an increase in the operating temperature

Ex. 2020 (Bretschneider)

Ground 5: Kurokawa § 103 — Same issues as Ground 4

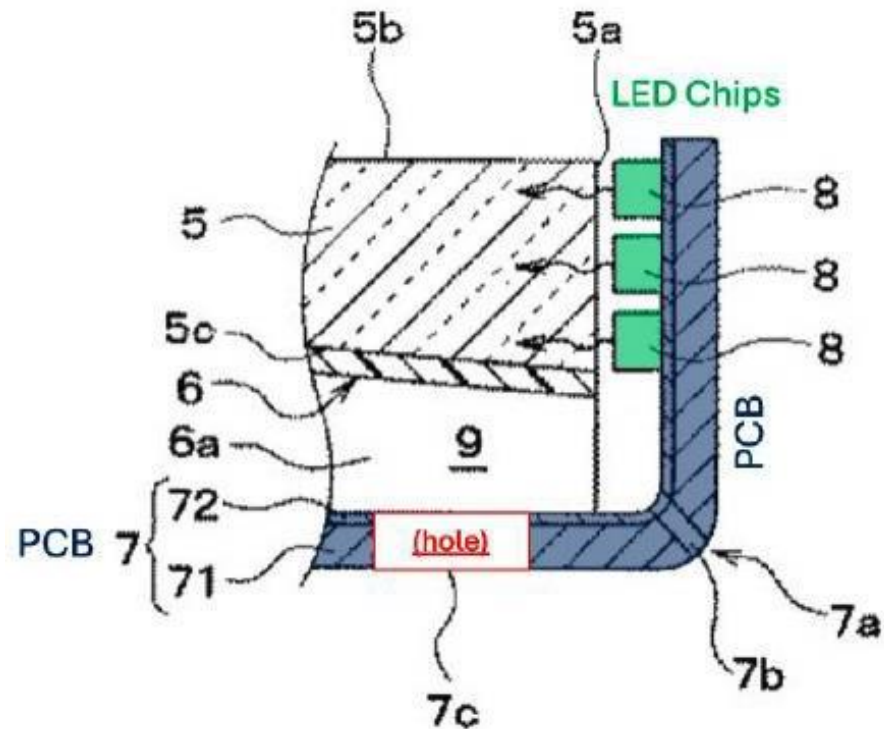
Ground 6: Kurokawa, Isoda § 103 More hindsight heat dissipation

No Heat Dissipating Means

2

5

Ex. 1005 (Isoda) at 2:1–3



[0010]

Because a metallic wiring board is used as the printed wiring board (7), the thermal conductivity of the printed wiring board (7) can be improved compared to that of a glass epoxy-based wiring board.

[0011]

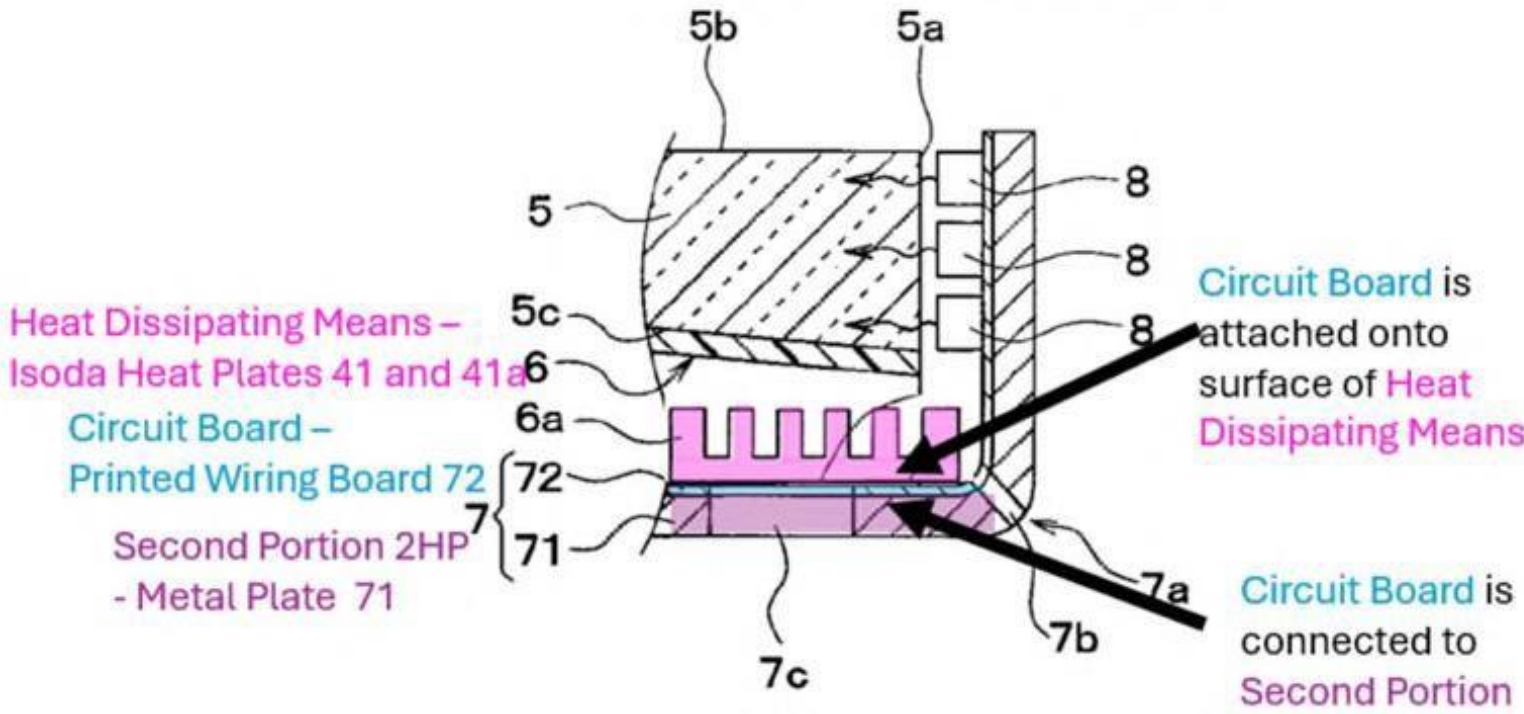
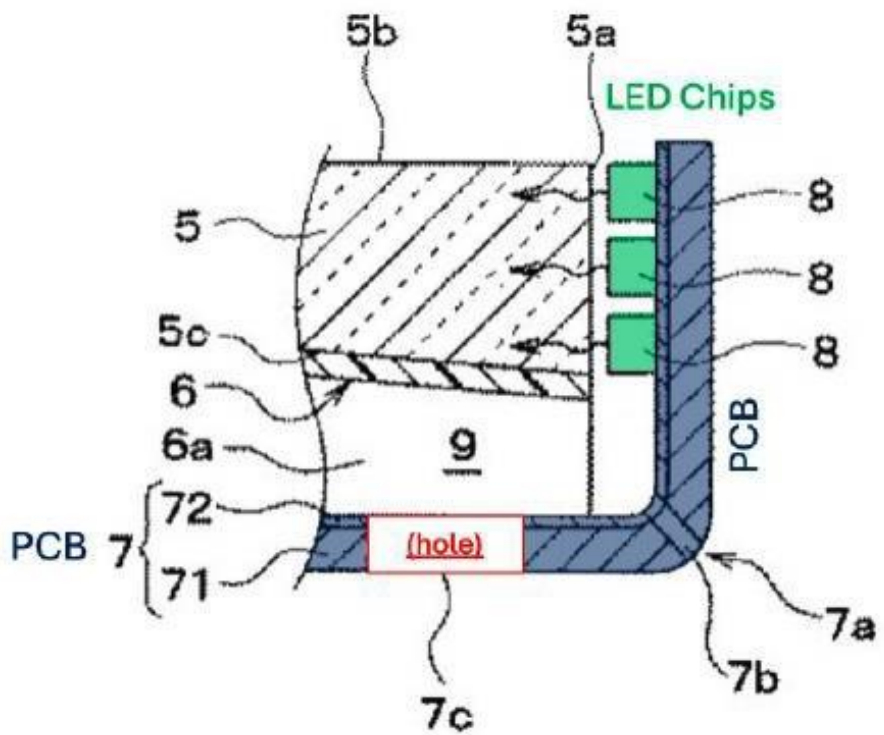
By bending the printed wiring board (7) as described above, a heat dissipating area can be secured for the printed wiring board (7) while reducing the size of the lighting device, and inexpensive vertical light-emitting diodes (8) can be used.

Ex. 1004 (Kurokawa) at Fig. 2

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No Heat Dissipating Means

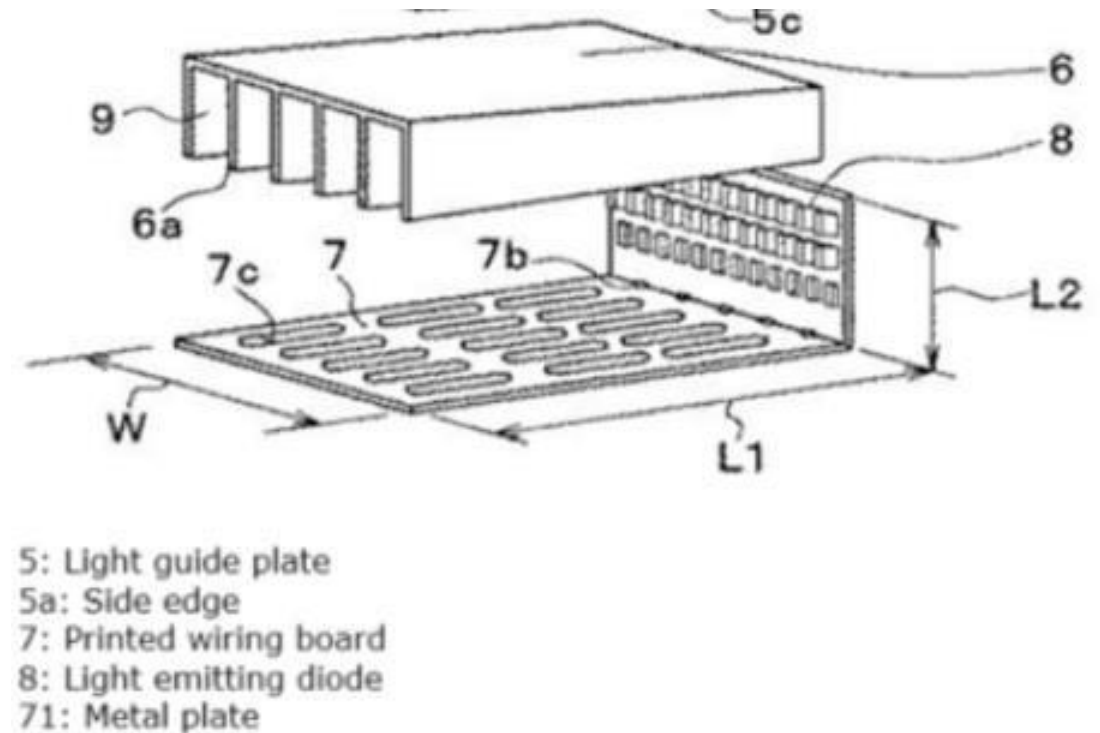
【 図 2 】 Kurokawa and Isoda Combined Demonstrative



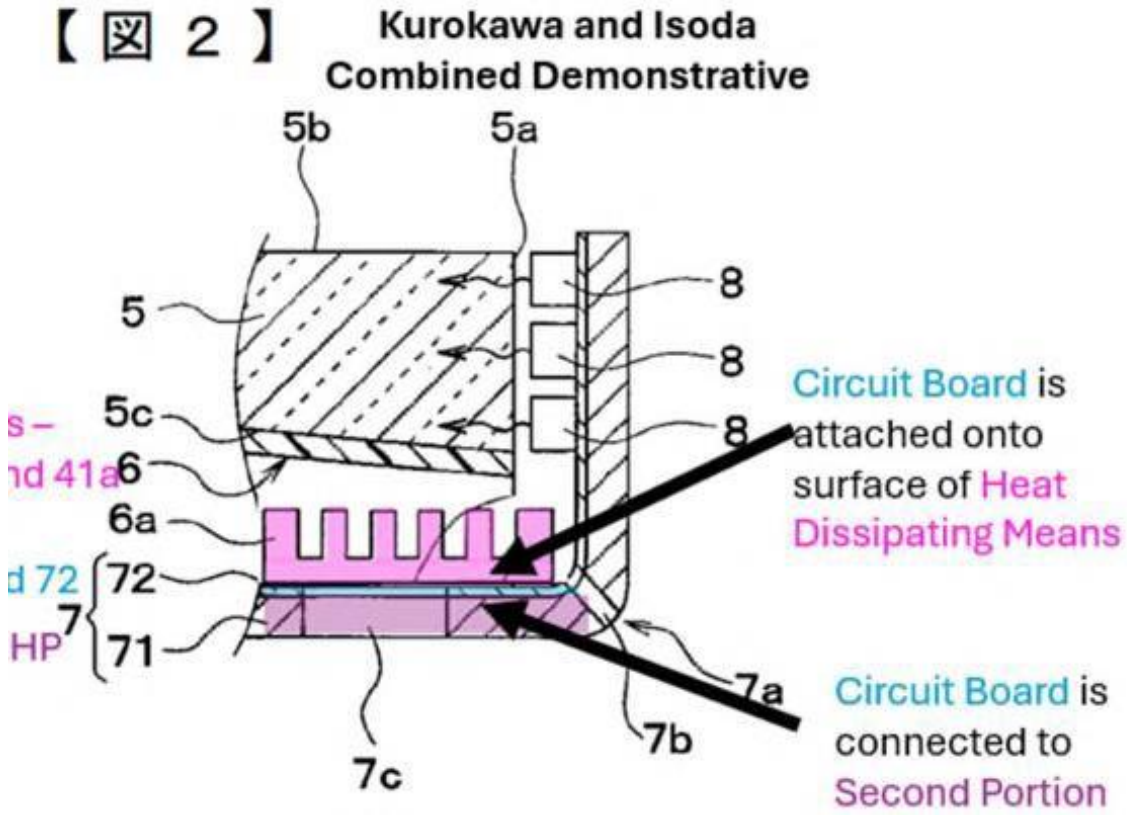
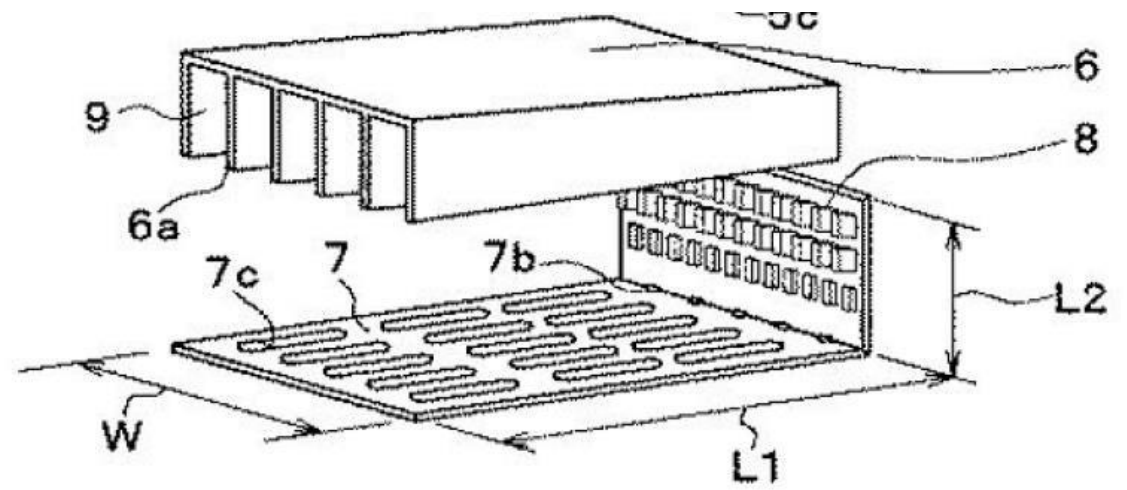
Petition at 72

No Heat Dissipating Means

106. Dr. Bretschneider's argument that the heat dissipating fins disposed on the printed wiring board 74 would cover the ventilation holes 7c from a single side profile figure in Kurokawa ignores the explicit disclosures in Fig. 1 of Kurokawa and Kurokawa's structure. As shown in figure 1 below, the ventilation holes 7c have ample space between them that would allow for heat sinks or fins to be placed *without* covering the ventilation holes which would allow for heat dissipation from the electronic components as described above (and as I explicitly state in my declaration).



No Heat Dissipating Means

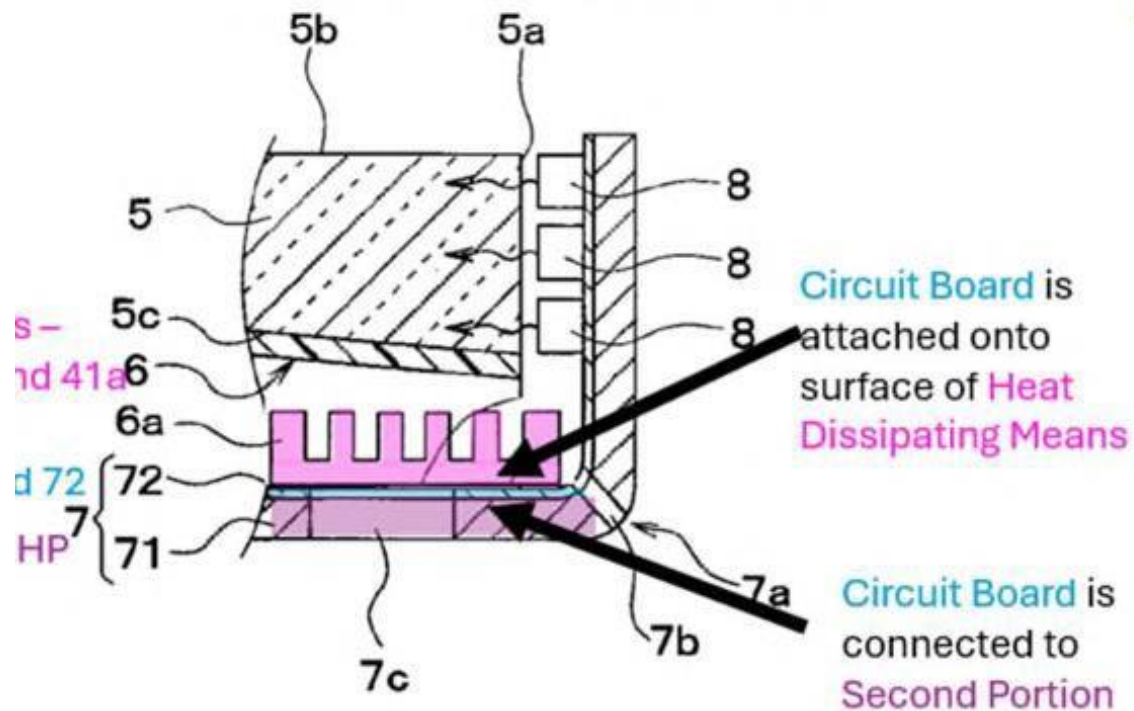


Petition at 72

Ex. 1005 at Fig. 4 (excerpt)

No Heat Dissipating Means

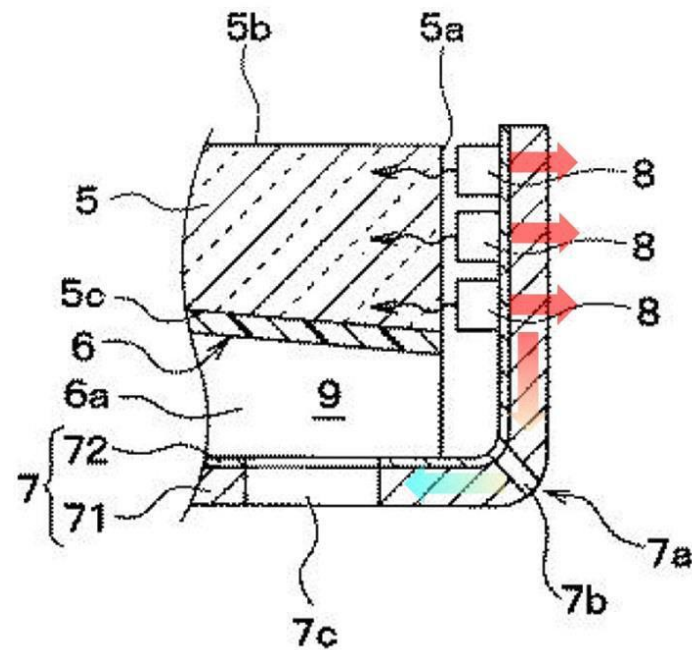
【 図 2 】 Kurokawa and Isoda
Combined Demonstrative



Petition at 72

As a result, the heat dissipation through what Dr. Baker identified as the second portion is likely to be minimal or may even be non-existent. Regardless, a POSITA

[Fig. 2]



Ex. 2020 (Bretschneider) ¶ 203

Optronic Sciences LLC, Ex. 2028

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Thank you.