UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

THERMALTAKE TECHNOLOGY CO., LTD. and

THERMALTAKE INC.,

Petitioner,

v.

CHEN, CHIEN-HAO,

Patent Owner.

IPR2024-01230

U.S. Patent No. 10,690,336 B1

Declaration of David B. Tuckerman, Ph.D. in Support of Patent Owners' Response and Contingent Motion To Amend

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Dated: May 14, 2025

Respectfully Submitted by:

David B. Tuckerman

David B. Tuckerman

TABLE OF CONTENTS

I. INTRODUCTION 1

II. BACKGROUND AND QUALIFICATIONS 2

III. LEGAL PRINCIPLES 6

IV. LEVEL OF ORDINARY SKILL IN THE ART 7

V. MATERIALS CONSIDERED 9

VI. OVERVIEW OF THE '336 PATENT 10

VII. PRIORITY DATE OF THE '336 PATENT 22

VIII. GROUND 4: LAI ALONE OR IN VIEW OF Hasegawa FAILS TO DISCLOSE Claim limitations 1[b], 1[c], and 1[d] 23

- A. Petitioner Fails To Show Lai Alone or in View of Hasegawa Teaches Limitation 1[b], "an Illumination Area on at Least Two Sides of the Fan at Top of the Body" 23
- B. Petitioner Fails To Show That Lai Teaches Limitation 1[c]: "a Power Socket and a First Connector on *One Side* of the Body, and a Second Connector on *Another Side* of the Body" 31
- C. Petitioner Fails to Establish Lai Alone or in View of Hasegawa Teaches "the Power Socket [Is] on the [Same] One Side of the Body" as the "First Connector" 38
- D. Petitioner Fails to Establish That Lai Alone or in View of Hasegawa Teaches "the First Connector of the Body [of the Illumination Fan] Is Connected with a Second Connector of a Body of Another Illumination Fan" 41

IX. GROUND 1: TSUJI ALONE OR IN VIEW OF HUANG FAILS TO TEACH LIMITATIONS 1[b], 1[c], AND 1[d] 44

- A. Overview of Tsuji (Ex-1007) 44
- B. Petitioner Fails To Show That Tsuji in View of Huang Teaches the Same Side Limitation 49

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 2 of 105, IPR2024-01230

C. Petitioner Fails To Show Tsuji in View of Huang Teaches Limitation 1[d]'s Requirement that "the First Connector of the Body [of the First Illumination Fan] Is Connected with a Second Connector of a Body of Another [*i.e.*, a Second] Illumination Fan". 54
D. Petitioner Fails To Show That Tsuji in View of Huang Teaches Limitation 1[b], "an Illumination Area on at Least Two Sides of the Fan at Top of the Body" 56

X. GROUNDS 2 & 6: petitioner fails to show Echazarreta is combinable with tsuji/huang or lai/Hasegawa 59

A. The Limitations of Claim 4 59
B. Petitioner Fails To Show Echazarreta Is Combinable with Tsuji/Huang or Lai/Hasegawa.....62

XI. GROUNDS 3 & 7: petitioner fails to show CHOU Or Liu TEACHES limitations in claim 5 and is combinable with tsuji/huang or lai/Hasegawa.....65

XII. CONCLUSION.....78

XIII. MOTION TO AMEND 78

XIV. RIGHT TO SUPPLEMENT.....82

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 3 of 105, IPR2024-01230

I, DAVID B. TUCKERMAN, DECLARE AS FOLLOWS:

I. INTRODUCTION

1. I have been retained by the Patent Owner, as a technical expert to provide my opinions regarding U.S. Patent No. 10,690,336 (the "'336 patent") in this declaration in support of Patent Owners' Response and Contingent Motion to Amend ("Declaration").

2. It is my opinion that none of the asserted prior art, alone or in combination, renders any of the challenged claims in this proceeding obvious under 35 U.S.C. § 103. My opinions and the bases and reasons for them are set forth in this Declaration.

3. I am being compensated at the rate of $550.00 per hour for my work on this matter. My compensation in no way depends on the outcome of this proceeding, the content of my testimony, or any issues involved in or related to this proceeding.

4. I reserve the right to modify or supplement my opinions, as well as the bases for my opinions, including based on the nature and content of the documentation, data, proof, and other evidence or testimony that Thermaltake Technology Co., Ltd. and Thermaltake Inc. (collectively "Petitioner"), or their expert(s) may present, on any additional information provided to me or found by

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 4 of 105, IPR2024-01230

me in this matter, or on further instructions or orders from the Patent Trial and Appeal Board ("PTAB").

II. BACKGROUND AND QUALIFICATIONS

5. My qualifications and experiences are set forth in Exhibit A. Additionally, I provide the following overview of my background as it pertains to my qualifications for rendering expert opinions in this matter.

6. I have two B.S. degrees, one in Electrical Engineering and another in Physics, and an M.S. in Electrical Engineering and Computer Science, all from Massachusetts Institute of Technology, Cambridge, Massachusetts. I also have a Ph.D. in Electrical Engineering and an M.B.A. from Stanford University, Stanford, California. My Ph.D. thesis, titled "Heat-Transfer Microstructures for Integrated Circuits", focused on developing new, high-performance liquid-cooled heat sinks for thermal management of high-speed integrated circuits, and received the Fannie and John Hertz Foundation Hertz Thesis Prize.[1] The key results in my Ph.D. thesis were published in the peer-reviewed journal IEEE Electron Device Letters with the title "High-Performance Heat Sinking for VLSI" in 1981, and this publication has so far received over 6,800 citations in the professional literature, as reported by Google Scholar.[2] This paper was selected by the IEEE Electron Devices Society to

[1] https://www.hertzfoundation.org/hertz-fellows/awards/hertz-doctoral-thesis-prize/

[2] https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=High-Performance+Heat+Sinking+for+VLSI&btnG=

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 5 of 105, IPR2024-01230

receive the first "Paul Rappaport Award", although this new award series was not officially approved by IEEE until 1983.[3]

7. I am an experienced innovator and inventor with approximately 180 issued U.S. patents, additional foreign patents, and numerous pending applications, spanning the fields of thermal management systems, heat transfer, electronic packaging and interconnect technologies, and superconducting devices and circuits, etc. More than 20 of my patents specifically describe novel electronic interconnection technologies.

8. Upon completing my Ph.D. in Electrical Engineering at Stanford University, I joined Lawrence Livermore National Laboratory (LLNL) as a physicist and later a project leader, supervising and managing advanced R&D programs in various fields including electronic packaging and interconnect. At LLNL, I developed and published novel methods for electrically connecting silicon chips to multichip module substrates.

9. I founded nCHIP, Inc. in 1989, focusing on advanced multi-chip module technologies enabling ultracompact high-performance digital systems. After I served for 6 years as its Chief Technical Officer, nCHIP was acquired by Flextronics International Ltd. in 1995. nCHIP's technology employed novel methods for providing electrical connections between semiconductor chips using

[3] https://eds.ieee.org/awards/paul-rappaport-award

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 6 of 105, IPR2024-01230

new interconnection methods and substrates, which I published and patented during my tenure.

10. I am an experienced entrepreneur, venture capitalist, and executive leader with over 30 years of experience in founding, growing, and/or advising technology companies. While working as senior VP and CTO of Tessera Inc., I helped Tessera grow via various acquisitions, one of which led to the development of a new technology for silent air cooling of laptop computers as a replacement for fans. I also supervised the development of novel chip packaging and interconnection methods, and was an inventor on numerous patents related to electrical interconnections.

11. In 2001 I was elected by the Institute of Electrical and Electronic Engineers (IEEE) to the grade of Fellow, which is the highest membership grade, and for which selection is limited to less than 0.1% of the IEEE membership each year. I was specifically cited by the IEEE Components, Packaging and Manufacturing Technology (CPMT) Society (renamed in 2017 as the IEEE Electronics Packaging Society) "for contributions to high-performance electronic packaging and interconnection technologies, including the development of the microchannel heat sink". In 2023 I became a "Life Fellow" of the IEEE owing to my many years of active membership.

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 7 of 105, IPR2024-01230

12. I am a licensed Professional Electrical Engineer in good standing in the State of California.

13. I am currently an independent consultant through my own company Tuckerman and Associates, Inc., working on various technical and intellectual property matters in the high-tech industries. Some of my major clients have included CMEA Capital, Tessera, Intellectual Ventures, Microsoft, and Bill Gates. I consulted for Microsoft's Quantum Computing and "Cold Logic" programs for 9 years (2011-2020), including management of a 6-year research contract with Auburn University to develop high-density flexible thin-film cryogenic interconnect having optimal heat-transfer properties (*i.e.*, minimal heat leakage between temperature stages) while maintaining excellent electrical performance. A major portion of this research involved developing novel methods for making electrical connections in quantum computers and superconducting logic. I was also a consultant for the first phase of Microsoft's "Project Natick" (which implemented a demonstrative underwater datacenter off the southern California coast in 2015), including the design of the heat exchanger structures and the subsequent analysis of its actual undersea performance. I have published papers in professional journals and conference proceedings as recently as January 2025 specifically relating to novel electrical connectors and interconnection schemes, for

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 8 of 105, IPR2024-01230

use with superconducting devices and flexible superconducting cables. My publications and patents have been cited over 10,000 times, per Google Scholar.[4]

14. I have attached an Appendix A listing my qualification and experience to this Declaration.

III. LEGAL PRINCIPLES

15. I understand that claim construction is an issue of law for the PTAB. I also understand that before an infringement or validity determination can be made, the claims must be construed by the PTAB.

16. I am informed that the words or phrases of a claim are generally given their plain and ordinary meanings that they would have had to a Person of Ordinary Skill in the Art ("POSITA") at the time of the invention. To determine the meaning of a claim term, I am informed that the PTAB will look first to the claims and specification, then to the file history, and only if necessary, to extrinsic evidence such as dictionaries and treatises. I also understand that limitations generally may not be imported from the specification or any embodiment(s) into the claims.

17. It is my further understanding that the same words and phrases within a claim or claims are presumed to have the same meaning. It is also my understanding that different words and phrases within a claim or claims are presumed to have different meanings. Similarly, all words in a claim have meaning,

[4] https://scholar.google.com/citations?hl=en&user=llRI2SUAAAAJ

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 9 of 105, IPR2024-01230

and a word or phrase in a claim should not be interpreted so as to render other words or phrases in the claim superfluous.

18. It is also my understanding that the POSITA is deemed to have read a disputed claim term or phrase being construed not only in the context of the particular claim in which the disputed term or phrase appears, but in the context of the entire patent, including the other claims, the specification, and the prosecution history.

IV. LEVEL OF ORDINARY SKILL IN THE ART

19. I understand that, to determine the appropriate level of skill of a POSITA, the following four factors may be considered: (a) the types of problems encountered by those working in the field and prior art solutions thereto; (b) the sophistication of the technology in question, and the speed with which innovations occur in the field; (c) the educational level of active workers in the field; and (d) the educational level of the inventor. I have been instructed that the level of ordinary skill in the art should be determined at the time of the invention. I have been asked to presume that the relevant date for my evaluation is December 26, 2018, based on Taiwan Application No. 107217659.

20. The field of the ’336 patent relates to computer or electronic hardware components and, specifically, a computer illumination fan connectable with at least one other illumination fan. In my prior declaration, I stated that a POSITA in the

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 10 of 105, IPR2024-01230

field of the '336 patent as of December 26, 2018 would have (i) earned a bachelor's degree in electrical engineering, mechanical engineering, or computer science, or a similar engineering or science degree, and (ii) attained two or more years of experience in designing and/or implementing hardware components for computers, servers, and/or other electronic devices. Alternatively, a person with a more advanced degree in the above fields might have had less practical experience and still be deemed a POSITA. Conversely, a person with a general college background not necessarily in the above fields might also have become a POSITA by acquiring more real-world experience in designing and/or implementing hardware components for computers, servers, and/or other electronic devices.

21. In the Institution Decision (Paper 12) (hereinafter "Decision"), the Board provided a slightly different definition for a POSITA:

> [W]e find that a person of ordinary skill in the art relevant to the challenged claims, as of the earliest claimed priority date, would have a bachelor's degree (or equivalent) in electrical engineering or mechanical engineering, and would have two years of experience in designing and/or implementing hardware components for computers, servers, and/or other electronic devices. We further determine that more experience could compensate for the absence of a bachelor's degree.

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 11 of 105, IPR2024-01230

22. I agree with the Board's definition of the POSITA above, and have adopted and applied the Board's definition in this declaration. Under either of the definitions, I believe that I have the relevant experience and understanding of a POSITA qualified to opine on interpretation of the '336 patent. My opinions as expressed in my prior declaration and this declaration also would stay the same and would not change under either definition.

V. MATERIALS CONSIDERED

23. In rendering my opinions in this Declaration, I have considered the following materials:

Material	Description
Paper 1	Petition for Inter Partes Review of U.S. Patent No. 10,690,336 ("Petition" or "IPR")
Paper 12	Decision Granting Institution of *Inter Partes* Review
Exhibit 1001	U.S. Patent No. 10,690,336 B1 to Chen
Exhibit 1004	Declaration of Dr. Andrew Wolfe ("Wolfe Decl.")
Exhibit 1006	Japanese Publication No. 2018041147A to Tsuji et al. published March 15, 2018 ("Tsuji")
Exhibit 1007	Certified Translation of Tsuji
Exhibit 1008	U.S. Patent No. 10,082,286 B1 to Huang issued September 15, 2018 ("Huang")
Exhibit 1009	Pat. App. Pub. No. US 2008/0124234 A1 ("Echazarreta")
Exhibit 1010	Pat. App. Pub. No. US 2008/0279694 A1 ("Chou")
Exhibit 1011	Pat. App. Pub. No. US 2015/0233391 A1 ("Liu")

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 12 of 105, IPR2024-01230

Material	Description
Exhibit 1012	Pat. App. Pub. No. US 2017/0314777 A1 ("Lai")
Exhibit 1013	Japanese Publication No. 2005051085A ("Hasegawa")
Exhibit 1014	Certified Translation of Hasegawa
Exhibit 2005	Deposition Transcript of Dr. Andrew Wolfe (April 25, 2025)

VI. OVERVIEW OF THE '336 PATENT

24. The '336 patent relates to an illumination fan connectable with at least one other illumination fan for a computer. '336 patent at 4:3-4. Computer fans are generally used for heat dissipation inside the housings of computers. To effectively dispel heat accumulated inside a computer housing, multiple cooling fans are often needed. '336 patent at 1:29-33. Traditionally, each computer fan had to be connected to a power supply through an independent power cable, which creates a lot of wiring inside the housing and makes cable routing and management cumbersome. Additionally, because independent power cables must be used for each fan, the number of cooling fans that can be assembled is limited by the finite number of connections available on the power supply. '336 patent at 1:34-40.

25. In addition, computers are increasingly used for entertainment and related purposes, and hence more attention has been focused on the aesthetics of computer housings in addition to heat dissipation, especially for gaming enthusiasts. This includes integrating light sources with cooling fans such that the illuminated fans are visible from outside the housing (*e.g.*, through transparent panels).

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 13 of 105, IPR2024-01230

26. To serve the increasing demand for aesthetically pleasing computer housings and improve the efficiency of heat dissipation for the computer at the same time, the ’336 patent contemplates an illumination fan connectable with at least one other illumination fan for a computer.

27. Figure 1 of the ’336 patent (reproduced and annotated below)[5] shows an embodiment (*i.e.*, an example) of such an illumination fan, which “includes a body **1**, a fan **2** disposed in the center of the body **1**, an illumination area **3** disposed on at least two sides of the fan at the top of the body **1**, a power socket **4** and a first connector **5** disposed on one side of the body **1**, and a second connector **6** disposed on another side of the body **1**. The power socket **4** is electrically connected with the first connector **5**, the second connector **6**, the fan **2** and the illumination area **3**”. ’336 patent at 2:61-3:3, Fig. 1 (annotated). “As such, once the power socket **4** at a side of the body is supplied with power, the fan 2 of the body 1 can be driven into rotation and the illumination area **3** can be illuminated”. ’336 patent at 3:4-6.

[5] All emphasis and annotations herein are mine, unless noted otherwise.

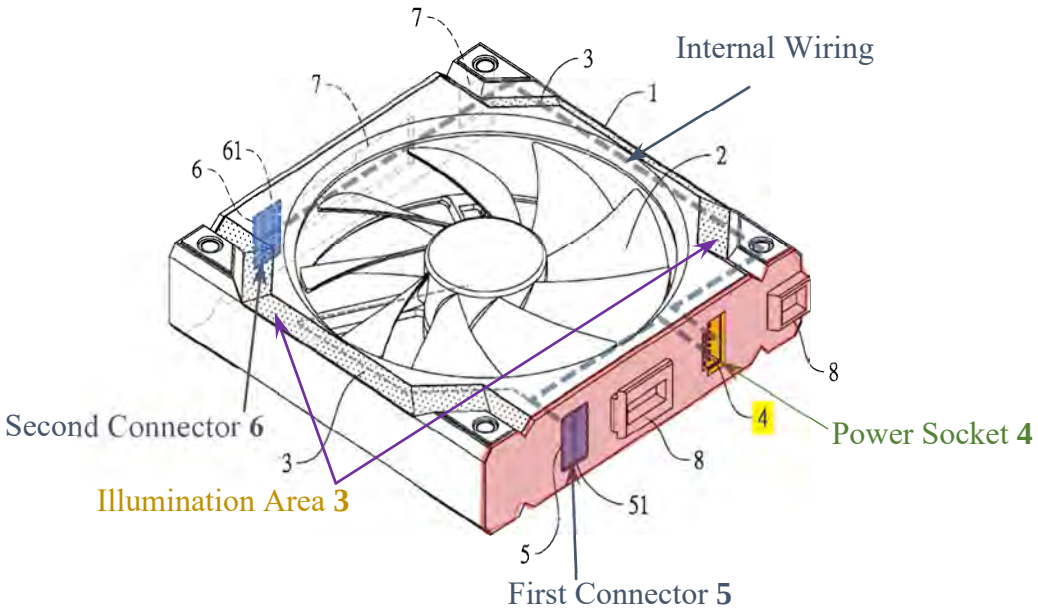


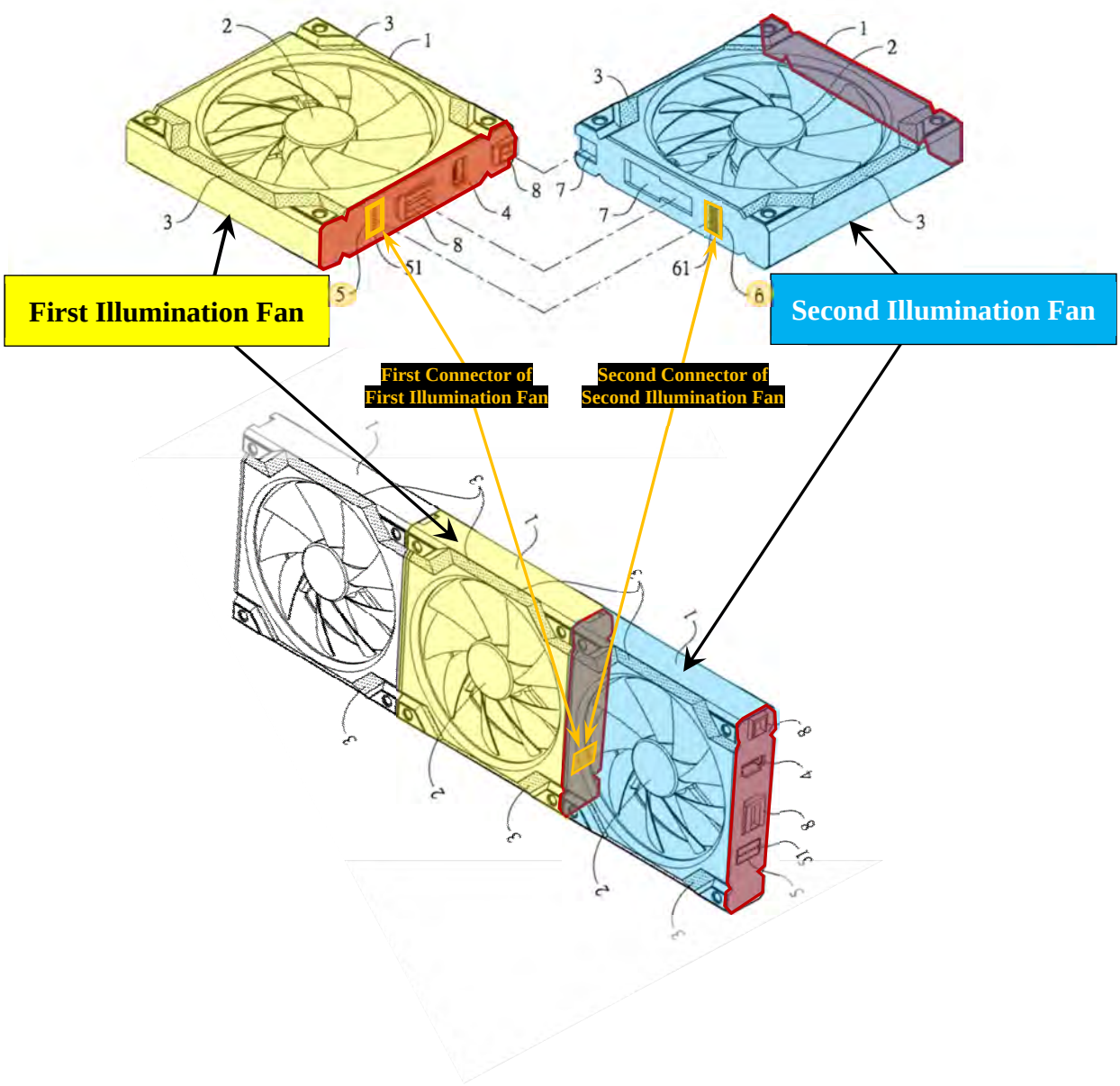
Fig. 1

'336 patent, Fig. 1 (exemplary annotations and highlighting added). The power socket **4** of the embodiment shown in Figure 1 above can be supplied with power in various ways. For example, in a non-limiting configuration, the power socket **4** (highlighted in yellow above) can be supplied with power via internal wiring from the second connector **6**, which can receive power from a prior illumination fan's first connector **5** in the manner as shown in Figure 2 (which illustrates the exemplary connections between any two adjacent illumination fans). As such, once the power socket **4** on the same side of the body **1** as the first connector **5** is supplied with power, the fan **2** of the body **1** can be driven into rotation and the illumination area **3** into illumination. '336 patent at 3:4-6, Fig. 1. Further, the power socket **4**, which is electrically connected with the first connector **5** of a first illumination fan's body **1**, can also supply power to the first connector **5** of the first illumination fan's body **1**

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 15 of 105, IPR2024-01230

"so that when the first connector **5** of [the first illumination fan's] body **1** is connected to the second connector **6** of another [or a second illumination fan's] body **1**, the fan **2** of the another [or second illumination fan's] body **1** can be driven into rotation and the illumination area **3** [of the another or second illumination fan's body **1]** can be illuminated". '336 patent at 3:7-16. This non-limiting configuration of connecting a first illumination fan and a second illumination fan is illustrated by Figures 2 and 3 (annotated) of the '336 patent below:

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 16 of 105, IPR2024-01230



'336 patent, Fig. 2 (annotated) and Fig. 3 (rotated and annotated); *see also id.* at 3:7-16. As shown above, a first illumination fan on the left (labeled in yellow) is connectable to a second illumination fan on the right (labeled in blue) (*e.g.*, using an engaging block [**8**] and a groove [**7**]). When the first illumination fan is supplied with power, its fan [**2**] is driven into rotation and the illumination area [**3**] is illuminated; when the second illumination fan is connected to the first illumination

fan through joining the first connector [**5**] of the first illumination fan and the second connector [**6**] of the second illumination fan, the fan and illumination area of the second illumination fan are also driven into rotation and illumination, respectively.

28. The entirety of claim 1 of the ’336 patent is reproduced below, with lettering added as per the Petition and in the Decision:

> 1. [preamble] An illumination fan connectable with at least one illumination fan for a computer, comprising:
>
> [a] a body, provided with a fan in center of the body,
>
> **[b] an illumination area on at least two sides of the fan at top of the body,**
>
> **[c] a power socket and a first connector on one side of the body, and a second connector on another side of the body,**
>
> **[d]** wherein the power socket is electrically connected with the first connector, the second connector, the fan and the illumination area, such that when **the power socket on the one side of the body** is supplied with power, the fan and the illumination area of the body are respectively driven into rotation and illumination, and when **the first connector of the body is connected with a second connector of a body of another illumination fan**, a fan and an illumination area of the body of another illumination fan are respectively driven into rotation and illumination.

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 18 of 105, IPR2024-01230

’336 patent, Cl. 1.[6]

29. This Declaration focuses on, *inter alia*, the following limitations of claim 1 corresponding to the numbered elements above:

- **1[b]** “an illumination area [**3**] on at least two sides of the fan at top of the body”;

- **1[c]** “a power socket [**4**] and a first connector [**5**] on one side of the body, and a second connector on another side of the body”;

- **1[d]** “… the power socket [**4**] on the one side of the body …. the first connector of the body [**5**] is connected with a second connector [**6**] of a body of another illumination fan”.

30. As shown above, limitation 1[d] has two requirements: (i) “the power socket [**4**] [is] on the [same] one side of the body” of the “*first* illumination fan” as the “first connector;” and (ii) “the first connector of the body [of the *first* illumination fan] is connected with a second connector of a body of another [*i.e.*, the *second*] illumination fan”. These two requirements (i.e., items (i) and (ii), above) of limitation 1[d] are related and discussed in more detail below.

[6] The lettering added to claim 1 is for illustrative purposes only and is not intended to convey any specific order or other requirements to the claim.

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 19 of 105, IPR2024-01230

31. Elements [**3**]-[**6**] in the embodiments corresponding to the above limitations are illustrated in Figure 1 below:

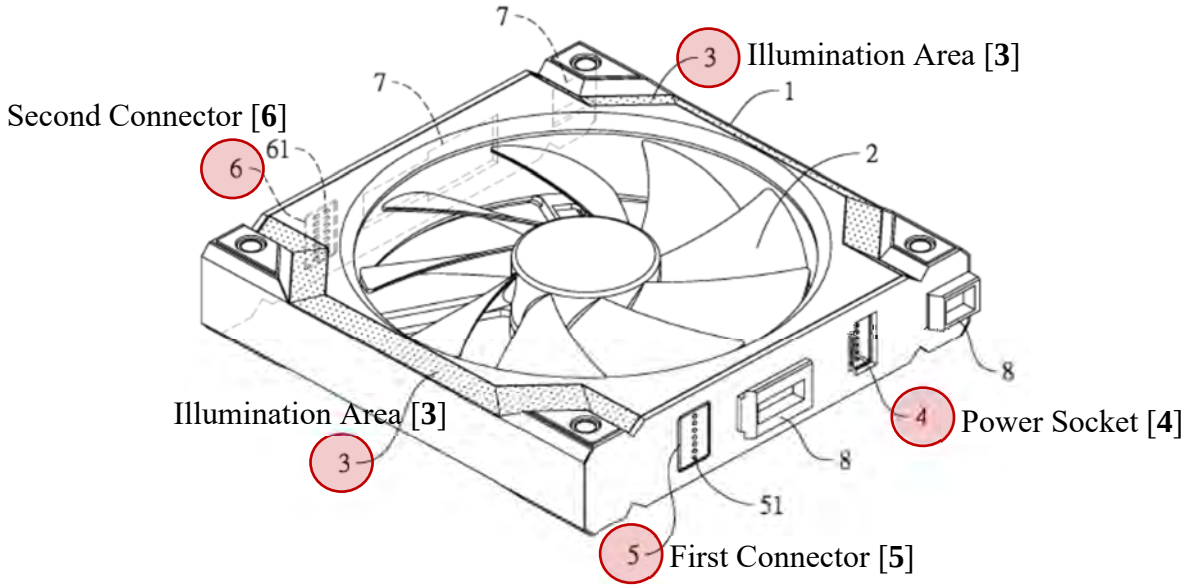


Fig. 1

32. This Declaration also addresses the limitation "the first connector [**5**] of the body is connected with a second connector [**6**] of a body of another illumination fan". This limitation is illustrated in Figures 2-3 when a plurality of illumination fans are connected and assembled as shown below:

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 20 of 105, IPR2024-01230

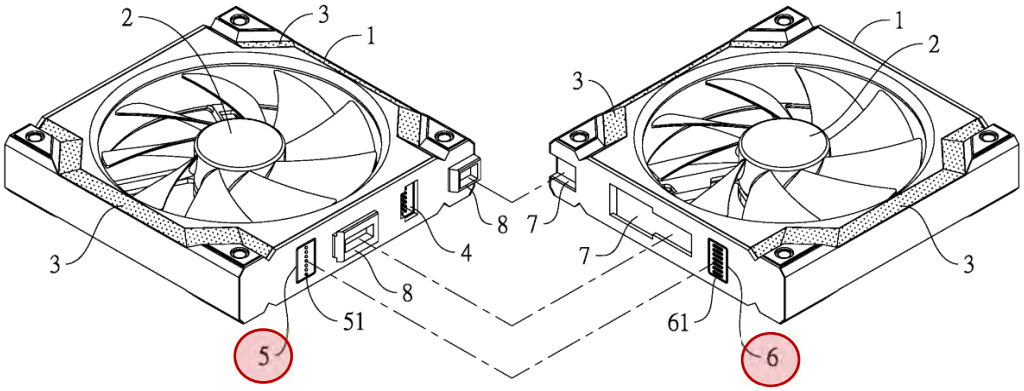


Fig. 2

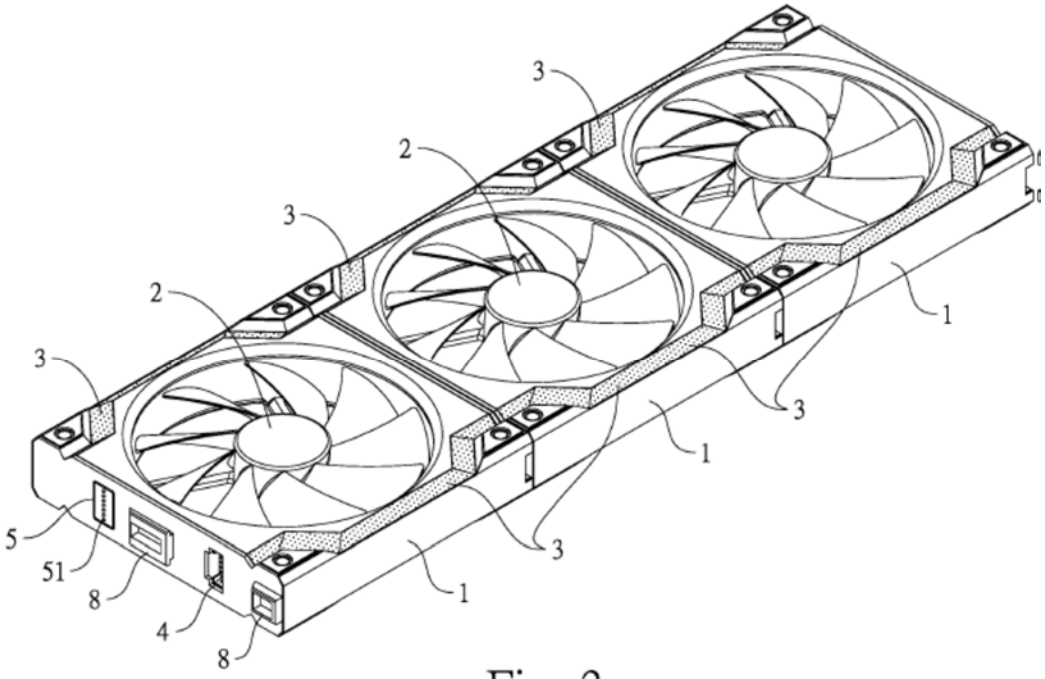


Fig. 3

33. Further, this Declaration addresses the limitations in claims 4-5.

34. I understand that Petitioner challenged all claims (1-5) of the '336 patent. Claim 1 is the only independent claim. Petitioner's Grounds and prior-art references are shown below:

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 21 of 105, IPR2024-01230

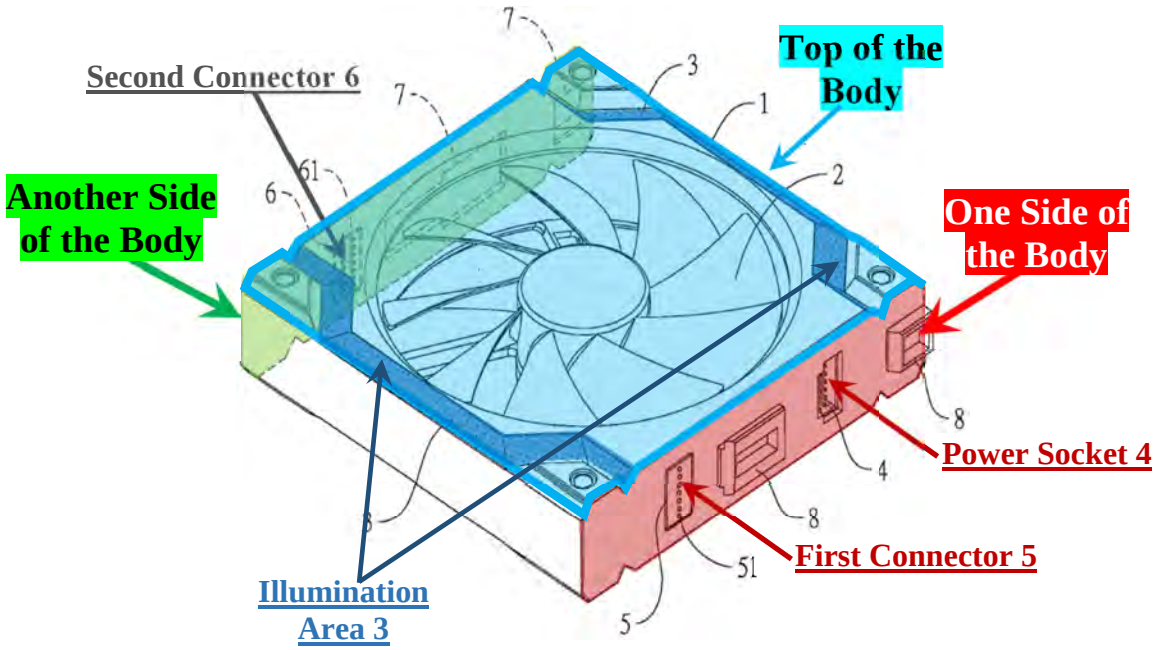
Ground	Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1	1-3	103	Tsuji, Huang
2	4	103	Tsuji, Huang, Echazarreta
3	5	103	Tsuji, Huang, Chou / Liu
4	1-2	103	Lai, Hasegawa
5	3	103	Lai, Hasegawa, Huang
6	4	103	Lai, Hasegawa, Echazarreta
7	5	103	Lai, Hasegawa, Chou / Liu

35. Petitioner contends that the plain and ordinary meaning should apply to all claim terms. (Petition at 7.) I apply the plain and ordinary meaning to the terms in the '336 Patent in this Declaration. I agree with the Board's construction that the "power socket" and the "first connector" recited in claim 1 must be located on the same "one side of the body" of the claimed illumination fan. Decision at 15-17. I further agree with the Board that the claimed illumination fan body has three separately recited locations: "a top of the body (with an illumination area on two sides of the fan), one side of the body with a power socket and a first connector, and another side of the body with a second connector" (*id.*) under the plain meaning standard.

36. I believe the Board's construction of claim 1 above is supported by, *e.g.*, Figure 1 of the '336 patent (reproduced and annotated below), which shows an illumination fan embodiment as claimed. This embodiment includes a body **1**, a

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 22 of 105, IPR2024-01230

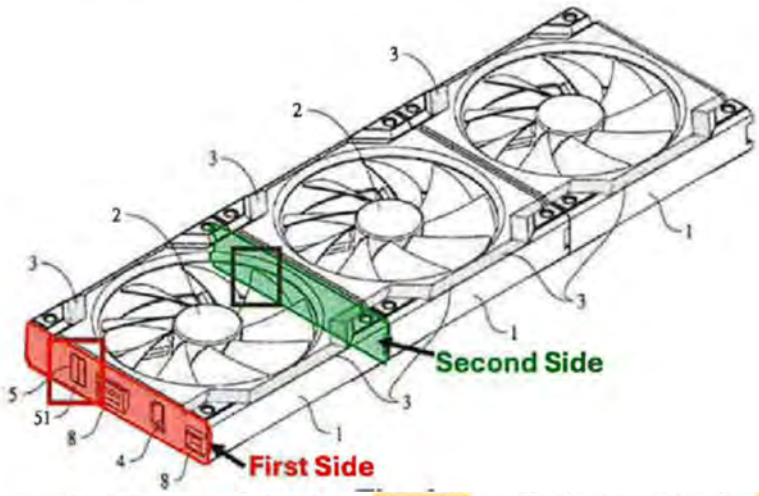
fan **2** disposed in the center of the body **1**, an illumination area **3** disposed on at least two sides of the fan at a top of the body **1** (cyan), a power socket **4** and a first connector **5** disposed on one side of the body **1** (red), and a second connector **6** disposed on another side (green) of the body **1**:



37. Petitioner and its expert, Dr. Wolfe, interpret the claim phrases, "one side of the body" and "another side of the body", in the same way as the Board's understanding under "the plain meaning of claim 1" (Decision at 17), as shown below in reproduced excerpts of the Petition:

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 23 of 105, IPR2024-01230

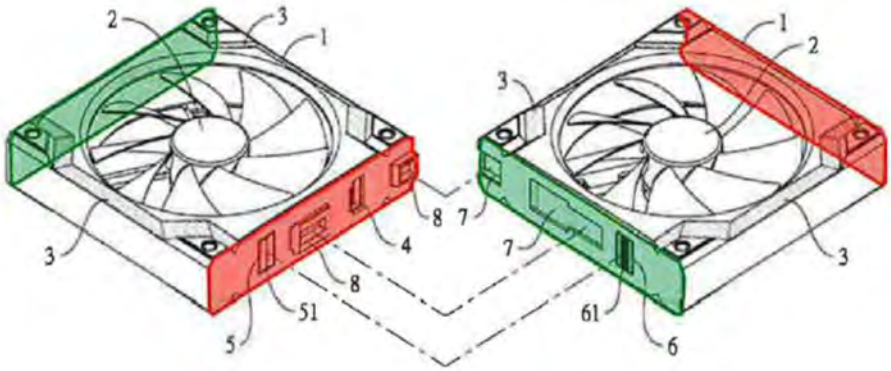
Figure 3 shows three fans connected, with the connectors on the first and second sides of the first fan box-outlined:



'336 Patent, Fig. 3 (annotated showing a first side highlighted in red and a second side highlighted in green. and first and second connectors box-outlined)

Petition at 8-9 (yellow highlighting added; *red* and *green* highlighting and other annotations original); *accord* Ex-1004 (Wolfe Declaration), ¶ 13.

Figure 2 shows two separate fans when they are disconnected from each other:



'336 Patent. Fig. 2 (annotated showing a first side highlighted in red and a second side highlighted in green)

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 24 of 105, IPR2024-01230

Petition at 9 (yellow highlighting added; *red* and *green* highlighting and other annotations original); *accord* Ex-1004 (Wolfe Declaration), ¶ 14.

38. I agree with the Board and believe the terms in the Challenged Claims should have their plain meaning from the viewpoint of a POSITA at the time of the '336 patent's filing and **do not require any express construction**. Petitioner agrees. Petition at 7 ("For the purposes of this Petition, Petitioners also give the claim terms in the '336 Patent their ordinary and customary meaning that they would have to a person having ordinary skill in the art at the time of the alleged invention[.]"). Should Petitioner change its claim construction position or offer a construction that deviates from the understanding adopted by the Board and me, I reserve the right to respond accordingly.

VII. PRIORITY DATE OF THE '336 PATENT

39. I apply a priority date of December 26, 2018 for the '336 patent in rendering my opinions in this Declaration. Petitioner contends that claims 1-4 of the '336 patent are entitled to a priority date of December 26, 2018, but further contends that claim 5 is not entitled to this date. Petition at 9-13. For purposes of the Declaration, however, the Board need not resolve this issue because all cited prior art predates December 26, 2018.[7]

[7] I currently take no position as to whether Petitioner's priority date position on claim 5 is correct.

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 25 of 105, IPR2024-01230

VIII. GROUND 4: LAI ALONE OR IN VIEW OF HASEGAWA FAILS TO DISCLOSE CLAIM LIMITATIONS 1[B], 1[C], AND 1[D]

40. Petitioner's Ground 4 relies on Lai in view of Hasegawa for claims 1 and 2. Petition at 6. Grounds 5-7 also rely on Lai and Hasegawa, and cite additional references to account for dependent claims 3-5. But, as shown below, Lai in view of Hasegawa fails to disclose several claim limitations of at least claim 1. Accordingly, all of Petitioner's Grounds based on the Lai-Hasegawa combination (*i.e.*, Grounds 4-7) fail.

A. Petitioner Fails To Show Lai Alone or in View of Hasegawa Teaches Limitation 1[b], "an Illumination Area on at Least Two Sides of the Fan at Top of the Body"

41. In my opinion, Lai alone or in view of Hasegawa does not disclose or teach the limitation, "**an** illumination **area** on at least two sides of the fan **at top of the body**". Petitioner points to the four discrete LEDs depicted in Lai's Figures 2 and 3 as the alleged "illumination area", but Petitioner fails to demonstrate an illumination area "at top of the body" of the illumination fan, as required by claim 1. Because Lai does not disclose this limitation, Grounds 4-7 fail.

42. Lai discloses the use of multiple RGB LEDs installed in each illumination fan. The only disclosures in Lai relating to the positioning of these LEDs in a perspective view are contained in Figure 3, reproduced below:

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 26 of 105, IPR2024-01230

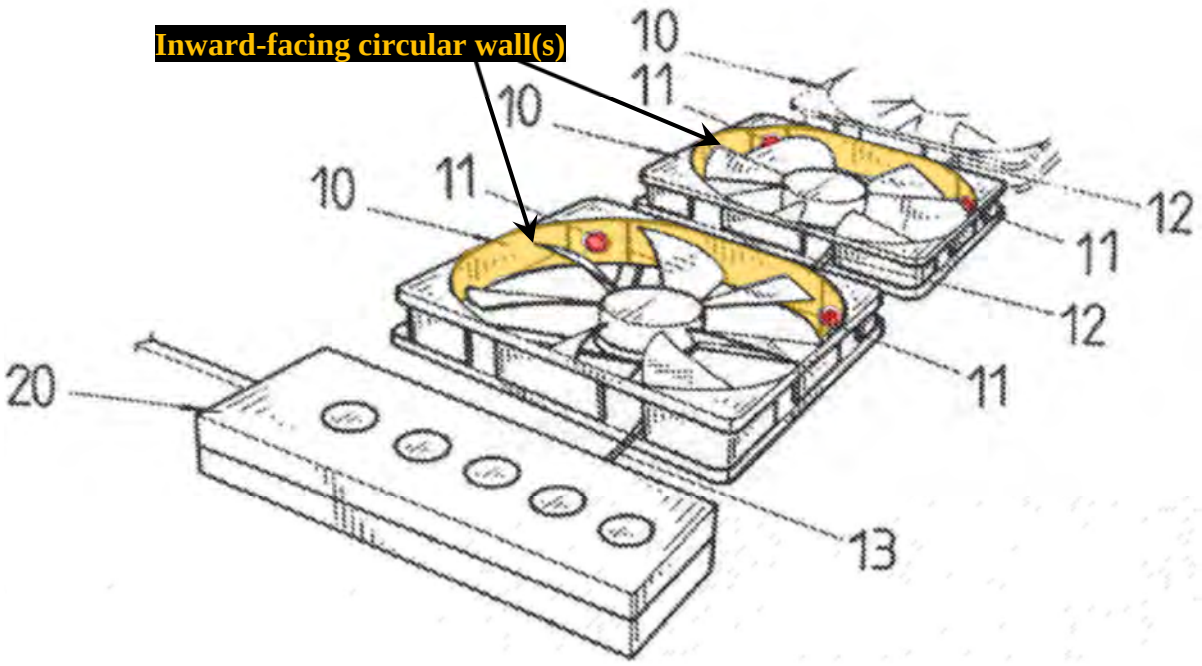


FIG.3

Lai, Fig. 3 (annotations added).

43. As seen above, Figure 3 of Lai makes it clear that the LEDs (labeled "11" in this figure) are attached near the corners of the fan body and are fixed to the inward-facing circular wall surrounding the circular opening within which the fan blades rotate. None of Lai's LEDs are positioned "at the top of the body" as required by the claims. Instead, as also shown in Figure 3, the LEDs are positioned below the top and to an inner sidewall of the Lai's fan. Indeed, a POSITA would have quickly recognized that Lai places the LEDs on the inner wall of its fan body, below the top, so as to illuminate the fan blades as they rotate. Lai therefore does not disclose an illumination fan with an illumination area "**at top of the body**", as claimed.

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 27 of 105, IPR2024-01230

44. Below, Patent Owner provides an annotated version of Figure 1 of the ’336 patent with Lai’s LEDs included, which illustrates how the ’336 patent’s illumination area 3 “at top of the body” differs from the ***Lai’s LEDs***:

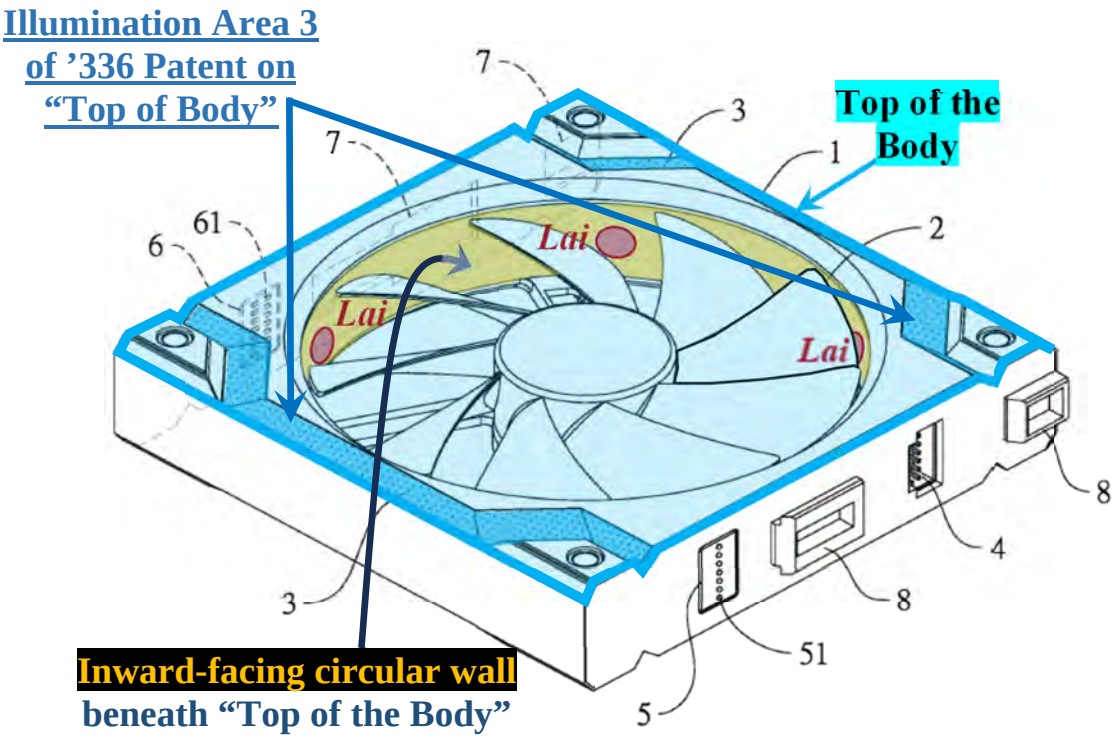


Fig. 1

’336 patent, Figure 1 (annotated).

45. The annotated Figure 1 above shows a version of the claimed illumination areas 3 (cyan). Consistent with the claim language, the illumination areas 3 are located at the top of the body. The ***red circles***, in contrast, show the positioning of ***Lai’s LEDs***. As shown, the LEDs are positioned on the **inward-**

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 28 of 105, IPR2024-01230

facing circular wall **beneath the "top of the body",** *i.e.*, ***not*** "at top of the body", as required by the '336 claims.

46. Placing the LEDs in Lai at the ***top*** of the body would have been far less effective in creating Lai's intended illuminated effect on the center fan blades. Lai's design thus does not disclose – and arguably teaches away from – an illumination area "at top of the body" like the '336 patent.

47. Figure 3 contains the sole perspective view of the Lai fans and shows that the LEDs are positioned on the inner wall of Lai's fan body, ***beneath*** the top. The only other source of information relating to positioning of Lai's LEDs is Figure 2, but nothing in this figure is inconsistent with Figure 3's perspective view. Figure 2 merely provides a "schematic view" [Lai, 0006], which a POSITA would have understood as referring to a simplified representation that shows the components and their electrical connections to each other, but not necessarily their actual physical layout or appearance.

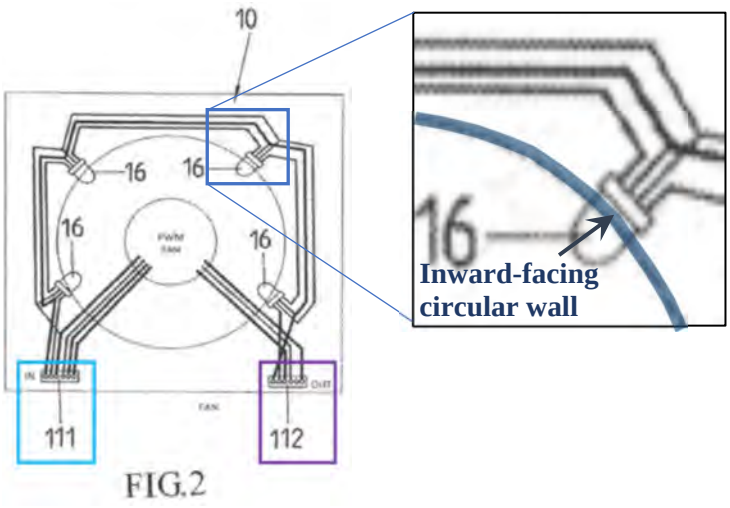


FIG.2

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 29 of 105, IPR2024-01230

Lai, Fig. 2 (annotations added).

48. As shown, Figure 2 includes four addressable RGB LEDs (labeled "16" in this figure), which are electrically connected in a circular arrangement, with the electrical wiring starting at the input points (labeled as "111") and progressing to the output points (labeled as "112"). The figure suggests that the preferred embodiment would place the four LEDs in roughly four equally spaced locations near the corners of the fan 10. And as can be seen in the annotated blow-up above-right, the circle denoting the inward-facing circular wall surrounding the center space for the rotating fan is drawn ***across*** the LED 16. This indicates to a POSITA that the LED 16 is ***beneath*** the top of the fan 10's body, which is to be expected. Figure 2 is thus consistent with, and actually supports, the depiction in Figure 3 showing the LEDs located approximately midway between the top and bottom of each fan 10's body.

49. Petitioner nevertheless argues that the LEDs in Lai "would be understood to be visible from outside the housing when LED fans 10 are normally mounted". Petition at 57. Petitioner cites to its expert declaration for the proposition that "Lai already indicates that lights should be visible from outside, including from the top, of the fan body". *Id.* at 58 (citing to Ex-1004 (Wolfe Dec.) at ¶ 115). But Dr. Wolfe merely makes a conclusory statement and cites no part of Lai to support this proposition. *See* Ex-1004 at ¶ 115. To the contrary, there is nothing in Lai suggesting that the LEDs' light should be directly visible from a top view of each

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 30 of 105, IPR2024-01230

fan 10's body; as explained, the purpose of the LEDs in Lai is not for the LEDs ***themselves*** to be visible but to emit light onto the rotating fan blades.

50. Petitioner's argument also overlooks that claim 1 expressly requires an illumination area that is ***physically located*** at the top of the body – not merely an illuminated area in which reflected light happens to be perceptible from a top view. Under Petitioner's apparent reasoning, virtually any illuminated fan would qualify as having its illumination area "at top of the body" if any amount of light was perceptible from a top view, rendering this limitation meaningless. Indeed, an area on the fan body can be passively illuminated by ambient light, but a POSITA would not have deemed that to be an illumination area.

51. Petitioner's argument also cannot be reconciled with the plain language of claim 1, which makes clear that an "**illumination area**" is not simply an area where light happens to be visible to the user – it is the area of the body that ***actually generates light, i.e., illuminates***. Claim 1 itself makes this clear by reciting that the "**illumination area**" is "**electrically connected**" with the power socket such that the illumination area is "***driven into … illumination***". '336, 4:9-15, Cl. 1. Thus, even if it were the case that some light from the LEDs in Lai might be visible from a top view (which Petitioner has not shown as explained below), this is insufficient to show the claimed illumination area at top of the body that is electrically connected to power and driven into illumination.

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 31 of 105, IPR2024-01230

52. In fact, the LEDs in Lai would likely not even be visible when the fan body is viewed from the top because they would be mostly, if not entirely, blocked by the "top of the body". This is because a POSITA would have understood that (1) the lenses of the LEDs in the use case in Lai would typically have been ***directional*** pointing toward the fan blades, and thus would not permit much, if any, light going in the lateral direction toward the user viewing the fan 10 from the top, and (2) the tips of the LEDs would not substantially extend into the circular space in which the fan blades rotate to avoid interfering with the blades' rotation. Further, it would only be the fan blades that would reflect and/or diffuse the LEDs' light, but the fan blades are not ***located*** at the "top of the body", as explained above.

53. Ultimately, I understand Petitioner bears the burden of demonstrating that Lai discloses or renders obvious an illumination area at the top of the body, but has failed to do so in my opinion. I believe Petitioner cannot make this showing given (a) the paucity of disclosures in Lai, and (b) the lack of any reasoned and non-conclusory analysis in the Petition.

54. Apparently recognizing that Lai does not disclose any LEDs or an illumination area at the top of the body, Petitioner resorts to its backup argument that "it would have been obvious to a PHOSITA to mount LEDs 16 on a different surface of LED fans 10 or pointing in a different direction". Petition at 58. But in my opinion, this conclusory argument fails for several reasons. First, Ground 4 does not

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 32 of 105, IPR2024-01230

cite any references disclosing placement of the LEDs for an illuminated fan at top of the body. Also, Petitioner's argument that Lai could be so modified amounts to little more than an appeal to "common sense" or "ordinary creativity" with no supporting prior art disclosure. I do not find any reasoned justification for this purported modification in the Petition.

55. Petitioner argues for example that "[t]here are no physical limitations that prevent or discourage moving them to the top surface", "[w]ire lengths would not need to substantially change and there are no obstacles to avoid", and "[e]lectronics modules are commonly available in a choice of light configurations, *e.g.*, top or corner or side lights, to facilitate wiring". Petition at 58. But these assertions (aside from being unsupported), do nothing more than generically assert that it might be physically ***possible*** to relocate the LEDs to some other position. These assertions do not provide any rationale for why a POSITA would be ***motivated*** to relocate the LEDs from their carefully-selected mid-depth position in Lai – let alone to the top of the body as claimed. In fact, if a POSITA repositioned the LEDs depicted in Lai's Figure 3 at the top of the body (a POSITA would not do so), Lai's LEDs would not serve their original purpose of illuminating the fan blades from the inner surface of the fan body at mid-depth, and ***beneath*** the top of the body.

56. Hasegawa does not teach any illumination area at all and thus cannot cure Lai's deficiency. Therefore, Petitioner fails to show that Lai in view of

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 33 of 105, IPR2024-01230

Hasegawa discloses or teaches limitation 1[b]: "**an illumination area** on at least two sides of the fan **at top of the body**" as recited in claim 1 of the '336 patent, so Ground 4 fails.

B. Petitioner Fails To Show That Lai Teaches Limitation 1[c]: "a Power Socket and a First Connector on *One Side* of the Body, and a Second Connector on *Another Side* of the Body"

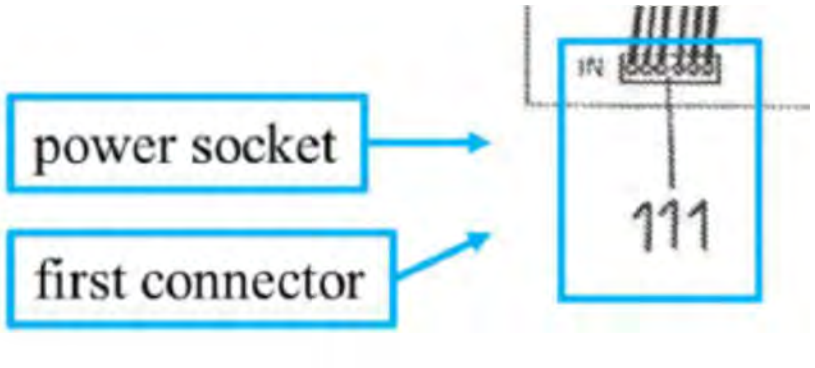
57. Limitation 1[c] of claim 1 requires "a power socket and a first connector on one side of the body, and a second connector on another side of the body". In my opinion, Petitioner fails to show that Lai teaches this limitation.

58. As an initial matter, Petitioner fails to show that Lai teaches any "power socket" or "connector". Indeed, ***neither "socket" nor "connector" of any kind is mentioned or even suggested at all throughout the entirety of Lai***. As explained below, Petitioner's tortured reading of Lai is based on impermissible hindsight and thus must be rejected. This is because, as I have been informed, obviousness cannot be based on the hindsight combination of components selectively culled from the prior art to fit the parameters of the patented invention. Thus, Petitioner's mappings must be rejected.

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 34 of 105, IPR2024-01230

59. As an initial matter, Petitioner attempts to characterize Lai's single input 111 as the "first connector" and "power socket"[8] and the single input 112 as the "second connector" as shown below:

[8] Petitioner maps the single input 111 of Lai to ***both*** the "power socket" and "first connector" limitations simultaneously:



Petition at 68 (Lai's "single input 111 comprising a power socket and a first connector on one side of the fan body"). I previously believed that the power socket and the first connector should be structurally separate (Ex-2002, ¶ 91), but the Board disagreed (Decision at 28 ("On this record, we do not agree that the claimed first connector, having an electrically conductive terminal, must be a separate structure from a power socket.")). I defer to the Board.

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 35 of 105, IPR2024-01230

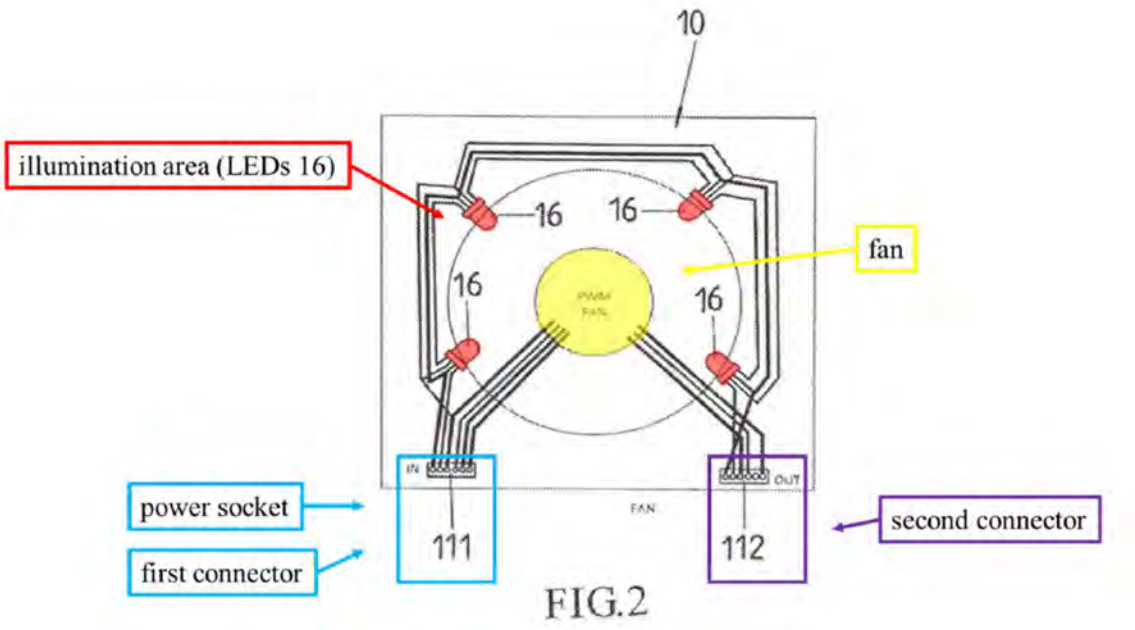


FIG.2

Petition at 68 (annotating Fig. 2 of Lai). But contrary to Petitioner's assertion, Lai does not characterize element 111 as a "socket" or a "connector". *See generally* Ex-1012. Instead, Lai simply refers to item 111 as a "***single*** input 111". *Id.* at 7. Similarly, Lai does not characterize 112 as any "connector" but rather as a "***single*** output 112". *Id.* Indeed, a POSITA would not have recognized Lai's "single input 111" or "single output 112" as having any "socket" nor "connector" structures, as Petitioner misleadingly argues. In my opinion, Petitioner is using hindsight based on the '336 patent itself to force the mapping of element 111 or 112 as a power socket and/or a connector, which I understand is prohibited.

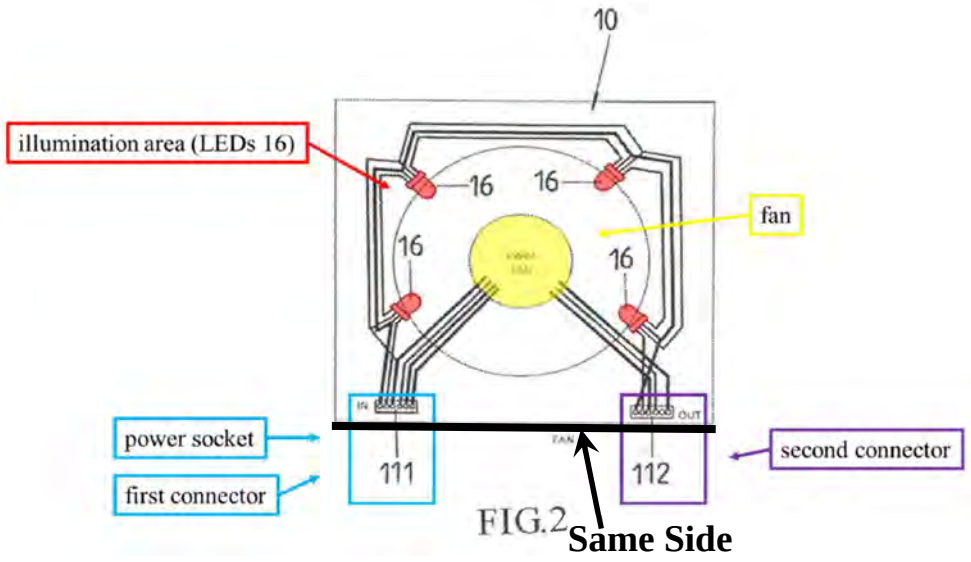
60. Apparently recognizing that Lai does not disclose or otherwise teach any "socket" structure at all, Petitioner again resorts to "common sense" to supply a missing claim limitation. Specifically, Petitioner argues that "it would have been

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 36 of 105, IPR2024-01230

obvious to a PHOSITA to use a socket-type power connector, which was ***common*** in the art and often used for fans"; that "[t]hey would be a trivial substitute for a connector that was not considered a 'socket'"; and that "[b]oth male and female connectors are commonly available and for low-voltage applications can be interchangeable as to which is on the cable and which is on the device". Petition at 60-61. But, like before, these conclusory arguments are fatally defective because they fail to cite ***any*** reference disclosing a "socket" structure. Petitioner's "common sense" argument does not and cannot provide a basis for the missing "socket" limitation. Petitioner again provides no reasoned justification for this purported modification to satisfy the "searching" requirement.

61. Even assuming *arguendo* Petitioner's proposed modification was acceptable (it is not), limitation 1[c] requires, *inter alia*, "a power socket and a first connector on ***one side*** of the body, and a second connector on ***another side*** of the body". '336 patent, Cl. 1. Petitioner fails to show that Lai, ***without modification***, teaches this limitation at least because the alleged "second connector" 112 is not located on "another side"; instead Lai's second connector 112 is located ***behind*** the ***same*** "one side" as the alleged "power socket" and "first connector" 111, as shown below:

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 37 of 105, IPR2024-01230



Petition at 68 (black "**Same Side**" labeling added, other annotations original). As shown, Petitioner maps Lai's element 111 as the "power socket" and "first connector", and Lai's element 112 as the "second connector" in Figure 2. Petitioner even admits that "the schematic in FIG. 2 of Lai shows both single input 111 and single output 112 on the ***same*** side". Petition at 62. Because both elements 111 and 112 are ***behind*** the ***same*** side of the fan body, they are ***not <u>on</u>*** "one side" and "another side".

62. In my opinion, Dr. Wolfe's testimony confirms that Lai fails to disclose a first connector ***on*** a first side and a second connector ***on*** another side. Specifically, during his deposition, Dr. Wolfe characterized the "**Same Side**" annotated in Lai's Figure 2 above as an "***edge***" and admitted elements 111 and 112 are ***internal*** components "***behind*** *the lower* ***edge***" and are "***not <u>on</u>***" it:

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 38 of 105, IPR2024-01230

> [Q.] Dr. Wolfe, would a POSITA reading Lai's Figures 2 and 3 have understood elements 111 and 112 as marked by you in Exhibit 2012 to be on the same edge of the LED fan 10?
>
> THE DEPONENT: ***No.*** **They are on the interior**, one on the left side and one on the right side. **So they are *not on* an edge at all.**
>
> …

Q. [Y]ou testified that given elements 111 and 112 are ***internal*** elements for the ***LED fan 10***, a POSITA would have understood these two elements to be ***behind the lower edge***, and one of them is also ***behind*** the left edge and the other one is also ***behind*** the right edge, correct?

A. **Yes. In the embodiment that's illustrated**.

Ex-2005 (4/25/2025 Wolfe Tr.) at 73:8-19 and 74:16-23; *compare id.* with Lai, Fig. 2. That is, Dr. Wolfe admits Lai teaches that elements 111 and 112 are ***behind*** the ***same*** "lower side" of fan 10's body (what he referred to as the "lower edge"). As mentioned, Petitioner also concedes that "the schematic in FIG. 2 of Lai shows both single input 111 and single output 112 on the ***same*** side". Petition at 62. In my opinion, either way Petitioner fails to show that Lai alone teaches the first and second connectors ***on different*** sides as required by limitation 1[d].

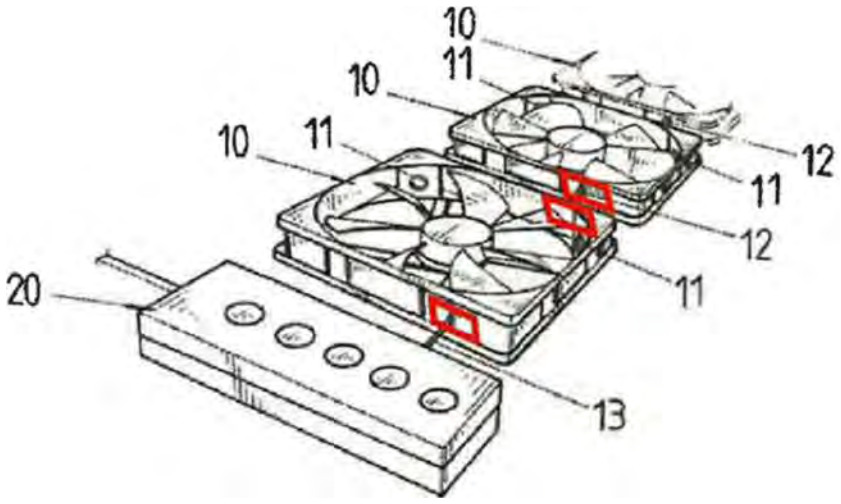
63. Acknowledging Lai fails to disclose limitation 1[d], Petitioner argues that "[t]o the extent it is argued or found that Lai does not to [*sic*] disclose connectors on ***two*** sides of the fan body, it would have been obvious to a PHOSITA that the

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 39 of 105, IPR2024-01230

connectors can be moved to opposite edges of the fan body without any substantial impact to the structure or operation of the fan of Lai". Petition at 63. Again Petitioner improperly resorts to common sense to provide a missing limitation: "[t]here are no physical limitations that prevent or discourage moving them around from the corners to the sides"; "[w]ire lengths would not need to substantially change and there are no obstacles to avoid"; and "[e]lectronics modules are **commonly** available in a choice of connector configurations, e.g. top or bottom or side connectors, to facilitate wiring" (Petition at 63-64). Again, I understand that Petitioner cannot rely on "common sense" to provide a missing claim limitation. In my opinion, Petitioner's purported modification of Lai also seems to rely on impermissible hindsight.

64. Effectively acknowledging Lai's deficiency, Petitioner argues that "[i]t would have been obvious to a PHOSITA to combine Lai and Hasegawa". Petition at 66. Specifically, Petitioner asserts that Lai in view of Hasegawa would teach a POSITA to produce a device similar to that of Figure 3 of Lai, but with visible connectors on the fan body sides" in "***red*** *boxes*", as shown below:

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 40 of 105, IPR2024-01230



Petition at 66-67. But as I explain below, irrespective of how Petitioner proposes modifying Lai, Petitioner fails to show that Lai alone or in view of Hasegawa teaches a "power socket on the [same] one side of the body" as the "first connector", as required by limitation 1[d].

C. Petitioner Fails to Establish Lai Alone or in View of Hasegawa Teaches "the Power Socket [Is] on the [Same] One Side of the Body" as the "First Connector"

65. As noted previously, claim 1 requires:

> 1. ***An illumination fan*** connectable with at least one illumination fan for a computer, comprising: ***a body***, *provided with* … ***a power socket and a first connector on one side of the body*** …

(the "*Same Side*" limitation). Limitation 1[d] confirms that the power socket is on the same "one side" as the first connector:

> "wherein the power socket is electrically connected with the first connector, the second connector, the fan and the illumination area,

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 41 of 105, IPR2024-01230

such that when *the power socket on* ***the one side*** *of the body* is supplied with power … ".

66. Thus, per the plain meaning of the claim language, both the power socket and the first connector must be located on the same "one side" of the body of a single illumination fan.

67. The specification of the '336 patent confirms this construction is correct. As shown in Figure 1 of the '336 patent, the power socket **4** and the first connector **5** are located on the ***same*** side of the body of the illumination fan:

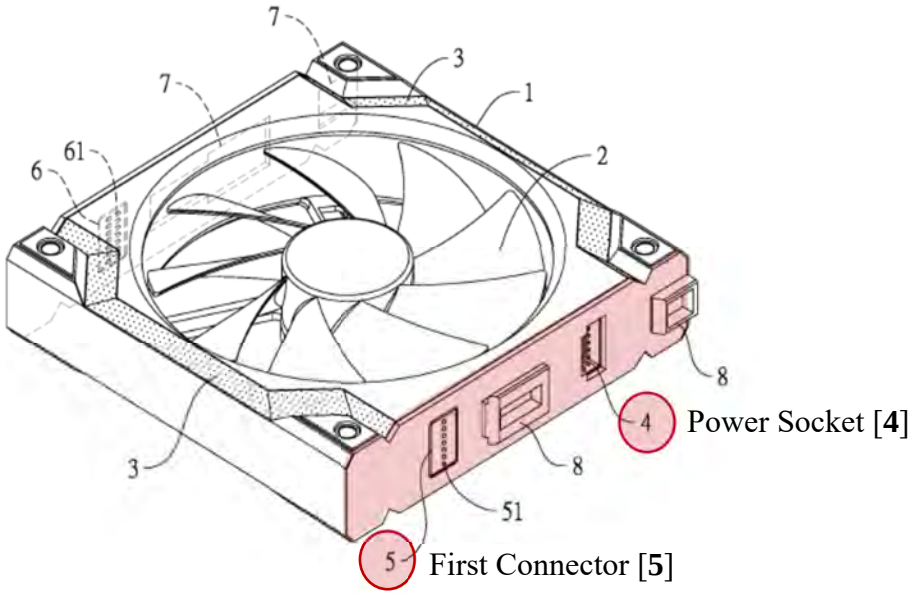


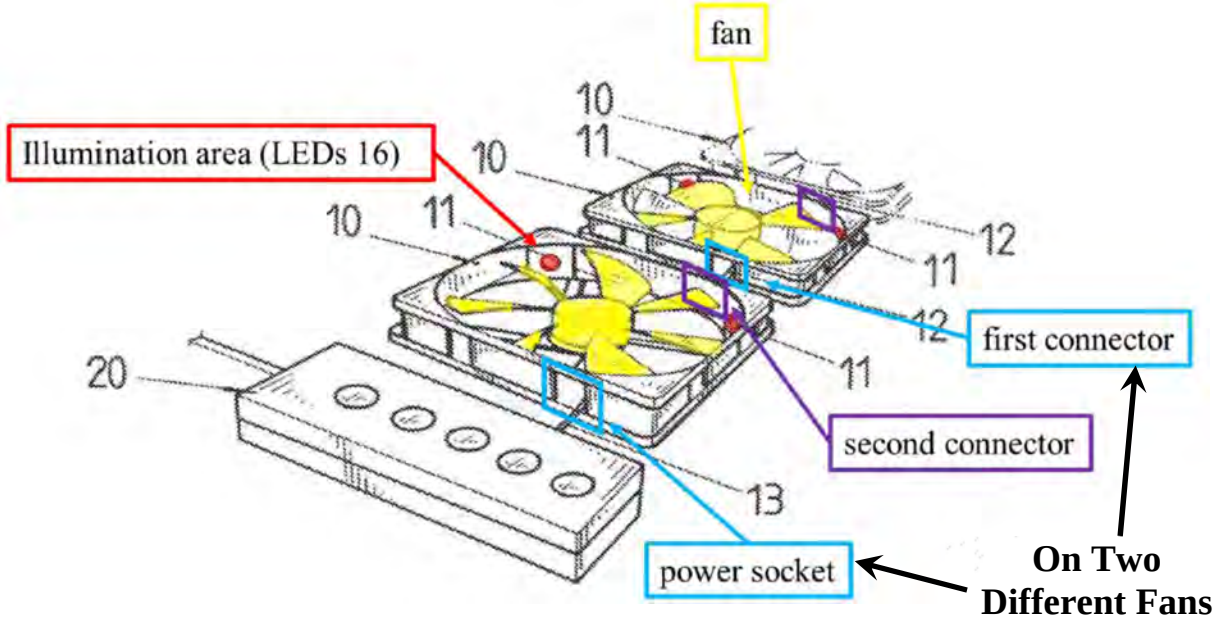
Fig. 1

Ex-1001 at Fig. 1. Further, this construction is also consistent with Petitioner's own claim construction position taken in the district court litigation, in which Petitioner proposed that this claim limitation be construed to require the "power

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 42 of 105, IPR2024-01230

socket" and the "first connector" to be "both … ***placed on the same side*** of the fan housing". Ex-2003 at 4.[9]

68. Attempting to meet the Same Side limitation, Petitioner creates a ***modified*** Lai system, purportedly by ***moving*** the alleged "power socket", the "first connector", and the "second connector" to different "side[s] of the two [fan 10] bod[ies]" (or "edges", if using the vocabulary of Dr. Wolfe during his deposition) in Figure 3, as shown below:



[9] Further, in contrast to the illumination area **3** located at the top of the body, the purported "LEDs 16" are ***not*** located at the top of the body of each fan 10 because they are located on an inside wall of the body.

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 43 of 105, IPR2024-01230

Petition at 69 ("On Two Different Fans" labeling added; other annotations original). In doing so, however, Petitioner fails to show that the ***modified*** Lai system, by itself or in view of Hasegawa, meets the Same Side limitation. As can be seen above, in Petitioner's purported Lai system as ***modified*** by itself or in view of Hasegawa, the "power socket" is mapped onto a first fan 10's body (the *first* fan 10 counting from the left) while the "first connector" is mapped onto a completely different fan (the *second* fan 10 counting from the left). The claims do not allow for the use of ***two different fans*** to meet the Same Side limitation because the plain language of the claim requires a ***single illumination fan*** to include both the power socket and the first connector on ***the same side***:

> "1. ***An illumination fan*** connectable with at least one illumination fan for a computer, comprising: ***a body***, provided with … a power socket and a first connector ***on one side of the body***, …"

69. Thus, in my opinion, as Petitioner's own analysis proves, Lai alone or in view of Hasegawa fail to teach the Same Side limitation of the claims.

D. Petitioner Fails to Establish That Lai Alone or in View of Hasegawa Teaches "the First Connector of the Body [of the Illumination Fan] Is Connected with a Second Connector of a Body of Another Illumination Fan"

70. As explained in the previous section, claim 1 requires the same illumination fan to have "a power socket and a first connector on [the same] one side

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 44 of 105, IPR2024-01230

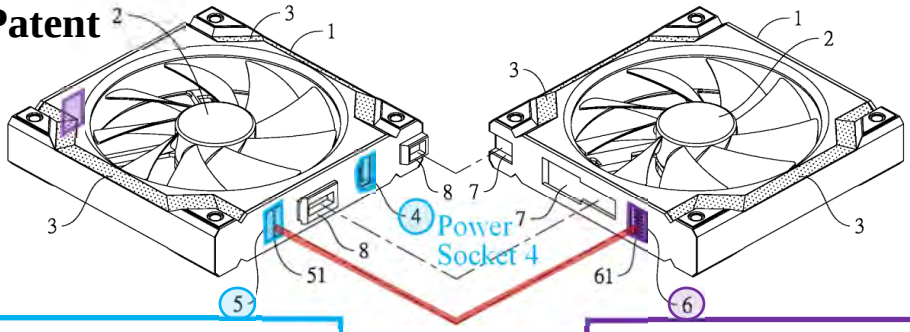
of the body" of that same illumination fan. As it relates to these components, limitation 1[d] in claim 1 further requires:

> "*when the **first** connector of the body [of the **first** illumination fan] is connected with a **second** connector of a body of another* [*i.e., a **second***] *illumination fan, a fan and an illumination area of the body of another illumination fan are respectively driven into rotation and illumination*".

That is, limitation 1[d] requires that the ***first*** connector of the body of the ***first*** illumination fan be connected with the ***second*** connector of the body of the ***second*** illumination fan". But Petitioner mapped Lai's components ***the other way around***:

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 45 of 105, IPR2024-01230

'336 Patent

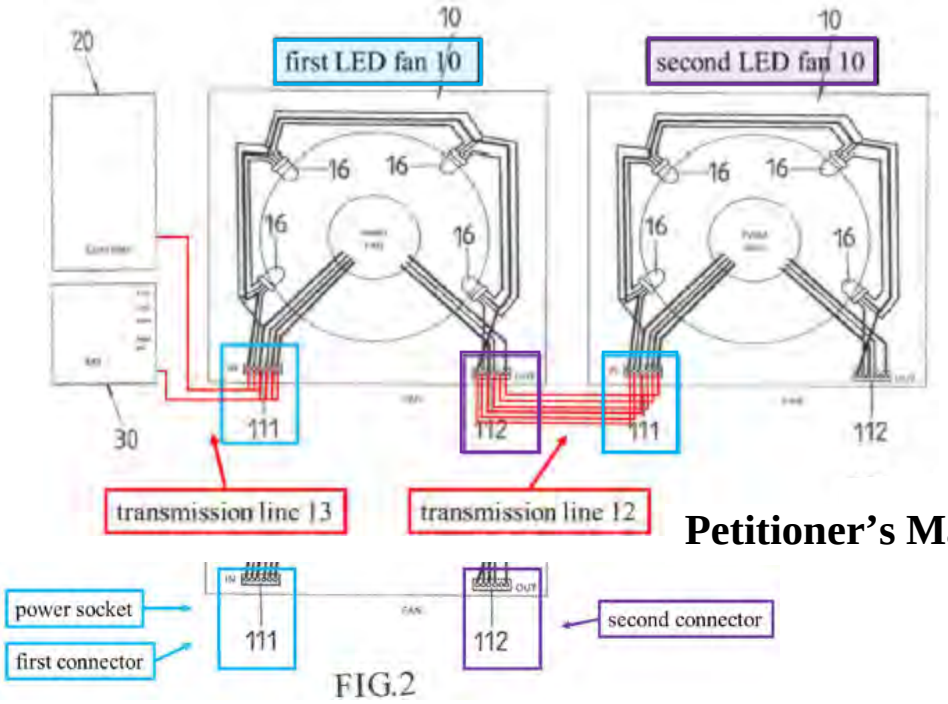


***First* connector *5* of *first* illumination fan**

***Second* connector *6* of *second* illumination fan**

Fig. 2

Petitioner's Mappings



Compare '336 patent, Cl. 1, Fig. 2 (annotated) *with* Petition at 71, 73, 68 (annotated). As seen above, instead of showing Lai's ***first*** connector 111 of Lai's ***first*** LED fan 10 is being connected with Lai's ***second*** connector 112 of Lai's ***second*** LED fan 10 (like claim 1), Petitioner shows Lai's ***second*** connector 112 of Lai's ***first*** LED fan 10 is being connected with Lai's ***first*** connector 111 of Lai's ***second*** LED fan 10 via transmission line 12. That is, Petitioner shows the ***converse*** of what claim 1 of

the ’336 patent requires. Critically, the respective mappings to the ***first*** and ***second*** connectors of the first illumination fan in claim 1 of the ’336 patent cannot be trivially swapped because the ***first*** connector must be on the ***same*** side as the ***power socket***, which must also be “supplied with power” and on a different side as the ***second*** connector.

71. Thus, Petitioner fails to show that Lai alone or in view of Hasegawa teaches “the first connector of the body [of the first illumination fan] is connected with a second connector of a body of another [*i.e.*, a second] illumination fan” as required by limitation 1[d] of the ’336 patent.

IX. GROUND 1: TSUJI ALONE OR IN VIEW OF HUANG FAILS TO TEACH LIMITATIONS 1[b], 1[c], AND 1[d]

72. Petitioner’s Ground 1 relies on Tsuji in view of Huang. Petition at 5. But as shown below, Tsuji in view of Huang fails to disclose at least limitations 1[b], 1[c], and 1[d]. Further, a POSITA would not have been motivated to combine the teachings of Tsuji and Huang. Indeed, the Board’s initial view is that, based on the “preliminary record, Petitioner has not sufficiently shown that Tsuji teaches or suggests limitation 1[c]”. Decision at 50. As explained below, the Board’s initial findings here were correct and should be adopted in the Final Written Decision.

A. Overview of Tsuji (Ex-1007)

73. A foundational purpose of Tsuji’s is to “enable hot swapping of one fan unit”, a goal Tsuji reiterates numerous times. See Tsuji (Ex-1007) at Cl. 3 (“[T]he

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 47 of 105, IPR2024-01230

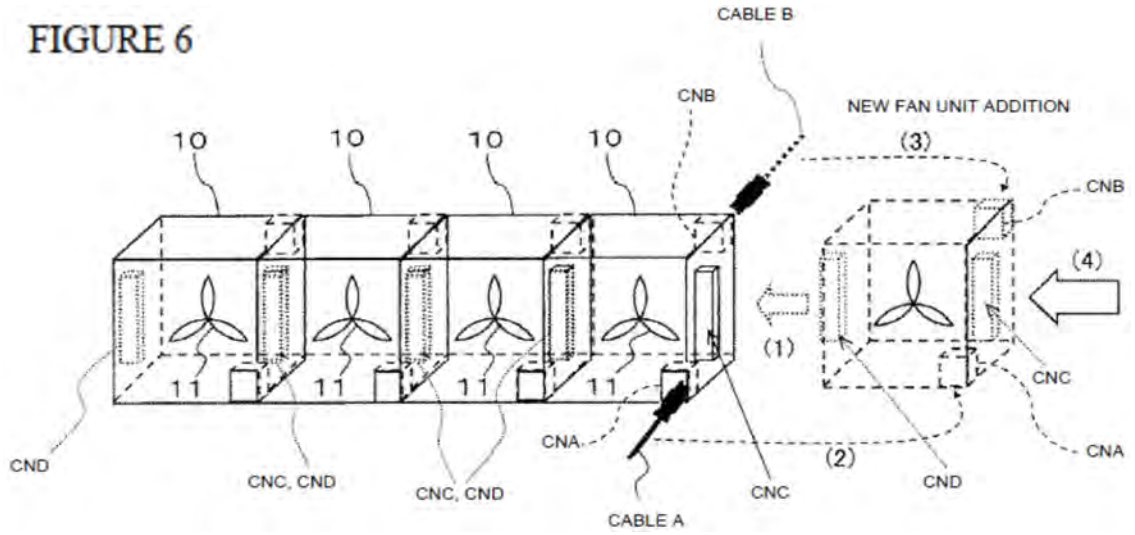
plurality of fan units is configured so as to enable hot swapping of one fan unit among the plurality of fan units …"); [0002] ("[A]n ability to perform hot maintenance and swapping while maintaining a system operational state (energized state) is desirable".); [0008]-[0009] ("[Summary of the Invention] … An object of the present invention is to provide an electronic device capable of assigning to each fan unit an address associated with a position of reach fan unit even when the fan unit is swapped".); [0042] ("Therefore, fan unit 10 can be hot-swapped without having to stop the system …"). Indeed, Tsuji's emphasis on "hot swap"—mentioned no fewer than 55 times throughout the patent—underscores its central importance to Tsuji.

74. For Tsuji's hot-swapping to be effective, each fan unit must maintain at least two exposed power sockets to be dynamically plugged in to ensure continuous power during a swap. This dual-socket configuration is crucial: when one power cable is disconnected from one power socket during maintenance, the second power cable connected to the second power socket maintains uninterrupted power. Tsuji's procedural description further illustrates this necessity:

> [0042] [T]he hot-swapping procedure of fan unit 10 according to the present embodiment will be explained while referring to FIG. 6 [reproduced below]. …

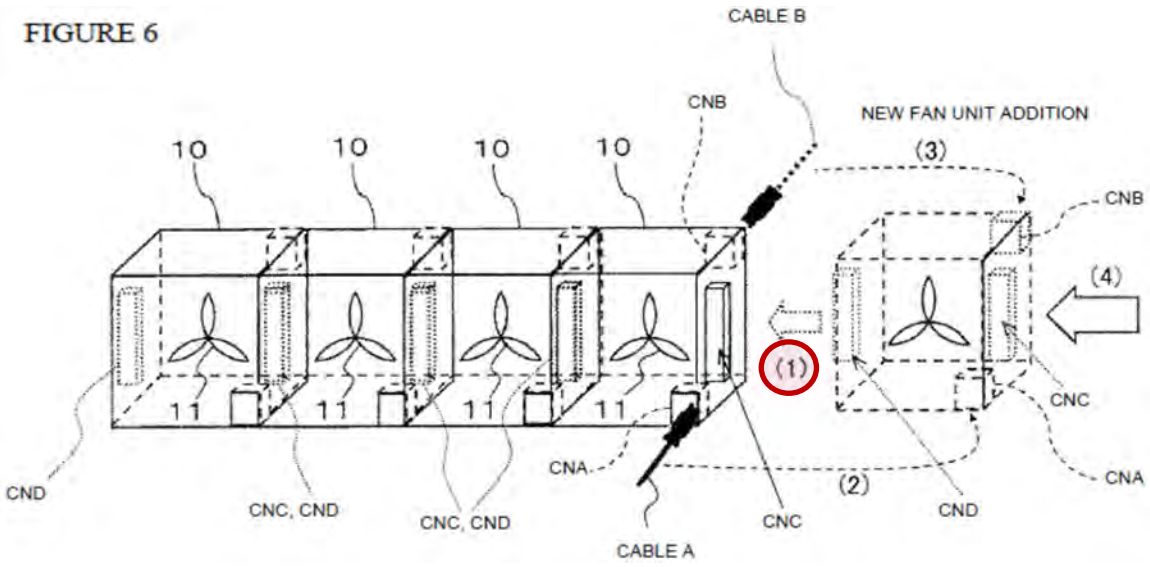
Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 48 of 105, IPR2024-01230

FIGURE 6



[0044] [T]he maintenance person engages the connector CNC (male) of fan unit 10 on the right-most side with the connector CND of the new fan unit 10 (refer to ***Arrow (1)*** shown in FIG. 6). Accordingly, the new unit 10 is connected to fan unit 10 on the right-most side as a fifth fan unit 10.

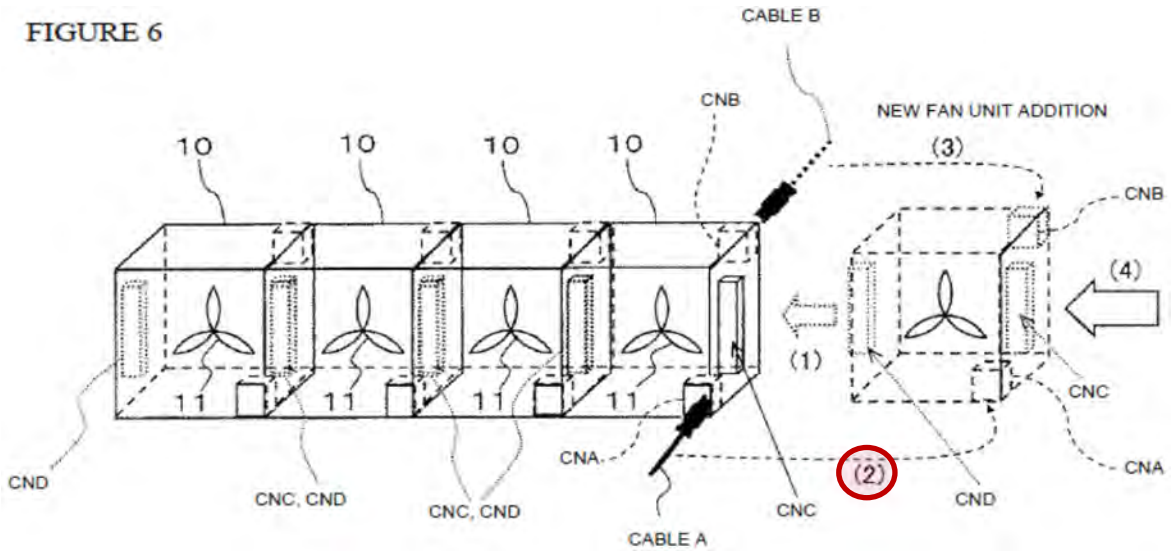
FIGURE 6



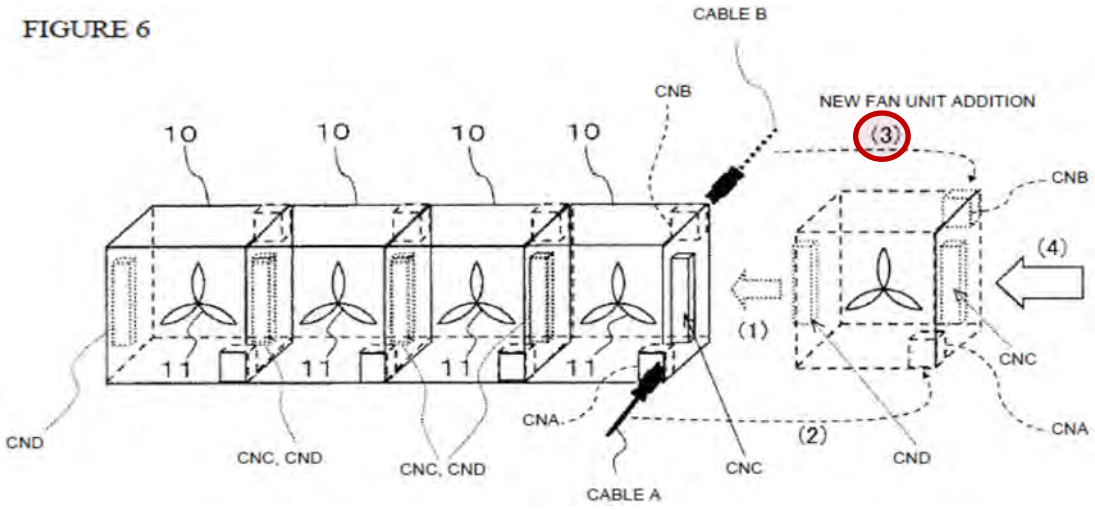
[0045] Subsequently, the maintenance person removes the cable A that is connected to the connector CNA of fan unit 10 on the right-most side, and connects the same to the connector CNA of the

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 49 of 105, IPR2024-01230

additionally- linked new fan unit 10, as shown by ***Arrow (2)*** of FIG. 6. …



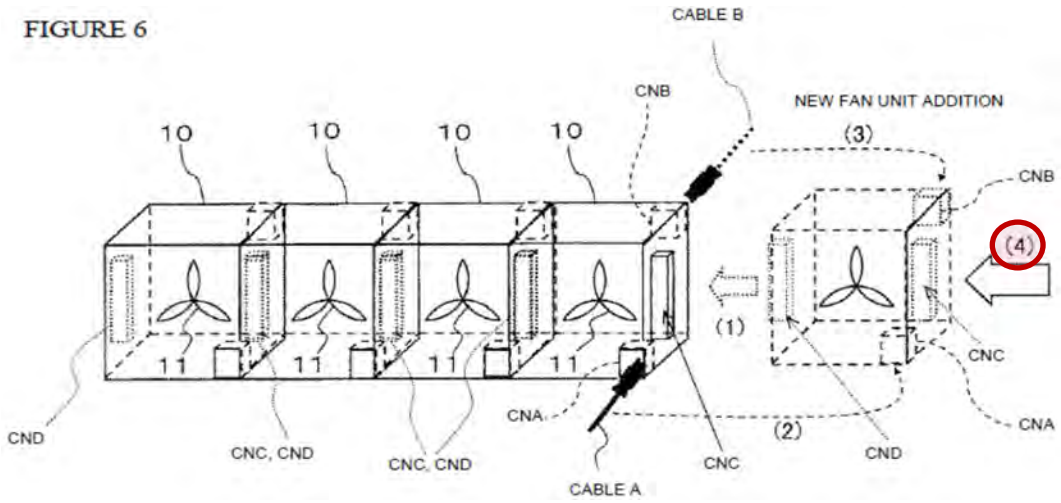
[0046] Furthermore, the maintenance person removes the cable B that is connected to the connector CNB of fan unit 10 on the right-most side, and connects the same to the connector CNB of the additionally- linked new fan unit 10, as shown by ***Arrow (3)*** of FIG. 6. …



Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 50 of 105, IPR2024-01230

[0047] Subsequently, the maintenance person performs the sliding operation to move all five fan units 10 in which the new fan unit 10 is added on the right-most side in a direction of the ***Arrow (4)*** (left side) shown in FIG. 6. Accordingly, the new fan unit 10 is pushed inside server 1, and a fifth fan unit 10 from the right (left-most side) is pushed outside from server 1.

FIGURE 6



[0048] At this time, when the pushed-out fan unit 10 is a faulty fan unit to be swapped (target fan unit), the pushed out fan unit 10 is removed, and the swapping operation is completed. When the pushed-out fan unit 10 is not the target fan unit, the maintenance person adds and connects that pushed-out fan unit 10 on the right-most side and pushes thereof inside server 1 as the new fan unit 10 as explained above. The maintenance person repeats such an operation till the target fan unit is pushed out.

[0049] In such a way, a specific fan unit among the serially-connected four fan units 10 (faulty fan unit) can be swapped with a new fan unit 10 without stopping the power supply to fan unit 10. Accordingly, swapping of fan unit 10 in a state in which rotation of

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 51 of 105, IPR2024-01230

the cooling fan 11 provided in each fan unit 10 is maintained as is, that is, swapping of fan unit 10 in the hot state can be performed.

See Tsuji (Ex-1007) at [0043]-[0049]. I have included photos of the 3-D printed models related to the Tsuji system in Appendix B as demonstratives.

B. Petitioner Fails To Show That Tsuji in View of Huang Teaches the Same Side Limitation

75. As explained previously, per the plain meaning of the claim language, both the power socket and the first connector must be located on the same "one side" of the body of a single illumination fan. Petitioner, however, fails to show that Tsuji teaches this Same Side limitation. The Board agrees. Decision at 16-17, 49-50.

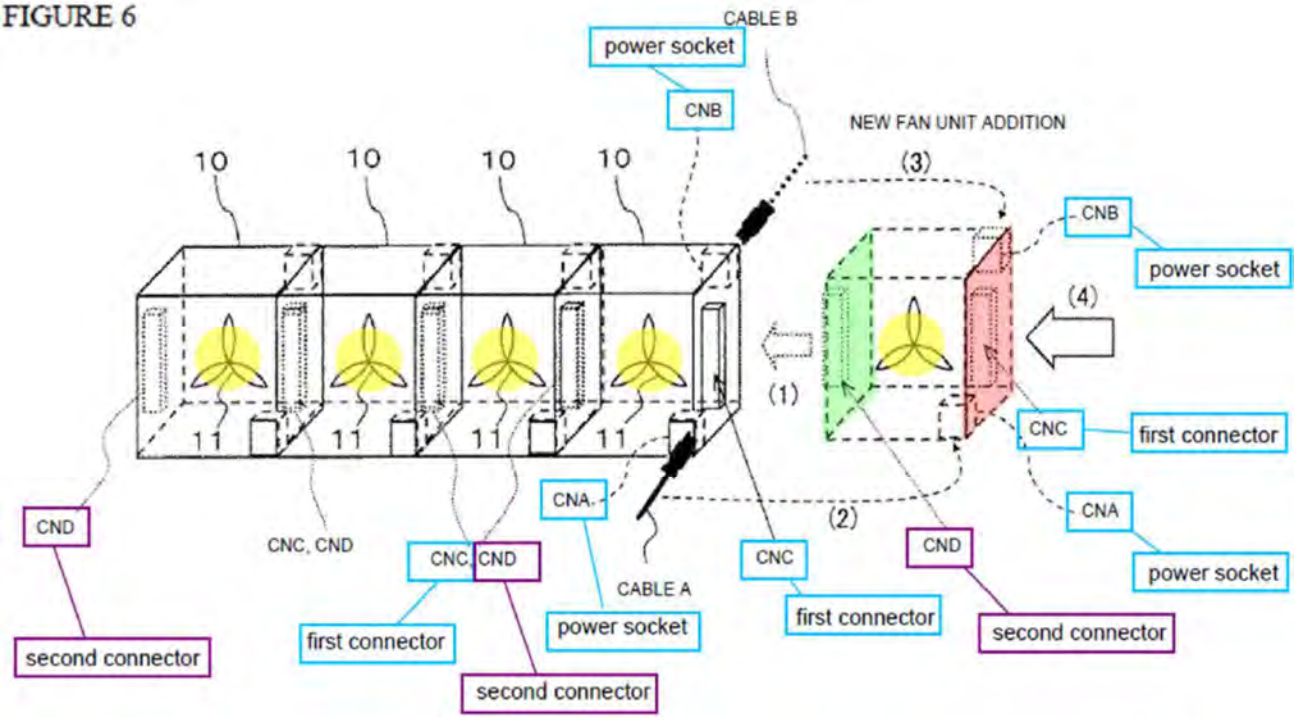
76. Petitioner did not apply the plain meaning of the claims to the prior art. Instead, Petitioner's Grounds based on Tsuji only require the "first connector" to be on the "one side of the body" but not the "power socket". Throughout the Petition and its supporting expert declaration, in no instance did Petitioner and its expert show that the cited prior art teaches a power socket and a first connector located on the same side of a single illumination fan. *See generally* Petition and Ex-1004. ***This misapplication of the plain meaning of the claims by Petitioner and Dr. Wolfe is a fatal blow to all of Petitioner's Tsuji grounds***, as explained in more detail below.

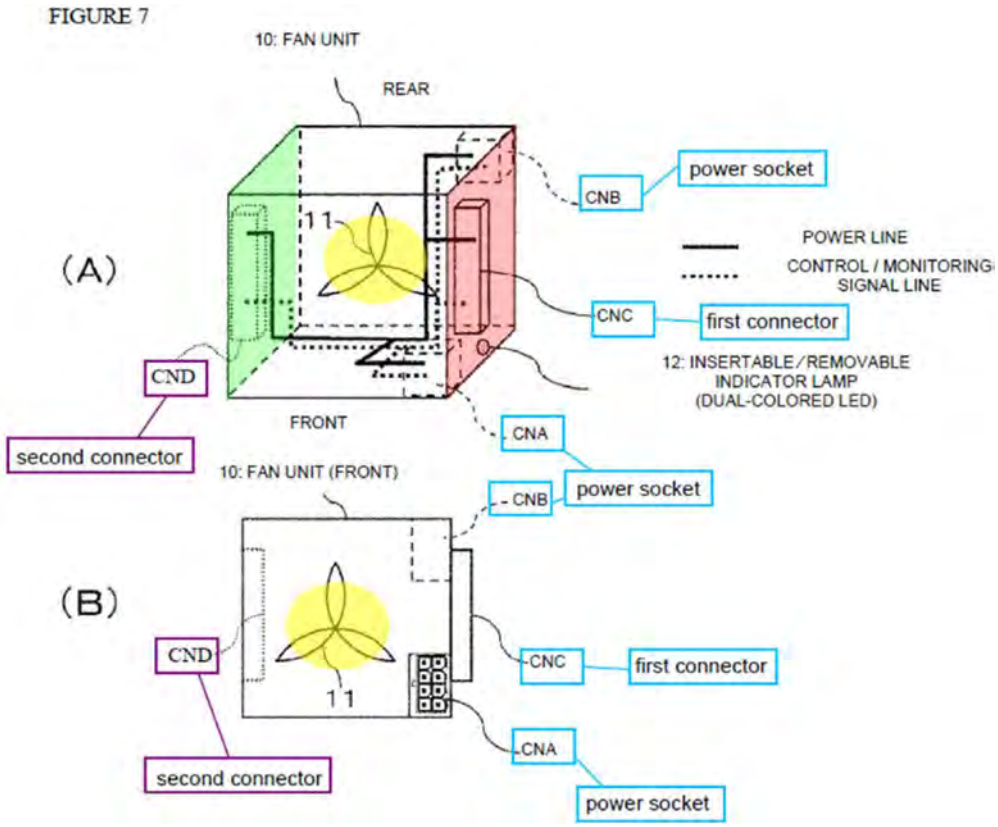
77. Petitioner has mapped Tsuji's power connector CNA or CNB as the alleged "power socket". ***However***, as acknowledged by Petitioner, Figure 6 of Tsuji illustrates the alleged power socket (CNA or CNB) on the "front" (equivalent to the

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 52 of 105, IPR2024-01230

"top" of the illumination fan body in the '336 patent's Fig. 1 embodiment) or the "rear" (equivalent to the bottom of the illumination fan body in the '336 patent's Fig. 1 embodiment), while the alleged first connector (CNC) is positioned on a separate "side". This arrangement in Tsuji does not read on the structure required by claim 1. Petitioner's own figures and analysis demonstrate that the CNA or CNB connector (the alleged "**power socket**") is, respectively, located on the "front" or the "rear" of the fan unit, while the CNC connector (the alleged "first connector") is positioned on a separate side of the fan unit:

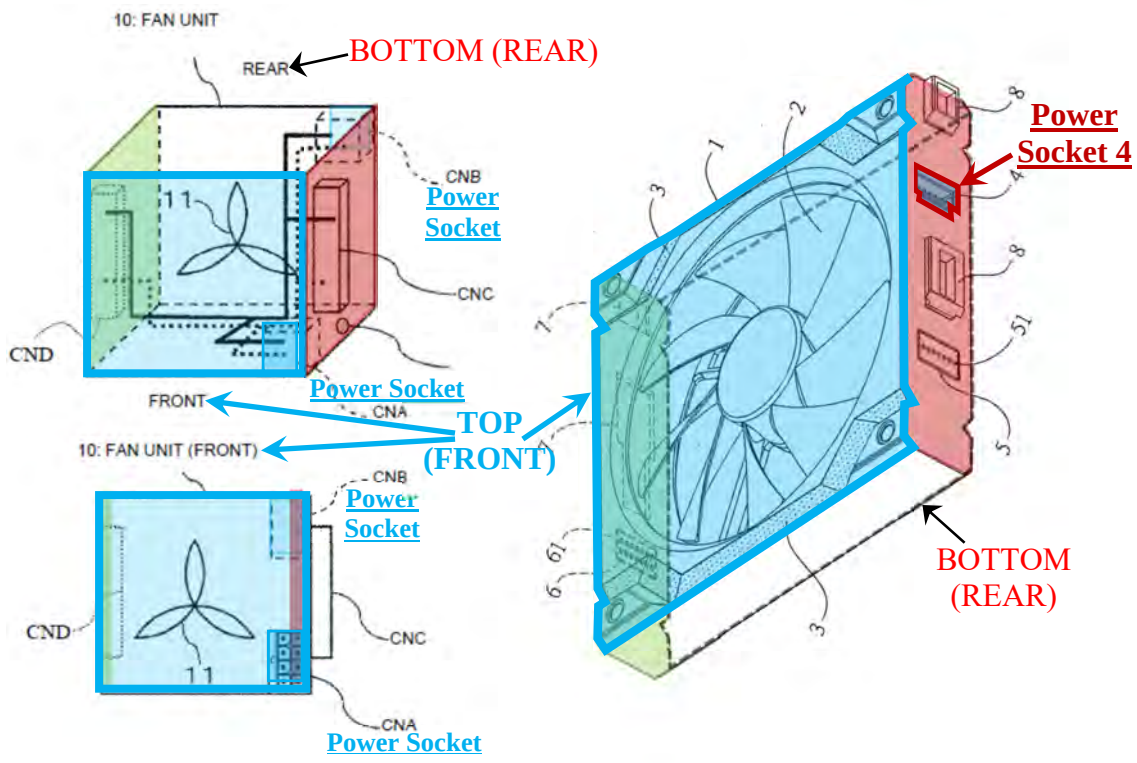
FIGURE 6





Petition at 34 (annotating Figs. 6-7 of Tsuji). In fact, Petitioner does not even allege – let alone attempt to demonstrate – that the CNA or CNB power connector (the alleged "**power socket**") is on the same side of the body as the CNC connector (the alleged "**first connector**"). Petition at 35. Petitioner's analysis of the "**on one side of the body**" limitation, in fact, only mentions the CNC connector and does not say anything about the alleged power socket CNA or CNB. *Id.* Thus, Petitioner fails to show that, in Tsuji, the alleged "power socket" CNA or CNB is on the same "one side of the body" that the alleged "first connector" CNC is on.

78. Indeed, ***the*** arrangement in Tsuji directly contradicts the structure required by the '336 patent, as shown below:



Compare Ex-1007 (FIGURE 7 of Tsuji, alleged "Power Socket" CNA/CNB) *with* '336 patent (FIG. 1 (rotated), "Power Socket 4") (annotated).

79. The diagram above depicts a comparison between a portion of Figure 7 from Tsuji (on the left) showing the location of the connectors that Petitioner maps to the claimed "**power socket**" (*i.e.* CNA/CNB), and Figure 1 of the '336 patent (on the right) depicting the location of the claimed power socket on the same side of the body as the first connector. As can be seen further above in Figures 6 and 7 of Tsuji as annotated by Petitioner, the connectors that Petitioner has mapped to the claimed "**power socket**" (CNA/CNB) are not located on the same side of the body as the connector that Petitioner mapped to the claimed "**first connector**" (CNC). Instead,

as shown, the CNA structure is located on the equivalent "top" (front) whereas the CNB structure is located on the equivalent bottom (rear) of the fan unit. Because neither CNA nor CNB is located on the same side of the fan unit as where CNC is, Tsuji fails to disclose "a power socket ***and*** a first connector ***on one side of the body***", as recited in claim 1.

80. Petitioner does not propose any modification of Tsuji (such as relocating the CNA/CNB connectors) in an attempt to cure the deficiency mentioned above. Petitioner also does not cite or rely on Huang for this claim limitation. *Id.* Thus, Ground 1 fails.[10]

81. Even if Petitioner had suggested a modification of Tsuji to relocate the CNA/CNB connectors (which Petitioner did not), such a modification would make no sense in the system of Tsuji and would render it inoperable. This is because, for example, relocating the power sockets CNA and CNB to the side of CNC would jam the power sockets between adjacent fan units, rendering them inaccessible and inoperable. Thus, the specific layout in Tsuji—placing the power sockets CNA and CNB on the front (top) and rear (bottom) of the fan body and the connectors CNC

[10] This failure is fatal to all of Petitioner's grounds based on Tsuji, *i.e.*, Grounds 1 through 3, because Petitioner relies solely on Tsuji for this limitation of claim 1. *See* Petition, at 32-35.

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 56 of 105, IPR2024-01230

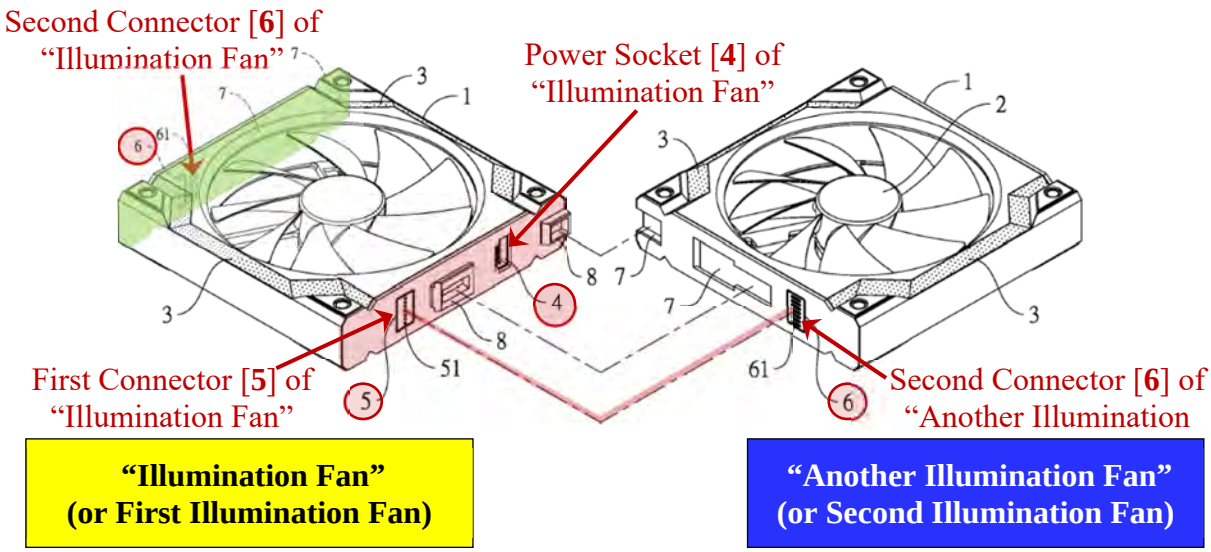
and CND on the sides—is a deliberate requirement aimed at preventing wiring interference and preserving uninterrupted power—all essential for the operational integrity of Tsuji's hot-swapping system. Further, Huang cannot cure Tsuji's deficiency because Petitioner uses Huang for only the illumination area related limitations.

82. In sum, it is a physical impossibility in Tsuji's hot-swapping scheme to have the power socket CNA or CNB located on the ***same*** "one side of the body" as the first connector, as required by claim 1 of the '336 patent.

C. Petitioner Fails To Show Tsuji in View of Huang Teaches Limitation 1[d]'s Requirement that "the First Connector of the Body [of the First Illumination Fan] Is Connected with a Second Connector of a Body of Another [*i.e.,* a Second] Illumination Fan".

83. Petitioner fails to show that Tsuji alone or in combination with Huang teaches limitation 1[d]'s requirement that "the ***first*** connector **[5]** of the body [of the illumination fan, *i.e.*, the **first illumination fan** on the left] is connected with a ***second*** connector **[6]** of a body of another illumination fan [*i.e.*, the **second illumination fan** on the right]" as exemplified below:

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 57 of 105, IPR2024-01230



'336 patent, Cl. 1, Fig. 2 (annotated). As can be seen above, the ***first*** connector **[5]** of the body of the **first illumination fan** must also be on the same side of the body of the **first illumination fan** (red side) as the power socket **[4]** of the **first illumination fan**. The second connector **[**6**]** of the **first illumination fan** also must be on a ***different*** side of the body of the **first illumination fan** (green side). Thus, the respective mappings to the "***first*** connector" and the "***second*** connector" of the first illumination fan ***cannot*** be trivially swapped, neither can the respective mappings to the (first) "illumination fan" and the (second or) "another illumination fan".

84. Petitioner must show all the above spatial relationships amongst the recited claim elements in limitation 1[d] in the Petition. Yet throughout the entire discussion of Tsuji, Petitioner has never once labeled which fan unit 10 is the alleged (first) "illumination fan" and which is the alleged (second or) "another illumination

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 58 of 105, IPR2024-01230

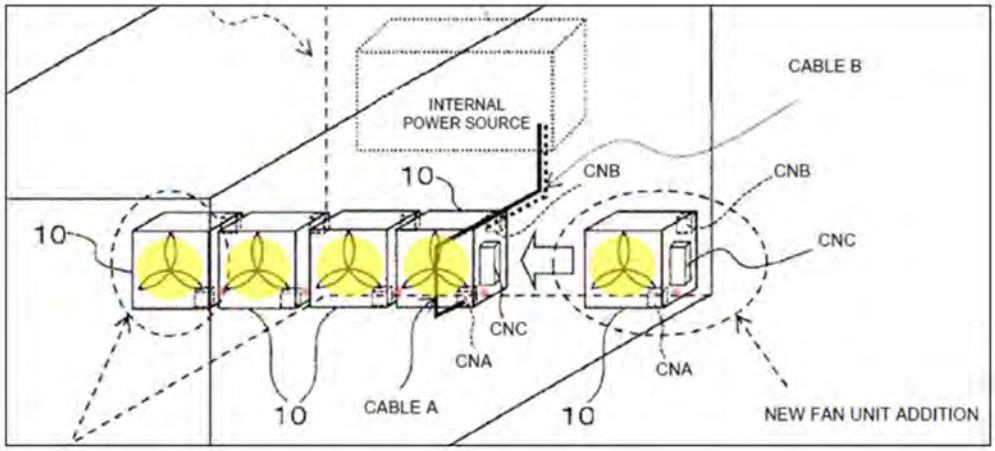
fan. Nor has Petitioner shown that the order of labeling the alleged first and second illumination fans does not matter, such that either of any two adjacent fan unit 10s in Tsuji can be the (first) "illumination fan" or the (second or) "another illumination fan" (it cannot because the order of labeling them does matter). The section discussing limitation 1[d] in the Petition (at 35-39) is also devoid of any explanation on ***which*** fan unit 10's CNC and CND connectors are respectively mapped to the first and second connectors of the (first) "illumination fan"; nor ***which*** fan unit 10's CND connector is mapped to the second connector of the (second or) "another illumination fan". Huang has nothing to teach in this regard, so Petitioner's reliance on Huang cannot save its defective analysis based on Tsuji. Thus, Petitioner fails to show that Tsuji alone or in combination with Huang teaches limitation 1[d]'s requirement that "the ***first*** connector of the body [of the illumination fan] is connected with a ***second*** connector of a body of another illumination fan".

D. Petitioner Fails To Show That Tsuji in View of Huang Teaches Limitation 1[b], "an Illumination Area on at Least Two Sides of the Fan at Top of the Body"

85. Claim 1 of the '336 patent requires, *inter alia*, claim limitation 1[b], "an illumination area on at least two sides of the fan **at top of the body**". However, Tsuji in view of Huang fails to teach this limitation. Thus, as explained below, Ground 1 fails.

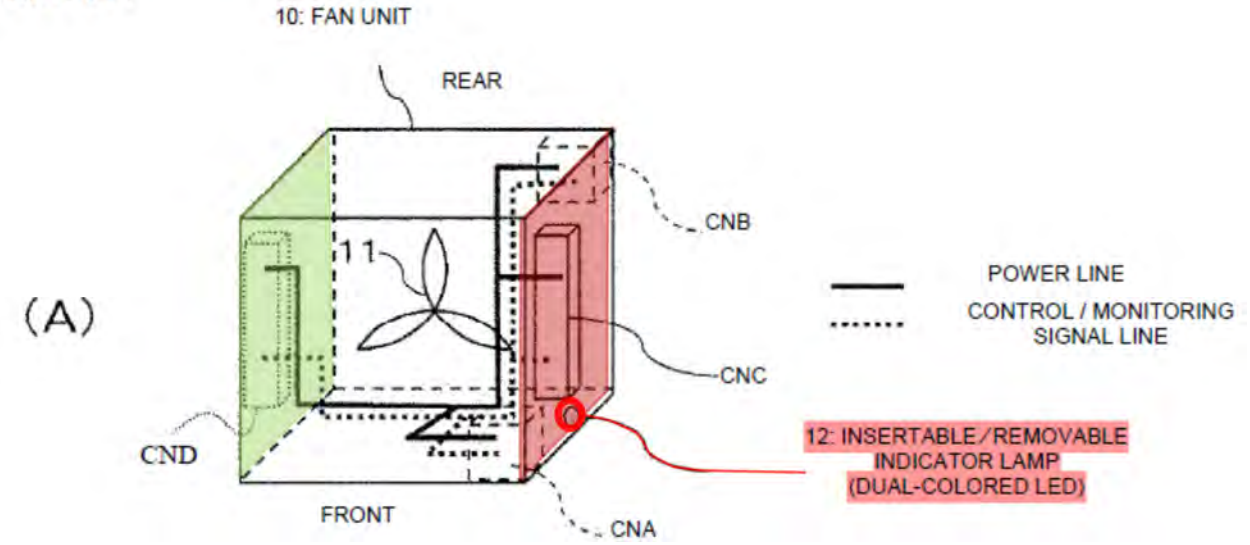
Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 59 of 105, IPR2024-01230

86. Petitioner contends that "Tsuji teaches an indicator lamp 12 on the side surface of the fan at the top of the body", as purportedly illustrated below:



Petition at 31. But as can be seen above and more clearly in Figure 7(A) (reproduced and annotated below), the indicator lamp 12 is ***not*** located at the "front", or at the equivalent "top" in the '336 patent, of the fan body:

FIGURE 7



87. Thus, Tsuji teaches a ***single*** indicator lamp located on only ***one*** side of the fan and also not on ***top*** (front) of the fan body. That is, Petition fails to show that Tsuji's indicator lamp is "on at least ***two*** sides of the fan at ***top*** of the body". Petitioner appears to acknowledge this deficiency by arguing that "it would have been obvious to a PHOSITA to include additional indicator lights on different sides ('at least two sides') of the fan body so that they can be viewed from multiple perspectives". Petition at 32. Petitioner's obviousness argument overlooks the many reasons a POSITA would have been discouraged to modify the Tsuji fan unit in the manner suggested, as the inclusion of more lamps (or any other lighting or illumination elements, such as those in Huang Ex-1008) would have conveyed no benefit and would only have added costs and energy consumption as well as heat generation that a POSITA would have strived to avoid. Indeed, Tsuji's primary objective is cooling computers in a server room where seldom anyone goes but for maintenance related reasons. That is, there is no motivation for a POSITA to add fancy illumination through, *e.g.*, translucent fan bodies such as that in Huang to the Tsuji system because such illumination adds only heat and costs to the hot-swapping system with ***no*** discernable benefits and only harms.

88. In sum, Tsuji alone or in view of Huang fails to disclose "an illumination area on at least two sides of the fan at top of the body" in claim 1 of the '336 patent, and thus Tsuji in view of Huang does not render claim 1 obvious.

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 61 of 105, IPR2024-01230

* * *

89. Because Grounds 1 and 4 fail, Petitioner has not shown that claim 1 is unpatentable. Thus, claims 2-5 have also not been shown to be unpatentable.

X. GROUNDS 2 & 6: PETITIONER FAILS TO SHOW ECHAZARRETA IS COMBINABLE WITH TSUJI/HUANG OR LAI/HASEGAWA

90. Petitioner's Grounds 2 and 6 rely on Tsuji/Huang or Lai/Hasegawa in view of Echazarreta. Petition at 44, 78. But as explained below, Petitioner fails to show how Echazarreta is combinable with Tsuji/Huang or Lai/Hasegawa.

A. The Limitations of Claim 4

91. Claim 4 is reproduced below:

> 4. The illumination fan connectable with at least one illumination fan for a computer of claim 1, wherein a groove is provided on one side of the body of the illumination fan, while ***an engaging block*** is provided on another side thereof to be engaged into the groove, such that when the groove of the body of the illumination fan is engaged with ***the engaging block of the body of another illumination fan***, the body of the illumination fan is connected with the body of another illumination fan.

92. As shown above, claim 4 relies on "***an engaging block***" as the antecedent basis for "***the engaging block of* the body of another illumination fan**". Thus, claim 4 effectively recites that "***a* groove** is provided on **one side of the body of the illumination fan**, while ***an engaging block*** [***of* the body of another**

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 62 of 105, IPR2024-01230

illumination fan] is provided on **another side** [**of the body of the illumination fan**] to be engaged into ***the*** **groove** [**of the body of the illumination fan**]", as exemplarily shown in the annotated Figure 2 below:

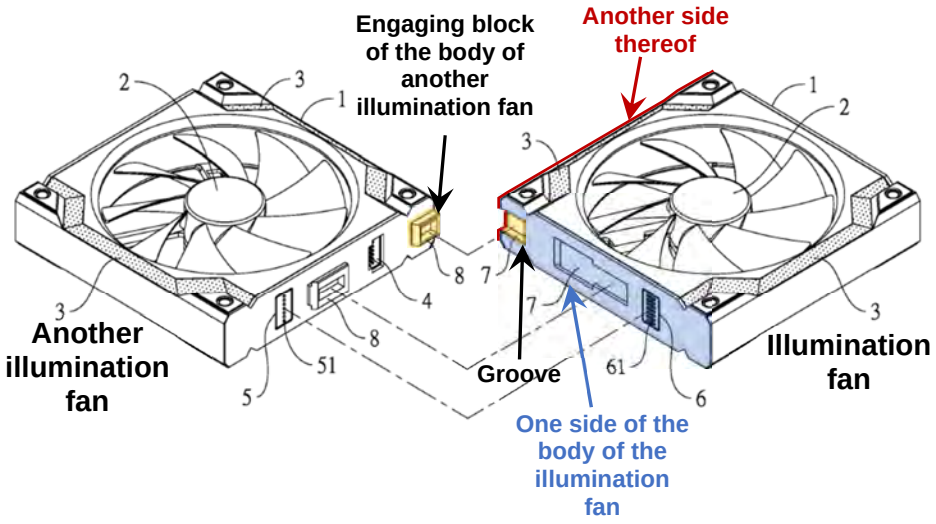
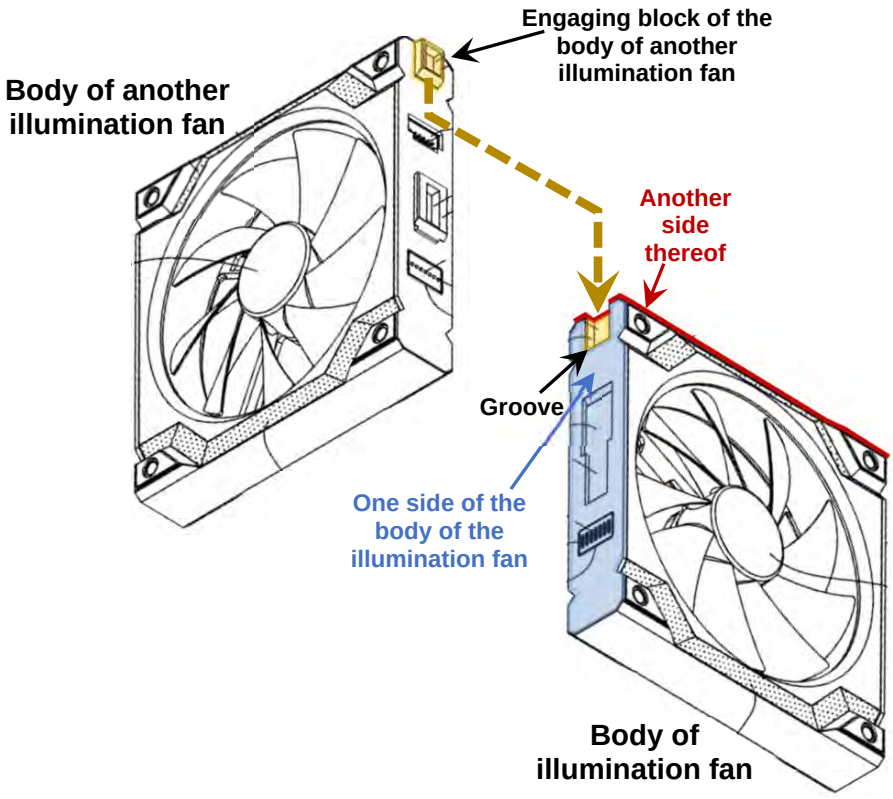


Fig. 2



Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 63 of 105, IPR2024-01230

93. As shown above, annotated Figure 2 exemplifies claim 4's language that "***an engaging block*** [**of the body of another illumination fan**] is provided on **another side** [**of the body of the illumination fan**] to be ***engaged into the groove*** [provided on **one side** **of the body of the illumination fan**]". The engaging block **8** of the body of another illumination fan is ***provided*** through an opening ***on*** the "another side" of the body of the illumination fan to be ***engaged into*** the groove **7** provided on the "one side" of the body of the illumination fan. This is what claim 4's language of providing "an engaging block" on the "another side thereof" means[11]—by providing the engaging block through the opening on the "another side

[11] The "an engaging block … provided on another side thereof" in claim 4 does ***not*** mean that the "an engaging block" is part of "the body of the illumination fan" even though it is "provided on another side thereof." This is because the engaging block, if interpreted to be part of the illumination fan body, would then have to be engaged into the ***same*** illumination fan body's ***own*** groove provided on ***another*** side of the ***same*** illumination fan body. The engagement under this interpretation is nonsensical and violates claim 4's language: "when the groove of the body of the illumination fan is engaged with ***the*** **engaging block *of the body of another illumination fan***, the body of the illumination fan is connected with the body of another illumination fan."

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 64 of 105, IPR2024-01230

side thereof" with respect to the body of the illumination fan to be engaged into the groove **7**. I have included photos of a product related to claim 4 in Appendix C as demonstratives.

B. Petitioner Fails To Show Echazarreta Is Combinable with Tsuji/Huang or Lai/Hasegawa

94. The Echazarreta art (Ex-1009) cannot be used to modify Tsuji/Huang or Lai/Hasegawa to teach the limitations of claim 4. This is because Echazarreta's fan bodies' purported engaging blocks will get in the way of Tsuji/Huang's or Lai/Hasegawa's electrical connections between their fan bodies' sides, causing their fans to become inoperable.

95. In the case of Tsuji/Huang, because Huang does not have connectors between adjacent fans, only Tsuji needs to be considered. As shown below, the connectors of Tsuji's fans are engaged and disengaged in a direction perpendicular to that in which the connectors of Echazarreta's fans are engaged and disengaged. As such, Tsuji's fan connectors simply cannot be combined with Echazarreta's fan connectors. Indeed, for example, the engagement of a CNC connector of a Tsuji fan with a CND connector of an adjacent Tsuji fan in the direction like Echazarreta's fan connectors would be impossible because Tsuji's CND connectors do not have openings in the perpendicular direction for Tsuji's CNC connectors to engage into. Conversely, the disengagement of a CNC connector of a Tsuji fan already engaged with a CND connector of an adjacent Tsuji fan in the perpendicular direction like

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 65 of 105, IPR2024-01230

Echazarreta's fan connectors will just break the Tsuji fan connectors. Tsuji's hot swapping mechanism also will not work if its fan bodies must be connected and disconnected in the perpendicular direction like Echazarreta's fan bodies due to vertical space constraints. Accordingly, Echazarreta is incompatible with Tsuji and cannot be combined with Tsuji to modify the Tsuji/Huang system.

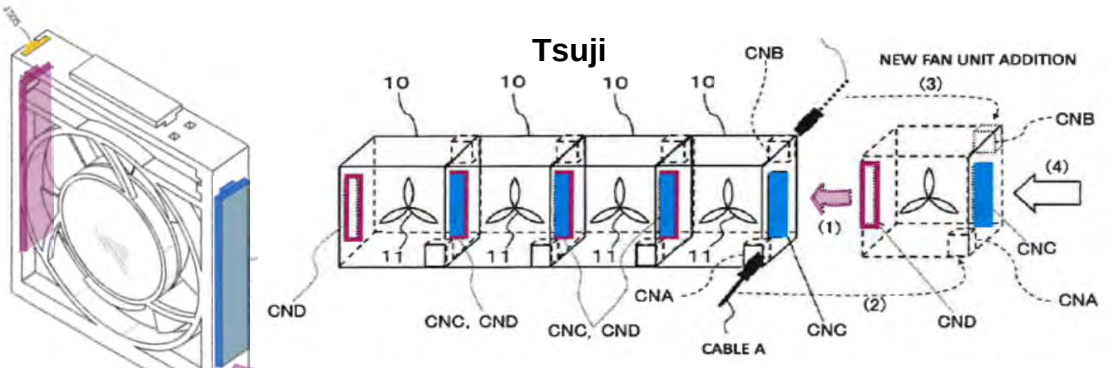
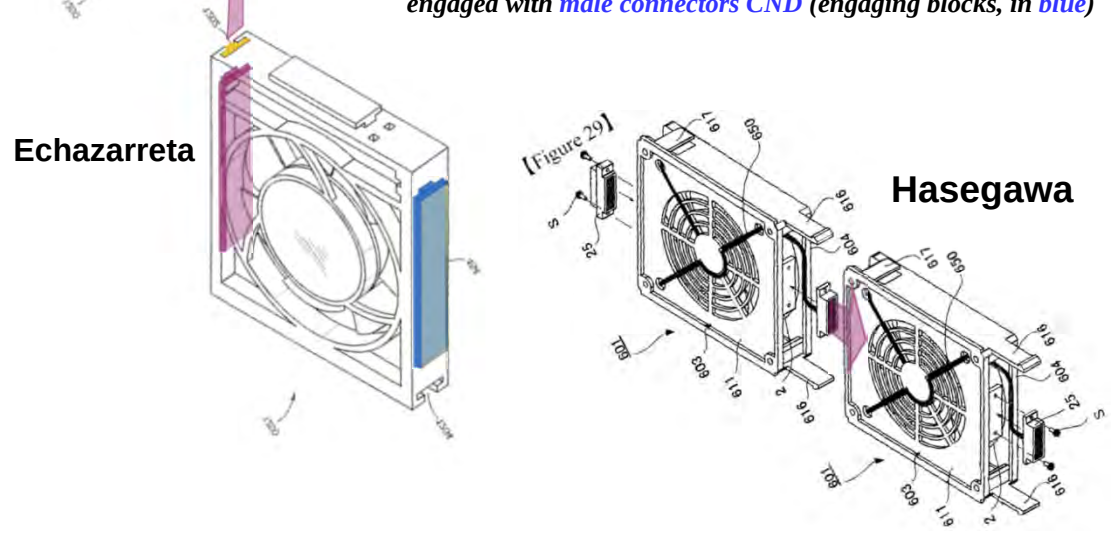


FIG. 6 of Tsuji, annotated showing female connectors CND (grooves, in purple) engaged with male connectors CND (engaging blocks, in blue)

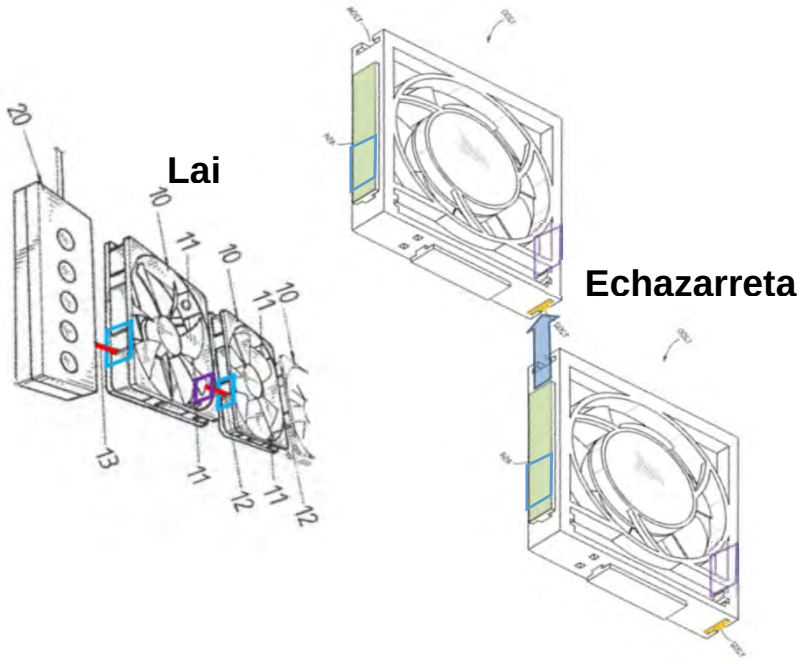


96. Hasegawa (*see* above-right) is like Tsuji in that it has connectors engaging and disengaging with each other in a direction ***perpendicular*** to that of Echazarreta, too, and thus cannot be modified in view of Echazarreta for the same

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 66 of 105, IPR2024-01230

reasons as those for Tsuji. Thus, Lai modified in view of Hasegawa cannot be combined with Echazarreta, either.

97. As to Lai alone, as shown below, before making an Echazarreta connection between Lai's adjacent fans, the fans will first need to be pulled apart so much that Lai's transmission line 12 (red) between the fans will simply break, not to mention that Echazarreta's purported engaging block (green) on Lai's fans will shear off and sever Lai's transmission line 12 when "engaging into" the groove (yellow). Then, upon full engagement, Echazarreta's purported engaging block (green) will also block off the openings (purple and blue) on the sides of Lai's fan bodies to prevent the transmission line 12 (red) from going through between the adjacent fans altogether. Thus, Echazarreta cannot be combined with Lai to modify it into an operable device.



Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 67 of 105, IPR2024-01230

98. In sum, Petitioner fails to show how Echazarreta can be combined with Tsuji/Huang or Lai/Hasegawa to create an operable system. Indeed, because of the difficulties above, a POSITA would not have been motivated to modify Tsuji/Huang or Lai/Hasegawa in view of Echazarreta. Thus, Grounds 2 and 6 fail.

XI. GROUNDS 3 & 7: PETITIONER FAILS TO SHOW CHOU OR LIU TEACHES LIMITATIONS IN CLAIM 5 AND IS COMBINABLE WITH TSUJI/HUANG OR LAI/HASEGAWA

99. Petitioner's Grounds 3 and 7 rely on Tsuji/Huang or Lai/Hasegawa in view of Chou or Liu. Petition at 47, 81. But as explained below, Petitioner fails to show how Chou or Liu teaches key limitations in claim 5 and is combinable with Tsuji/Huang or Lai/Hasegawa.

Claim 5 is reproduced below:

> 5. The illumination fan connectable with at least one illumination fan for a computer of claim 1, wherein a groove is provided on two sides of the body of the illumination fan, and the body of the illumination fan is connected with the body of another illumination fan by respectively engaging an engaging block with one of the grooves on the sides of the body of the illumination fan and one of the grooves on the sides of the body of another illumination fan.

100. As can be seen below, Figures 4 and 5 of the '336 patent show an embodiment of claim 5, in which the illumination fan bodies are connected laterally on their sides:

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 68 of 105, IPR2024-01230

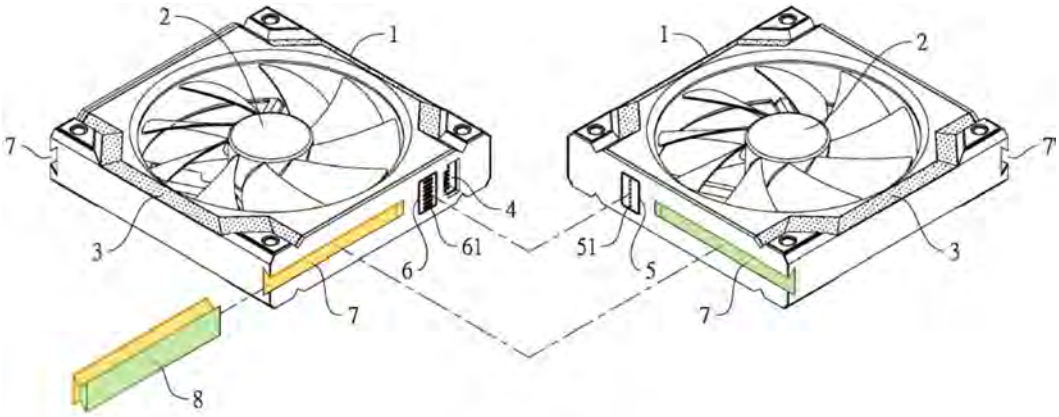


Fig. 4

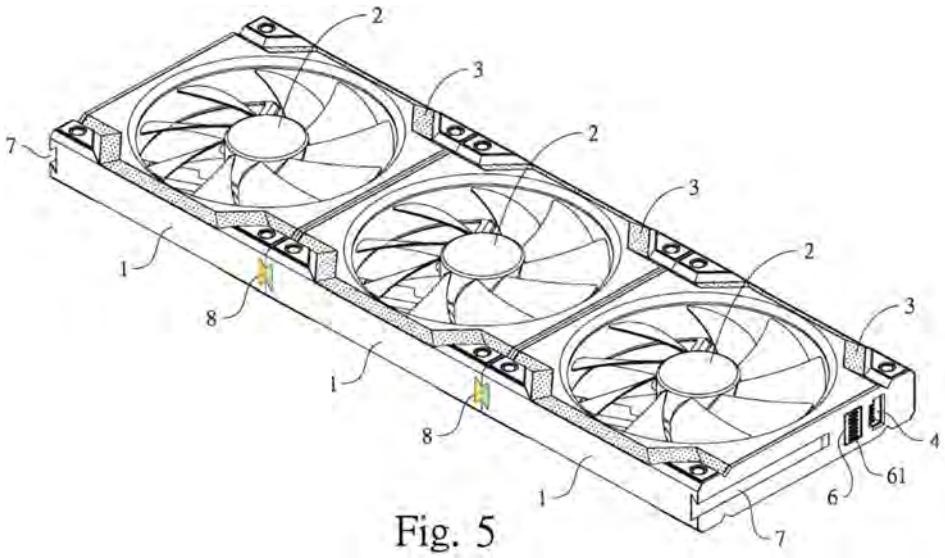


Fig. 5

101. Chou, including without limitation its Figure 4, does not teach the original claim 5 because Chou's fan connection is on the top and bottom (or the front and back) of the fan bodies such that they are connected in the ***top/bottom*** (front/back) direction of the fans' rotational axes, as shown below:

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 69 of 105, IPR2024-01230

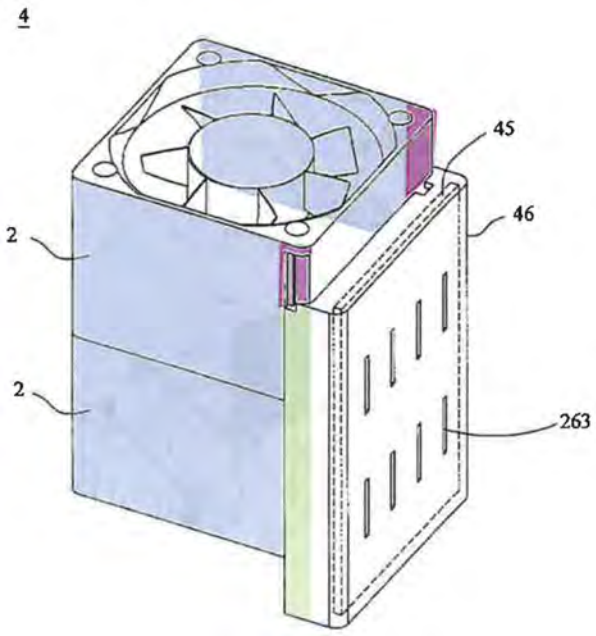


FIG. 4 of Chou, annotated

Fig. 4 of Chou (annotated); *Compare id. with* Fig. 5 of '336 patent.

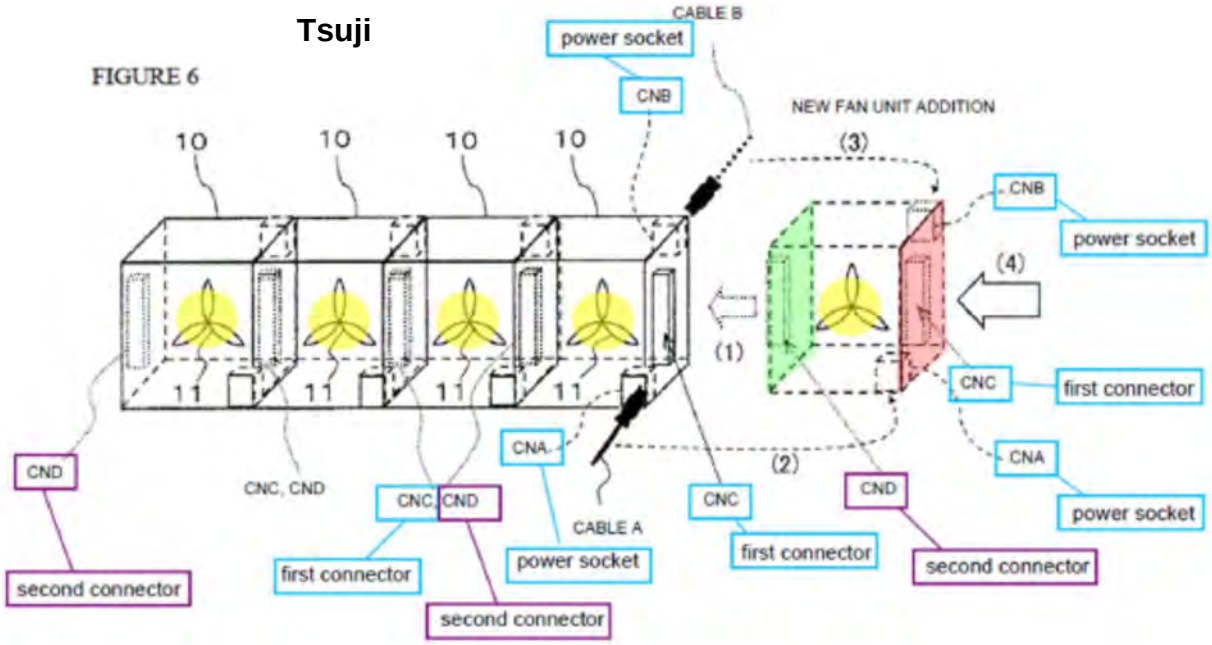
102. Indeed, Chou states that "[a]s shown in FIG. 4 [reproduced and annotated above], the fan assembly 4 includes two fans 2 ***connected in series*** and connected together". *See, e.g.*, Chou at [0025]; *see also id. at* [0009] (stating its "fans are ***connected together in series***".) A POSITA would have understood from the phrase "connect[ion] in series", Chou means the fan body connection in the top/bottom (front/back) direction. In contrast, the fan bodies in claim 5 are connected on their sides ***laterally*** at least because claim 5 depends from the claim 1, which recites an illumination area on "top" of the body of the illumination fan. Thus, the fan connection in claim 5 should ***not*** be on the top of the fan body to avoid blocking the illumination area. Claim 5 is therefore distinguishable from and

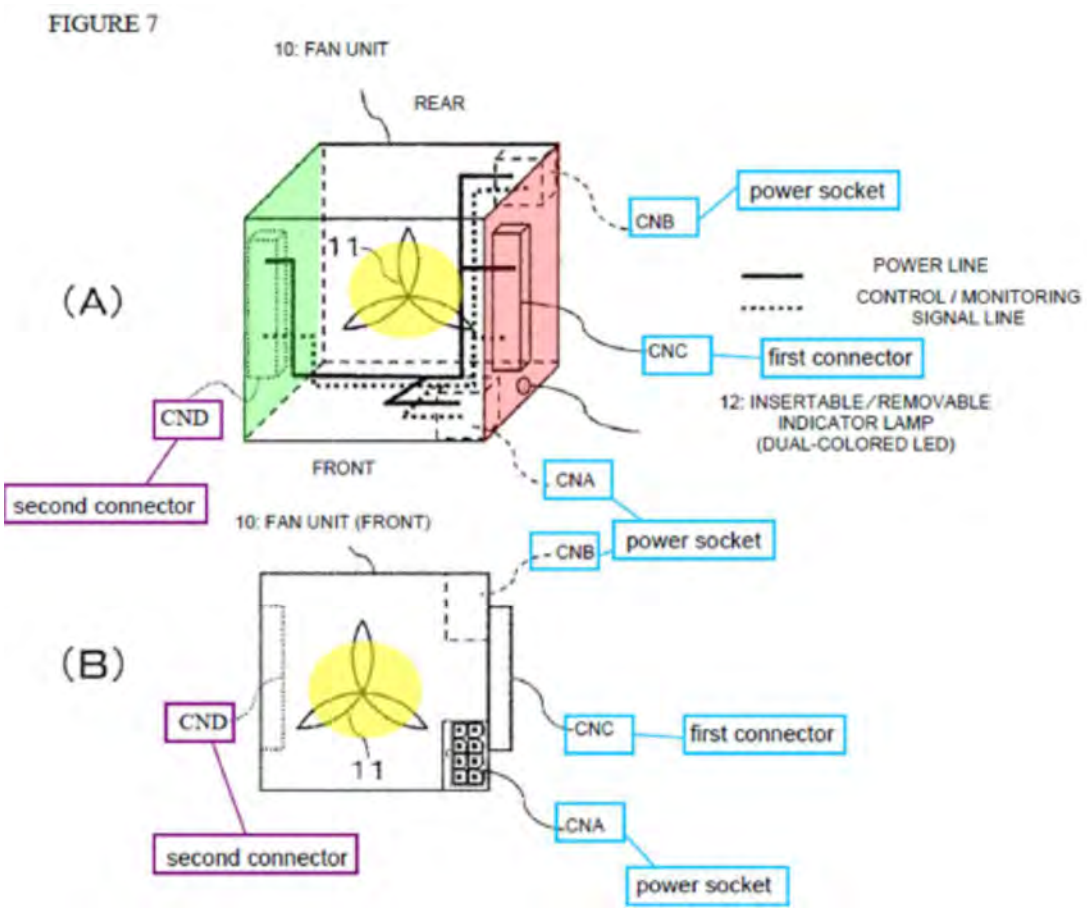
Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 70 of 105, IPR2024-01230

patentable over Chou.

103. Further, Chou also cannot be used to modify Tsuji/Huang or Lai/Hasegawa to connect the fan bodies in the top/bottom (*i.e.*, front/back) direction because Tsuji's and Lai/Hasegawa's electrical connectors are all located laterally on the fan bodies' sides (highlighted in ***red*** and ***green*** by Petitioner) in a direction ***perpendicular*** to Chou's fan body connection, as shown below:

Tsuji





Petition at 34 (annotations original).

Lai (modified)

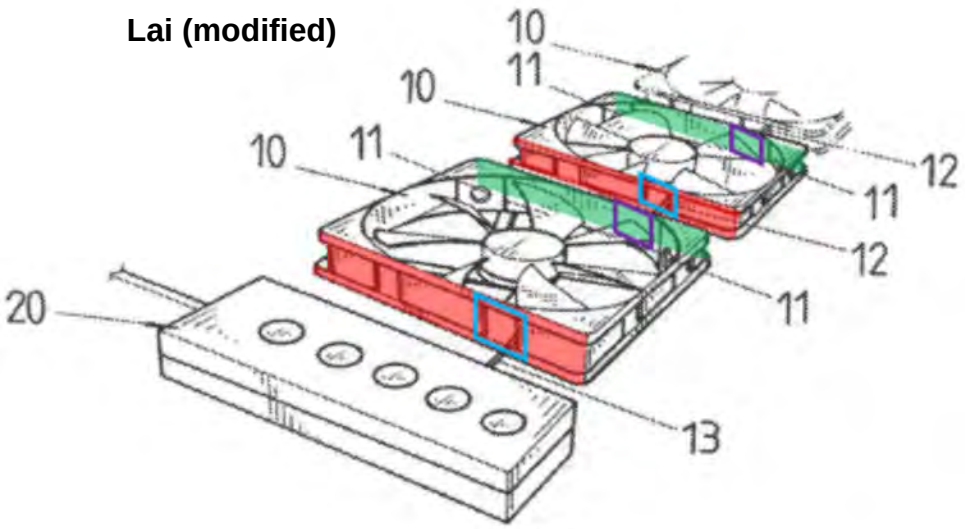
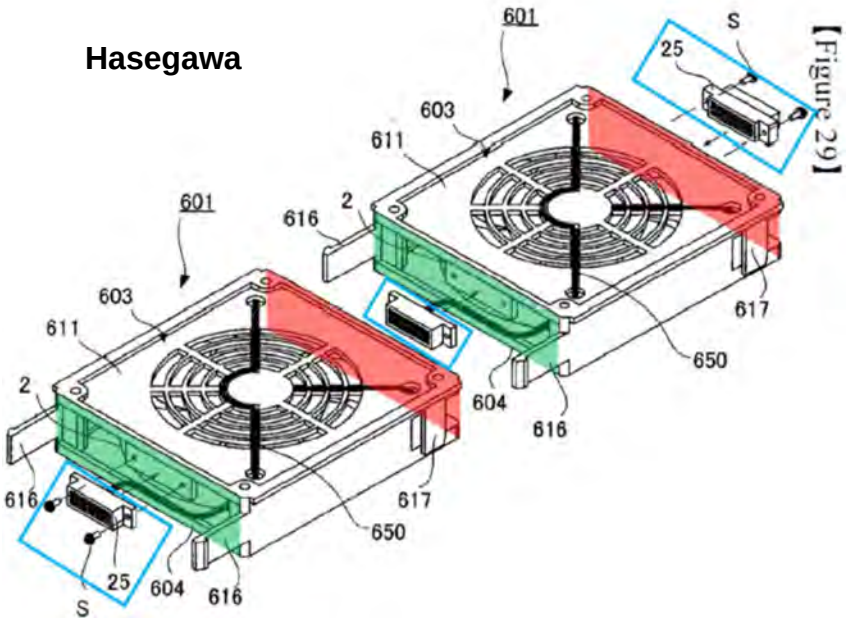


FIG.3

Petition at 59 (annotations original).



Petition at 65 (annotations original).

104. As shown above, the fan bodies in Tsuji, Lai, or Hasegawa connected laterally on their sides cannot be combined with Chou's connection on the fan bodies' top/front and bottom/back in a direction that is perpendicular to that in Tsuji, Lai, or Hasegawa. This is at least because the fan bodies in Tsuji, Lai, and Hasegawa must be connected laterally via their electrical connectors on their fan body sides to be operable. As a result, a POSITA would not have been motivated to modify Tsuji, Lai, and/or Hasegawa in view of Chou. Critically, Petitioner has completely ignored the stark contrast between the ***top/bottom*** fan connection in Chou and the ***lateral*** fan connection in Lai, Tsuji, and/or Hasegawa on their fan body ***sides***. Indeed, nowhere in the Petition nor in Dr. Wolfe's declaration is the ***top/bottom v. lateral/side fan***

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 73 of 105, IPR2024-01230

connection issue addressed, at all.

105. Assuming *arguendo* that Chou could be somehow combined with Lai, Tsuji, or Hasegawa to teach a connection on the fan bodies' sides (it cannot be so combined), Tsuji/Huang or Lai/Hasegawa as modified by Chou still do not teach "a groove is provided on two sides of the body of the illumination fan, and the body of the illumination fan is connected with the body of another illumination fan by respectively engaging an engaging block with one of the grooves on the sides of the body of the illumination fan and one of the grooves on the sides of the body of another illumination fan[,]" as required by claim 5. This is at least because Chou's alleged engaging block is *a sliding clamp that* ***clamps serially*** *two* ***sliding rails*** *on the two fan bodies' corners*, such that when Chou is used to purportedly modify Lai and/or Tsuji to clamp the fan bodies ***laterally***, the sliding rails will have to be moved onto the ***top/front*** and the ***bottom/back*** of each fan body for the sliding clamp to clamp them. But that is contrary to claim 5's requirement that the "grooves" be on the "***sides*** of the body" of each illumination fan.

106. In the case of Tsuji, as shown in the annotated figure below (reproduced from Petition), the "[a]dded connecting member" in the front (*i.e.*, on the "top") of each fan 10 even cuts off (or at least interferes with) the critical cable **A**, thus rendering the hot-swapping system in Tsuji inoperable:

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 74 of 105, IPR2024-01230

FIGURE 6

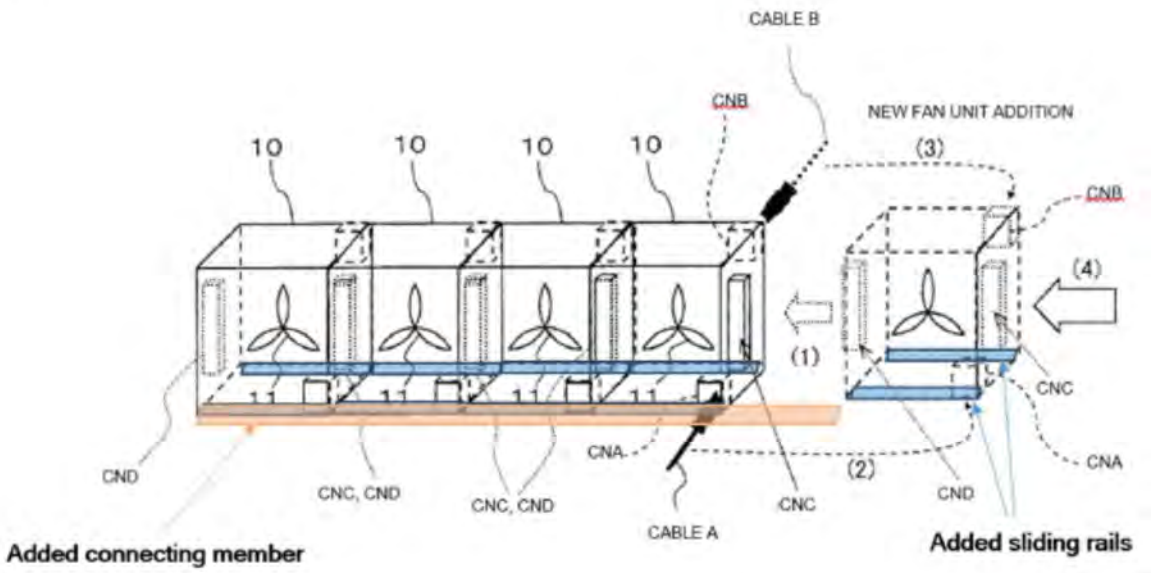


FIG. 6 of Tsuji (modified)

Petition at 51 (annotations original). The "[a]dded sliding rails" of each fan 10 to purportedly engage with the "[a]dded connecting member" are also ***not*** located on "***two sides*** of the [fan 10's] body" as required by claim 5—instead, they appear to be located on either the ***same lower*** side (singular), or the front/top and back/bottom, of each fan 10's body. This is contrary to claim 5's language reciting "***a groove is provided on two sides of the body of the illumination fan***, and the body of the illumination fan is connected with the body of another illumination fan by respectively engaging an engaging block with one of ***the grooves on the sides of the body of the illumination fan and one of the grooves on the sides of the body of another illumination fan***".

107. In the case of Lai, the situation is similar, as shown in the below

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 75 of 105, IPR2024-01230

annotated figure (reproduced from the Petition) purportedly to be a Lai system modified in view of Chou:

Lai (modified in view of Chou)

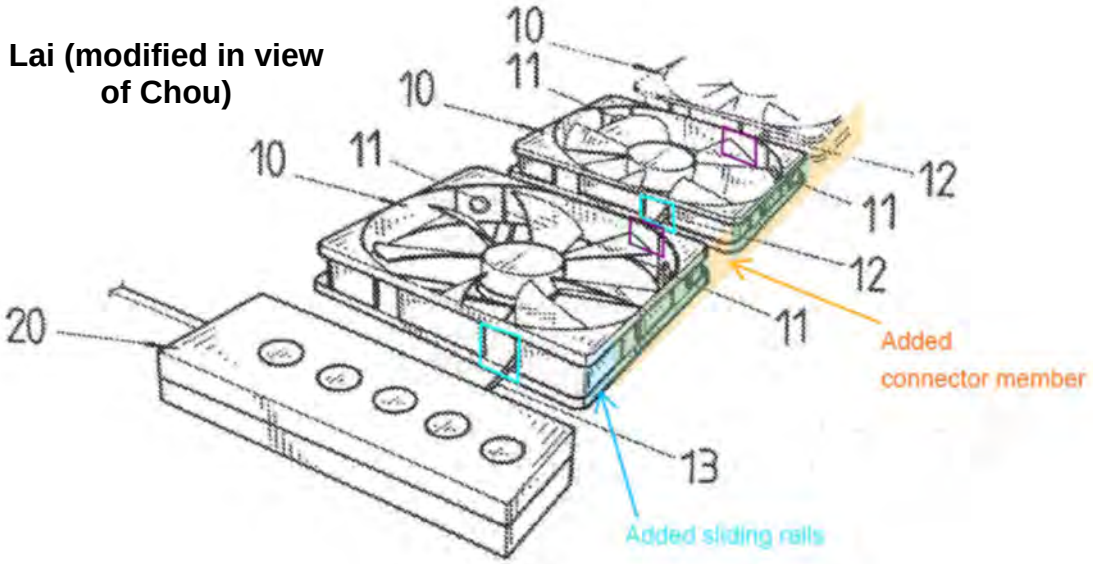


FIG.3

Petition at 84 (black labeling added; other annotations original). As can be seen above, the "[a]dded sliding rails" of each fan 10 to purported engage with the "[a]dded connecting member" are ***not*** located on "***two sides*** of the [fan 10's] body" as required by claim 5—instead, they appear to be located on the same lower side of each fan 10's body. This is contrary to claim 5's language reciting "***a groove is provided on two sides of the body of the illumination fan***, and the body of the illumination fan is connected with the body of another illumination fan by respectively engaging an engaging block with one of ***the grooves on the sides of the***

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 76 of 105, IPR2024-01230

body of the illumination fan and one of the grooves on the sides of the body of another illumination fan".

108. Similarly, Liu, including without limitation its Figures 4A and 4B, is cumulative of Chou with respect to at least the serial fan connection and thus cannot cure the deficiencies of Chou, as shown below:

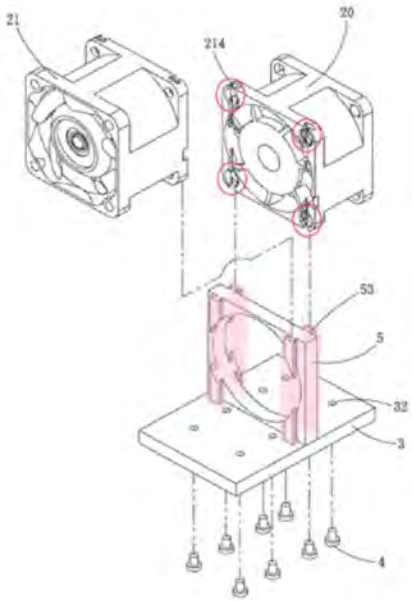


Fig. 4A

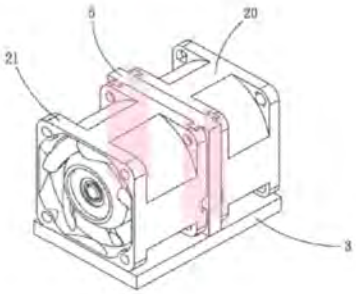


Fig. 4B

Petition at 86 (annotations original).

109. Indeed, just like Chou, Liu teaches only a ***top/bottom*** connection of the fan bodies, and does not teach any ***lateral*** connection on the fan bodies' ***sides***. As a result, Liu cannot be used to modify Tsuji, Hasegawa, or Lai, each designed to connect on their fan bodies' ***sides*** and ***not*** on their ***top/bottom*** like Liu. And even if Lui *arguendo* could be somehow used to modify Tsuji, Hasegawa, or Lai (Liu cannot), Liu's engaging block ***that must get in-between the fan bodies*** will also

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 77 of 105, IPR2024-01230

break the electrical connections on the fan bodies' sides in Tsuji, Hasegawa, and Lai, as shown below:

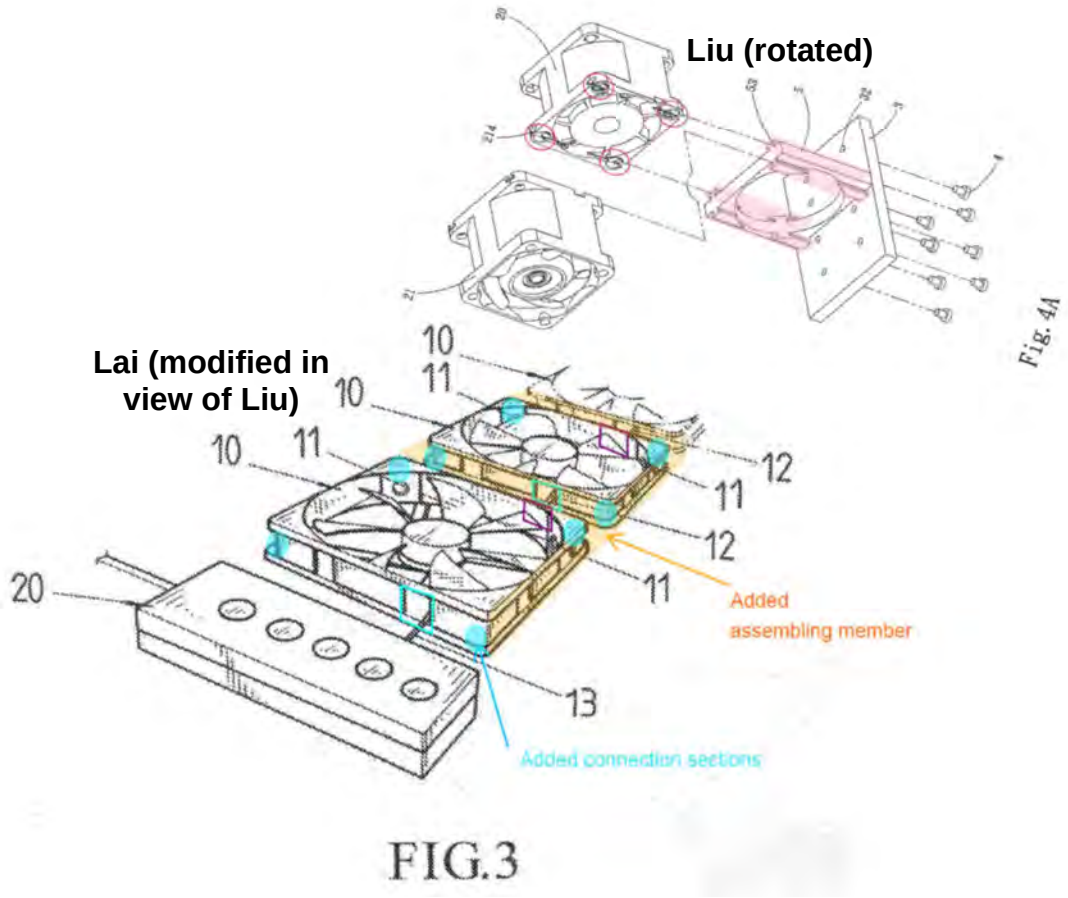
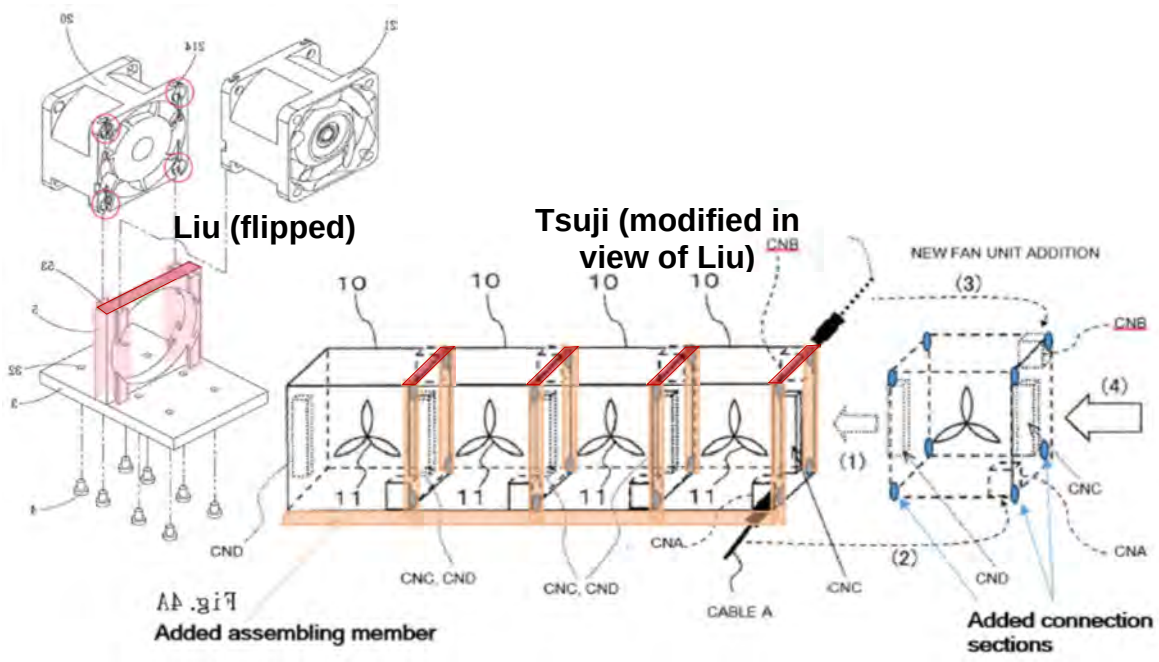


FIG.3

Petition at 86-87 (black labeling added; other annotations original). As can be seen above, Liu's "[a]dded assembling member" (yellow) when sliding in-between the fan bodies 10 in Lai will sever the transmission lines **12** between Lai's fan bodies.

110. The same severance will happen to Tsuji's connectors CNC and CND as well if combined with Liu and will similarly cause the Tsuji fans to become inoperable, as shown below:



Petition at 53-54 (black labeling and *red* highlighting added; other annotations original). As shown above, even if *arguendo* the Tsuji system were modified in view of Liu, the "[a]dded assembling member" (orange) when sliding in-between the fan bodies 10 in Tsuji will be blocked by the protruding CNC connectors. Note that the top portions of Liu's "[a]dded assembling member" (red) cannot be trivially removed due to structural integrity issues without undue experimentation. If sliding the "[a]dded assembling member" in-between the fans 10 by force, the protruding CNC connectors may break, thus severing the electrical connection between two adjacent fans 10 and rendering the hot-swapping system inoperable. Further, the CNC and CND connectors after being engaged/connected between two adjacent fans 10 must be disengaged/disconnected in a horizontal direction (parallel with the pink, left-pointing arrow between the first two Tsuji fans counting from the right below)

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 79 of 105, IPR2024-01230

that is ***perpendicular*** to the vertical direction of the fan disengagement in Liu system:

Liu (flipped)

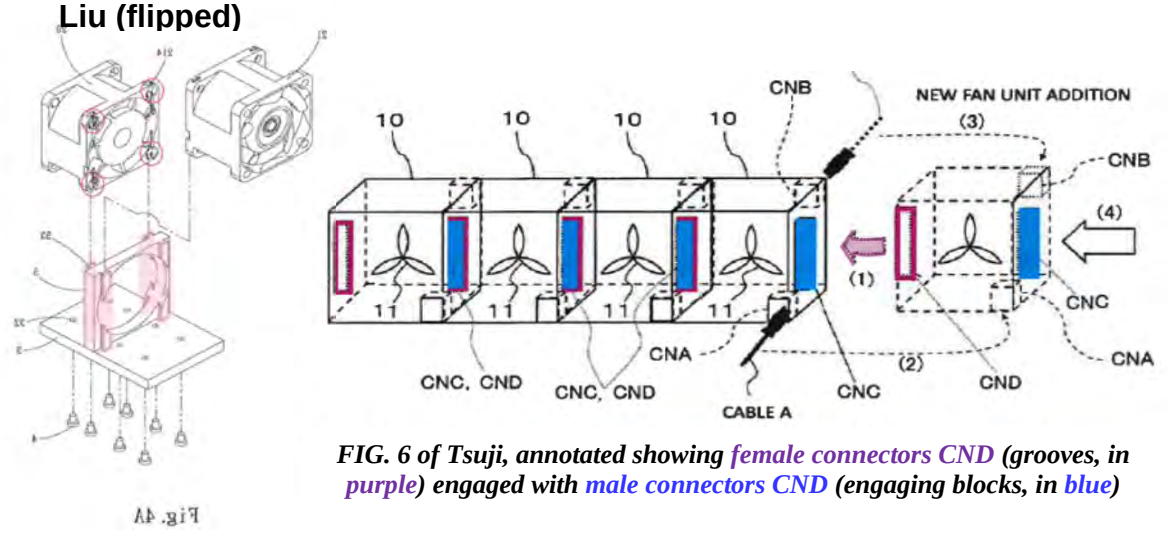


FIG. 6 of Tsuji, annotated showing female connectors CND (grooves, in purple) engaged with male connectors CND (engaging blocks, in blue)

111. As shown above, the engaged/connected CNC and CND between two adjacent fans 10 in Tsuji cannot be disengaged/disconnected in the vertical direction like Liu, and if the disengagement/disconnection is forced, the CNC and CND connectors will simply break, again rendering the Tsuji system inoperable. Thus, a POSITA would have understood that Tsuji cannot be modified by Liu and remain operable.

112. Similarly, a POSITA would have understood that Hasegawa will have the same ***top/bottom*** *vs.* ***lateral/side*** connection issue as that concerning Lai and Tsuji if the combination of Hasegawa with Chou or Liu is attempted. In the Petition, however, Petitioner never shows that Hasegawa can be modified in view of Chou or Liu. *See generally* Petition. Thus, Petitioner fails to prove that Hasegawa can be

combined with Chou or Liu.

113. Huang is irrelevant here because it does not have any connection between fan bodies.

114. In sum, by not addressing the top/bottom fan connection in Chou and Liu that is ***perpendicular*** to the fan connection in Lai, Tsuji, or Hasegawa, Petitioner fails to show that Chou or Liu is combinable with Lai, Tsuji, and/or Hasegawa. That is, Petitioner fails to prove that claim 5 is unpatentable over Lai, Hasegawa, Tsuji, and/or Huang in view of Chou or Liu.

XII. CONCLUSION

115. For at least the above reasons as presented in this Declaration, the Board should find that Petitioner has not shown by preponderance that any of claims 1-5 of the ’336 patent is unpatentable.

* * *

XIII. MOTION TO AMEND

116. I have read Patent Owner’s Contingent Motion to Amend in its entirety and analyzed the new claims against the prior-art references, including Lai, Tsuji, Hasegawa, and Huang. In my opinion, the proposed independent claims 6 and 7 are both patentable over these prior-art references.

117. Independent claims 6 and 7 both require “(iv) a power socket comprising an opening located on the first side of the body” and “(v) a first connector

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 81 of 105, IPR2024-01230

disposed on the first side of the body, wherein the first connector is structurally distinct and separable from the power socket …." None of the cited prior art disclose, teach or suggest these requirements.

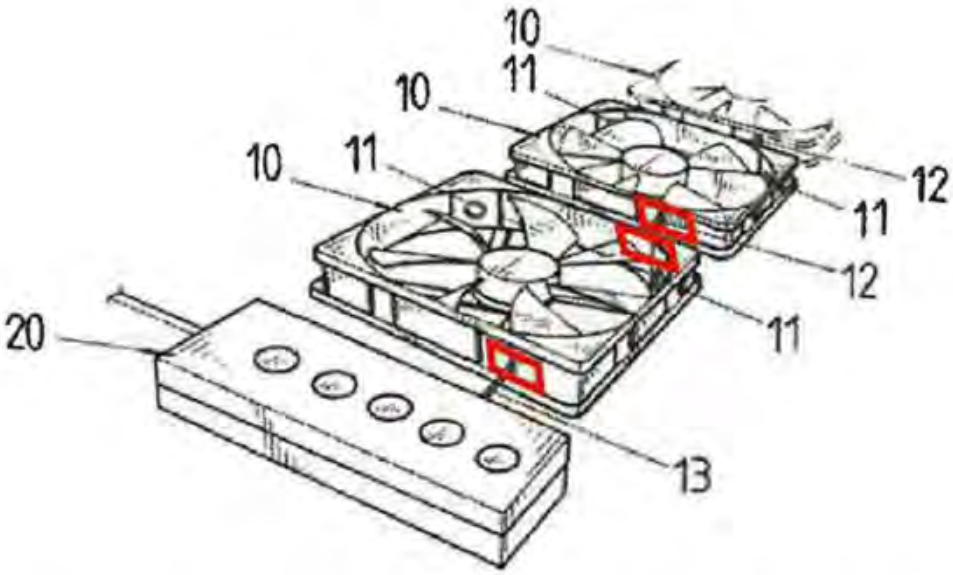


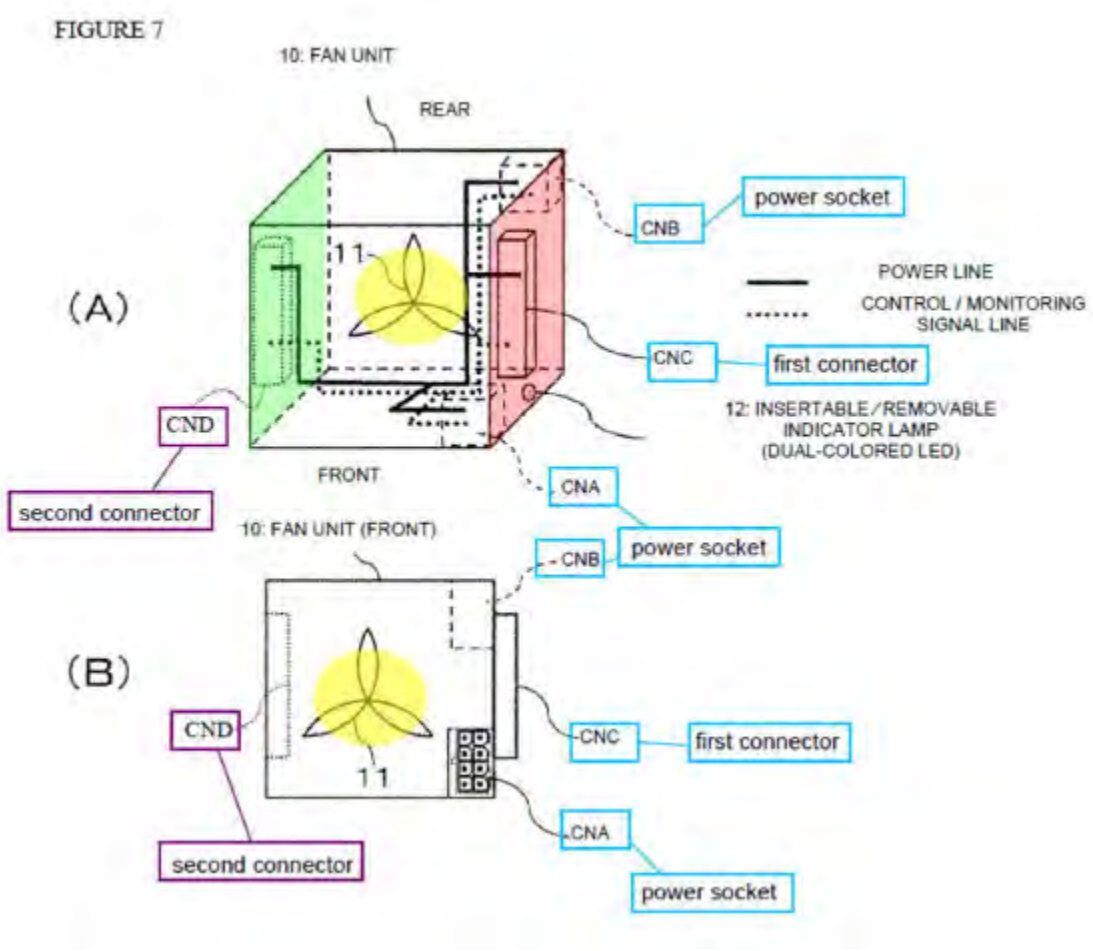
*FIG. 3 of Lai (modified to position connectors on sides of the LED fan 10 body as shown in **red** boxes)*

118. As can be seen above, Lai discloses (at best) a *single* connector on each of the two opposite sides of a fan body, but Lai fails to disclose "(iv) a power socket comprising an opening located on the first side of the body" *and* "(v) a first connector disposed on the first side of the body, wherein the first connector is structurally distinct and separable from the power socket …."

119. Tsuji also fails to disclose the requirements of "(iv) a power socket comprising an opening located on the first side of the body" and "(v) a first connector

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 82 of 105, IPR2024-01230

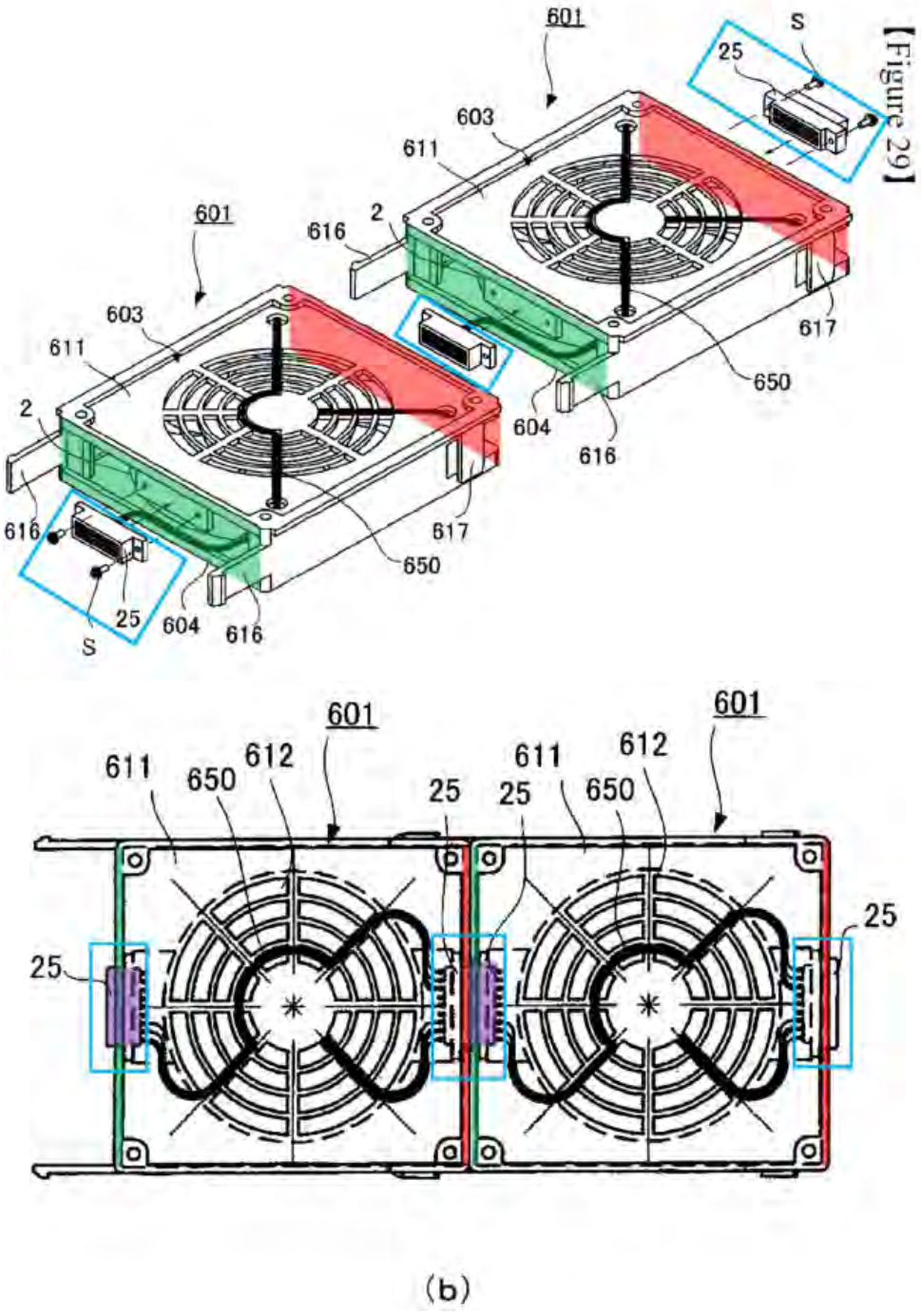
disposed on the first side of the body, wherein the first connector is structurally distinct and separable from the power socket ….” Tsuji discloses the use of either a CNC connector having a protrusion or a CND connector having an opening, but not *both* a power socket having an opening on the fan body’s first side and a distinct first connector located on the *same* first side. Further, neither the CNC connector nor the CND connector of Tsuji has a flat surface as required by claim 7.



120. Hasegawa (JP 2005051085 A) is cumulative of Tsuji with respect to the connectors. Accordingly, Hasegawa also fails to disclose, teach or suggest the requirements of “(iv) a power socket comprising an opening located on the first side

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 83 of 105, IPR2024-01230

of the body" and "(v) a first connector disposed on the first side of the body, wherein the first connector is structurally distinct and separable from the power socket …." As shown below, Hasegawa's arrangement has only a single connector (boxed in blue or purple) on each side (green or red) of the body:



121. Huang also fails to disclose "(iv) a power socket comprising an opening located on the first side of the body" and "(v) a first connector disposed on the first side of the body, wherein the first connector is structurally distinct and separable from the power socket …." Specifically, Huang discloses no power socket or connector at all. Thus, Huang cannot cure the deficiencies of Lai, Tsuji, and/or Hasegawa.

122. For at least the above reasons, substitute claims 6 and 7 patentably define over the prior art of Tsuji, Huang, Lai, and Hasegawa.

XIV. RIGHT TO SUPPLEMENT

123. I reserve the right to amend, supplement, or otherwise modify my opinions, whether in a further written declaration or otherwise. I also reserve the right to reply to positions taken by the Dr. Wolfe.

124. I hereby declare that all statements made herein of my knowledge are true and that all statements made on information and belief are believed to be true and that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001.

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 85 of 105, IPR2024-01230

APPENDIX A:
QUALIFICATIONS AND EXPERIENCE

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 86 of 105, IPR2024-01230

David B. Tuckerman, Ph.D, P.E., FIEEE
12724 128th Ave NE
Lake Stevens, WA 98258
Cell: 415-298-4040
d.tuckerman@comcast.net

EXPERIENCE:

Tuckerman and Associates, Inc., 2009-present: Independent consultant on a variety of technical and IP matters in high-tech industries. Major clients have included CMEA Capital, Tessera, Intellectual Ventures, Microsoft, and Bill Gates. Consultant to Microsoft from 2011 through 2020 in the fields of quantum computing and superconducting devices, including management of a 6-year research contract with Auburn University to develop high-density flexible thin-film superconducting interconnection technologies for quantum computing applications.

Tessera Inc., 2003-2009: Senior Vice President and Chief Technical Officer. Member of the executive team that executed a successful IPO in November 2003, with a market capitalization that later exceeded $1 billion. Responsible for managing R&D activities and generating intellectual property in electronic packaging and related technologies, and for formulating a strategy for growth by acquisition. Identified numerous targets that were successfully acquired (North, Shellcase, Digital Optics, Eyesquad, Viewmagic, DBlur, Kronos); these acquisitions established Tessera in two new lines of business: "Imaging and Optics" (ultraminiature camera modules incorporating extended-depth-of-field wafer-scale optics; this 'OptiML WLC' technology was winner of an R&D 100 Award) and "Silent Air Cooling" (fanless, electrostatically driven air cooling, enabling quiet ultra-thin laptop computers).

CMEA Capital, 1997 – 2013: Venture Partner at a venture capital firm that has over $1 billion under management. Responsible for sourcing and screening deals, performing due diligence, facilitating syndication, and making ongoing strategic and operational contributions to portfolio companies (including participating in Board meetings), for all deals having to do with physical technologies (electronics, optics, materials, energy, etc.). Primarily investing in technologies related to energy and advanced materials since 2008. Currently on Board of Directors of Reel Solar (electroplated CdTe photovoltaic technology).

nCHIP, Inc., 1989-1997: Founder, Sr. VP, and Chief Technical Officer. Developed advanced multi-chip module technologies enabling ultracompact high-performance digital systems. Responsible for all technical development activities prior to transfer to manufacturing. nCHIP was financed by venture capital from three top-tier venture funds: Kleiner Perkins, Mohr Davidow, and Mayfield. nCHIP grew to approximately $12 million in annualized revenues, and was sold to **Flextronics International Ltd**. in 1995 for $38 million. Venture investors who held their Flextronics stock received up to 40x their initial investment.

Lawrence Livermore National Laboratory, 1983-1989: Project Leader, Physics Department. Managed advanced R&D programs in laser processing, electronic packaging and interconnect, X-ray optics, and other national-defense related programs.

IBM T. J. Watson Research Center, 1977-1980 (MIT Co-op program): Member of the Josephson junction computer project (superconducting logic circuit design, simulation, and testing). Designed and demonstrated ultrahigh-performance sampling circuitry for on-chip diagnostics of superconducting logic.

EDUCATION:

M.I.T, B.S. Electrical Engineering, 1980.
M.I.T., B.S. Physics, 1980.
M.I.T., M.S. Electrical Engineering & Computer Science, 1980.
Stanford, Ph.D. Electrical Engineering, 1984.
Stanford, MBA, 1998.

PUBLICATIONS:

See attached list. 10,000+ citations in the professional literature (per Google Scholar)

PATENTS:

~180 issued U.S. patents, plus various foreign patents and numerous pending applications.

MAJOR HONORS:

Life Fellow of the IEEE
Licensed Professional Engineer (Electrical), California
IEEE Paul Rappaport Award
Fannie and John Hertz Foundation Outstanding Ph.D. Thesis
Consulting Associate Professor of E.E., Stanford University (late 1980's/early 1990's) (co-supervised two PhD theses on 'laser planarization')
Best Paper Award, VLSI Multilevel Interconnection Conference, 1989
Technical Program Chair, IEEE Multichip Module Conference, 1995
General Chair, IEEE Multichip Module Conference, 1996
Plenary speaker, ASME 9th International Conference on Nanochannels, Microchannels, and Minichannels, 2011.

PRIOR EXPERT WITNESS EXPERIENCE:

Asetek Danmark A/S v. Coolit Systems Inc. **(Northern District of California, 3:19-cv-00410-EMC)**

Expert for Plaintiff Asetek Danmark A/S, engaged by Finnegan Henderson Farabow Garrett & Dunner, LLP

***Asetek Danmark A/S v. Corsair Gaming, Inc. et al* (Northern District of California, 3:20-cv-06541-EMC)**

Expert for Plaintiff Asetek Danmark A/S, engaged by Finnegan Henderson Farabow Garrett & Dunner, LLP

Selected Publications

- Tuckerman, D. B., 1978, "Analog Simulator of a Josephson Quantum Interference Device", Review of Scientific Instruments, **49**(6), pp. 835-839.
- Tuckerman, D. B., 1980, "A Josephson Ultrahigh-Resolution Sampling System", Applied Physics Letters, **36**(12), pp. 1008-1010.
- Tuckerman, D. B., and Magerlein, J. H., 1980, "Resonances in Symmetric Josephson Interferometers", Applied Physics Letters, **37**(2), pp. 241-243.
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David B. Tuckerman, Ph.D. - List of granted patents

1	US-4450472-A	Method and means for improved heat removal in compact semiconductor integrated circuits and similar devices utilizing coolant chambers and microscopic channels
2	US-4567505-A	Heat sink and method of attaching heat sink to a semiconductor integrated circuit and the like
3	US-4573067-A	Method and means for improved heat removal in compact semiconductor integrated circuits
4	US-4674176-A	Planarization of metal films for multilevel interconnects by pulsed laser heating
5	US-4681795-A	Planarization of metal films for multilevel interconnects
6	US-4814578-A	Planarization of metal films for multilevel interconnects
7	US-4992847-A	Thin-film chip-to-substrate interconnect and methods for making same
8	US-5017509-A	Stand-off transmission lines and method for making same
9	US-5046656-A	Vacuum die attach for integrated circuits
10	US-5134539-A	Multichip module having integral decoupling capacitor
11	US-5214844-A	Method of assembling integrated circuits to a silicon board
12	US-5274270-A	Multichip module having SiO2 insulating layer
13	US-5397997-A	Burn-in technologies for unpackaged integrated circuits
14	US-5541524-A	Burn-in technologies for unpackaged integrated circuits
15	US-5804004-A	Stacked devices for multichip modules
16	US-7224056-B2	Back-face and edge interconnects for lidded package
17	US-7262368-B2	Connection structures for microelectronic devices and methods for forming such structures
18	US-7298030-B2	Structure and method of making sealed capped chips
19	US-7351641-B2	Structure and method of forming capped chips
20	US-7449779-B2	Wire bonded wafer level cavity package
21	US-7462936-B2	Formation of circuitry with modification of feature height
22	US-7485956-B2	Microelectronic package optionally having differing cover and device thermal expansivities
23	US-7566853-B2	Image sensor employing a plurality of photodetector arrays and/or rear-illuminated architecture
24	US-7593636-B2	Pin referenced image sensor to reduce tilt in a camera module
25	US-7632708-B2	Microelectronic component with photo-imageable substrate
26	US-7709968-B2	Micro pin grid array with pin motion isolation
27	US-7793414-B2	Methods for forming connection structures for microelectronic devices
28	US-7816251-B2	Formation of circuitry with modification of feature height
29	US-7858445-B2	Wire bonded wafer level cavity package
30	US-8035258-B2	Systems and methods for assessing standoff capabilities of in-service power line insulators
31	US-8174270-B2	Systems and methods for assessing standoff capabilities of in-service power line insulators
32	US-8248080-B2	Systems and methods for assessing standoff capabilities of in-service power line insulators
33	US-8253525-B2	Smart link coupled to power line
34	US-8310036-B2	Chips having rear contacts connected by through vias to front contacts
35	US-8391934-B1	Customized hardware selection for a mobile phone
36	US-8405196-B2	Chips having rear contacts connected by through vias to front contacts
37	US-8425965-B2	Method for heating or sterilizing a liquid stream
38	US-8426736-B2	Maintaining insulators in power transmission systems
39	US-8427800-B2	Smart link coupled to power line
40	US-8460814-B2	Fluid-surfaced electrode
41	US-8531039-B2	Micro pin grid array with pin motion isolation
42	US-8563867-B2	Smart link coupled to power line
43	US-8595037-B1	Systems and methods for insurance based on monitored characteristics of an autonomous drive mode selection system
44	US-8673219-B2	Nasal passage insertion device for treatment of ruminant exhalations
45	US-8692226-B2	Materials and configurations of a field emission device

46	US-8735205-B2	Chips having rear contacts connected by through vias to front contacts
47	US-8776145-B2	In-transit electronic media with location-based content
48	US-8810131-B2	Field emission device with AC output
49	US-8810161-B2	Addressable array of field emission devices
50	US-8865361-B2	Instrumented fluid-surfaced electrode
51	US-8872022-B2	Phase-change cooling of subterranean power lines
52	US-8884813-B2	Surveillance of stress conditions of persons using micro-impulse radar
53	US-8889312-B2	Instrumented fluid-surfaced electrode
54	US-8897116-B1	Systems and methods for atomic film data storage
55	US-8907529-B2	Smart link coupled to power line
56	US-8909307-B2	Customized hardware selection for a mobile phone
57	US-8928228-B2	Embodiments of a field emission device
58	US-8946992-B2	Anode with suppressor grid
59	US-8958786-B2	Mobile device that activates upon removal from storage
60	US-8965288-B2	Cost-effective mobile connectivity protocols
61	US-8968903-B2	Fluid-surfaced electrode
62	US-8969848-B2	Materials and configurations of a field emission device
63	US-8970113-B2	Time-varying field emission device
64	US-8971043-B2	Management of exterior temperatures encountered by user of a portable electronic device in response to an inferred user contact with the portable electronic device
65	US-8971868-B2	Mobile device that activates upon removal from storage
66	US-8971869-B2	Mobile device that activates upon removal from storage
67	US-8971969-B2	Customized hardware selection for a mobile phone
68	US-8974939-B2	Fluid-surfaced electrode
69	US-9013564-B2	Controllable lenticular lenslets
70	US-9019149-B2	Method and apparatus for measuring the motion of a person
71	US-9024814-B2	Tracking identities of persons using micro-impulse radar
72	US-9055166-B2	Customized hardware selection for a mobile phone
73	US-9056556-B1	System and method for configuration and management of an energy storage system for a vehicle
74	US-9069067-B2	Control of an electronic apparatus using micro-impulse radar
75	US-9077815-B1	Customized hardware selection for a mobile phone
76	US-9079505-B1	System and method for management of a fleet of vehicles having an energy storage system
77	US-9083819-B2	Customized hardware selection for a mobile phone
78	US-9106764-B2	Customized hardware selection for a mobile phone
79	US-9140499-B2	Phase-change cooling of subterranean power lines
80	US-9143605-B2	Customized hardware selection for a mobile phone
81	US-9149010-B2	Harvesting and grafting of trees
82	US-9158908-B2	Power source for in-transit electronic media
83	US-9171690-B2	Variable field emission device
84	US-9177592-B2	Systems and methods for atomic film data storage
85	US-9177600-B2	Systems and methods for atomic film data storage
86	US-9191489-B2	Customized hardware selection for a mobile phone
87	US-9193068-B2	Structural assessment, maintenance, and repair apparatuses and methods
88	US-9193402-B2	Structural assessment, maintenance, and repair apparatuses and methods
89	US-9199193-B2	Treatment of ruminant exhalations
90	US-9207270-B2	Method and apparatus for measuring negawatt usage of an appliance
91	US-9216133-B2	Using a 3D display to train a weak eye
92	US-9230442-B2	Systems and methods for adaptive vehicle sensing systems
93	US-9269268-B2	Systems and methods for adaptive vehicle sensing systems
94	US-9270808-B2	Customized hardware selection for a mobile phone

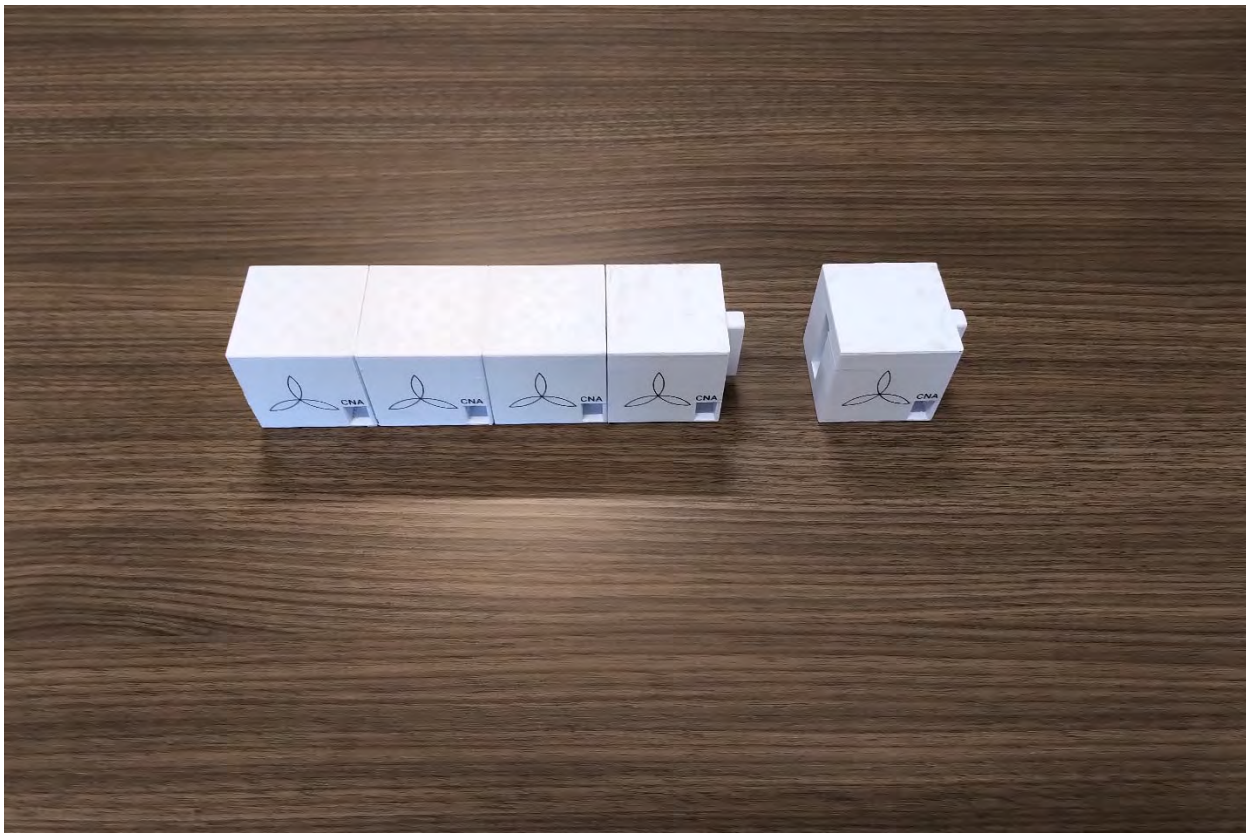
95	US-9291297-B2	Multi-layer phononic crystal thermal insulators
96	US-9291399-B2	Management of exterior temperatures encountered by user of a portable electronic device
97	US-9291400-B2	Management of exterior temperatures encountered by user of a portable electronic device using multiple heat-rejection elements
98	US-9305737-B2	Liquid filament for incandescent lights
99	US-9320174-B2	Management of exterior temperatures encountered by user of a portable electronic device in response to an inferred user contact with the portable electronic device
100	US-9321357-B2	Method and apparatus for supplying auxiliary electrical power to an electric or hybrid vehicle
101	US-9341065-B2	Dual element turbine blade
102	US-9349562-B2	Field emission device with AC output
103	US-9373870-B2	Battery damage indicator
104	US-9396810-B2	Systems and methods for acoustic wave enabled data storage
105	US-9396814-B2	Systems and methods for acoustic wave enabled data storage
106	US-9424893-B2	Systems and methods for acoustic wave enabled data storage
107	US-9435320-B2	Mitigating wind turbine blade noise generation in view of a minimum power generation requirement
108	US-9437849-B2	Battery damage indicator
109	US-9451394-B2	Cost-effective mobile connectivity protocols
110	US-9452281-B2	Tattooing systems and methods
111	US-9456648-B2	Systems and methods for helmet liner evaluation
112	US-9457666-B2	Method and apparatus for supplying auxiliary electrical power to an electric or hybrid vehicle
113	US-9486386-B2	Using a 3D display to train a weak eye
114	US-9488670-B2	Systems and methods for detecting overhead line motion
115	US-9490097-B2	Liquid filament for incandescent lights
116	US-9511634-B2	Systems and methods for anticipatory tire pressure control
117	US-9512580-B2	Systems and methods for deicing
118	US-9514653-B2	Systems, methods, and devices for providing assistance to an unmanned aerial vehicle
119	US-9531864-B2	Customized hardware selection for a mobile phone
120	US-9548507-B2	Systems and methods for hydrogen fuel storage and hydrogen powered vehicles
121	US-9549406-B1	Automatically adjustable radiofrequency link
122	US-9553959-B2	Customized hardware selection for a mobile phone
123	US-9562704-B2	Phase-change cooling of subterranean power lines
124	US-9599407-B2	System and structure for heating or sterilizing a liquid stream
125	US-9602650-B2	Customized hardware selection for a mobile phone
126	US-9602673-B2	Systems and methods for monitoring sound during an in-building emergency
127	US-9648309-B2	Controllable lenticular lenslets
128	US-9653128-B2	Systems and methods for acoustic wave enabled data storage
129	US-9681557-B2	Metastable gas heating
130	US-9688402-B2	Systems, methods, and devices for unmanned aerial vehicle dispatch and recovery
131	US-9691500-B2	Casimir effect memory cell
132	US-9696119-B2	Camouflage for transmission towers and lines
133	US-9714494-B2	Systems and methods for deicing
134	US-9719902-B2	Systems and methods for helmet liner evaluation
135	US-9723702-B2	Liquid filament for incandescent lights
136	US-9751207-B2	Structural assessment, maintenance, and repair apparatuses and methods
137	US-9751812-B2	Taggant for cement authentication
138	US-9759196-B2	Mitigating wind turbine blade noise generation in response to an atmospheric variation
139	US-9772062-B2	Multi-layer phononic crystal thermal insulators
140	US-9776632-B2	Systems and methods for adaptive vehicle sensing systems
141	US-9781664-B2	Cost-effective mobile connectivity protocols

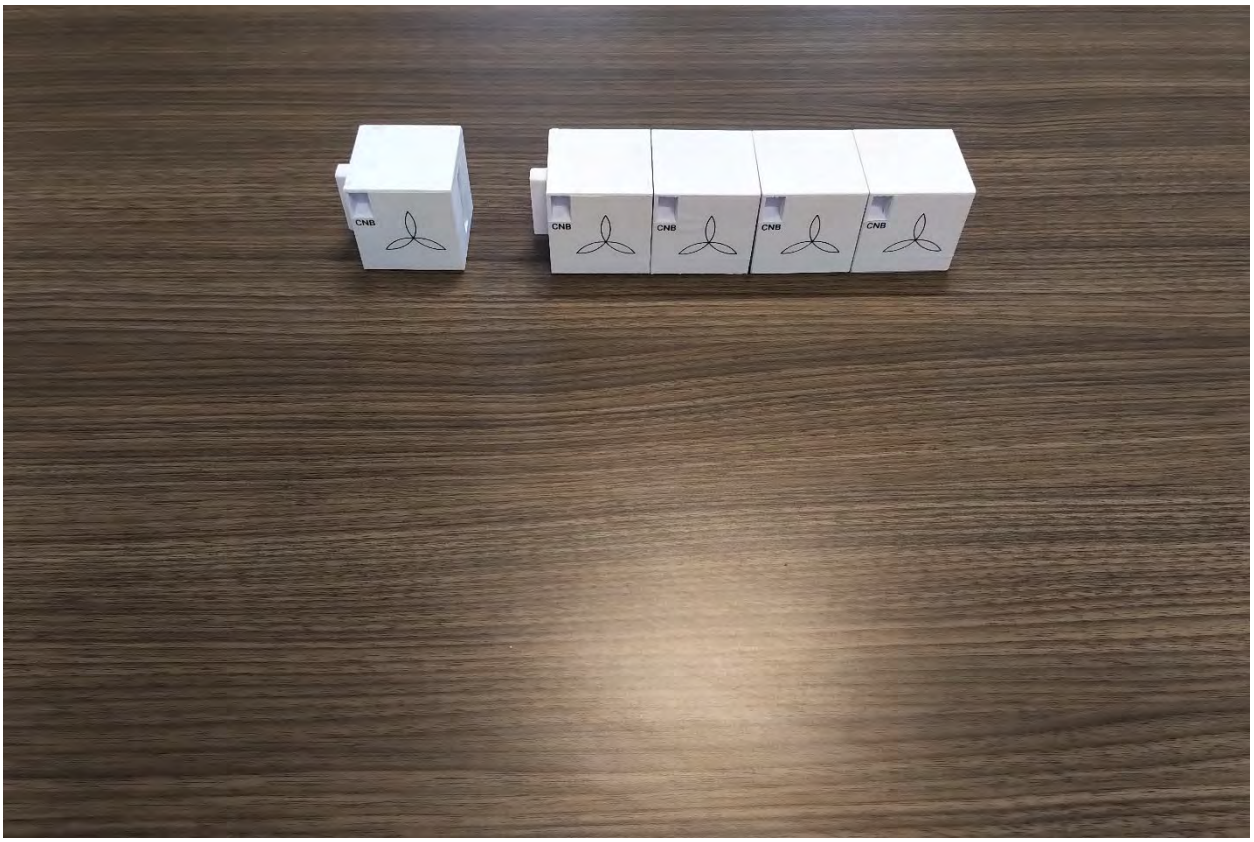
142	US-9788195-B2	Mobile device that activates upon removal from storage
143	US-9800738-B2	Systems and methods for monitoring sound during an in-building emergency
144	US-9801313-B2	Underwater container cooling via integrated heat exchanger
145	US-9805763-B2	Systems and methods for atomic film data storage
146	US-9810819-B2	Camouflage for transmission towers and lines
147	US-9819184-B2	Balancing power grid parameters using distributed energy control
148	US-9824845-B2	Variable field emission device
149	US-9826534-B2	Automatically adjustable radiofrequency link
150	US-9832628-B2	Cost-effective mobile connectivity protocols
151	US-9844167-B2	Underwater container cooling via external heat exchanger
152	US-9844983-B2	Systems and methods for anticipatory tire pressure control
153	US-9876762-B2	Cost-effective mobile connectivity protocols
154	US-9878631-B2	System and method for predictive control of an energy storage system for a vehicle
155	US-9878786-B2	System and method for operation and management of reconfigurable unmanned aircraft
156	US-9878787-B2	System and method for operating unmanned aircraft
157	US-9902491-B2	Reconfigurable unmanned aircraft system
158	US-9919797-B2	System and method for operation and management of reconfigurable unmanned aircraft
159	US-9924642-B2	Harvesting and grafting of trees
160	US-9930898-B2	Pasteurization system and method
161	US-9989077-B2	Systems and methods for selective control of fuel tanks
162	US-10015931-B2	Production of electricity from plants
163	US-10015971-B2	Articles and methods for administering CO2 into plants
164	US-10017392-B2	Articles and methods for administering CO2 into plants
165	US-10052469-B2	Tattooing systems and methods
166	US-10072503-B2	Dual element turbine blade
167	US-10074879-B2	Instrumented fluid-surfaced electrode
168	US-10119592-B2	Vehicle drivetrain with active magnetic bearings
169	US-10135302-B2	Mobile phone having a wireless power module
170	US-10136437-B2	Automatically adjustable radiofrequency link
171	US-10141493-B2	Thermal management for superconducting interconnects
172	US-10146222-B2	Driver training in an autonomous vehicle
173	US-10171677-B2	Systems and methods for monitoring sound during an in-building emergency
174	US-10184867-B2	Systems and methods for helmet liner evaluation
175	US-10348884-B2	Customized hardware selection for a mobile phone
176	US-10453592-B1	Reducing losses in superconducting cables
177	US-10651362-B2	Method of forming superconducting apparatus including superconducting layers and traces
178	US-10763013-B2	Reducing losses in superconducting cables
179	US-11114602-B2	Method of forming superconducting layers and traces
180	US-11211722-B2	Superconductor interconnect system
181	US-12027361-B2	High temperature supercondutor-based interconnect systems with a lowered thermal load for interconnecting cryogenic electronics with non-cryogenic electronics
182	AU-2011326765-B2	Treatment of ruminant exhalations
183	AU-2018341994-B2	Fabrication of apparatus including superconducting wiring layers and interconnects
184	AU-2019265449-B2	Reducing losses in superconducting cables
185	CA-2057744-C	Multichip module
186	EP-2638389-B1	Treatment of ruminant exhalations
187	EP-2801102-B1	Anode with suppressor grid
188	EP-2920548-B1	Systems and methods for detecting overhead line motion
189	EP-3210279-B1	Wireless power receiver in a mobile device
190	EP-3610519-B1	Thermal management for superconducting interconnects

191	EP-3688796-B1	Fabrication of apparatus including superconducting wiring layers and interconnects
192	EP-3745481-B1	Thermal management for superconducting interconnects
193	EP-3791432-B1	Reducing losses in superconducting cables
194	TW-I317555-B	Image sensor employing a plurality of photodetector arrays and/or rear-illuminated architecture
195	TW-I333247-B	Method of forming a microelectronic connection component

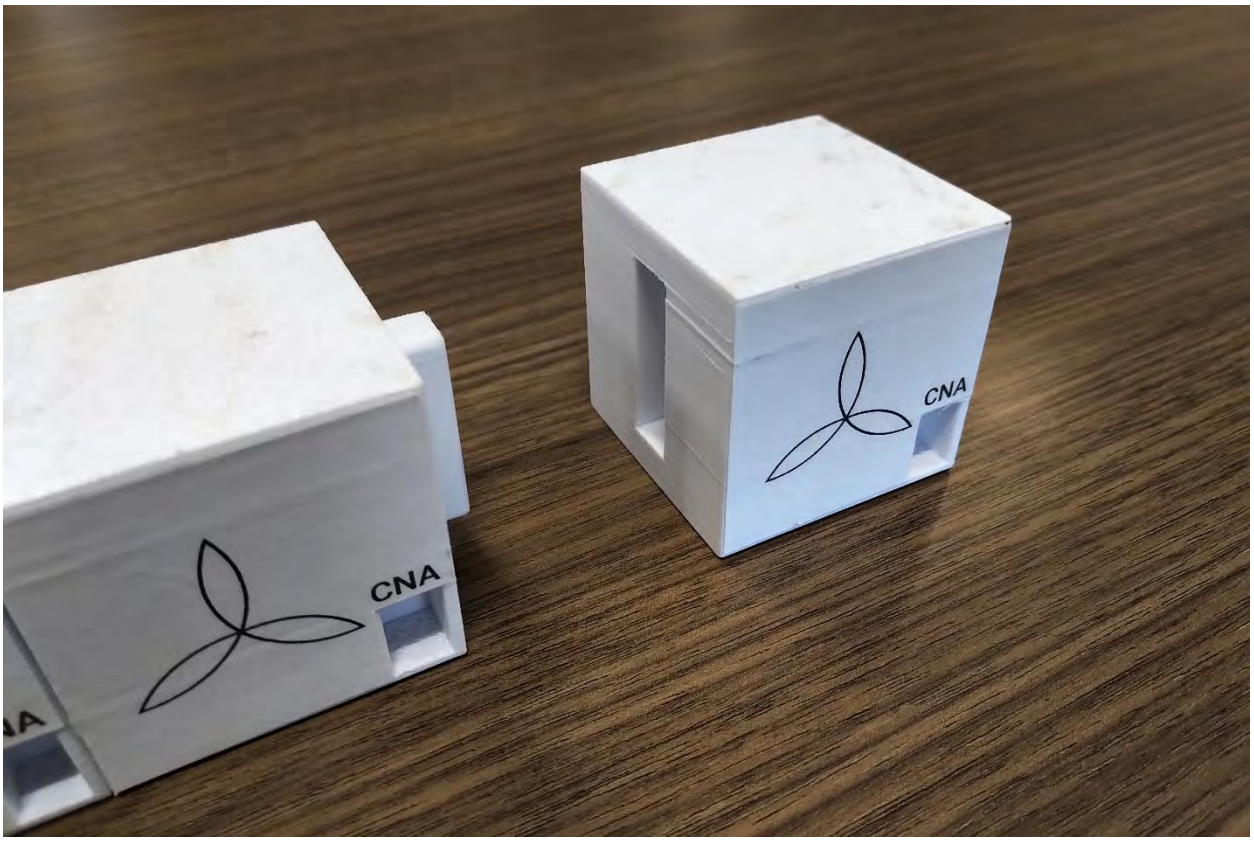
APPENDIX B:
PHOTOS OF 3-D PRINTED MODELS OF TSUJI DEVICES

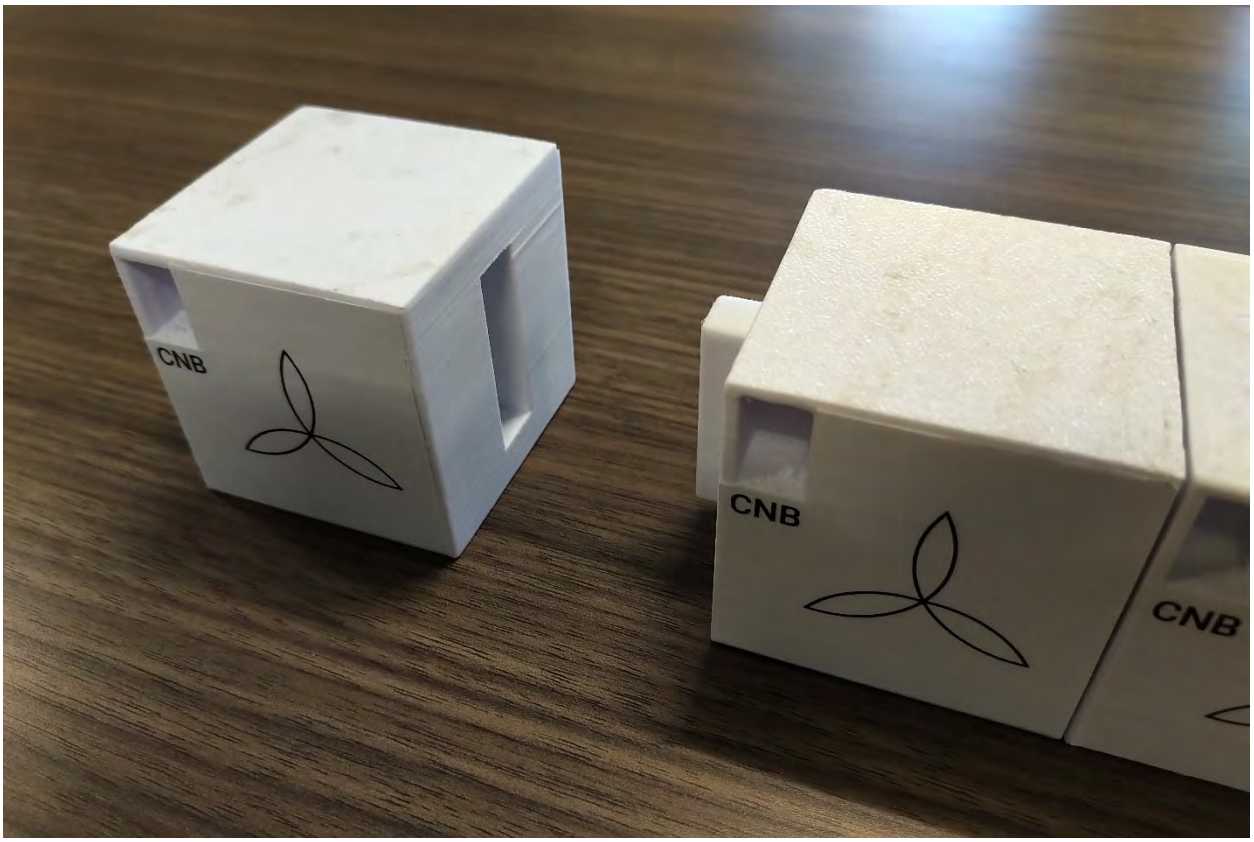
Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 100 of 105, IPR2024-01230



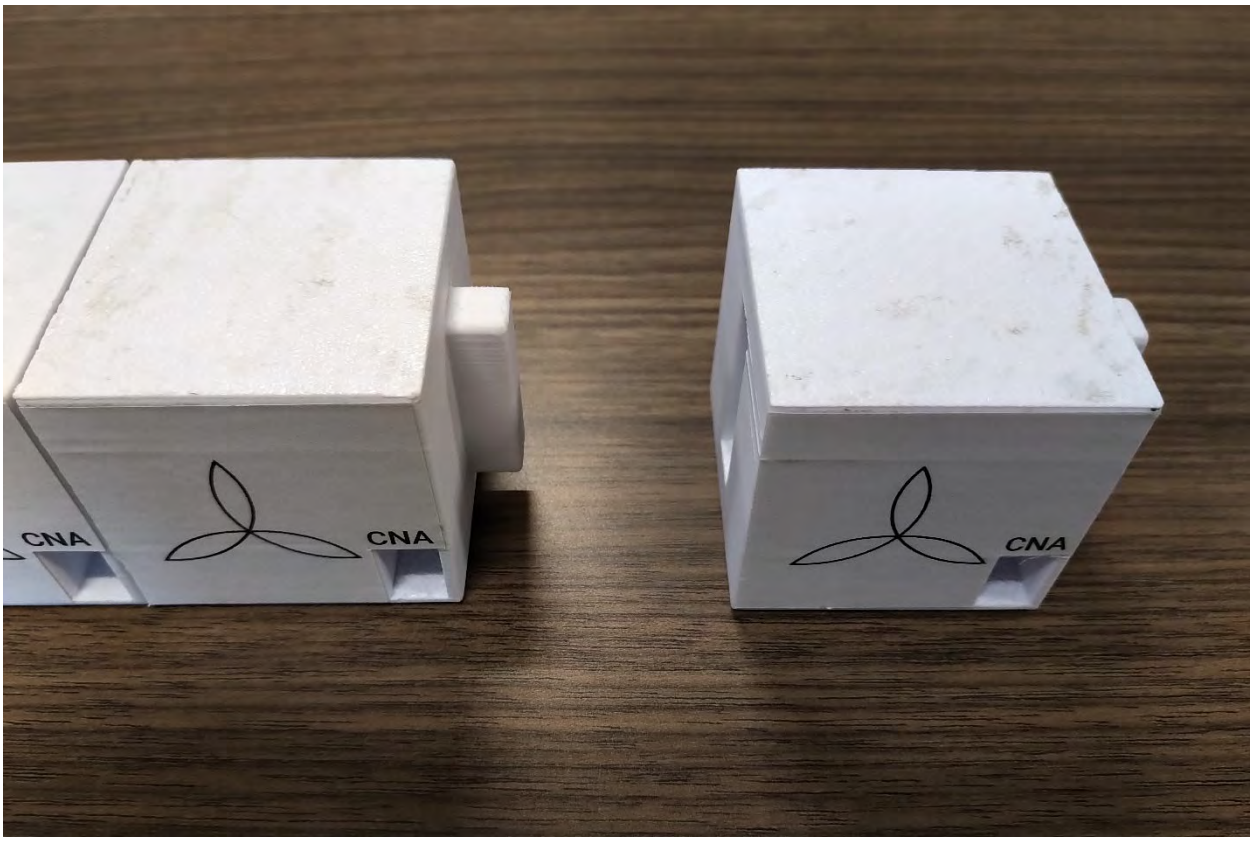


Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 101 of 105, IPR2024-01230





Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 102 of 105, IPR2024-01230



Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 103 of 105, IPR2024-01230

APPENDIX C:
PHOTOS OF RELATED TO CLAIM 4

Thermaltake Tech. Co. v. Lian Li Ind. Co., Ex-2006
Page 104 of 105, IPR2024-01230



