



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the application of:	)	Group Art Unit: 3993
10,690,336	)	
	)	Examiner: Laura L. Davison
Application No.: 90/019,565	)	
Filed: July 2, 2024	)	<u>DECLARATION OF DAVID B.</u>
	)	<u>TUCKERMAN PH.D.</u>
Confirmation No.: 5828	)	
Atty. Ref: 219491.010200	)	
For: "Illumination Fan Connectable with at	)	
least one Illumination Fan for a	)	
Computer"	)	

Dear Sirs:

With my signature above, I, David B. Tuckerman, Ph.D., declare as follows:

I. INTRODUCTION

1. I have been retained by the patent owner, Chen, Chien-Hao, and the exclusive licensee, Lian Li Industrial Co., Ltd. (collectively "Patentee"), 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 Patentee's response ("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 any additional information provided to me or found by me in this matter, or on further instructions or orders from the USPTO.

II. BACKGROUND AND QUALIFICATIONS

5. My qualifications and experiences are set forth in Appendix 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 6,600 citations in the professional literature, as reported by Google Scholar.² This paper was selected by the IEEE Electron Devices Society to receive the first "Paul Rappaport Award", although this new award series was not officially approved by IEEE until 1983.³

¹ <https://www.hertz-foundation.org/hertz-fellows/awards/hertz-doctoral-thesis-prize/>
² https://scholar.google.com/scholar?hl=en&as_sdt=0%2C3&q=High-Performance+Heat+Sinking+for+VLSI&btnG=
³ <https://eds.ieee.org/awards/paul-rappaport-award>

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 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.

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, and Microsoft. 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 2022 specifically relating to novel electrical connectors and interconnection schemes, for use with superconducting devices and flexible superconducting cables.

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

III. LEGAL PRINCIPLES

15 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 USPTO 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.

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

17 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

18. 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

19. 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. Based on my review and analysis of the '336 patent and applying the considerations identified above as best they are known to me today, a POSITA in the 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.

20. Under any 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.

V. MATERIALS CONSIDERED

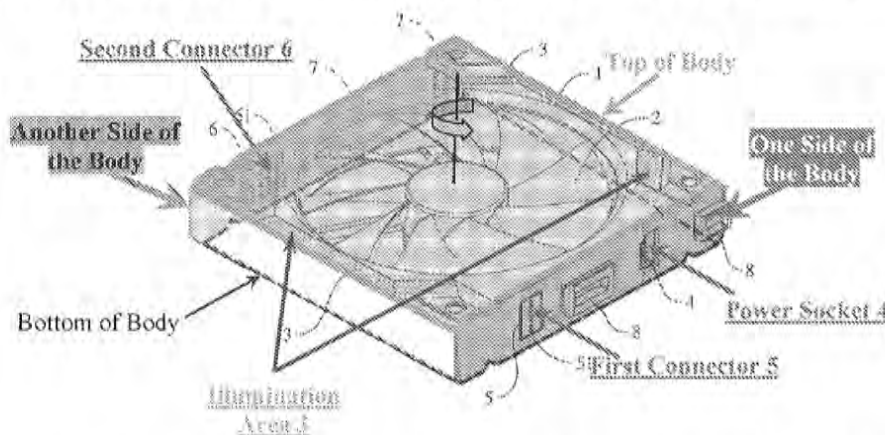
21. In rendering my opinions in this Declaration, I have considered the following materials:

Description
Request for Ex Parte Reexamination of U.S. Patent No. 10,690,336
Ex Parte Office Action dated October 17, 2024 (hereinafter "Action")
U.S. Patent No. 10,690,336 B1 to Chen
U.S. Publication No. 2017/0314777A1 to Lai ("Lai")
Japanese Publication No. 2018041147A to Fujitsu et al. ("Fujitsu") published March 15, 2018
Translation of Fujitsu
Chinese Patent Publication No. CN 207064277 U ("Tsai") published March 2, 2018
Translation of Tsai

VI. OVERVIEW OF THE '336 PATENT

22. The '336 patent relates to an illumination fan connectable with at least one other illumination fan for a computer. 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. 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 managing cumbersome. Additionally, because of the need to connect to power supply with independent power cables, the number of cooling fans that can be assembled is limited by the finite number of connections available on the power supply.

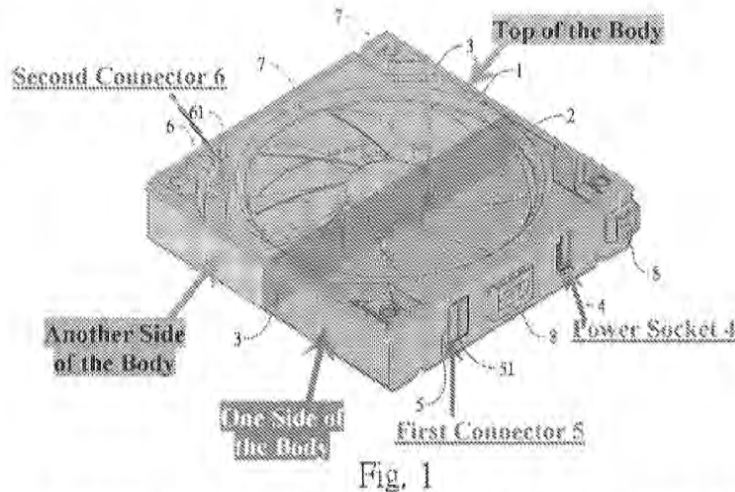
23 Figure 1 of the '336 patent (reproduced and annotated below) shows an embodiment (i.e., an example) of such an illumination fan, which includes a body 1, a fan 2 disposed in the center of the body 1, an illumination area 3 disposed on at least two sides of the fan at the top (cyan) of the body 1, a power socket 4 and a first connector 5 disposed on one side (red) of the body 1, and a second connector 6 disposed on another side (green) of the body 1:



24. In this embodiment, the illumination fan's body 1 has a "top" (cyan) facing up and a bottom (with a dashed black perimeter) facing down along the rotational axis of the fan 2. The body 1 also has *four* sides facing lateral directions perpendicular to the rotational axis of the fan 2. The power socket 4 and the first connector 5 are both located on one of the four sides, while the second connector 6 is located on another one of the four sides. The "top" of the body 1 in this embodiment is adjacent to the four sides, and is where the illumination area 3 (on the at least two sides of the fan 2) is located.

25. I have been informed that, in an alternative interpretation of the claim phrase "side of the body" suggested by an Examiner panel at the Patent Office, everything to the right of a centerline of the body was considered to be on "one side of the body" and everything to the left of the centerline on "another side of the body." Below is an annotated version of Figure 1 of the '336

patent showing the “one side of the body” and the “another side of the body” according to this alternative interpretation:



26. As shown in the annotated Figure 1 immediately above, under this alternative interpretation of “one side of the body” and “another side of the body” in claim 1 of the ’336 patent, each side extends outward from a centerline creating two halves. The body 1 under such interpretation would only have two sides. But this interpretation is inconsistent with a POSITA’s understanding of the ’336 patent since the “top of the body” will be subsumed and rendered superfluous by the “one side of the body” and the “another side of the body” because anything located at the “top of the body” (cyan) will be on *either* the “one side of the body” (red) *or* the “another side of the body” (green), or both, as shown above. If something is located right on the centerline at the “top of the body” (cyan), then it will also span over both the “one side of the body” (red) and the “another side of the body” (green), making it simultaneously on three different regions of the body. That is, the “top of the body” will be eviscerated and rendered meaningless

27 A second problem with this alternative interpretation is that, depending on how the two halves of the "body" are divided, the locations of the power socket 4, first connector 5, and second connector 6 become indefinite. In the above exemplary division, the power socket 4 and the first connector 5 are on "one side of the body" (red), while the second connector 6 is on "another side of the body" (green). But in the below exemplary division, the power socket 4 is on "one side of the body" (red), while the first connector 5 and the second connector 6 are on "another side of the body" (green), even causing the preferred embodiment to be excluded from the claim scope because the power socket 4 and the first connector 5 are no longer on the same side, and the first connector 5 and second connector 6 are not on two different sides:

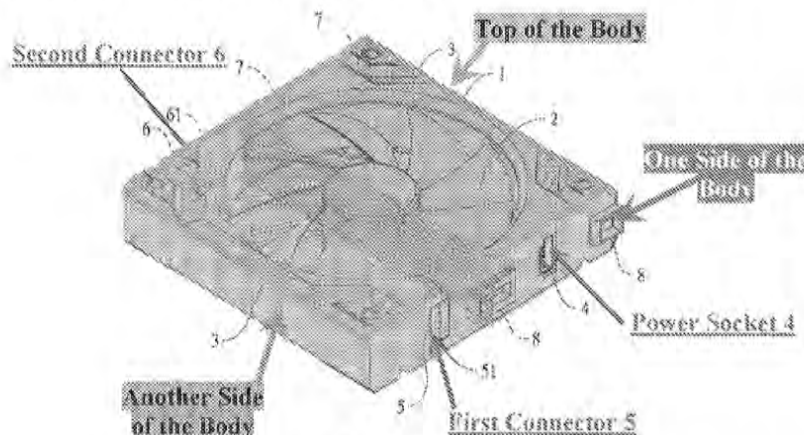
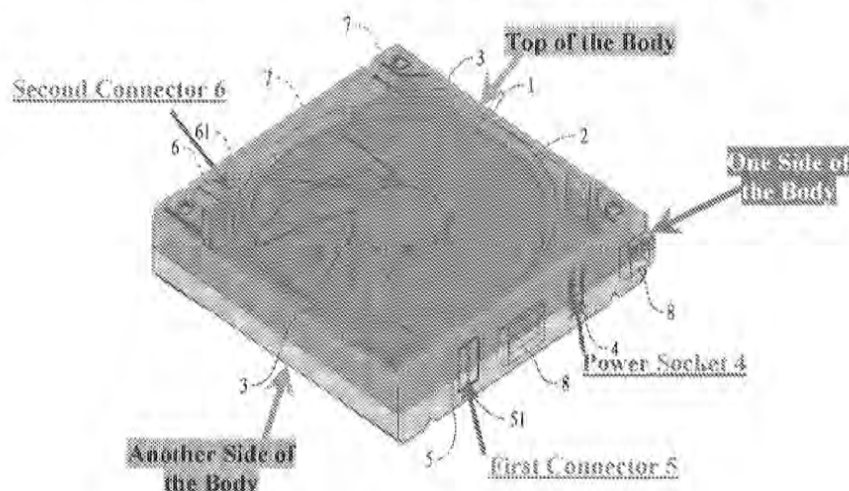


Fig. 1

28. Claim 1 of the '336 patent does not include language on how the two "side[s] of the body," if interpreted as the two halves of the "body," can be divided. Thus, in yet another exemplary division below, the two "side[s] of the body" can be the top and bottom halves of the body, respectively. This division causes all the power socket 4, the first connector 5, and the

second connector 6 to be on both “side[s] of the body,” and the “top of the body” to be completely subsumed and rendered superfluous by the “one side of the body”:



29 As a result, the alternative interpretation of the “one side of the body” and the “another side of the body” as two halves of the “body” causes the locations of the power socket 4, the first connector 5, and the second connector 6 to become indefinite. As such, this alternative interpretation makes no sense to a POSITA.

30 A POSITA would clearly not have interpreted “one side of the body” and “another side of the body” as two halves of the “body” because such interpretation causes the previously described nonsensical results.

31 The ordinary meanings of “side of the body” and “top of the body,” which are distinct from each other as would have been understood by a POSITA, are consistent with the usage of such terms in the claims of the '336 patent. The tortured explanation of the two “side[s] of the body” as the two halves creates ambiguity.

32 A POSITA would have known that the “top of the body” means the top and that the body has a bottom opposite the “top.” And a POSITA would have known that a fan body typically has four sides distinct from and adjacent to the top and the bottom.

33 Thus, a POSITA clearly would not have understood the “side[s] of the body” to mean that the claimed “body” only has two sides. Rather, a POSITA would have understood Figure 1 of the '336 patent to disclose an illumination fan including a body having *four* sides, a top, and a bottom, all distinct locations.

34 The '336 patent further discloses that the power socket 4 is electrically connected with the first connector 5, the second connector 6, the fan 2, and the illumination area 3 through, for example, internal wiring:

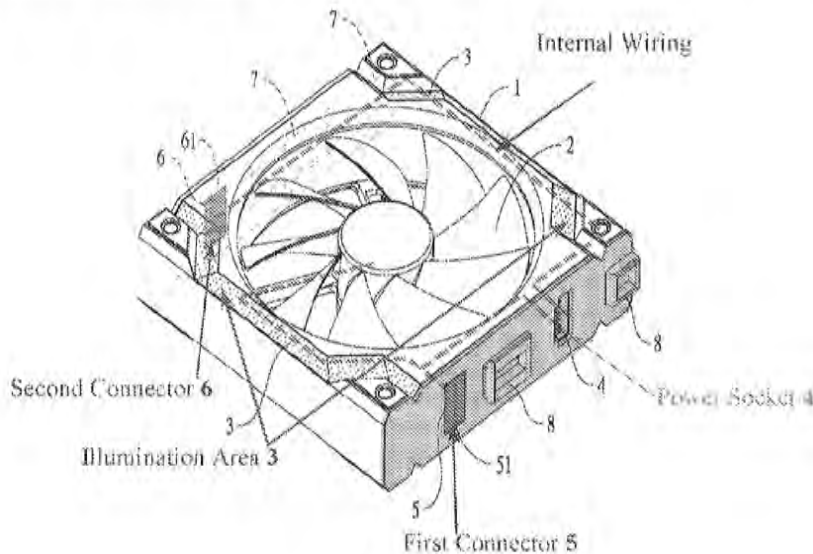
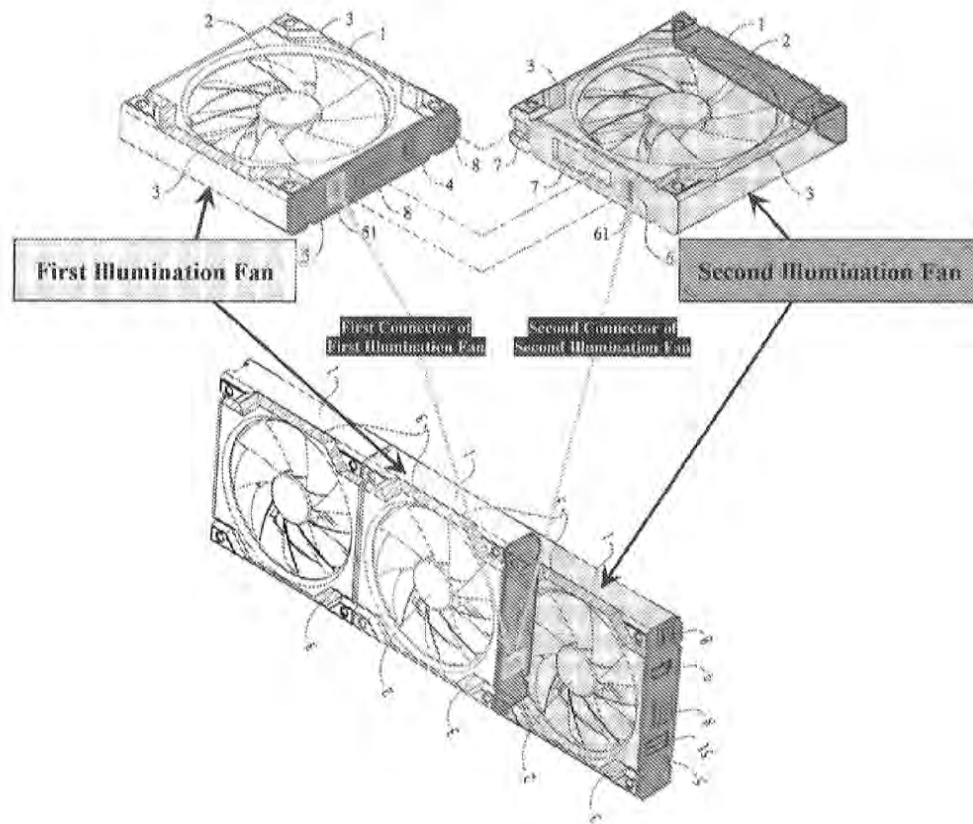


Fig. 1

'336 pat. at 2:61-3:3, Fig. 1 (exemplary annotations and highlighting added)

35 In a non-limiting configuration, the power socket 4 (highlighted in yellow above) can be supplied with power from behind by 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, which is electrically connected with the fan 2 and the illumination area 3, the fan 2 of the body 1 can be driven into rotation and the illumination area 3 into illumination. '336 pat. at 3:4-6, Fig. 1.

36. Further, the power socket 4, which is electrically connected with the first connector 5 of a first illumination fan's body 1, can in turn supply power to the first connector 5 of the first illumination fan's body 1 "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 pat. at 3:7-16. This non-limiting configuration of connecting a first illumination fan and a second illumination fan can be illustrated by Figures 2 and 3 (annotated) of the '336 patent below:



'336 pat., Fig. 2 (annotated) and Fig. 3 (rotated and annotated); *see also id.* at 3:7-16.

37. 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). 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.

38. Claim 1 of the '336 patent is reproduced below:

1. An illumination fan connectable with at least one illumination fan for a computer, comprising,

a body, provided with a fan in center of the body,

an illumination area on at least two sides of the fan at top of the body,

a power socket and a first connector on one side of the body, and a second connector on another side of the body,

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,

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.

VIII. THE REJECTED CLAIMS OF THE '336 PATENT ARE NOT ANTICIPATED NOR OBVIOUS

40. The Third-Party Requester requested reexamination based on four grounds of rejections. However, only the ground based on Fujitsu in view of Tsai and the ground based on

Lai in view of Fujitsu address the patentability of Claim 1. Claims 2-5 are all dependent on Claim 1, so it is only necessary to demonstrate that arguments against Claim 1 are manifestly faulty; then the arguments against the remaining dependent claims will be similarly faulty. For that reason, I will limit my comments just to the discussions of Claim 1, which are covered only in Grounds 1 and 3. I respectfully suggest that the Examiners will find my arguments wholly sufficient without the need to spend further time on reviewing any of the dependent claims. All '336 patent claim terms herein will be construed under their plain (i.e., ordinary and customary) meanings to a POSITA at the time of that patent's filing. As previously set forth herein, I qualify as a POSITA.

a. LAI AND ALTERNATIVELY LAI IN VIEW OF FUJITSU

41. The Action first rejected the claims on the ground based on Lai in view of Fujitsu and then on the ground based on Fujitsu in view of Tsai later. I've addressed the rejections in the same order presented in the Action. The Action rejected claim 1 as being anticipated by Lai and rejected claims 1-4 as being obvious over Lai in view of Fujitsu. I disagree. As discussed above, I am only going to discuss the arguments about independent claim 1 in this declaration and not the claims depending therefrom.

i. LAI - OVERVIEW OF PRIOR ART

42. Before examining the Action's arguments in detail, I will first make some general comments on the Lai disclosure that the reader should be made aware of. Lai is a brief patent application that describes a method for connecting and controlling multiple LED fans simultaneously from a single controller, by using a serial (daisy-chained) configuration and a *one-wire* control bus. Lai's disclosure suffers from several defects. First, it appears that Figures 4 and 5 are incorrectly labeled, i.e., the references in the specification text to Figure 4 actually describe

the figure labeled as "FIG. 5" (depicting "addressable" RGB LEDs, labeled as 16; these contain built-in driver ICs), and the references to Figure 5 actually describe the figure labeled as "FIG. 4" (depicting RGB LEDs labeled as 11 connected to separate driver ICs labeled as 14). Second, the circuit schematic in Figure 2, which is identified as an LED fan that incorporates the addressable LEDs labeled as 16 (i.e., having built-in drivers) shows an "input" 111 and "output" 112, each having 6 input and output points, respectively, but none of these points are labeled, and none of the three system schematics (Figs. 4-6) comport with those counts of input and output points. Specifically, the figure labeled as FIG. 5 (but which appears to be described in the specification text as FIG. 4) is the only one containing addressable LEDs 16, and it shows 7 inputs and 6 outputs from each fan (not 6 inputs). Nor do any of the other figures show a configuration of 6 inputs and outputs as depicted in FIG. 2. An additional defect in Figs. 4-6 is that they do not explicitly show the motor power supply (voltage and ground) lines as connecting through from the input to the output, in contrast to the LED power supply lines which are drawn as connecting through. One has to infer that the motor supply lines do in fact connect, otherwise only the first fan in the daisy chain would rotate.

43. My point regarding the preceding critique is that one could argue that, with all its multiple defects, the Lai publication cannot reasonably be interpreted to disclose or teach anything that the Action attempts to argue. A POSITA might well disregard Lai's disclosure as too illegible, error-riddled, confusing, and with items insufficiently labeled, to take advantage of its teachings. It strikes me as an unreasonable expectation that a POSITA would have been able to resolve these issues when Lai has himself not taken the trouble to describe his ideas accurately, legibly, and with a sufficiency of annotations on the schematics that a POSITA would expect and deserve when reading it.

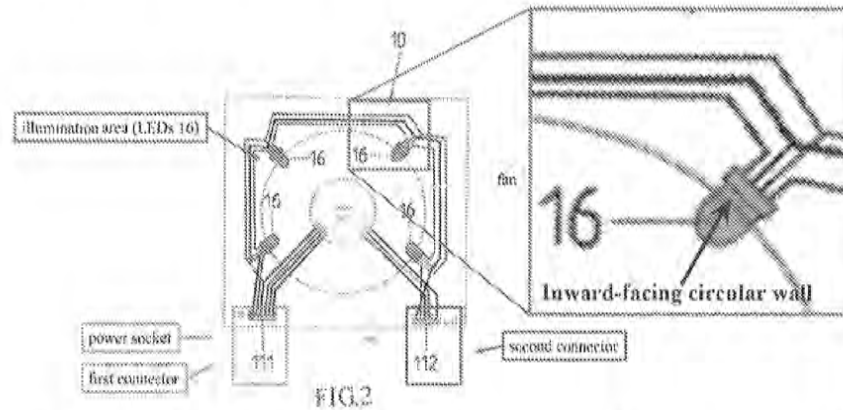
44 In any event, I have numerous other reasons why a careful scrutiny of Lai's disclosure, with or without Fujitsu's disclosure, does not render Claim 1 of the '336 patent as obvious, and so will proceed now with that analysis.

ii. LIMITATIONS THAT ARE NOT MET

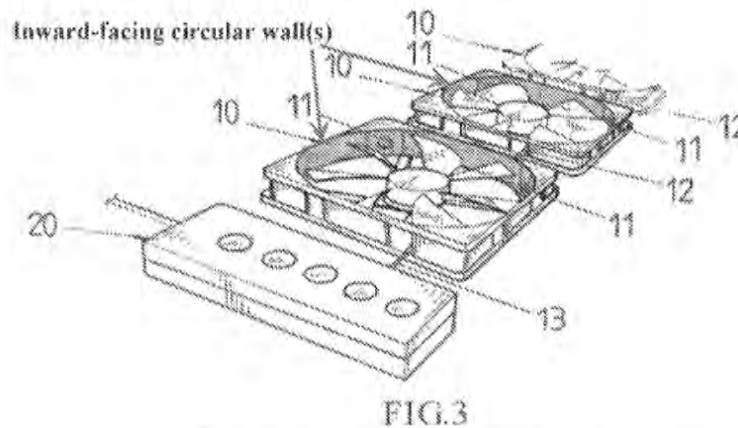
1. LAI DOES NOT DISCLOSE AN ILLUMINATION AREA AT TOP OF BODY AS CLAIMED

45 In my opinion, a POSITA would have concluded that Lai does *not* disclose or teach the limitation, "an illumination area on at least two sides of the fan at top of the body", nor does the combination of Lai and Fujitsu. Here the Action's rejection has a major problem: even if we stipulate that the four discrete LEDs depicted in Lai's Figures 2 and 3 by themselves constitute an "illumination area", there is no evidence that Lai disclosed or intended that these LEDs should be located "at top of the body", and in fact Lai teaches away from locating them at the top, as will be discussed below.

46 Lai discloses the use of multiple RGB LEDs installed in each fan. However, the LEDs of Lai are not "at top of the body", as claimed in claim 1. The only information about how these LEDs might be positioned is implied in Figure 2, and then expressly provided and confirmed in Figure 3. Figure 2 is described as a "schematic view" [Lai 0006] which a POSITA would have understood means a circuit diagram, not a physical depiction. The figure suggests that the preferred embodiment would place the four LEDs in roughly four equally spaced locations near the four corners of the fan on an inward-facing circular wall *beneath* the "top of the body".



47. Figure 2 above shows a *solid* circle going *across* the LEDs 16, suggesting the LEDs 16 are located *beneath* the “top of the body”. This is because a POSITA would have understood that, were the LEDs 16 located at the “top of the body”, which they are not, the portions of the circle going through the LEDs 16 would be *blocked* by the LEDs 16, not the *other way* around. That the LEDs 16 are blocked by the *solid* circle in Figure 2 suggests that the LEDs 16 are not at and are instead *beneath* the “top of the body,” as further confirmed by Figure 3⁴ shown below:



⁴ Figure 3 is described by Lai as a “planar view of an LED fan” [Lai 0007]. This is yet another example of the stoppiness of Lai’s disclosure, as it in fact depicts multiple fans and also a controller, not a single fan. Moreover, a POSITA would deem this figure as a non-planar view, not a planar view, as the terms are generally understood. (A planar view would be, for example, a top view)

48 As can be seen above, Figure 3 makes it clear that the LEDs (labeled "11" as opposed to "16" in this figure) are indeed attached near the corners of the fan body, and are fixed to the inward-facing circular wall surrounding the large circular opening within which the fan blades rotate, about mid-height (or mid-depth, if one prefers the term) (as Fig. 2 also implies)

49. In other words, the LEDs are not located at the "top of the body" (as this term would be interpreted in the '336 patent, i.e., the front face of the fan body). The LEDs are not at the bottom of the body either; they are midway in-between. So, Lai's Figure 3 teaches away from the LEDs being 'at top of the body', and there is nothing else in Lai's disclosure to contradict this impression. A POSITA would have understood Lai to disclose LEDs positioned mid-depth on the inward-facing circular wall surrounding the fan to shine light onto the surfaces of the fan blades, illuminating them as they rotate by, as the primary illumination effect, as opposed to direct viewing of the LEDs located at the "top of the body". A POSITA would have concluded that placing the LEDs at the top of the body would not have been nearly as effective in accomplishing this visual effect to illuminate the fan blades, so a POSITA would not have been motivated to do so. So again, Lai's design clearly does not disclose and, in contrast, teaches away from having an illumination area at the "top of the body."

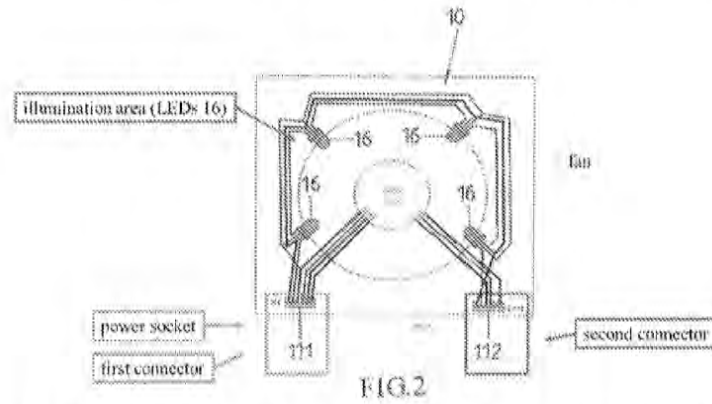
50 A POSITA would have understood that, considering Lai's illustration of the inward-facing, mid-body LEDs, those LEDs may not even be visible at the "top of body", as claimed in claim 1 of the '336 patent, because they may be mostly, if not entirely, blocked by the "top of the body." This is because a POSITA would have understood that (1) the lenses of the LEDs are directional and normally would not permit much, if any, light going in the lateral direction, and (2) the tips of the LEDs should not extend into the circular space in which the fan blades rotate to avoid interfering with the rotation. Further, it would only be the fan blades that

would reflect and/or diffuse the LED light and create frontal visibility of the illumination. Even so, the illuminated fan blades are not themselves at 'top of the body'. In the terminology of the '336 patent, the fan is not even part of the body; it is a separate component 'disposed in the center of the body' ['336 patent, line 63]. Note that an illuminated area being visible in a top view is not the same as an illumination area being physically located at the top of the body, as is required in the '336 patent. Thus, Lai clearly does not disclose the claimed "an illumination area on at least two sides of the fan at top of the body . . ." as claimed in claim 1 of the '336 patent.

2. LAI FAILS TO DISCLOSE "POWER SOCKET AND FIRST CONNECTOR ON ONE SIDE" AND "SECOND CONNECTOR ON ANOTHER SIDE"

51. The Action states that "Lai discloses an illumination fan (LED fan 10, Fig. 3) connectible with at least one illumination fan (§ 12)¹, comprising: a body provided with a fan in a center of the body (*see* Fig. 3), an illumination area on at least two sides of the fan at a top of the body (at LEDs 16, Figs. 2 and 4-6, §§ 11 and 13-16), a power socket and a first connector (shown as input 111 in schematic view of Fig. 2, the power socket being the input power supply connection of the fan 10, and the first connector being any other of the input connections of the fan 10 for connecting the fan 10 to the controller 20 or to an adjacent fan 10, as shown in Figs. 4-6) on one side of the body (i.e., on the side closest to the controller 20, Fig. 3) . . ." See Action at 5 (footnote 1 omitted).

52. The Action further states that Lai discloses a second connector (shown as output 112 in schematic view of Fig. 3; *see also* Figs. 4-6) on another side of the body (i.e., on the side closest to the next fan 10 in the series, Fig. 3). See *id.* For clarity, these purported mappings with respect to Figure 2 of Lai are illustrated below:



53. As illustrated above, the Action (at 5) maps Lai's single input 111 as the "power socket" and "first connector" and Lai's 112 as the "second connector" in Figure 2

54. But Lai in fact does not disclose nor otherwise teach any of the "socket" and "connector" limitations in claim 1 of the '336 patent. As an initial matter, no part of Lai discloses or even suggests a "socket" or a "connector," period. The entire Lai reference mentions no structure that is even close to a socket or connector. At most, Lai refers to element 111 as a "single input," which includes neither a socket nor a connector structure. Critically, claim 1 of the '336 patent includes a conditional phrase, "*when* the first connector of the body [of the illumination fan] is connected with a second connector of a body of another illumination fan." This phrasing implicitly requires both a connected state and a disconnected state between the connectors of the two illumination fans, respectively, as demonstrated by Figures 2 (disconnected state) and 3 (connected state) of the '336 patent:

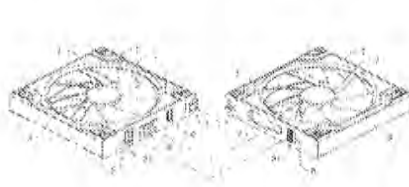


Fig. 2 (Disconnected State)

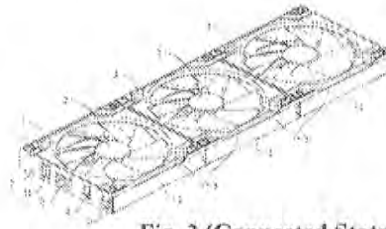
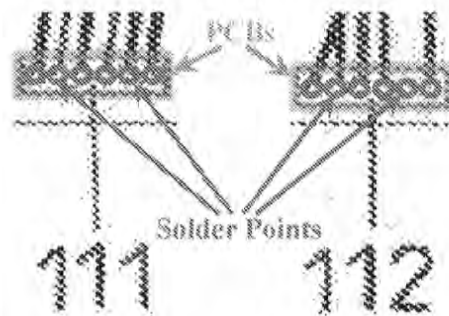


Fig. 3 (Connected State)

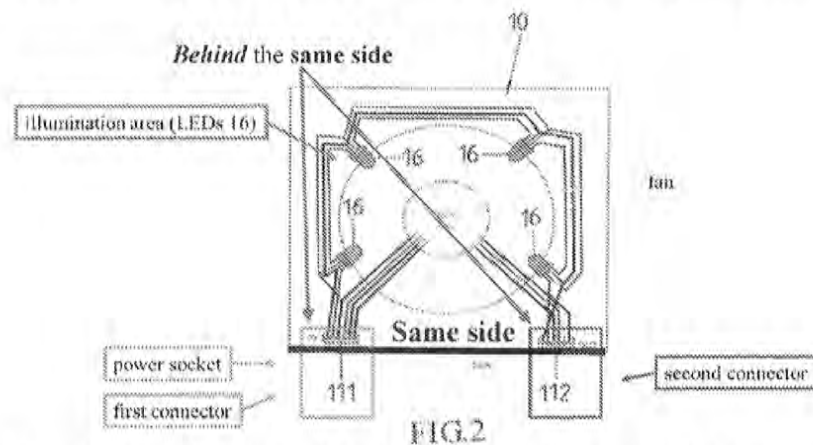
55. In contrast, Lai has no disclosure nor suggestion of such two states for the alleged “connectors” 111 or 112. Indeed, contrary to the Action’s assertion, Lai does not characterize element 111 as, nor suggest it to be, any “socket” nor “connector” at all. *See generally* Lai. Similarly, Lai does not characterize 112 as any “connector” but simply a “single output 112”. Thus, a POSITA *would not* have recognized Lai’s “single input 111” or “single output 112” as having any “socket” nor “connector” structures. In contrast, based on Lai’s disclosure, a POSITA would have understood the single input 111 and single output 112 as having nothing more than fixed solder points on printed circuit boards (or PCBs), as shown below:



56. Fixed solder points on PCBs in Lai’s “single input 111” and “single output 112” are simply not a “power socket” nor a “connector,” and cannot be conveniently divided into separate “socket” and “connector” components at least because of the “single” input 111’s and output 112’s *singular* structures repeatedly emphasized by Lai. Further, to connect to a separate socket and connector, the single transmission line will need to be split in two, which also violates

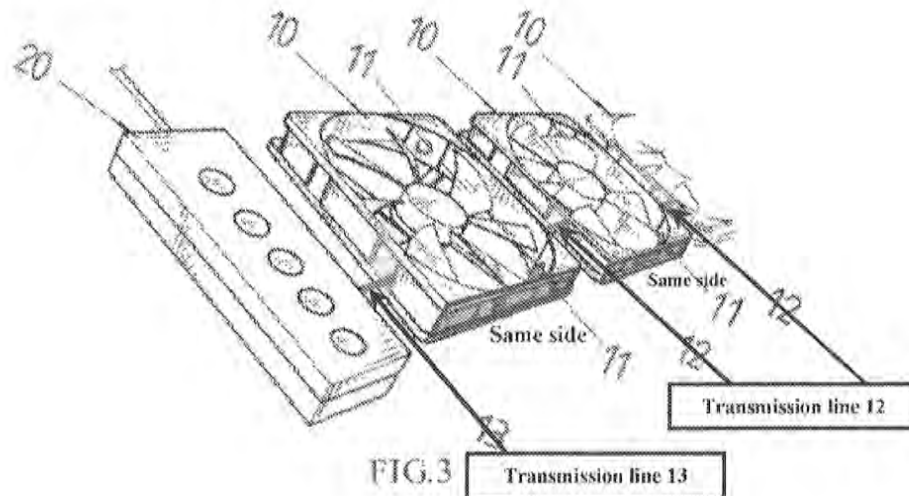
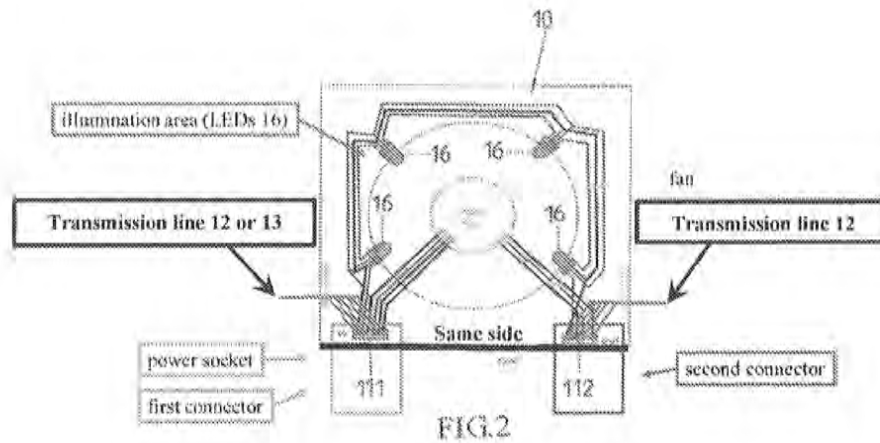
Lai's preference of the transmission line being "single" as well. Thus, Lai's single input 111 and output 112 do not disclose or otherwise teach the claimed "socket" nor "connector" structures. In fact, Lai's repeatedly emphasized *singular* structures teach away from splitting the input 111 into a power socket and a first connector, which in Lai's configuration will require *two* transmission lines, not a "single" transmission line.

57. Further, Lai's 111 and 112 are *behind* the *same* side of the fan body in Figure 2 and thus fail to disclose "a power socket and a first connector *on one side* of the body, and a second connector *on another side* of the body" as required by claim 1 of the '336 patent, as shown below.



58. Acknowledging as much, the Action argues that, "[a]lthough the schematic view of the fan shown in Fig. 2 of Lai illustrates the input (111) and the output connectors (112) on the same side of the fan body, the fan shown in Fig. 3 of Lai is understood to show the input and output connectors on opposite sides of the fan body, e.g., for connection to a controller (20) on one side via a transmission line (13) and to another fan on another side via another transmission line (12), or for connection to one fan on one side via a first transmission line (12) and to another fan on the other side via a second transmission line (12)." Action at 5-6. But Lai has no such disclosure of "the input and output connectors on opposite sides of the fan body" in Figure 3 because the

purported “connectors” are in fact just openings and are not connectors at all, as a POSITA would have understood. Instead, Lai refers to those openings as merely the “windows of a single input 111 and a single output 112” (*i.e.*, gold-colored openings shown below) to allow the transmission lines 12 and 13 to go through, as opposed to the input 111 and the output 112 *themselves*. Note that claim 1 of the '336 patent requires the two connectors *themselves* to be located on two different sides, not their “windows”. Indeed, the “same side” in the annotated Figure 3 of Lai below, corresponding to the “same side” *behind* which the alleged input 111 and output 112 are in the annotated Figure 2 above and below, shows no particular structures at all on that “same side”. That is, as shown in Figures 2 and 3 of Lai together, the alleged input 111 and output 112 are both located *behind* the *same* side (and thus *hidden* and invisible in Figure 3), and are thus not on two *different* sides. Lai only discloses that the input 111 and output 112 are *behind* the same side and are connected to the single transmission lines 12 and 13 that go through the “windows” (gold-colored) to the outside, as shown below:



59. The Action also states “the power socket being the input power supply connection of the fan 10, and the first connector being any other of the input connections of the fan 10 for connecting the fan 10 to the controller 20 or to an adjacent fan 10, as shown in Figs. 4-6) ...” See Action at 5. The Action further states that “the first connector being any other of the input

connections of the fan 10 for connecting the fan 10 to the controller 20 or to an adjacent fan 10, as shown in Figures 4-6) on one side of the body (i.e., on the side closest to the controller 20, Fig. 3).” See Action at 5. But in fact, Figures 4-6 of Lai are circuit diagrams that merely show electrical pathways, and *do not even identify elements corresponding to Lai’s single input 111 nor single output 112 at all*. A POSITA would have understood that the components and wiring shown in Figures 4-6 of Lai do not teach any specific physical positioning whatsoever. For instance, a POSITA would have understood that the various elements 11 (LEDs), 14 (LED Driver ICs), 15 (Motor Control), 16 (LEDs), and/or 17 (MCU) cannot be physically positioned as shown in Figures 4-6 because they will be interfering with the rotating fan blades, as shown below:

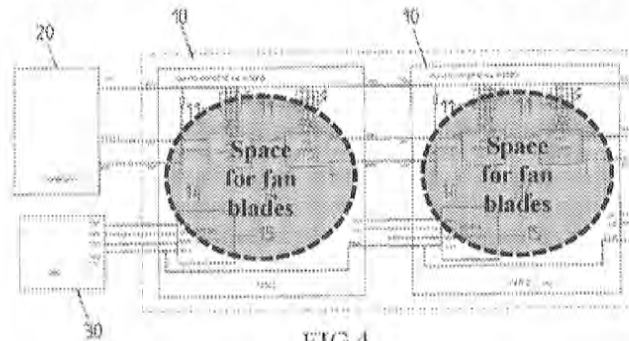


FIG. 4

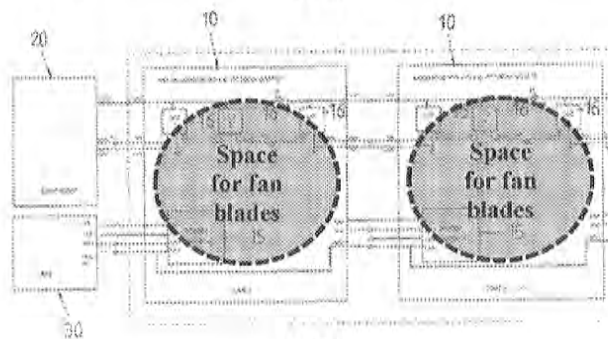


FIG. 5

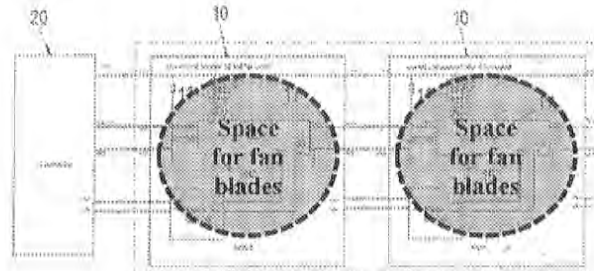


FIG. 6

60. Thus, it would have been clear to a POSITA that Figures 4-6 are circuit diagrams that merely show communication and electrical current pathways, NOT spatial relationships. Critically, *neither* the single input 111 (the purported “power socket” and “first connector”) *nor* the single output 112 (the purported “second connector”) are even included in Figures 4-6 at all, which thus cannot possibly disclose their locations relative to the fan bodies. Thus, Figures 4-6 of Lai simply do not disclose a first connector together with a power socket on one side of the body, nor a second connector on another side of the body, as required in claim 1 of the ’336 patent.

61. In sum, none of Figures 2-6 of Lai nor any other part thereof discloses or otherwise teaches “a power socket and a first connector on one side of the body, and a second connector on another side of the body” as required by claim 1 of the ’336 patent.

3. LAI DOES NOT DISCLOSE THAT “THE POWER SOCKET IS ELECTRICALLY CONNECTED WITH THE FIRST CONNECTOR”

62. Under the Action’s mappings, Lai fails to disclose that “the power socket is electrically connected with the first connector” as required by claim 1 of the ’336 patent. This is because, according to the Action, Lai’s purported “power socket” and “first connector” are separate connections in the input 111.

[A] power socket and a first connector (shown as input 111 in schematic view of Fig. 2, the power socket being the input power supply connection of the fan 10, and the first connector being any *other* of the input connections of the fan 10 for connecting the fan 10 to the controller 20 or to an adjacent fan 10, as shown in Figs. 4-6) . . .

Action at 5 (emphasis added).

63. That is, the Action asserts that Lai's purported "first connector" is any of "the input connections of the fan 10" *other than* "the input power supply connection of the fan 10" that is Lai's purported "power socket." In other words, the Action asserts that Lai's "power socket being the input power supply connection of the fan 10" is *different from* Lai's "first connector being any *other* of the input connections of the fan 10 for connecting the fan 10 to the controller 20 or to an adjacent fan 10, as shown in Figs. 4-6)." Thus, a POSITA would have therefore understood Lai's purported "power socket" and "first connector" are *separate* connections in the input 111 that are *not* "electrically connected" with each other. This is because otherwise, Lai's "power socket" and "first connector" in the input 111 will be *short-circuited out* with each other and thus will not be different from each other, as how the Action has mapped them. Indeed, a POSITA would have understood that any of "the input connections of the fan 10" *other than* "the input power supply connection of the fan 10" is a *signal line* for changing the lighting of "the addressable RGB LEDs 16 . . . controlled individually by a controller 20 (as shown in FIG. 3) to result in even more complex and expressive lighting effects through the change in output signals" or for "adjust[ing] the rotational speed of the LED fan 10 using the PWM (Pulse Width Modulation) technique." Lai ¶¶ 11, 15. A POSITA would have understood that such signal line(s) in Lai cannot be cross-wired with "the input power supply connection of the fan 10" because the control signals will be overwhelmed by the power and thus lost and unusable. That is, under the Action's mappings, Lai's purported "power socket" is *not* "electrically connected with" Lai's "first connector" as required by claim 1 of the '336 patent.

4. LAI DOES NOT DISCLOSE THAT, “WHEN THE FIRST CONNECTOR OF THE BODY [OF THE ILLUMINATION FAN] IS CONNECTED WITH A SECOND CONNECTOR OF A BODY OF ANOTHER ILLUMINATION FAN, A FAN AND AN ILLUMINATION AREA OF THE BODY OF THE OTHER ILLUMINATION FAN ARE RESPECTIVELY DRIVEN INTO ROTATION AND ILLUMINATION”

64. Under the Action's mappings, Lai fails to disclose that, “*when* the first connector of the body [of the illumination fan] is connected with a second connector of a body of another illumination fan, a fan and an illumination area of the body of the other illumination fan are respectively driven into rotation and illumination.” '336 pat., Cl. 1 (emphasis added). This is at least because, as explained in the previous section, Lai's purported “first connector” is a *signal line* not electrically connected with Lai's purported “power socket.” Thus, Lai's “first connector” is *not* supplied with power by Lai's “power socket” even “when the power socket on the one side of the body is supplied with power,” as recited by claim 1 of the '336 patent. In turn, under the Action's mappings, Lai's purported “first connector” cannot be connected to *another illumination fan* for its fan and illumination area to be driven into action. That is, Lai fails to disclose that, “when the first connector of the body [which is merely a signal line] 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.”

65. Further, the Action's mappings do not explain how Lai's purported “*first connector on one side of the body*” (i.e., on the side closest to the controller 20, Fig. 3) of the “*illumination fan*” (located on the *far-left*) can be conditionally connected with a “*second connector of a body of another illumination fan*” (located on the *far-right*) “when the input connectors [in 111] of one fan are connected with the output connectors [in 112] of the adjacent fan in the series, e.g., via a transmission line 12, Fig. 3)” (Action at 5):



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67. Furthermore, as discussed previously, claim 1's conditional phrasing, "*when* the first connector of the body [of the illumination fan] is connected with a second connector of a body of another illumination fan," implicitly requires both a connected state and a disconnected state between the connectors of the two illumination fans, as shown in Figures 2 (disconnected state) and 3 (connected state) of the '336 patent:

68. But a POSITA would have understood that the (first) illumination fan adjacent the controller 20 and the (second or) another illumination fan adjacent the (first) illumination fan are *permanently* connected via the "single transmission line 12." That is, under the Action's mappings, a POSITA would have understood that the *far-left* first connector (which is merely a signal line) on the one side of the illumination fan's body "closest to the controller 20, Fig. 3" cannot be *conditionally* connected to the *far-right* "second connector of a body of another illumination fan" to allow the fan and illumination area of the another illumination fan to be driven into action, as implicitly required by claim 1 of the '336 patent.

69. In sum, under the Action's mappings, Lai fails to disclose that, "*when* the first connector of the body [of the illumination fan] is connected with a second connector of a body of another illumination fan, a fan and an illumination area of the body of the other illumination fan are respectively driven into rotation and illumination."

iii. FUJITSU - OVERVIEW OF PRIOR ART

70. Before getting into the detailed arguments, I will first provide a summary of the Fujitsu patent application publication, based on its certified translation of "Fujitsu". The stated problem that Fujitsu is addressing is: "To provide an electronic device capable of assigning an address associated with a position of each fan unit to each fan unit even when the fan unit is swapped". [Fujitsu, p.2]

71 More specifically, Fujitsu explains that: “In cooling fans conventionally used in **large-scale backbone servers**, an ability to perform **hot maintenance and swapping** while maintaining a system operational state (energized state) is desirable”. [Fujitsu, ¶ 0002, bold-facing added]

72. Fujitsu summarizes his solution as: “An electronic device includes an electronic apparatus, and a plurality of serially-connected fan units that cools the electronic apparatus. Each fan unit includes a controlling unit that assigns to its own fan unit an address that identifies its own fan unit among the plurality of fan units by associating the same with a connection position of its own fan unit among the plurality of fan units”. [Fujitsu, p.2]

73. A POSITA would have therefore understood the Fujitsu patent to address a specific market need, i.e., the ability to “hot-swap” a defective fan in a “large-scale backbone server”, such as would exist as part of a server farm in a large data center. This is an ultrahigh reliability environment where downtime is viewed as intolerable. A large-scale server will be designed with multiple fans to provide cooling redundancy, and it is desirable to be able to swap out a defective fan without shutting down the server nor any of its operating fans. Fujitsu offers just such a method in his patent application.

74 A POSITA would have further understood that the essence of the Fujitsu publication is about how to incorporate a controller in each fan to essentially make it a “smart fan”, so that when multiple fans are serially connected together in a row, with power connections between each fan and its neighbor, and also a serial bus connection such as I2C, it is possible for each fan to determine its location in the row and self-report its condition by signaling techniques. In Fujitsu’s preferred embodiments, each fan also has a pair of redundant connectors CNA and CNB that can be connected to a pair of power supply cables (only the right-most fan is intended

to be connected to these cables in normal operation). This feature permits a hot-swapping procedure whereby a new fan can be attached at the end of the row, powered up, slid into the server, and a fan at the opposite (left) end of the row can then be removed. The power cables A and B are transferred one at a time from the original right-most fan to the newly attached right-most fan, so that all the fans are continuously supplied with power. This procedure can be repeated until the defective fan has been removed from the row.

75. A POSITA would most definitely **not** view the Fujitsu reference as having any bearing on the subject of "illumination fans", such as are a subject of the '336 patent. A POSITA would have understood that the purpose of an illumination fan is to provide widely viewable lighting (usually with full-color RGB capability that can be dynamically varied) having some cosmetic or entertainment value to the user or his guests. Illumination fans are typically marketed to users of desktop personal computers or gamers, where the casing has been specifically designed to make the fans visible. They would not be designed into backbone servers (Fujitsu's target market), which are generally installed in rack-mounted cabinets in highly secure restricted-access facilities that are normally only viewed by maintenance engineers or technicians. To add illumination would increase fan cost, add to the power consumption and hence electricity cost, increase the heat load on the server which would reduce reliability (or require additional cooling fan capability to dispose of the heat), and increase the air conditioning load on the data center which further adds to electricity cost. All of these effects are detrimental to the goals of a data center operator, so the use of illumination fans would not be considered in that market. Fujitsu [¶ 0005] specifically states "lower power consumption is desirable in the servers in recent years". The addition of illumination to Fujitsu's fan units would be contrary to this desire to minimize

power, would provide no benefit, and would in fact cause significant detrimental effects to the heat dissipation and the economic operation of a data center.

76. A POSITA would therefore consider that cooling fans for high-reliability high-end servers are in a different “field of endeavor” from illumination fans for personal computers, which is the subject of the ’336 patent. Moreover, the inventive essence of the Fujitsu publication is to enable the ability to “hot swap” fans in a high-reliability environment. Hot-swapping is not something that would be of interest to a designer of illumination fans. Personal computer manufacturers routinely caution against opening the computer case when it is powered up, primarily because it is unsafe for users (for example, fingers might get cut by spinning fan blades, might contact the high-voltage power connection, or might get burned on a hot semiconductor chip), but also because it could damage the electronics (e.g., by inadvertently short-circuiting components with a metal tool, by damaging semiconductor components with a static electricity discharge, or by adversely affecting the flow of cooling air so that components overheat). No typical illumination fan designer would want to encourage hot-swapping of fans, as it risks putting the user’s fingers in contact with sharp fan blades rotating at high speeds. Accordingly, it is my view that the Fujitsu publication, being aimed at solving the problem of hot swapping of fans, is not “reasonably pertinent” to a designer of illumination fans, and so Fujitsu would not “logically commend itself” to an inventor’s attention who is focused on improving illumination fans. A POSITA would look at the Fujitsu publication and consider that its purpose is to allow hot-swapping of a defective fan in an array of fans, and would not even consider that it is pertinent to illumination fans in a PC.

77. The Action attempts to categorize Fujitsu as depicting an illumination fan merely because, in the preferred embodiments shown, the fan unit has a small “insertable / removable

indicator lamp" on its right side to indicate the power status of the fan. The Action's position is simply incorrect. Many electrical devices have indicator lamps to show the operational status of the device, for example battery chargers, hard disk drives, and washing machines, to name a few. We do not call them "illumination battery chargers", "illumination disk drives", or "illumination washing machines", merely because they have one or more status lights on them. It would be clear to a POSITA that the sole function of the indicator lamp in Fujitsu is to assist in performing a hot-swapping procedure, by confirming the power status of a fan (i.e., whether one or two power cables are plugged in, in which case the lamp respectively indicates yellow or green). The indicator lamp does not fulfill any aesthetic function as an illumination fan would be expected to do, and indeed is not even visible except on the rightmost fan, since all the other fans in the serial connection would have the lamp covered up by their neighbors on the right. In fact, the indicator lamp is not even an essential component for practicing the Fujitsu invention. Fujitsu Figures 8-11 depict various steps in the hot-swapping procedure, none of which even show the indicator lamp. The flowchart in Fujitsu, Figure 20, makes it clear that the indicator lamp is not an essential part of the hot-swapping process, it merely provides additional assurance that power cables A/B have been correctly installed. The hot swap procedure could be successfully performed without referring at all to the indicator lamp. Fujitsu apparently felt that the role of the indicator lamp is sufficiently non-essential to the invention that none of Fujitsu's 9 claims mention it. Nor is the indicator lamp mentioned in any of Fujitsu's 20 "Supplementary Notes", which are written in a form that suggests they were intended as additional potential claims.

78. The use of the phrase "insertable / removable" modifying every use of the phrase "indicator lamp" provides still further evidence that the lamp is not viewed as an essential component of the Fujitsu invention. Fujitsu does not explain the reasons why the indicator lamp

should be insertable / removable, but given the excellent reliability of LED lamps at the time, it would be highly unusual for a fan designer to add cost and complexity by making the lamp replaceable merely because of a concern that the lamp might burn out; in such an unlikely event, the relatively inexpensive fan unit could simply be tossed. My opinion is that Fujitsu specified "insertable / removable" because the lamp is in fact intended to be inserted and removed by maintenance personnel during the hot-swapping operation. It does not need to be present on any fan during normal operation, even on the right-most fan. When installed, the lamp probably protrudes from the right side, since a flush-mounted or recessed lamp would be very difficult to be "removable"; thus, it would preferably not be installed in any of the interior fans, unless sufficient clearance was designed between adjacent fans so that the protruding lamp does not smash against its right-hand neighboring fan unit (which doesn't appear to be the case in Fujitsu's Figure 6, as it depicts the neighboring fans as flush against each other). The lamp may or may not remain installed on the rightmost fan during normal operation (if not, the maintenance technician would bring a lamp with him when performing a hot swap). In my opinion, the insertable / removable feature further teaches away from the idea that the Fujitsu fan unit is in any sense an "illumination fan"; the indicator lamp is clearly intended to be viewed only on the right-most fan during a hot-swap operation, and it does not need to be installed at all at any other times.

iv. LIMITATIONS THAT ARE NOT MET

79. In my opinion, the preamble of claim 1, "[a]n illumination fan connectable with at least one illumination fan for a computer", to the extent it is limiting is not met by either Fujitsu nor the combination of Lai and Fujitsu. As discussed at length in the preceding paragraphs, Fujitsu is not an illumination fan by any reasonable POSITA's interpretation. So Action's analysis therefore fails immediately. As explained previously, the sole purpose of the indicator lamp on

the right side of a fan unit of Fujitsu is to assist in the hot-swapping of a failed fan unit by verifying the powered-up status of a new fan that is being inserted. There is no advantage to the maintenance technician in making this lamp larger or with more uniform illumination than a standard LED indicator lamp normally provides. To do so would require adding extra circuitry and/or light diffusers, which increases fan unit cost, power consumption, and heat dissipation, all undesirable properties in a large-scale backbone server. The Action's rejection in this regard should fail just at this step without need for further discussion.

80. In my opinion, the limitation of "an illumination area on at least two sides of the fan at top of the body" is not met by either Fujitsu nor the combination of Lai and Fujitsu. In all of Fujitsu's preferred embodiments, the only illumination comes from a single "insertable / removable indicator lamp" on the "right side surface when viewed from the front surface" of each fan unit body [Fujitsu 0040]. To a POSITA reading the '336 patent, "top of the body" clearly means that frontal portion of the body when viewing along the fan's axis of rotation. The '336 illumination areas are clearly shown and labeled as "3" in all the preferred embodiments ('336 patent Figures 1-5), and they are located on two different sides of the fan, both at "top of the body". In stark contrast, Fujitsu teaches that the single indicator lamp is located on the "*right* side surface when viewed from the front surface". This location is clearly not at "top of the body"; rather, using the claim language of the '336 patent, such an indicator lamp would be described as being on the right "side of the body", which is where Fujitsu requires the lamp to be located. The only figure in Fujitsu depicting the indicator lamp is Fig. 7(A), and the lamp's position is depicted as low on the right side of the fan unit between the front and rear faces, hence nowhere near the "top of the body" (i.e., nowhere near the front face), and certainly not providing illumination for the front of the body.

81 In Fujitsu's words: "[b]ecause the right side surface is exposed to the outside when fan unit 10 is arranged on the right-most side of the plurality of fan units 10 (when fan unit 10 is added), the maintenance person can check a lighting state of the insertable / removable indicator lamp 12" [Fujitsu ¶ 0040]. Thus Fujitsu locates the indicator lamp on the "right side surface" of the fan unit, because the rest of the fan body is expected to be mostly if not entirely concealed by the server's case, as a POSITA would have understood.

82 Therefore, Fujitsu teaches away from placing any type of illumination at the "top of the body" (as this term would be construed by a POSITA in the '336 patent), and instead teaches that the sole illumination (an indicator lamp) shall be placed on a "side of the body" (as this term is understood in the '336 patent).

83 Furthermore, there would be no motivation for a POSITA to take the single indicator lamp of Fujitsu and locate it on "two sides of the fan" because to do this would increase cost and generate more heat for no benefit. That is, Fujitsu teaches away from this modification which also would not cure the fundamental defect that the proposed lamps would still be placed on the sides of the body, as taught by Fujitsu to facilitate maintenance from the side(s). Hence, neither lamp would be located at "top of the body", as required in the '336 claim language, and there would be no motivation to add illumination at top of the body.

84 For all the above reasons, the Action has failed to justify why a POSITA would consider or be motivated to modify Fujitsu to create an illumination area "on at least two sides at top of the body", something that would add cost, complexity, power consumption, and heat, for no apparent benefit. For all the same reasons, Fujitsu teaches away from a combination with Tsai to add more illumination. The Action's rejection in this regard should fail at this step (if not earlier) without need for further discussion. Nevertheless, I continue:

85 In my opinion, the 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”, is not taught by Fujitsu nor the combination of Lai and Fujitsu. The Action identifies connectors CNA and CNB in each fan unit of Fujitsu as being “power sockets”. See Office Action at 6. However, neither CNA nor CNB is on a “side of the body”, as a POSITA would have interpreted the ’336 patent. An explanation follows immediately below.

86 In the ’336 patent, it is clear from the specification and associated figures that each fan body has an approximately square profile when viewed from the front (i.e., viewing along the axis of fan rotation, so that the viewer is facing the illumination areas), and so has four sides, as well as a “top of the body” (containing the illumination area) and an opposite face which we might call the rear or “bottom” of the body (the ’336 patent does not name this bottom face, but its existence is apparent). In one or more of the ’336 patent’s embodiments, the power socket and first connector are located on one side of the body, and a second connector is located on another side of the body.

87 In contrast, applying the same interpretation of “side of the body” and “top of the body” to the Fujitsu publication, it is apparent that connector CNA is located on the *top* (i.e., the front) of the fan body, not on a *side* of the fan body as required by claim 1 of the ’336 patent. This is evident from Figs. 7A and 7B in Fujitsu, and is also evident from a close reading of paragraph [0039] in Fujitsu, which states that “[t]he connector CNA on one side is arranged on a lower part of the front surface of each fan”, and furthermore that “[t]he connector CNB on the other side is arranged on an upper part of the rear surface of each fan unit...” Note that Fujitsu is using the phrases “one side” and “other side” to refer to the front and rear surfaces of the fan unit. This is different from the ’336 patent’s use of the word “side” in each embodiment’s “side of the body”.

wherein the “side of the body” in the embodiments means one of the major faces or surfaces (there are four such faces in the preferred embodiments shown) bounding the fan body that are perpendicular to the front and rear faces of the fan body. Fujitsu’s “front surface” is equivalent to “top of the body” in the claim language of the ’336 patent. Yet, the Action incorrectly claims that Fujitsu teaches a power socket and a first connector on one side of the body. Action at 6. This appears to incorrectly interpret the translation of Fujitsu using the word “side” as describing the location of connectors CNA and CNB, but without including Fujitsu’s additional explanatory language which makes it clear that the “front side” or “front surface” in this context is referring to the front or rear surfaces, not one of the “sides of the body” in the ’336 patent context, which are in fact perpendicular to the front and rear surfaces in the embodiments.

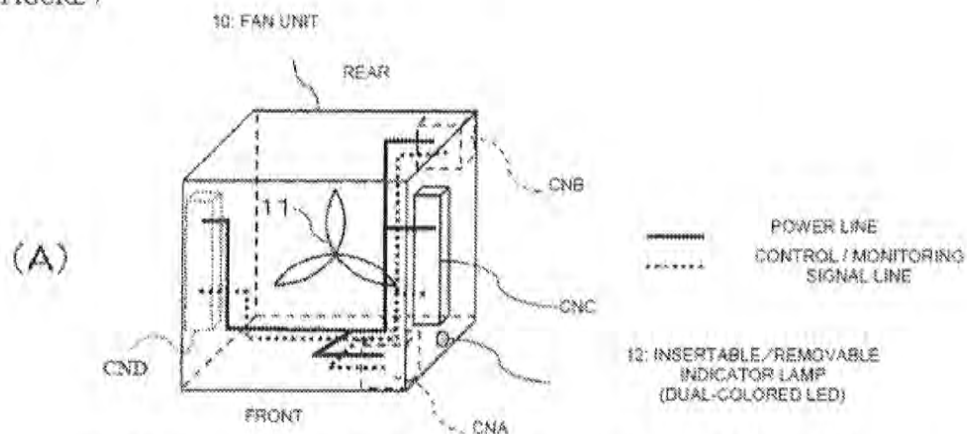
88. As discussed, a foundational purpose of Fujitsu’s invention is to “enable hot swapping of one fan unit”, a goal Fujitsu reiterates numerous times. *See id.* At Cl. 3 (“[T]he plurality of fan units is configured so as to enable hot swapping of one fan unit among the plurality of fan units ...”); [0002] (“[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 each fan unit even when the fan unit is swapped”); [0041] (“Therefore, fan unit 10 can be hot-swapped without having to stop the system ...”). Indeed, Fujitsu’s emphasis on “hot swap”—mentioned no fewer than 55 times throughout the patent—underscores its central importance to the invention.

89. As also discussed above, for Fujitsu’s hot-swapping to work, each fan unit must maintain at least two power sockets 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. Thus, it would not have been obvious to a POSITA to move CNA and CNB onto the same side as CNC as a matter of design choice because to do so would be in direct contradiction of the teachings of Fujitsu. In fact, Fujitsu teaches away from such movements, as explained below. As discussed, Fujitsu discloses a system that is configured to enable hot-swapping of fans. Fujitsu's procedural description further illustrates this necessity:

[0040] Furthermore, as shown in FIG. 7A [reproduced below], an insertable / removable indicator lamp 12 is provided on the right side surface when viewed from the front surface of each fan unit 10. Because the right side surface is exposed to the outside when fan unit 10 is arranged on the right-most side of the plurality of fan units 10 (when fan unit 10 is added), the maintenance person can check a lighting state of the insertable / removable indicator lamp 12. The insertable / removable indicator lamp 12 is, for example, a dual-colored LED. The lighting color (luminescent color) of the insertable / removable indicator lamp 12 is controlled by a later-explained LED lighting circuit 20 (refer to FIGS. 14 and 15). For example, when the cables A and B are respectively connected to the connectors CNA and CNB, that is, the cables A and B are in a insertable / removable state (a state in which the power supply is not interrupted even when one of the cables is removed), the insertable / removable indicator lamp 12 is controlled to be in a green color state (to lit up in green color). On the other hand, when only one of the cables A and B is connected to the connector CNA and CNB (hereinafter, a state in which the power supply is interrupted when a cable is removed), the insertable / removable indicator lamp 12 is controlled to be in a yellow color state (to lit up in yellow color).

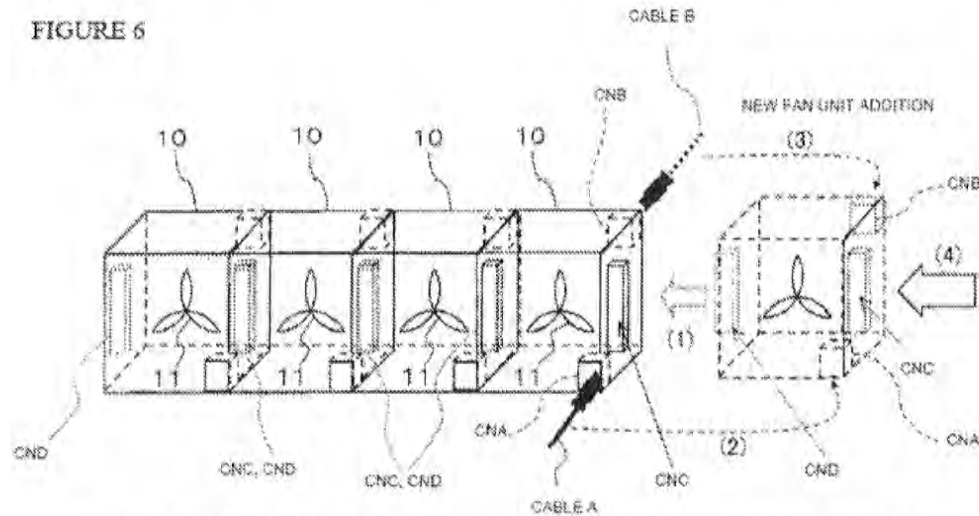
FIGURE 7



[0041] The power is supplied to the serially-connected plurality of fan units 10 from the power supplying unit 2 via the cables A and B and the connectors CNA, CNB, CNC, and CND explained above in a sequence. Moreover, the management unit 7 (I2C master; refer to FIGS. 8 to 13) and the fan controllers 13 of the plurality of fan units 10 (I2C slaves; refer to FIGS. 12 and 13) are connected in a daisy chain form by a serial interface such as I2C. Accordingly, the control signal (pulse signal) from the management unit 7 or the adjacent fan unit 10 is transmitted to the serially-connected plurality of fan units 10 via the cables A and B and the connectors CNA, CNB, CNC, and CND explained above. Therefore, fan unit 10 can be hot-swapped without having to stop the system (server 1).

[0042] Next, *the hot-swapping procedure of fan unit 10 according to the present embodiment will be explained while referring to FIG. 6 [reproduced below]*. Here, an operation performed by the maintenance person when adding a new fan unit 10 on one side (right side) and sliding the already installed fan unit 10 in server 1 to push out fan unit 10 on the other end (left side) is explained. At the start of the operation, four serially-connected fan units 10 are installed in server 1 and the connectors CNA and CNB of the fan unit on the right-most side are connected to the cables A and B, respectively.

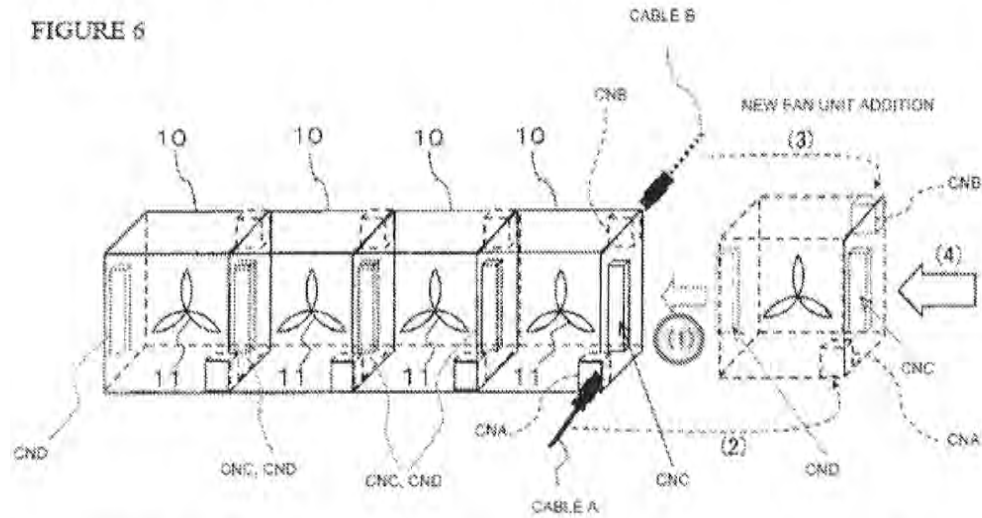
FIGURE 6



[0043] At this time, the maintenance person confirms that the insertable / removable indicator lamp 12 provided on the right side of fan unit 10 arranged on the right-most side among the already installed fan units 10 inside server 1 is in the green color state. In other words, the maintenance person confirms that the connectors CNA and CNB of fan unit 10 arranged on the right-most side is connected to the cables A and B, and is in a state in which the cable can be inserted / removed.

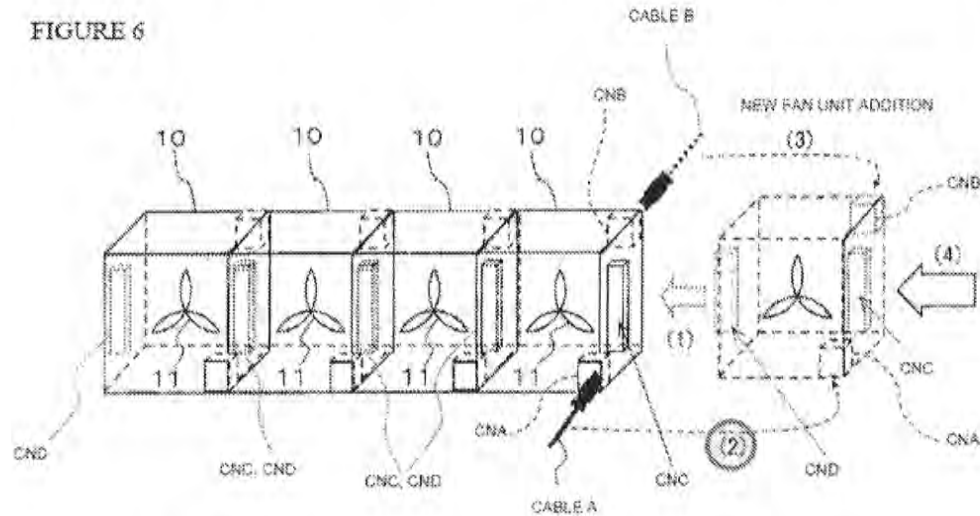
[0044] Upon visually confirming the insertable / removable indicator lamp 12 and confirming that it is the state in which the cable can be inserted / removed, *the maintenance person engages the connector CNC (male) of fan unit 10 on the right-most side with the connector CND of the new fan unit 10 (refer 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 additionally-linked new fan unit 10, as shown by Arrow (2) of FIG. 6. At this step, the insertable / removable indicator lamp 12 switches from the green color state to the yellow color state when the cable A is removed, and switches back to the green color when the cable A is connected to the connector CNA of the new fan unit 10.

FIGURE 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. Even at this step, the insertable / removable indicator lamp 12 switches from the green color state to the yellow color state when the cable B is removed, and switches back to the green color when the cable B is connected to the connector CNB of the new fan unit 10.

[illegible][illegible]

[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 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.

Fujitsu, ¶¶ 40-49.

90. In my opinion, Lai alone or in view of Fujitsu does not render any '336 claims Obvious. The Action maps a connector CNC in the Fujitsu patent as the "first connector" in the '336 claim language. Fujitsu explains that "connector CNC (male) ... is provided by protruding on the right side surface when viewed from a front surface of each fan unit 10". [Fujitsu ¶ 0038] In the language of the '336 patent, connector CNC would indeed be considered as being "on one side of the body". However, by glossing over the fact that Fujitsu and the '336 patent used the word "side" in two entirely different meanings (as recently explained above), the Action incorrectly concludes that Fujitsu embodies the claim limitation "a power socket and a first connector on one side of the body". For this to be true, the power socket and first connector would both need to be on the same side of the body. But a POSITA would conclude that they are

obviously not on the same sides, as clearly shown in the colored annotations of Fujitsu's Figures 6 and 7:

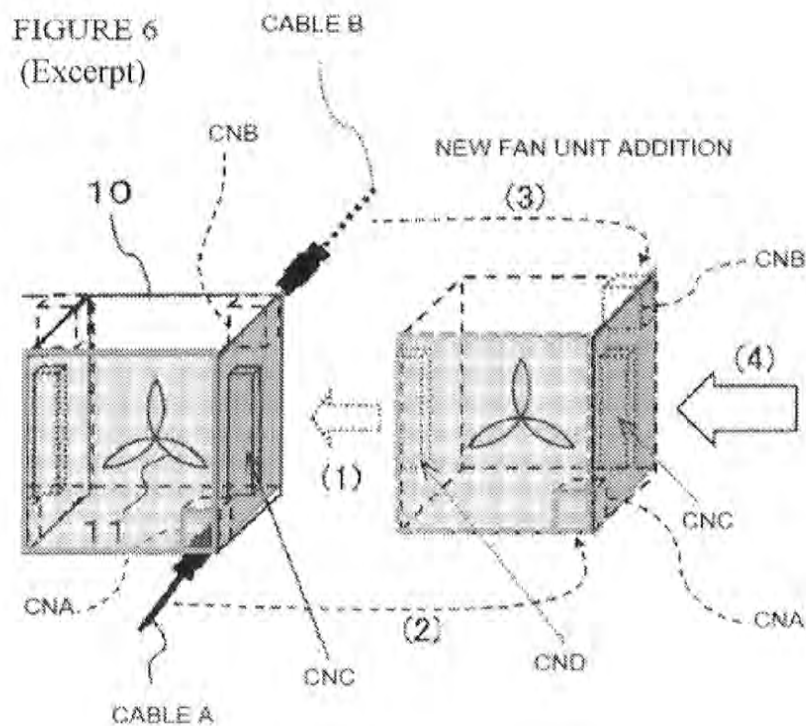
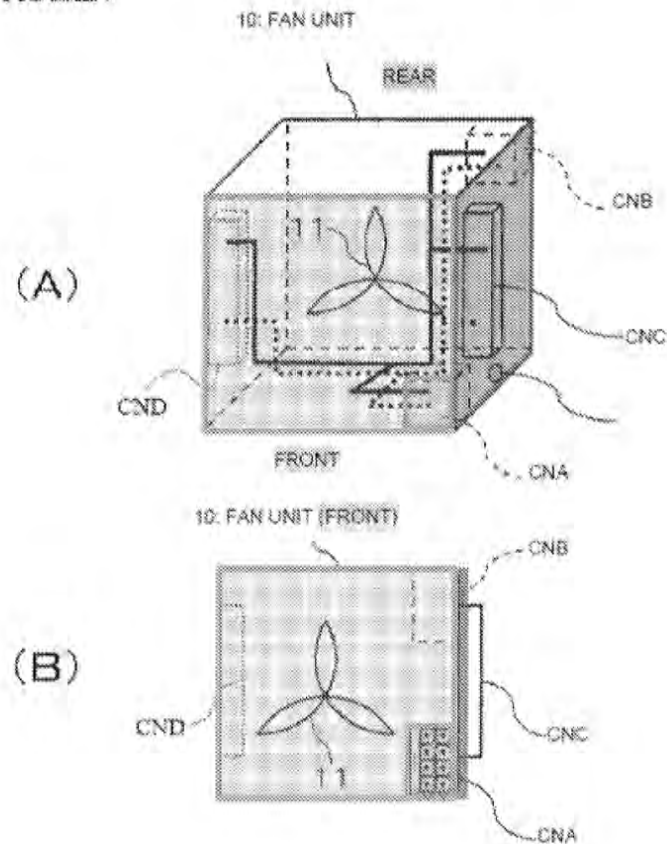


FIGURE 7



91. The Action identifies connector CNC as being the “first connector”, and connectors CNA and CNB are each identified as a “power socket”. Action at 6. But it is unequivocal from the Figures 6 and 7 (reproduced and annotated above) that connector CNA is mounted on a surface facing the reader (Fujitsu’s “front surface”, which is equivalent to the ’336 patent’s “top of the body”), connector CNC is mounted on a surface facing to the right (Fujitsu’s “right side surface” or “end side”, and the ’336 patent’s “side of the body”), and connector CNB is mounted on a

surface facing away from the reader (Fujitsu's "rear surface" and what would be considered the "bottom of the body" in the '336 patent, though that term is never used). So, in both figures and text, Fujitsu does not teach having a power connector/socket and another connector being on the same side of the fan unit.

92. In one or more of the '336 patent's embodiments, the power socket and first connector are located on one side of the body, and a second connector is located on another side of the body. Claim 1 of the '336 patent requires, *inter alia*, "a power socket and a first connector on one side of the body and "the power socket on the one side of the body." These two claim phrases together confirm that the "power socket" and the "first connector" must be on the *same side* of the illumination fan's body. This required configuration of the power socket 4 and the first connector 5 being located on the *same side* of the body of the illumination fan (red) is depicted in Figure 1 of the '336 patent, as shown below:

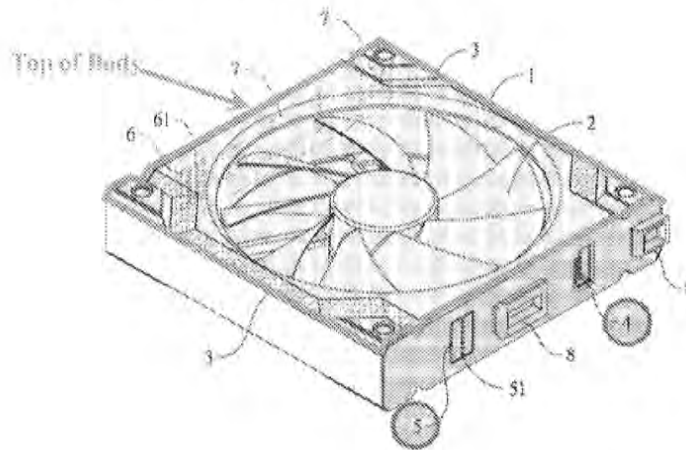


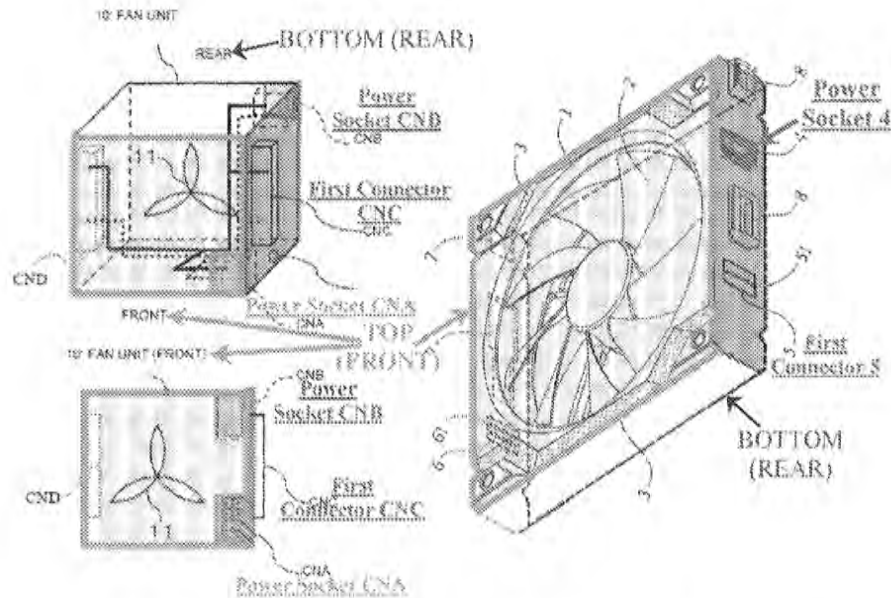
Fig. 1

51

('336 patent at Fig. 1). In contrast to the illumination area **3** located at the top of the body, the power socket **4** and the first connector **5** are *not* located at the top of the body (cyan) because they are located on the side of the body (red).

93. This feature is expressly required by claim 1, which recites “a power socket and a first connector on one side of the body,” *i.e.*, with both being on the same side of the body. In contrast to the illumination area **3** located at the top of the body, the power socket **4** and the first connector **5** are *not* located at the top of the body because they are located on the side of the body.

94. In contrast, Fujitsu illustrates the alleged power socket (CNA or CNB) on the “front” (equivalent to the “top” of the illumination fan body in '336 patent's Fig. 1 embodiment) or the “rear” (equivalent to the bottom of the illumination fan body in '336 patent's Fig. 1 embodiment), while the alleged first connector (CNC) is positioned on a separate “side.” This arrangement in Fujitsu does not read on the structure required by claim 1.



Compare Fig. 7 of Fujitsu, alleged “Power Socket CNA/CNB” with ’336 pat. Fig. 1 (rotated), “Power Socket 4”) (annotated).

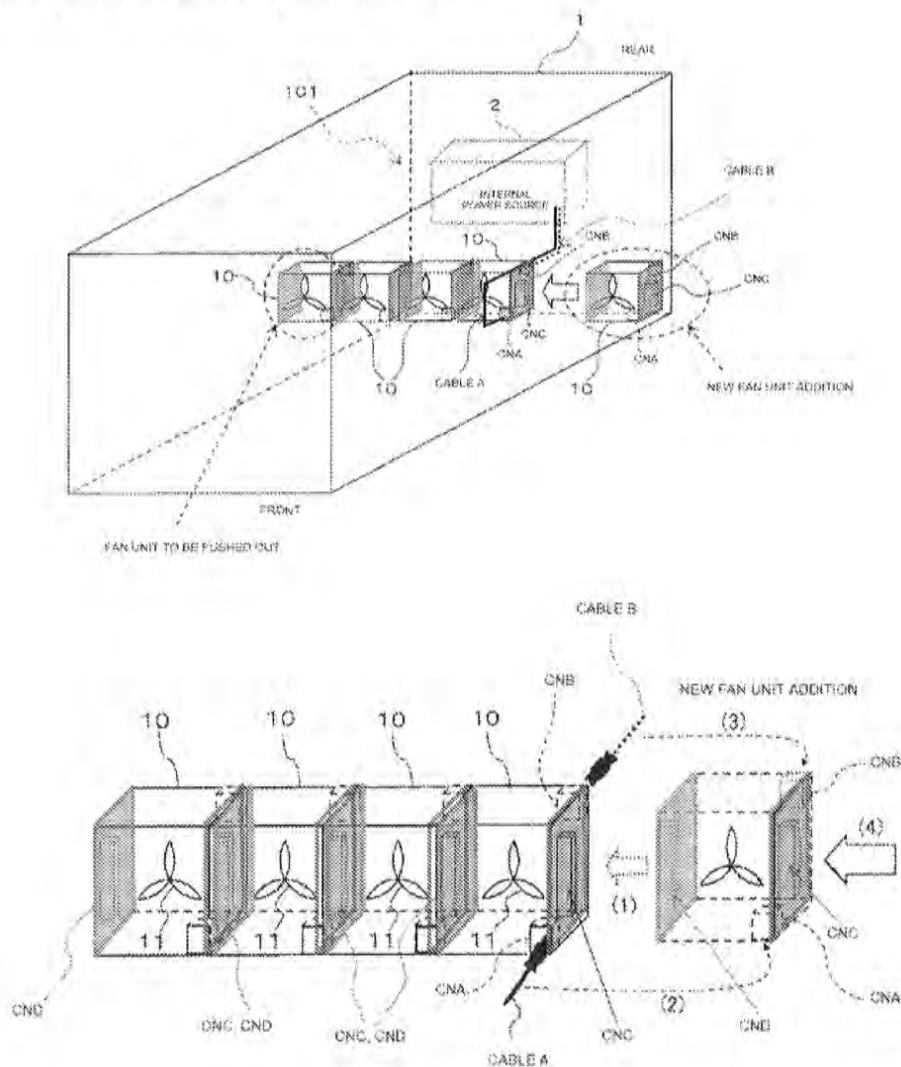
95. The diagram above depicts a comparison between (1) on the left, a portion of Figure 7 from Fujitsu showing the location of the connectors that the Action maps to the claimed “**power socket**” (i.e., CNA/CNB) and (2) on the right, Figure 1 of the ’336 patent depicting the location of the claimed power socket on the same side of the body as that the first connector is on. As can be seen further above in annotated Figures 6 and 7 of Fujitsu, the connectors that the Action has mapped to the claimed “**power socket**” (CNA/CNB) are not located on the same side of the body as the connector that the Action 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, Fujitsu fails to disclose “a power socket *and* a first connector *on one side of the body*”, as recited in claim 1.

96. As discussed previously in paragraphs 25, *et seq.*, a POSITA would clearly not interpret “one side of the body” and the “another side of the body” as two halves of the “body” because such interpretation causes the previously described nonsensical results. The ordinary meaning of “sides” and “top” as known by a POSITA is consistent with the usage of such terms in the claims of the ‘336 patent. The tortured explanation of “sides” by the Action creates ambiguity. A POSITA knows that “top of the body” means the top. And, a POSITA knows that “sides” of a body means a side. Thus, a POSITA would clearly not understand “sides” to mean that the claimed body only has two sides according to the Action’s interpretation of the use of “side[s]” in claim 1. Rather, a POSITA would understand the ‘336 patent to disclose a body having four sides, a top and a bottom.

97. An astute reader might now say, “well, OK, it’s now evident that the power socket and first connector in Fujitsu are not on the same side of the body. But surely it would be obvious to a POSITA that one could move them onto the same side as a matter of design choice, right?” *Actually, no – because this proposed arrangement would be impossible.* The way the hot-swap process works, one must first connect a new fan unit to the right of the rightmost existing fan unit (mating connector CND of the new fan unit to connector CNC of the existing fan unit). This connection is done while “connectors CNA and CNB of the fan unit on the right-most side are connected to the cables A and B, respectively” [Fujitsu ¶ 0042]. In other words, the power cables A and B initially remain plugged into the pre-existing right-most fan while the new fan is attached, if both cables were removed, then all the fans would shut down, which could overheat the server. Leaving the cables attached would not be possible if either CNA or CNB was on the same side as

connector CNC, the cable would be squashed when the two fans are plugged together, as is evident from inspection of Fujitsu's Figures 5 and 6 below.



98. Indeed, the hot-swap procedure requires that one remove the two cables, one at a time, on the fan that is now in second position after a new fan has been attached on the right, so

that they can be re-connected one at a time to the new right-most fan. And if the CNA and CNB are located on the same “side” as that CNC is located on, cables A and B will be jammed between the fans, making the serial removal of them, and hence the required “hot-swapping”, rendered impossible.

99. Fujitsu’s entire hot-swapping concept relies on the physical necessity that connectors CNA and CNB (the “power socket” in the Action’s rejection) not be located on the same side as connector CNC (aka the “first connector” in Action’s rejection). *Fujitsu therefore teaches away from the power socket and first connector being on the same side of the body*, as his concept cannot be implemented in such a configuration. Fujitsu cannot be modified to comport with the above claim limitation. And, Lai cannot cure Fujitsu’s deficiency for the reasons previously set forth herein.

100. In sum, it is a physical impossibility in Fujitsu’s hot-swapping scheme to have the power socket located on the same “side of the body” as that the first connector is located on as required by claim 1 of the ’336 patent.

101. I will note that a POSITA would not have been motivated to combine Fujitsu’s server fan with Tsai’s illumination features, as doing so would impose unnecessary cost and run counter to Fujitsu’s technical objectives.

102. I understand claim 4 of the ’336 patent is being amended, and new claims 6-48 are being added, and that these claims have been submitted.

103. Below I provide the explanation of support for the amended 4 and the new claims 6-48 that have been submitted. Based on my review, it is my opinion that a POSITA would have found the support needed in the specification of the ’336 patent based on the explanation of support for the corresponding claim language in each row of the following table:

Amended or New Claim	Explanation of Support
4 (Currently Amended) 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 <u>of the body of another illumination fan</u> 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.	The underlined added text in "an engaging block <u>of the body of another illumination fan</u> is provided on another side thereof to be engaged into the groove" provides proper antecedent basis for the later statement in the same claim 4 of "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". This added text is supported at Column 2, lines 24-30 and Column 3, lines 18-28 and Figures 4 and 5 showing the grooves and engaging block.
6 (New) <u>The illumination fan connectable with at least one illumination fan for a computer of claim 1, wherein the top of the body is adjacent to the one side of the body of the illumination fan.</u>	Column 1, line 53 – Column 2, line 2 and Column 2, line 61 – Column 3, line 3 and Figs. 1-5 (showing the top of body as being adjacent to one side of the body of the illumination fan.)
7 (New) <u>The illumination fan connectable with at least one illumination fan for a computer of claim 1, wherein the top of the body is adjacent to the another side of the body of the illumination fan.</u>	Column 1, line 53 – Column 2, line 2 and Column 2, line 61 – Column 3, line 3 and Figs. 1-5 (showing the top of body as being adjacent to another side of the body of the illumination fan.)
8 (New) <u>The illumination fan connectable with at least one illumination fan for a computer of claim 1, wherein the one side of the body of the illumination fan and the another side of the body of the</u>	Column 1, line 53 – Column 2, line 2 and Column 2, line 61 – Column 3, line 3 and Figs. 1-5 (showing the <u>one side of the body of the illumination fan and the another side of the body of the illumination fan as being adjacent</u>

Amended or New Claim	Explanation of Support
<u>illumination fan are adjacent to a bottom of the body of the illumination fan.</u>	<u>to a bottom of the body of the illumination fan.)</u>
<u>9. (New) The illumination fan connectable with at least one illumination fan for a computer of claim 2, wherein the top of the body is adjacent to the one side of the body of the illumination fan.</u>	Column 1, line 53 – Column 2, line 2 and Column 2, line 61 – Column 3, line 3 and Figs. 1-5 (showing the <u>top of the body being adjacent to the one side of the body of the illumination fan.)</u>
<u>10. (New) The illumination fan connectable with at least one illumination fan for a computer of claim 2, wherein the top of the body is adjacent to the another side of the body of the illumination fan.</u>	Column 1, line 53 – Column 2, line 2 and Column 2, line 61 – Column 3, line 3 and Figs. 1-5 (showing the <u>top of the body being adjacent to the another side of the body of the illumination fan</u>
<u>11. (New) The illumination fan connectable with at least one illumination fan for a computer of claim 2, wherein the one side of the body of the illumination fan and the another side of the body of the illumination fan are adjacent to a bottom of the body of the illumination fan.</u>	Column 1, line 53 – Column 2, line 2 and Column 2, line 61 – Column 3, line 3 and Figs. 1-5 (showing the <u>one side and the another side of the body of the illumination fan as adjacent to a bottom of the body of the illumination fan.)</u>
<u>12. (New) The illumination fan connectable with at least one illumination fan for a computer of claim 3, wherein the top of the body is adjacent to the one side of the body of the illumination fan.</u>	Column 1, line 53 – Column 2, line 2 and Column 2, line 61 – Column 3, line 3 and Figs. 1-5 (showing the <u>top of the body being adjacent to the one side of the body of the illumination fan.)</u>
<u>13. (New) The illumination fan connectable with at least one illumination fan for a computer of claim 3, wherein the top of the body is adjacent to the another side of the body of the illumination fan.</u>	Column 1, line 53 – Column 2, line 2 and Column 2, line 61 – Column 3, line 3 and Figs. 1-5 (showing the <u>top of the body being adjacent to the another side of the body of the illumination fan.)</u>

Amended or New Claim	Explanation of Support
14. (New) The illumination fan connectable with at least one illumination fan for a computer of claim 3, wherein the one side of the body of the illumination fan and the another side of the body of the illumination fan are adjacent to a bottom of the body of the illumination fan.	Column 1, line 53 – Column 2, line 2 and Column 2, line 61 – Column 3, line 3 and Figs. 1-5 (showing the one side and the another side of the body of the illumination fan being adjacent to a bottom of the body of the illumination fan.)
15. (New) The illumination fan connectable with at least one illumination fan for a computer of claim 4, wherein the top of the body is adjacent to the one side of the body of the illumination fan.	Column 1, line 53 – Column 2, line 2 and Column 2, line 61 – Column 3, line 3 and Figs. 1-5 (showing the top of the body being adjacent to the one side of the body of the illumination fan.)
16. (New) The illumination fan connectable with at least one illumination fan for a computer of claim 4, wherein the top of the body is adjacent to the another side of the body of the illumination fan.	Column 1, line 53 – Column 2, line 2 and Column 2, line 61 – Column 3, line 3 and Figs. 1-5 (showing the top of the body being adjacent to the another side of the body of the illumination fan.)
17. (New) The illumination fan connectable with at least one illumination fan for a computer of claim 4, wherein the one side of the body of the illumination fan and the another side of the body of the illumination fan are adjacent to a bottom of the body of the illumination fan.	Column 1, line 53 – Column 2, line 2 and Column 2, line 61 – Column 3, line 3 and Figs. 1-5 (showing the one side of the body of the illumination fan and the another side of the body of the illumination fan being adjacent to a bottom of the body of the illumination fan.)
18. (New) The illumination fan connectable with at least one illumination fan for a computer of claim 5, wherein the first connector of the illumination fan is	Column 1, line 53 – Column 2, line 2; Column 2, lines 3-11; Column 2, line 61 – Column 3, line 3 and Column 3, lines 6-22

Amended or New Claim	Explanation of Support
<u>electrically connected with the second connector of the another illumination fan.</u>	
19. (New) <u>The illumination fan connectable with at least one illumination fan for a computer of claim 5, wherein the second connector of the illumination fan is connected with a first connector of the another illumination fan.</u>	Column 3, lines 7-22 and Figs. 2 and 4 (showing <u>the second connector of the illumination fan being connected with a first connector of the another illumination fan</u> .)
20. (New) <u>The illumination fan connectable with at least one illumination fan for a computer of claim 5, wherein the second connector of the illumination fan is electrically connected with a first connector of the another illumination fan.</u>	Column 1, line 53 – Column 2, line 2; Column 2, lines 3-11; Column 2, line 61 – Column 3, line 3 and Column 3, lines 6-22
21. (New) <u>The illumination fan connectable with at least one illumination fan for a computer of claim 1, wherein the power socket on the one side of the illumination fan has an opening located on the one side of the illumination fan.</u>	Column 1, line 53 – Column 2, line 2; Column 2, line 61 – Column 3, line 6 and Column 3, lines 29-29 and Figs. 1, 2 and 4 (showing <u>the power socket on the one side of the illumination fan having an opening located on the one side of the illumination fan</u> .)
22. (New) <u>The illumination fan connectable with at least one illumination fan for a computer of claim 21, wherein the top of the body is adjacent to the one side of the body of the illumination fan.</u>	Column 1, line 53 – Column 2, line 2 and Column 2, line 61 – Column 3, line 3 and Figs. 1-5 (showing <u>the top of the body being adjacent to the one side of the body of the illumination fan</u> .)
23. (New) <u>The illumination fan connectable with at least one illumination fan for a computer of claim 21, wherein the top of the body is adjacent to the another side of the body of the illumination fan.</u>	Column 1, line 53 – Column 2, line 2 and Column 2, line 61 – Column 3, line 3 and Figs. 1-5 (showing <u>the top of the body being adjacent to the another side of the body of the illumination fan</u> .)

Amended or New Claim	Explanation of Support
<u>24. (New) The illumination fan connectable with at least one illumination fan for a computer of claim 21, wherein the one side of the body of the illumination fan and the another side of the body of the illumination fan are adjacent to a bottom of the body of the illumination fan.</u>	Column 1, line 53 – Column 2, line 2 and Column 2, line 61 – Column 3, line 3 and Figs. 1-5 (showing <u>the one side and the another side of the body of the illumination fan being adjacent to a bottom of the body of the illumination fan.</u>)
<u>25. (New) The illumination fan connectable with at least one illumination fan for a computer of claim 1, wherein an electrically conductive contact surface is provided in the second connector of the illumination fan and is located on the another side of the illumination fan.</u>	Column 1, line 53 – Column 2, line 2, Column 2, lines 3-11; Column 2, line 61 – Column 3, line 3 and Column 3, lines 6-22 and Figs. 1, 2, 4 and 5 (showing <u>an electrically conductive contact surface being provided in the second connector of the illumination fan and being located on the another side of the illumination fan.</u>)
<u>26. (New) The illumination fan connectable with at least one illumination fan for a computer of claim 25, wherein the top of the body is adjacent to the one side of the body of the illumination fan.</u>	Column 1, line 53 – Column 2, line 2 and Column 2, line 61 – Column 3, line 3 and Figs. 1-5 (showing <u>top of the body being adjacent to the one side of the body of the illumination fan.</u>)
<u>27. (New) The illumination fan connectable with at least one illumination fan for a computer of claim 25, wherein the top of the body is adjacent to the another side of the body of the illumination fan.</u>	Column 1, line 53 – Column 2, line 2 and Column 2, line 61 – Column 3, line 3 and Figs. 1-5 (showing <u>the top of the body being adjacent to the another side of the body of the illumination fan.</u>)
<u>28. (New) The illumination fan connectable with at least one illumination fan for a computer of claim 25, wherein the one side of the body of the illumination fan and the another side of the body of the</u>	Column 1, line 53 – Column 2, line 2 and Column 2, line 61 – Column 3, line 3 and Figs. 1-5 (showing <u>the one side and the another side of the body of the illumination fan being</u>

Amended or New Claim	Explanation of Support
<u>illumination fan are adjacent to a bottom of the body of the illumination fan.</u>	<u>adjacent to a bottom of the body of the illumination fan.)</u>
29. (New) <u>The illumination fan connectable with at least one illumination fan for a computer of claim 1, wherein an electrically conductive terminal is provided in the first connector of the illumination fan and is located on the one side of the body of the illumination fan.</u>	Column 1, line 53 – Column 2, line 2; Column 2, lines 3-11; Column 2, line 61 – Column 3, line 3 and Column 3, lines 6-22 and Figs. 1-5 (showing an <u>electrically conductive terminal in the first connector of the illumination fan and being located on the one side of the body of the illumination fan.)</u>)
30. (New) <u>The illumination fan connectable with at least one illumination fan for a computer of claim 29, wherein the top of the body is adjacent to the one side of the body of the illumination fan.</u>	Column 1, line 53 – Column 2, line 2 and Column 2, line 61 – Column 3, line 3 and Figs. 1-5 (showing the <u>top of the body being adjacent to the one side of the body of the illumination fan.)</u>)
31. (New) <u>The illumination fan connectable with at least one illumination fan for a computer of claim 29, wherein the top of the body is adjacent to the another side of the body of the illumination fan.</u>	Column 1, line 53 – Column 2, line 2 and Column 2, line 61 – Column 3, line 3 and Figs. 1-5 (showing the <u>top of the body being adjacent to the another side of the body of the illumination fan.)</u>)
32. (New) <u>The illumination fan connectable with at least one illumination fan for a computer of claim 29, wherein the one side of the body of the illumination fan and the another side of the body of the illumination fan are adjacent to a bottom of the body of the illumination fan.</u>	Column 1, line 53 – Column 2, line 2 and Column 2, line 61 – Column 3, line 3 and Figs. 1-5 (showing <u>one side and the another side of the body of the illumination fan being adjacent to a bottom of the body of the illumination fan.)</u>)
33. (New) <u>The illumination fan connectable with at least one illumination fan for a computer of claim 1, wherein the second connector of the body of the</u>	Column 1, line 53 – Column 2, line 2; Column 2, lines 3-11; Column 2, line 61 – Column 3, line 3 and Column 3, lines 6-22 and Figs. 2-5 (showing the <u>second connector of the body of</u>

Amended or New Claim	Explanation of Support
<u>illumination fan is connected with a first connector of the body of another illumination fan.</u>	<u>the illumination fan being connected with a first connector of the body of another illumination fan.)</u>
34. (New) <u>The illumination fan connectable with at least one illumination fan for a computer of claim 33, wherein the top of the body is adjacent to the one side of the body of the illumination fan.</u>	Column 1, line 53 – Column 2, line 2 and Column 2, line 61 – Column 3, line 3 and Figs. 1-5 (showing <u>the top of the body being adjacent to the one side of the body of the illumination fan.)</u>
35. (New) <u>The illumination fan connectable with at least one illumination fan for a computer of claim 33, wherein the top of the body is adjacent to the another side of the body of the illumination fan.</u>	Column 1, line 53 – Column 2, line 2 and Column 2, line 61 – Column 3, line 3 and Figs. 1-5 (showing <u>the top of the body being adjacent to the another side of the body of the illumination fan.)</u>
36. (New) <u>The illumination fan connectable with at least one illumination fan for a computer of claim 33, wherein the one side of the body of the illumination fan and the another side of the body of the illumination fan are adjacent to a bottom of the body of the illumination fan.</u>	Column 1, line 53 – Column 2, line 2 and Column 2, line 61 – Column 3, line 3 and Figs. 1-5 (showing <u>the one side and the another side of the body of the illumination fan being adjacent to a bottom of the body of the illumination fan.)</u>
37. (New) <u>The illumination fan connectable with at least one illumination fan for a computer of claim 2, wherein the first connector of the body of the illumination fan is electrically connected with the second connector of the body of another illumination fan when the first connector of the body of the illumination fan is connected with the second connector of the body of another illumination fan.</u>	Column 1, line 53 – Column 2, line 2; Column 2, lines 3-11; Column 2, line 61 – Column 3, line 3 and Column 3, lines 6-22; Column 1, line 53 – Column 2, line 2; Column 2, line 61 – Column 3, line 3 and Column 3, lines 6-22 and Figs. 3 and 5 (showing <u>the first connector of the body of the illumination fan being electrically connected with the second connector of the body of another illumination fan.)</u>

Amended or New Claim	Explanation of Support
38. (New) <u>The illumination fan connectable with at least one illumination fan for a computer of claim 37, wherein the second connector of the illumination fan is connected with a first connector of the another illumination fan when the first connector of the body of the illumination fan is connected with the second connector of the body of another illumination fan.</u>	Column 1, line 53 – Column 2, line 2; Column 2, lines 3-11; Column 2, line 61 – Column 3, line 3 and Column 3, lines 6-22
39. (New) <u>The illumination fan connectable with at least one illumination fan for a computer of claim 38, wherein the second connector of the illumination fan is electrically connected with the first connector of the another illumination fan when the first connector of the body of the illumination fan is connected with the second connector of the body of another illumination fan.</u>	Column 1, line 53 – Column 2, line 2 and Column 2, line 61 – Column 3, line 3 and Figs. 3 and 5 (showing <u>the second connector of the illumination fan being electrically connected with the first connector of the another illumination fan.</u>)
40. (New) <u>The illumination fan connectable with at least one illumination fan for a computer of claim 37, wherein the second connector of the illumination fan is electrically connected with the first connector of the another illumination fan when the first connector of the body of the illumination fan is connected with the second connector of the body of another illumination fan.</u>	Column 1, line 53 – Column 2, line 2; Column 2, lines 3-11; Column 2, line 61 – Column 3, line 3 and Column 3, lines 6-22 and Figs. 3 and 5 (showing <u>the second connector of the illumination fan being electrically connected with a first connector of the another illumination fan.</u>)

Amended or New Claim	Explanation of Support
<u>41. (New) An illumination fan connectable with at least one other illumination fan for a computer, comprising:</u> <u>a body, provided with a fan in a center of the body,</u> <u>an illumination area on at least two sides of the fan at a top of the body,</u> <u>a power socket and a first connector on one side of the body, and a second connector on another side of the body,</u> <u>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,</u> <u>and</u> <u>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 the another illumination fan are respectively driven into rotation and illumination.</u>	Column 1, line 53 – Column 2, line 2; Column 2, line 61 – Column 3, line 22 and Column 3, lines 29-39 and Figs. 1-5.
<u>42. (New) The illumination fan connectable with at least one other illumination fan for a computer of claim 41, wherein an electrically conductive terminal</u>	Column 1, line 53 – Column 2, line 2; Column 2, lines 3-11; Column 2, line 61 – Column 3, line 3 and Column 3, lines 6-22 and Figs. 1-5

Amended or New Claim	Explanation of Support
<u>is provided in the first connector of the illumination fan, and an electrically conductive contact surface is provided in the second connector of the another illumination fan for being electrically connected with the electrically conductive terminal, such that when the first connector of the body of the illumination fan is connected with the second connector of the body of the another illumination fan, the fan and the illumination area of the body of the another illumination fan are respectively driven into rotation and illumination.</u>	
<u>43. (New) The illumination fan connectable with at least one other illumination fan for a computer of claim 41, wherein when the body of the illumination fan is connected with the body of the another illumination fan, the illumination areas of the two bodies form a continuous illumination area.</u>	Column 3, lines 16-17
<u>44. (New) The illumination fan connectable with at least one other illumination fan for a computer of claim 41, wherein a groove is provided on one side of the body of the illumination fan, while an engaging block is provided on another side of the body of the another illumination fan to be engaged into the groove of the body of the illumination fan, such that when the groove</u>	Column 2, line 16-30 and column 3, line 7-28

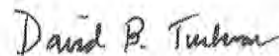
Amended or New Claim	Explanation of Support
<u>of the body of the illumination fan is engaged with the engaging block of the body of the another illumination fan, the body of the illumination fan is connected with the body of the another illumination fan.</u>	
45. (New) <u>The illumination fan connectable with at least one other illumination fan for a computer of claim 41, wherein a groove is provided on each of two sides of the body of the illumination fan and on each of two sides of the body of the another illumination fan, and the body of the illumination fan is connected with the body of the 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 the another illumination fan.</u>	Column 2, line 16-30 and column 3, line 7-28
46. (New) <u>The illumination fan connectable with at least one other illumination fan for a computer of claim 41, wherein the first connector of the body of the illumination fan is electrically connected with the second connector of the body of the another illumination fan and the second connector of the body of the illumination fan is connected with a first connector of the body of the another illumination fan when the first connector of the body of the</u>	Column 1, line 53 – Column 2, line 2; Column 2, lines 3-11; Column 2, line 61 – Column 3, line 3 and Column 3, lines 6-22; Column 1, line 53 – Column 2, line 2; Column 2, line 61 – Column 3, line 3 and Column 3, lines 6-22 and Figs. 3 and 5 (showing <u>the first connector of the body of the illumination fan being electrically connected with the second connector of the body of the another illumination fan and the second connector of the body of the illumination fan being</u>

Amended or New Claim	Explanation of Support
<u>illumination fan is connected with the second connector of the body of the another illumination fan.</u>	<u>connected with a first connector of the body of the another illumination fan.)</u>
47. (New) <u>The illumination fan connectable with at least one other illumination fan for a computer of claim 41, wherein the second connector of the body of the illumination fan is electrically connected with a first connector of the body of the another illumination fan when the first connector of the body of the illumination fan is connected with the second connector of the body of the another illumination fan.</u>	Column 1, line 53 – Column 2, line 2; Column 2, lines 3-11; Column 2, line 61 – Column 3, line 3 and Column 3, lines 6-22; Column 1, line 53 – Column 2, line 2; Column 2, line 61 – Column 3, line 3 and Column 3, lines 6-22 and Figs. 1-5 (showing the <u>second connector of the body of the illumination fan being electrically connected with a first connector of the body of the another illumination fan.)</u>)
48. (New) <u>The illumination fan connectable with at least one other illumination fan for a computer of claim 41, wherein the first connector of the body of the illumination fan is electrically connected with the second connector of the body of the another illumination fan when the first connector of the body of the illumination fan is connected with the second connector of the body of the another illumination fan.</u>	Column 1, line 53 – Column 2, line 2; Column 2, lines 3-11; Column 2, line 61 – Column 3, line 3 and Column 3, lines 6-22; Column 1, line 53 – Column 2, line 2; Column 2, line 61 – Column 3, line 3 and Column 3, lines 6-22 and Figs. 1-5 (showing the <u>first connector of the body of the illumination fan being electrically connected with the second connector of the body of the another illumination fan.)</u>)

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The undersigned declares that all statements made herein of his own knowledge are true and that all statements made in information and belief are believed to be true; and further 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 § 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.



David B. Tuckerman

December 17, 2024

Date

APPENDIX A: QUALIFICATIONS AND EXPERIENCE

David B. Tuckerman, Ph.D., P.E., FIEEE
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Lake Stevens, WA 98258
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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, and Microsoft. 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" (ultraminature 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:

181 issued U.S. patents, plus various foreign patents and numerous pending applications. See attached list.

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

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- A. Shah, S. Peek, B. Yelamanchili, V. Gupta, D. Tuckerman, C. Cantaloube, J. Sellers, M. Hamilton, "Superconducting Molybdenum Multi-Chip Module Approach for Cryogenic and Quantum Applications", *IEEE 72nd Electronic Components and Technology Conference (ECTC)*, 276-282, 2022

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 SiO ₂ 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 superconductor-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