

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

BOE Technology Group Co., Ltd,
Petitioner,

v.

Optronic Sciences LLC
Patent Owner

IPR2024-01130
Patent No. 7,168,842

PATENT OWNER'S PRELIMINARY RESPONSE

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Table of Authorities

Cases

<i>Apple Inc. v. Fintiv, Inc.</i> , IPR2020-00019, Paper 11 (PTAB Mar. 20, 2020)	21, 22, 23
<i>Sotera Wireless, Inc. v. Masimo Corp.</i> , IPR2020-01019, Paper 12 (PTAB Dec. 1, 2020)	22, 23

Statutes

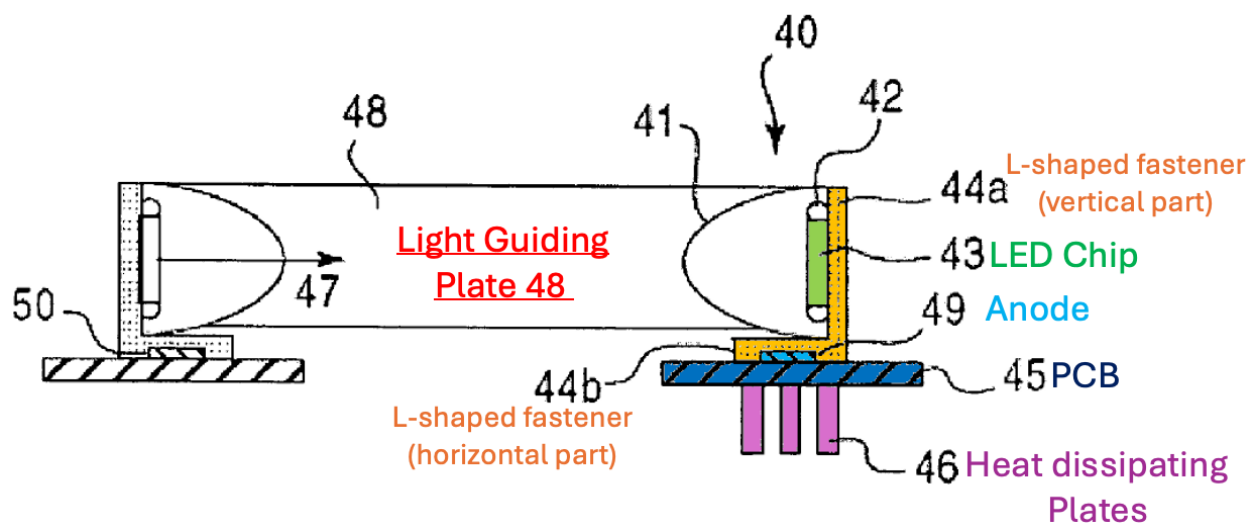
35 U.S.C. § 102	7, 15
35 U.S.C. § 103	13, 15, 19

Patent Owner's Exhibit List

Exhibit	Description
2001	Docket Control Order from <i>Optronic Sciences LLC v. BOE Tech. Group Co., Ltd.</i> , No. 2:23-cv-00549-JRG, Dkt. 33 (E.D. Tex. Aug. 5, 2024).
2002	Optronic Sciences LLC's Infringement Contentions from <i>Optronic Sciences LLC v. BOE Tech. Group Co., Ltd.</i> , No. 2:23-cv-00549-JRG (E.D. Tex. July 19, 2024).
2003	BOE Technology Group Co., LTD's Invalidity Contentions from <i>Optronic Sciences LLC v. BOE Tech. Group Co., Ltd.</i> , No. 2:23-cv-00549-JRG (E.D. Tex. Oct. 25, 2024).
2004	Machine translation of JP2004-279262, retrieved from https://patents.google.com/patent/JP2004279262A/en?q=JP2004-279262 on October 26, 2024.

I. Introduction

Patent 7,168,842 to Chou et al. teaches an innovative LED design that “requires minimal space while producing maximum luminosity.” Ex. 1001 at 1:10–11. The space is minimized using a design where an L-shaped fastener causes the LED to be vertically stacked over other components including heat dissipating plates. The heat dissipating plates allow more current and better thermal performance, producing maximum luminosity. Figure 4 below shows an example of the design:



Ex. 1001 at Fig. 4 (annotated by Patent Owner).¹ This design starts at the bottom right with a horizontal printed circuit board (“PCB”) 45. Below the PCB 45 are vertical heat-dissipating plates 46 that dissipate heat in a space-efficient design. Compare Ex. 1001 at Fig. 4, with Fig. 2 (showing conventional horizontal layout for

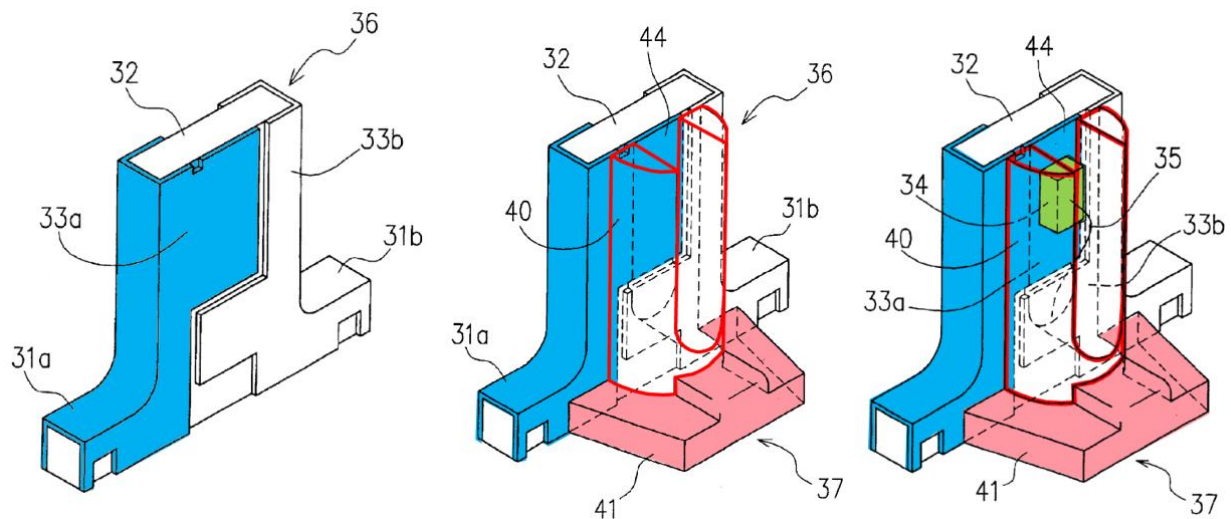
¹ All coloring herein are annotations.

plates 23). The horizontal part 44b of the L-shaped fastener is mounted to the top of the horizontal PCB 45 and an anode 49. An LED chip 43 is vertically mounted on the vertical portion 44a of the L-shaped fastener. The LED chip 43 emits light toward the lens 41 and longitudinally into the light guiding plate 48.

The L-shaped fastener 44a+44b provides many benefits. First, mounting the LED chip 44 vertically above the PCB 45 and vertically extending the heat-dissipating plates 46 reduces the footprint of the device because the LED chip 44, PCB 45, and heat-dissipating plates 46 are vertically stacked. Second, light is emitted longitudinally into the light guiding plate 48 to improve luminosity. Third, the heat-dissipating plates 46 efficiently dissipates heat for improved thermal performance, allowing greater power delivery and luminosity.

In the first primary reference, Uekusa's Figure 1 shows a very different design. Ex. 1008. The following figures 5–7 show that Uekusa's LED chip 34 is “fixed on” an electrode 33a (like the anode 49 of Patent 7,168,842), which is not an L-shaped fastener. Ex. 1008 at 3:63–65. What Petitioner points to as the horizontal part of the L-shaped fastener are parts 37/41, which are a “resin forming section 37 [that] is composed of a generally U-shaped frame 40 . . . and a plate-shaped extension part 41 which is formed integrally with the frame 40.” Ex. 1008 at 4:4–7. None of the resin forming section 37, the U-shaped frame 40, nor the plate-shaped extension part 41 are integrally formed with the electrode 33a that LED chip 34 is fixed on.

Ex. 1008 at 4:4–7, 4:35, 5:57–58. The “**extension part 41** has a generally trapezoidal shape [not an L-shape] and is formed . . . with a rectangular mounted portion 42 projecting from the **extension part 41**.” *Id.* at 4:11–14. Thus, Uekusa’s **resin forming section 37** is an extension of the **U-shaped frame 40**, not an extension of the **electrode 33a**.



Ex. 1008 at Fig. 5–7.

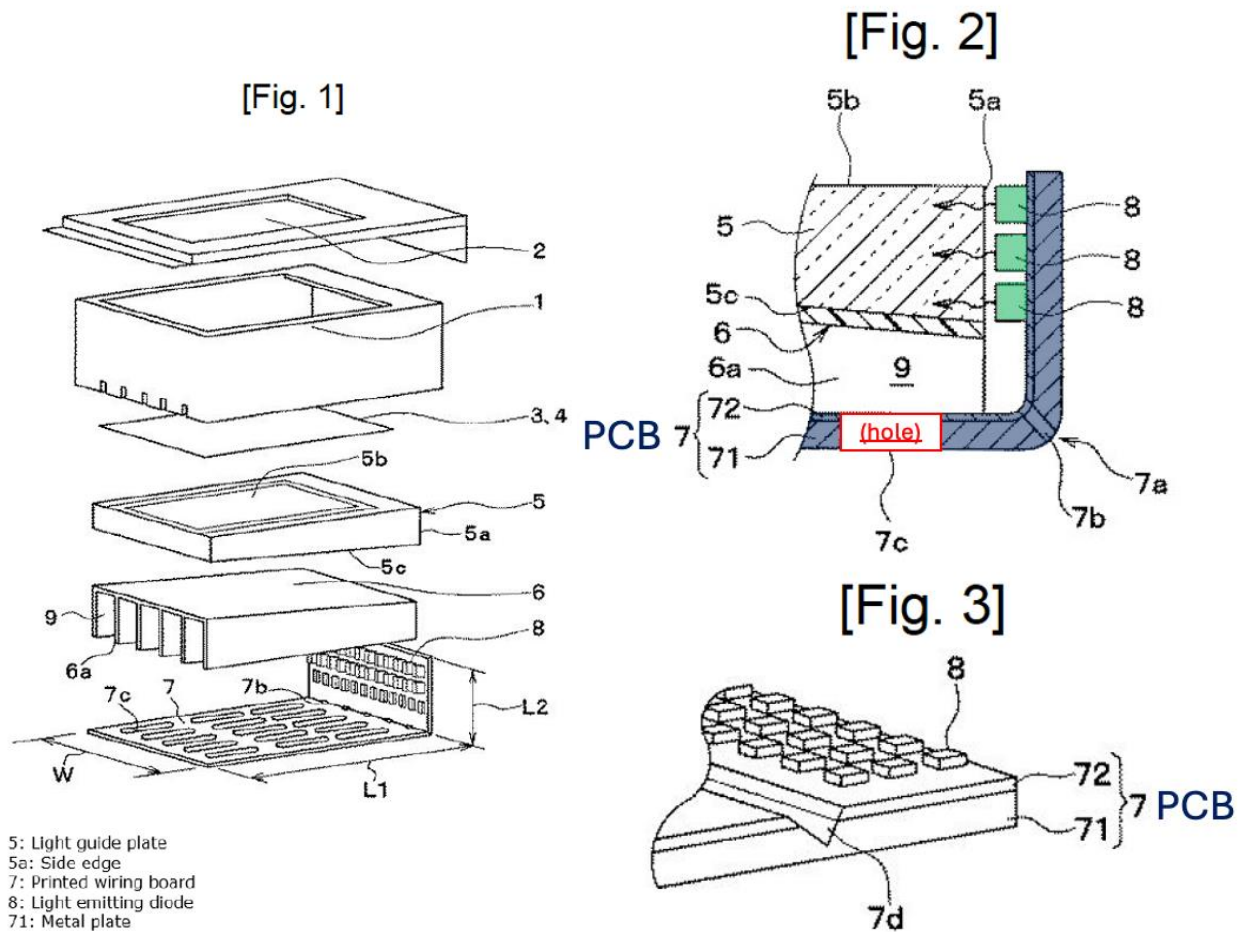
The **LED chip 34** is disposed within a concave cavity of the **frame 40**. *Id.* at 4:28–36. The **U-shaped frame 40** and the **extension part 41** are formed of “a non-transparent resin of white color . . . because it can reflect effectively the light from the light emitting diode element 34.” *Id.* at 4:54–60.

In summary, 1) the **LED chip 34** is fixed on only the **electrode 33a**, 2) the “**plate-shaped extension part 41** which is formed integrally with the **frame 40**” do not even touch the **LED chip 34** (much less fasten it to anything), and 3) the

electrode 33a and resin forming section 37 are distinct components that are **not** collectively a fastener.

The second primary reference, Kurokawa, also shows a very different design that also lacks an L-shaped fastener. Ex. 1004 at Figs. 1, 2. Instead, Kurokawa's design bends the PCB 7 itself into an L-shape, and the LED 8 is mounted directly on the PCB 7. *Id.* at [0009] ("a printed wiring² board (7) on which the light emitting diodes (8) are mounted), Fig. 3 (showing LEDs 8 directly mounted to PCB 7 without any intermediate L-shaped fastener). Kurokawa's design also lack external heat dissipating plates. Instead, the LEDs release heat **inside** the package, and the heat dissipates through ventilation holes 7c. *Id.* at [0019].

² Petitioner failed to submit an actual copy of the Kurokawa reference. Ex. 1004. Instead using the unusual phrase "printed wiring board" in place of "printed circuit board." See Ex. 2004 at Abstract for a Google machine-translated version that uses "printed circuit board" instead of "printed wiring board."



Ex. 1004 at Figs. 1–3.

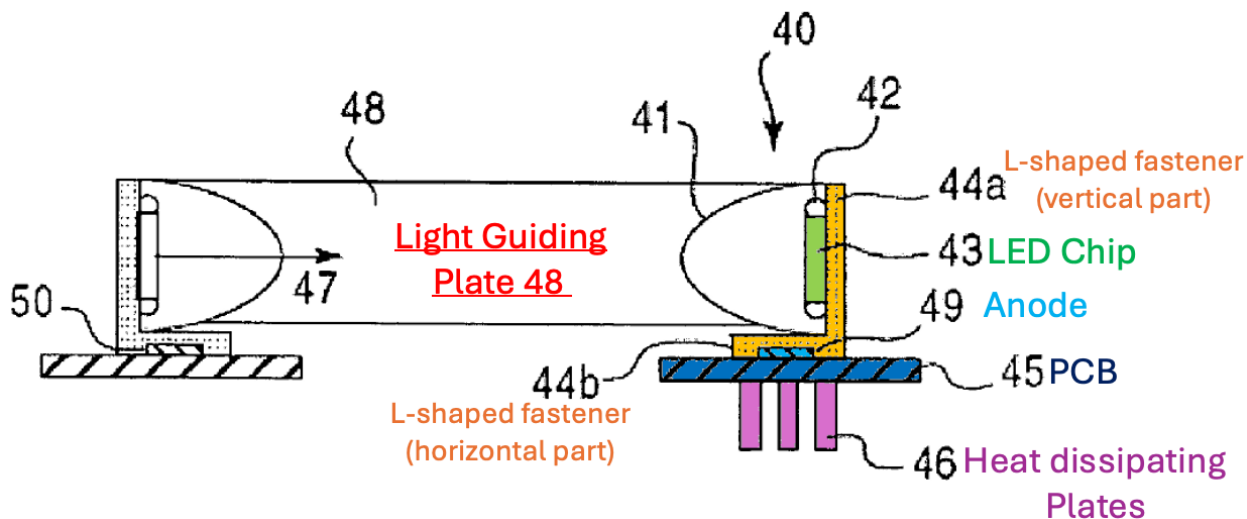
Neither Uekusa nor Kurokawa have the L-shaped fastener recited in the claim.

II. Claim Construction

For purposes of institution, the Board need not construe either of the terms that Petitioner proposed. Furthermore, the Board may adopt Petitioner’s proposal the remaining terms should be given their plain and ordinary meanings. Petition at 3. The Board should, however, make a limited ruling on what cannot be reasonable encompassed within the plain and ordinary meaning of “fastener.”

A. “fastener” – all claims

Patent Owner respectfully submits that any reasonable construction of “fastener” cannot refer to the other numbered parts of Figure 4 below that are not annotated as “fastener.” Any such construction would go against the embodiment and go against the common-sense idea that different words have different meanings. Thus, any reasonable construction of “fastener” should not mean the lens 41, wires 42, LED chip 43, PCB 45, heat dissipating plates 46, light guiding plate 48, or anode 49.



Ex. 1001 at Fig. 4. Additionally, the “fastener” cannot be the same as the circuit board. This is because claims 5 and 7 both recite a “circuit board” and the “fastener” as separate elements.

III. Institution Should Be Denied Because the References Lack the L-Shaped Fastener

The Board should deny institution because the Petition fails to identify critical

claim elements in each ground and thus has not established a reasonable likelihood of prevailing on the merits.

It would be unfair and unreasonable to invalidate this patent when the prior art lacks an L-shaped fastener.

A. Ground 1 (Uekusa § 102, Claims 3-9): Uekusa Lacks the L-Shaped Fastener

- 1. Independent Claim [3b]: “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.”**

Uekusa does not have this claimed “first fastener.” The Petition merely points to a mix of both fastener and non-fastener structures that collectively happen form something that is L-shaped when viewed from a specific perspective. The claim requires, in part, “a first fastener having a first portion and a second portion . . . wherein the first portion and the second portion . . . form a substantially L-shaped structure.” The claim does not say, “a first fastener that is arranged in L-shaped structure in combination with an extension portion of a light reflector cavity.”

For purposes of deciding institution only, the Board may assume that either Uekusa’s portion 32 and/or electrode 33a are the claimed “first portion” of the

fastener.³ Petition at 11–13 (presenting alternative theories).

Even so, Petitioner has failed to identify the claimed “second portion” of that same claimed fastener. Instead, Petitioner points to something separate: an extension 41 (including portion 42 thereof) of Uekusa’s U-shaped frame. Petition at 11. These do not form a part of the first fastener for three reasons. First, they are not considered to be integral with the other parts that Petitioner alleges to be a “fastener” that actually fastens the LED chip 41. Second, they are not fastening anything at all, much less fastening the same LED chip 41. Third, their purpose is to reflect and redirect light—not to fasten other components.

Uekusa makes clear that extension 41 (and portion 42 thereof) are not integrally formed with electrode 33a or with the upright portion 32. As explained above, the “plate-shaped extension part 41 [] is formed integrally with the frame 40,” not with the electrode 33. Ex. 1008 at 4:4–7. Indeed, the electrode 33 would be made of a conductor, whereas the extension part 41, its portion 42, and the U-shaped frame are made of a non-transparent resin. Ex. 1008 at 4:4–7, 4:54–60. They are separate, distinct parts made of different materials.

None of the U-shaped frame, the plate-shaped extension part 41, nor the mounted portion 42 of the plate-shaped extension 41 are a “fastener.” They do not

³ Both of Petitioner’s theories have problems to be addressed in the full Patent Owner Response. Nothing in this section should be construed as an admission of any interpretation of “first portion.”

fasten the LED chip 41 to anything because the LED chip 41 is mounted to the electrode 33a in a cavity of the U-shaped frame 40. It is unclear, what, if anything, they contribute to the fastening of.

Instead of performing any fastening-related function, the plate-shaped extension part 41 and U-shaped frame 40 collectively act as a white, concave cavity for reflecting light from the LED. *Id.* at 4:45–60. Their purpose is focusing light, not fastening LED chips. They are more analogous to the lens 41 of Patent 7,168,842 than to the fastener 44. *See* Ex. 1001 at Fig. 4.

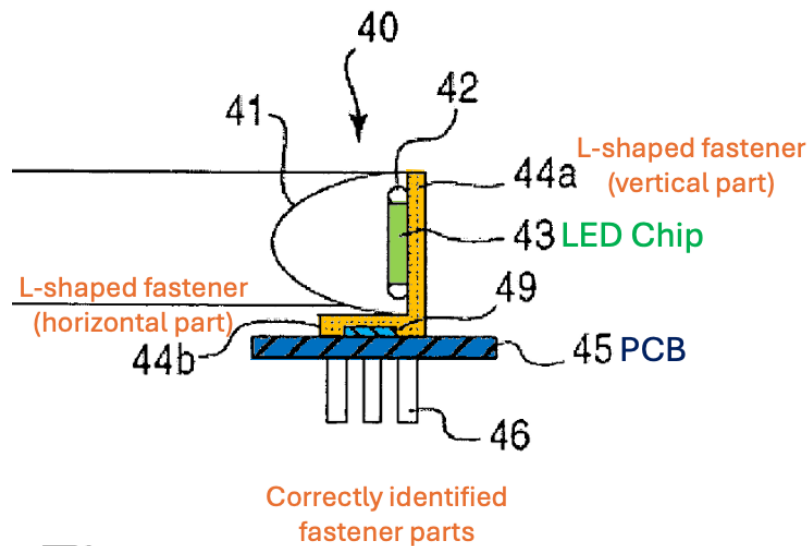


Fig.4

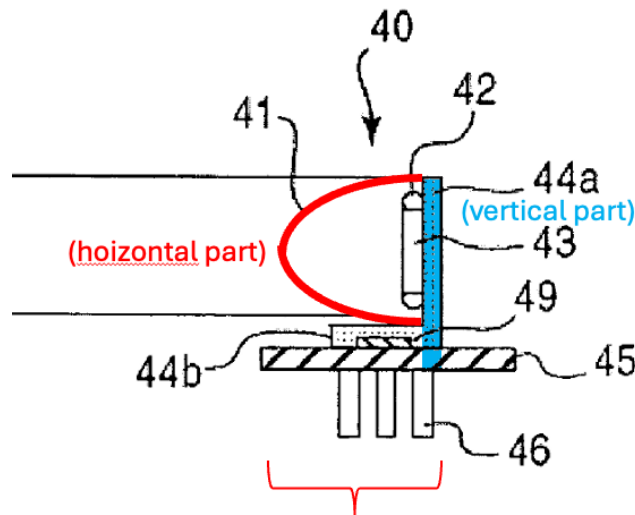


Fig.4

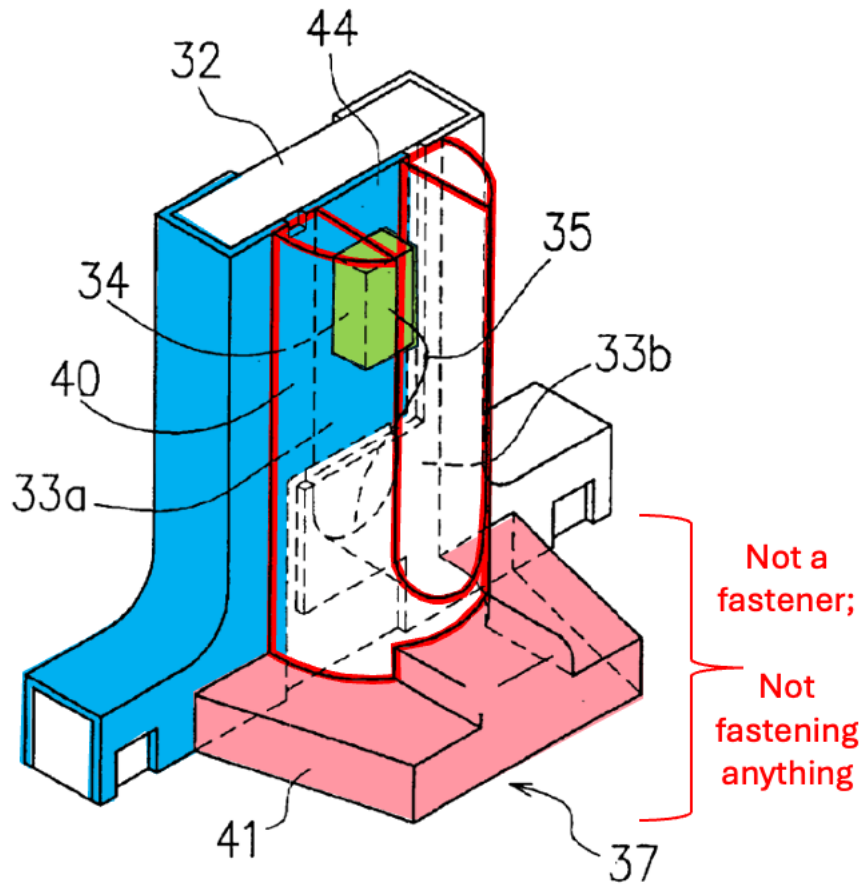
Analogy of what
Petitioner argues is
the "fastener"

Ex. 1001 at Fig. 4 (excerpted, annotated differently).

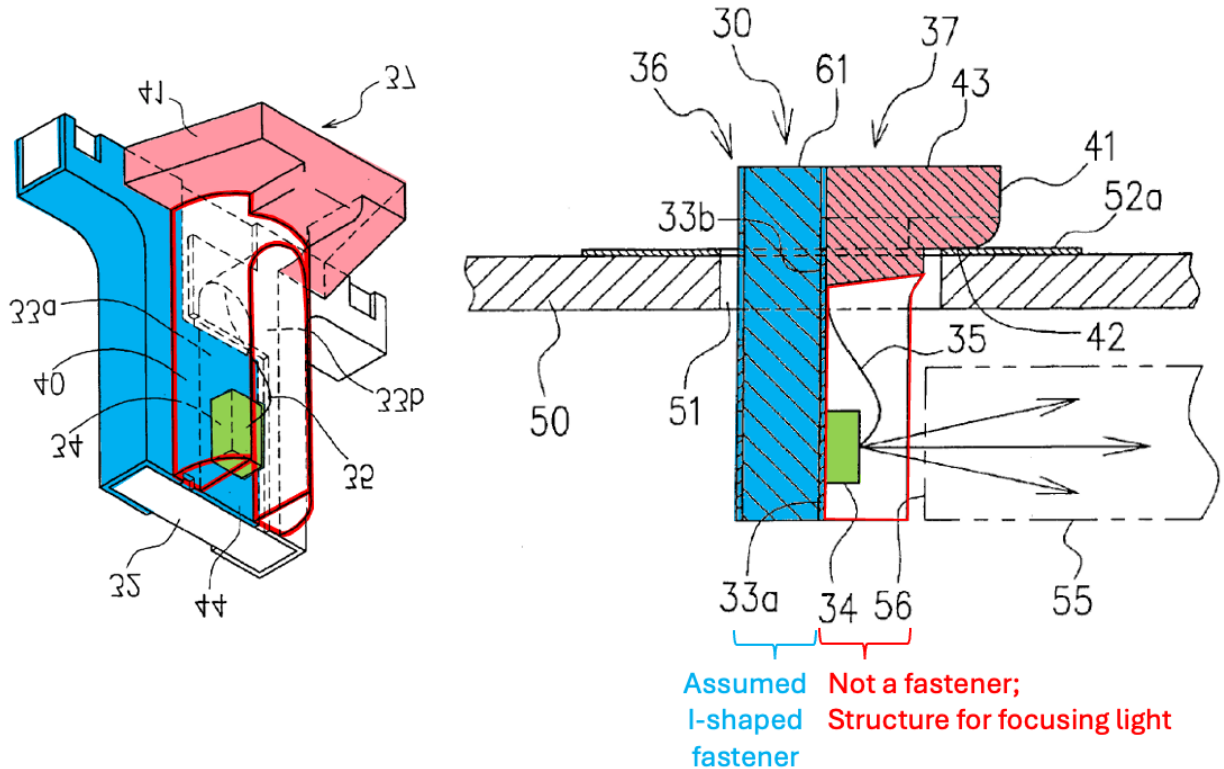
Indeed, there is otherwise no evidence to support Petitioner's arguments. The only evidence in the record is the expert testimony of Dr. Baker. His declaration is basically an identical copy of the petition, including the font colors, minus the citations to itself. *Compare* Petition at 10–13, with Ex. 1002 at 33–36.

Dr. Baker does not provide any opinion that the plate-shaped extension part 41 of the U-shaped frame or the mounted portion 42 of the plate-shaped extension 41 do any type of "fastening" of anything, much less fastening of the LED chip that is recited in claim element [3c]. Ex. 1002 at 33–36. Dr. Baker does not deny that the extension part 41 is an integral extension of the U-shaped frame 40, not an extension of the electrode 33 or upright portion 32. Dr. Baker does not deny that the purpose of the U-shaped frame and its extension is to be a white, reflective surface for

focusing light, not for fastening.



Ex. 1001 at Fig. 7. As better seen in Patent Owner's version of Figure 3 below, there is no L-shaped fastener in the prior art:



Ex. 1001 at Fig. 7 (flipped, rotated), Fig. 3. As seen from the figure, when the red-shaded and red-outlined light reflecting structures are not improperly considered to be part of a “fastener,” all that remains of Petitioner’s theory is an I-shaped fastener that does not meet the claim limitation. Petitioner is unlikely to succeed on this theory.

2. Independent Claim [7b]: same argument as for [3b]

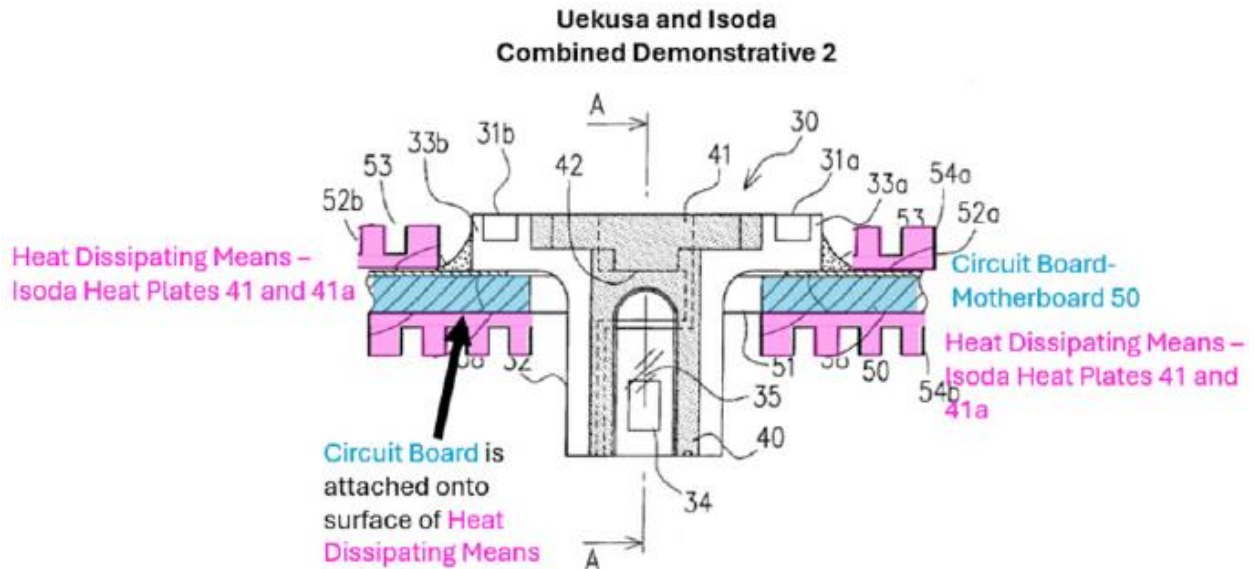
Petitioner’s entire argument for independent claim [7b] refers back to its arguments for claim [3b]. Petition at 26–27. Petitioner is unlikely to succeed on claim [7b] for the same or similar reasons discussed for claim element [3b] in the immediately preceding subsection.

3. Dependent Claims 4–6 and 8–9

Dependent claims 4–6 depend from claim 3. Dependent claims 8–9 depend from claim 7. None of Petitioner’s arguments regarding these dependent claims cures the deficiencies regarding independent claims 3 and 9. Because the Petition fails to demonstrate a reasonable likelihood that the underlying independent claims are anticipated for at least the reasons discussed above, the Petition similarly fails to demonstrate a reasonable likelihood of success regarding these dependent claims.

B. Ground 2 (Uekusa and Isoda § 103, Claims 3–9): The Proposed Modification Is Irrelevant

In Ground 2, the Petition cites back to its argument in claim 1, except for further adding obviousness arguments about the addition of heat dissipating fins. Petition at 29 (“It would have been obvious . . . to combine Uekusa’s teachings related to LCD backlight devices utilizing LEDs with Isoda’s teachings of enhanced heat dissipation methods by placing heat dissipating fins disclosed in Isoda to the left, right, and back sides . . .”).



Id. This proposed modification does nothing to the L-shaped fastener that is missing from Uekusa, so it does not cure the deficiencies from Ground 1.

1. Independent Claim [3b]: Same Arguments as in Ground 1

For independent claim element 3b, the Petition merely cites back to its argument from Ground 1, without relying on Isoda or any proposed modification. Petition at 36. Thus, Petitioner's Ground 2 argument for claim 3b is similarly unlikely to succeed on the merits for the reasons discussed in Ground 1 above.

2. Independent Claim [7b]: Same Arguments as in Ground 1

For independent claim element [7b], the Petition merely cites back to its argument from claim element [3b], without relying on Isoda or any proposed modification. Petition at 36, 46. Thus, Petitioner's Ground 2 argument for claim 7b is similarly unlikely to succeed on the merits for the reasons discussed in Ground 1

above.

3. Dependent Claims 4–6 and 8–9

Dependent claims 4–6 depend from claim 3. Dependent claims 8–9 depend from claim 7. None of Petitioner’s arguments regarding these dependent claims cures the deficiencies regarding independent claims 3 and 9. Because the Petition fails to demonstrate a reasonable likelihood that the underlying independent claims are obvious for at least the reasons discussed above, the Petition similarly fails to demonstrate a reasonable likelihood of success regarding these dependent claims.

C. Ground 3 (Uekusa and AAPA § 103, Dependent Claims 6 and 9)

Dependent claim 6 depends from claim 3. Dependent claim 9 depends from claim 7. None of Petitioner’s arguments regarding these dependent claims cures the deficiencies regarding independent claims 3 and 9. Because the Petition fails to demonstrate a reasonable likelihood that the underlying independent claims are obvious for at least the reasons discussed above, the Petition similarly fails to demonstrate a reasonable likelihood of success regarding these dependent claims.

D. Ground 4 (Kurokawa § 102, claims 3–9): Missing the L-Shaped Fastener

Kurokawa does not have any L-shaped fastener for reorienting the chip with respect to the PCB. Kurokawa just teaches to bend the PCB itself—an altogether different technique.

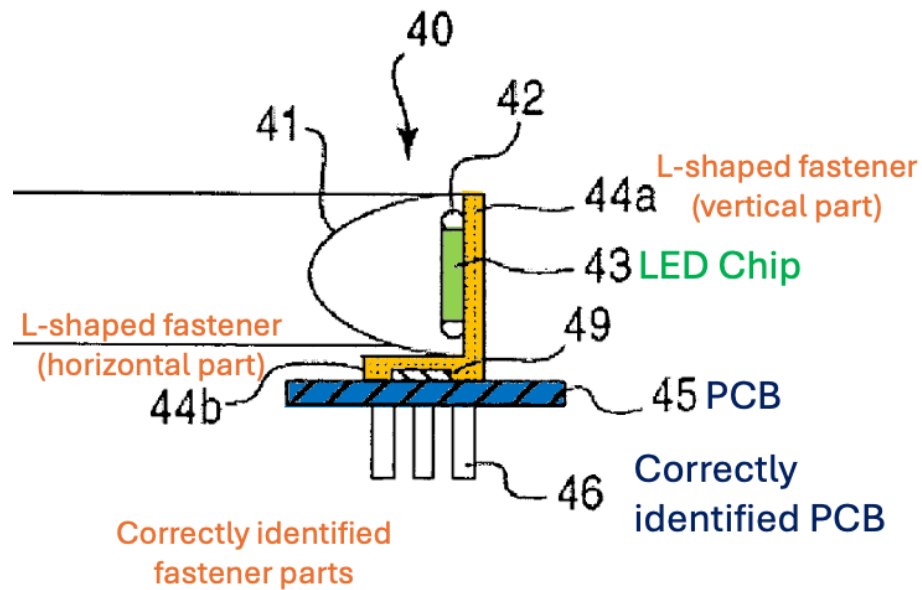
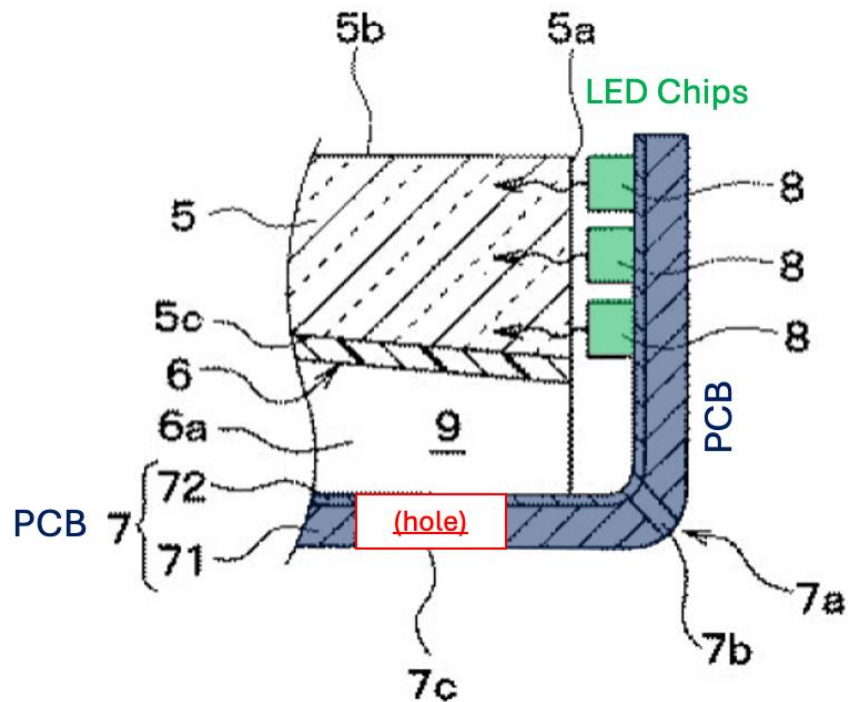


Fig.4



Compare Ex. 1001 at Fig. 4 (showing fastener between PCB and chip), with Ex. 1004 at Fig. 2 (bending the PCB itself). These are different technologies.

1. **Independent Claim [3b]: “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.”**

Kurokawa lacks this fastener because Kurokawa teaches to bend a flexible printed circuit board instead of an intermediate fastener between the PCB and the chip. Thus, there is no claimed fastener.

No reasonable construction allows for the fastener to be the entire PCB itself. Patent 7,168,842 shows that the “fastener” and the “circuit board” are different parts. Ex. 1001 at Fig. 4. Patent 7,168,842 describes the “fastener” and the “circuit board” as having different roles. *E.g.*, Ex. 1001 at 3:6–38. The claims separately recite the fastener and the circuit board. *Id.* at claims 1, 5, 6, 7.

Bending the entire PCB itself to reorient the chip is a fundamentally different technology in comparison to the teaching of Patent 7,168,842, which is to use an L-shaped fastener to reorient the chip.

Petitioner’s argument for claim 3 is inconsistent with its own argument for claims 5 and 6. In its argument for claim 1, Petitioner argues that Kurokawa’s flexible printed wiring board 72 (either alone or in combination with a layer of metal plate 71) are the claimed “first fastener.” Petition at 53–54. In its argument for claims 5 and 6 that both further recite a “circuit board,” Petitioner argues that the

same flexible printed wiring board 72 is the “circuit board.” Petition at 58–61. Kurokawa’s printed wiring board 72 cannot simultaneously be both the fastener itself and the circuit board that the fastener is fastened to.

2. Independent Claim [7b]: same argument as for [3b]

Petitioner’s entire argument for independent claim 7 refers back to its prior arguments. Petition at 66–67. Petitioner is unlikely to succeed on claim [7b] for the same or similar reasons discussed for claim element [3b] in the immediately preceding subsection.

Additionally, within claim 7, element [7d] recites “a circuit board connecting the second portion of the first fastener,” making it clear that the circuit board is a *different* component that is connected to the fastener. Petitioner relies on the same circuit board 7 (consisting of 71 with or without 72) of Kurokawa for meeting these different claim elements—a hindsight argument that does not make sense.

3. Dependent Claims 4–6 and 8–9

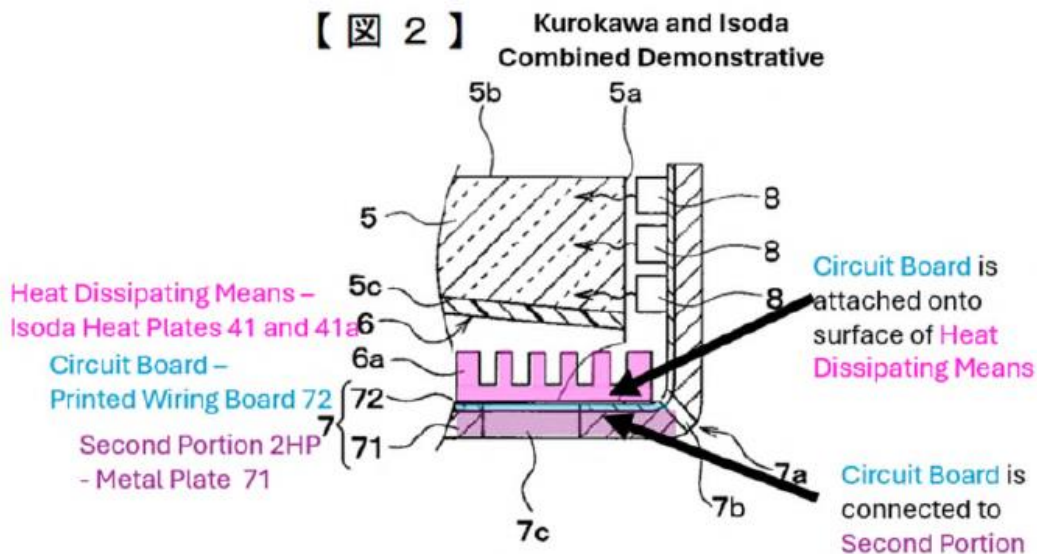
Dependent claims 4–6 depend from claim 3. Dependent claims 8–9 depend from claim 7. None of Petitioner’s arguments regarding these dependent claims cures the deficiencies regarding independent claims 3 and 7. Because the Petition fails to demonstrate a reasonable likelihood that the underlying independent claims are anticipated for at least the reasons discussed above, the Petition similarly fails to demonstrate a reasonable likelihood of success regarding these dependent claims.

E. Ground 5 (Kurokawa § 103, claims 4, 7–9): Flipping Is Irrelevant

In Ground 5, Petitioner proposes to flip Kurokawa’s device upside-down to meet an alternative claim construction of “above.” Petition at 67–68. This has nothing to do with Kurokawa’s lack of an L-shaped fastener. For the same reasons discussed under Ground 4 above, claims 4 and 7–9 are not obvious.

F. Ground 6 (Kurokawa, Isoda § 103, claims 4–9): The modification of blocking ventilation holes is irrelevant

In Ground 6, Petitioner proposes to block Kurokawa’s ventilation holes by covering them with heat dissipating plates inside of the display device (in clear hindsight provided by claim 6, as heat would no longer escape via the original ventilation holes 7c). Petition at 72.



However, even this hindsight modification does not address the fundamental deficiency with Kurokawa discussed above in Ground 4. For the same reasons

discussed under Ground 4 above, claims 4 and 7–9 are not obvious.

G. Grounds 7 and 8 (Fukuta, claims 3 and 4): Irrelevant

The Fukuta prior art is asserted against claims 3 and 4 only. Notably, Fukuta describes a LED fabricated within a semiconductor device, not an LED that is mounted on an PCB. Claims 3 and 4 have no mention of a PCB. The other claims 5–9 either recite a “circuit board” or depend on a claim that recites a circuit board.

To simplify the issues and facilitate denial of this IPR Petition, Patent Owner hereby disclaims claims 3 and 4 of U.S. Patent No. 7,168,842. Patent Owner is in the process of filing form PTO/SB/43 (11-23) in the file history, and this is expected to be completed shortly. Thus, there is nothing left in Grounds 7 and 8 that Petitioner could succeed on.

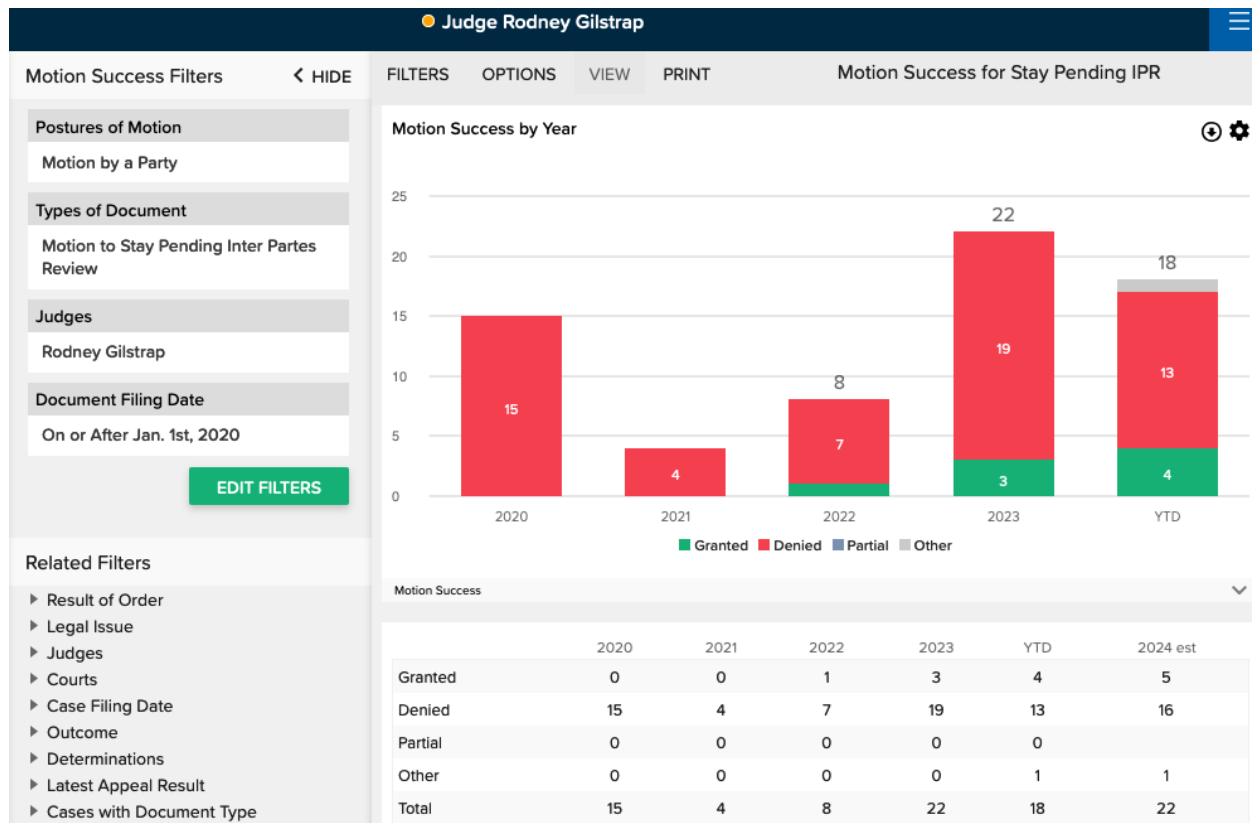
IV. The Board Should Deny Institution Under *Fintiv*

The Board should not waste its limited resources on reconsidering the same types of repeatedly rejected arguments when, under the *Fintiv* factors, the Board’s decision will likely have no effect whatsoever on trial. The final written decision is not expected until January 29, 2026, after the trial scheduled for January 5, 2026.

The *Fintiv* factors are: 1) whether the court granted a stay, or evidence exists that one may be granted if a proceeding is instituted; 2) a comparison of the district court trial date to the Board’s statutory deadline; 3) an investment in the district court proceedings; 4) overlap between issues raised in the petition and in the parallel

proceeding; 5) overlapping parties; and 6) other considerations. *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 at 5 (PTAB Mar. 20, 2020) (precedential).

Factor 1 (a stay) weighs against institution. Judge Gilstrap has rarely stayed a patent case pending *inter partes* review, only granting 8 of 67 motions to stay pending an IPR (12%) since 2020 according to a report from Docket Navigator:



Docket Navigator Motion Outcomes Report (October 17, 2024)

Because of the 88% chance that a stay will be denied, this factor weighs against institution.

Factor 2 (the trial and written decision deadlines) also weighs against institution. Trial is set for January 5, 2026. Ex. 2001 at 1. The final written decision

is not expected until February 16, 2026, more than a month after trial. These facts weigh in favor of denying institution. *Fintiv* at 9.

Factor 3 (investment in court proceedings) is neutral. The deadline for an institution decision is February 16, 2025. By then, the parties will have spent *over a year* litigating in district court and be close to the start of the claim construction process set for March 11, 2025. When the stage of the case just before *Markman* is balanced against the year-long investment by the parties, this factor should be neutral. *Fintiv* at 9–10.

Factor 4 (overlap of the issues) weighs against institution because Petitioner asserts the same prior art in district court, without a *Sotera*-type stipulation, such that the duplicative arguments in these two forms are inefficient. *See Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12 at 18–19 (Dec. 1, 2020) (precedential). In litigation, Petitioner asserts 13 patent publications, including Uekusa, Kurokawa, and Fukuta. Ex. 2003 at 6–7. Moreover, Petitioner is asserting **85** systems as prior art. *Id.* at 8–10. Due to the sheer volume of systems identified as prior art in litigation, even a *Sotera* stipulation will have little effect. Regardless of what the Board does, Petitioner is likely to wastefully proceed with parallel invalidity arguments in litigation asserting at least one of its 85 systems as prior art. The Board should deny institution in the interest of efficiency, so that Petitioner will pick its best prior art references—including from among any system art—and

present Petitioner's best arguments in a single proceeding.

Petitioner asserted claims 3, 4, 5, 7, and 8 in the district court. Ex. 2002, *passim*. Here, Patent Owner additionally challenges dependent claim 6, but as seen in Section III above, Petitioner's arguments about dependent claim 6 fall with independent claim 3. Thus, there is almost complete overlap. This factor should be neutral.

Factor 5 (same parties) favors denial. It is undisputed that the parties in the IPR are the same as those in litigation, so "this factor supports denying institution." *Sotera*, Paper 12 at 19.

The final *Fintiv* factor considers the merits and other circumstances. For the reasons in Section III above, the Petition is not likely to succeed on the merits, much less reach any level of compelling merit. The prior art is fundamentally different because they do not teach L-shaped fasteners. This factor heavily weighs against institution.

V. Conclusion: The Board Should Deny the Petition

The Board should deny the Petition on the merits because both primary references fail to disclose or render obvious the L-shaped fastener. Alternatively, the Board should deny institution under *Fintiv* to avoid wasting its limited resources writing a decision that will not issue until about a month after trial.

Respectfully submitted,

Dated: October 29, 2024

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CERTIFICATION REGARDING WORD COUNT

Pursuant to 37 C.F.R. §42.24(d), Patent Owner certifies that there are 3,866 words in the paper excluding annotations and excluding the portions exempted under 37 C.F.R. §42.24(a)(1). Even with annotations, the word count is less than 14,000.

Dated: October 29, 2024

/s/ Qi Tong
Qi Tong

CERTIFICATE OF SERVICE (37 C.F.R. § 42.6(e)(1))

The undersigned hereby certifies that the above document was served on October 29, 2024, by filing this document through P-TACTS as well as delivering a copy via electronic mail upon the following attorneys of record for Petitioners:

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