

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SENKO ADVANCED COMPONENTS, INC.,
Petitioner

v.

US CONEC LTD.,
Patent Owner

Case IPR2024-00805
U.S. Patent No. 11,385,415

**PATENT OWNER PRELIMINARY RESPONSE
UNDER 37 C.F.R. § 42.107(a)**

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Patent Trial and Appeal Board
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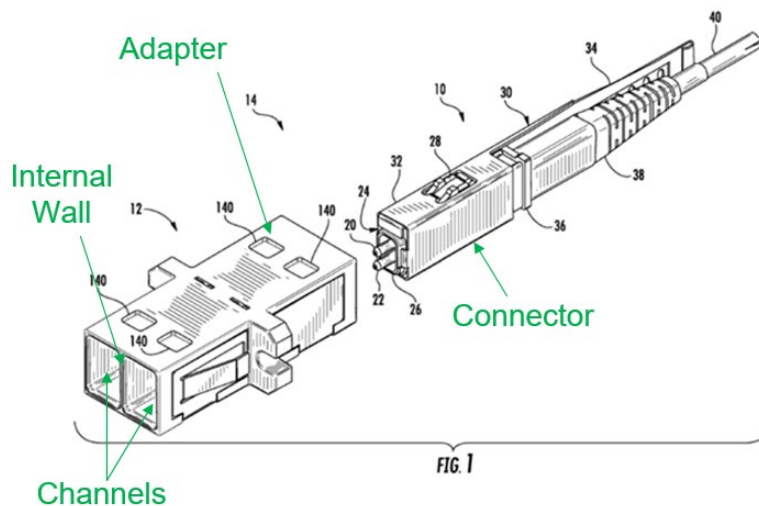
PATENT OWNER'S EXHIBIT LIST

Exhibit No.	Description
2001	International Publication No. WO 2017/127208 to Lee
2002	Molex Adapter
2003	Definition of Frame, <i>Oxford University Press</i> , accessed at https://www.encyclopedia.com/science-and-technology/computers-and-electrical-engineering/computers-and-computing/frame

I. INTRODUCTION

The present invention relates to fiber optic connectors and adapters.

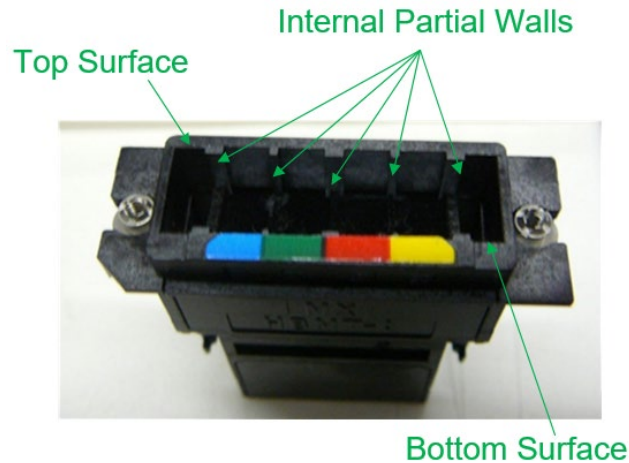
EX1001, Abstract. At the time of the invention, multiplex adapters for engaging more than one connector on each side of the adapter were known in the art. The conventional multiplex adapter design provided internal walls within the adapter that defined a plurality of channels. Each channel received a connector or a connector sub-assembly that includes a ferrule and structure holding the ferrule (referred to as a ferrule holder in the '415 patent). For example, International Publication No. WO 2017/127208 shows an adapter with an internal wall defining two channels for receiving two connectors in each end:



EX2001, FIG. 1 (annotated).

Internal walls were known to take a variety of forms. For instance, they could span the entire height of the adapter, from the top surface to the bottom surface, as shown in the adapter above. Alternatively, internal walls could extend

only a portion of the distance between the top and bottom walls of the adapter, forming ribs or guide rails separating the channels. For example, Molex has sold adapters with upper and lower guide rails separating connector channels since 1999:



EX2002, 0001 (annotated; showing an adapter with four color-coded channels separated by internal partial walls).

The inventors of the '415 patent recognized that internal walls (including partial walls like ribs and guide rails) occupy space in the adapter. Eliminating the internal walls would allow the adapter to accommodate more connectors in a smaller space, thereby increasing the density of the overall assembly. *See* EX1001, 1:22-26. Eliminating internal walls also provides improved organization for prearranged routing of ganged fiber optic ferrules. EX1001, 1:26-31.

But eliminating the internal walls creates a new problem. Internal walls help ensure that connectors or ferrule-holding sub-assemblies are properly aligned within their respective channels of the adapter. Without internal walls, there is a

risk of ferrules becoming misaligned or being inserted into the adapter improperly.

The inventors thus developed an alternative way to align the ferrules that did *not* use internal walls (i.e., it did not use walls for guiding/aligning the sides of connectors or ferrule holders). EX1001, 1:43-45. Instead, the inventors introduced special alignment features in the adapter—denoted “grooves”—in the central portion of the adapter that mate with corresponding projections in the ferrule holders. EX1001, 2:13-53.

The Petition completely ignores the novel features of the claimed adapter and the specialized structures recited in the claims that embody those novel features. Specifically, it fails to recognize the recited “grooves” as alignment features within internal top and bottom surfaces of the top and bottom walls of the adapter. Importantly, in the context of mechanical devices like ferrule-based connectors and adapters, the specific shape and topography of the mating pieces are essential to the design objectives of the assembly. Words like channel, rib, wall, groove, projection, guide rail, top, bottom, and side are all highly context-dependent. Not every concavity is a “groove.” Not every extension is a “projection.” Likewise, not every “projection” or “groove” that appears in the art discloses the same structures as those denoted “projection” and “groove” in the ’415 patent. One of skill in the art would understand that these words name very specific structures that have particular functions (which vary from adapter to

adapter) and must be ascertained in the context of the complete disclosure in which the words appear. Accordingly, the Board should construe the claimed “grooves” to denote indentations disposed in the internal surfaces of the top and bottom walls that are dimensioned to accept projections from the ferrule holders.

The Petition, however, ignores the context of the complete disclosures of both the ’415 patent and the cited references, and ignores the express function of the recited “grooves.” As a result, the Petition simply points to adapters in the prior art with internal walls (such as guide rails) that use the sides of the ferrule holders to ensure alignment. Pet., 31, 89-90, 123, 128, 144. It incorrectly calls the channels between those internal walls “grooves,” and mislabels the surrounding surfaces and projections to compensate for the wrongly identified grooves. *See, e.g.*, Pet., 31, 89-90, 123, 128. In doing so, the Petition relies on exactly the configuration in the prior art that the invention expressly distinguished, and to which the claimed adapter provides an *alternative*. EX1001, 1:43-45. This fatal misapprehension of the claims pervades every one of the Grounds in the Petition. Petitioner has therefore failed to show the required likelihood of success on at least one challenge. The Board should deny institution.

II. RESPONSE TO GROUND 1: CLAIMS 1-14 ARE NOT ANTICIPATED BY IWANO.

Iwano fails to disclose every feature of claims 1-14 at least because it fails to disclose every feature of independent claims 1, 8, and 12.

A. Independent Claims 1 and 8

Iwano does not disclose “a plurality of grooves disposed in a second top surface and a plurality of grooves disposed in a second bottom surface of the central portion,” as recited in claims 1 and 8. EX1001, 6:38-51, 7:5-24.

Specifically, Iwano does not disclose the claimed grooves because Iwano has no comparable structure in the top and bottom surfaces of the adapter.

The Petitioner alleges that the claimed “plurality of grooves” in the “second top” and “second bottom” surfaces in Iwano are the spaces between projections 424 and partition walls 423 (or the spaces between projections 424 and a side wall of the housing body 422). Pet., 31. These spaces between the internal walls and projections of the Iwano adapter are not “grooves” as claimed. Indeed, they are the exact opposite of what the ’415 patent defines as grooves. A groove in the context of the ’415 patent is a depression or indentation in the top and bottom surfaces of the adapter configured to receive a projection on a ferrule assembly/optical connector. EX1001, 4:53-57, 5:19-29.

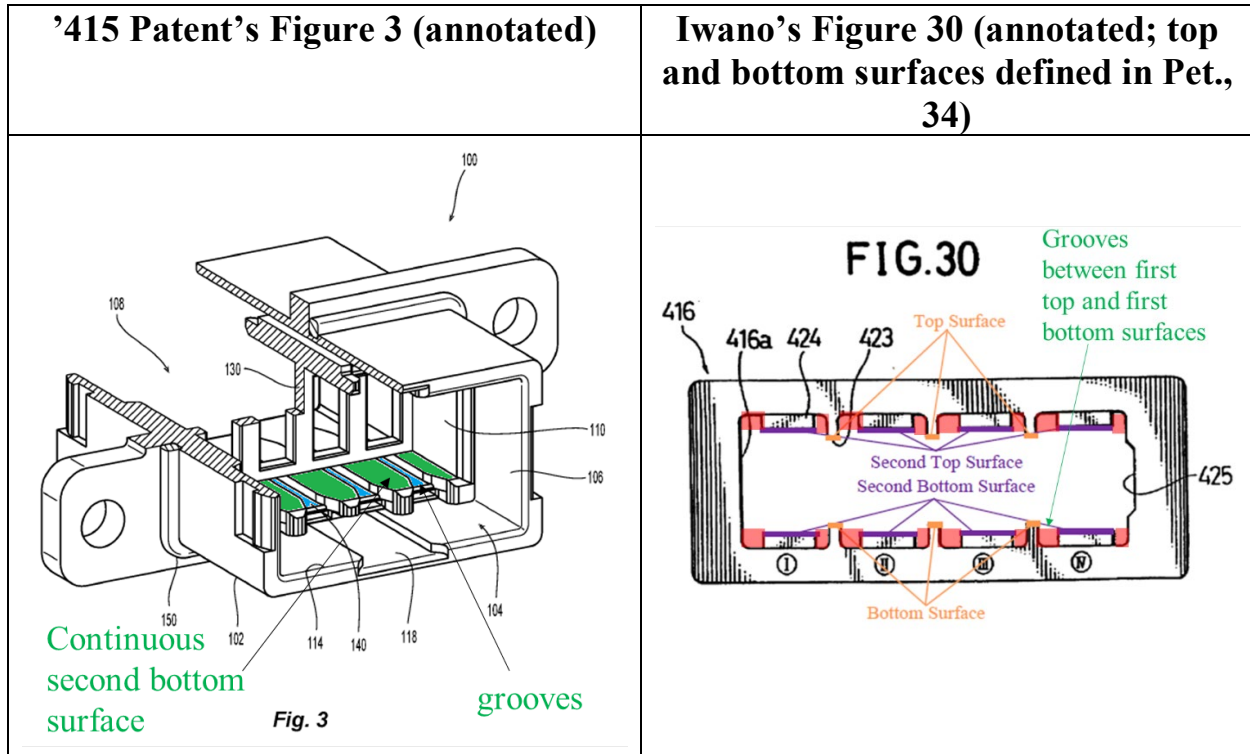
The spaces between projections and side walls extending from the top and bottom surfaces in Iwano are not indentations disposed in the surfaces of the top and bottom walls. Construing them as such would falsely equate any surface that supports projections with any surface that supports grooves. One of skill in the art would understand that where adjacent surfaces have complementary topography,

there is an important distinction between which surface has projections and which surface has mating grooves. Whether a given surface has projections or grooves has important implications for the sizing, stability, and rigidity of the component, manufacturing feasibility, susceptibility to breakage or wear and tear, and the density of the overall assembly. One cannot simply take an assembly like Iwano, which has so-called projections on the adapter surfaces and mating grooves on the connector surface, and treat it as though it discloses the inverse: projections on the connector and mating grooves on the adapter. Even if the so-called “projections” and “grooves” on those components were the same as the projections and grooves recited in the ’415 patent—which they are not in structure or function—those topographies would be the opposite of one another.

Moreover, Iwano teaches a projection (424) from the adapter that mates with a groove 418 on an optical connector. EX1006, 30:18-39. While a side wall of the adapter in Iwano contains a space to receive a projection 419 on an optical connector, this side wall, even if the adapter were rotated, does not contain “a plurality of grooves,” as recited by claim 1. Rather, each sidewall surface defines a single groove 425 running along its length. EX1006, 30:1-18.

Additionally, the grooves alleged by the Petitioner are not in a “second top surface” and a “second bottom surface,” as recited by claims 1 and 8. EX1001, 6:38-51, 7:5-24. For example, the Petitioner identifies the surfaces of partitions

423 as the first top/bottom surfaces and the surfaces of projections 424 and the second top/bottom surfaces. The alleged grooves are *in between* these surfaces, not *in* these surfaces, as required by the claims. Pet., 31-32.



Comparison of EX1001, FIG. 3 with EX1006, FIG. 30.

In the above comparison chart, Patent Owner has annotated and color coded the '415 patent's Figure 3 and the red spaces in Iwano's Figure 30. Petitioner annotated and color coded the tips of the projections in Iwano's Figure 30. Patent Owner has added an additional annotation to Iwano's Figure 30 (green text) to identify the grooves as alleged by the Petitioner. Note that the grooves of the '415 patent (blue) are in a single planar surface (green) while the alleged grooves in

Iwano's Figure 30 (red) separate at least two different surfaces (orange and purple).

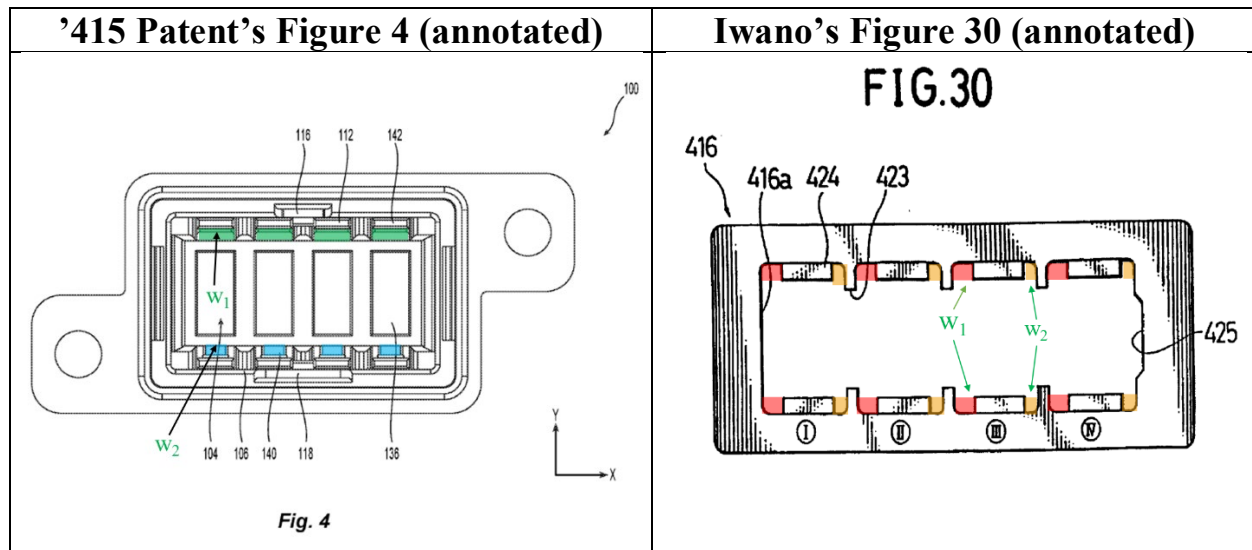
B. Independent Claim 12

Iwano does not disclose, “the first top wall having first internal grooves spaced apart along the width and the first bottom wall having second internal grooves spaced apart along the width,” for at least the reasons outlined above in regards to claim 1. EX1001, 8:4-24. Specifically, Iwano does not disclose “grooves” as claimed.

Iwano further does not disclose, “each of the first internal grooves having a first width and each of the second internal grooves having a second width,” as recited in claim 12. EX1001, 8:4-24. The plain language of “each” connotes “every.” *ResQNet.com, Inc. v. Lansa, Inc.*, 346 F.3d 1374, 1379 (Fed. Cir. 2003). Claim 12 thus requires that all of the grooves on the top wall have the same first width, and all of the grooves on the bottom wall have the same second width, which is different from the first width. One of ordinary skill in the art would immediately recognize that the reason for this difference between the first and second widths is to preserve the polarity of the connector alignment. EX1001, 1:48-51.

The plurality of spaces on both the second top and second bottom surfaces in Iwano, however, as described by the Petitioner, alternate between a first width on

the left side of projections 424 and a second width on the right side of projections 424. These alternating widths are the same on both the top and bottom of the adapter. These spaces thus do not satisfy the plain language of the claim and one of ordinary skill in the art would recognize that they do not perform the function of the recited grooves.



Comparison of EX1001, FIG. 4 with EX1006, FIG. 30.

In the above comparison chart, Patent Owner has annotated and color coded the '415 patent's Figure 4 to show each of the first widths (green) and each of the second widths (blue). Patent Owner's annotations of Iwano's Figure 30 are in green text. Patent Owner has added color coding in red and orange to Iwano's Figure 30 to illustrate the spaces between projections and sidewalls that Petitioner misidentifies as the "grooves" of the claims.

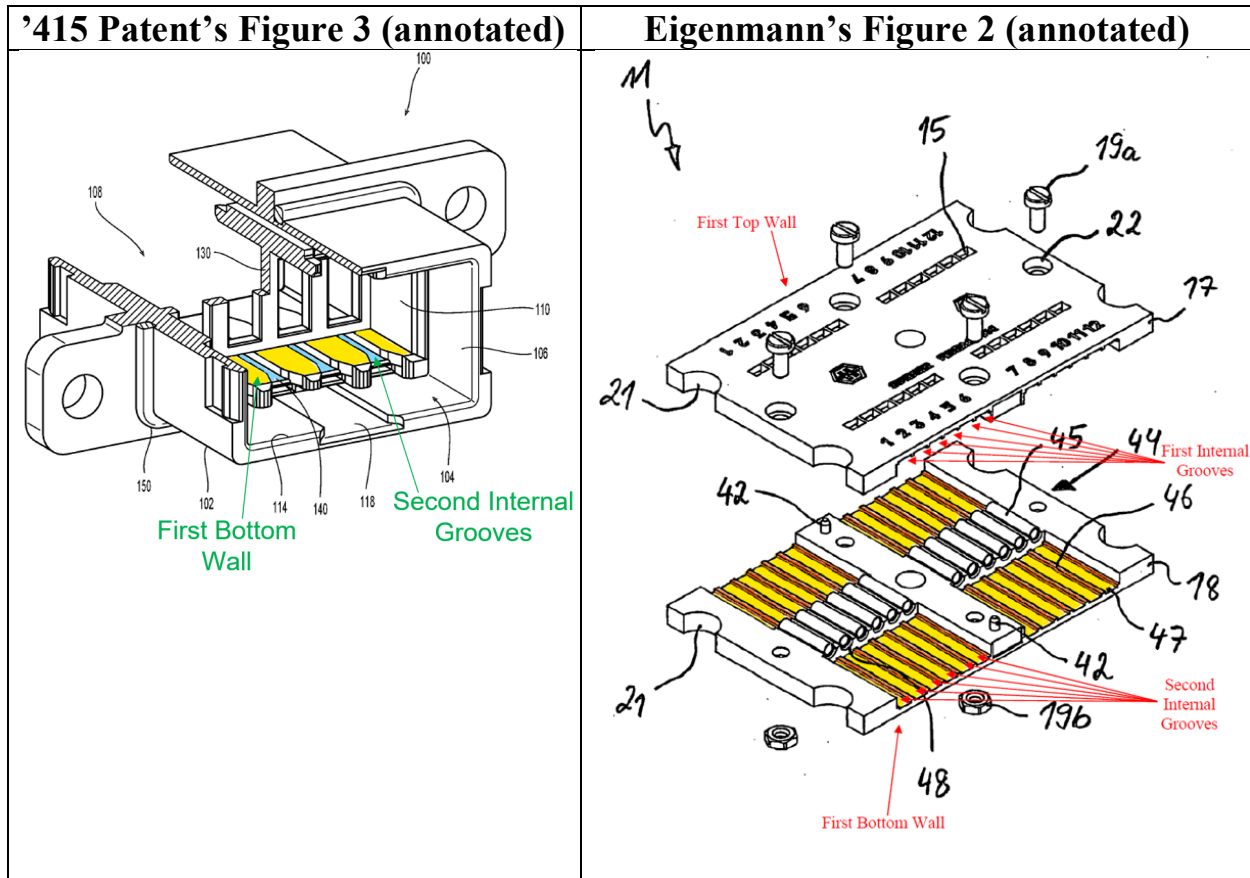
Accordingly, Iwano does not disclose that *each* of the first internal grooves (in the top surface) have a first width and *each* of the second grooves (in the

bottom surface) have a second width. *See* Comparison of EX1001, FIG. 4 with EX1006, FIG. 30 above.

III. RESPONSE TO GROUND 2: CLAIMS 12-14 ARE NOT ANTICIPATED BY EIGENMANN.

Eigenmann (EX1010) fails to anticipate claims 12-14 at least because Eigenmann fails to disclose all of the features of independent claim 12. Specifically, Eigenmann fails to disclose the recited “grooves,” EX1001, 8:14-16, and fails to disclose an adapter “free of internal walls.” EX1001, 8:20. Importantly, the claimed grooves do not each receive an entire width of a ferrule holder (in the way that a channel defined by internal walls does). Rather, the grooves receive projections from the ferrule holder that are special alignment features. EX1001, 4:29-36.

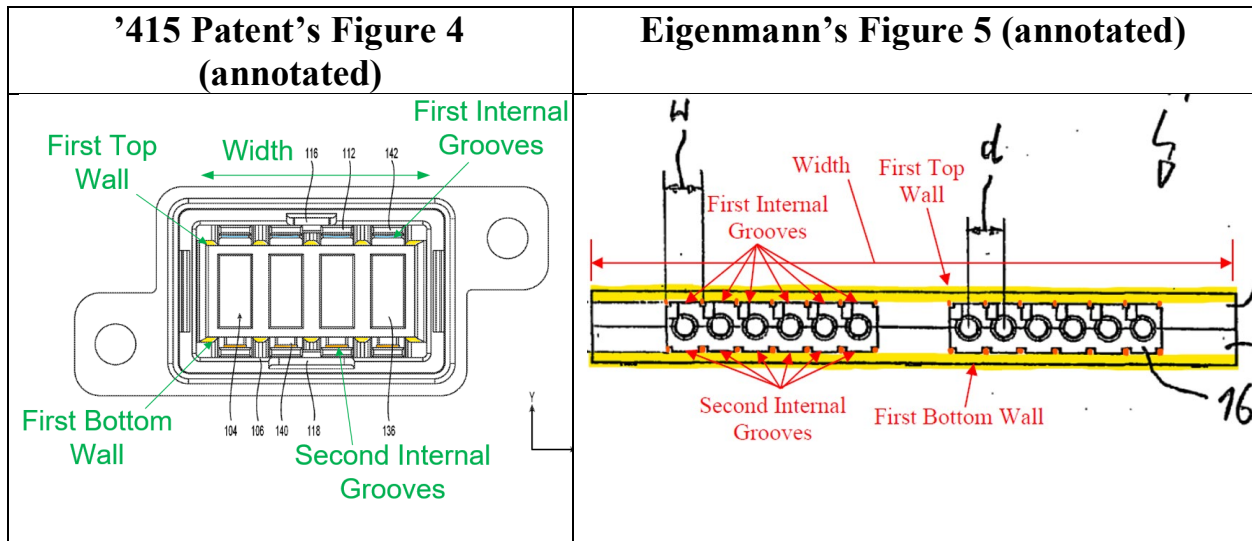
Eigenmann discloses an adapter with multiple channels 47 that each receive individual optical plug-in connectors (i.e., the entire ferrule holder is received in each channel). EX1010, FIG. 1, ¶288. The channels 47 are separated by guide rails 46. EX1010, FIG. 5, ¶¶312-313. Guide rails separating channels do not define the claimed grooves in a surface, at least because channels are not grooves and the tips of the guide rails are not a continuous top or bottom surface. If anything, guide rails defining channels are an *alternative* to claimed alignment grooves, as explained in the ’415 patent. EX1001, 1:43-45.



Comparison of EX1001, FIG. 3 with EX1010, FIG. 2.

In the above comparison chart, Patent Owner has annotated and color coded the '415 patent's Figure 3 to show the grooves (blue) in the bottom surface (yellow). Petitioner has (incorrectly) annotated Eigenmann's Figure 2 in red text to identify the channels between the internal walls as the claimed grooves. Patent Owner has provided additional color-coding in yellow and red on Eigenmann's Figure 2 to illustrate the distinct structures and functions of the two figures. As shown, Eigenmann has partial internal walls (red) protruding from the bottom surface (yellow), and therefore fails to disclose grooves in that surface as claimed.

Additionally, the claimed device is “free of internal walls,” which includes partial walls like Eigenmann’s guide rails 46. EX1001, 8:20. Indeed, the guide rails of Eigenmann are the exact kind of structures distinguished in the ’415 patent: walls between ferrule holders that use the side of the ferrule holder to maintain alignment of the ferrule holders within the adapter. Conversely, the grooves of the claimed device extend into the surface of the interior adapter walls and mate with projections on the connectors (not in between connectors).



Comparison of EX1001, FIG. 4 with EX1010, FIG. 5.

In the above comparison chart, Patent Owner has labeled the ’415 patent’s Figure 4 with annotations and color coding showing the first grooves (blue) and second grooves (orange) in the top and bottom surfaces (yellow). Petitioner has (incorrectly) annotated Eigenmann’s Figure 5 in red text. Patent Owner has provided color-coding in both figures to illustrate the distinct structures and functions between the ’415 patent and Eigenmann. The color-coding shows that

Eigenmann has partial internal walls (red) protruding from a surface (yellow), and therefore fails to disclose grooves in a surface. Eigenmann also has a complete internal wall around the midpoint of Petitioner's identified "width," separating the two sets of channels. *See* EX1010, FIG. 5. That central wall is yet another reason Eigenmann does not disclose an adapter "free of internal walls." EX1001, 8:20.

One of skill in the art would therefore understand that Eigenmann does not disclose grooves as claimed because the device in Eigenmann does not *need* grooves. The guide rails ensure that each connector is properly aligned within its respective channel. The adapter in Eigenmann therefore does not have the problem that the grooves of the claimed adapter solve, nor does Eigenmann disclose the solution.

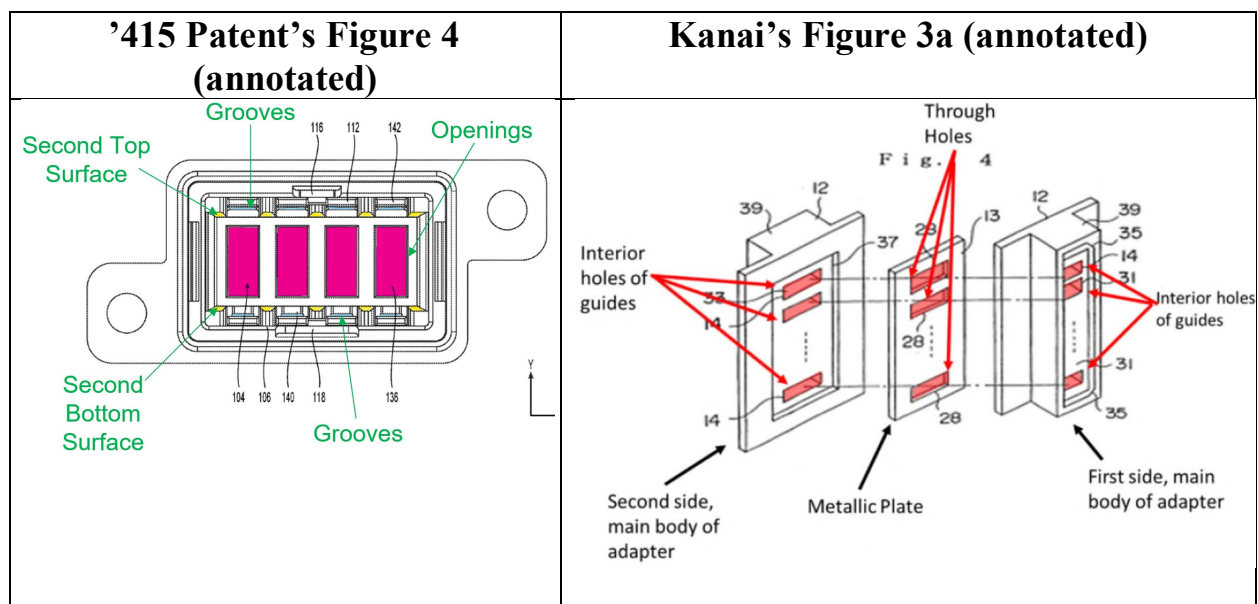
IV. RESPONSE TO GROUND 3: CLAIMS 1 AND 4-10 WOULD NOT HAVE BEEN OBVIOUS OVER KANAI IN VIEW OF SAITO.

The combination of Kanai and Saito does not teach or suggest claims 1 and 4-10 at least because neither Kanai nor Saito (alone or in alleged obvious combination) discloses the features of independent claims 1 and 8. Patent Owner does not concede that these references are properly combined or that one of skill in the art would be motivated to modify them as Petitioner does, but even assuming Petitioner's combination, the combination fails to disclose the recited elements.

A. Grooves

Kanai in view of Saito does not disclose at least “a plurality of grooves disposed in a second top surface and a plurality of grooves disposed in a second bottom surface of the central portion,” as recited in independent claims 1 and 8. EX1001, 6:45-47, 7:17-19. This is true at least because Petitioner points to the wrong structures in Kanai and/or Saito as the purported “grooves” recited in the claims. Pet., 92-93, 104. Specifically, Petitioner improperly identifies Kanai’s guides 31, 33 as an allegedly interchangeable design alternative to the claimed “plurality of grooves.” Pet., 96, 104.

As illustrated below, the guides 31, 33 of Kanai may at best correspond to the plurality of openings 136 in wall 130 of the ’415 patent—not the claimed grooves, which are completely different structures:



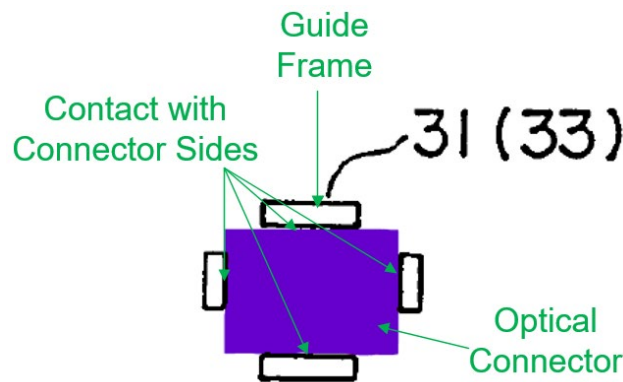
Comparison of EX1001, FIG. 4 with EX1003, FIG. 3a.

In the above comparison chart, Patent Owner has labeled the '415 patent's Figure 4 with annotations. Petitioner has labeled Kanai's Figure 3a with annotations. Patent Owner has provided color-coding in the '415 patent's Figure 4 to illustrate the distinct structures and functions between the '415 patent and Kanai. Kanai's interior holes of guides 31, 33 (orange) are similar to the openings 136 (pink) in wall 130 of the '415 patent, and not the claimed grooves 140, 142 (blue) in the second top surface and the second bottom surface (yellow).

As discussed, a groove in the context of the '415 patent is a depression or indentation in a continuous surface configured to receive a projection on a ferrule assembly/optical connector. EX1001, 4:53-57. Kanai instead discloses guides 31, 33, each of which is a rectangular "hole space enclosed by the inner circumferential wall 14 of the first and second guides 31 and 33, through which optical connectors are inserted." EX1003, 8:45-53. For example, Kanai discloses dimensions of height and width for each hole of guides 31, 33 that are slightly larger than, but substantially match, the dimensions of height and width of the first and second optical connectors 3a to 3f and 4a to 4f. EX1003, 9:8-17. Accordingly, the inner circumferential wall 14 of guides 31, 33 fully encloses all sides of an optical connector (e.g., optical connectors 3a-3f). EX1003, FIG. 2. This function is not the same as the claimed "plurality of grooves."

Petitioner notes that Kanai also discloses “a frame-like guide” in which “the frame may not be formed of a continuous wall frame, but, for example, may be formed of a non-continuous frame (intermittent frame) as shown in FIG. 9.” Pet., 93; EX1003, 11:59-12:3. But a “frame” is a rigid structure that surrounds or encloses something. EX2003, 0001.

Accordingly, Kanai illustrates four rectangular guide pieces that would make contact with all four sides of the corresponding optical connector, thereby framing the connector. EX1003, FIG. 9.



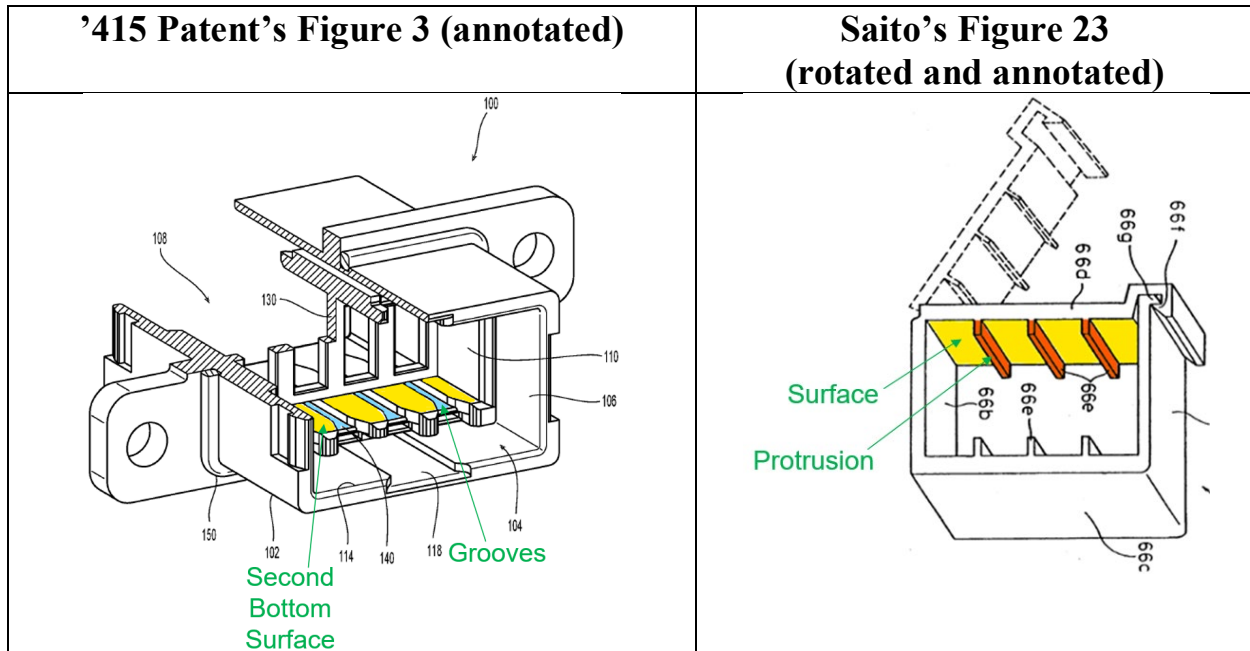
EX1003, FIG. 9 (annotated).

Patent Owner has annotated Kanai’s Figure 9 to illustrate how a non-continuous frame for guides 31, 33 would fully enclose all sides of an optical connector. Therefore, as shown above, Kanai only discloses a guide that fully encloses all sides of an optical connector, even if the guide is a non-continuous frame. Accordingly, Kanai does not disclose the claimed “plurality of grooves” in the same context as the term is used in the ’415 patent.

Saito also does not disclose the claimed grooves, nor does it overcome the shortcomings of Kanai discussed above when combined with Kanai even if the combination were deemed obvious.

In Saito, “each of the optical connectors is fitted into the specific space enclosed by the side piece 66c, the flap 66d and each 66e of the adapter 66.” EX1004, 11:22-27. Saito notably teaches “a plurality of partitioning pieces 66e *protruding* from the side piece 66c and the flap 66d.” EX1004, 10:31-36 (emphasis added). Saito thus teaches protrusions from side piece 66c and flap 66d, not grooves embedded in a continuous surface as claimed. A groove in the context of the ’415 patent is a depression or indentation in a continuous surface configured to receive a projection on a ferrule assembly/optical connector. A protrusion (as taught in Saito) is the structural opposite of a groove (as claimed in the ’415 patent).

Furthermore, as shown below, both the structure and function of partitioning pieces 66e is different from the claimed “plurality of grooves” in the ’415 patent.



Comparison of EX1001, FIG. 3 with EX1004, FIG. 23.

In the above comparison chart, Patent Owner has annotated the '415 patent's Figure 3 and Saito's Figure 23 to show the surface (yellow), the grooves of the '415 patent claims (blue) and the projections of Saito (red). Saito therefore fails to disclose grooves in a surface, just as Kanai fails to do so. Combining Saito with Kanai does nothing to overcome these failures.

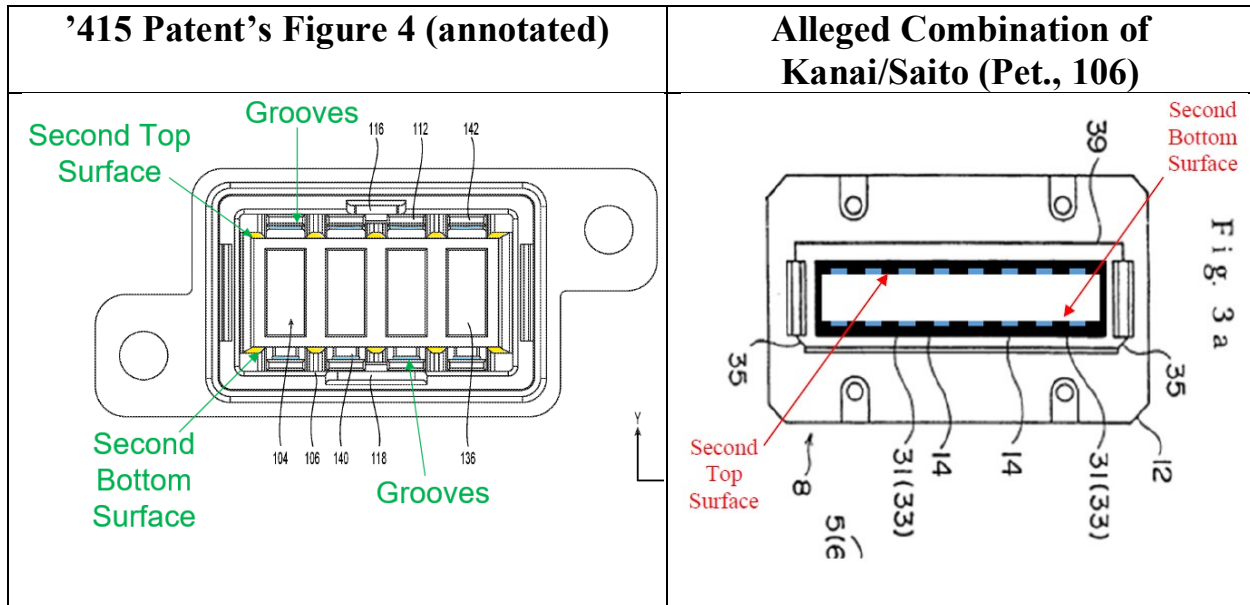
Additionally, Saito uses the term “groove” in an entirely different context than what Petitioner alleges. Saito describes a stacking pin 12 used to fasten five ferrules 11 in a stack. EX1004, 4:41-45. This stacking pin 12 contains a concave groove 12c for receiving a snap ring 15 to securely fasten the ferrules 11 together, performing the function of a mated bolt and nut. EX1004, 4:53-63. Accordingly, the lexicography of Saito uses the term “groove” as a structure for locking ferrules in a stack, not for aligning butt-connected ferrules from opposite sides of an

adapter as used in the lexicography of the '415 patent. The complete disclosure of Saito thus confirms that the term “groove” is highly context-sensitive. It is not the name of a common structure in the art.

As a result, neither reference, alone or in alleged obvious combination, discloses the claimed “plurality of grooves” as the term is used in the '415 patent.

B. Top and Bottom Surfaces

Petitioner’s combination of Kanai and Saito also fails to disclose the claimed top and bottom surfaces because Petitioner uses the wrong structure as the starting point to modify the references in arriving at these claim features. The Petitioner improperly reconstructs the references to create a “second top surface” and “second bottom surface” with “a plurality of grooves disposed in” each surface by using hindsight bias. *See Sensonics, Inc. v. Aerosonic Corp.*, 81 F.3d 1566, 1570 (Fed. Cir. 1996) (“To draw on hindsight knowledge of the patented invention, when the prior art does not contain or suggest that knowledge, is to use the invention as a template for its own reconstruction—an illogical and inappropriate process by which to determine patentability.”).



Comparison of EX1001, FIG. 4 with the alleged combination of Kanai and Saito.

In the above comparison chart, Patent Owner has annotated the '415 patent's Figure 4 to show the claimed surfaces (yellow) and grooves (blue). Petitioner has (incorrectly) annotated the proposed Kanai/Saito with color-coding that shows spaces (blue) between Kanai/Saito's projections (black). Based on impermissible hindsight, Petitioner has labeled the tops of the projections as the claimed surface to allegedly recreate the claimed features. Petitioner thus used the '415 patent as a template in modifying the teachings of Kanai.

As discussed above, Kanai discloses rectangular guides 31, 33 having inner circumferential walls 14. EX1003, 8:45-53. Each inner circumferential wall 14 of Kanai's adapter 8 forms an independent hole for receiving a corresponding optical connector. EX1003, 8:45-53. Kanai's arrangement of independent holes fundamentally precludes the existence of the claimed continuous "second top

surface” and “second bottom surface” because the holes are entirely separated from each other by the surrounding material forming adapter 8. EX1003, FIG. 3a.

Therefore, Kanai’s adapter 8 necessarily does not contain a “second top surface” and a “second bottom surface” as claimed in the ’415 patent.

As discussed above, Saito discloses partitioning pieces 66e protruding from the side piece 66c and the flap 66d. EX1004, 10:31-36. Petitioner does not identify a “second top surface” or a “second bottom surface” on Saito; instead, Petitioner only notes that the “ribs define opposing grooves on each side (or top and bottom surface depending on the orientation of the adapter) of the adapter.” Pet., 105. But ribs protruding from a surface do not define grooves embedded in that surface. Therefore, Saito does not disclose a “second top surface” or a “second bottom surface” with “a plurality of grooves disposed in” each surface as claimed in the ’415 patent.

Accordingly, Petitioner takes various structures from Kanai to create an alleged combination of Kanai and Saito, and only then identifies a “second top surface” or a “second bottom surface” on the alleged combination—top and bottom surfaces that are different than the top and bottom surfaces of the original references. Petitioner provides no rationale or justification for changing the designations of the various surfaces in the proposed combination. In other words, Petitioner first combines the cited references, and then applies the “groove,” “top

surface,” and “bottom surface” labels to the resulting combination using hindsight—hindsight that conflicts with the actual teachings of the references. *Compare* Pet., 106 (annotated Figure 3a of Kanai provided with no explanation accompanying the labeling of alleged surfaces), *with* EX1003, 8:45-53 (rectangular inner circumferential walls 14 of guides 31, 33) *and* EX1004, 10:33-37 (partitioning pieces 66e protruding from the side piece 66c and the flap 66d). That analysis is improper. *See Sensonics*, 81 F.3d at 1570 (“The invention must be viewed not after the blueprint has been drawn by the inventor, but as it would have been perceived in the state of the art that existed at the time the invention was made.”).

V. RESPONSE TO GROUND 4: CLAIMS 2 AND 3 WOULD NOT HAVE BEEN OBVIOUS OVER KANAI IN VIEW OF SAITO AND KATOH.¹

Ground 4 fails for the same reason Ground 3 fails—the combination of Kanai and Saito does not teach or suggest all of the features of claims 2 and 3 at

¹ The identification of Grounds for the Petition identifies Ground 4 as relying on the combination of Kanai, Saito, and Shirakawa. *See* Pet., 2. That appears to be an error, as the substantive discussion of Ground 4 relies on Katoh and not Shirakawa. *See* Pet., 123-127. To the extent there is uncertainty as to the basis for Ground 4, that uncertainty should be resolved against the Petitioner, who bears the burden to clearly identify the Grounds of the challenge.

least because neither Kanai nor Saito (alone or in alleged obvious combination) disclose the features of independent claim 1 from which claims 2 and 3 respectively depend. The addition of Katoh is only purported to disclose the additional features of claims 2 and 3. Petitioner does not suggest that Katoh overcomes any failure of Kanai and Saito to disclose at least the “plurality of grooves disposed in a second top surface and a plurality of grooves disposed in a second bottom surface of the central portion” of claim 1. Pet., 127.

Additionally, Petitioner has committed a drafting error by combining the alleged adapter combination of Kanai and Saito with optical connector 1 of Katoh to create a modified adapter. *Id.* at 123. Petitioner has confused the two-dimensional drawing of Figure 9 as allegedly disclosing grooves instead of its actual disclosure of plural first keys 51 and second key 52. EX1005, ¶77, FIG. 9. An adapter and an optical connector have different structural components and functions, so the keys 51 on optical connector 1 do not teach an adapter having “a plurality of grooves disposed in a second top surface and a plurality of grooves disposed in a second bottom surface of the central portion” as claimed.

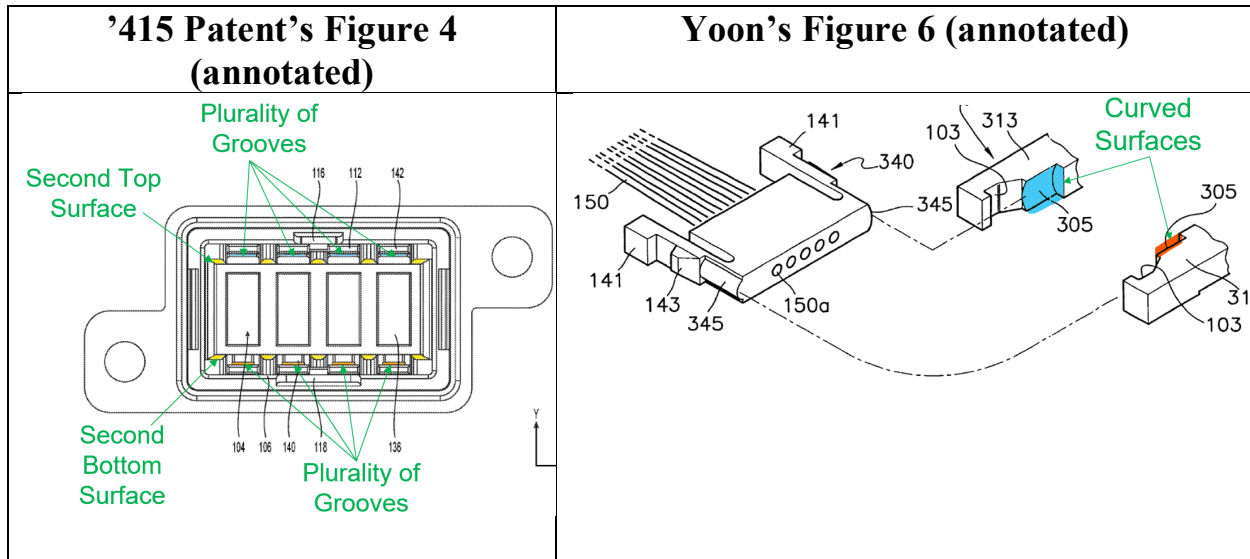
Patent Owner does not concede that any of the references in this Ground are properly combined or that one of skill in the art would be motivated to modify them as Petitioner does, but even assuming Petitioner’s combination, the combination fails to disclose the recited elements, as discussed above.

VI. RESPONSE TO GROUND 5: CLAIMS 11-14 WOULD NOT HAVE BEEN OBVIOUS OVER KANAI IN VIEW OF SAITO AND YOON.

The combination of Kanai, Saito, and Yoon does not render claims 11-14 obvious at least because the combination does not teach or suggest all of the features of independent claims 8 and 12 from which claims 11-14 respectively depend. Patent Owner does not concede that these references are properly combined or that one of skill in the art would be motivated to modify them as Petitioner does, but even assuming Petitioner's combination, the combination fails to disclose the recited elements.

A. Claim 11

For the same reasons the combination of Kanai and Saito does not teach claim 8, it also fails to teach or suggest claim 11. In particular, Yoon does not teach or suggest “a plurality of grooves disposed in a second top surface and a plurality of grooves disposed in a second bottom surface of the central portion,” as recited by independent claim 8. EX1001, 7:17-19. The Petition erroneously asserts that “[w]hile Yoon's guide grooves (305) and guide portions (345) are curved, they are otherwise similar to and provide the same function as the grooves and guides of the Saito adapter (66) and ferrule (70).” Pet., 128.



Comparison of EX1001, FIG. 4 with EX1008, FIG. 6.

In the above comparison chart, Patent Owner has annotated the '415 patent's Figure 4 and Yoon's Figure 6 to illustrate the structural differences between the plurality of grooves as claimed and Yoon's round guide grooves 305. Patent Owner has provided color-coding to the plurality of grooves in the '415 patent's Figure 4 in blue and orange. Patent Owner has provided similar color-coding to the allegedly corresponding round guide grooves 305 in Yoon's Figure 6.

Yoon fails to disclose "a plurality of grooves" for various reasons. First, the structure of Yoon's guide grooves 305 does not correspond to the structure of the claimed plurality of grooves. Yoon discloses "a pair of round guide grooves 305 . . . at the inner sides of the sidewall portions 313 of the body 300." EX1008, 7:36-41. As shown in Yoon's Figure 6, the round guide grooves 305 are merely curved inner surfaces of the sidewall portions 313 that span the entire height of the body

300. EX1008, FIG. 6. This structure is not the same as an alignment groove embedded in a continuous surface as used in the context of the '415 patent.

Second, Yoon does not disclose a *plurality* of grooves disposed in each surface. Yoon specifically discloses “a pair of round guide grooves 305” on opposing sidewall portions 313. Such a configuration can only receive a single optical connector. In contrast, the '415 patent accommodates “at least two fiber optic connectors” on each side. EX1001, 7:10-15. Therefore, Yoon does not disclose any structure that performs the function of “a plurality of grooves” as used by claim 8 and its dependent claim 11. EX1001, 7:17-19.

Third, even though Yoon uses the term “grooves,” the term is used in an entirely different context than the claimed plurality of grooves. Yoon discloses a “means for guiding the connector into the body, which allows for *alignment between the optical fibers and the optical device*” “such that the optical devices 121 mates with the input/output ends of *optical fibers 150*.” EX1008, 7:34-36, 3:56-63 (emphasis added). Yoon’s optical device 121 is “a light emitter for emitting a light signal from an electrical signal applied through the leads 125, and/or a light receiver for receiving a light signal and converting the same into an electrical signal for transmission through the leads 125.” EX1008, 4:7-13. Such an alignment structure does not perform the same context-sensitive function as the claimed plurality of grooves that “receive at least two additional *fiber optic*

connectors from the second side to mate with the at least two fiber optic connectors on the first side.” EX1001, 7:13-15 (emphasis added). Therefore, Yoon’s guidance of optical fibers represents a completely different concept from receiving fiber optic connectors in the claimed plurality of grooves (after the optical fibers have been terminated in the connectors).

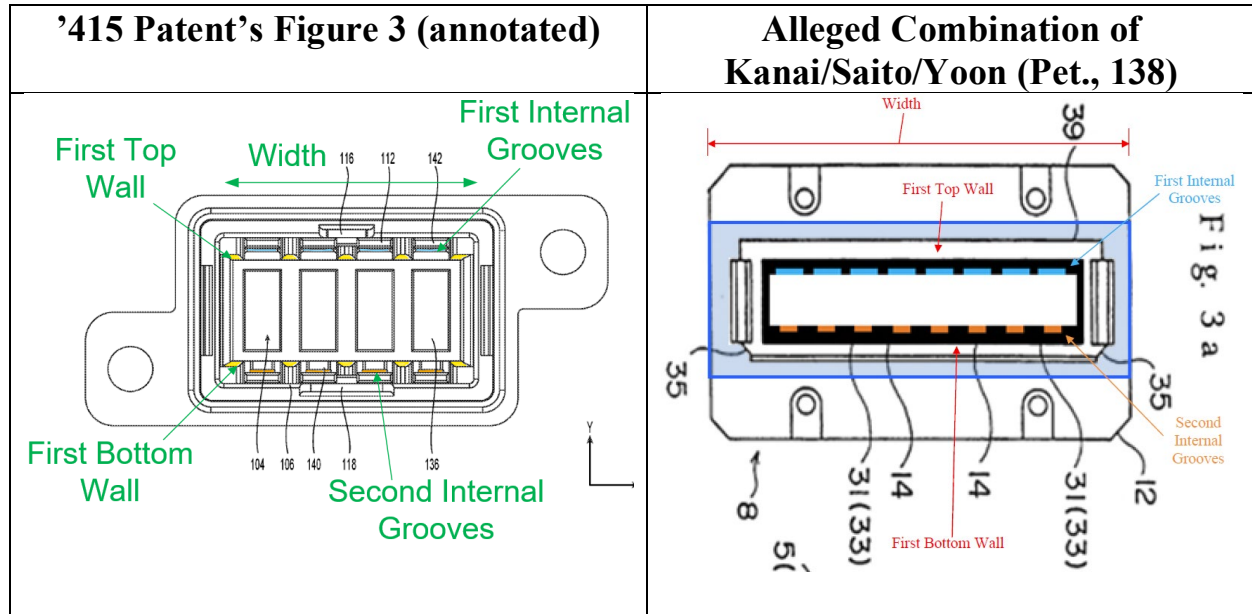
In light of the above deficiencies, Yoon is primarily purported to disclose the additional features of claim 11. Pet., 130. Even if it did teach the additional features of claim 11 (it does not), Yoon would do nothing to cure the above noted deficiencies of Kanai and Saito, because it suffers the same flaws: it does not teach a plurality of alignment grooves in the adapter top and bottom surfaces that receive mating projections of the multiple ferrule holders on each side.

B. Claims 12-14

Kanai in view of Saito and Yoon does not teach or suggest “the first top wall having first internal grooves spaced apart along the width and the first bottom wall having second internal grooves spaced apart along the width,” as recited in claim 12. EX1001, 8:14-16. None of these references (alone or in allegedly obvious combination) disclose at least “internal grooves” as claimed, nor do they disclose those “internal grooves” being disposed in the recited locations.

An internal groove in the context of the ’415 patent is a depression or indentation on a continuous inside surface of a wall such that the internal groove is

configured to receive a projection on a ferrule holder/optical connector. The Petitioner improperly identifies the “internal grooves” as the spaces between the protruding partitioning pieces in the proposed combination:



Comparison of EX1001, FIG. 3 with the alleged combination of Kanai, Saito, and Yoon.

In the above comparison chart, Patent Owner has annotated and color-coded the '415 patent's Figure 3 to show the first top wall and first bottom wall (yellow), the first internal grooves (blue), and the second internal grooves (orange). Petitioner has (incorrectly) annotated the alleged combination of Kanai, Saito, and Yoon in red, blue, and orange text and color-coded the alleged combination to show spaces (blue and orange) between projections (black). The color-coding on both annotated figures illustrates the distinct structures and functions between the '415 patent and the alleged combination. The alleged combination has internal

walls protruding from a surface, and therefore fails to disclose internal grooves in the first top wall and the first bottom wall.

Once again, the claimed grooves in a surface are not the same as the alleged spaces between projections extending from that surface. Kanai discloses guides 31, 33, each of which is a rectangular “hole space enclosed by the inner circumferential wall 14 of the first and second guides 31 and 33, through which optical connectors are inserted.” EX1003, 8:48-52. For example, Kanai discloses dimensions of height and width for each hole of guides 31, 33 that are slightly larger than, but substantially match, the dimensions of height and width of the first and second optical connectors 3a to 3f and 4a to 4f. EX1003, 9:9-17. Accordingly, the inner circumferential wall 14 of guides 31, 33 fully encloses all sides of an optical connector (e.g., optical connectors 3a-3f). EX1003, FIG. 2. Neither this structure nor this function bears any resemblance to the “internal grooves” claimed in the ’415 patent. EX1001, 8:14-16.

Saito suffers the same flaw as Kanai. Saito discloses “a plurality of partitioning pieces 66e *protruding* from the side piece 66c and the flap 66d.” EX1004, 10:33-34 (emphasis added). Saito explicitly teaches protrusions from side piece 66c and flap 66d, not grooves embedded in a continuous surface. Therefore, the structure of partitioning pieces 66e is not the same as “internal grooves” in the ’415 patent. No combination of these two references yields a device that has the

opposite of their collective teaching. As a result, neither reference, alone or in alleged obvious combination, discloses “internal grooves” as the term is used in the ’415 patent. EX1001, 8:14-16.

Yoon does not overcome the shortcomings of Kanai and Saito. Yoon’s pair of round guide grooves 305 are curved inner surfaces of opposing sidewall portions 313 that span the entire height of the body 300, which is not the same as a plurality of alignment grooves embedded in a continuous surface. EX1008, 7:40-41, FIG. 6. Such a configuration can only receive a single optical connector. Even though Yoon uses the word “grooves” to describe its side walls, the disclosure is that the entire surface is gently curved, and the Petition cites Yoon only for the concept of adapter/connector polarity. The structure of Yoon’s pair of round guide grooves 305 therefore cannot accommodate “two fiber optic connectors adjacent one another on a same side of the adapter” as claimed. EX1001, 8:21-22. As a result, Yoon does not overcome any failure of Kanai and Saito to disclose at least “the first top wall having first internal grooves spaced apart along the width and the first bottom wall having second internal grooves spaced apart along the width,” as used in the context of the ’415 patent. EX1001, 8:14-16.

As claim 12 is not met by this allegedly obvious combination, neither are claims 13 and 14 met by this allegedly obvious combination at least for the same reasons, and additionally for their recited features.

VII. RESPONSE TO GROUND 6: CLAIMS 1-5 AND 8-13 WOULD NOT HAVE BEEN OBVIOUS OVER HODGE IN VIEW OF IWANO.

The combination of Hodge and Iwano does not render obvious claims 1-5 and 8-13, at least because neither Hodge nor Iwano (alone or in allegedly obvious combination) teaches or suggests every feature of independent claims 1, 8, and 12. Patent Owner does not concede that these references are properly combined or that one of skill in the art would be motivated to modify them. Even assuming Petitioner's combination, the combination fails to disclose the recited elements.

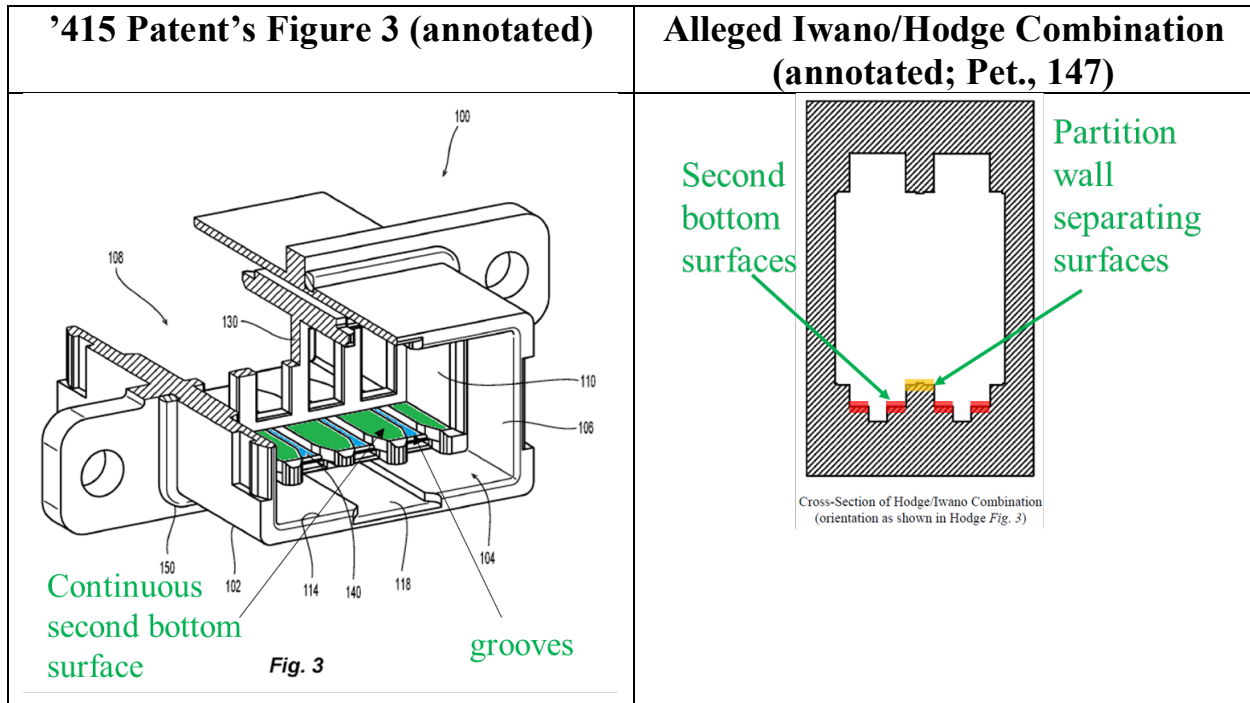
A. Independent Claims 1 and 8

Petitioner is forced to tacitly admit that no combination of Hodge and Iwano expressly discloses the claimed grooves. Instead, the Petition alleges that a person of ordinary skill in the art would recognize that the function of the claimed "center portion" is to provide ledges to engage sidewalls (14) of the of the ferrule body and includes alignment slots to receive the forward sections (39) of the cantilever arms (37). Pet., 143; EX1009, FIG. 3. The Petition then assumes that providing a structure to perform this function would be obvious, and therefore one of skill in the art would modify Hodge and Iwano in order to create that structure. Pet., 142-145. There are multiple legal and analytical flaws with Petitioner's reasoning.

First, a person of ordinary skill in the art would not recognize the function of the claimed "central portion" structures as obvious. For example, the optical connector taught by Hodge contains several alignment features, including, but not

limited to, grooves on alignment cover (20), a central alignment projection (48), and a key on one of cantilever arms (37). Hodge therefore already performs the function of the claimed central portion in a different way using *different* structures. Given these alignment features in Hodge, it is not necessary to provide additional alignment slots to receive the forward sections (39) of the cantilever arms (37). EX1009, FIG. 3, ¶¶31, 38. One of ordinary skill in the art would therefore have no reason to modify Hodge as Petitioner urges absent impermissible hindsight. In fact, Petitioner's suggested modification would add unnecessary complexity to the adapter of Hodge. One of ordinary skill would thus be *discouraged* from the modification relied upon in the Petition.

Furthermore, the combination of Hodge and Iwano does not teach or suggest at least the claimed “a plurality of grooves disposed in a second bottom surface of the central portion.” In Petitioner's proposed combination adapter (Hodge/Iwano), the alleged second bottom surface (red) is interrupted by a partition (orange) providing yet another surface. The proposed combination thus does not have grooves in a single planar bottom surface, as claimed. Rather, the combination has a series of projections and partitions that interrupt the internal surface of the bottom wall. In contrast, the '415 patent shows continuous second top and second bottom planar surfaces, in which the claimed grooves are found. EX1001, FIG. 3.



Comparison of EX1001, FIG. 3 with the alleged combination of Hodge and Iwano.

In the above comparison chart, Patent Owner has annotated both the '415 patent's Figure 3 and the alleged combination of Hodge and Iwano. Patent Owner has provided color coding in green and blue in the '415 patent's Figure 3 and color coding in red and orange in the alleged combination of Hodge and Iwano to illustrate the distinct structures and functions between the '415 patent and the alleged combination. The color-coding shows that the alleged combination has partitions protruding from a surface, and therefore fails to disclose internal grooves in the first top wall and the first bottom wall.

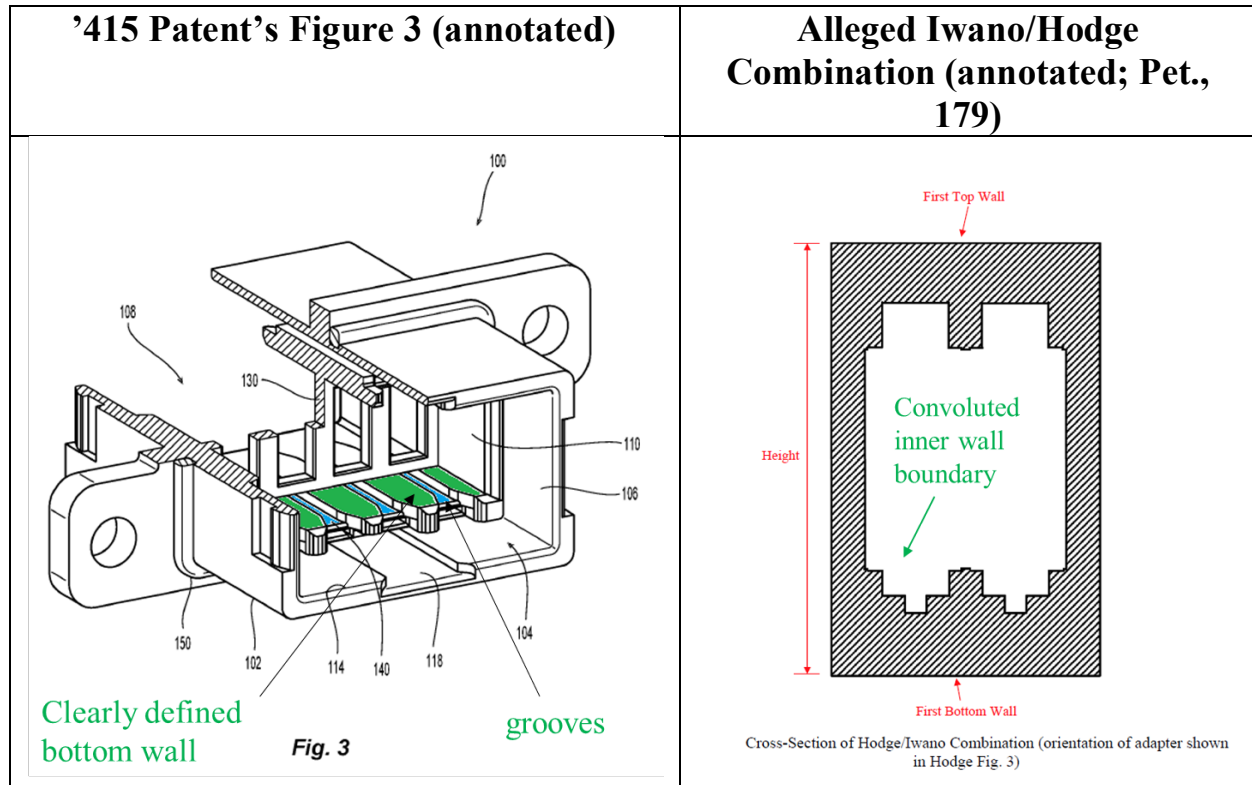
Additionally, in Petitioner's proposed Hodge/Iwano combination, the claimed "second bottom surface" is alleged to be the bottom surface of each groove in the alleged plurality of grooves. Each second bottom surface then

contains a second “groove within a groove,” which the Petitioner alleges as the grooves in the second bottom surface. Pet., 152-154. The second bottom surface alleged by the Petitioner is therefore a *series* of surfaces separated by partition walls, and not a continuous planar surface as defined in the ’415 patent. EX1001, 1:61-65 (explaining that the plurality of grooves forms a continuous feature).

B. Independent Claim 12

The combination of Hodge and Iwano does not teach or suggest at least the claimed “the first top wall having first internal grooves” and “the first bottom wall having second internal grooves.”

Petitioner points to the outer surfaces of adapter 60 of Hodge as the top and bottom walls. While the Petitioner purports to identify grooves, it is unclear where the inner surface of wall is located. For example, the lower wall comprises a complicated topology of internal walls and projections that simply does not translate to the single planar surface (free of internal walls) with grooves that is recited in claim 12.

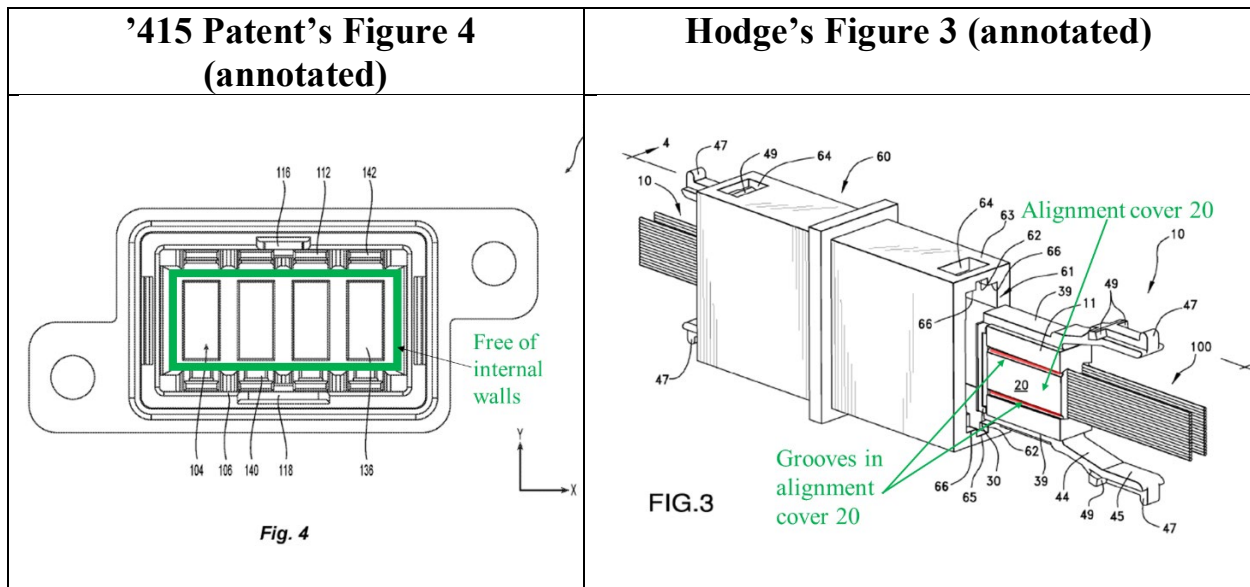


Comparison of EX1001, FIG. 3 with the alleged combination of Hodge and Iwano.

In the above comparison chart, Patent Owner has annotated the '415 patent's Figure 3. Petitioner's annotations to the Hodge/Iwano combination are in red text. Patent Owner has provided additional annotations to the alleged combination in green text. The annotations illustrate the differences between a clearly defined planar surface of the '415 patent and the convoluted inner wall topography of the alleged combination.

The combination of Hodge and Iwano also does not teach or suggest the claimed "adapter is free of internal walls along the width and between the first top wall and first bottom wall along the height."

The multi-fiber ferrule assembly described by Hodge includes an alignment cover 20. Alignment cover 20 has alignment grooves, *see* annotated EX1009, FIG. 3 below, that engage with internal features on the side walls of adapter 60. Thus, if the adapter described by Hodge were expanded to accept multiple fiber optic connectors, the expanded adapter would need to contain internal walls between the spaces for each adapter to provide the internal features that mate with the alignment grooves on alignment cover 20. Conversely, the ferrule assembly described in the '415 patent gangs multiple fiber optic connectors together via a plug. This necessitates an opening to facilitate the plug while also allowing alignment of multiple ferrule assemblies simultaneously.

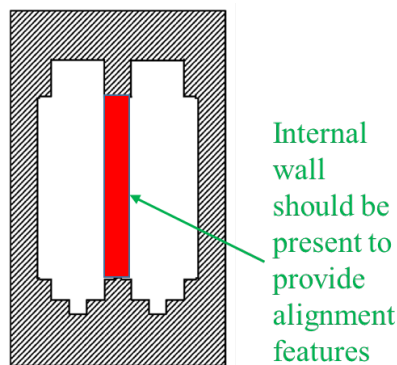


Comparison of EX1001, FIG. 4 with EX1009, FIG. 3.

In the above comparison chart, Patent Owner has annotated the '415 patent's Figure 4 with a green rectangle to show a portion free of internal walls. Patent

Owner has annotated Hodge's Figure 3 to show grooves (red) in an alignment cover 20 that mate with features on the walls of adapter 60. This comparison shows that Hodge's structural need for internal wall features therefore fails to disclose the claimed adapter free of internal walls.

Furthermore, the Petitioner argues that a person of ordinary skill in the art would have eliminated any partitions when combining Hodge/Iwano to achieve the highest density. Pet., 144-145, 185. There are two problems with this suggestion. First, the argument is hindsight. A person of ordinary skill in the art would have known that Hodge's partitions are necessary to ensure alignment. As shown below, Patent Owner has annotated the alleged combination of Hodge and Iwano with a red rectangle to show an internal wall that must be present to receive the alignment features on the alignment cover 20 of the optical connector disclosed by Hodge.



Cross-Section of Hodge/Iwano Combination
(orientation as shown in Hodge Fig. 3)

Alleged Combination of Hodge/Iwano (annotated; Pet., 147).

It was the '415 patent inventors who recognized that eliminating partitions could increase density, but presented a new problem of risking misalignment of the

ferrule holders. The '415 patent inventors then had to solve this new problem with the claimed grooves.

The second problem with Petition's allegations is that eliminating the partition of Hodge in favor of a partial partition does not necessarily increase density. That is why claim 12 recites an adapter free of internal walls. The Petition cites Iwano for the proposition that one of skill in the art would cut away partitions when combining Iwano with Hodge. Pet., 144-145 (citing EX1006, 28:65-29:5). But the cited portion of Iwano describes cutting away the partitions walls 423 to fit a projection 412 on the side surface of the optical connector plug 401. The ferrule assembly described by Hodge does not have side projections, and thus cuts in the partitions walls would not achieve a higher density.

In the end, the combination of Hodge and Iwano thus does not teach or suggest the combined structure that the Petition attributes to it.

VIII. RESPONSE TO GROUND 7: CLAIMS 6, 7, AND 14 WOULD NOT HAVE BEEN OBVIOUS OVER HODGE IN VIEW OF IWANO AND KANAI

Ground 7 fails for the same reasons as Ground 6. The combination of Hodge and Iwano does not disclose independent claim 1, from which claims 6 and 7 depend, nor the features of independent claim 12, from which claim 14 depends. The addition of Kanai is only purported to disclose the additional features of claims 6, 7, and 14. Pet., 187. Furthermore, the Petitioner does not suggest that

Kanai overcomes any failure of Hodge and Iwano to disclose the grooves or lack of internal walls, nor does it. Pet., 187-192. Patent Owner does not concede that these references are properly combined or that one of skill in the art would be motivated to modify them as Petitioner does, but even assuming Petitioner's combination, the combination fails to disclose the recited elements, as discussed above.

IX. CONCLUSION

The Petition fails to show a reasonable likelihood that any of the challenged claims are unpatentable in view of the applied references. The Board should deny institution.

Respectfully submitted,

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CERTIFICATE OF WORD COUNT (37 C.F.R. § 42.24(d))

1. This Patent Owner Preliminary Response complies with the type-volume limitation of 14,000 words, comprising 7,702 words, excluding the parts exempted by 37 C.F.R. § 42.24(a)(1).

2. This Patent Owner Preliminary Response complies with the general format requirements of 37 C.F.R. § 42.6(a) and has been prepared using Microsoft® Word 2016 in 14-point Times New Roman font.

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