IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

US CONEC LTD,
Petitioner

v.

SENKO ADVANCED COMPONENTS, INC.,
Patent Owner

Case IPR2024-00117
U.S. Patent No. 11,333,836

DECLARATION OF WILLIAM SINGHOSE, PH.D. IN SUPPORT OF PETITION FOR *INTER PARTES* REVIEW

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Patent Trial and Appeal Board
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4. Element [1.3] – "a first longitudinal rib formed on the inner surface of the upper wall at a location spaced apart along the width of the outer housing between the first side wall and the second side wall and a second rib formed on the inner surface of the lower wall at a location spaced apart along the width of the outer housing between the first side wall and the second side wall, the first and second ribs being aligned along the width of the outer housing, the first rib being spaced

apart from the second rib along the transverse axis by a transverse gap" 99

5. Element [1.4] – "wherein the first longitudinal rib and the second longitudinal rib are located between the first and second channels 102

B. Claim 2 – "The adapter as set forth in claim 1, wherein the upper wall comprises a first latch opening aligned with the first channel and a second latch opening aligned with the second channel, the first rib being spaced apart between the first latch opening and the second latch opening along the width." 103

C. Claim 3 104

1. Element [3.1] – "The adapter as set forth in claim 2, wherein the adapter is configured to receive a first one of the optical fiber connectors in the first channel and a second one of the optical fiber connectors in the second channel such that:" 104

2. Element [3.2] – "a flexible latch arm of the first optical fiber connector is latched with the first latch opening and a front section of a remote release of the first optical fiber connector is received in the first channel at a location spaced apart from the first latch opening along the longitudinal axis toward the second end portion of the outer housing" 106

3. Element [3.3] – "a flexible latch arm of the second optical fiber connector is latched with the second latch opening and a front section of a remote release of the second optical fiber connector is received in the [second] channel at a location spaced apart from the second latch opening along the longitudinal axis toward the second end portion of the outer housing" 108

D. Claim 4 – "The adapter set forth in claim 3, wherein the first channel is configured to allow the front section of the remote release of the first optical fiber connector to slide along the flexible latch arm of the first optical fiber connector within the first channel toward the first end portion of the outer housing to depress the flexible latch arm of the first optical fiber connector and wherein the second channel is configured to allow the front

section of the remote release of the second optical fiber connector to slide along the flexible latch arm of the second optical fiber connector within the second channel toward the first end portion of the outer housing to depress the flexible latch arm of the second optical fiber connector." 109

E. Claim 5 – "The adapter set forth in claim 4, wherein the upper wall is configured to unlatch from the flexible latch arm of the first optical fiber connector when the flexible latch arm of the first optical fiber connector is depressed and the upper wall is configured to unlatch from the flexible latch arm of the second optical fiber connector when the flexible latch arm of the second optical fiber connector is depressed." 113

F. Claim 6 – "The adapter as set forth in claim 2, wherein the lower wall is free of latch openings" and Claim 7 – "The adapter as set forth in claim 2, wherein the lower wall is configured to slidably engage each of the first and second optical fiber connectors without latching." 115

G. Claim 8 – "The adapter as set forth in claim 1, wherein the first longitudinal rib has a first height along the transverse axis and the second longitudinal rib has a second height along the transverse axis, the first height being greater than the second height." 117

H. Claim 9 – "The adapter as set forth in claim 1, wherein each of the first and second channels opens through the first end portion of the outer housing." 118

I. Claim 13 – "The adapter set forth in claim 1, wherein each of the optical fiber connectors is a multi-fiber connector comprising a multi-fiber ferrule." 119

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A. Claim 1 120

1. Preamble – "An adapter for mating with optical fiber connectors, the adapter comprising:" 120

2. Element [1.1] – "an outer housing having a first end portion and a second end portion spaced apart along a longitudinal axis, the outer housing comprising a first side wall and a second side wall spaced apart along a

lateral axis perpendicular to the longitudinal axis, the outer housing having a width extending along the lateral axis from the first side wall to the second side wall, the outer housing comprising a upper wall and a lower wall spaced apart along a transverse axis oriented perpendicular to the lateral axis and perpendicular to the longitudinal axis” 123

3. Element [1.2] – “each of the upper wall and the lower wall having an inner surface, the outer housing defining a plurality of channels spaced apart along the width, each of the channels being configured to receive an optical fiber connector, the plurality of channels including first and second channels” 129

4. Element [1.3] – “a first longitudinal rib formed on the inner surface of the upper wall at a location spaced apart along the width of the outer housing between the first side wall and the second side wall and a second rib formed on the inner surface of the lower wall at a location spaced apart along the width of the outer housing between the first side wall and the second side wall, the first and second ribs being aligned along the width of the outer housing, the first rib being spaced apart from the second rib along the transverse axis by a transverse gap” 131

5. Element [1.4] – “wherein the first longitudinal rib and the second longitudinal rib are located between the first and second channels” 133

B. Claim 2 – “The adapter as set forth in claim 1, wherein the upper wall comprises a first latch opening aligned with the first channel and a second latch opening aligned with the second channel, the first rib being spaced apart between the first latch opening and the second latch opening along the width.” 134

C. Claim 3 137

1. Element [3.1] – “The adapter as set forth in claim 2, wherein the adapter is configured to receive a first one of the optical fiber connectors in the first channel and a second one of the optical fiber connectors in the second channel such that:” 137

2. Element [3.2] – "a flexible latch arm of the first optical fiber connector is latched with the first latch opening and a front section of a remote release of the first optical fiber connector is received in the first channel at a location spaced apart from the first latch opening along the longitudinal axis toward the second end portion of the outer housing" 138

3. Element [3.3] – "a flexible latch arm of the second optical fiber connector is latched with the second latch opening and a front section of a remote release of the second optical fiber connector is received in the first channel at a location spaced apart from the second latch opening along the longitudinal axis toward the second end portion of the outer housing" 142

D. Claim 6 – "The adapter as set forth in claim 2, wherein the lower wall is free of latch openings" 143

E. Claim 7 – "The adapter as set forth in claim 2, wherein the lower wall is configured to slidably engage each of the first and second optical fiber connectors without latching." 145

F. Claim 8 – "The adapter as set forth in claim 1, wherein the first longitudinal rib has a first height along the transverse axis and the second longitudinal rib has a second height along the transverse axis, the first height being greater than the second height." 147

G. Claim 9 – "The adapter as set forth in claim 1, wherein each of the first and second channels opens through the first end portion of the outer housing." 148

H. Claim 10 – "The adapter set forth in claim 9, further comprising a transverse wall extending between the upper wall and the lower wall at a location longitudinally spaced apart from the first end portion of the outer housing." 149

I. Claim 13 – "The adapter set forth in claim 1, wherein each of the optical fiber connectors is a multi-fiber connector comprising a multi-fiber ferrule." 153

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2. Transverse wall 157

B. Claim 3 159

1. Element [3.1] – "The adapter as set forth in claim 2, wherein the adapter is configured to receive a first one of the optical fiber connectors in the first channel and a second one of the optical fiber connectors in the second channel such that:" 159

2. Element [3.2] – "a flexible latch arm of the first optical fiber connector is latched with the first latch opening and a front section of a remote release of the first optical fiber connector is received in the first channel at a location spaced apart from the first latch opening along the longitudinal axis toward the second end portion of the outer housing" 160

3. Element [3.3] – "a flexible latch arm of the second optical fiber connector is latched with the second latch opening and a front section of a remote release of the second optical fiber connector is received in the first channel at a location spaced apart from the second latch opening along the longitudinal axis toward the second end portion of the outer housing" 163

C. Claim 4 – "The adapter set forth in claim 3, wherein the first channel is configured to allow the front section of the remote release of the first optical fiber connector to slide along the flexible latch arm of the first optical fiber connector within the first channel toward the first end portion of the outer housing to depress the flexible latch arm of the first optical fiber connector and wherein the second channel is configured to allow the front section of the remote release of the second optical fiber connector to slide along the flexible latch arm of the second optical fiber connector within the second channel toward the first end portion of the outer housing to depress the flexible latch arm of the second optical fiber connector." 164

D. Claim 5 – "The adapter set forth in claim 4, wherein the upper wall is configured to unlatch from the flexible latch arm of the

first optical fiber connector when the flexible latch arm of the first optical fiber connector is depressed and the upper wall is configured to unlatch from the flexible latch arm of the second optical fiber connector when the flexible latch arm of the second optical fiber connector is depressed.” 169

E. Claim 8 – “The adapter set forth in claim 1, wherein the first longitudinal rib has a first height along the transverse axis and the second longitudinal rib has a second height along the transverse axis, the first height being greater than the second height.” 172

F. Claim 10 – “The adapter set forth in claim 9, further comprising a transverse wall extending between the upper wall and the lower wall at a location longitudinally spaced apart from the first end portion of the outer housing.” 174

G. Claim 11 – “The adapter set forth in claim 10, wherein the transverse wall includes a socket in each of the first and second channels configured to receive a ferrule of one of the optical fiber connectors.” 176

H. Claim 12 – “The adapter set forth in claim 11, wherein the socket in each of the first and second channels comprises a pair of cylindrical sockets in each of the first and second channels, each pair of sockets configured to receive a pair of cylindrical ferrules of one of the optical fiber connectors.” 178

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A. Claim 1 180

1. Preamble – “An adapter for mating with optical fiber connectors, the adapter comprising:” 180

2. Element [1.1] – “an outer housing having a first end portion and a second end portion spaced apart along a longitudinal axis, the outer housing comprising a first side wall and a second side wall spaced apart along a lateral axis perpendicular to the longitudinal axis, the outer housing having a width extending along the lateral axis from the first side wall to the second side wall, the outer housing comprising a upper wall and a lower wall spaced apart along a transverse axis oriented

perpendicular to the lateral axis and perpendicular to the longitudinal axis”.....181

3. Element [1.2] – “each of the upper wall and the lower wall having an inner surface, the outer housing defining a plurality of channels spaced apart along the width, each of the channels being configured to receive an optical fiber connector, the plurality of channels including first and second channels”.....184

4. Element [1.3] – “a first longitudinal rib formed on the inner surface of the upper wall at a location spaced apart along the width of the outer housing between the first side wall and the second side wall and a second rib formed on the inner surface of the lower wall at a location spaced apart along the width of the outer housing between the first side wall and the second side wall, the first and second ribs being aligned along the width of the outer housing, the first rib being spaced apart from the second rib along the transverse axis by a transverse gap” 186

5. Element [1.4] – “wherein the first longitudinal rib and the second longitudinal rib are located between the first and second channels” 187

B. Claim 2 – “The adapter set forth in claim 1, wherein the upper wall comprises a first latch opening aligned with the first channel and a second latch opening aligned with the second channel, the first rib being spaced apart between the first latch opening and the second latch opening along the width.” 188

C. Claims 6 & 7 – “The adapter set forth in claim 2, wherein the lower wall is free of latch openings.” and “The adapter set forth in claim 2, wherein the lower wall is configured to slidably engage each of the first and second optical fiber connectors without latching.” 189

D. Claim 8 – “The adapter set forth in claim 1, wherein the first longitudinal rib has a first height along the transverse axis and the second longitudinal rib has a second height along the transverse axis, the first height being greater than the second height” 191

E. Claim 9 – "The adapter set forth in claim 1, wherein each of the first and second channels opens through the first end portion of the outer housing" 192

F. Claim 10 – "The adapter set forth in claim 9, further comprising a transverse wall extending between the upper wall and the lower wall at a location longitudinally spaced apart from the first end portion of the outer housing" 192

G. Claim 11 & 12 – "The adapter set forth in claim 10, wherein the transverse wall includes a socket in each of the first and second channels configured to receive a ferrule of one of the optical fiber connectors" and "The adapter set forth in claim 11, wherein the socket in each of the first and second channels comprises a pair of cylindrical sockets in each of the first and second channels, each pair of sockets configured to receive a pair of cylindrical ferrules of one of the optical fiber connectors" 194

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A. Motivation to Combine 197

B. Claim 3 199

1. Element [3.1] – "The adapter set forth in claim 2, wherein the adapter is configured to receive a first one of the optical fiber connectors in the first channel and a second one of the optical fiber connectors in the second channel such that:" 199

2. Element [3.2] – "a flexible latch arm of the first optical fiber connector is latched with the first latch opening and a front section of a remote release of the first optical fiber connector is received in the first channel at a location spaced apart from the first latch opening along the longitudinal axis toward the second end portion of the outer housing" 201

3. Element [3.3] – "a flexible latch arm of the second optical fiber connector is latched with the second latch opening and a front section of a remote release of the second optical fiber connector is received in the [second] channel at a location spaced apart from the second latch

opening along the longitudinal axis toward the second end portion of the outer housing”.....204

C. Claim 4 – “The adapter set forth in claim 3, wherein the first channel is configured to allow the front section of the remote release of the first optical fiber connector to slide along the flexible latch arm of the first optical fiber connector within the first channel toward the first end portion of the outer housing to depress the flexible latch arm of the first optical fiber connector and wherein the second channel is configured to allow the front section of the remote release of the second optical fiber connector to slide along the flexible latch arm of the second optical fiber connector within the second channel toward the first end portion of the outer housing to depress the flexible latch arm of the second optical fiber connector.” 206

D. Claim 5 – “The adapter set forth in claim 4, wherein the upper wall is configured to unlatch from the flexible latch arm of the first optical fiber connector when the flexible latch arm of the first optical fiber connector is depressed and the upper wall is configured to unlatch from the flexible latch arm of the second optical fiber connector when the flexible latch arm of the second optical fiber connector is depressed.”.....208

E. Claim 13 – “The adapter set forth in claim 1, wherein each of the optical fiber connectors is a multi-fiber connector comprising a multi-fiber ferrule.” 210

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TABLE OF MATERIALS CONSIDERED

Exhibit No.	Description
1001	U.S. Patent No. 11,333,836 to Wong et al. ("'836 Patent")
1002	File History for U.S. Patent Application Serial No. 17/375,856, which issued as U.S. Patent No. 11,333,836
1004	*Curriculum Vitae* of William Singhose, Ph.D.
1005	U.S. Patent Application Publication No. 2016/0161680 to Nguyen et al. ("Nguyen")
1006	International Patent Application Publication No. WO 2017/127208 to Lee ("Lee")
1007	U.S. Patent Application Publication No. 2005/0135752 to Kiani ("Kiani")
1008	U.S. Patent No. 6,311,079 to Grois ("Grois")
1009	Japanese Patent Application Publication No. 2004/354,693 to Nakagawa ("Nakagawa")
1010	U.S. Patent Application Publication No. 2011/009,1159 to deJong ("deJong")
1011	U.S. Patent Application Publication No. 2004/007,8961 to Chen ("Chen")
1012	Japanese Patent Publication No. 2004/354693 to Nakagawa ("Nakagawa") (English translation)
1013	U.S. Patent No. 6,764,222 to Szilagyi ("Szilagyi")
1014	International Patent Application Publication No. WO 2013/100892 to Tsuzaki ("Tsuzaki")
1015	QSFP-DD MSA Group, MDC Receptacle Interface Specification Rev 4, February 2020, ("MDC Receptacle Interface Specification"); [http://www.qsfp-dd.com/wp-content/uploads/2020/02/MDC-Receptacle-Interface-Specification-Rev-4.pdf]

Exhibit No.	Description
1016	Exhibit J of Complaint – Claim Chart U.S. Patent No. 11,333,836 and MMC Adapters, *Senko Advanced Components, Inc. v. US Conec, Ltd.*, No. 1:23-cv-00083 (D. Del. Jan. 24, 2023), ECF No. 1-1
1022	Moxel Adaptor
1023	"HDI-45 Connector," Wikipedia, accessed at https://en.wikipedia.org/wiki/HDI-45_connector
1024	Jenkins, A., et al., "Controlling Human Perception of Haptic Profiles Using Contextual Cues," IEEE (July 2023)
1025	"QSFP-DD MSA Group offers rev 6.0 specifications for QSFP-DD800, QSFP112," Lightwave, accessed at https://www.lightwaveonline.com/optical-tech/transmission/article/14204021/qsfp-dd-msa-group-offers-rev-60-specifications-for-qsfp-dd800-qsfp112
1026	"QSFP-DD MSA Group intros new specs, plus white paper," Cabling Installation Maintenance, accessed at https://www.cablinginstall.com/standards/article/14203903/qsfp-dd-msa-group-intros-new-specs-plus-white-paper
1027	"QSFP-DD releases Interface Specification," Fiberroad, accessed at https://fiberroad.com/400g-qsfpdd-dco-standards/

I, William Singhose, Ph.D., hereby declare:

I. INTRODUCTION

A. Scope of Engagement

1. I have been retained as an expert by counsel for Petitioner US Conec Ltd. ("Petitioner") in connection with the above-captioned *Inter Partes* Review ("IPR") proceeding.

2. I submit this Declaration in the above-captioned proceeding to provide my expert opinion in support of Petitioner's Petition for *Inter Partes* Review of U.S. Patent No. 11,333,836 (the "'836 Patent", EX1001).

3. The opinions to which I will testify, if asked, are set forth in this Declaration. My opinions in this Declaration are based upon the information that I have received to date. They may be supplemented or modified if additional information is received. They may also be supplemented to rely on additional information or opinions provided by the parties (or witnesses retained by the parties) and issues that may arise.

B. Compensation

4. I am being compensated for my time spent working on this IPR. My compensation is not in any way dependent on the statements I set forth herein or the outcome of this proceeding.

C. Professional Qualifications and Experience

5. I believe that I am well qualified to serve as a technical expert in this matter based upon my educational and work experience. A copy of my curriculum vitae is submitted herewith as Exhibit 1004.

6. I am a Professor of Mechanical Engineering at the Georgia Institute of Technology ("Georgia Tech"). I received a B.S. in Mechanical Engineering from the Massachusetts Institute of Technology ("MIT") in 1990. I then received an M.S. in Mechanical Engineering from Stanford University in 1992. Finally, I received a Ph.D. in Mechanical Engineering from MIT in 1997. After receiving my Ph.D., I was a postdoctoral researcher at MIT before becoming a professor at Georgia Tech in 1998.

7. Based on my work experience, described in my curriculum vitae and in more detail below, I am knowledgeable about the subject matter of the '836 patent, and the related prior art. The primary elements of the subject matter and prior art include connectors, adapters, channels, sockets, springs, latches, and latch releases. I have experience working with each of these key elements, and combinations of these elements.

8. My qualifications as an expert in this subject matter stem from my industry work experience, as well as my experience as a Professor in the Woodruff

School of Mechanical Engineering at Georgia Tech performing research, teaching, and consulting.

9. In my current position at Georgia Tech, I teach courses in mechanical design, dynamics, and controls. I also lead teams of professors, post-docs, graduate students, and undergraduate students that conduct research in mechanical design, dynamics, controls, automation, robotics, spacecraft, and human-machine interfaces. During my 25 years at Georgia Tech, I have also had visiting academic appointments at MIT, Stanford, the Polytechnic University of Madrid, and the Tokyo Institute of Technology.

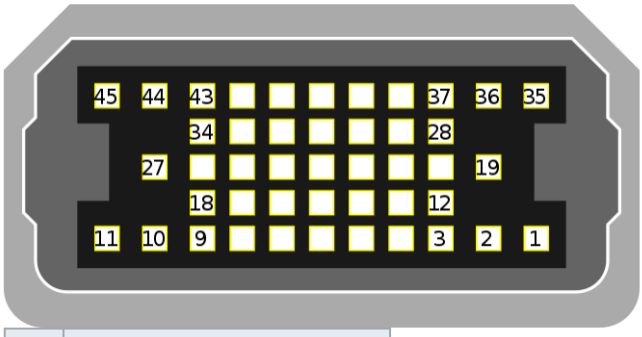
10. Before starting my teaching career at Georgia Tech, I worked as a full-time mechanical engineer for several companies, including Walt Disney World, Apple Computers, Inc., and Convolve, Inc. During my tenure at Georgia Tech I have continued to actively work for companies as either a part-time consultant or as a full-time engineer. For example, from 2017-2020 I took a leave of absence from Georgia Tech to work full-time at Google.

11. In my role at Walt Disney World, I developed connectors for securing under-water ultrasonic sensors for the Maelstrom water ride in the Norway pavilion at EPCOT. The sensors operated underwater to detect a fin along the bottom of the boats so that the position of each boat was known and the boats could be kept properly separated.

12. I also designed and developed a number of structures and components for the Disney parks' other attractions, including operational control procedures for the Body Wars simulators. These simulators were rooms that held about 40 people at a time. The entire rooms, and the guests seated within, were automatically moved up, down, side-to-side, and through a range of inclinations via a series of preprogrammed motions. The machines were equipped with numerous sensors that accurately measured the state of the machine and enabled accurate feedback control of the structure. One of the key elements I worked on was the door latches that automatically locked and unlocked the doors leading into the simulator rooms.

13. For Apple Computers, my primary responsibility was the design of the AudioVision 14 Display, which included the High-Density Interconnect 45 (HDI-45) connector. This connector was one of Apples' cable-to-onboard video connectors. It was a 45-pin connector that was used in the first generation Power Mac computers (the Power Macintosh 6100, 7100, and 8100) specifically for the Apple AudioVision 14 Display. A schematic diagram of the connector and the pinout is provided below.

AudioVision HDI-45 pinout[4]



Pin	Function
1	Analog audio ground
2	Audio input shield
3	Audio input (L)
4	Audio input (R)
5	Audio output (L)
6	Audio output (R)
7	Reserved
8	Monitor ID sense line 1
9	Monitor ID sense line 2
10	Video ground/shield (G)
11	Video output (G), 75Ω
12	Video input power ground
13	+5V for camera
14	Reserved
15	
16	
17	
18	Monitor ID sense line 3
19	S-video input shield
20	S-video input, luminance (Y)
21	S-video input, chroma (C)
22	Reserved
23	Not used
24	Reserved
25	
26	Video ground/shield (R)
27	Video output (R), 75Ω
28	I^2C data signal
29	I^2C clock signal
30	Reserved
31	Monitor ID
32	Monitor ID
33	Vertical sync
34	Composite sync
35	ADB power, +5V
36	ADB ground
37	ADB data
38	Keyboard switch
39	Reserved
40	
41	Monitor ID
42	Horizontal sync
43	Video sync ground
44	Video ground/shield (B)
45	Video output (B), 75Ω

EX1023.

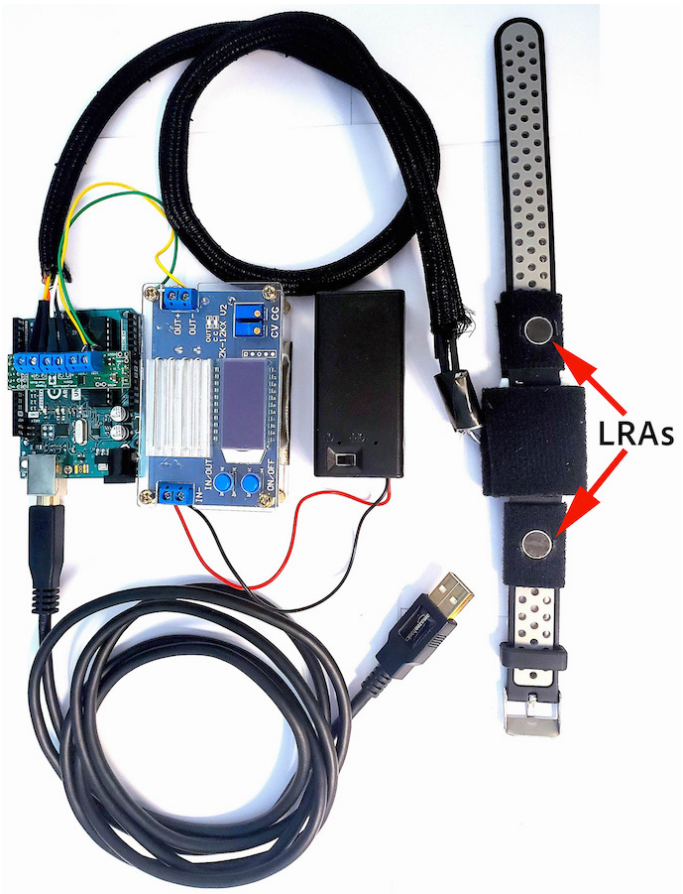
14. The AudioVision monitor project also developed adapters for the HDI-45 connector. One such adapter, the HDI-45 to DB-15 adapter is shown in the picture below.



Apple's HDI-45 to DB-15 Adapter.

15. During my years at Google I worked in both the Advanced Technology and Projects lab (ATAP), as well as Google augmented reality division. While working for Google, I developed prototypes of several consumer electronic products. The prototypes utilized numerous connectors that enabled the microcontrollers within the devices to both read sensors and control small actuators, such as linear resonant actuators (LRAs).

16. After returning to Georgia Tech in 2020, Google provided approximately $750,000 to sponsor my research activities in the area of LRA dynamics and control for consumer electronics. A significant portion of this funding was directed at the development of hardware platforms to test novel LRA configurations and control methods. All of these hardware platforms utilized numerous adapters and connectors. One such test platform is shown below.



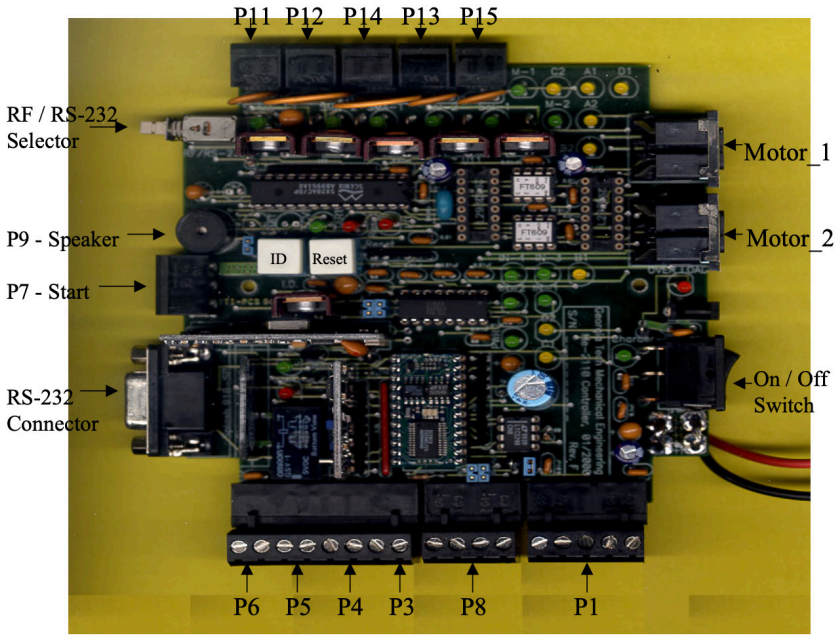
EX1024, FIG. 1.

17. As part of my duties as a professor at Georgia Tech, I have designed and constructed a number of electronic devices that have utilized numerous connectors and adapters. For example, twenty years ago I designed and constructed dozens of controller boxes for use by my students in an introductory design class. The controller box, shown below, was provided to the students so that they could design and build an automated machine.



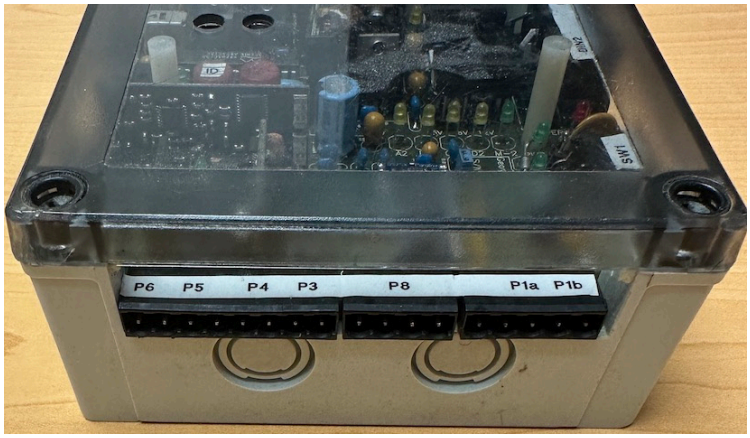
Electronic Controller used in Introductory Mechanical Design Course at Georgia Tech in 2003.

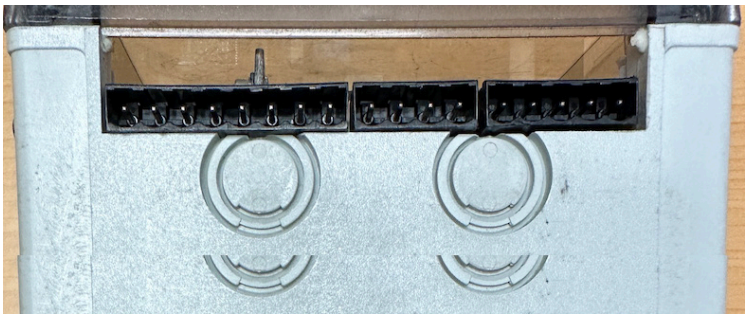
18. The controller box utilized 15 connectors and adapters so that students could transfer information between the control computer, sensors, and actuators such as electric motors and solenoids. These input and outputs are shown on the labeled board diagram below.



Labeled Board Diagram for 2003 Georgia Tech Controller Box.

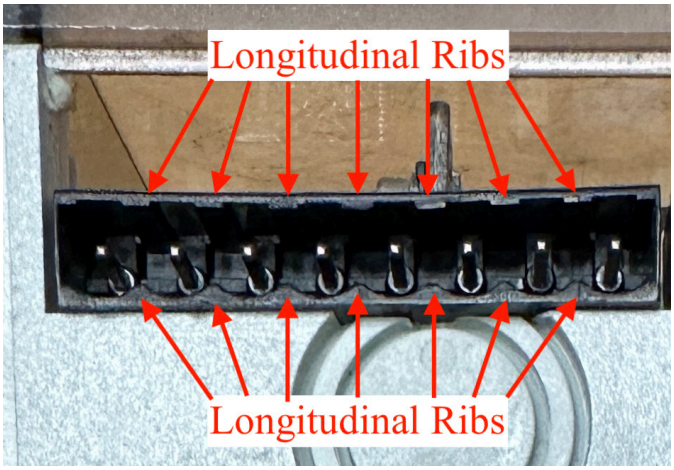
19. The adapters along one side of the controller box are shown below. As shown below, the six adapters along this side were formed from three separate housings. That is, there are vertical walls that partition the connector adapters into three separate parts.





Adapters along One Side of the 2003 Georgia Tech Controller Box.

20. As shown above, the 4 connections on the left side - P6, P5, P4, and P3 – are created from one housing. This housing is shown in more detail below. Along the inner surface of the upper wall of the housing are a number of longitudinal ribs. Corresponding ribs are also formed on the inner surface of the lower walls in order to form channels for the connectors that are plugged into the adapter. While these ribs help guide the corresponding connectors into place, they do not form continuous partitions running from the bottom wall to the top wall. Such partition-free adapters allow for more closely-space connectors.



Longitudinal Ribs Formed within an Adapter of the 2003 Georgia Tech Controller

Box.

21. I have commercialized control technologies developed in my Georgia Tech lab by founding two companies: CAMotion Cranes and InVekTek. CAMotion Cranes designed and installed crane control systems that decrease payload sway, automatically avoid obstacles, and improve crane safety. These improvements were achieved through sensor systems and control methods that my research group developed, patented, and deployed. The products developed by CAMotion Cranes included PLCs, drives, and communication card chassis, which utilized equipment racks with numerous adapters, connectors, and cable management structures. CAMotion Cranes was acquired by PAR Systems in 2013. InVekTek develops and commercializes control systems for large robotic and industrial material-handling systems. InVekTek products include control systems that read sensor signals and accurately control machine actuators. These products also require electronic systems with numerous adapters and connectors.

22. It terms of my previous work in intellectual property law, I worked as an expert on ITC-1197: Certain Portable Gaming Console Systems with Attachable Handheld Controllers and Components Thereof II. That case involved portable gaming devices that used detachable connectors that allowed a user to detach the game control modules from the main console and then easily reattach them. I also analyzed the internal electronic structure of the devices, which included several

compact connectors. Finally, the infringement and validity analyses also involved adjustable latching and release mechanisms of several prior art products, as well as those provided in the prior art publications.

23. On the basis of my education and the experience described above, I believe I am qualified to provide the opinions set out herein.

D. Materials Considered

24. For purposes of this Declaration, I have reviewed and, where applicable, relied upon the information and/or teachings of the documents identified in the TABLE OF MATERIALS CONSIDERED above. I have also relied on materials for which I have provided direct citations in this Declaration. In addition to documents, I also base my opinions on my education and professional experience, as described above.

25. I confirm that to the best of my knowledge the accompanying exhibits are true and accurate copies of what they purport to be, and that an expert in the field would reasonably rely on them to formulate opinions such as those set forth in this Declaration.

II. LEGAL STANDARDS FOR INVALIDITY

26. I understand that in *inter partes* review proceedings, a patent claim is construed using the same standard that would be used in a civil action, and that a claim should be construed in accordance with the ordinary and customary meaning

of the claim as it would be understood by a person of ordinary skill in the art ("POSITA").

27. While I am neither a patent lawyer nor an expert in patent law, I have been informed of the applicable legal standards for patent validity. I have relied upon these legal principles, as explained to me by counsel, in forming my opinions set forth in this Declaration.

28. It is my understanding that a patent can be found invalid for several reasons. It is my understanding that these reasons include, among others: (i) being anticipated by the prior art; (ii) being obvious in view of the prior art; or (iii) being indefinite for failing to inform, with reasonable certainty, the scope of the invention or for failing to enable its claims. My understanding of each of these bases for invalidity is discussed in greater detail below.

29. In addition, I understand that objective evidence of non-obviousness such as (i) commercial success, (ii) long-felt but unresolved need, (iii) failure of others, (iv) skepticism by experts, and (v) unexpected results should also be considered in determining whether a claim would have been obvious, if relevant.

30. I understand that in undertaking an invalidity analysis, the claims are to be interpreted from the perspective of a POSITA, at the time of the invention.

A. Anticipation

31. I understand that one way to show that a patent claim is invalid is to show that the claim is anticipated by a prior art reference. I understand this to mean that the patent claim is not new or novel in view of the prior art.

32. I further understand that to determine whether a prior art reference anticipates a patent claim requires a comparison of the claim language to the prior art on a limitation-by-limitation basis. I have been informed that a prior art reference "anticipates" under 35 U.S.C. § 102 and renders a patent claim invalid if all of the claim's limitations are expressly or inherently disclosed in that single prior art reference. The disclosure in the prior art reference does not have to use the same words as the claim, but all of the requirements of the claim must be expressly or inherently present.

33. I have been informed of the scope of prior art that can be used in an anticipation analysis as set forth in 35 U.S.C. § 102. In particular, I understand that a patent or publication generally qualifies as prior art to an asserted patent claim if it was published prior to the invention of the asserted patent claim or more than one year before the filing date of the application of the asserted patent. I further have been informed that a patent issued on a patent application filed before the invention of the asserted patent claim also is generally prior art to the asserted

patent claim. I am aware some exceptions may apply based on, *e.g.*, the same inventors of the asserted patent being the inventors of a prior art reference.

34. I understand that a prior art reference anticipates a patent claim when the claim limitations not expressly found in that reference are nonetheless inherent in it. I understand that express disclosure means that the subject matter is clearly described in the prior art reference.

35. I understand that a limitation or the entire invention is inherent and in the public domain if it is the natural result flowing from the explicit disclosure of the prior art. I understand that for a claimed element to be inherently present within a prior art document, it must be necessarily present. That is, the prior art reference must necessarily function in accordance with or include the claimed element. I understand that inherency may not be established by probabilities or possibilities—the mere fact that a certain thing may result from a given set of circumstances is not sufficient.

36. I understand that in some cases, the inherent property corresponds to a claimed new benefit or characteristic of a purported invention otherwise in the prior art. I understand that in such circumstances, the new realization alone does not render the old invention patentable. I further understand that when a prior art method is at issue, the inherent anticipation examines the natural and inherent

results in that method without regard to the full recognition of those benefits or characteristics within the field of art at the time of the prior art disclosure.

B. Obviousness

37. I have been informed that a patent claim is invalid as being obvious in view of the prior art if the differences between the patented subject matter and the prior art are such that the subject matter as a whole would have been obvious at the time of the invention to a person having ordinary skill in the art. In making a determination of obviousness, I understand that the following factors are analyzed: (i) the scope and content of the prior art; (ii) the differences, if any, between the prior art and the claims at issue; (iii) the level of ordinary skill in the pertinent art; and (iv) objective evidence of non-obviousness, if any exists.

38. I have been informed that any of the following rationales are some of the acceptable bases for the conclusion that a claim is obvious: (i) the claimed invention is simply a combination of prior art elements according to known methods to yield predictable results; (ii) the claimed invention is a simple substitution of one known element for another to obtain predictable results; (iii) the claimed invention uses known techniques to improve similar devices (methods, or products) in the same way; (iv) the claimed invention was "obvious to try" because it was a choice from a finite number of identified, predictable solutions, with a reasonable expectation of success; (v) there is known work in one field of endeavor

that may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces, if the variations would have been predictable to a POSITA; or (vi) there is some teaching, suggestion, or motivation in the prior art that would have led a POSITA to modify the prior art references or to combine prior art reference teachings to arrive at the claimed invention.

39. I have been informed that in order for a patent claim to be considered obvious, at the time the invention was made, each and every limitation of the claim must be present within the prior art, or within the prior art in combination with the general knowledge held by a POSITA, and that such a person would have a reasonable expectation of success in combining these teachings to achieve the claimed invention. I also understand that the reason to select and combine features, the predictability of the results of doing so, and a reasonable expectation of success of doing so may be found in the teachings of the prior art themselves, in the nature of any need or problem in the field that was addressed by the patent, in the knowledge of a POSITA in the field at the time, as well as in common sense or the level of creativity exhibited by a POSITA. There need not be an express or explicit suggestion to combine references.

40. I understand that substituting one known element for another known element would have been obvious when it leads to reasonably predictable results.

41. I understand that a combination of elements would have been obvious when a POSITA has a good reason to pursue the combination, which is among a finite number of known options within his or her technical grasp, and leads to reasonably expected results.

42. A prior art reference can be said to teach away from the claimed invention when a POSITA would be discouraged from following the path set out in the reference or would be led in a direction divergent from the path that was taken in the claimed invention. The mere disclosure of more than one alternative does not constitute a teaching away from alternatives that are not disclosed when the prior art does not criticize, discredit, or otherwise discourage the solution claimed in the alleged invention. Similarly, a prior art reference that merely expresses a general preference for an alternative invention does not teach away.

C. Miscellaneous

43. I understand that Petitioner has the burden of proving unpatentability by a preponderance of evidence, which means that the claims are more likely than not to be unpatentable.

44. I also understand that the claims are to be construed according to the same claim construction standard that district courts use wherein claim terms are given their ordinary and customary meaning from the perspective of a POSITA at the time of the invention.

45. The analysis in this Declaration is in accordance with the above-stated legal principles.

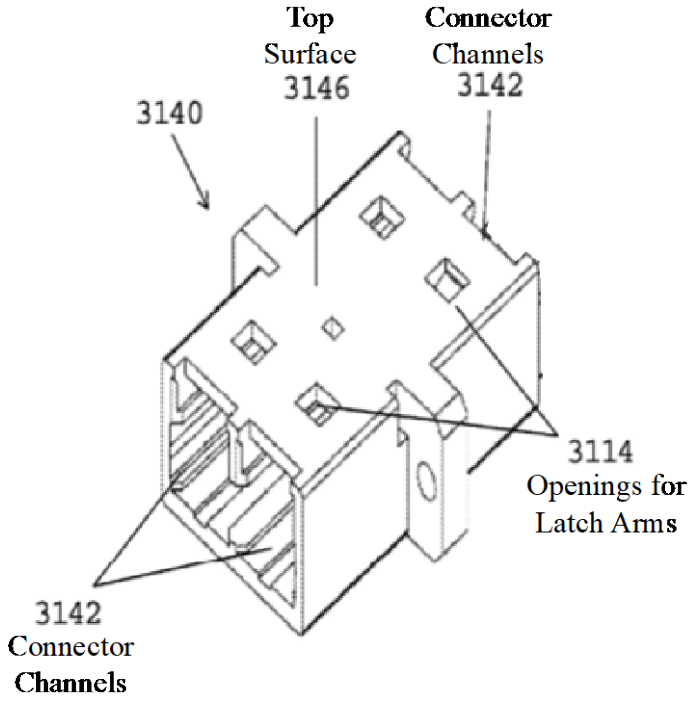
III. LEVEL OF ORDINARY SKILL IN THE ART

46. I understand that patent claims must be analyzed from the perspective of a person of ordinary skill in the art at the time of the invention. A POSITA to which the claimed subject matter pertains would have the capability of understanding the scientific and engineering principles applicable to the pertinent art.

47. In my opinion, a person of ordinary skill in this art at the time of the effective filing dates of the claimed inventions of the ’836 patent (circa January 30, 2017) would typically have had an undergraduate degree in mechanical engineering, industrial engineering, or a closely related field and one year of experience working with adapters and connectors. Additional relevant experience can compensate for a lack of relevant education, and vice versa.

48. In arriving at my opinion, I first considered the claims themselves, in light of the specification. Independent claim 1 describes an adapter. More specifically, it claims an "adapter for mating with optical fiber connectors." As shown below, an embodiment of the adapter is provided in FIG. 25 of the ‘836 Patent. The adapter has openings on the front and back sides that form channels

wherein connectors can be inserted. The top surface has openings that allow the latch arms on the inserted connectors to securely engage the adapter.

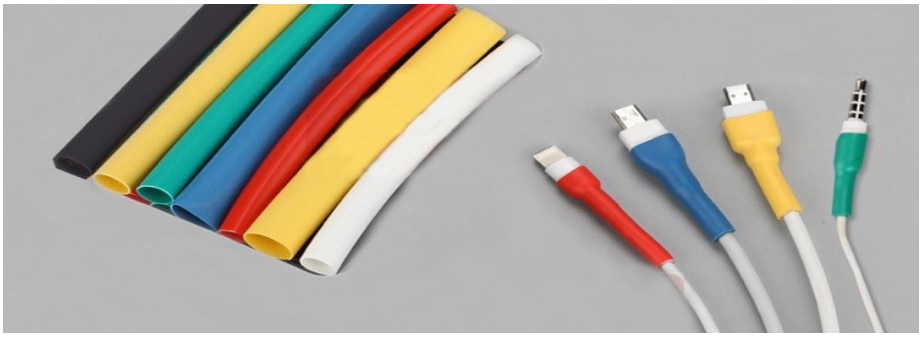


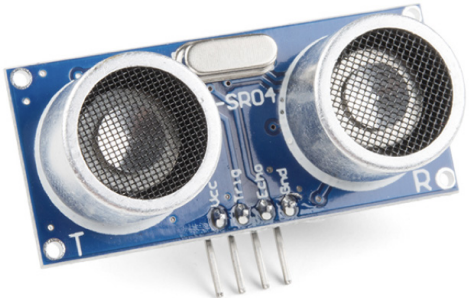
EX1001, FIG. 25.

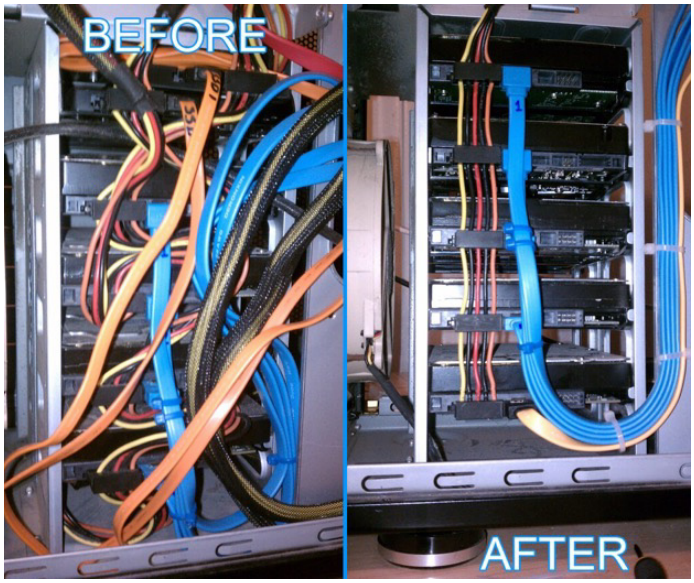
49. The limitations in claim 1 focus of the physical structure and geometry of the adapter. The required structure and geometry is very straightforward. Undergraduates majoring in mechanical or industrial engineering could certainly understand and practice the claimed adapter by, for example, creating a CAD model and then 3D printing a prototype of the claimed adapter. Claim 2 adds an additional geometric requirement pertaining to latch openings (holes in the upper wall). Again, this is a straightforward geometrical limitation.

50. Claim 3 adds limitations on how the adapter must function in conjunction with a corresponding connector. The corresponding connector must have a flexible latch arm and a remote release mechanism. Such latch arms and remote releases are simple mechanical structures. For example, the ubiquitous RJ45 ethernet connector has a flexible latch arm. The other dependent claims 4-13 add similarly straightforward limitations to the claimed adapter.

51. Connectors and adapters are one of the most basic elements in mechanical engineering. For example, at Georgia Tech, I teach an introductory mechanical design class to sophomores and juniors, in which I teach the students how to design and use connectors. I also teach about the challenges of cable management in the context of the dense-connector housing problem that is addressed in the '836 patent specification. Below I have included some of the pictures of connectors and cables that I show to my students during lectures.







52. Adapters are used to connect cables or to attach the ends of cables to signal-processing devices. Given that many adapters are placed in close proximity to each other, workers may have difficulty using their fingers or tools to attach and detach connectors to densely-packed adapters. Some of the claimed adapters work with connectors that have a remote release that aids a worker in detaching the connector.

53. The vast majority of the claim limitations are directed at very simple mechanical components such as housings, channels, ribs, latches, sockets, and remote release handles. The housings are described as having longitudinal, lateral,

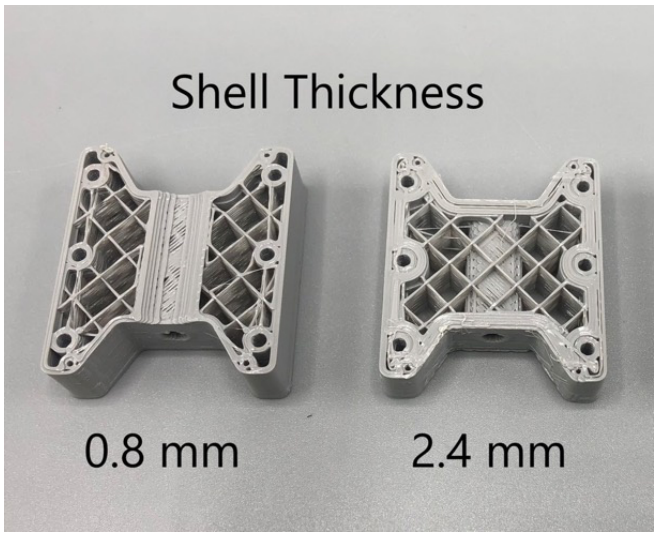
and transverse axes – every adapter has those three axes. Virtually all of the claimed adapter components and their functions would be covered at the undergraduate level of mechanical engineering and industrial engineering. The specific arrangements of the components and the purpose for those arrangements would obviously not be taught in undergraduate classes; therefore, some industrial experience working with adapters and connectors would be beneficial for understanding the claimed subject matter.

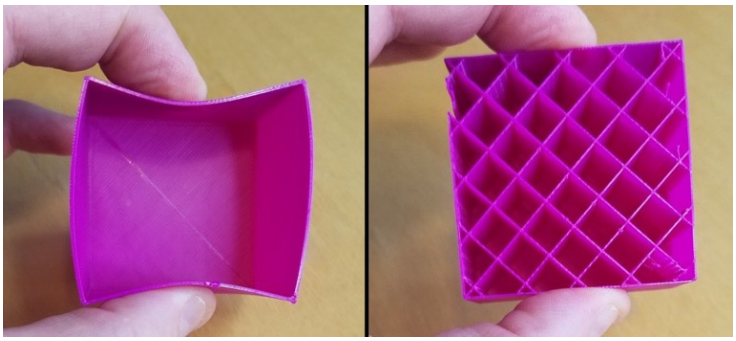
54. In addition to examining the claim language, I also considered several of the six legal factors that I understand typically may be considered in determining the ordinary level of skill in the art: (1) the educational level of the inventors ; (2) the type of problems encountered in the art; (3) prior art solutions to those problems; (4) rapidity with which innovations are made; (5) sophistication of the technology; and (6) the educational level of active workers in the field.

55. Problems encountered is the field of adapters, and especially adapters used in compact and dense configurations include the challenge of making the adapters "small," while simultaneously making them "big enough" to be handled, installed, and operated by humans. Both mechanical and industrial engineers continually face these types of "ergonomic" design tradeoffs. As a result, both mechanical and industrial engineering curriculums contain subject matter and assignments that would prepare their students to address such problems.

56. Another problem faced in this field is the challenge of firmly securing the connector to the adapter, in a releasable manner, without damaging the components. This problem centers on the forces involved in both the initial insertion of the connector into the adapter and in retaining the connector within the adapter so that it does not become detached over time and during expected-use conditions. Once again, consideration of such forces during the design of adapters and connectors falls firmly within the domain of mechanical and industrial engineering.

57. Much like the claimed invention in the '836 patent, the prior art solutions to densely-spaced adapters used "flexible latch arms" and "remote releases" that extend out from the densely packed adapters. Such prior art solutions of flexible removeable latches fall squarely in the fields of mechanical and industrial engineering. For example, in my introductory mechanical design class, students routinely use CAD to design, and 3D printers to manufacture, parts with components and features that have similar complexity to those claimed in the '836 patent. Furthermore, I instruct them on how to control the flexibility of the parts that they make by setting the wall thickness and the infill geometry. Below I have reproduced figures that I use while teaching students about 3D printing.





58. The sophistication of the claimed technology is relatively rudimentary engineering. For example, there are no claimed features based on "high-tech" elements such as microprocessors, artificial intelligence, intelligent sensors, or even advanced materials. Rather, the claims focus on well-known mechanical structures that would be studied at the undergraduate level.

59. Therefore, I am confident that mechanical and industrial engineering degrees provide an excellent basis for understanding the claim terms. I have added a requirement of 1 year experience working with adapters and connectors to the

educational component merely to ensure that a POSITA could understand the full scope of the claimed invention.

60. In 2017, and well before, I would have qualified as a person of ordinary skill in the art under this definition. My opinions in this report are made from the perspective of a person of ordinary skill in the art, as I have defined it above. However, if a definition of a POSITA is adopted that has higher educational or work experience requirements, my opinions, in all likelihood, would not change. My analysis is intended to reflect how a POSITA would have understood the '836 Patent claims as of the priority date, even if I use the present tense.

IV. BACKGROUND OF THE TECHNOLOGY

61. My discussion of the background of the technology is intended to provide some context for my later analysis of the '836 patent and prior art. This discussion provides a high-level overview of the components and basic setup in a data center, but it is not intended to reflect the meaning of any particular claim term in a patent, which must be assessed in view of the specification and the context of the claim language. Rather, this is a simply general overview of fiber optic cables, connectors, adapters, and other components.

62. The technology at issue generally relates to fiber optic adapters and connectors of the type commonly used in data centers. In general, using optical

fiber provides benefits in extremely wide bandwidth and low-noise operation. Optical fiber has been used for a variety of applications, including but not limited to, broadband voice, video, and data transmission.

63. Public and private fiber optic networks used for, *e.g.*, voice, video, and data transmissions often include fiber optic equipment located in data distribution centers or central offices to support interconnections. The patent at issue here generally relates to details of the connectors, which interconnect fiber optic cables in these data distribution centers.

V. U.S. PATENT NO. 11,333,836

A. Background

64. U.S. Patent No. 11,333,836 (EX1001) (the "'836 Patent"), entitled "Adapter for Optical Connectors," issued on May 17, 2022, was filed as U.S. Patent Application Serial No. 17/375,856 (the "'856 Application") on July 14, 2021. The '836 Patent is a continuation of U.S. Patent Application Serial No. 17/375,856 filed on March 12, 2021 (now U.S. Patent No. 11,181,701), which is a continuation of U.S. Patent Application Serial No. 16/297,607 filed on March 9, 2019 (now U.S. Patent No. 10,976,505), which is a continuation of International Patent Application Serial No. PCT/US2018/016049 filed on January 30, 2018, which claims benefit to U.S. Provisional Application No. 62/581,961 filed on November 6, 2017, U.S. Provisional Application No. 62/546,920 filed on August

17, 2017, U.S. Provisional Application No. 62/485,042 filed on April 13, 2017, U.S. Provisional Application No. 62/463,898 filed on February 27, 2017, U.S. Provisional Application No. 62/457,150 filed on February 9, 2017, and U.S. Provisional Application No. 62/452,147 filed on January 30, 2017. Based on the above, the earliest priority date for the '836 Patent is January 30, 2017.

65. The '836 Patent explains that "[t]he prevalence of the Internet has led to unprecedented growth in communication networks," and so "network providers [seek] to continuously find ways to improve quality of service while reducing cost." ['836 Patent, 1:29-33.] The patent describes that while some developments have increased the volume of interconnections there is "room for improvement in the area of data centers, specifically as it relates to fiber optic connections." [*Id.*, 1:40-42.]

66. The '836 Patent admits "manufacturers of connectors and adapters are always looking to reduce the size of the devices, while increasing each of deployment, robustness, and modifiability after deployment." [*Id.*, 1:42-45.] It explains that "more optical connectors may need to be accommodated in the same footprint previously used for a smaller number of connectors in order to provide backward compatibility with existing data center equipment." [*Id.*, 1:45-49.] The background of the patent further describes "numerous interconnections between mating connectors may be compacted into high-density panels" and that

"producers may optimize for such high densities by shrinking the connector size and/or the spacing between adjacent connectors." [*Id.*, 1:62-66.]

67. The patent explains that reducing the size of the connectors and/or spacing between adjacent connectors can create problems such as increasing the support cost, diminishing the connection quality, obstructing the release mechanisms of the connectors, and increasing the stress to the fiber optic cables. [See *id.*, 1:61-2:16.]

68. The patent thus claims adapters that address the problem of reducing the spacing between adjacent connectors and allowing the easy unlatching of closely spaced connecters. [See*, e.g., id.*, FIGs. 23-28, 12:8-16:16.]

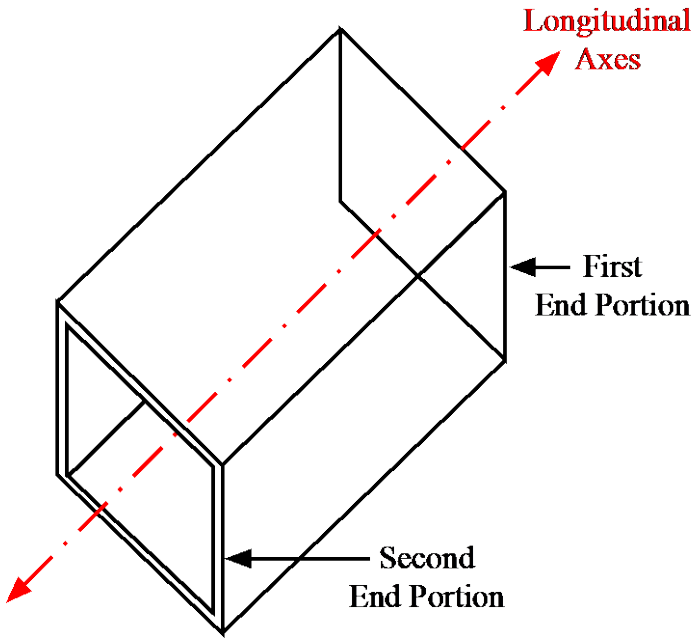
69. The claims of the '836 Patent focus on adapters that have multiple channels wherein connectors can be inserted. For example, claim 1 is the only independent claim and it simply requires a box-shaped **adapter housing** with two **channels**. The channels are partition-free in the sense that there is no requirement for a wall to be placed between the connector channels. Rather, the channels can be formed by using **ribs** along the top inner surface and along the bottom inner surface of the housing.

70. Specifically, the elements of Claim 1 are (**emphasis added**):

Element	Claim Language
1-Pre	An **adapter** for mating with optical fiber connectors, the **adapter** comprising:

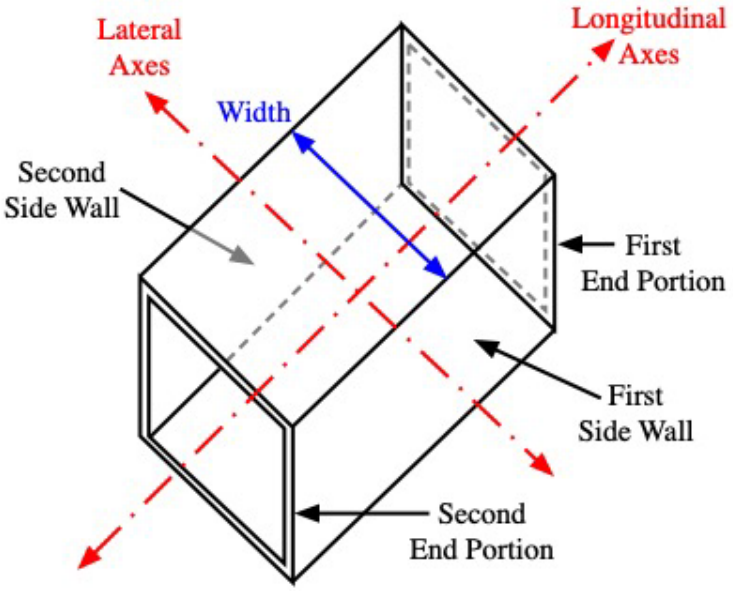
1.1	an outer **housing** having a first end portion and a second end portion spaced apart along a longitudinal axis, the outer housing comprising a first side wall and a second side wall spaced apart along a lateral axis perpendicular to the longitudinal axis, the outer housing having a width extending along the lateral axis from the first side wall to the second side wall, the outer housing comprising a upper wall and a lower wall spaced apart along a transverse axis oriented perpendicular to the lateral axis and perpendicular to the longitudinal axis,
1.2	each of the upper wall and the lower wall having an inner surface, the outer housing defining a plurality of **channels** spaced apart along the width, each of the channels being configured to receive an optical fiber connector, the plurality of channels including first and second channels; and
1.3	a first longitudinal rib formed on the inner surface of the upper wall at a location spaced apart along the width of the outer housing between the first side wall and the second side wall and a second rib formed on the inner surface of the lower wall at a location spaced apart along the width of the outer housing between the first side wall and the second side wall, the **first and second ribs** being aligned along the width of the outer housing, the first rib being spaced apart from the second rib along the transverse axis by a transverse gap,
1.4	wherein the first longitudinal rib and the second longitudinal **rib are located between the first and second channels**.

71. Although Element 1.1 contains a fair number of words, what it describes could simply be a rectangular box. For example, the first limitation of element 1.1 (an outer **housing** having a first end portion and a second end portion spaced apart along a longitudinal axis) is illustrated by the box below.



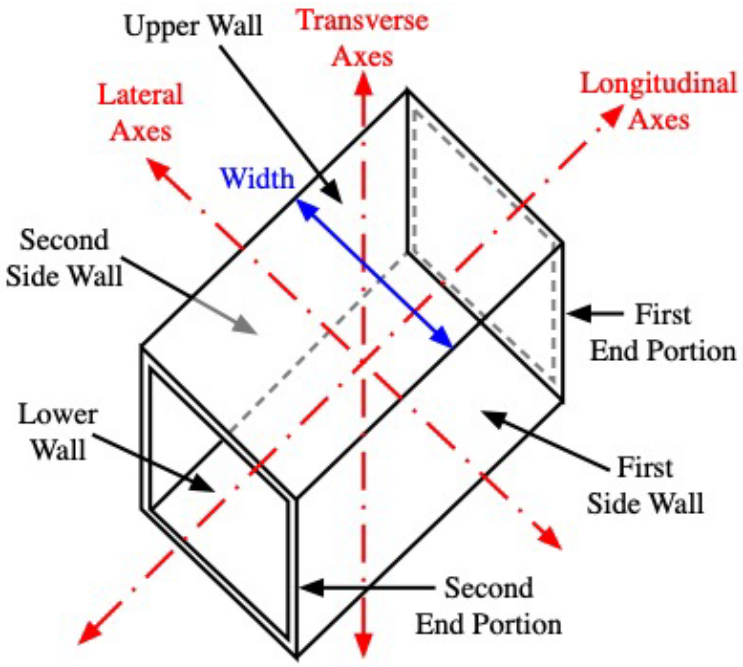
First limitation of Element 1.1.

72. The requirements of the second limitation of Element 1.1 (the outer housing comprising a first side wall and a second side wall spaced apart along a lateral axis perpendicular to the longitudinal axis, the outer housing having a width extending along the lateral axis from the first side wall to the second side wall) are overlaid on the box below.



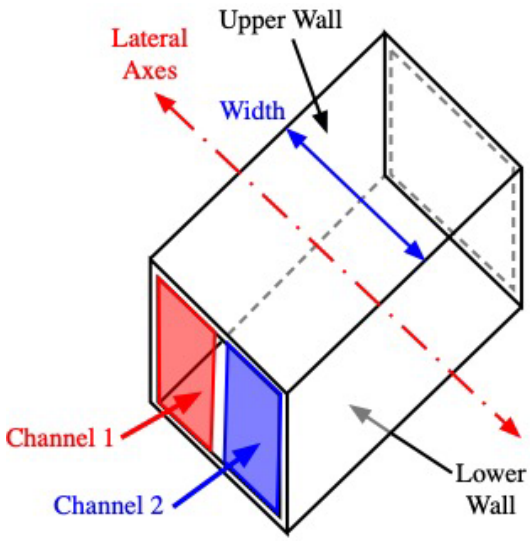
First and Second Limitations of Element 1.1.

73. The requirements of the third, and final, limitation of Element 1.1 (the outer housing comprising a upper wall and a lower wall spaced apart along a transverse axis oriented perpendicular to the lateral axis and perpendicular to the longitudinal axis) are overlaid on the box below.



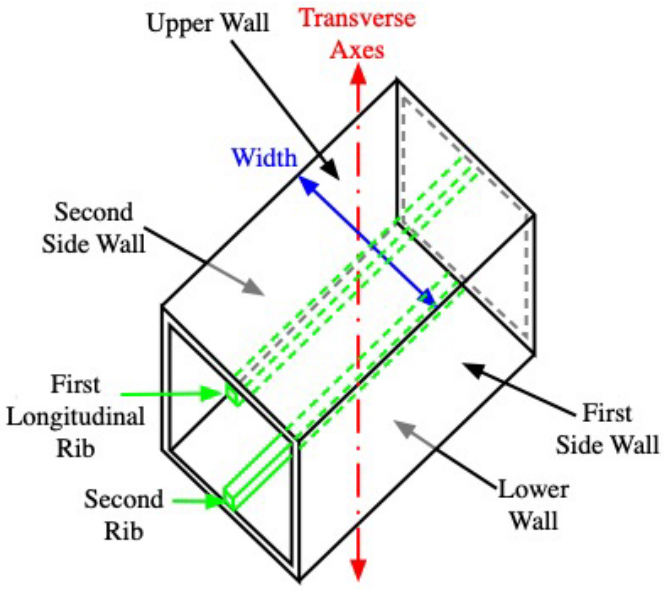
First, Second, and Third Limitations of Element 1.1.

74. Element 1.2 of claim 1 could be practiced by simply having two channels, spaced apart along the width direction, within the housing. Each of the channels can receive an optical fiber connector. This channel limitation is illustrated on the box below.



Element 1.2 of Claim 1.

75. Element 1.3 of claim 1 is practiced by adding ribs to the top and bottom inner surfaces of the housing. The ribs need to be aligned along the width. Examples of such first and second ribs are shown on the box below.



Element 1.3 of Claim 1.

76. Finally, Element 1.4 of claim 1 simply requires the ribs to be located between the first and second channels claimed in Element 1.2. That is, the ribs effectively form the boundary of the channels without requiring a full partition wall to be placed between the channels.

77. The dependent claims of the ‘836 Patent add commonly-used adapter features such as latch openings (Claim 2), flexible latch arms (Claim 3), remote release handles (Claim 4), transverse walls with holes to receive the ferrules (Claim 10 and 11), and multi-fiber ferrules (Claim 13).

B. Summary of Relevant Prosecution History

78. I have reviewed the file history of the ’836 Patent. For purposes of this Declaration, I summarize below certain parts of the file history that I reviewed. I also received input of counsel in conjunction with this review, who explained the relevant principles of patent law.

79. U.S. Application No. 17/375,856 (the “’856 Application”) was filed on July 14, 2021. As filed, the ’856 Application included twenty-one (21) claims, with claims 1 and 17 as the only independent claims. [*See* EX1002, 251-255.] A Track One request was filed with the ’856 Application. [*See id.*, 219.]

80. The Applicant appears to have not cited any references before the first Office Action was issued. [*See* EX1002, 44-298.]

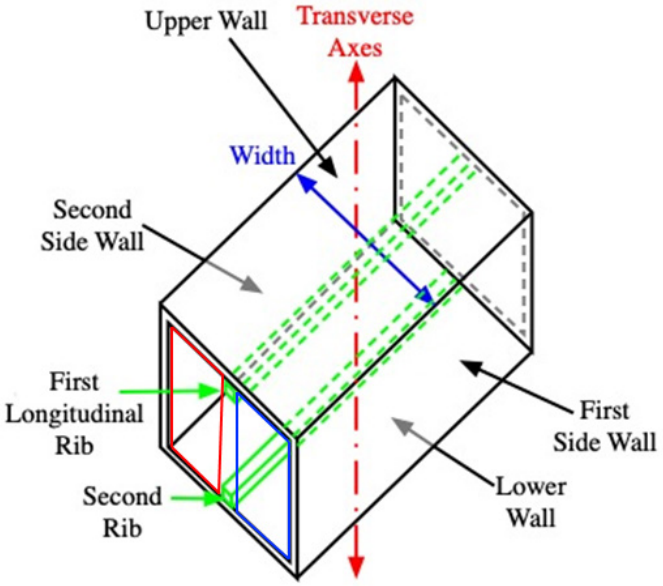
81. The first, and only, Office Action issued on December 8, 2021. [*See* EX1002, 37-43.] The Office Action rejected the first pending independent claim and various dependent claims under 35 U.S.C. § 102(a)(1) as being anticipated by U.S. Patent Application Publication No. 2005/0135752 to Kiani (hereinafter “Kiani”). [*See id.*, 39-41.]

82. The December 8, 2021 Office Action then indicated that various originally-filed dependent claims were allowable. [EX1002, 5.] In particular, the Office Action noted that the following limitations, in combination with the

limitations in the independent claim and intervening dependent claims, were not present in the prior art:

- "a first longitudinal rib formed on the inner surface of the upper wall at a location spaced apart along the width of the outer housing between the first side wall and the second side wall"
- "a second rib formed on the inner surface of the lower wall at a location spaced apart along the width of the outer housing between the first side wall and the second sidewall"
- the first and second ribs being aligned along the width of the outer housing, the first rib being spaced apart from the second rib along the transverse axis by a transverse gap"
- "wherein the first longitudinal rib and the second longitudinal rib are located between the first and second channels" [*See id.*]

83. These simple geometric limitations are shown on the box housing below.



84. In response, the Applicant canceled claims 1-16 and added new claims 23-29 to depend from allowable claim 17. [*See* EX1002, 28-33.]

85. A Notice of Allowance issued on January 21, 2022. [EX1002, 7-11.] No further substantive analysis or explanation was included.

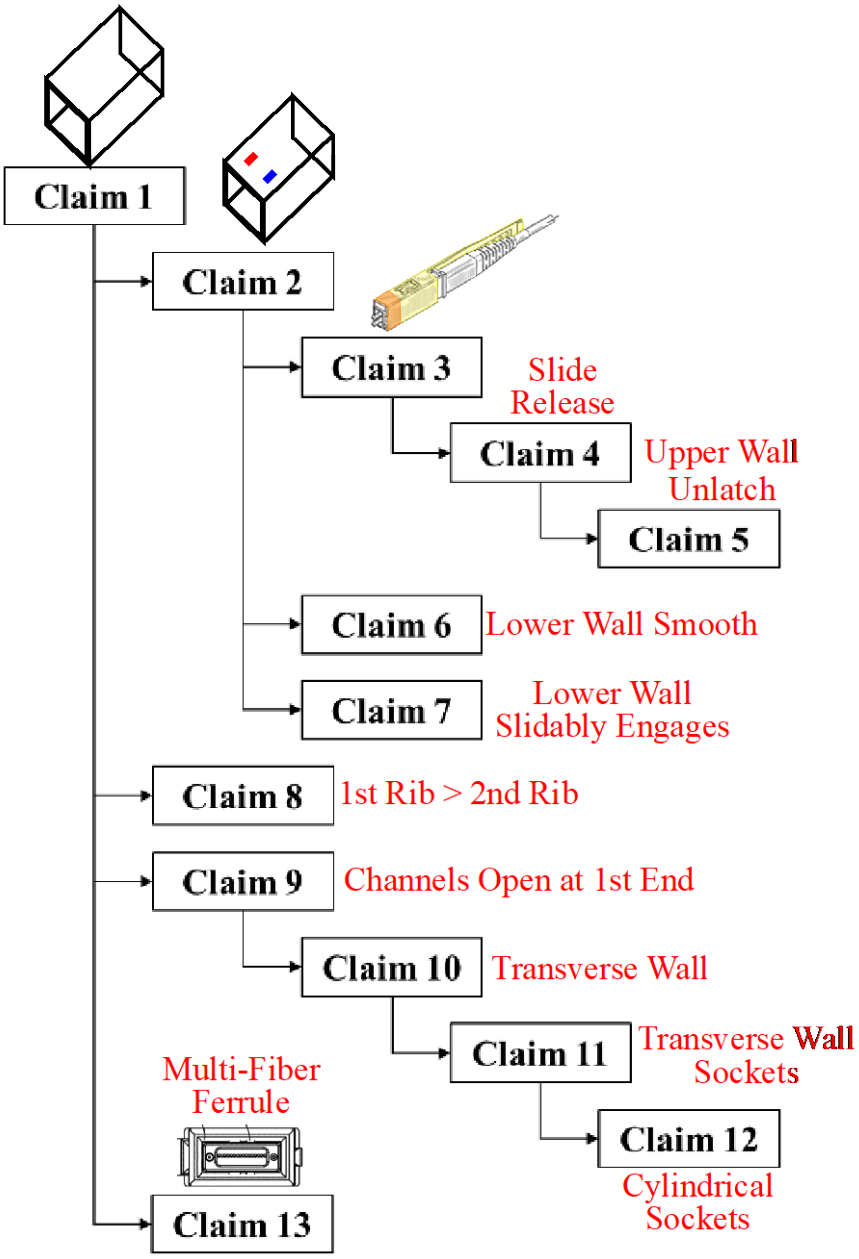
C. Claim Dependencies of the '836 Patent

86. The '836 Patent issued with 13 claims, of which claim 1 is the sole independent claim. As described above, independent claim 1 recites an adapter for mating with optical fiber connectors.

1. Independent Claim 1 of the '836 Patent

87. The preamble and 4 elements of claim 1 were provided above in tabular form. As discussed above, claim 1 can be practiced by a simple rectangular adapter housing. A representation of the claim 1 housing is shown on the claim

dependency tree diagram provided below. The tree illustrates the limitations added by each dependent claim using simple figures or short phrases.



Claim Dependencies of the '836 Patent.

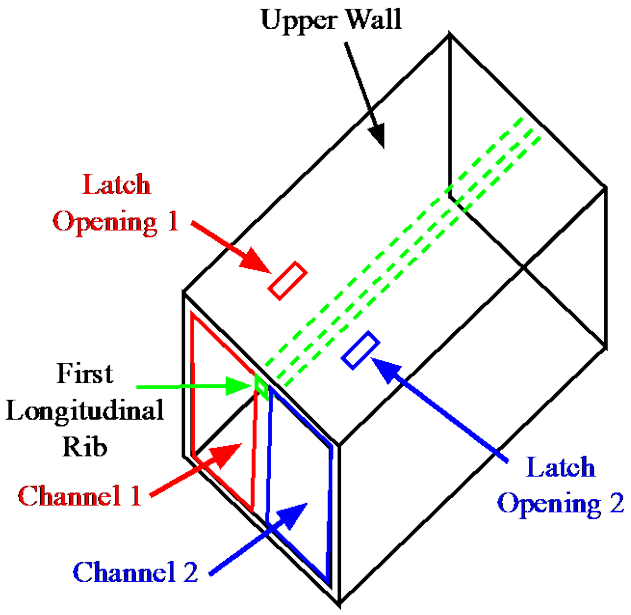
2. Dependent Claims 2-13 of the '836 Patent

88. Dependent claims 2-13 impose additional limitations on the adapter recited in independent claim 1. As shown in the claim dependency diagram above, each dependent claim depends either directly or indirectly from independent claim 1.

89. **Claim 2** depends from claim 1 and recites:

> **[2]** The adapter as set forth in claim 1, wherein the upper wall comprises a first latch opening aligned with the first channel and a second latch opening aligned with the second channel, the first rib being spaced apart between the first latch opening and the second latch opening along the width. [EX1001, 18:43-47.]

90. The two latch openings required by claim 2 can be practiced by placing two holes in the upper wall of the housing. One hole is placed over the first channel and the second hole is placed over the second channel. These two holes are illustrated on the box adapter housing below. A representation of this latch-opening limitation has been placed on the claim-dependency tree provided above.



Latch Openings Required by Claim 2.

91. **Claim 3** depends from claim 2 and recites (**emphasis added**):

[3.1] The adapter as set forth in claim 2, wherein the adapter is configured to receive a first one of the optical fiber connectors in the first channel and a second one of the optical fiber connectors in the second channel such that:

[3.2] a flexible latch arm of the first optical fiber connector is latched with the first latch opening and a front section of a remote release of the first optical fiber connector **is received in the first channel** at a location spaced apart from the first latch opening along the longitudinal axis toward the second end portion of the outer housing; and

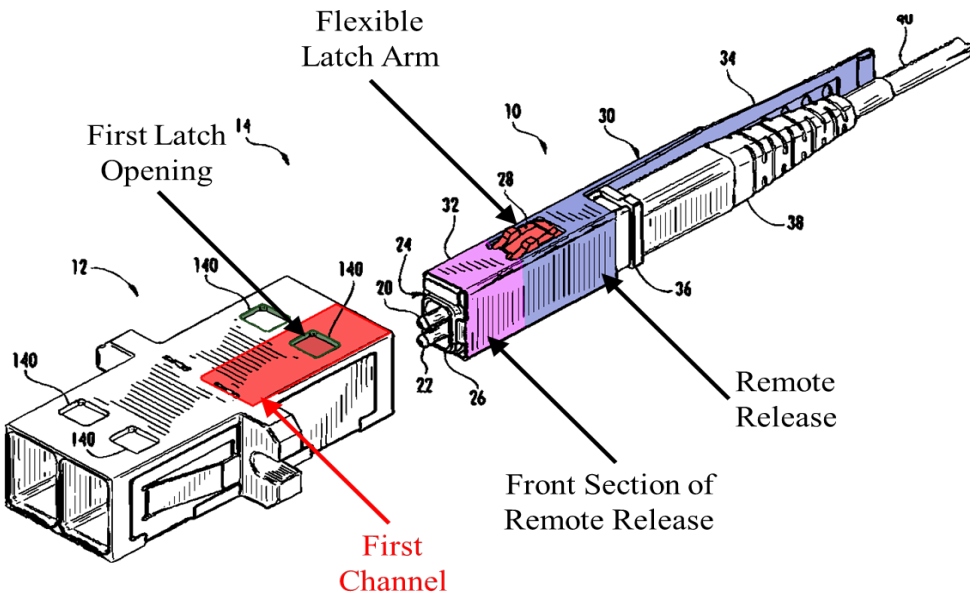
> **[3.3]** a flexible latch arm of the second optical fiber connector is latched with the second latch opening and a front section of a remote release of the second optical fiber connector **is received in the first channel** at a location spaced apart from the second latch opening along the longitudinal axis toward the second end portion of the outer housing. [EX1001, 18:48-64.]

92. As an initial matter, it appears that claim 3 is invalid because it violates Section 112 of the patent code. Specifically, a POSITA would not understand how a remote release for the *second connector*, which is placed in the *second channel*, could be received in the *first channel*. This requirement appears to pose a geometric incompatibility. There is no apparent way that a connector in the second channel could have its remote release received in the first channel because the first channel contains the first connector and its corresponding remote release. I have not performed an exhaustive analysis of this issue, so I cannot guarantee there is not some type of geometrical manipulations that can be undertaken to save this claim. However, at this point in time, the claim appears to violate Section 112 for at least the reason that the specification does not enable this claim.

93. On the other hand, I understand that patent holder may try to save this claim by arguing that there is a grammatical error in Element 3.3. Patent holder may argue that the phrase "is received in the first channel", which appears in

Element 3.3, should actually read "is received in the second channel." If this maneuver is used to salvage the claim and this argument is accepted, then my analysis below holds.

94. Note that the requirement in Element 3.1 is redundant with element 1.2. The requirement that the adapter be able to receive optical fiber connectors in two channels is already effectively required by element 1.2. Therefore, claim 3 simply adds two flexible latch arms and remote releases for each latch that are spaced apart from the latch openings along the longitudinal axis toward the second end of the housing. An example of such flexible latch arms equipped with remote releases are shown below in an annotated version of Figure 1 from a prior art reference I will refer to as Lee, and address is more detail below. A representation of this latch-and-release limitation has been placed on the claim-dependency tree provided above.



EX1006, FIG. 1 (annotated).

95. **Claim 4** depends from claim 3 and recites:

[4] The adapter as set forth claim 3, wherein the first channel is configured to allow the front section of the remote release of the first optical fiber connector to slide along the flexible latch arm of the first optical fiber connector within the first channel toward the first end portion of the outer housing to depress the flexible latch arm of the first optical fiber connector and wherein the second channel is configured to allow the front section of the remote release of the second optical fiber connector to slide along the flexible latch arm of the second optical fiber connector within the second channel toward the first end

portion of the outer housing to depress the flexible latch arm of the second optical fiber connector. [EX1001, 18:65-19:10.]

96. **Claim 5** depends from claim 4 and recites:

> **[5]** The adapter as set forth in claim 4, wherein the upper wall is configured to unlatch from the flexible latch arm of the first optical fiber connector when the flexible latch arm of the first optical fiber connector is depressed and the upper wall is configured to unlatch from the flexible latch arm of the second optical fiber connector when the flexible latch arm of the second optical fiber connector is depressed. [EX1001, 19:11-17.]

97. **Claim 6** depends from claim 2 and recites:

> **[6]** The adapter as set forth in claim 2, wherein the lower wall is free of latch openings. [EX1001, 19:18-19.]

98. **Claim 7** depends from claim 2 and recites:

> **[7]** The adapter as set forth in claim 2, wherein the lower wall is configured to slidably engage each of the first and second optical fiber connectors without latching. [EX1001, 19:20-22.]

99. **Claim 8** depends from claim 1 and recites:

[8] The adapter as set forth in claim 1, wherein the first longitudinal rib has a first height along the transverse axis and the second longitudinal rib has a second height along the transverse axis, the first height being greater than the second height. [EX1001, 19:23-20:3.]

100. **Claim 9** depends from claim 1 and recites:

[9] The adapter as set forth in claim 1, wherein each of the first and second channels opens through the first end portion of the outer housing. [EX1001, 20:4-6.]

101. **Claim 10** depends from claim 9 and recites:

[10] The adapter as set forth in claim 9, further comprising a transverse wall extending between the upper wall and the lower wall at a location longitudinally spaced apart from the first end portion of the outer housing. [EX1001, 20:7-11.]

102. **Claim 11** depends from claim 10 and recites:

[11] The adapter as set forth in claim 10, wherein the transverse wall includes a socket in each of the first and second channels configured to receive a ferrule of one of the optical fiber connectors. [EX1001, 20:12-15.]

103. **Claim 12** depends from claim 11 and recites:

[12] The adapter as set forth in claim 11, wherein the socket in each of the first and second channels comprises a pair of cylindrical sockets in each of the first and second channels, each pair of sockets configured to receive a pair of cylindrical ferrules of one of the optical fiber connectors. [EX1001, 20:15-19.]

104. **Claim 13** depends from claim 1 and recites:

[13] The adapter as set forth in claim 1, wherein each of the optical fiber connectors is a multi-fiber connector comprising a multi-fiber ferrule. [EX1001, 20:20-22.]

105. The multi-fiber ferrule required by claim 13 was commonplace at the time the '836 was filed. For example, US 10,156,684 to Nguyen shows a multi-fiber ferrule in its ferrule holder 300 in FIG. 5C, which is reproduced below. A representation of this multi-fiber ferrule has been placed on the claim-dependency tree provided above.

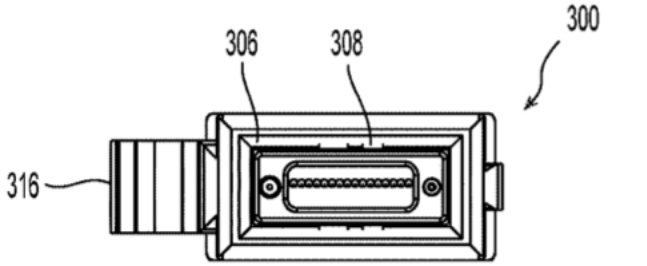


Fig. 5C

EX1005, FIG. 5C.

D. Discussion of Certain Embodiments

106. All 13 of the claims in the '836 patent are directed to "An adapter for mating with optical fiber connectors." [EX1001, Claim 1.] The '836 Patent includes 28 figures, many of which are not directed to adapters. Rather, they are directed at entirely different embodiments of fiber optic *connectors*, aspects of the release assembly, and the fiber optic cable assemblies. [*See generally* EX1001, 4:3-6:6, FIGs. 1-28.] The claimed adapters are only illustrated in FIGs. 25-28 and discussed in columns 12 to 16 of the specification. [EX1001, 12:8-16:16.]

107. Although I have reviewed and considered the full specification and each of the disclosed embodiments in the '836 Patent, it appears to me the adapter embodiments in Figures 25-28 and the connector remote release tabs in Figures 23-24 are the most pertinent for the claims in the '836 Patent. I believe FIGs. 23-28 were first added to this family of applications in U.S. Pat. App. No 17/375,856 filed on July 14, 2021 (the patent that issued to become the '836 patent). Therefore, I will discuss these figures, and the corresponding textual disclosures in the specification, in more detail.

108. Figures 25-28 are reproduced here for convenience.

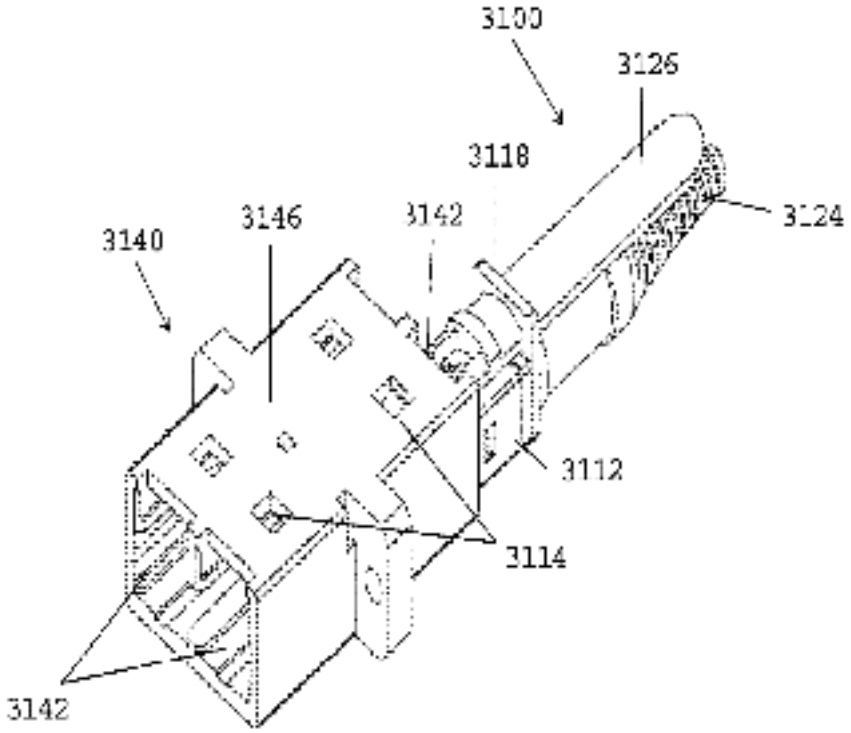

3100
3126
3118
3146
3142
3124
3140
3112
3114
3142

FIG. 25

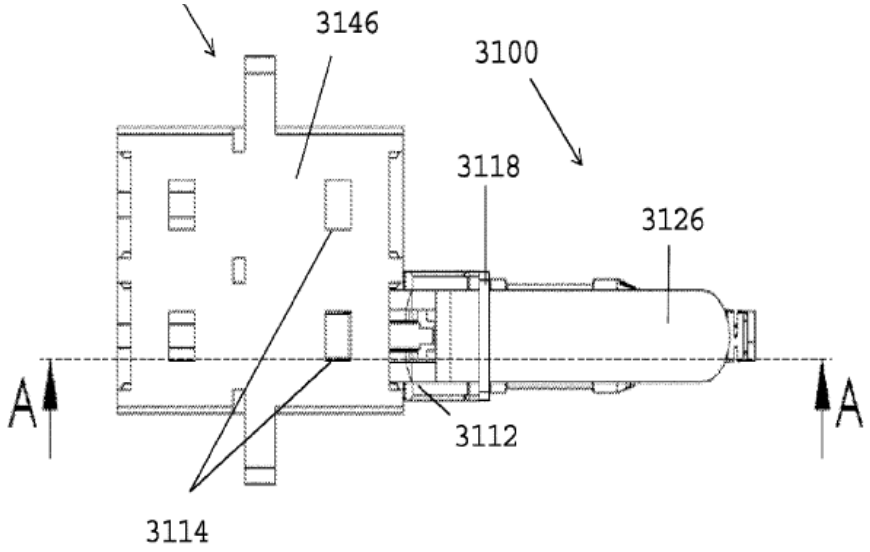

3146
3100
3118
3126
A
A
3112
3114

FIG. 26

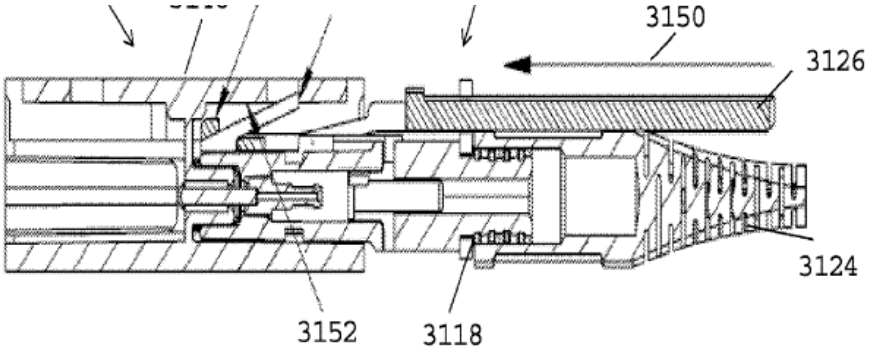


FIG. 27

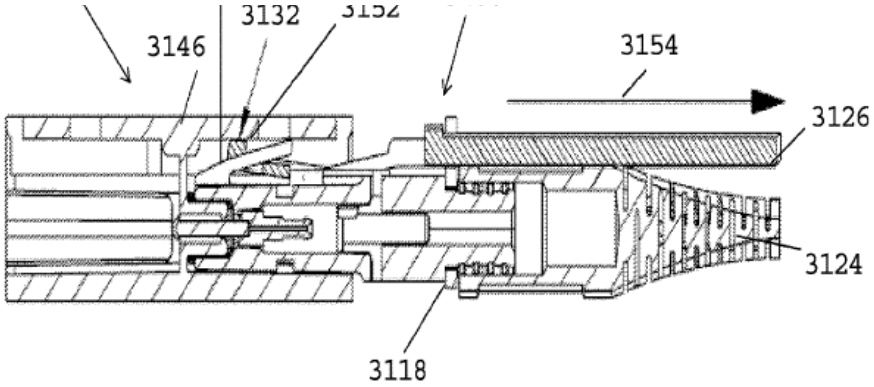


FIG. 28

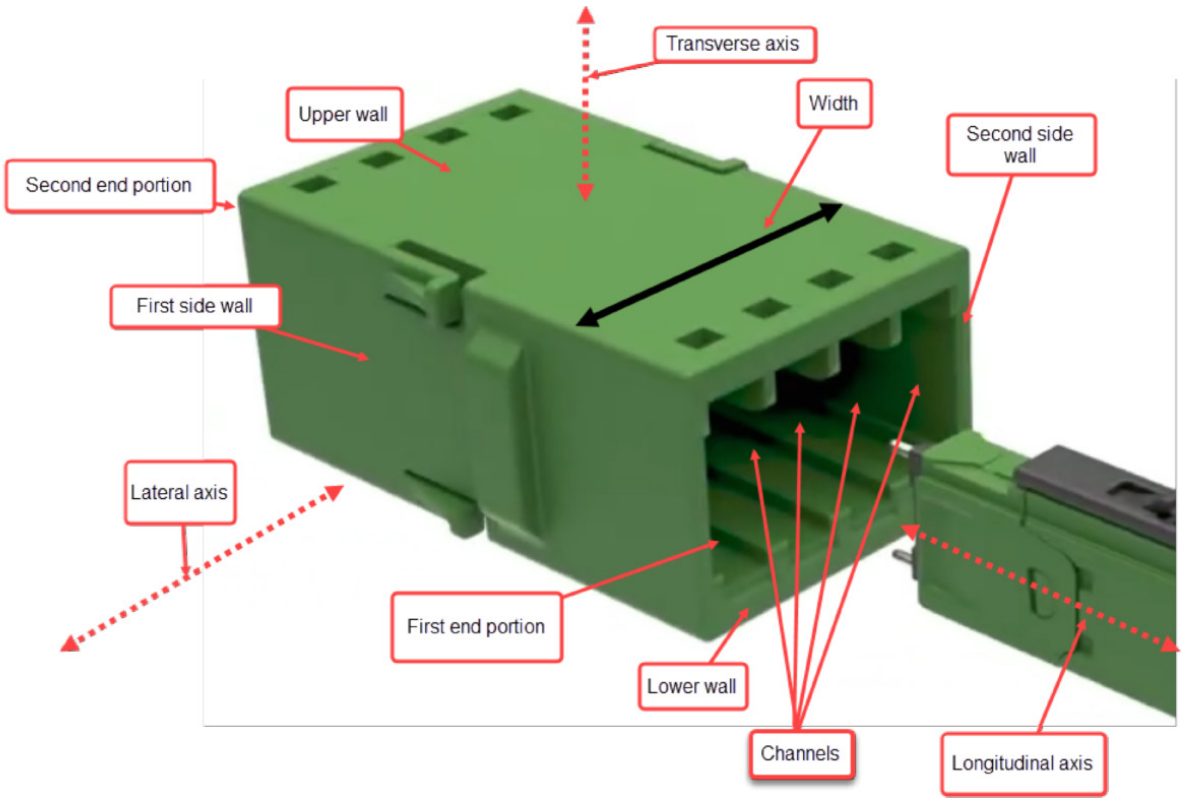
EX1001, FIGs. 25-28.

109. FIGs. 25-28 show an embodiment involving an adapter 3140 coupled to a connector assembly 3100. [EX1001, 15:35-16:16.] The patent explains the "adapter may have a plurality of channels 3142 configured to receive connectors"

and "openings 3144 configured to engage the latch arm 3111 of the connector assembly 3100." [*Id.*, 15:36-40.]

110. I do not see any other figures of the '836 Patent that illustrates an adapter embodiment.

111. I have reviewed the Complaint filed by Patent Owner (Senko Advanced Components) asserting Petitioner (US Conec) infringes the '836 Patent. In particular, I have reviewed Exhibit J of the Complaint. [*See* EX1016.] I note that Patent Owner has mapped the language of the claims of the '836 patent onto an accused adapter as shown below.



EX1016, 2[1] (showing how Senko mapped the claim language onto an allegedly illustrative adapter in the copending litigation).

112. Based on my reading of the claim language and my interpretation of Figure 25, it appears to me that Figure 25 of the '836 patent aligns with the components recited in claim 1 as follows:

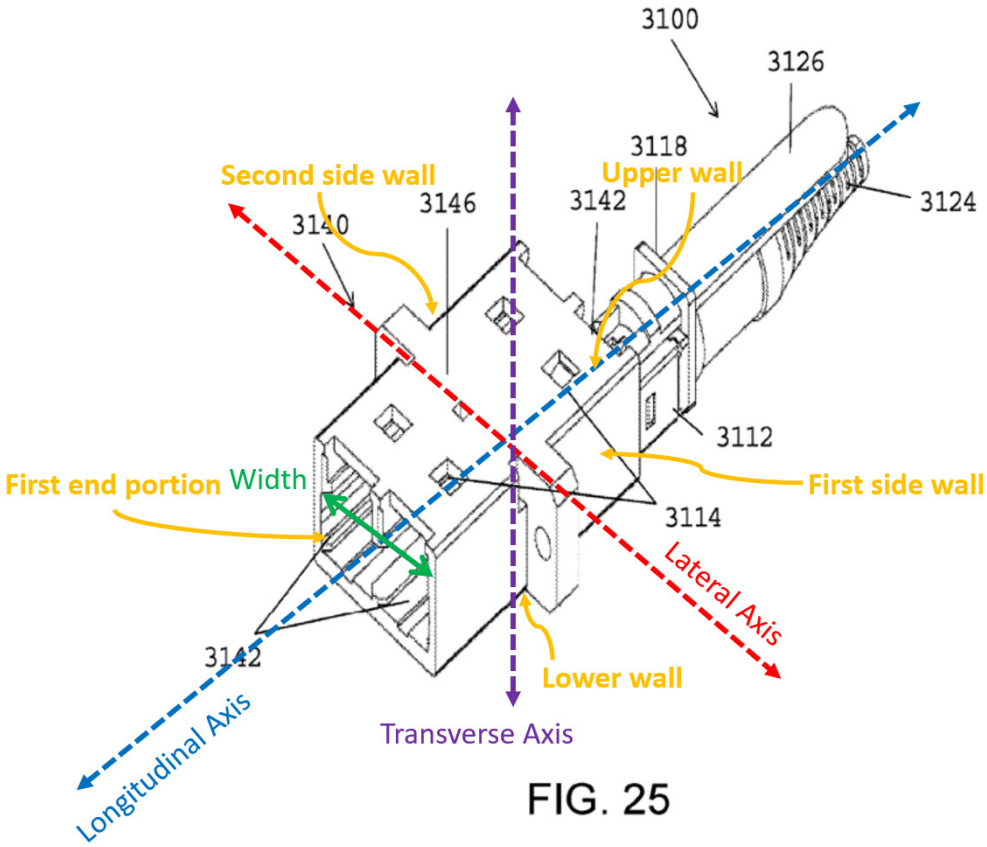


FIG. 25

EX1001, FIG. 25. (I note that my mapping of the claim language onto Figure 25 is consistent with how Patent Owner mapped the same claim language onto the illustrative adapter in the copending litigation.)

[1] All color annotations to the figures throughout this Declaration are added.

VI. CLAIM CONSTRUCTION

113. I understand that in interpreting claims, I should consider the literal language of the claim at issue, as well as the language of other claims, the specification, and the prosecution history of the underlying claims.

114. I also understand that the words of a claim should be given their plain and ordinary meaning as understood by those of skill in the art, unless it is clear from the specification or prosecution history (or both) that a different meaning was intended.

115. I understand that Petitioner does not propose any particular claim constructions. I agree that no express constructions are necessary to determine that the prior art discussed below establishes all of the elements recited in the claims.

116. Accordingly, I have given all terms their plain and ordinary meaning as understood by those of skill in the art at the relevant times for all of my opinions rendered herein. For purposes of my opinion, the relevant times are from approximately 2017 to 2021. None of the meanings of the claim terms material to my opinions would change depending on whether they were analyzed as of 2017 or 2021.

VII. PRIOR ART

A. Overview of the Interface Specification for the MDC Receptacle

117. The Interface Specification for the MDC Receptacle is a commercial whitepaper that defines the MDC optical connector interface for receptacles to be

used in QSFP-DD and SFP-DD module applications, which are well-known commercial products manufactured and sold by US Conec. This particular publication is dated January 30, 2019. The document states on its face that it is being provided confidentially to members of the QSFP-DD and SFP-DD multi-source agreements. However, I understand that it is available to the general public. [*See generally* EX1015.] I also understand that the QSFP-DD and SFP-DD multi-source agreements include 63 companies and organizations (including Patent Owner) representing most individuals having interest and ordinary skill in the relevant art. [*See, e.g.*, EX1025.] The relevance of this, and similar whitepapers, were well known in the art and would have been readily located and accessible to any interested member of the public. [*See* EX1026; EX1027.]

118. I further understand that the MDC Receptacle Specification was made publicly available on the QSFP-DD MSA website as of February 6, 2020. Accordingly, the MDC Receptacle Specification qualifies as prior art at least as of that date assuming that the ’836 patent is properly assessed based on its accorded filing date of July 14, 2021.

119. The document discloses an MDC receptacle, a kind of fiber optic connector adapter that receives up to four two-fiber optical connectors. The four channels in which the connectors are received are separated by longitudinal ribs, and the adaptor includes latch openings that receive flexible latch arms configured

with remote releases, as shown below in Figures 3.1 and 3.2 of the MDC Receptacle Specification.

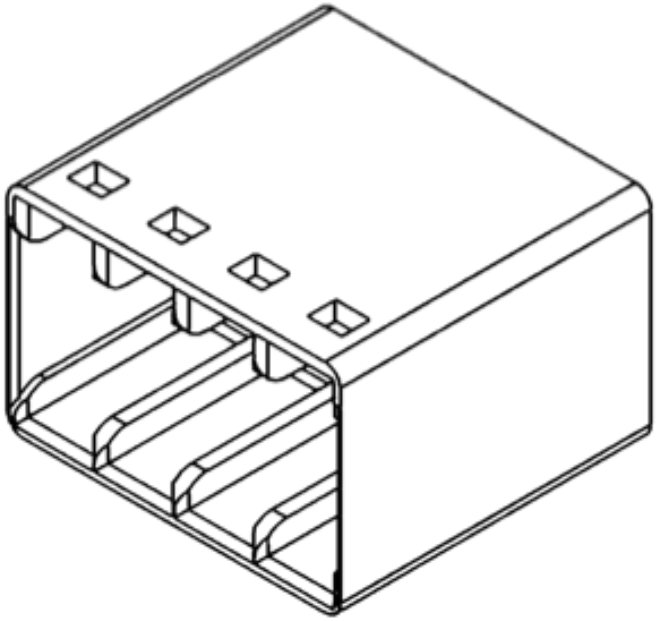


Figure 3.1: MDC Receptacle for QSFP-DD Module Applications

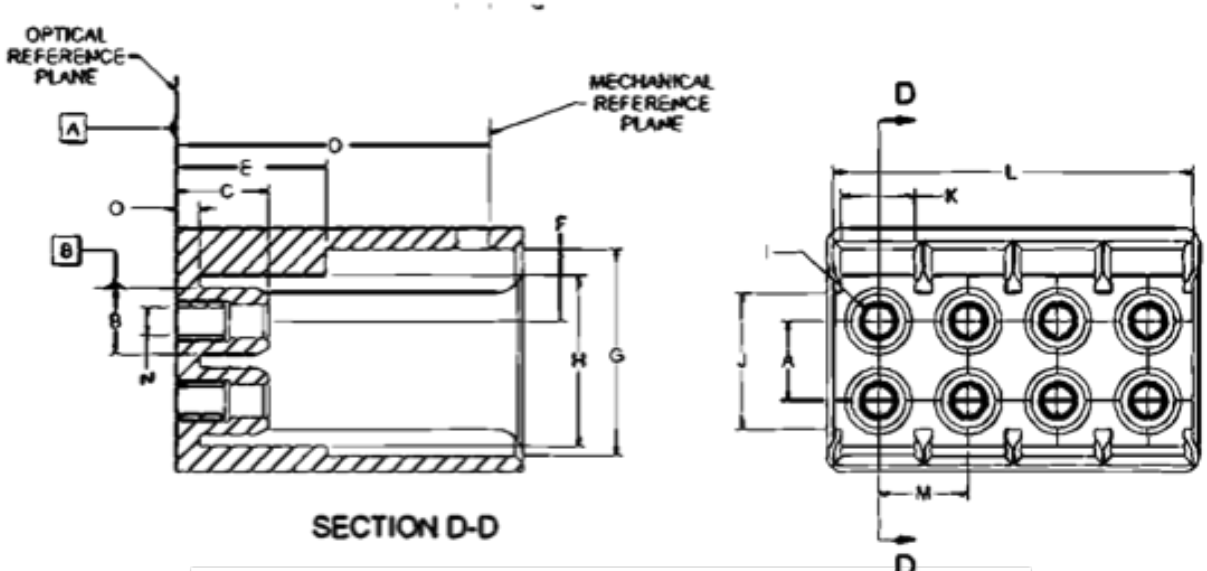


Figure 3.2 – MDC Receptacle Interface (QSFP-DD)

EX1015, MDC Receptacle Interface Specification, FIGs. 3.1-3.2.

B. Overview of Nguyen

120. U.S. Patent Application Publication No. U.S. 2016/0161680 (hereinafter "Nguyen") is titled "Alignment Adapter and Alignment Design for a Connector Therefor." [Nguyen, cover.] Hiep Nguyen, Darrell Childers, Michael Hughes, Jillcha Wakjira, and Joseph Howard are named inventors, and U.S. Patent Application Publication No. U.S. 2016/0161680 published on June 9, 2016. Nguyen is based on U.S. Patent Application No. 14/214,931, which was filed on March 15, 2014. Nguyen claims benefit to U.S. Provisional Application No. 61/789,499 filed on March 15, 2013. [Nguyen, cover.]

121. I understand that Nguyen is prior art to the '836 Patent based on my discussion of the legal standards above and discussions with counsel. In particular, I understand that Nguyen has a filing date prior to the earliest possible priority date of the '836 Patent (January 30, 2017), and so Nguyen qualifies as prior art at least for this reason. I also understand that Nguyen published on June 9, 2016—about six months prior to the earliest possible priority date for the '836 Patent—and so Nguyen also qualifies as prior art for this reason.

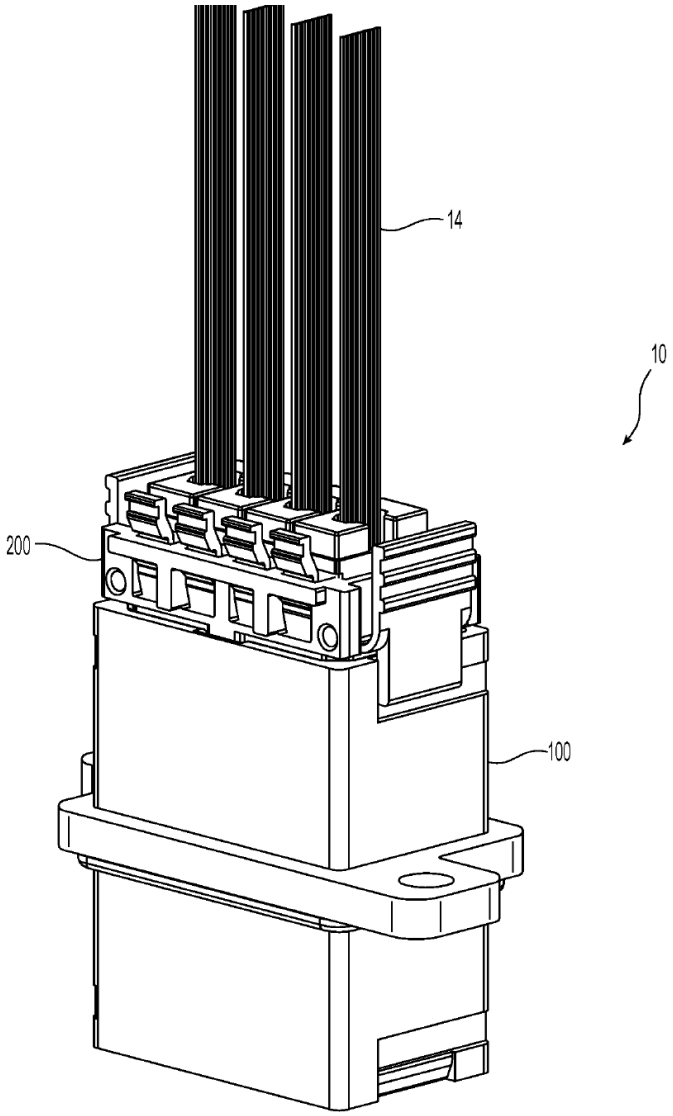
122. Nguyen generally describes an adapter for aligning ferrule holders. [Nguyen, ¶4.] Nguyen explains its invention also relates to "an adapter for aligning fiber optic ferrules inserted from opposing sides," "a ferrule holder," and "a fiber

optic connector that includes a plurality of ferrule holders." [Nguyen, ¶¶5, 7, and 8.]

123. Nguyen explains that fiber optic connectors are needed for fiber optic ferrules that are ganged together with a tight pitch to allow for many fiber optic ferrules to be connected simultaneously while occupying less space. [Nguyen, ¶2.] Nguyen explains that "[t]ypically, these ganged fiber optic ferrules are mounted into a single housing and the housings are then mated to one another" and require complex and tight alignment tolerances between a pair of mated ferrules. [Nguyen, ¶2.] "By requiring a tight tolerance of the housing relative to the fiber optic ferrules, the designs are expensive to design, maintain, and to scale various fiber optic ferrule counts." It is similarly difficult to scale very large arrays of fiber optic ferrules within one housing. [Nguyen, ¶2.]

124. Therefore, I believe a POSITA would understand Nguyen to articulate a goal of designing an adapter capable of easily connecting and aligning large arrays of optical fiber connectors.

125. Nguyen discloses an adapter assembly 10 in Figures 1 and 2, which have been reproduced below for convenience. Figure 1 shows an assembled view, while Figure 2 shows an exploded view of the adapter.



Nguyen FIG. 1.

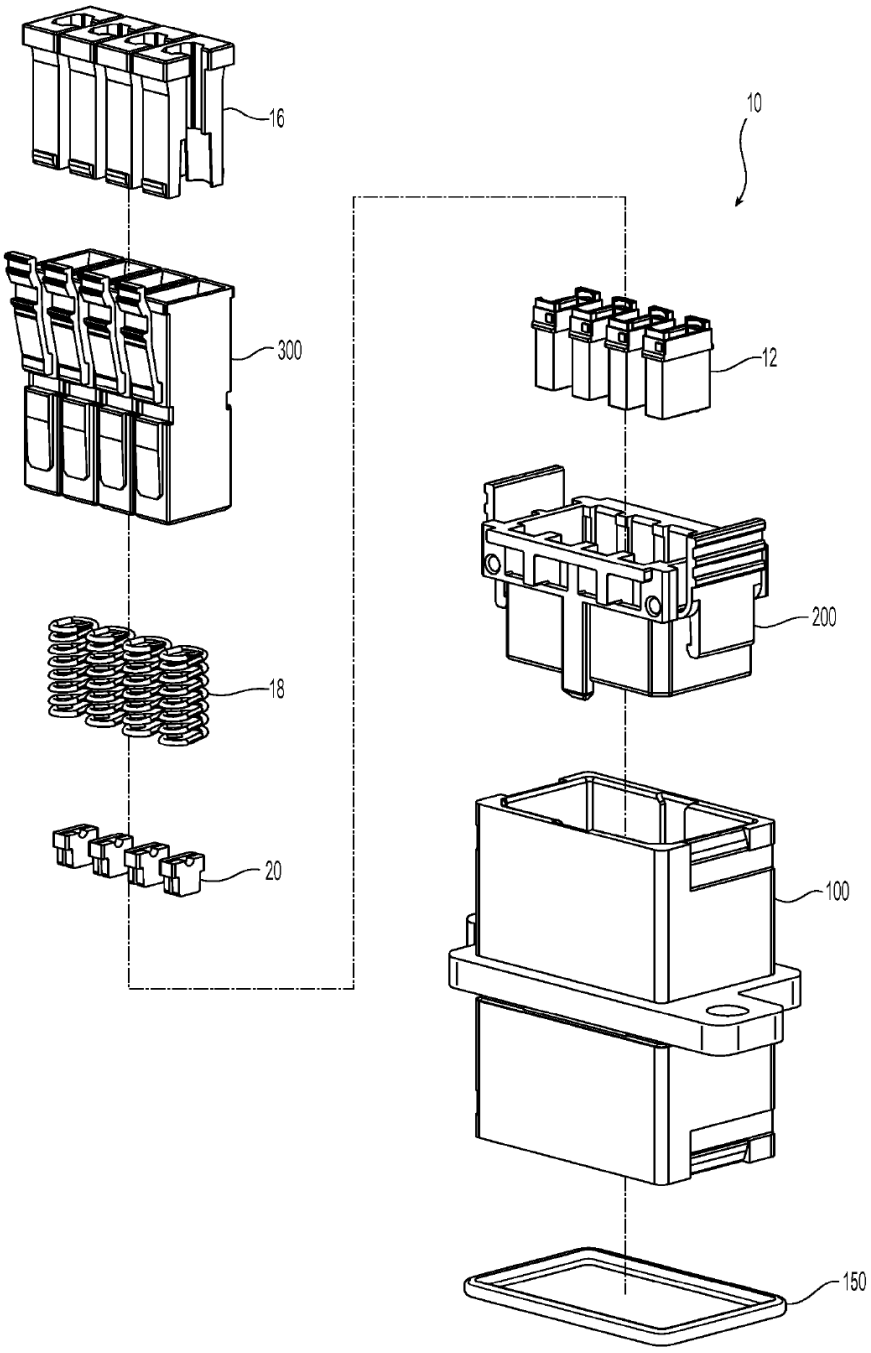


Fig. 2

Nguyen FIG. 2.

126. The adapter assembly 10 "is used to align ferrules 12 to other ferrules in a tightly controlled manner and in a tighter space than has been possible before."

[Nguyen, ¶26.] As shown above in Figure 1, the adapter assembly 10 includes an adapter 100, a plug 200, and a ferrule holder 300. The ferrules 12 and the optical fibers 14 are disposed within the ferrule holders 300. The ferrule holders 300 are inserted into the plug 200. [Nguyen, ¶26.] The plug 200 with the ferrule holders 300 is inserted into the adapter 100. [Nguyen, ¶30.] "The ferrules 12 are held somewhat loosely within the ferrule holder 300 so that they can move relative to the ferrule holder 300 to align with other ferrules 12 that are inserted in the adapter 100 from the other side." [Nguyen, ¶26.]

127. As shown below, FIG. 3 of Nguyen illustrates a perspective cut-away view of adapter 100.

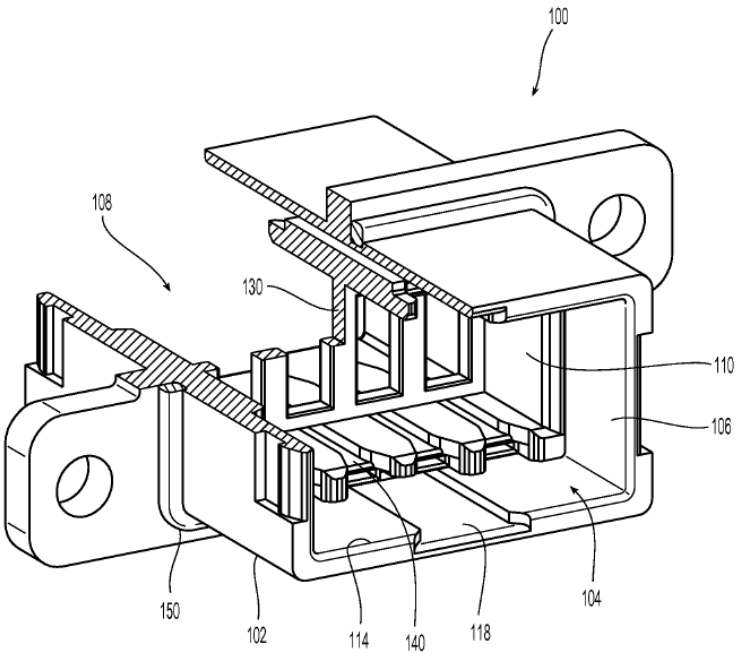


Fig. 3

Nguyen, FIG. 3.

128. Figure 3 illustrates "a wall 130 that extends across the opening 104 in the adapter 100 and divides the center portion 110 in half." [Nguyen, ¶33.] "The wall 130 has a plurality of openings 136 that are sized to allow the ferrules 12 to pass therethrough to engage a corresponding ferrule 12." [Nguyen, ¶33.] Nguyen's FIGs. 6A and 6C, reproduced below for convenience, show a perspective and front elevation view of the plug 200 and ferrule holders 300. [Nguyen, ¶¶18 and 20.]

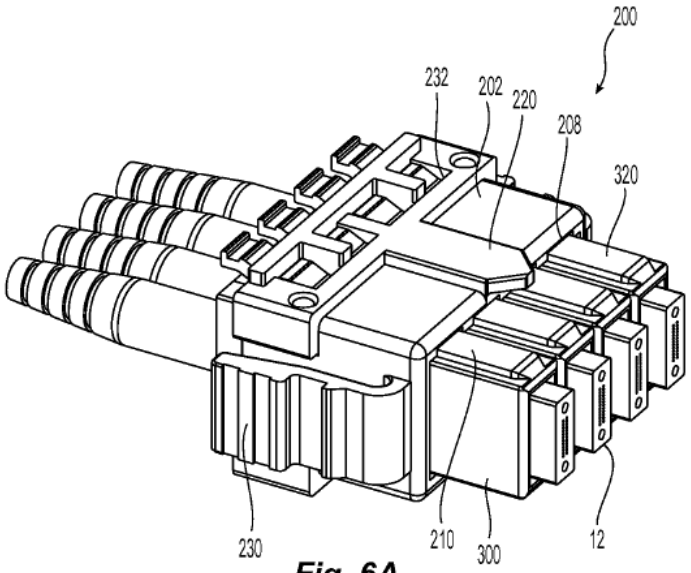


Fig. 6A

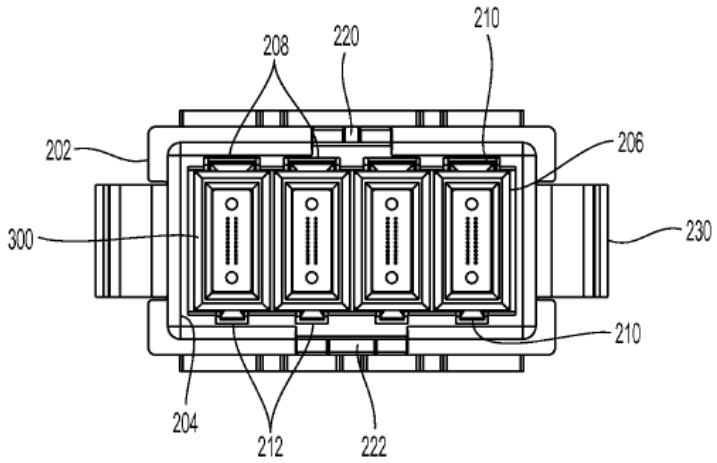


Fig. 6C

Nguyen, FIGs. 6A, 6C.

129. Nguyen explains "[a]s the plug 200 with the ferrule holders 300 positioned therein are inserted into the adapter 100, the projections 220, 222 from the plug 200 engage the grooves 116, 118 on the top surface 112 and the bottom surface 114 to roughly align the ferrule holders 300 with the center portion 110 and the plurality of grooves 140 in particular." [Nguyen, ¶35.] "As the plug 200 is inserted farther into the adapter 100, the projections 320, 322 from the ferrule holders 300 engage plurality of grooves 140, 142 to align the ferrule holders 300 with the adapter and the openings 136 in the wall 130." [Nguyen, ¶35.] Nguyen also explains that "projection 220 has a width that is different than the width of projection 222 so as to act as a key in inserting the plug 200 into the adapter 100." [Nguyen, ¶29.] Nguyen also explains "[t]he plug 200 also has two cantilevered

latches 230 on the sides to engage corresponding structure on the adapter 100" and "latch receptacles 232 on the top side of the plug 200 to engage the latches 316 of the ferrule holders 300." [Nguyen, ¶29.]

130. As shown below, Nguyen Figures 5A-5C illustrate an embodiment of a ferrule holder 300. As Figure 5c clearly shows, the Nguyen "ferrules 12 are typically multi-fiber ferrules."

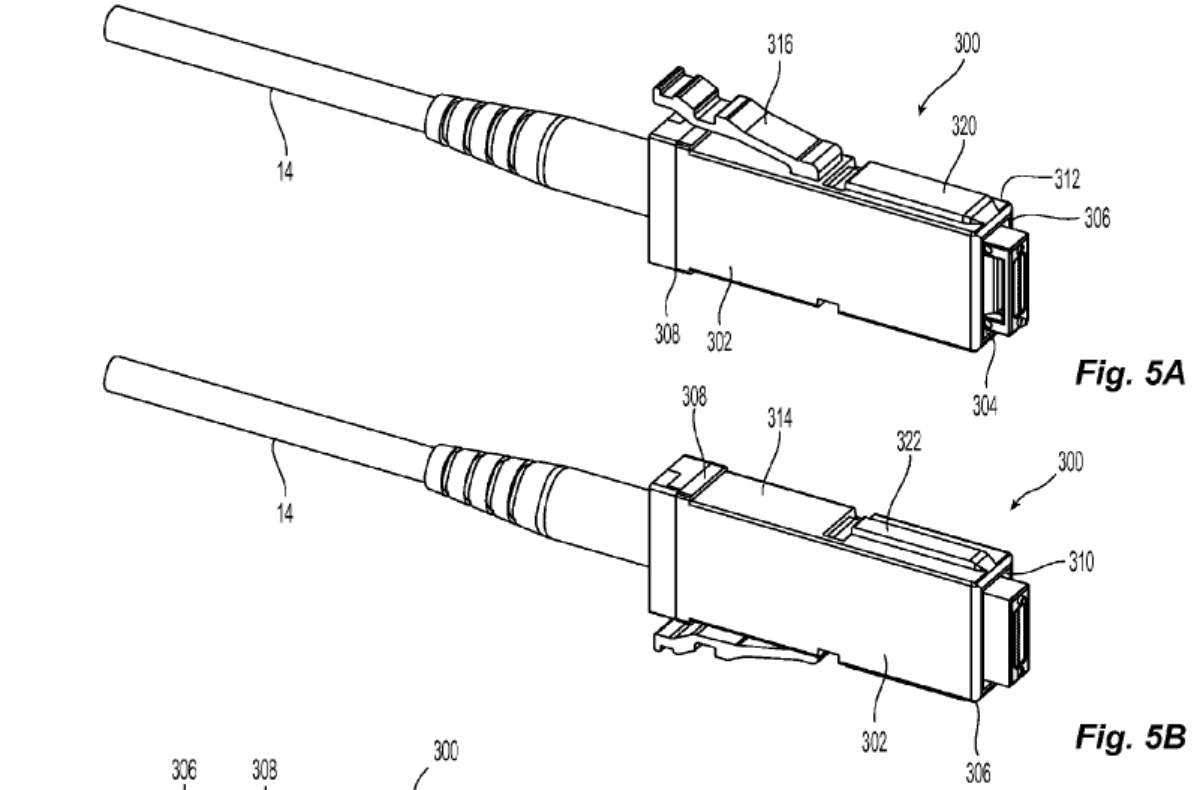


Fig. 5A

Fig. 5B

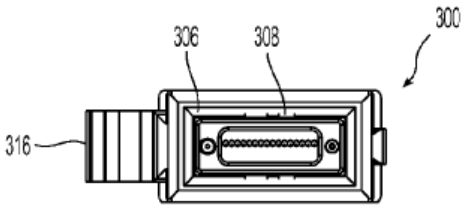


Fig. 5C

Nguyen, FIGs. 5A-5C.

131. Nguyen explains that "the ferrule holder 300 has a main body 302 with a central opening 304 that extends from a first end 306 to a second end 308 to house the fiber optic ferrules 12." [Nguyen, ¶27.] "[T]he ferrule holder 300 has a top surface 312 and a bottom surface 314, with a cantilevered latch 316 to engage the plug 200." [Nguyen, ¶27.] "The top surface 312 has a projection 320 and the bottom surface 314 has a projection 322." [Nguyen, ¶27.] "The projections 320, 322 are used to engage grooves in the plug 200 and the adapter 100 to position the ferrule holders 300 with precision in the adapter 100" and "projection 320 has a width that is different than the width of projection 322 so as to act as a key in inserting the ferrule holder 300 in the plug 200." [Nguyen, ¶27.]

132. In operation, Nguyen's adapter assembly 10 is assembled by attaching the adapter 100 and plug 200 to one another, which together receive one or more ferrule holders 300. [Nguyen, ¶¶26-28, 31, FIGs. 1, 2.] The adapter assembly include grooves, projections, and channels to allow ferrules 12 contained in ferrule holders 300 to align with ferrules placed into the opposite side of the adapter assembly 10. [Nguyen, *See, e.g.*, ¶26, FIGs. 1, 2.]

C. Overview of Lee

133. International Publication No. WO 2017/127208 is titled "Fiber Optic Connector with Small Profile, and Cable Assemblies, Systems, and Methods Including the Same." [Lee, cover.] The only named inventor is Jhih-Ping Lee, and

International Publication No. WO 2017/127208 A1 (hereinafter "Lee") published on July 27, 2017. Lee is based on International Application No. PCT/US2016/067809, which was filed on December 21, 2016. Lee claims benefit to two U.S. provisional patent applications – U.S. Provisional Application No. 62/388,129 filed on January 20, 2016, and U.S. Provisional Application No. 62/398,673 filed on September 23, 2016. [Lee, cover.]

134. I understand that Lee is prior art to the '836 Patent based on my discussion of the legal standards above and discussions with counsel. In particular, I understand that Lee has a filing date prior to the earliest possible priority date of the '836 Patent (January 30, 2017), and so Lee qualifies as prior art at least for this reason.

135. Lee generally describes fiber optic connectors suitable for use in, for example, data centers. [Lee, ¶2.] Lee further discloses a fiber optical connector system with an adapter and the fiber optical connector. [Lee, ¶29.]

136. Lee explains that connectors are typically provided on the ends of optical fiber cables to conveniently provide connections for data transmission. [Lee, ¶3.] Lee further describes that "[t]he connectors are designed to be received in ports that align the optical fiber(s) carried by connectors with the optical fiber(s) of other connectors or with equipment (e.g., transceivers) so that data can be transmitted between components." [Lee, ¶3.]

137. Lee explains that a desire for high bandwidth tends to drive a need for a high-density of interconnects. [Lee, ¶4.] Lee identifies that it "can be a challenge, however, to design fiber optic connectors [capable] of providing high-density interconnects" because, *e.g.*, "[t]he fiber optic connectors often become more difficult to handle and less robust as components are made smaller." [Lee, ¶4.]

138. Therefore, I believe a POSITA would understand Lee to articulate a goal of designing small interconnects that provide sufficient robustness and handleability (*e.g.*, the ability to be easily removed and installed).

139. Pertinent to my analysis below, Lee discloses a fiber optic connector 10 and an adapter 12 and illustrates this fiber optic connector system 14 in Figure 1, which is reproduced below for convenience.

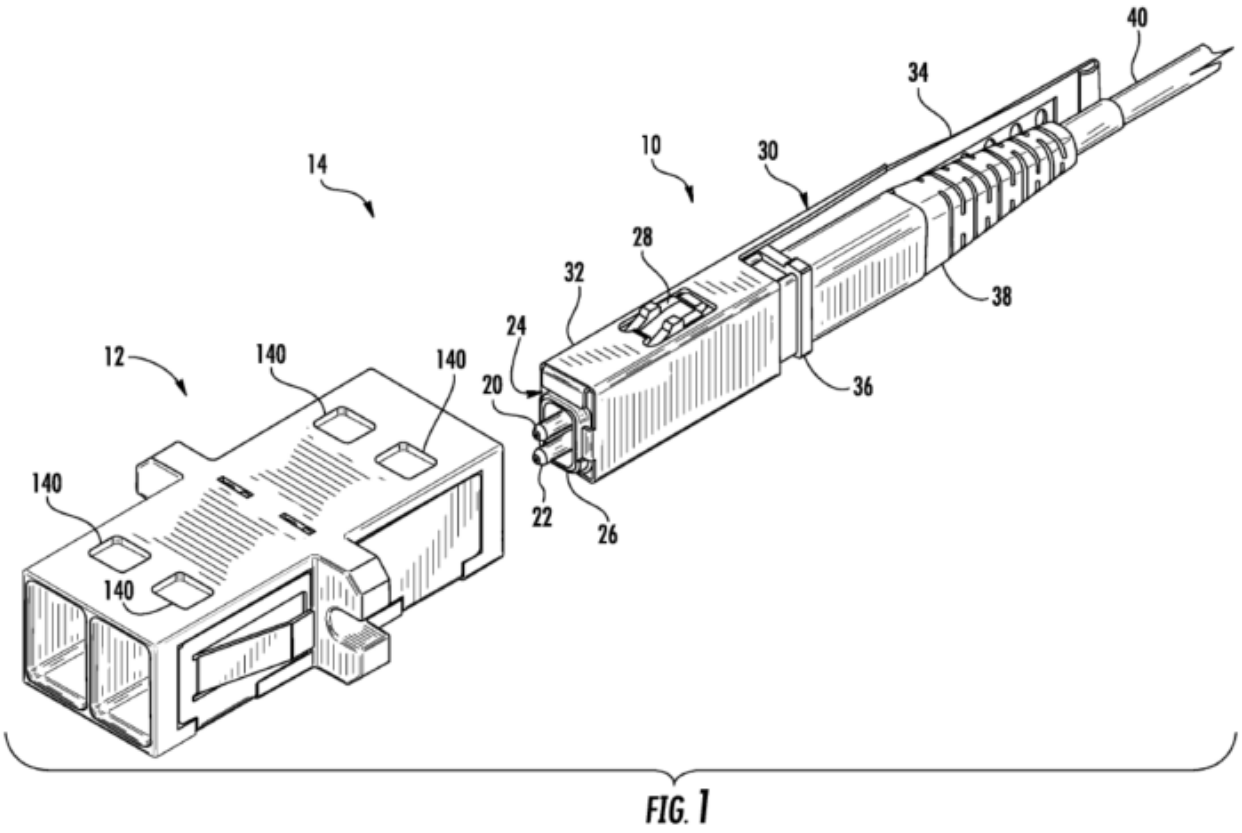


FIG. 1

Lee, FIG. 1.

140. The fiber optic connector 10 "is designed to have a small profile and thereby enable high-density interconnects." [Lee, ¶29.] As shown in FIG. 1, the fiber optic connector 10 includes a first ferrule 20 and a second ferrule 22 exposed at a front end 26 of the fiber optic connector 10 for mating with the adapter 12. [*See id.*, ¶30.] "The first and second ferrules 20, 22 in an embodiment shown are cylindrical." [*Id.*, ¶36.] The fiber optic connector 10 includes an inner connector body 24 and a latch arm 28 that extends upward from the inner connector body 24. [*Id.*, ¶30.]

141. The fiber optic connector includes a handle 30, which includes a housing portion 32 that houses the inner connector body 24. [*Id.*, ¶30.] The handle 30 includes "a grip portion 34 extending rearward from the housing portion 32." [*Id.*, ¶30.] Lee explains "the handle 30 can move relative to the inner connector body 24 so that the housing portion 32 can cause the latch arm 28 to flex toward the inner connector body 24." [*Id.*, ¶30.]

142. As can also be seen in FIG. 1, the fiber optic connector 10 includes an outer connector body 36, which is "coupled to the inner connector body 24 within the housing portion 32 of the handle 30." [Lee, ¶30.] "A boot 38 is coupled to the outer connector body 36 outside of the housing portion 32." [Lee, ¶30.]

143. As shown below, FIG. 2 of Lee illustrates an exploded view of the fiber optic connector 10.

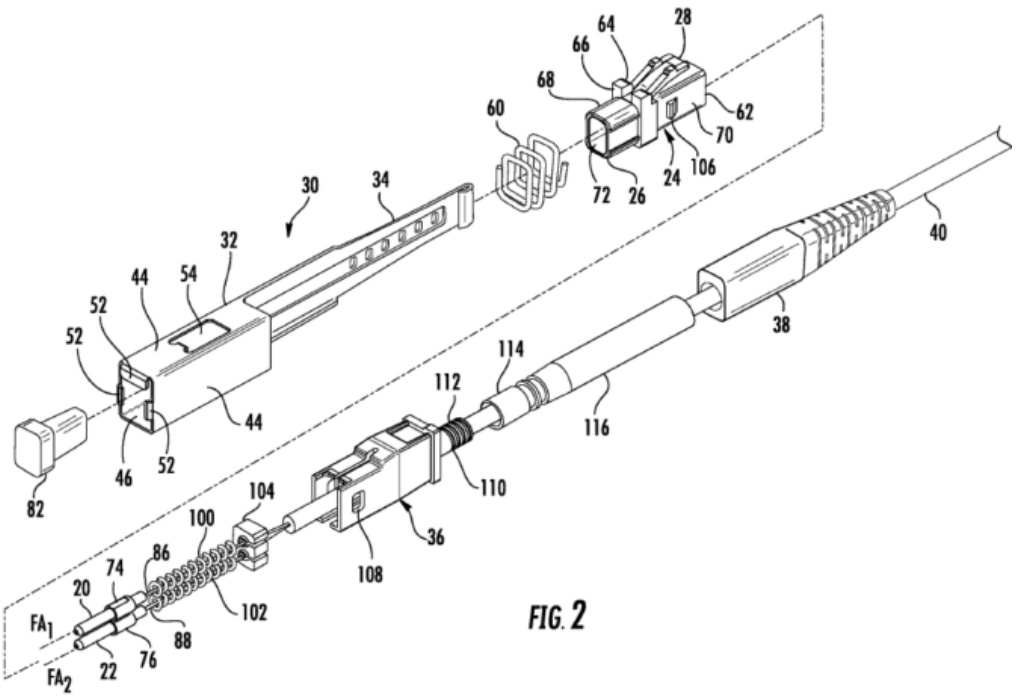


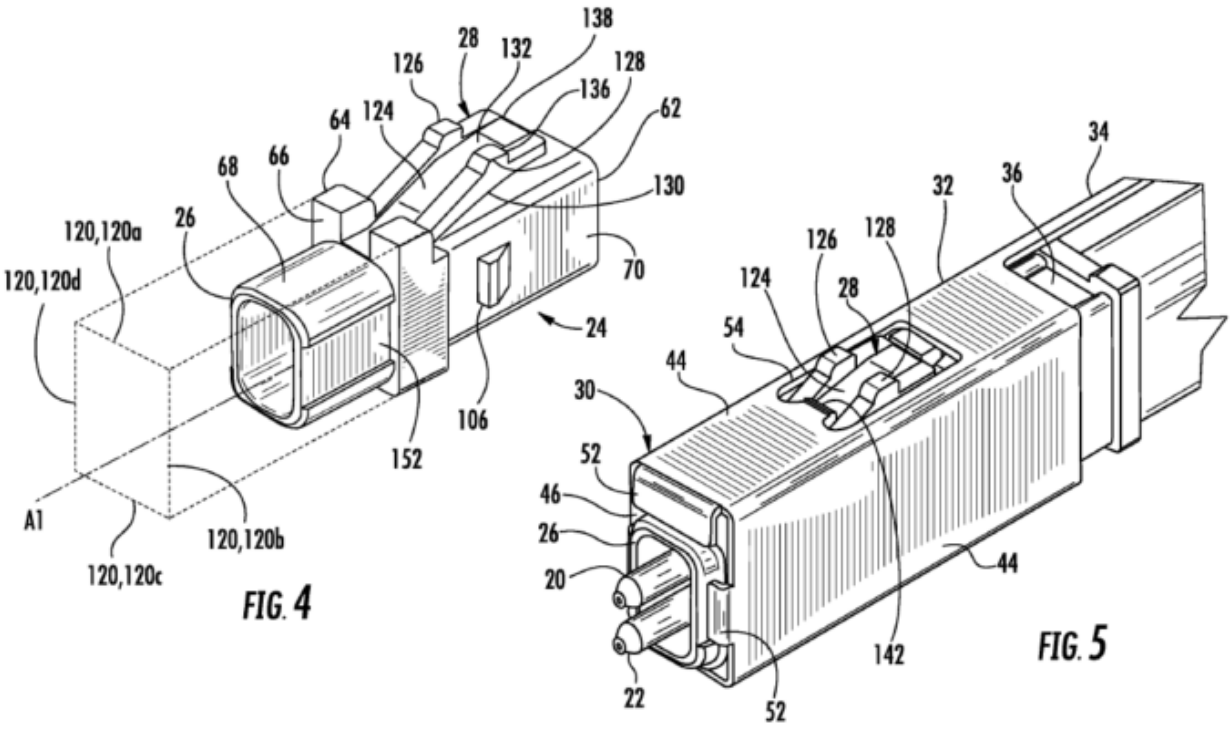
FIG. 2

Lee, FIG. 2.

144. FIG. 2 illustrates "the housing portion 32 of the handle 30 is in the form of a tubular body having a rectangular profile defined by sides 44." [Lee, ¶31.] "Additionally, one of the sides 44 includes an opening 54 through which the latch arm 28 extends when the inner connector body is received in the housing portion 32 (see Fig. 1)." [*Id.*] As can be seen from looking at Figures 1 and 2 in conjunction with one another, the latch arm 28 of the inner connector body 24 is positioned to protrude through the opening 54 of the handle 30. Further, the inner connector body 24 is connected to the outer connector body 36. [*See id.*, ¶¶38-39.] For example, Lee discusses that the inner and outer connector bodies 24, 36 may

be coupled together "in any suitable manner," such as snapping together, latching together, and/or coupled by springs. [*See id.*]

145. Lee shows enlarged perspective views of the optical connector in Figures 4 and 5, provided below, to help further illustrate and describe "how the handle 30 cooperates with the inner connector body 24." [Lee, ¶40.]



Lee, FIGs. 4-5.

146. Lee explains that the latch arm 28 has particular dimensions (*e.g.*, the ramp 124 and first and second latching features 126) that allow the latch arm 28 to protrude through the opening 54 and then to be depressed when the handle 30 is pulled rearward. [*See* Lee, ¶¶42-47.]

147. Further, Lee discloses that the housing portion 32 of the handle 30 includes a pushing feature 142 "for contacting the latch arm 28." [*Id.*, ¶47.] Lee explains that in the embodiment shown in Figure 5, "the pushing feature 142 is in the form of a finger extending into the opening 54." The pushing feature 142 includes a rounded surface 144 (as best seen in Figure 3 below). This rounded surface 144 is configured to depress the latch arm 28 by contacting the ramp 124 of the latch arm 28.

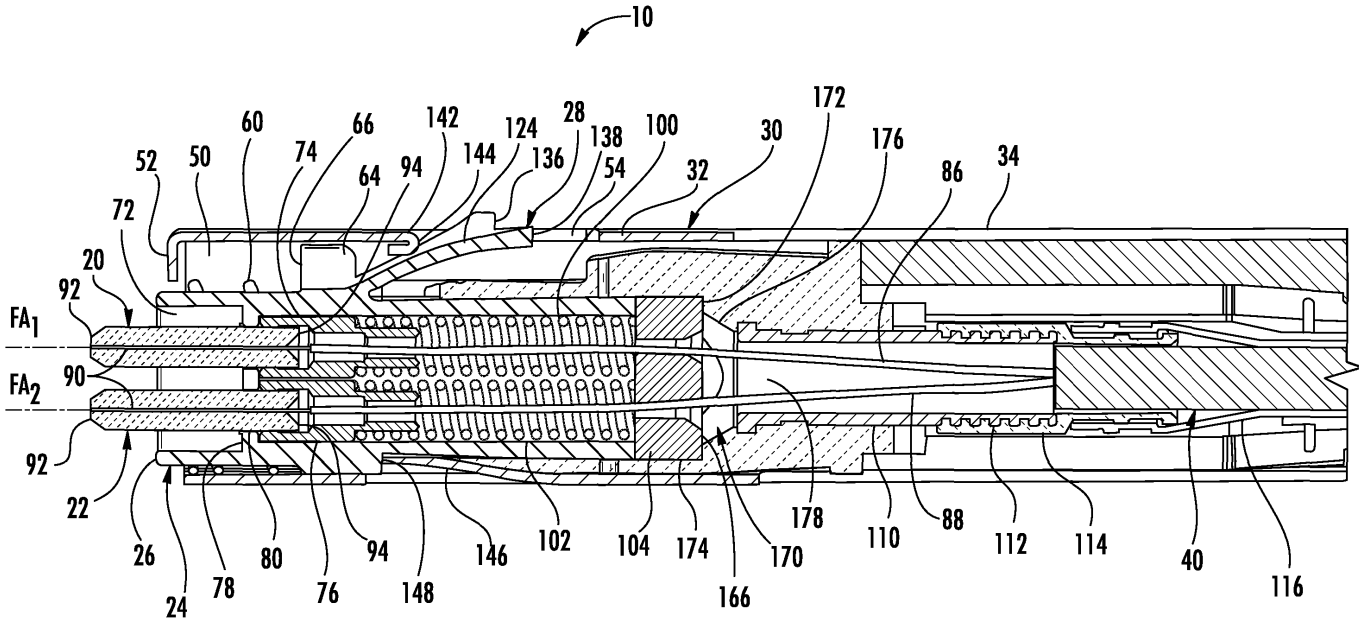


FIG. 3

Lee, FIG. 3.

148. As shown below, Figure 8 of Lee illustrates an exploded view of the adapter 12.

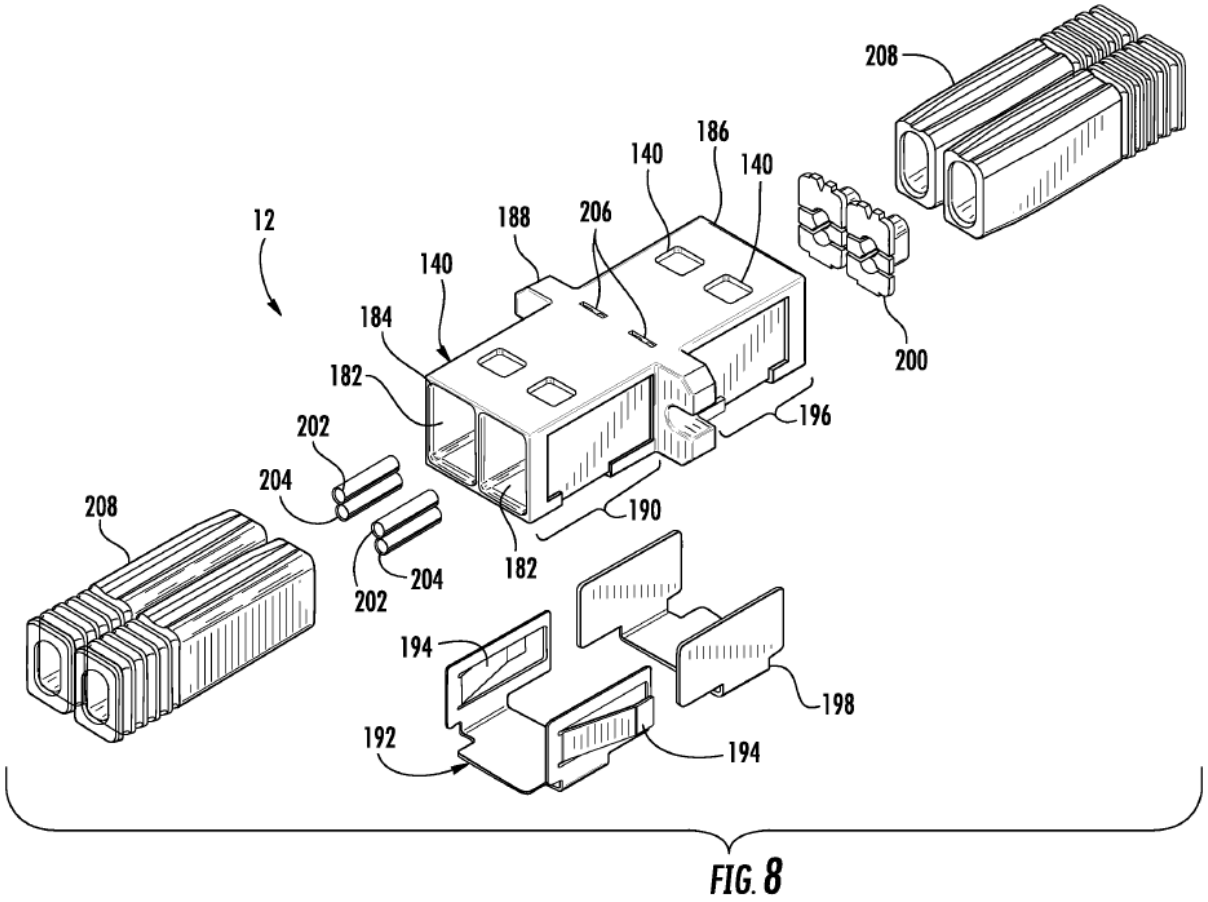
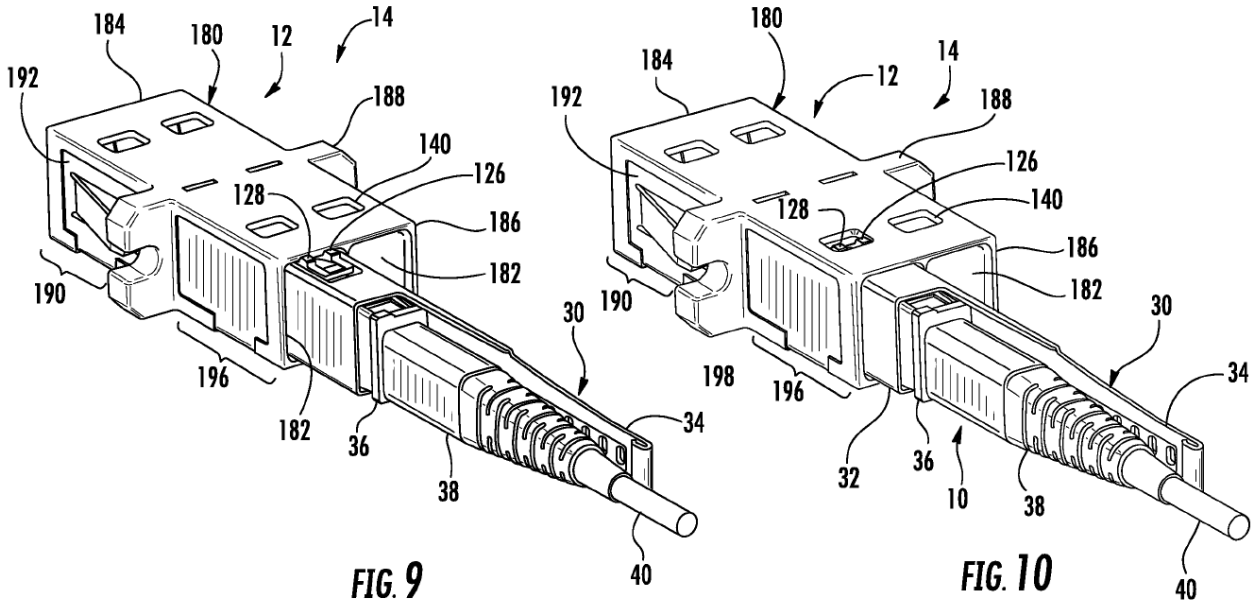


FIG. 8

Lee, FIG. 8.

149. Lee's adapter 12 may include among other things "at least one sleeve holder 200 configured to position first and second sleeves 202, 204 in each of the ports 182." [Lee, ¶62.] "The first and second sleeves 202, 204 that are positioned by the sleeve holders 200 are used to align the first and second ferrules 20, 22 of the connector 10 with similarly-shaped ferrules of a mating component" such as the cylindrical shaped ones shown and described with respect to Figure 1. [*See* Lee, ¶¶36 and 62.] "Ultimately the first and second sleeves 202, 204 within the port 182 receive the first and second ferrules 20, 2[2]." [Lee, ¶63.]

150. As shown below, Figures 9 and 10 of Lee illustrate perspective views of the adapter 12 with fiber optical connector 10 partially inserted (FIG. 9) and fully inserted (FIG. 10).



Lee FIGs. 9 and 10.

151. As shown in the figures above, Lee's fiber optical connector 10 with handle 30 may be placed into and removed from port 182 of adapter 12 with latching features 128 and 126 of latch arm 28 engaging with corresponding openings 140. [*See id.*, ¶¶63, 65.]

152. As shown below, Figure 14 of Lee illustrates a perspective view of the adapter 512 with three inserted fiber optical connectors 510 and one removed fiber optical connector 510:

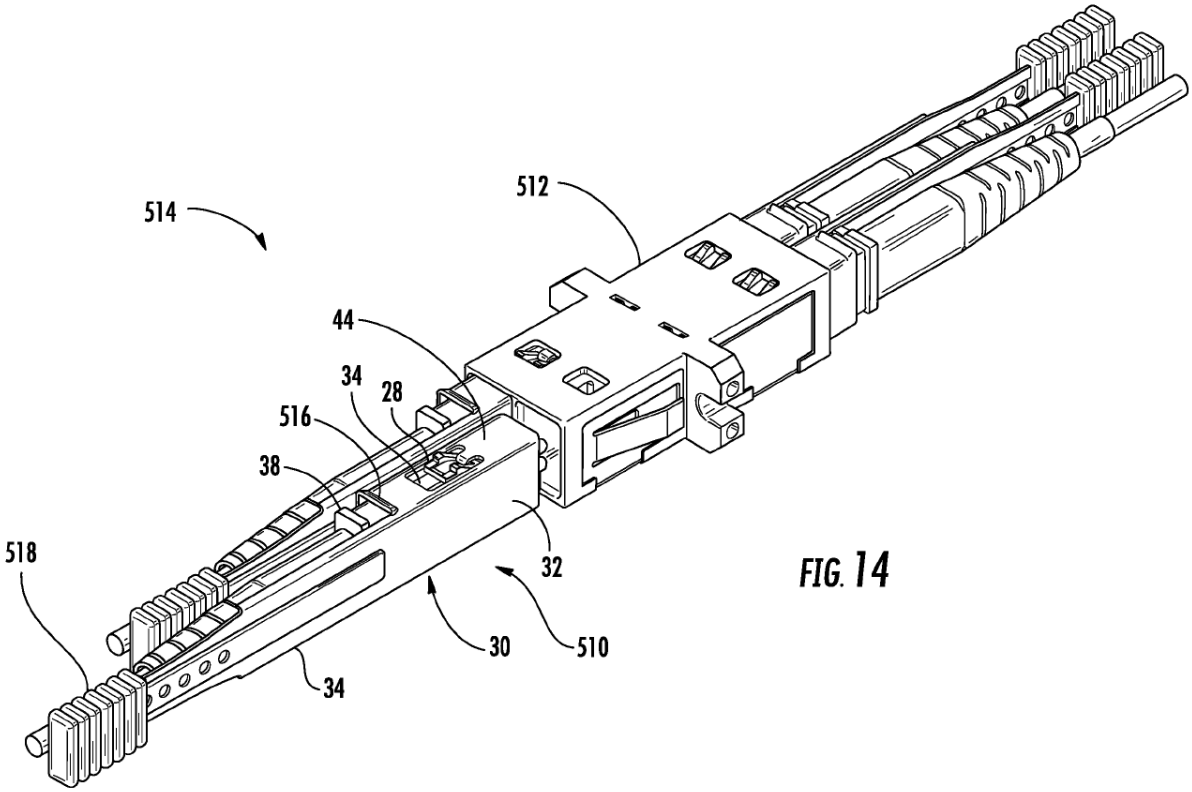


FIG. 14

EX1006, FIG. 14.

153. As shown in the figures above, Lee's adapter 514 can accommodate more than one fiber optical connector 510. [*See id.*, ¶70.]

154. In operation, Lee's handle 30 is withdrawn in the rearward direction to move the handle 30 (and thus the housing portion 32 of the handle) rearward relative to the inner connector body 24 to depress the latch arm 28. [*See* Lee, ¶¶42-51, 62-66, FIGs. 4, 5, 9, 10.] This allows the fiber optic connector 10 to be removed from the adapter 12. [*See id.*] The inner connector housing 24 includes guide channels 152. [*See, e.g.*, ¶50, FIG. 4.] Two of the tabs 52 of the forward end of the housing portion 32 are received in the guide channels 152, and the "tabs 52

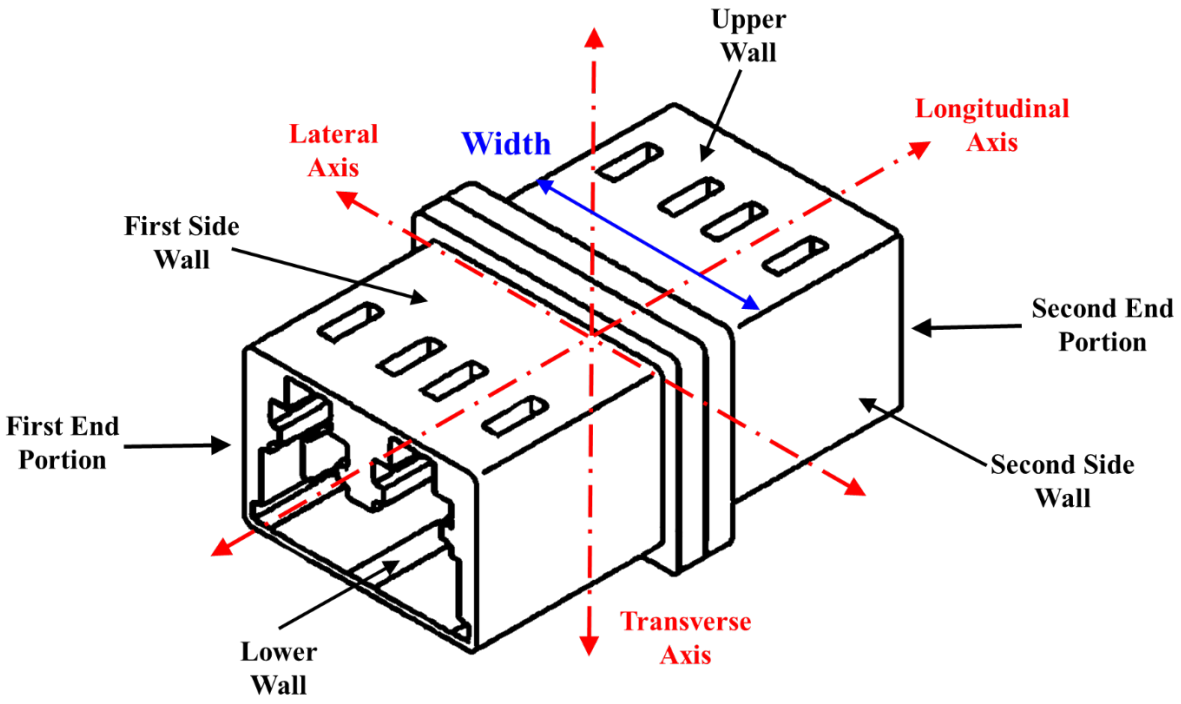
travel along the guide channels 152 when the handle 30 moves relative to the inner connector body 24." [*Id.]* Additionally, when connector 10 is inserted into adapter 12, the adapter's 12 sleeves 202, 204 combine with sleeve holder 200 to receive and align ferrules 20, 22 located in connectors 10. [*Id.,* ¶62, FIG. 8.]

D. Overview of Nakagawa

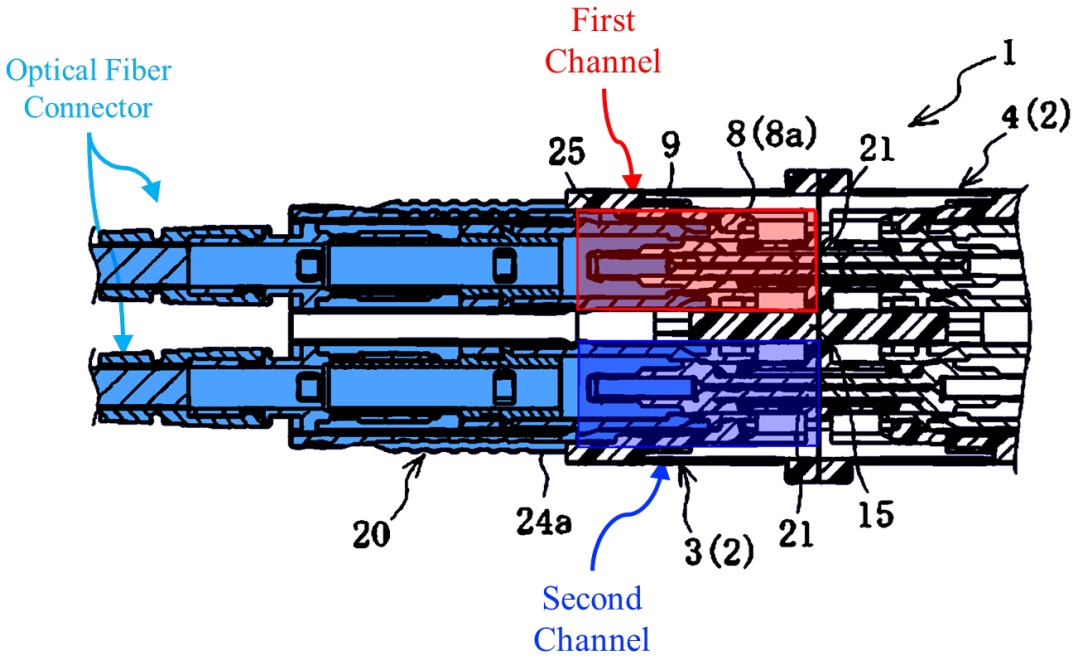
155. JP 2004/354,693 is titled "Optical Connector" (hereafter "Nakagawa"). [Nakagawa, cover.] The sole inventor is Masaya Nakagawa. The application on which Nakagawa is based was filed on May 29, 2003 and published on December 16, 2004. [Nakagawa, cover.] I understand that Nakagawa is prior art to the '836 Patent based on my discussion of the legal standards above and discussions with counsel. In particular, I understand that Nakagawa has a filing date prior to the earliest possible priority date of the '836 Patent (January 30, 2017), and so Nakagawa qualifies as prior art at least for this reason.

156. Nakagawa discloses an optical connector assembly comprising a duplex optical fiber connector and an adapter configured to receive said optical fiber connector. [Nakagawa, FIG. 13.] Nakagawa discloses an adapter designed to accommodate both MU-type and LC-type fiber optic connectors. [Nakagawa, Abstract.]

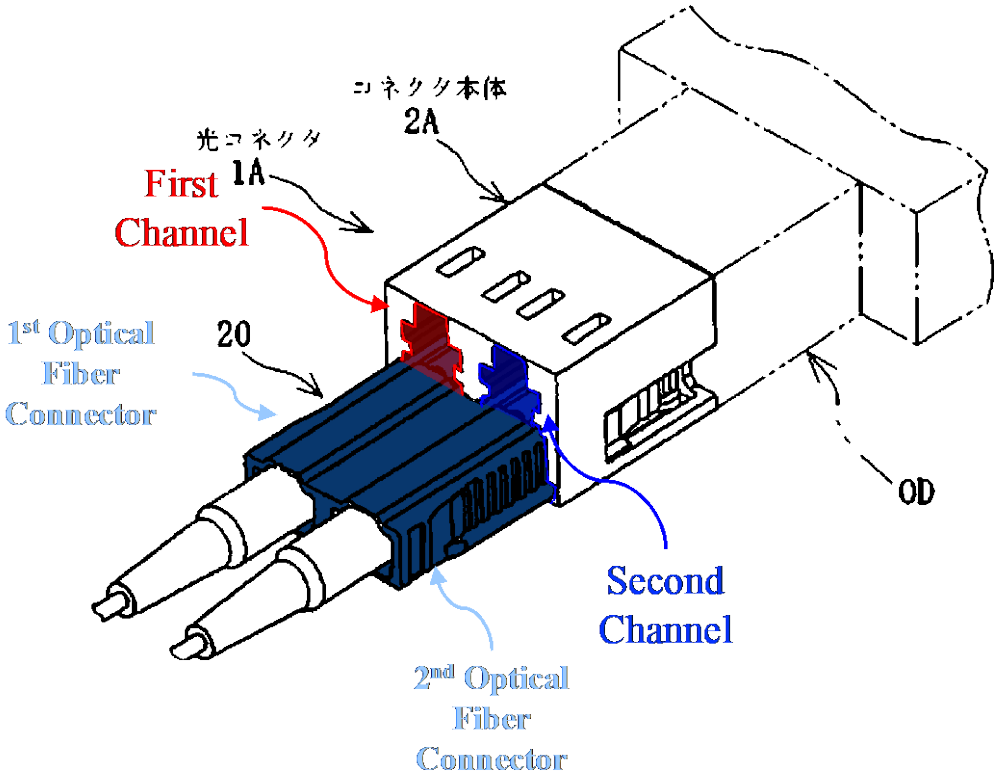
157. Embodiments of the disclosed optical connector assembly are illustrated in FIGs. 1, 10, and 13 below.



Nakagawa, FIG. 1 (Annotated).

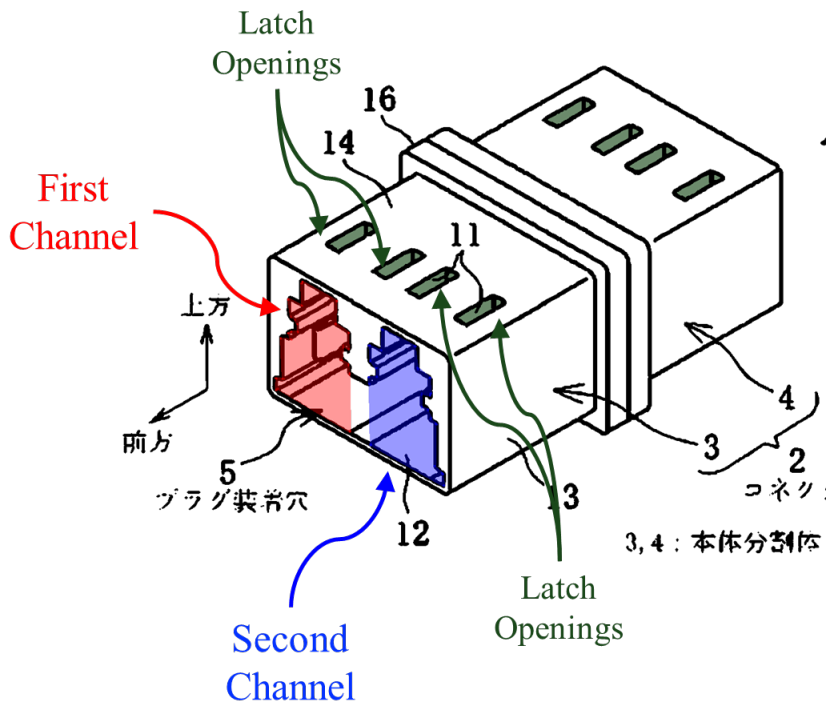


Nakagawa, FIG. 10 (annotated).

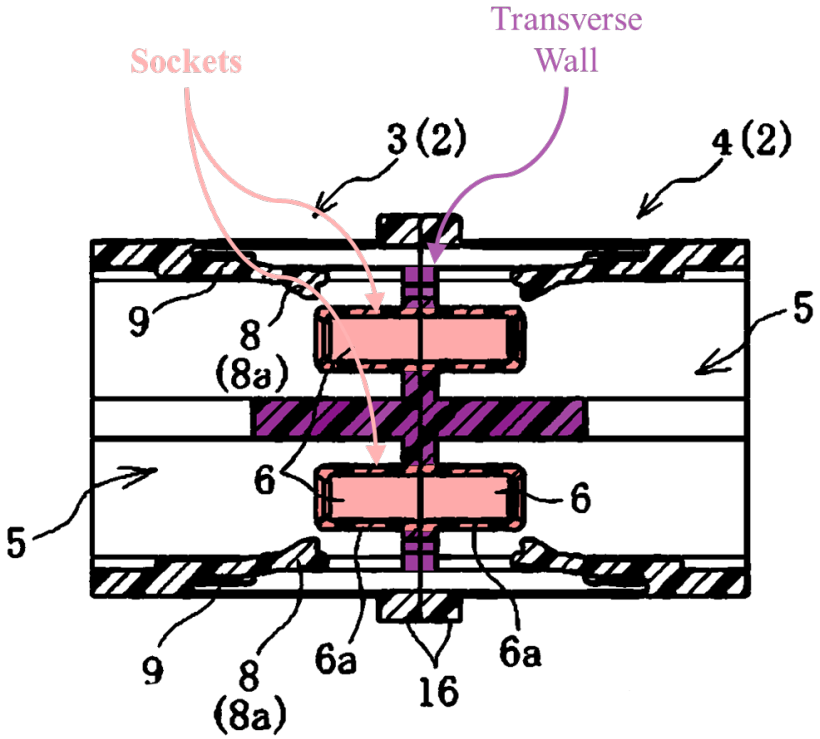


Nakagawa, FIG. 13 (annotated).

158. Nakagawa's assembly comprises an adapter which includes an outer housing having an upper, lower, first side, and second side walls. [Nakagawa, FIG. 1.] The adapter further includes a first and second end portions wherein the first end portion is configured to receive optical fiber connectors and a transverse wall that extends between the upper wall and the lower wall at a location spaced between the first and second end portions of the adapter housing. [Nakagawa, FIG. 1, 3.]



Nakagawa, FIG. 1 (annotated).

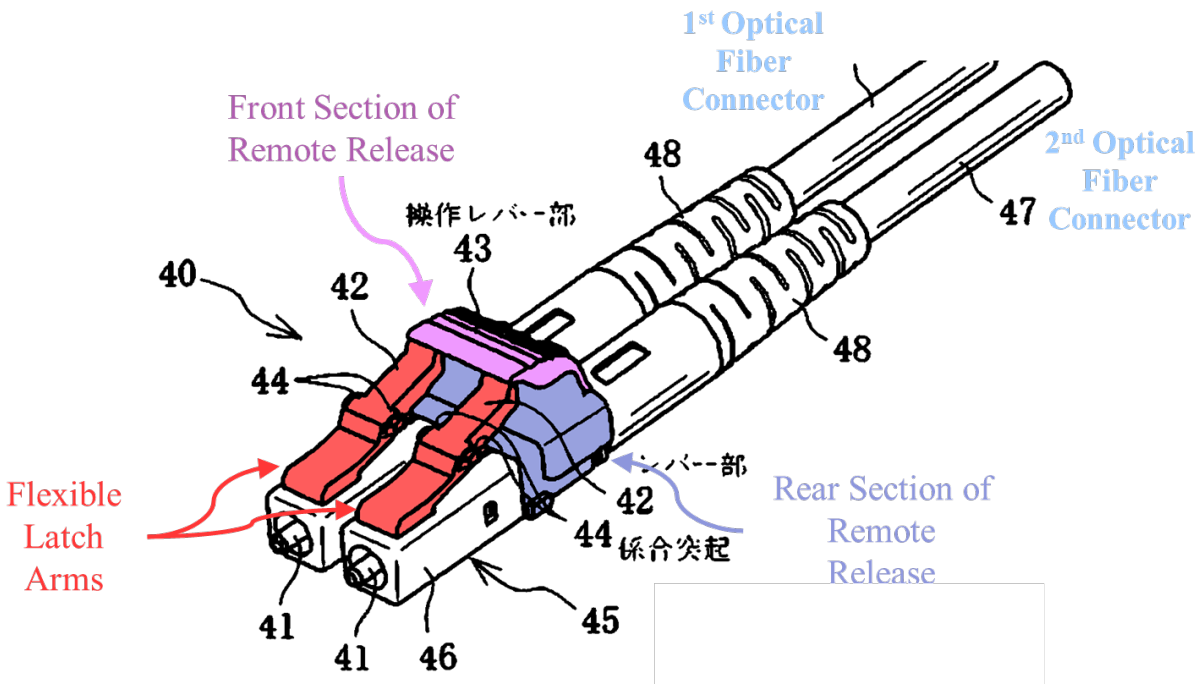


Nakagawa, FIG. 3 (annotated).

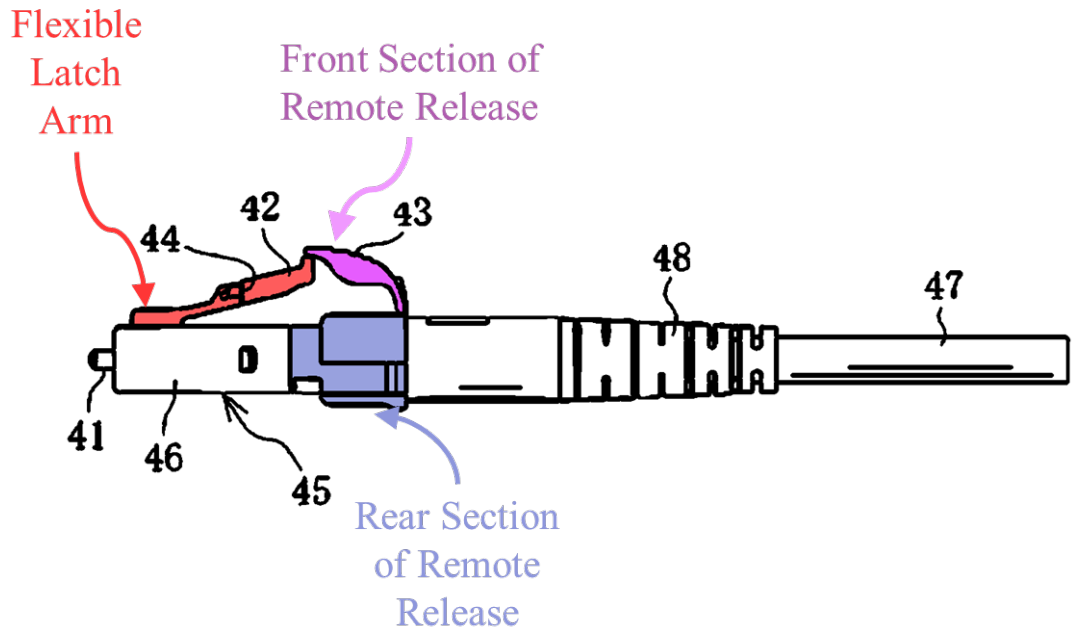
159. Additionally, the upper wall of the adapter housing includes latch openings configured to latch with a flexible latch arm of one or more connectors when the one or more connectors are inserted into the adapter. [*See* Nakagawa, FIG. 1, ¶27; "engaging sections 10 which engage the LC plug 40 inserted into the plug insertion hole 5 are formed in the top wall section of the half-body 3 of the connector body 2 via four rectangular holes 11."].

160. Nakagawa's adapter further includes longitudinal ribs formed on the inner surface of the upper and lower walls spaced apart along the width of the outer housing between the first side wall and the second side wall and extending in the transverse direction. [Nakagawa, FIG. 1.] These longitudinal ribs define a plurality of channels spaced apart along the width of the adapter, wherein each of the channels is configured to receive an optical fiber connector. [Nakagawa, FIG. 1.]

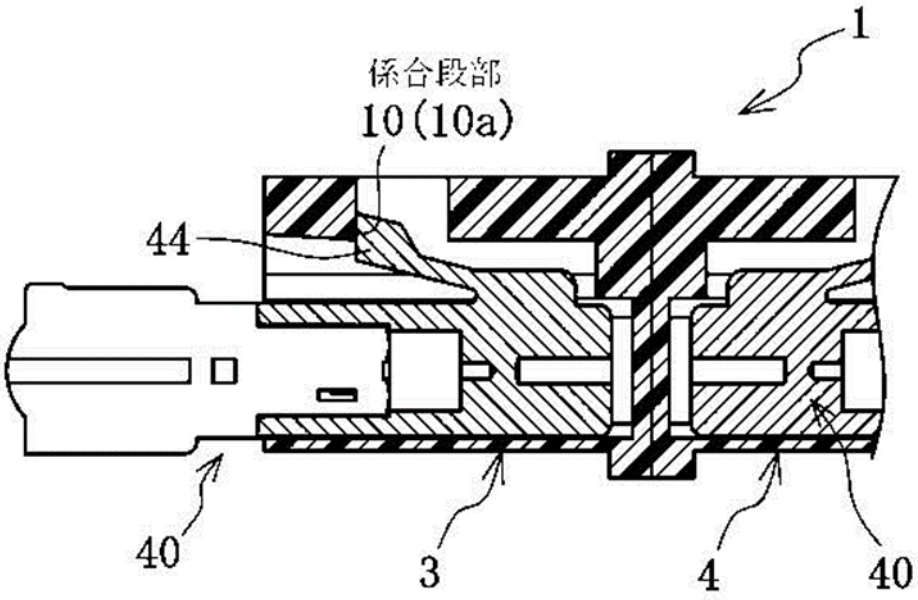
161. As shown below, Nakagawa teaches a duplex optical fiber connector. [Nakagawa, FIG. 7, FIG. 8, (depicting a side view of the duplex connector)]. Nakagawa's optical fiber connectors include a flexible latch arm 42 configured to latch with latch openings 11 on the adapter's upper wall. [Nakagawa, FIGs. 1, 8, 12.]



Nakagawa, FIG. 7 (annotated).



Nakagawa, FIG. 8 (annotated).



Nakagawa, FIG. 12.

E. Overview of deJong

162. U.S. Publication No. 2011/009,1159 is titled "Push-Pull Fiber Optic Connectors and Method for Making the Same" (hereafter "deJong"). [deJong, cover.] The inventors are Michael de Jong, Paul X. Devereaux, Ashley W. Jones, and Ronald L. Mudd. DeJong was filed on October 15, 2009 and published on April 21, 2011. [deJong, cover.]

163. I understand that deJong is prior art to the '836 Patent based on my discussion of the legal standards above and discussions with counsel. In particular, I understand that deJong has a filing date prior to the earliest possible priority date of the '836 Patent (January 30, 2017), and so deJong qualifies as prior art at least for this reason.

164. deJong discloses push-pull fiber optic connectors and associated cable assemblies, with a particular focus on enhancing ease of connection and disconnection, especially in high-density installations. [*See* deJong, ¶6-7, Abstract.] deJong explains that the disclosed push-pull fiber optic connectors serve to simplify the connection and disconnection process, particularly when dealing with high-density setups, such as those found in patch panels and equipment racks. [*See* DeJong, ¶¶5, 19.] In high-density configurations, the space available for the user to manipulate individual fiber optic connectors may be limited. Therefore, the disclosed push-pull connectors feature a latch actuated by a cam surface to enable easy connection and disconnection by merely pushing or pulling the connector with sufficient force. [*See* DeJong,, ¶¶5-7.]

165. deJong explains that the fiber optic connector assembly includes "a ferrule 12, a housing 14 having a latch 15, a shroud 16, a decoupling member 17, and a boot 18." [deJong, ¶20.] deJong further explains that "[d]ecoupling member 17 includes one or more retaining features 17b disposed on the rearward end of the arms for attaching decoupling member 17 to shroud 16." [deJong, ¶23.]

166. Figures 1, 4, and 6 of deJong, provided below for convenience, illustrate the disclosed connector.

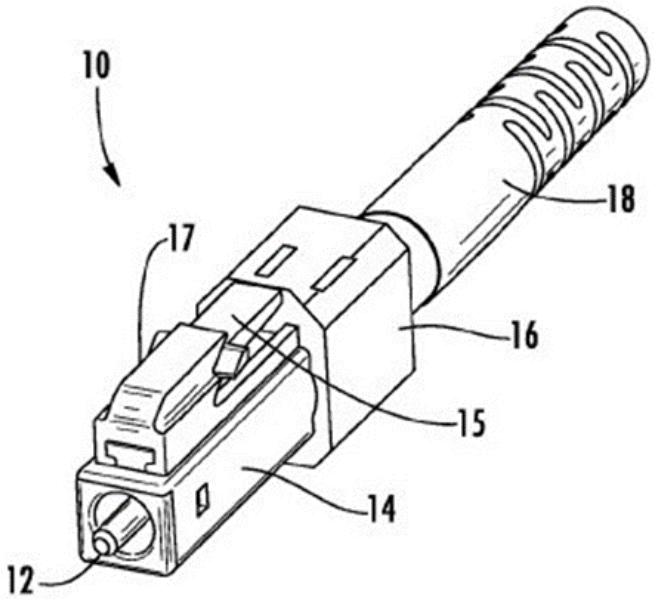


FIG. 1

deJong, FIG. 1.

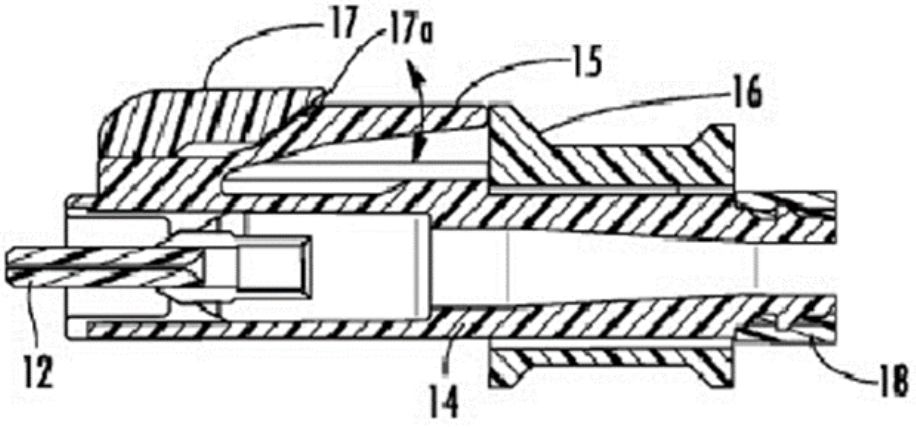


FIG. 4

deJong, FIG. 4.

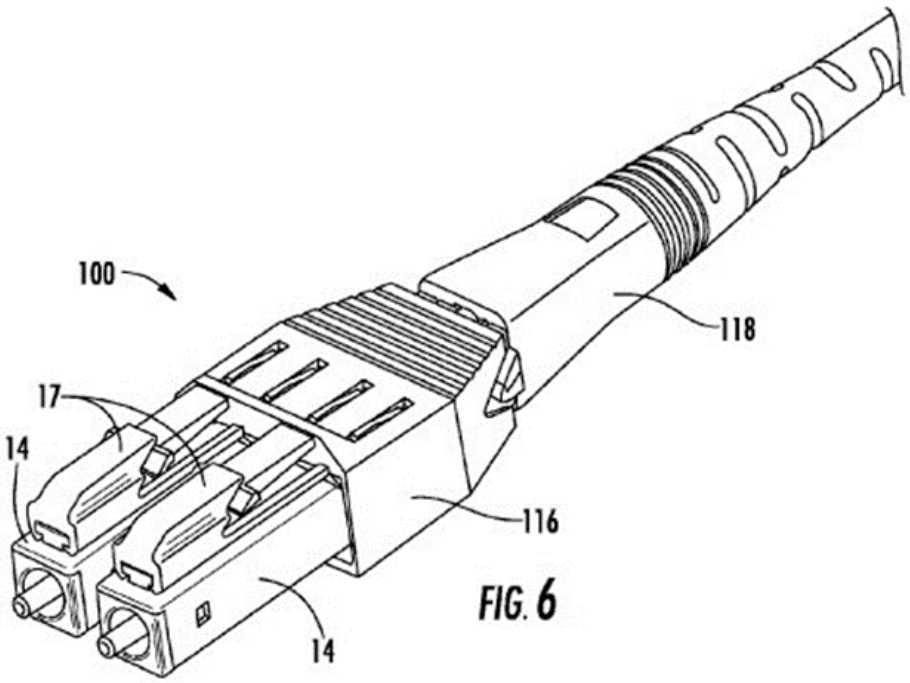


FIG. 6

deJong, FIG. 6.

167. deJong describes that "as fiber optic connector 10 is pushed into the adapter" the shroud 16 (or 116 in Figure 6's duplex connector) is pushed into a forward position allowing the latch 15 to slide into the adapter such that "the latch is pushed downward to and then springs upward to engage complimentary geometry on the adapter or the like for securing the same." [deJong, ¶24.]

168. Pertinent to my analysis below, deJong teaches a multi-fiber optical fiber connector having a push-pull mechanism—ferrule 12, housing 14, latch 15, shroud 16 (or 116 in Figure 6's duplex connector), decoupling member 17, and boot 18—that allows for "easy connection and disconnection for the craft in high-density installations." [deJong, ¶¶6, 20, 28.]

F. Overview of Kiani

169. U.S. Patent Publication No. 2005/0135752 is titled "Optical Connector Assembly" (hereafter "Kiani"). [Kiani, cover.] The inventors are Sepehr Kiani and Richard Roth. [*Id.*] Kiani was filed on December 23, 2003 and published on June 23, 2005.

170. I understand that Kiani is prior art to the '836 Patent based on my discussion of the legal standards above and discussions with counsel. In particular, I understand that Kiani has a filing date prior to the earliest possible priority date of the '836 Patent (January 30, 2017), and so Kiani qualifies as prior art at least for this reason.

171. Kiani discloses an optical connector assembly that includes an adapter and a connector comprising a ferrule carrier that is mounted in a housing. [Kiani, Abstract.] The adapter is configured to align the connector housings and facilitate easy mating and disengagement of optical connectors. [*See id.,* ¶21.]

172. Kiani explains that the assembly is capable of housing different types of connectors, such as duplex connectors or connectors with single ferrule carriers. [*See* Kiani, ¶¶35, 42, and 45.]

173. Traditionally, "[a]lignment in optical connectors is achieved through the use of several levels of alignment mechanisms," which can be complicated and prone to assembly error. [*Id.*, ¶12.] Kiani addresses this issue by providing "an

optical interconnection system that is easy to make and use." [Kiani, ¶19.] This is achieved with an optical connector assembly with an adapter that "includes a latch release mechanism." [Kiani, ¶¶20, 21.]

174. Embodiments of such an adapter are illustrated in Figures 3 and 8 of Kiani, both of which are reproduced below for convenience.

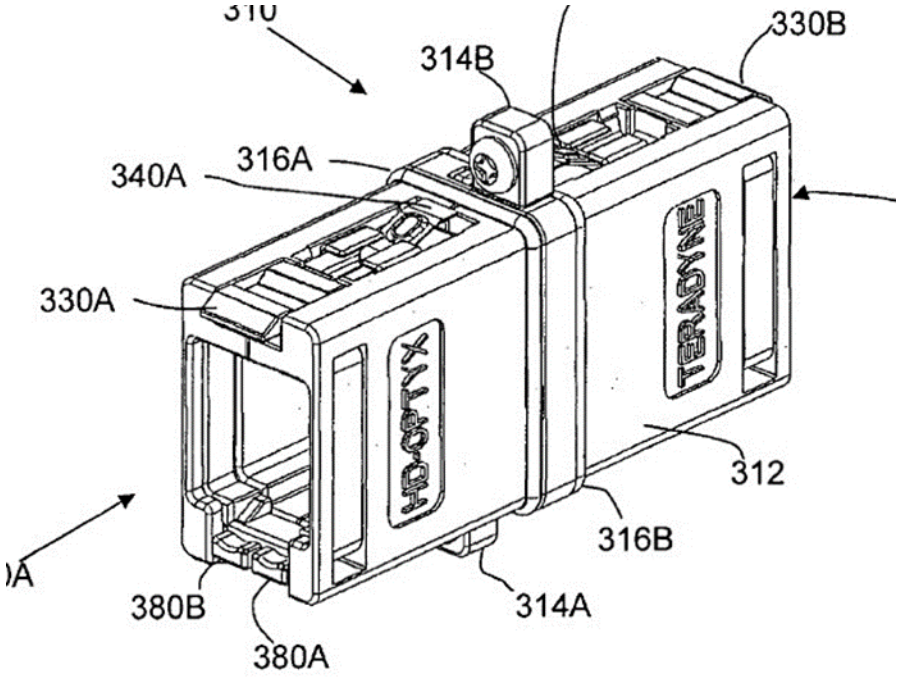


FIG. 3

Kiani, FIG. 3.

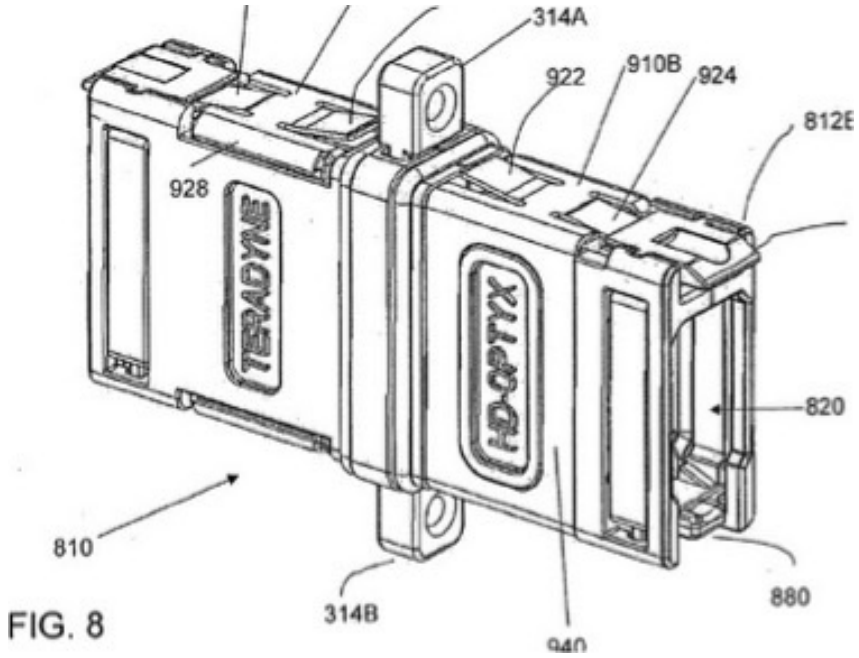


FIG. 8

Kiani, FIG. 8.

175. Kiani explains that the adapter provides alignment for the connectors and ensures they stay pressed together during operation. [*See* Kiani, ¶38.] The adapter also provides a latch release mechanism that includes latch rings to facilitate connector-to-adapter engagement. These latch rings slide up and down within channels and are biased upwards by springs. [*See id*., ¶¶52-55.] Kiani explains that when a connector is inserted, latch portions on the connector engage tapered surfaces on the latch ring, thereby compressing the spring. Once fully inserted, the latch portions move past the tapered surfaces, and the spring force locks the connector in place. To release the connector, downward pressure on the release tab on the adapter's exterior pushes the latch ring downward, disengaging it from the connector. [*See* Kiani, ¶¶60, 61.]

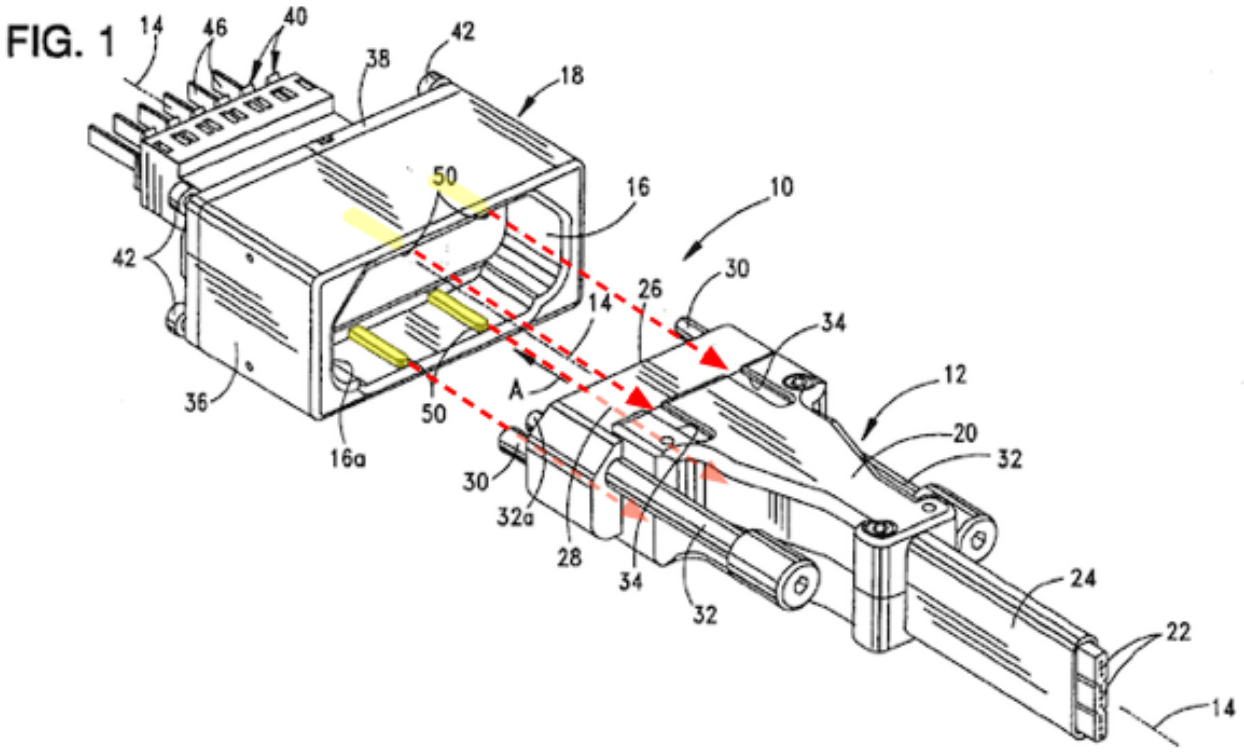
G. Overview of Szilagyi

176. U.S. Patent No. 6,764,222 is titled "Fiber Optic Connector Assembly" (hereafter "Szilagyi"). [Szilagyi, cover.] Szilagyi issued on July 20, 2004. The inventors are B. Daniel Szilagyi, Scot A. Ernst, and Igor Grois. The application from which Szilagyi issued was filed on January 16, 2003 and published on July 20, 2004. [*Id.*]

177. I understand that Szilagyi is prior art to the '836 Patent based on my discussion of the legal standards above and discussions with counsel. In particular, I understand that Szilagyi has a filing date prior to the earliest possible priority date of the '836 Patent (January 30, 2017), and so Szilagyi qualifies as prior art at least for this reason.

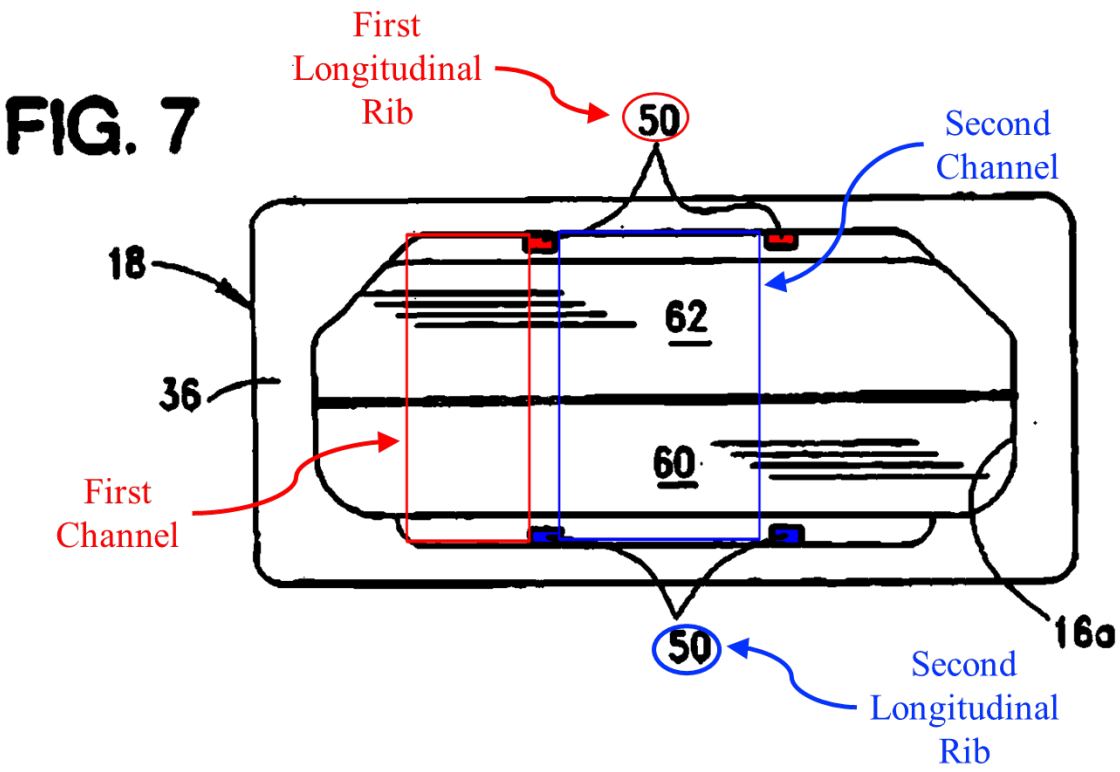
178. Szilagyi discloses a fiber optic connector assembly that includes "a receptacle for receiving a fiber optic connector along an optic axis." [Szilagyi, Abstract.] Specifically, Szilagyi discloses a fiber optic connector assembly that provides "specific dimensional relationships between a receptacle and a plug of [the] connector assembly to prevent alignment pins on the plug from damaging the mating interface within the receptacle." [Szilagyi, 2:31-35.] Szilagyi explains that "a pair of guide ribs 50 project inwardly from opposite sides of receptacle 16 for insertion into guide grooves 34 on the top and bottom of plug connector 10." [Szilagyi, 4:38-40.] The annotated version of Szilagyi Figure 1 below shows guide

ribs 50 and the manner in which they would be received into the guide grooves 34. These features serve to accurately align the connector as it is inserted into the adapter 18.



Szilagyi FIG. 1 (annotated).

179. Additionally, as shown below, Figure 7 of Szilagyi discloses a front view of the adapter such that the guide ribs 50 on both the upper and lower walls of the adapter are visible.



Szilagyi FIG. 7 (annotated).

H. Overview of Tsuzaki

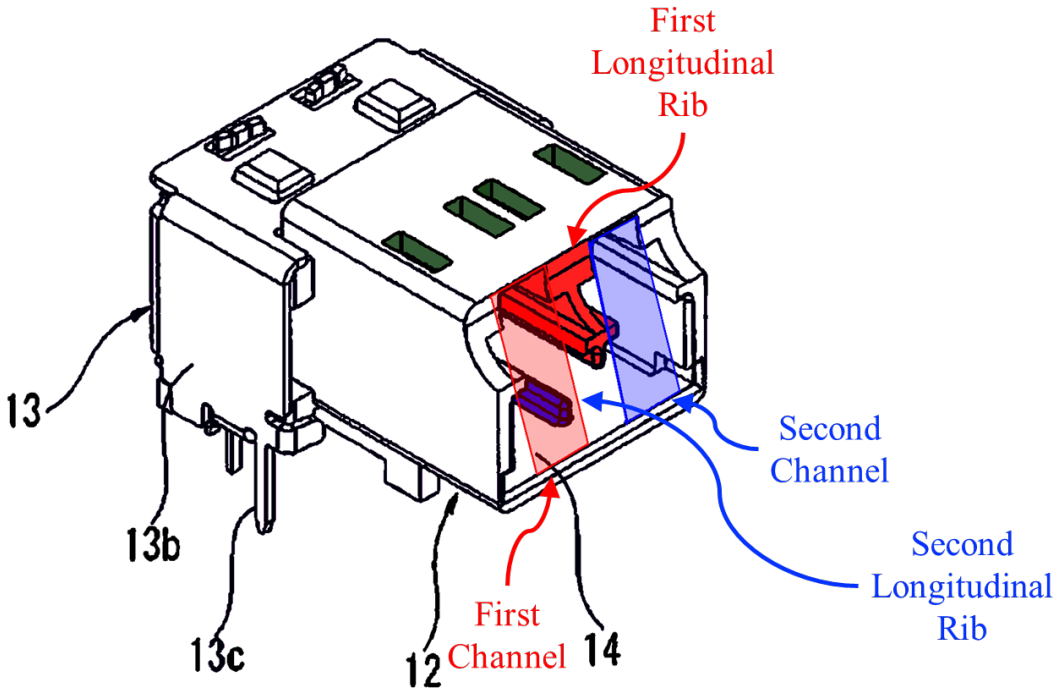
180. WO 2013/100892 is titled "Optical Module" (hereafter "Tsuzaki"). [Tsuzaki, cover.] The inventors are Nozomi Tsuzaki and Norman R. Lampert. Tsuzaki was filed on December 27, 2011 and published on July 4, 2013. [Tsuzaki, cover.]

181. I understand that Tsuzaki is prior art to the '836 Patent based on my discussion of the legal standards above and discussions with counsel. In particular, I understand that Tsuzaki has a filing date prior to the earliest possible priority date

of the ’836 Patent (January 30, 2017), and so Tsuzaki qualifies as prior art at least for this reason.

182. Tsuzaki discloses an optical module for a fiber optic transceiver having “a light-emitting/receiving surface for transmitting light with an optical fiber,” and a housing having a “holding portion which holds the fiber optic transceiver and a cylindrical portion.” [Tsuzaki, Abstract.] Tsuzaki explains that the cylindrical portion has “a first opening facing on the light-emitting/receiving surface and a second opening from which the optical fiber is inserted.” [Tsuzaki, Abstract.] Tsuzaki’s optical module is designed such that it can be “coupled to a plurality of optical fibers accorded to different standards.” [Tsuzaki, ¶5.]

183. Pertinent to my analysis in this Declaration is that Tsuzaki’s optical module has an adapter that includes a longitudinal rib that extend inwardly from the inner surface of the upper and lower walls of the housing. [Tsuzaki, FIG. 2.] These ribs form channels inside the adapter that are configured to receive fiber optic connectors. [Tsuzaki, ¶14 and FIG. 2.] The annotated version of Tsuzaki FIG. 2 provided below shows the channels formed by the ribs inside the housing of the adapter.



Tsuzaki, FIG. 2 (annotated).

VIII. SUMMARY OF GROUNDS

184. In my opinion, all Claims of the '836 are invalid as anticipated by and/or obvious in view of the prior art. The following table summarizes the Grounds that I believe show invalidity:

Ground	Basis	Reference(s)	Claims
1	§ 102(a)(1)	MDC Receptacle Specification (EX1015)	1-9 and 13
2	§ 102(a)(2)	Nguyen (EX1005)	1-3, 6-10 and 13
3	§ 103(a)	Nguyen and Lee (EX1006)	3-5, 8 and 10-12
4	§ 102(a)(2)	Nakagawa(EX1009)	1-2 and 6-12
5	§ 103(a)	Nakagawa and deJong(EX1010)	3-5 and 13

IX. GROUND 1: CLAIMS 1-9 AND 13 OF THE '836 PATENT ARE ANTICIPATED BY THE MDC RECEPTACLE SPECIFICATION.

185. I believe that a POSITA would have understood that the Interface Specification for the MDC Receptacle ("MDC Specification") expressly discloses all the limitations of claims 1-9 and 13 of the '836 Patent.

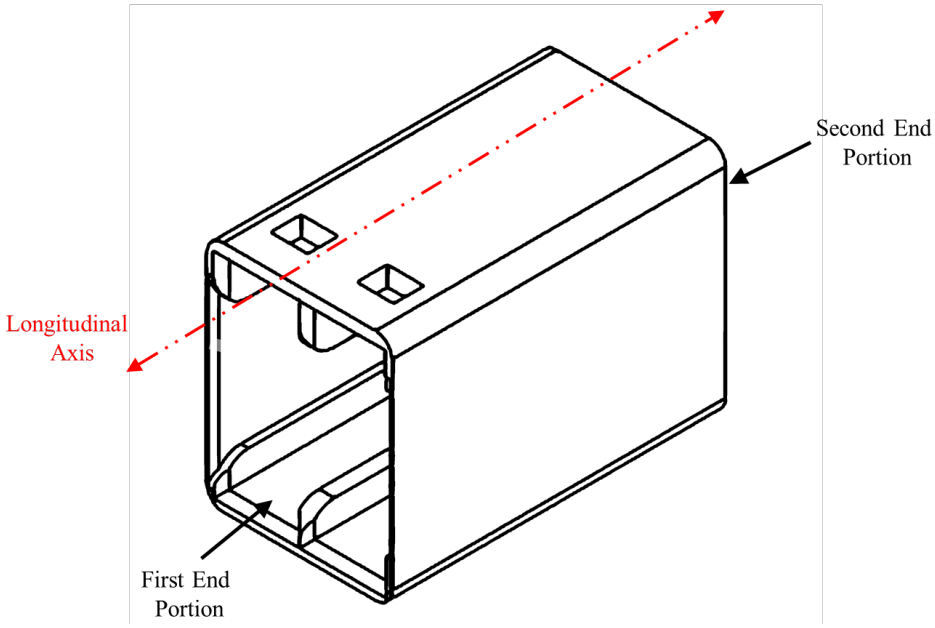
186. I understand that the MDC Specification qualifies as prior art based on my discussion with counsel regarding the effective filing date of the '836 patent. I understand that Petitioner will argue that the '836 patent is not entitled to its claimed 2017 priority date because the provisional applications to which it claims priority do not provide adequate written description for the challenged claims. I also understand that the limited disclosure in the provisional applications related to the claimed adapters was not carried through the continuity chain to the '836 patent. For purposes of my analysis in this proceeding and my opinions expressed below for Ground 1 only, I have been asked to assume that Petitioner's priority argument is correct, and that the MDC Specification qualifies as prior art to the claims. I was not asked to evaluate whether any of the written description in the file history of the '836 patent supports the priority claim on the face of the patent.

A. Claim 1

1. Preamble – "An adapter for mating with optical fiber connectors, the adapter comprising:"

187. To the extent that the preamble is limiting, I believe the MDC Specification discloses an adapter for mating with optical fiber connectors.

188. For example, Figure 4.1 of the MDC Specification, shown below in annotated form, illustrates an adapter for mating with optical fiber connectors. [*See e.g.,* MDC Specification, FIG. 4.1.] The MDC Specification additionally describes that "[t]he MDC receptacle for SFP-DD module applications (Figure 4.1) will allow access for up to (2) MDC two-fiber optical connectors." [MDC Specification, pg. 6, section 4.]



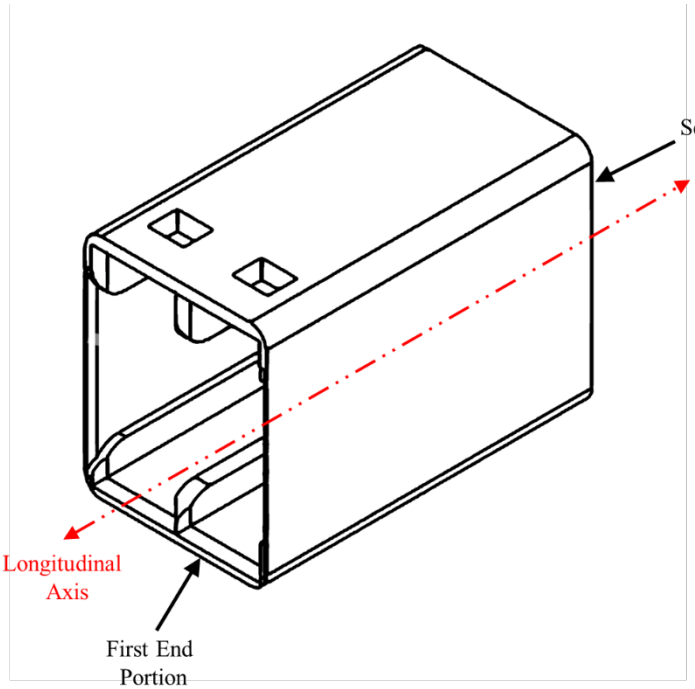
MDC Specification, FIG. 4.1 (annotated).

189. Accordingly, I believe the MDC receptical discloses the preamble of claim 1.

2. Element [1.1] – "an outer housing having a first end portion and a second end portion spaced apart along a longitudinal axis, the outer housing comprising a first side wall and a second side wall spaced apart along a lateral axis perpendicular to the longitudinal axis, the outer housing having a width extending along the lateral axis from the first side wall to the second side wall, the outer housing comprising a upper wall and a lower wall spaced apart along a transverse axis oriented perpendicular to the lateral axis and perpendicular to the longitudinal axis"

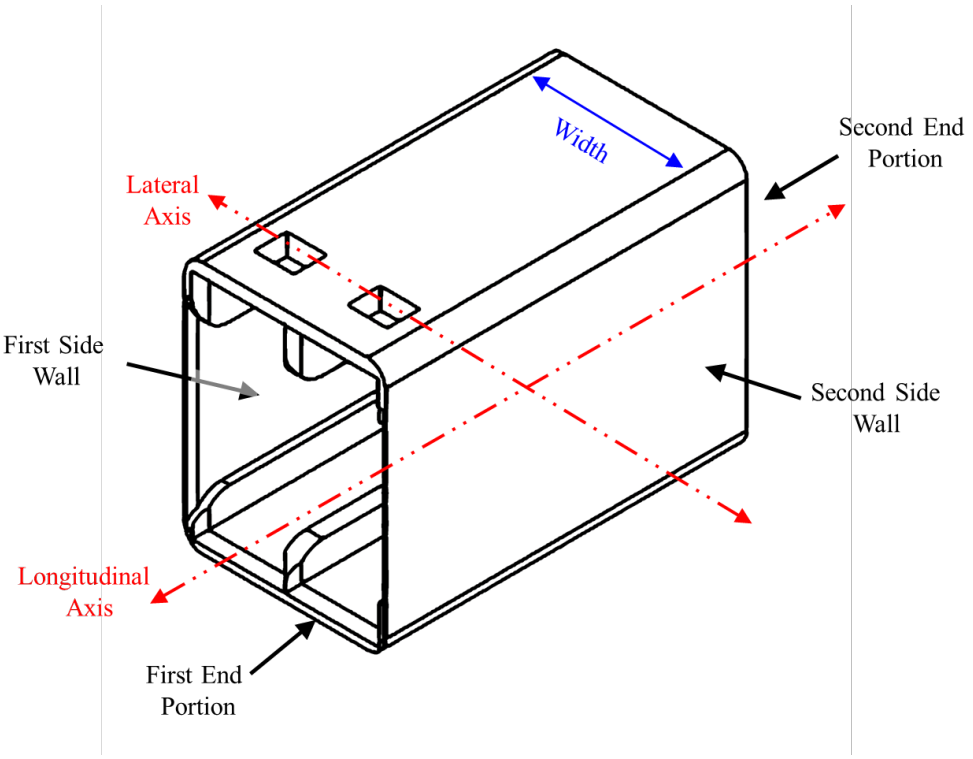
190. The MDC Receptacle Specification discloses all the limitations of element 1.1 of claim 1.

191. For example, the first limitation of element 1.1 (an outer **housing** having a first end portion and a second end portion spaced apart along a longitudinal axis) is illustrated in the annotated version of Figure 4.1 provided below.



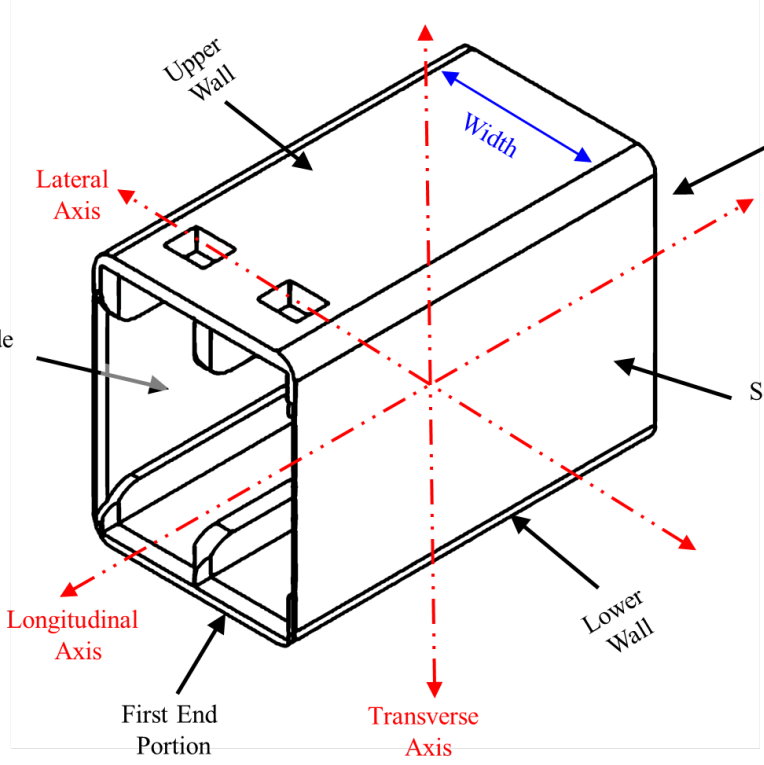
MDC Specification, FIG. 4.1 – First limitation of Element 1.1 (annotated).

192. The requirements of the second limitation of Element 1.1 (the outer housing comprising a first side wall and a second side wall spaced apart along a lateral axis perpendicular to the longitudinal axis, the outer housing having a width extending along the lateral axis from the first side wall to the second side wall) are overlaid on the annotated version of Figure 4.1 provided below.



MDC Specification, FIG. 4.1 – First and second limitations of Element 1.1 (annotated).

193. The requirements of the third, and final, limitation of Element 1.1 (the outer housing comprising a upper wall and a lower wall spaced apart along a transverse axis oriented perpendicular to the lateral axis and perpendicular to the longitudinal axis) are overlaid on the annotated version of Figure 4.1 provided below.



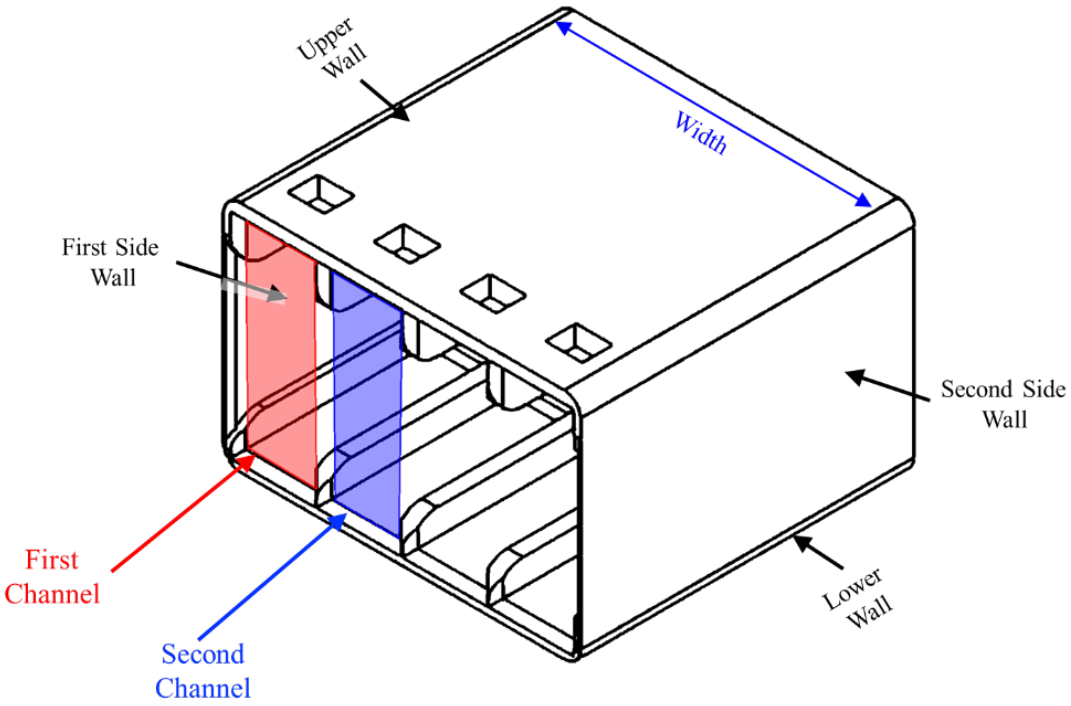
MDC Specification, FIG. 4.1- First, Second, and Third Limitations of Element 1.1 (annotated).

194. Accordingly, I believe the MDC Receptacle Specification discloses all the features of element [1.1] of claim 1.

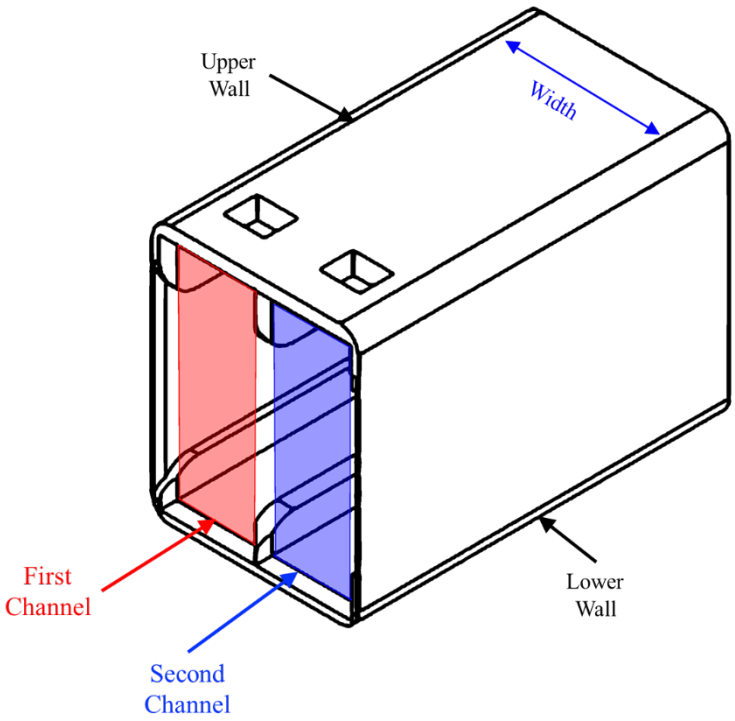
3. Element [1.2] – "each of the upper wall and the lower wall having an inner surface, the outer housing defining a plurality of channels spaced apart along the width, each of the channels being configured to receive an optical fiber connector, the plurality of channels including first and second channels"

195. I believe that the MDC Receptacle Specification discloses this element of claim 1.

196. For example, Figures 3.1 and 4.1 of the MDC Receptacle Specification, shown below in annotated form, illustrate an adapter with "each of the upper wall and the lower wall having an inner surface, the outer housing defining a plurality of channels spaced apart along the width, each of the channels being configured to receive an optical fiber connector, the plurality of channels including first and second channels" as recited in element [1.2] of claim 1.



MDC Specification, FIG. 3.1 (annotated).



MDC Specification, FIG. 4.1 (annotated).

197. Additionally, as noted above, the MDC Receptacle Specification describes that "[t]he MDC receptacle for SFP-DD module applications (Figure 4.1) will allow access for up to (2) MDC two-fiber optical connectors." [MDC Specification, pg. 6, section 4.]

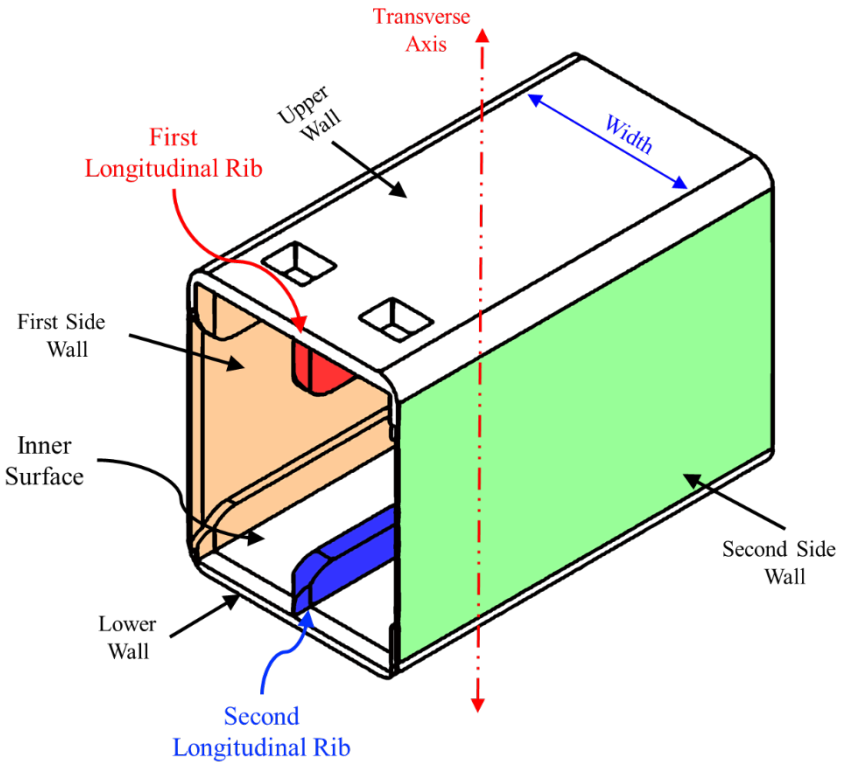
198. Accordingly, I believe the MDC Receptacle Specification discloses all the features of element 1.2 of claim 1.

4. Element [1.3] – "a first longitudinal rib formed on the inner surface of the upper wall at a location spaced apart along the width of the outer housing between the first side wall and the second side wall and a second rib formed on the inner surface of the lower wall at a location spaced apart along the width of the outer housing between the first side wall and the second side wall, the first and second ribs being aligned along the width of the outer housing, the first rib

being spaced apart from the second rib along the transverse axis by a transverse gap"

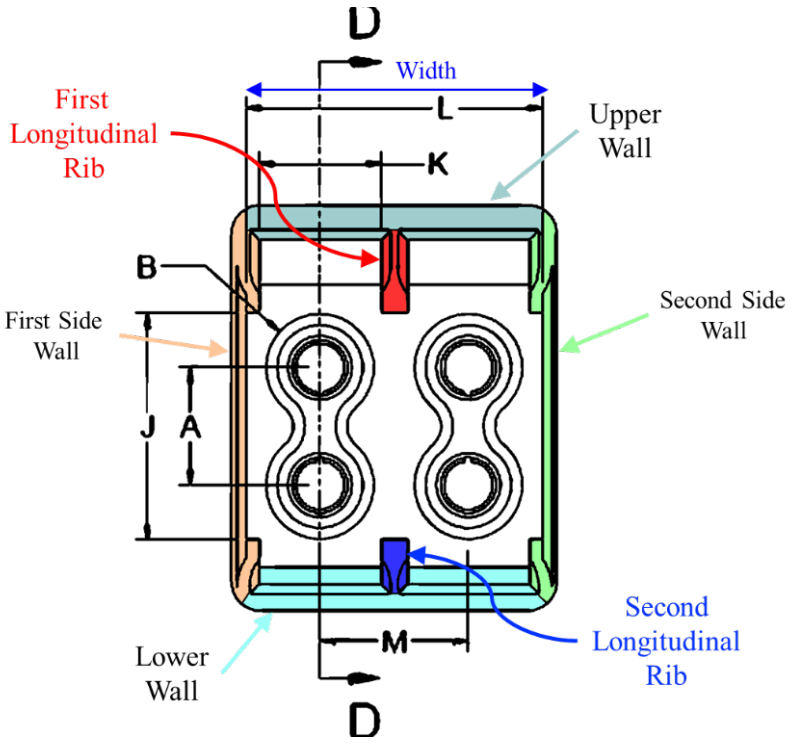
199. I believe the MDC Receptacle Specification discloses "a first longitudinal rib formed on the inner surface of the upper wall at a location spaced apart along the width of the outer housing between the first side wall and the second side wall and a second rib formed on the inner surface of the lower wall at a location spaced apart along the width of the outer housing between the fist side wall and the second side wall, the first and second ribs being aligned along the width of the outer housing, the first rib being spaced apart from the second rib along the transverse axis by a transverse gap," as recited in claim 1.

200. For example, Figure 4.1 of the MDC Receptacle Specification, shown below in annotated form, illustrates an adapter including a first longitudinal rib on the upper wall and a second longitudinal rib on the lower wall.



MDC Specification, FIG. 4.1 (annotated).

201. Additionally, Figure 4.2, provided below in annotated form, depicts a cross sectional diagram of the adapter of Figure 4.1 having a first and second longitudinal rib extending inward along the transverse axis from the upper and lower wall respectively. There is a transverse gap between the two ribs. Furthermore, the two ribs are aligned along the width of the outer housing.



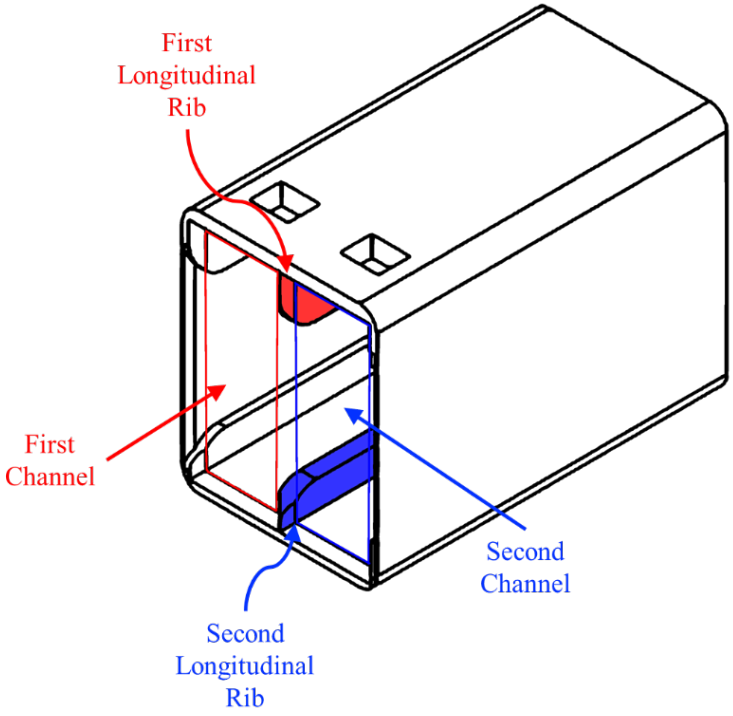
MDC Specification, FIG. 4.2 (cropped, annotated).

202. Accordingly, I believe the MDC Specification discloses element 1.3 of claim 1.

5. Element [1.4] – "wherein the first longitudinal rib and the second longitudinal rib are located between the first and second channels

203. I believe the MDC Specification discloses an adapter wherein the first and second longitudinal rib are located between the first and second channels.

204. For example, Figure 4.1 below illustrates a first and second channel with a first and second longitudinal rib located between the channels.



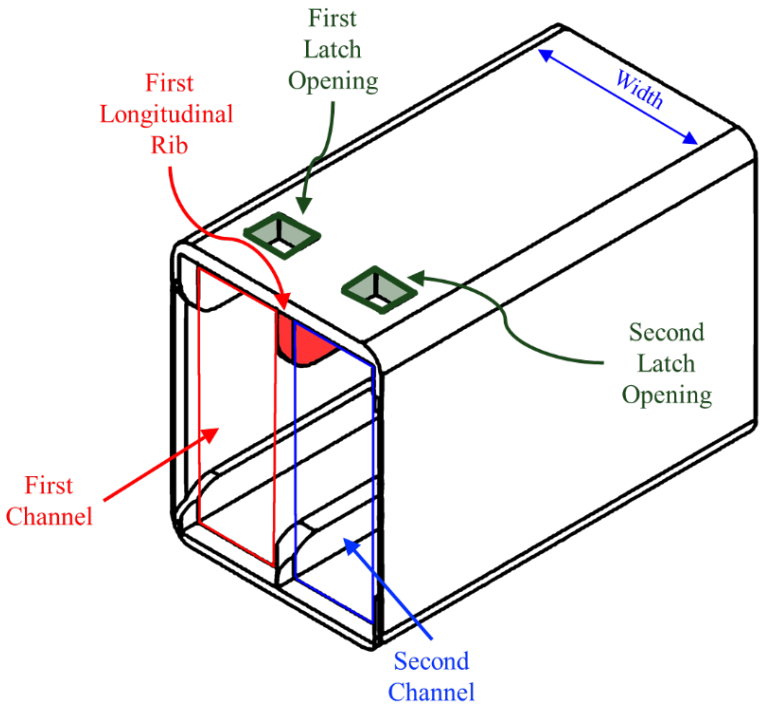
MDC Specification, FIG. 4.1 (annotated).

205. Accordingly, I believe the MDC Receptacle Specification discloses all the features of element [1.4] of claim 1, and the entirety of claim 1.

B. Claim 2 – "The adapter as set forth in claim 1, wherein the upper wall comprises a first latch opening aligned with the first channel and a second latch opening aligned with the second channel, the first rib being spaced apart between the first latch opening and the second latch opening along the width."

206. I believe the MDC Specification discloses an adapter wherein the upper wall comprises a first and second latch opening aligned with the first and second channels respectively. The MDC Specification further discloses the first longitudinal rib of the adapter being spaced apart between the first and second

latch openings along the width. [*See e.g.,* MDC Specification, FIG. 4.1.] Annotated Figure 4.1 below illustrates these features with the relevant elements identified.



MDC Specification, FIG. 4.1 (annotated).

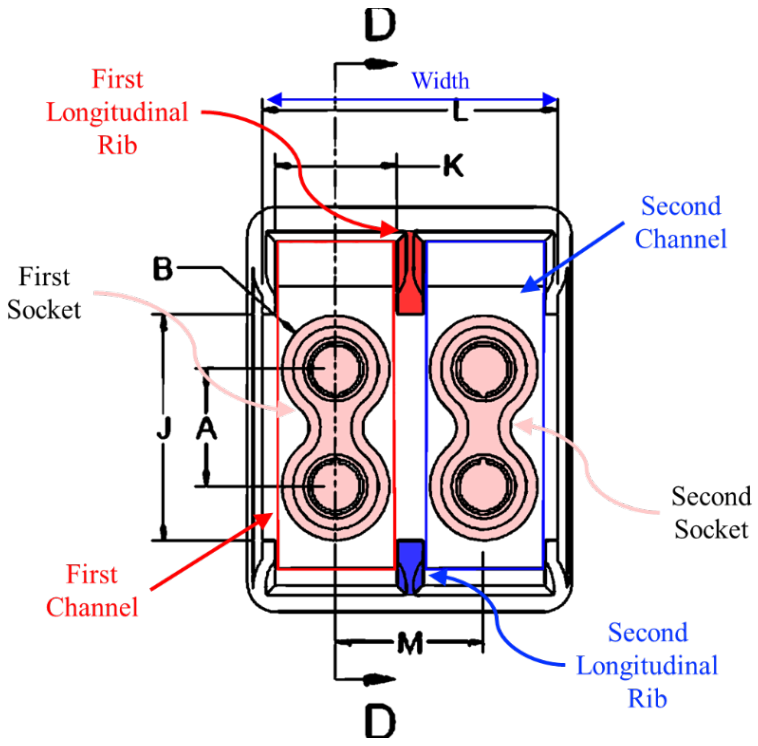
207. Accordingly, I believe the MDC Specification discloses all the elements of claim 2.

C. Claim 3

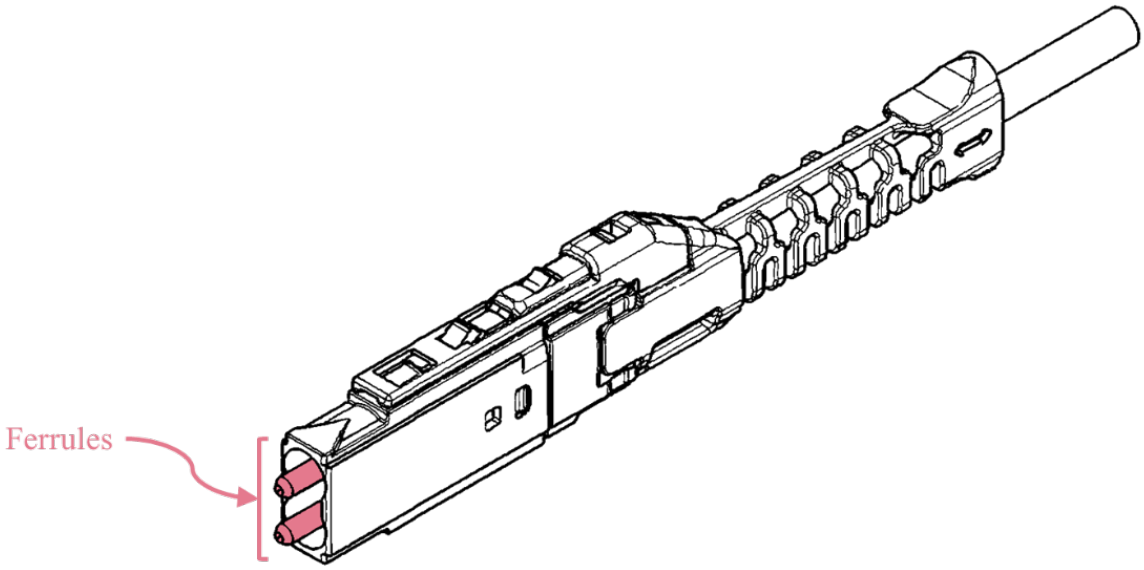
1. Element [3.1] – "The adapter as set forth in claim 2, wherein the adapter is configured to receive a first one of the optical fiber connectors in the first channel and a second one of the optical fiber connectors in the second channel such that:"

208. I believe the MDC Specification a discloses an adapter configured to receive a first optical fiber connector in the first channel and a second optical fiber

connector in the second channel. For example, Figure 4.2 of the MDC Specification, shown below in annotated form, illustrates a cross sectional diagram of the adapter of Figure 4.1 with a first and second channel configured to receive a first and second optical fiber connector respectively. [*See* MDC Specification, FIG. 4.2.] Figure 4.2 further illustrates that each of the first and second channels include a socket configured to receive a ferrule of one of the first or second optical fiber connector (shown below in annotated Figure 2.1).



MDC Specification, FIG. 4.2 (cropped, annotated).



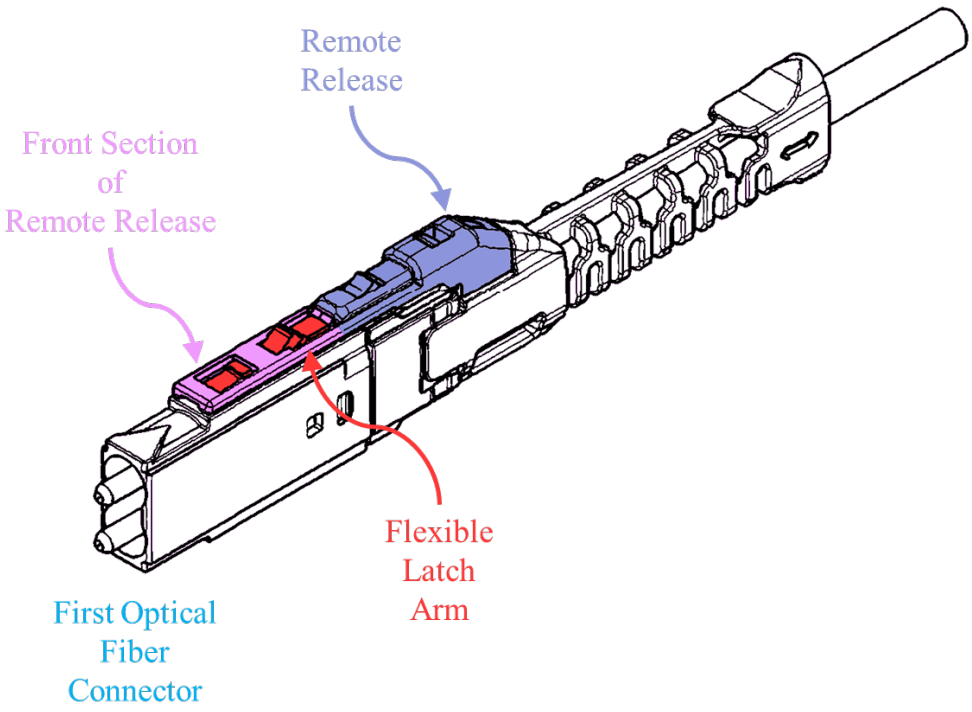
MDC Specification, FIG. 2.1 (annotated).

209. Accordingly, I believe the MDC Specification discloses the features of element 3.1 of claim 3.

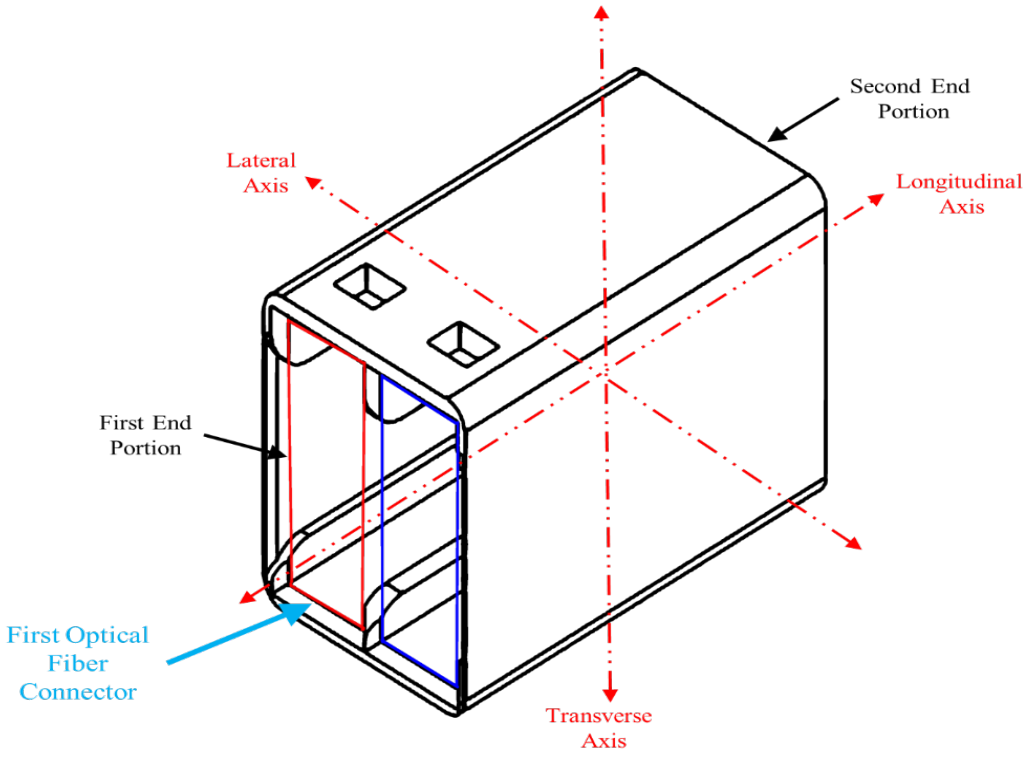
2. Element [3.2] – "a flexible latch arm of the first optical fiber connector is latched with the first latch opening and a front section of a remote release of the first optical fiber connector is received in the first channel at a location spaced apart from the first latch opening along the longitudinal axis toward the second end portion of the outer housing"

210. I believe the MDC Specification discloses a first optical fiber connector with a flexible latch arm that is latched with the first latch opening and a front section of a remote release that is received in the first channel of the adapter. For example, Figure 2.1 of the MDC Specification illustrates an optical fiber connector with a flexible latch arm that is configured to latch with the first latch opening of the adapter of Figure 4.1. [*See* MDC Specification, FIG. 2.1.]

211. Additionally, the MDC Receptacle Specification also discloses a remote release mechanism with a front section that is received in the first channel of the adapter. [*See* MDC Specification, FIG. 2.1.] This feature is depicted in Figure 2.1 shown below in annotated form. As is visible from the positioning of the front section of the remote release, it is spaced apart from the first latch opening along the longitudinal axis toward the second end portion of the outer housing, because it is distal (further "forward") to the portion of the latch arm that engages the flexible latch opening.



MDC Specification, FIG. 2.1 (annotated).



MDC Specification, FIG. 4.1 (annotated).

212. The MDC Specification further describes that the optical fiber connector of Figure 2.1 includes a "push-pull boot" (remote release) which "allows for simple insertion (and removal) of the MDC connectors to (and from) the receptacles." [MDC Specification, pg. 3, section 2.]

213. Accordingly, I believe the MDC Specification discloses all the features of element 3.2 of claim 3.

3. Element [3.3] – "a flexible latch arm of the second optical fiber connector is latched with the second latch opening and a front section of a remote release of the second optical fiber connector is received in the [second] channel at a location

spaced apart from the second latch opening along the longitudinal axis toward the second end portion of the outer housing"

214. I believe that the MDC Specification discloses a second optical fiber connector with a flexible latch arm that is latched with the second latch opening and a front section of a remote release that is received by the second channel of the adapter.

215. As discussed above, the MDC Specification discloses an adapter having a first and second channel configured to receive a first and second optical fiber connector respectively. The MDC Specification further discloses that the first and second optical fiber connectors each have a flexible latch arm and a remote release with a front section that is received in the first and second channel of the adapter. The second optical connector, like the first (discussed above), has the same front section of the remote release spaced apart from the first latch opening along the longitudinal axis toward the second end portion of the outer housing.

216. Accordingly, I believe the MDC Specification discloses element 3.3 of claim 3.

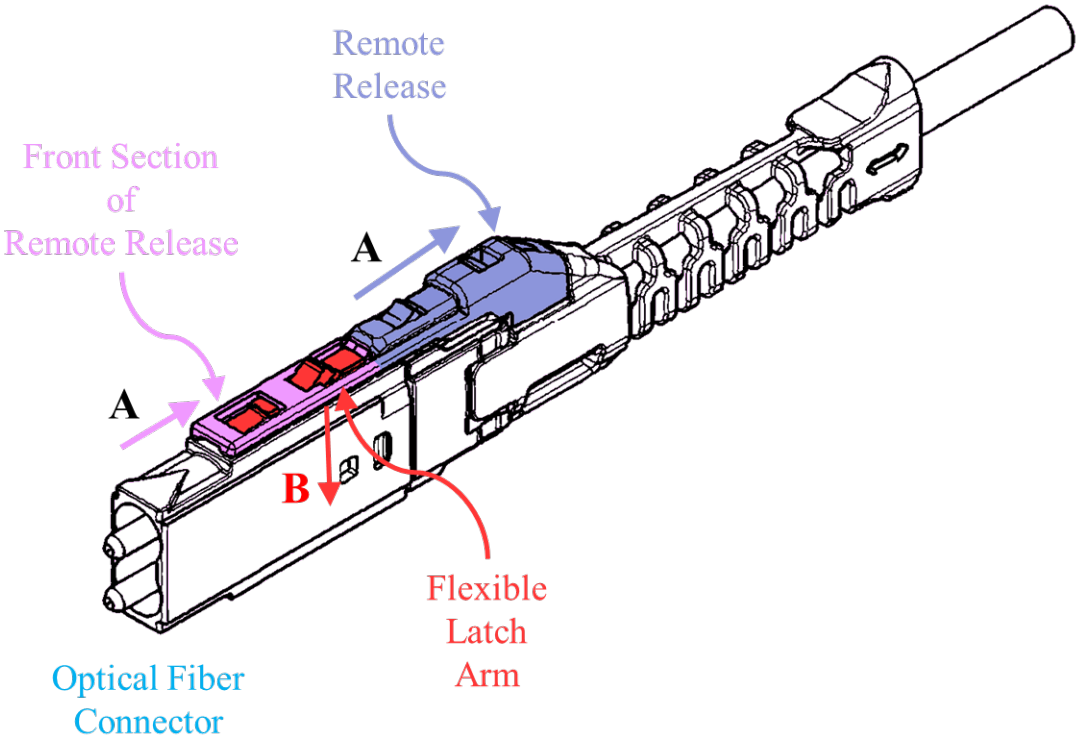
D. Claim 4 – "The adapter set forth in claim 3, wherein the first channel is configured to allow the front section of the remote release of the first optical fiber connector to slide along the flexible latch arm of the first optical fiber connector within the first channel toward the first end portion of the outer housing to depress the flexible latch arm of the first optical fiber connector and wherein the second channel is configured to allow the front section of the remote release of the second optical fiber connector to

slide along the flexible latch arm of the second optical fiber connector within the second channel toward the first end portion of the outer housing to depress the flexible latch arm of the second optical fiber connector."

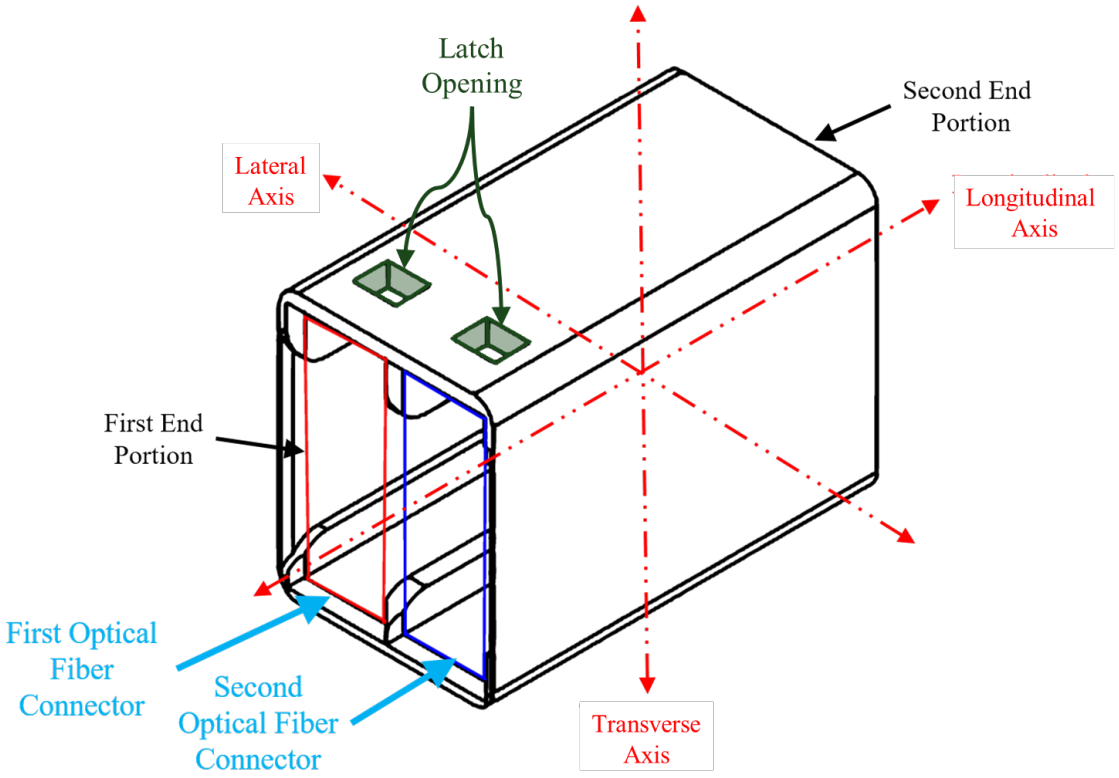
217. I believe that the MDC Specification discloses a first and second channel of an adapter configured to allow the front section of the remote release to slide along the flexible latch arm of each of the first and second optical fiber connectors respectively such that the flexible latch arms of the first and second connectors are depressed.

218. As discussed above, Figure 4.1 of the MDC Specification discloses a duplex adapter having a first and second channel configured to receive a first and second optical fiber connector respectively. The MDC Specification further discloses that the first and second channels of the adapter are configured to allow the front section of the remote release of a first and second optical fiber connector to slide along the flexible latch arms of the connectors within the first and second channels toward the first end portion of the outer housing to depress the flexible latch arm of the first and second optical fiber connectors. In other words, when the connector is inserted into the adapter, it slides in the direction from the first end portion towards the second end portion. On the other hand, when the connector is removed from the adapter, the front section of the remote release slides back, in the direction of arrows "A" in annotated Figure 2.1 below, towards the first end portion to depress the flexible latch arm, in the direction of arrow "B," and

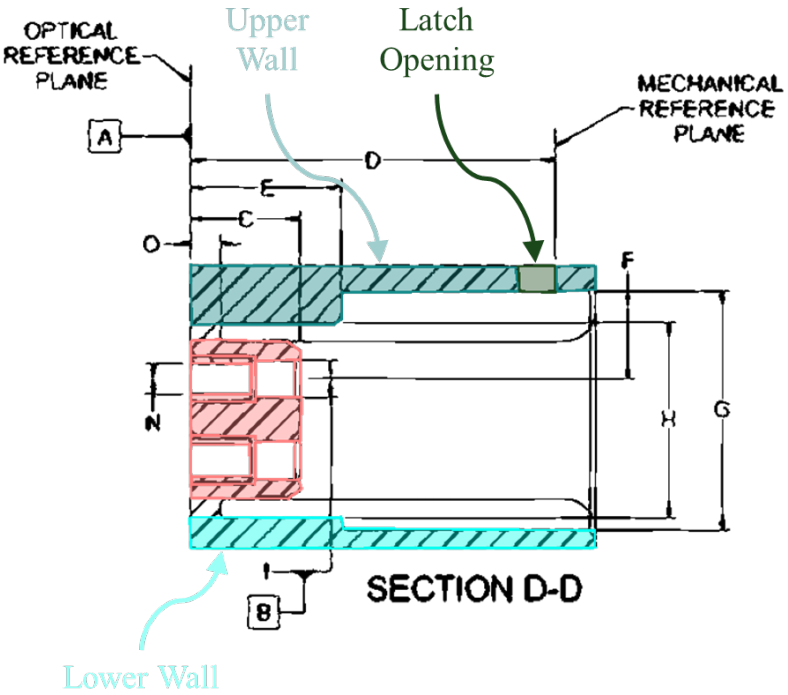
disengages the latch arm from the latch opening. Figures 2.1, 4.1, and 4.2 have been annotated below to identify the relevant elements of this feature.



EX1015, MDC Specification, FIG. 2.1 (annotated).



MDC Specification, FIG. 4.1 (annotated).

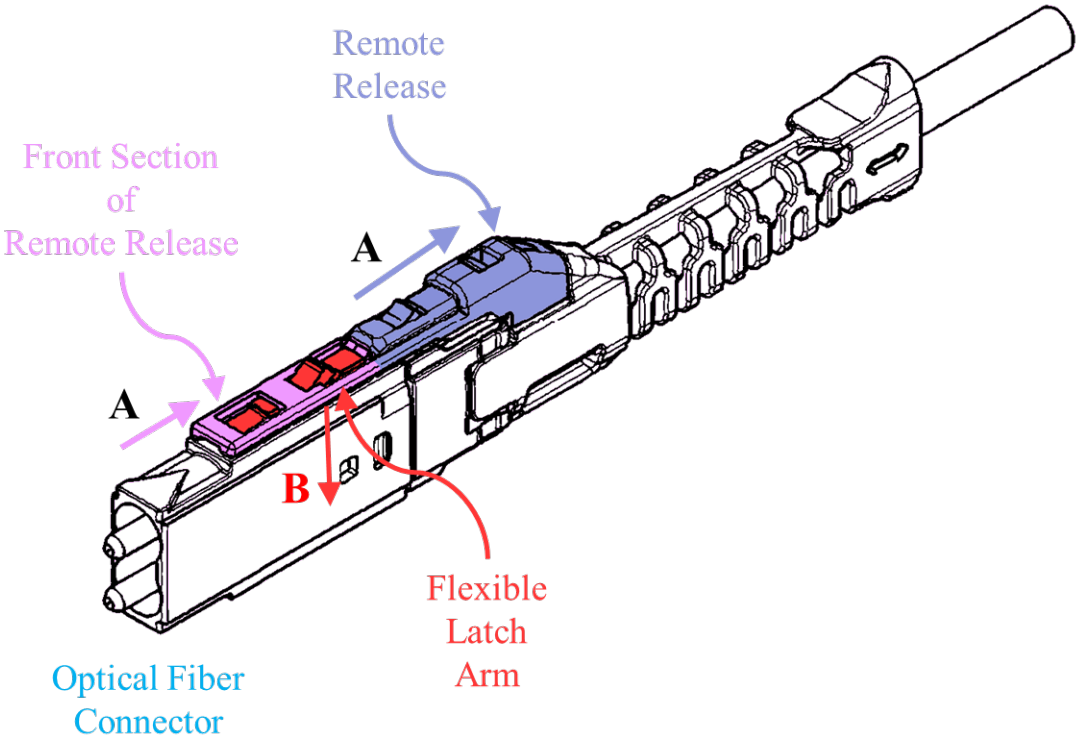


MDC Specification, FIG. 4.2 (cropped, annotated).

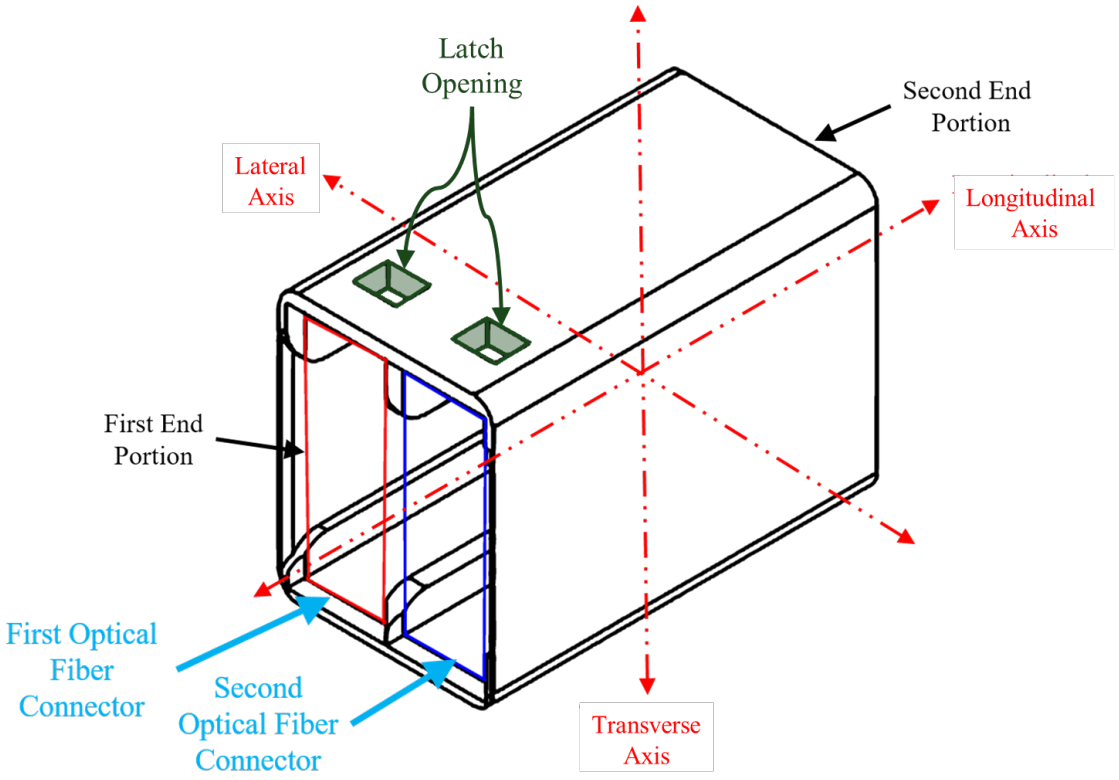
219. Accordingly, I believe the MDC Specification discloses all the features of claim 4.

E. Claim 5 – "The adapter set forth in claim 4, wherein the upper wall is configured to unlatch from the flexible latch arm of the first optical fiber connector when the flexible latch arm of the first optical fiber connector is depressed and the upper wall is configured to unlatch from the flexible latch arm of the second optical fiber connector when the flexible latch arm of the second optical fiber connector is depressed."

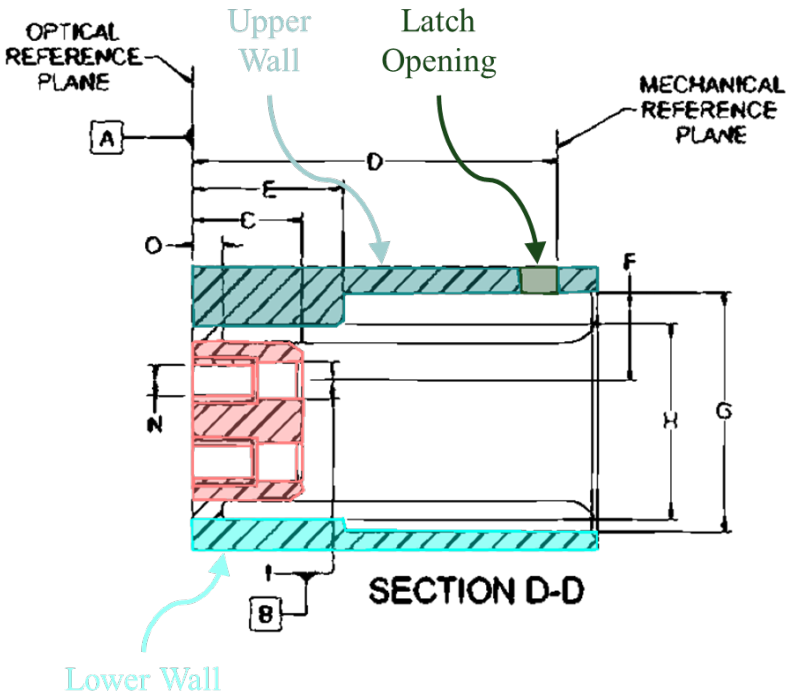
220. I believe the MDC Specification discloses an adapter having an upper wall "wherein the upper wall is configured to unlatch from the flexible latch arm of the first optical fiber connector when the flexible latch arm of the first optical fiber connector is depressed and the upper wall is configured to unlatch from the flexible latch arm of the second optical fiber connector when the flexible latch arm of the second optical fiber connector is depressed" as recited in claim 5. Specifically, the flexible latch arms engage with latch openings in the upper wall and lock into place. A user then engages the remote release by sliding it backward relative to the flexible latch arm, in the direction of arrows "A" as illustrated in annotated Figure 2.1 below, which in turn depresses the flexible latch arm, disengaging the latch from the latch opening in the upper wall. Figures 2.1, 4.1, and 4.2 have been annotated below to identify the relevant elements of this feature.



MDC Specification, FIG. 2.1 (annotated).



MDC Specification, FIG. 4.1 (annotated).



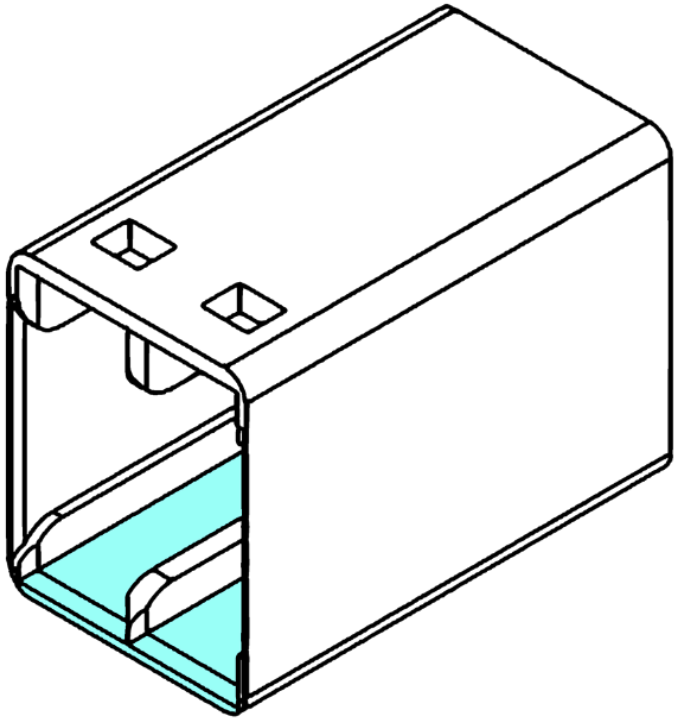
MDC Specification, FIG. 4.2 (annotated).

221. Accordingly, I believe the MDC Specification discloses all the elements of claim 5.

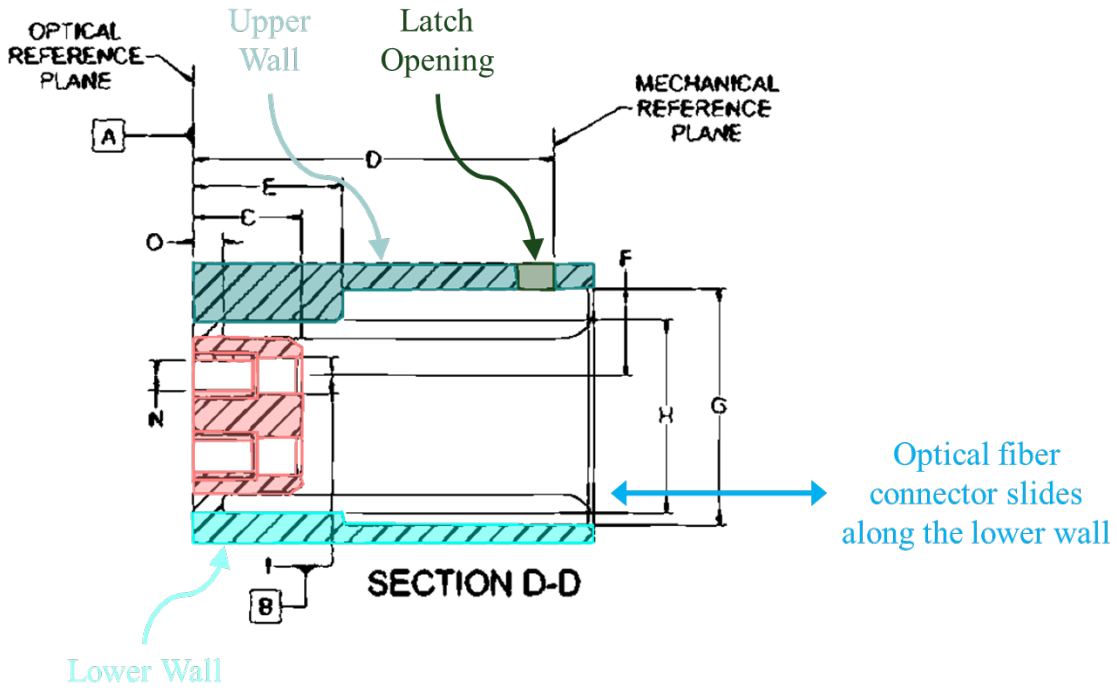
F. Claim 6 – "The adapter as set forth in claim 2, wherein the lower wall is free of latch openings" and Claim 7 – "The adapter as set forth in claim 2, wherein the lower wall is configured to slidably engage each of the first and second optical fiber connectors without latching."

222. I believe the MDC Specification discloses an adapter wherein the "lower wall is free of latch openings" and is "configured to slidably engage each of the first and second optical fiber connectors without latching" as recited in claims 6 and 7. For example, annotated Figure 4.1 of the MDC Specification below

illustrates an adapter having a lower wall that is free of latch openings. Furthermore, Figure 4.1 illustrates that the lower wall of both the first and second channels of the adapter is smooth and without latch openings. As such, the MDC adapter disclosed in Figure 4.1 is configured to slidably engage each of the first and second optical fiber connectors without latching to the lower wall.



MDC Specification, FIG. 4.1 (annotated).



MDC Specification, FIG. 4.2 (annotated).

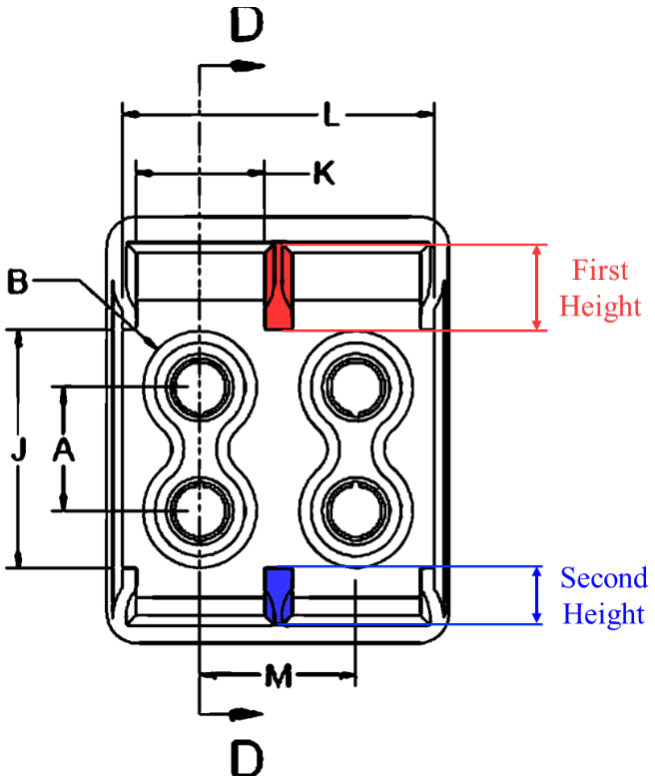
223. Accordingly, I believe the MDC Specification discloses all the features of claim 6 and 7.

G. Claim 8 – "The adapter as set forth in claim 1, wherein the first longitudinal rib has a first height along the transverse axis and the second longitudinal rib has a second height along the transverse axis, the first height being greater than the second height."

224. I believe the MDC Specification discloses a first and second longitudinal rib wherein the first rib has a first height along the transverse axis that is greater than the height of the second rib in the transverse axis.

225. For example, Figure 4.2 of the MDC Specification has been annotated below to identify the relevant features. Annotated Figure 4.2 of the MDC

Specification illustrates that the first longitudinal rib is visibly greater in height than the second longitudinal rib.

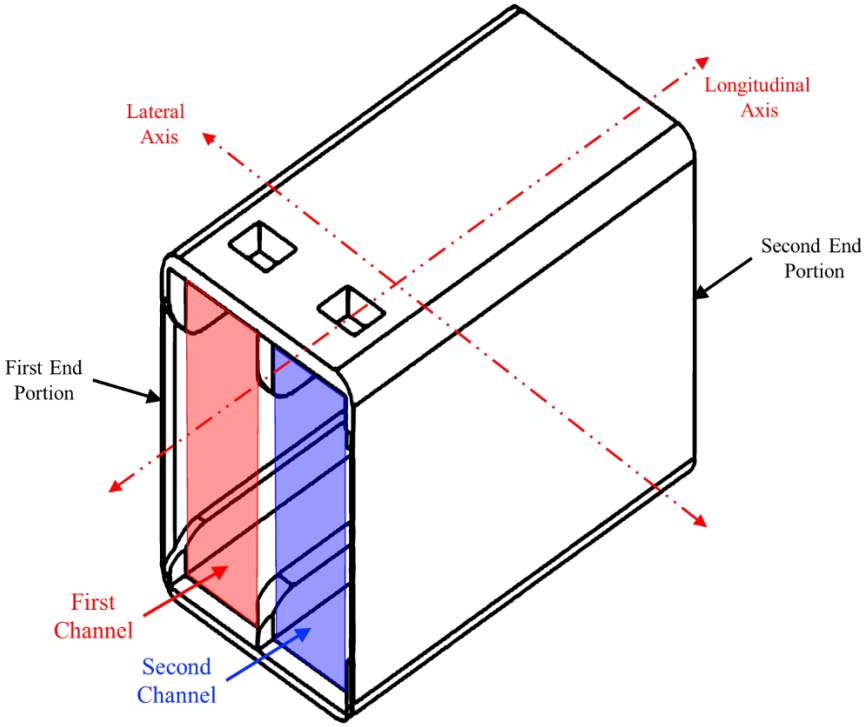


MDC Specification, FIG. 4.2 (cropped, annotated).

226. Accordingly, I believe the MDC Specification discloses all the features claim 8.

H. Claim 9 – "The adapter as set forth in claim 1, wherein each of the first and second channels opens through the first end portion of the outer housing."

227. I believe the MDC Specification discloses an adapter wherein each of the first and second channels open through the first end portion of the outer housing. This feature is illustrated in annotated Figure 4.1 below.



MDC Specification, FIG. 4.1 (annotated).

228. Accordingly, I believe the MDC Specification discloses the features of claim 9.

I. Claim 13 – "The adapter set forth in claim 1, wherein each of the optical fiber connectors is a multi-fiber connector comprising a multi-fiber ferrule."

229. I believe the MDC Specification discloses multi-fiber optical fiber connectors comprising a multi-fiber ferrule.

230. For example, the MDC Specification explains that the "MDC connector (Figure 2.1) is a very small form factor optical connector designed to provide (4) separate two-fiber connections into a OSFP or QSFP-DD module and

(2) separate two-fiber connections into a SFP-DD module." [MDC Specification, pg. 3, section 2.]

231. Accordingly, I believe the MDC Specification discloses the features of claim 13.

X. GROUND 2: NGUYEN ANTICIPATES CLAIMS 1-3, 6-10 AND 13

232. I believe that Nguyen expressly discloses all of the limitations in claims 1-3, 6-10, and 13 of the '836 Patent, either through its narrative description or its illustrative depictions of adapters. Additionally, to the extent any limitation in claims 1-3, 6-10, and 13 of the '836 Patent is not expressly disclosed, I believe a POSITA would have understood that such limitation is inherently disclosed (*i.e.*, necessarily present based on the disclosure) in Nguyen. Therefore, I believe these claims are invalid because they are anticipated by Nguyen.

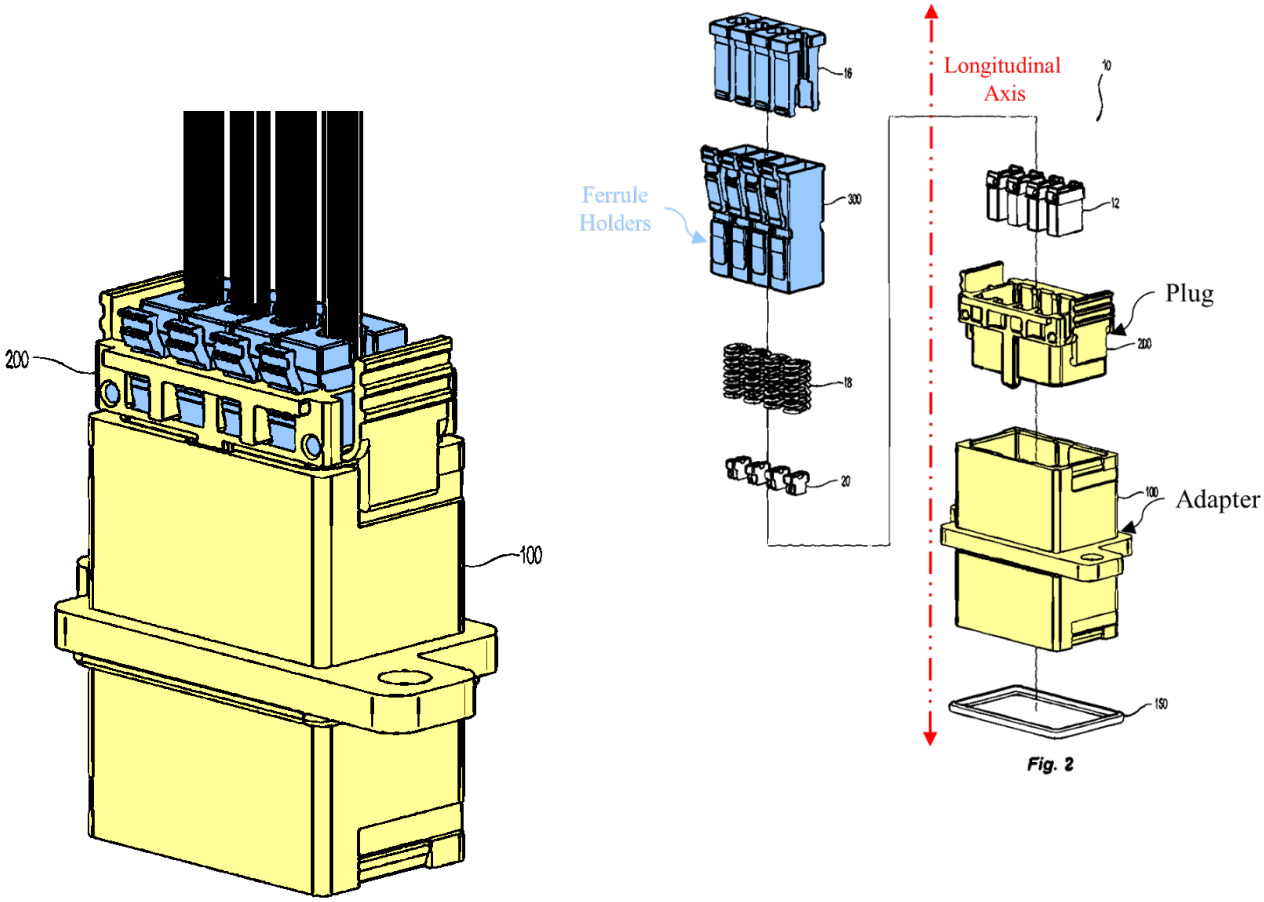
233. I provide a more detailed discussion regarding the disclosures and teachings in Nguyen relative to the claim limitations of the '836 Patent below.

A. Claim 1

1. Preamble – "An adapter for mating with optical fiber connectors, the adapter comprising:"

234. In my opinion, Nguyen discloses an adapter for mating with optical fiber connectors. [Nguyen, ¶4 ("[A]n adapter and adapter assembly with novel alignment features is provided to engage with alignment features on a plug, which in turn assists in aligning the ferrule holders with alignment grooves in the

adapter.")] As shown below in annotated versions of Figures 1, 2, and 6A, Nguyen discloses an adapter for mating with optical fiber connectors. The components of the adapter are highlighted in yellow.



Nguyen, FIGs. 1 and 2 (annotated).

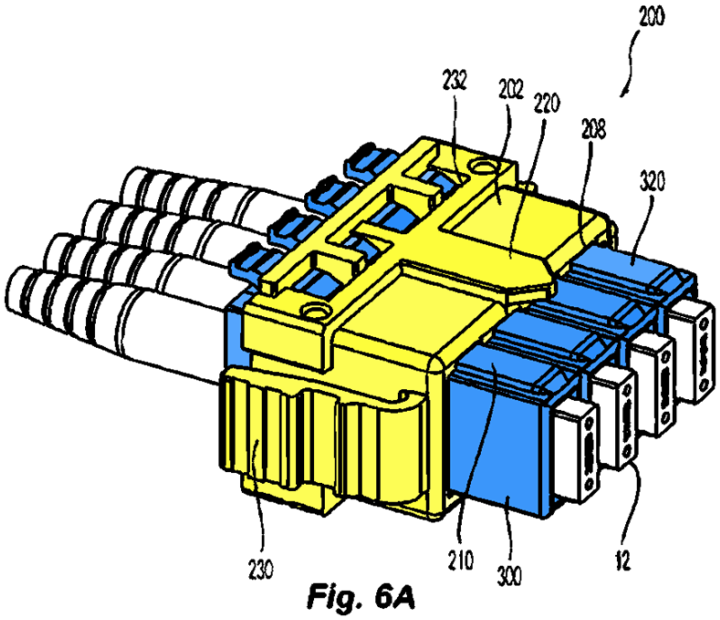


Fig. 6A

Nguyen, FIG. 6A (annotated).

235. A POSITA would have readily understood that the adapter 100 and plug 200 combine to receive and connect with ferrule holders 300 and function together as an "adapter for mating with optical fiber connectors." Furthermore, Nguyen explains that "the ferrule holders 300 are inserted into the plug 200." [Nguyen, ¶26.] Nguyen also describes "inserting the plug 200 into the adapter 100." [Nguyen, ¶29.] Nguyen describes and illustrates with respect to Figure 6A, the "plug 200 also has two cantilevered latches 230 on the sides to engage corresponding structure on the adapter 100." [Nguyen, ¶30.] Nguyen also describes the "grooves within the adapter that aligns the ferrule holders is one continuous feature for both sides of the adapter and the mating ferrule holders." [Nguyen, ¶3.]

236. I believe a POSITA would have understood these disclosures to illustrate that the adapter 100 and plug 200 collectively are an "adapter for mating with optical fiber connectors." [*See* Nguyen, ¶26.]

237. Further, Nguyen explains, referring to FIGs. 1 and 2, the "adapter assembly 10 is used to align ferrules 12 to other ferrules in a tightly controlled manner and in a tighter space than has been possible before." [Nguyen, ¶26.] This is the same type of adapter as disclosed in the '836 Patent. [*See, e.g.,* EX1001, title, 6:40-67 and 14:41-16:16 (explaining the need for safely connecting and disconnecting high-density fiber optic connectors and disclosing an adapter), FIGs. 25-28 (illustrating an example embodiment of an adapter).]

238. Accordingly, I believe that a POSITA would have understood Nguyen discloses an adapter for mating optical fiber connectors.

2. Element [1.1] – "an outer housing having a first end portion and a second end portion spaced apart along a longitudinal axis, the outer housing comprising a first side wall and a second side wall spaced apart along a lateral axis perpendicular to the longitudinal axis, the outer housing having a width extending along the lateral axis from the first side wall to the second side wall, the outer housing comprising a upper wall and a lower wall spaced apart along a transverse axis oriented perpendicular to the lateral axis and perpendicular to the longitudinal axis"

239. A POSITA would have readily understood that Nguyen's plug 200 and adapter 100 combine to form an adapter having an outer housing. In particular, Nguyen discloses an outer housing having a first end portion and a second end

portion spaced apart along a longitudinal axis with the outer housing comprising a first side wall and a second side wall spaced apart along a lateral axis perpendicular to the longitudinal axis, having a width extending along the lateral axis from the first side wall to the second side wall, and comprising a upper wall and a lower wall spaced apart along a transverse axis oriented perpendicular to the lateral axis and perpendicular to the longitudinal axis. [*See, e.g.,* Nguyen, ¶¶28, 29, FIGs. 1, 2.] For example, below I have annotated Figure 2 of Nguyen to identify how the outer housing includes all aspects of this claim element:

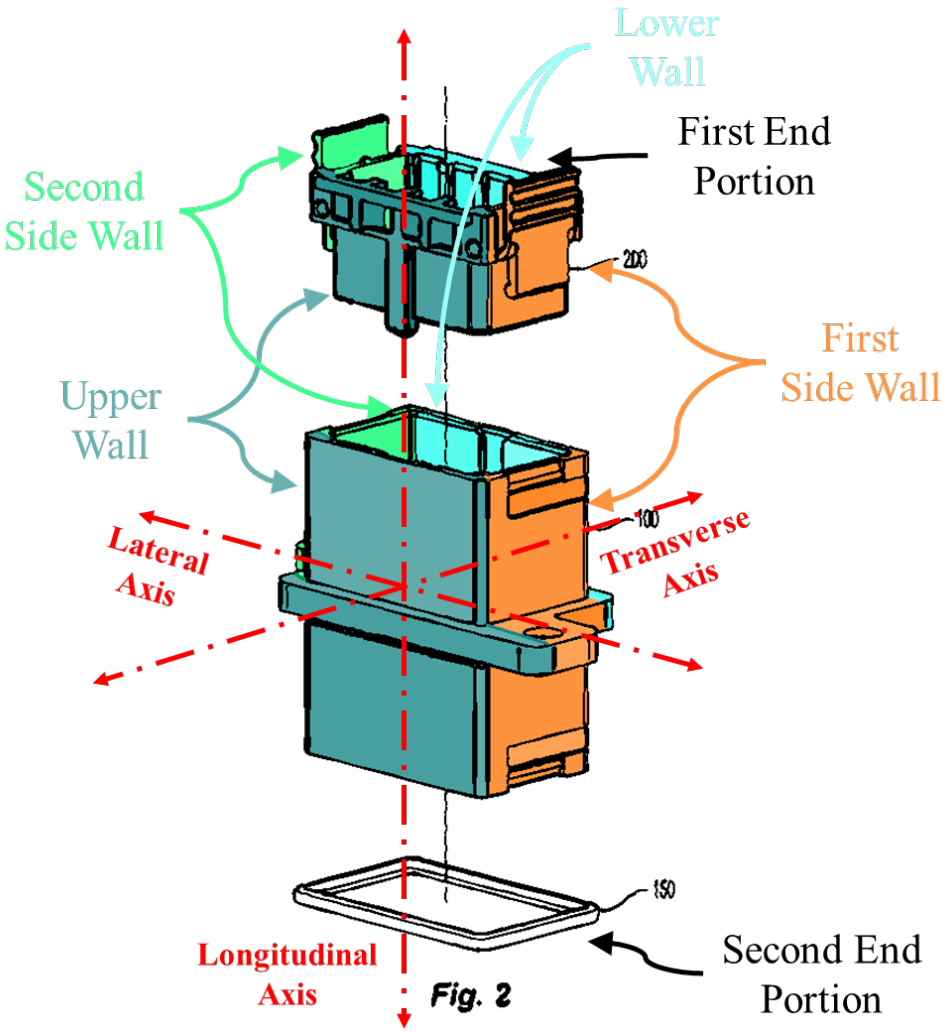
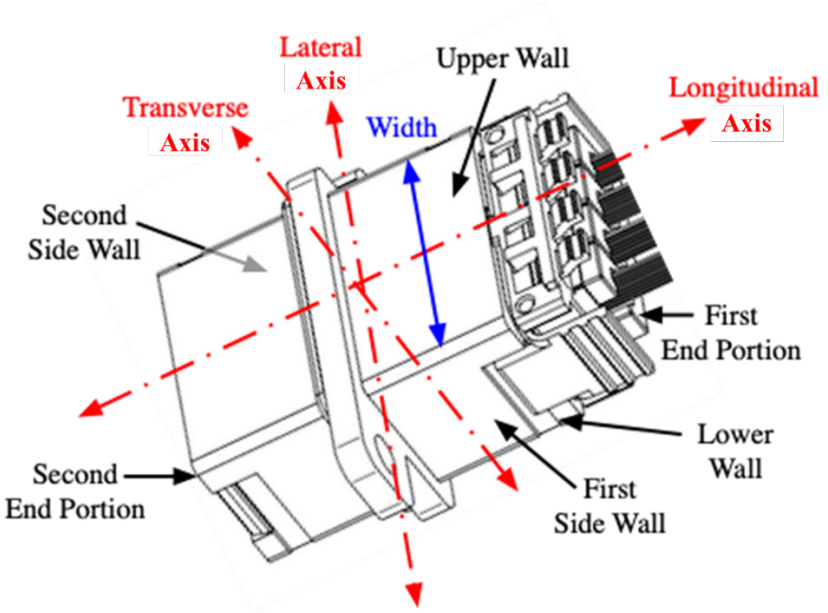


Fig. 2

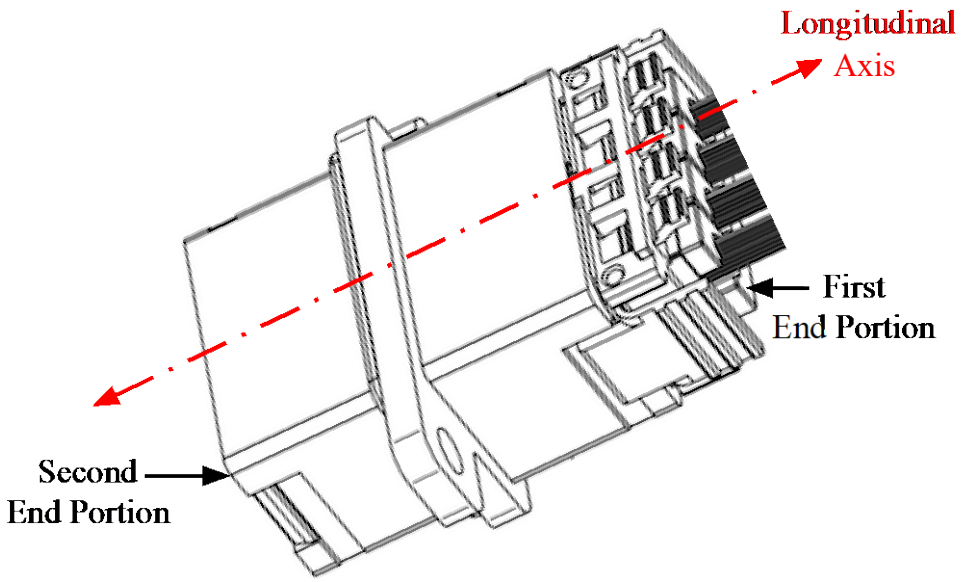
Nguyen, FIG. 2 (cropped, annotated).

240. Figure 1 also shows the outer housing that has all of the aspects recited in this claim.



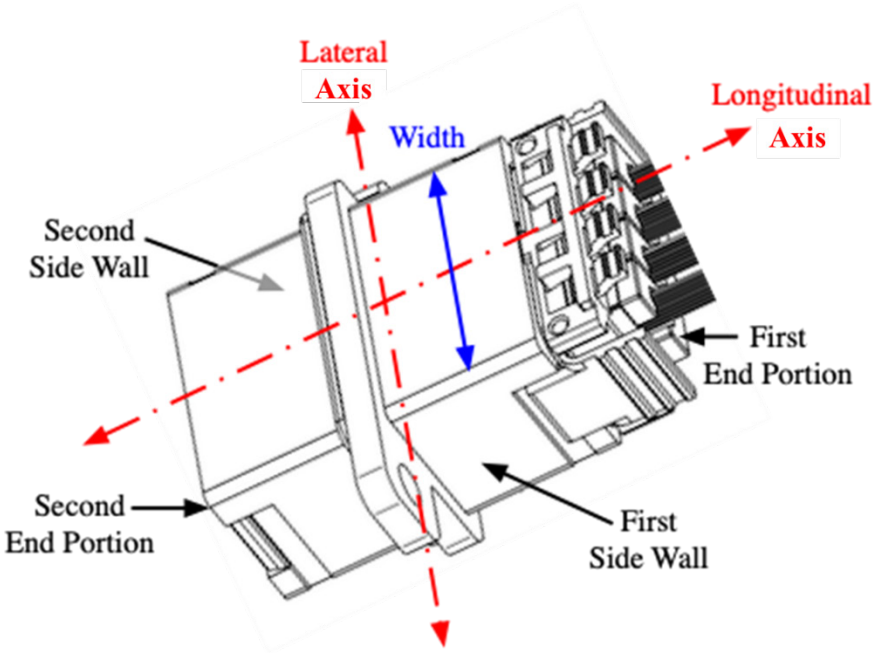
Nguyen, FIG. 1 (showing the "outer housing" that includes the axis and walls as labeled in the exploded view above of Figure 2) (cropped, annotated).

241. Recall from the section above that provided an overview of the '836 patent, that this limitation is practiced by a rectangular box. The adapter presented in Nguyen is very much like a rectangular box and similarly teaches this limitation. For example, the first limitation of element 1.1 (an outer **housing** having a first end portion and a second end portion spaced apart along a longitudinal axis) is illustrated by the annotated version of Nguyen FIG. 1 provided below.



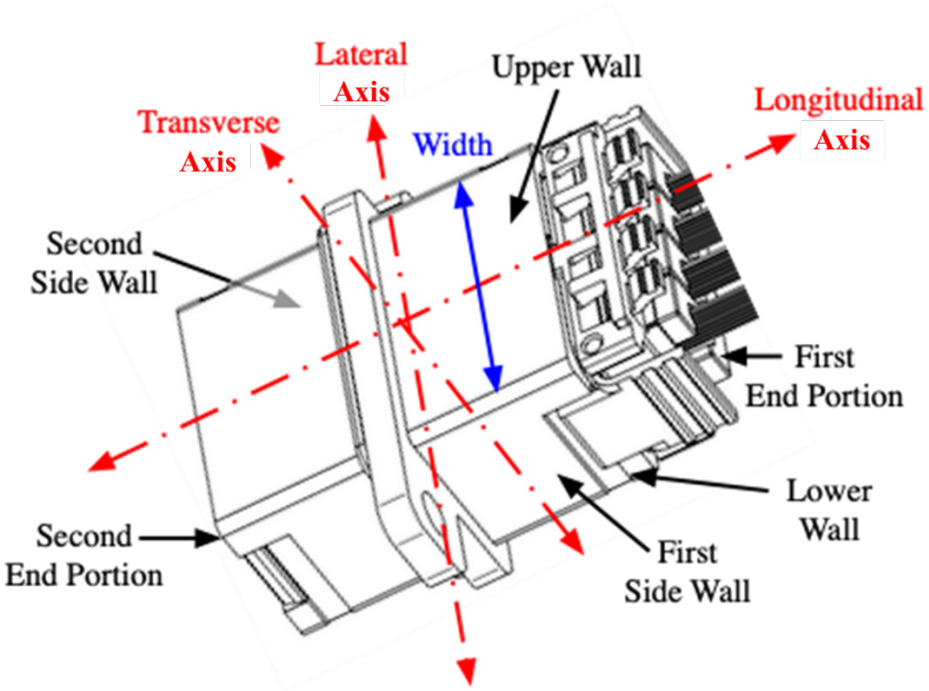
Nguyen Fig. 1 - First limitation of Element 1.1 (cropped, annotated).

242. The requirements of the second limitation of Element 1.1 (the outer housing comprising a first side wall and a second side wall spaced apart along a lateral axis perpendicular to the longitudinal axis, the outer housing having a width extending along the lateral axis from the first side wall to the second side wall) are overlaid on the annotated version of Nguyen Fig. 1 provided below.



Nguyen Fig. 1 - First and Second limitations of Element 1.1 (cropped, annotated).

243. The requirements of the third, and final, limitation of Element 1.1 (the outer housing comprising a upper wall and a lower wall spaced apart along a transverse axis oriented perpendicular to the lateral axis and perpendicular to the longitudinal axis) are overlaid on the annotated version of Nguyen Fig. 1 provided below.



Nguyen FIG. 1 - First, Second, and Third Limitations of Element 1.1 (cropped, annotated).

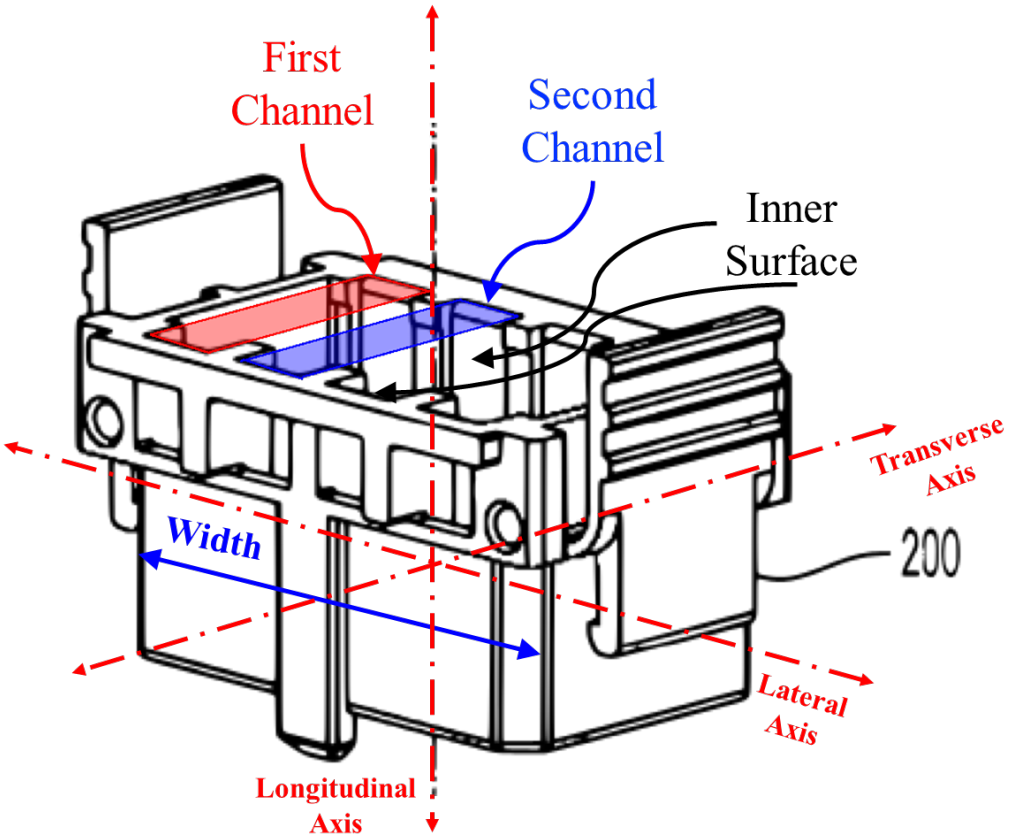
244. The adapter housing of Nguyen is described as being composed of two main parts, plug 200 and adapter 100. While a POSITA would understand a single housing is often constructed from multiple components, they would also understand that the claims of the '836 patent do not require a singular housing. The '836 Patent confirms my understanding by defining "a" and "an" as "one or more." [*See, e.g.,* EX1001, 6:15-17 and 17:7-23.] Thus, I believe a POSITA would have interpreted "an outer housing" as "one or more" outer housings that collectively form the claimed outer housing. This confirms that although the plug 200 and adapter 100 are separable from one another, they collectively form a modular

housing when connected that satisfies all aspects of this claim. [*See* Nguyen, FIGs. 1-2.]

245. Accordingly, I believe that a POSITA would have understood Nguyen discloses element [1.1].

3. Element [1.2] – "each of the upper wall and the lower wall having an inner surface, the outer housing defining a plurality of channels spaced apart along the width, each of the channels being configured to receive an optical fiber connector, the plurality of channels including first and second channels"

246. In my opinion, Nguyen discloses that each of the upper and lower walls have an inner surface and that the outer housing defines a plurality of channels, including first and second channels, spaced apart along the width where each channel is configured to receive an optical fiber connector. [*See, e.g.*, Nguyen, ¶28, FIGs. 1, 2.] For example, I believe a POSITA would have understood that the plug 200 has an opening with grooves and projections defining channels for inserting ferrule holders 300 that are spaced apart along the width, thereby corresponding to the inner surface and channels as used in this claim. [*See, e.g., id.*, FIG. 2.] Put another way, Nguyen's FIG. 2 illustrates the inner surface of the upper wall and the lower wall as claimed by the '836 Patent. [*See id.*, FIG. 2.] I have provided below an annotated Figure 2 to identify relevant features.



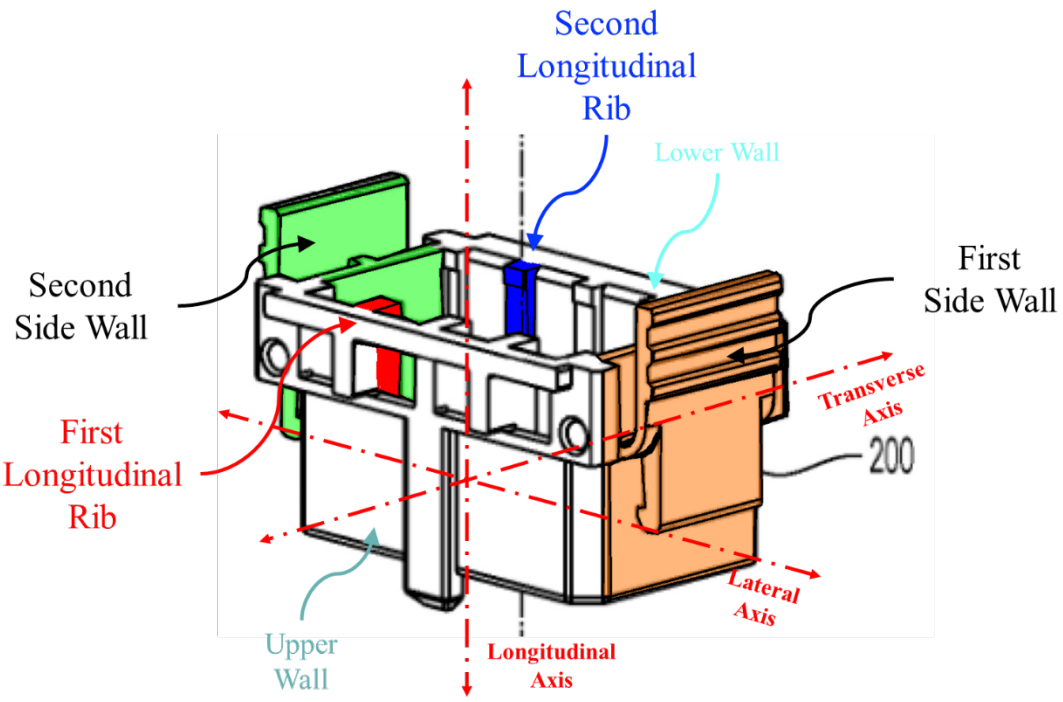
Nguyen, FIG. 2 (cropped, annotated).

247. In my opinion, a POSITA would have understood that Nguyen's ferrule holders 300 are optical fiber connectors because Nguyen describes a plurality of ferrule holders 300 that hold optical fibers and connect with an adapter to connect with optical fibers on the other side of the adapter. [*See id.*, ¶26, FIGs. 1, 2.] Nguyen's channels identified above in Figure 2 are configured to receive these optical fiber connectors. [*See, e.g., id.*, FIG. 1 (showing the ferrule holders 300 received in the adapter 100 and plug 200); FIG. 2 (showing an exploded view illustrating how the assembly is done).]

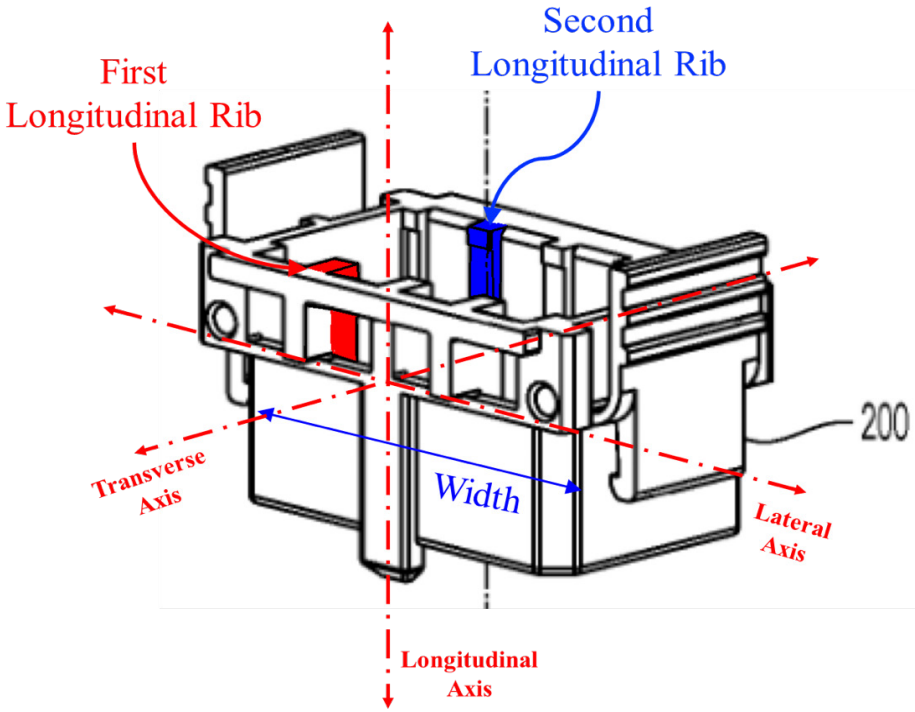
248. Accordingly, I believe that a POSITA would have understood Nguyen discloses element [1.2].

4. Element [1.3] – "a first longitudinal rib formed on the inner surface of the upper wall at a location spaced apart along the width of the outer housing between the first side wall and the second side wall and a second rib formed on the inner surface of the lower wall at a location spaced apart along the width of the outer housing between the first side wall and the second side wall, the first and second ribs being aligned along the width of the outer housing, the first rib being spaced apart from the second rib along the transverse axis by a transverse gap"

249. In my opinion, Nguyen discloses first and second longitudinal ribs positioned as recited in this claim. [*See, e.g.*, Nguyen, FIG. 2.] Below are provided versions of Nguyen Fig. 2 wherein I have annotated and enlarged a portion of Nguyen's Figure 2 in two different instances to identify the first and second longitudinal ribs in relation to other features on plug 200. As the figures show, the first and second ribs have the claimed spacing and alignment. They are aligned along the width (lateral axis) of the outer housing because they are directly opposite one another in the transverse direction.



Nguyen, FIG. 2 (cropped, annotated).

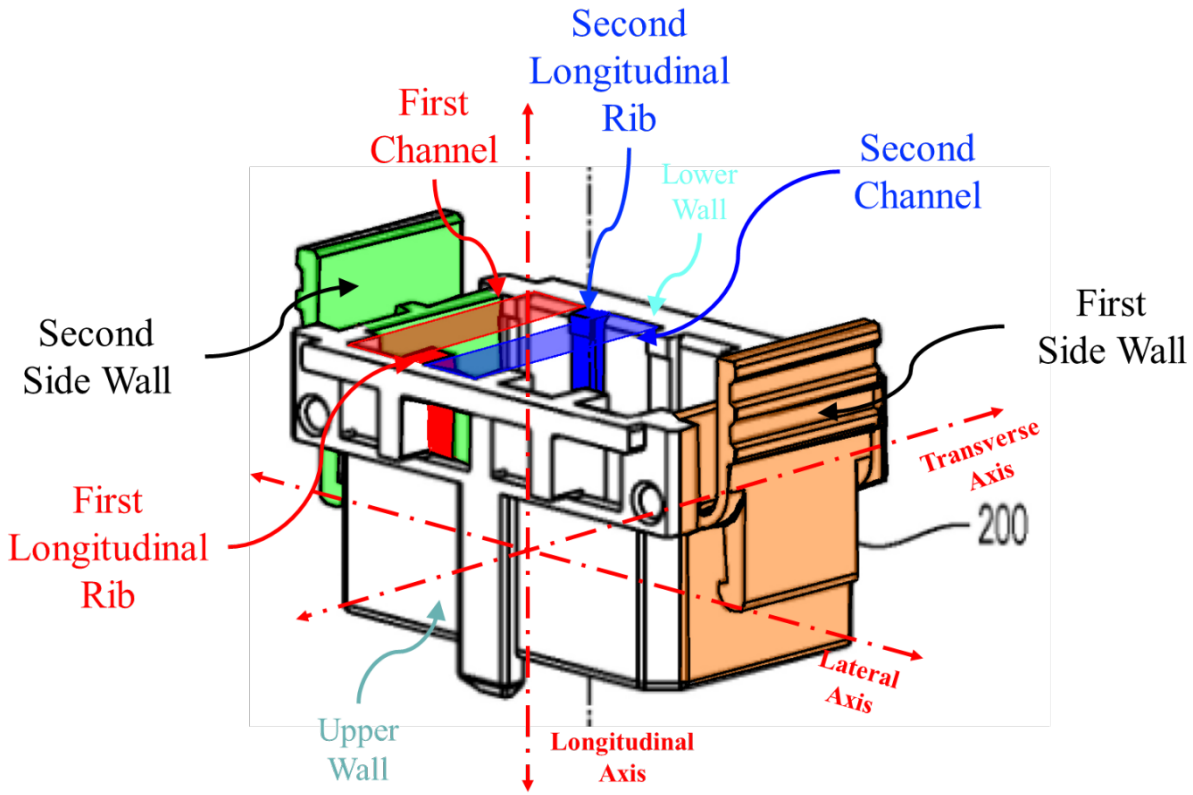


Nguyen, FIG. 2 (cropped, annotated).

250. Accordingly, I believe that a POSITA would have understood Nguyen discloses element [1.3].

5. Element [1.4] – "wherein the first longitudinal rib and the second longitudinal rib are located between the first and second channels"

251. In my opinion, Nguyen discloses the first and second ribs are located between the first and second channels formed on the inner surfaces of the upper and lower walls as shown below in an enlarged portion of Figure 2:



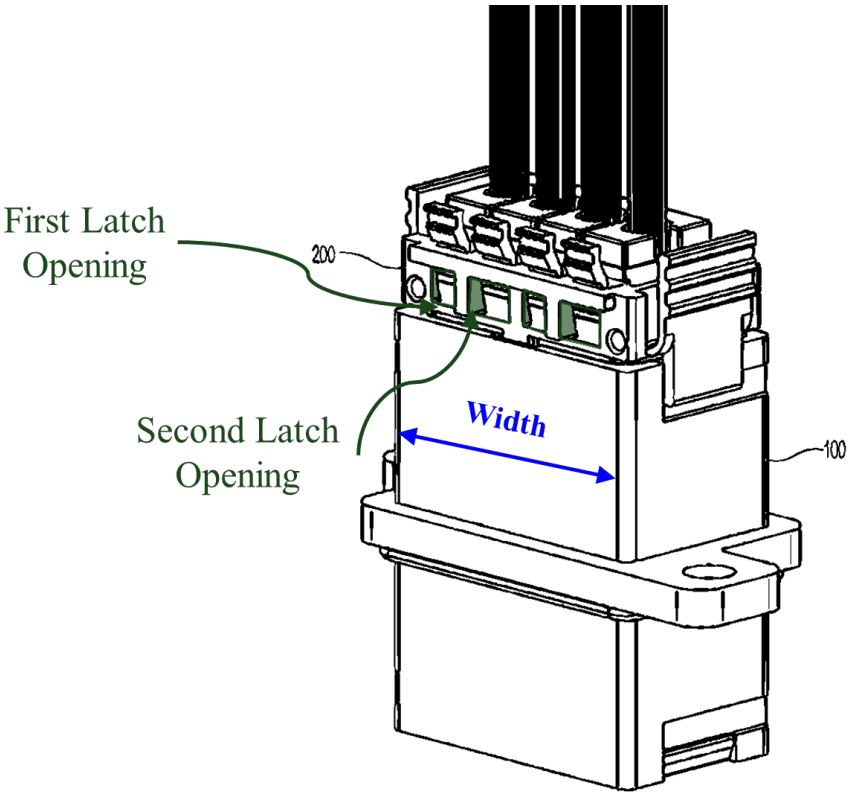
Nguyen, FIG. 2; (showing both ribs located between the two channels) (cropped, annotated).

252. Accordingly, I believe that a POSITA would have understood Nguyen discloses element [1.4], and thus, the entirety of claim 1.

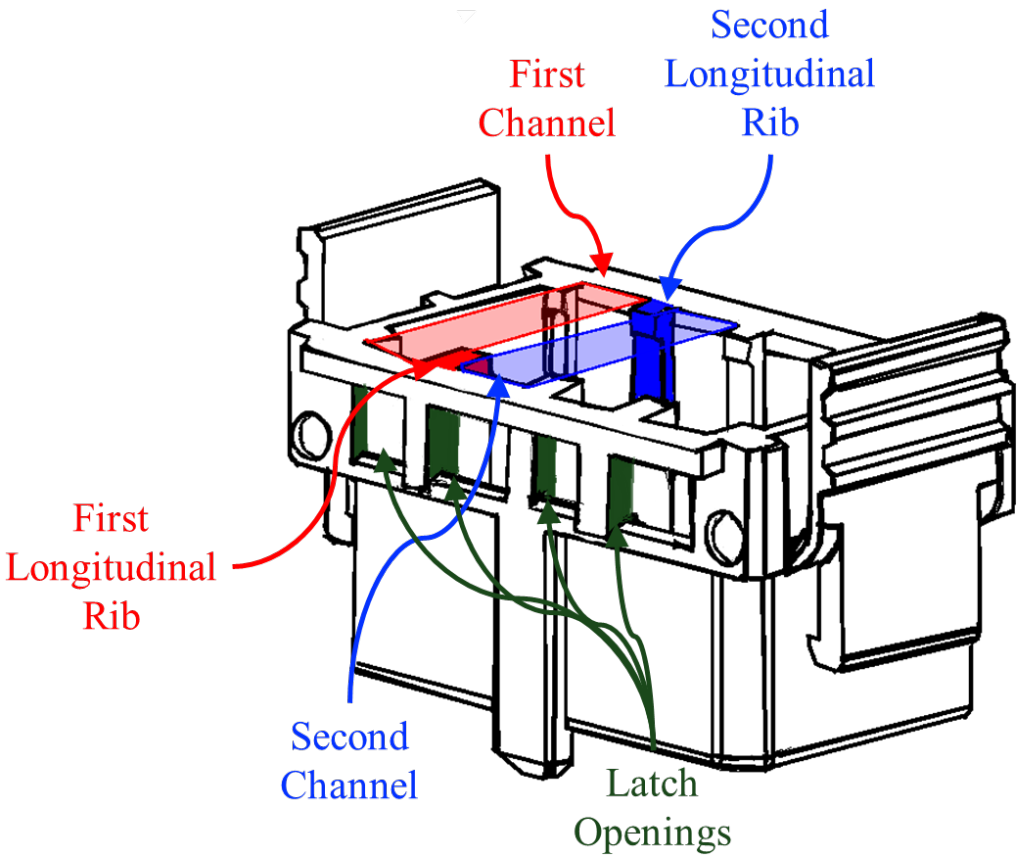
B. Claim 2 – "The adapter as set forth in claim 1, wherein the upper wall comprises a first latch opening aligned with the first channel and a second latch opening aligned with the second channel, the first rib being spaced apart between the first latch opening and the second latch opening along the width."

253. In my opinion, a POSITA would have understood Nguyen discloses latch openings aligned with their respective channels and the first rib being positioned between two latch openings along a width. Therefore, I believe Nguyen anticipates claim 2.

254. For example, Nguyen explains how there are latch receptacles 232 on the top side of the plug 200 to engage the latches 316 of the ferrule holders 300. [Nguyen, ¶30.] A POSITA would have understood that latch receptacles are "latch openings" because Nguyen's latch receptacles 232 are openings configured to receive latches. Further, I believe a POSITA would have understood that Figures 1, 2, and 6A illustrate two latch receptacles aligned with respective channels and the first rib spaced between the two latch openings along the width as annotated below with respect to Figures 1, 2, and 6A:



Nguyen, FIG. 1 (cropped, annotated).



Nguyen, FIG. 2 (cropped, annotated).

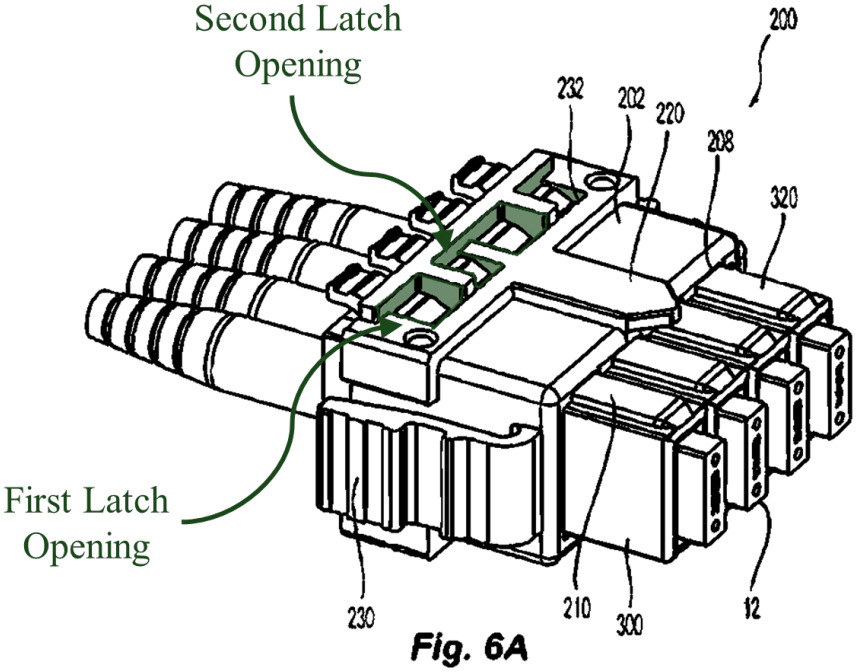


Fig. 6A

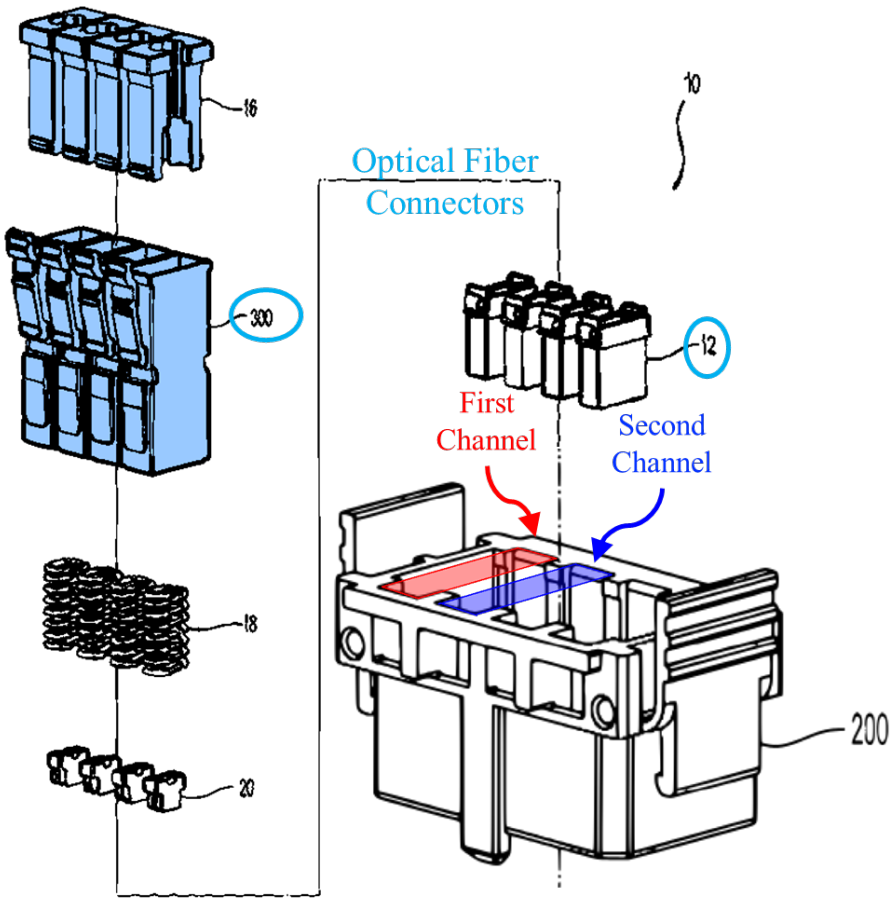
Nguyen, FIG. 6A (annotated).

255. Accordingly, I believe that a POSITA would have understood Nguyen discloses claim 2.

C. Claim 3

1. Element [3.1] – "The adapter as set forth in claim 2, wherein the adapter is configured to receive a first one of the optical fiber connectors in the first channel and a second one of the optical fiber connectors in the second channel such that:"

256. In my opinion, a POSITA would have understood that Nguyen discloses an adapter configured to receive a first optical fiber connector in the first channel and a second optical fiber connector in the second channel. For example, Nguyen explains that "ferrules 12 are disposed within the ferrule holder 300 and have optical fibers 14 secured therein" and that "the ferrules holders 300 are inserted into the plug 200." [Nguyen, ¶26.] FIG. 2, as annotated below, illustrates ferrule holders 300 and ferrules 12 are received by respective channels in the plug 200.



Nguyen, FIG. 2 (cropped, annotated).

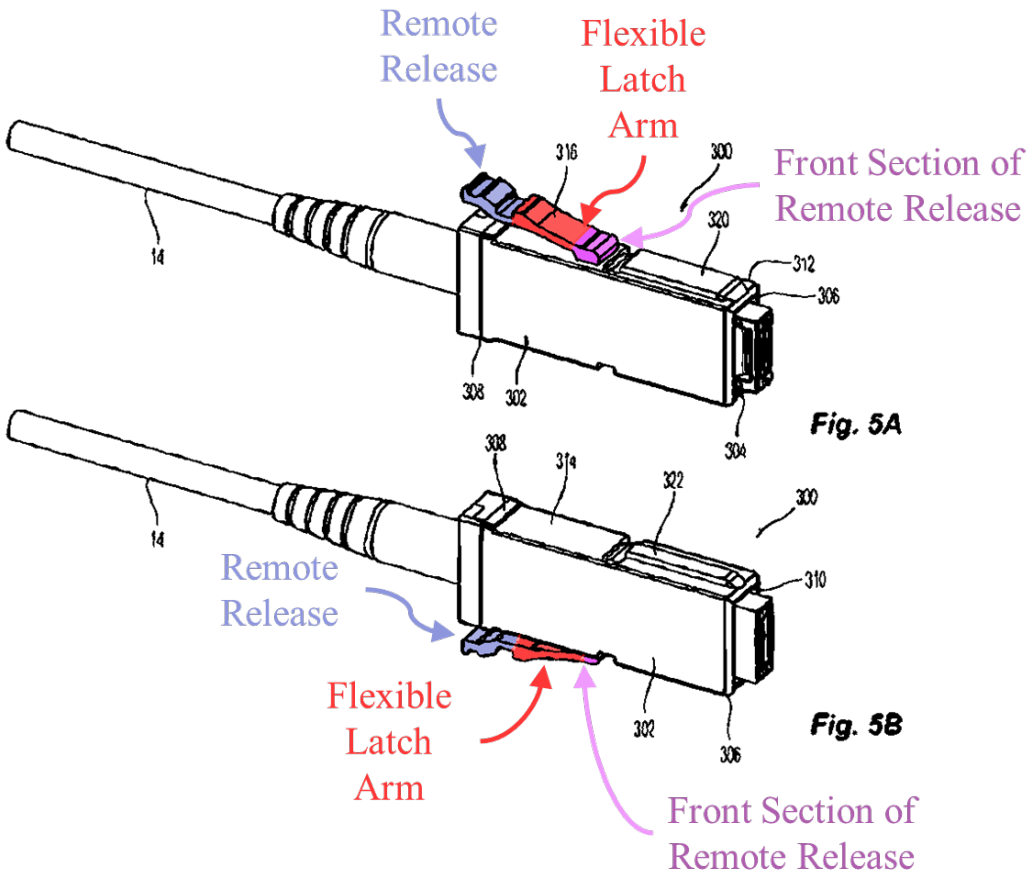
257. Accordingly, Nguyen discloses element [3.1] of claim 3.

2. Element [3.2] – "a flexible latch arm of the first optical fiber connector is latched with the first latch opening and a front section of a remote release of the first optical fiber connector is received in the first channel at a location spaced apart from the first latch opening along the longitudinal axis toward the second end portion of the outer housing"

258. Nguyen discloses a flexible latch arm of the first optical fiber connector is latched with the first latch opening and a front section of a remote release of the first optical fiber connector is received in the first channel at a

location spaced apart from the first latch opening along the longitudinal axis toward the second end portion of the outer housing.

259. For example, the annotated version of Nguyen Figures 5A and 5B shown below illustrate a "ferrule holder 300 has a top surface 312 and a bottom surface 314, with a cantilevered latch 316 to engage the plug 200." [Nguyen, ¶27.]

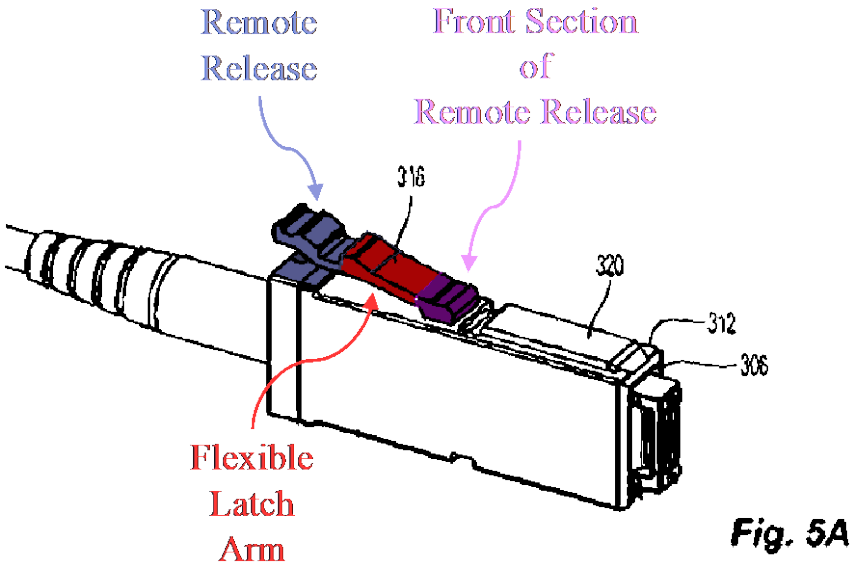


Nguyen, FIGs. 5A, 5B(annotated).

260. Nguyen further discloses a release mechanism that is configured to cooperate with the plug portion of the adapter to depress the latch arm such that the

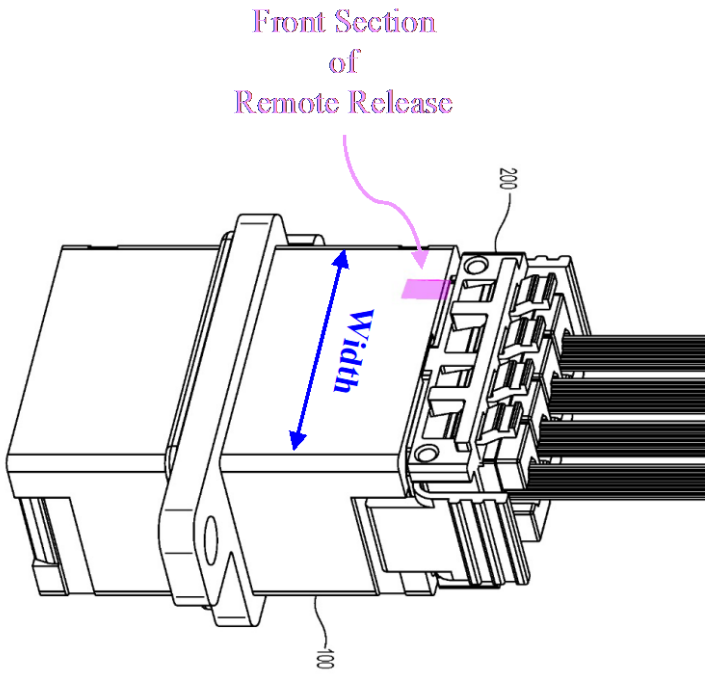
latch portion of the optical fiber connector unlatches from latch receptacles 232. [*See* Nguyen, ¶¶27, 29, 30, and FIGs. 2, 5A, 5B.]

261. The annotated version of Nguyen Figure 5 provided below shows the remote release and the latch of Nguyen. The front section of the remote release has also been highlighted.



Nguyen Figure 5 (annotated).

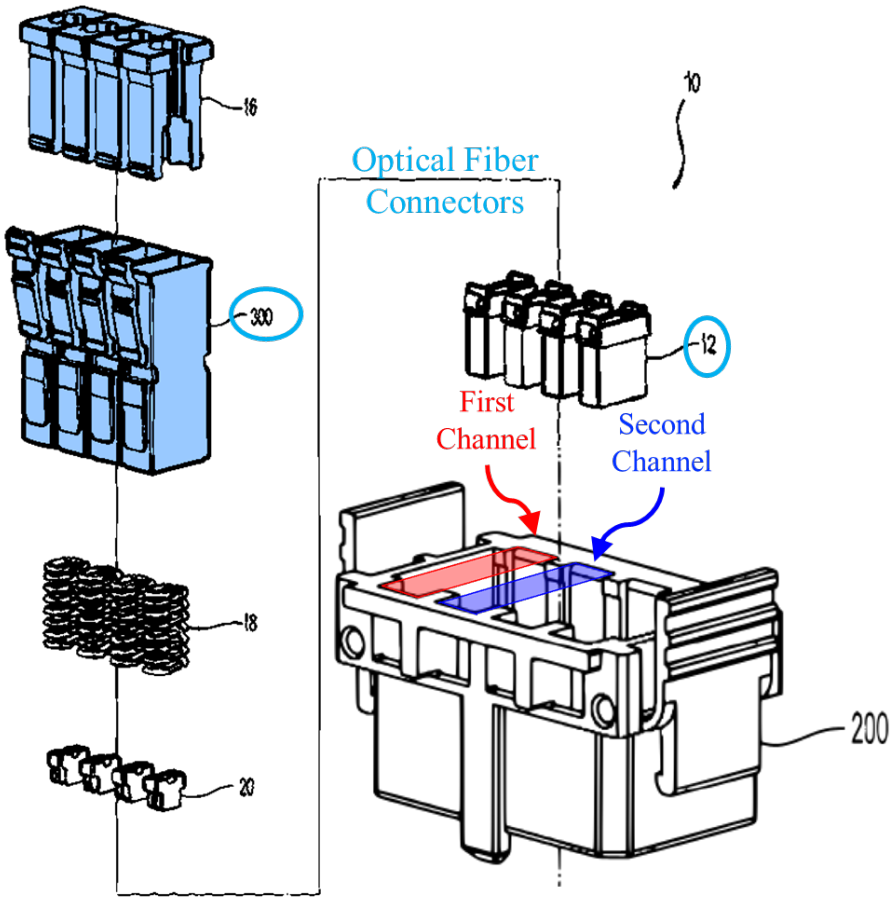
262. When the front section of the remote release is received in the first channel, it is spaced apart from the first latch opening toward the second end portion of the housing, as shown below in an annotated version of Nguyen Fig. 1.



Nguyen Figure 1 (cropped, annotated).

263. Therefore, Nguyen discloses a flexible latch arm, as well as a remote release feature.

264. Additionally, Figure 2 of Nguyen, as annotated below, illustrates ferrule holders 300 and ferrules 12 are received by respective channels in the plug 200.



Nguyen, FIG. 2 (cropped, annotated).

265. Accordingly, Nguyen discloses element [3.2] of claim 3.

3. Element [3.3] – "a flexible latch arm of the second optical fiber connector is latched with the second latch opening and a front section of a remote release of the second optical fiber connector is received in the first channel at a location spaced apart from the second latch opening along the longitudinal axis toward the second end portion of the outer housing"

266. As discussed above, Figures 5A and 5B illustrate a ferrule holder having a flexible latch arm that is configured to engage with the latch openings in plug 200 and Figure 2 illustrates ferrule holders 300 and ferrules 12 are received

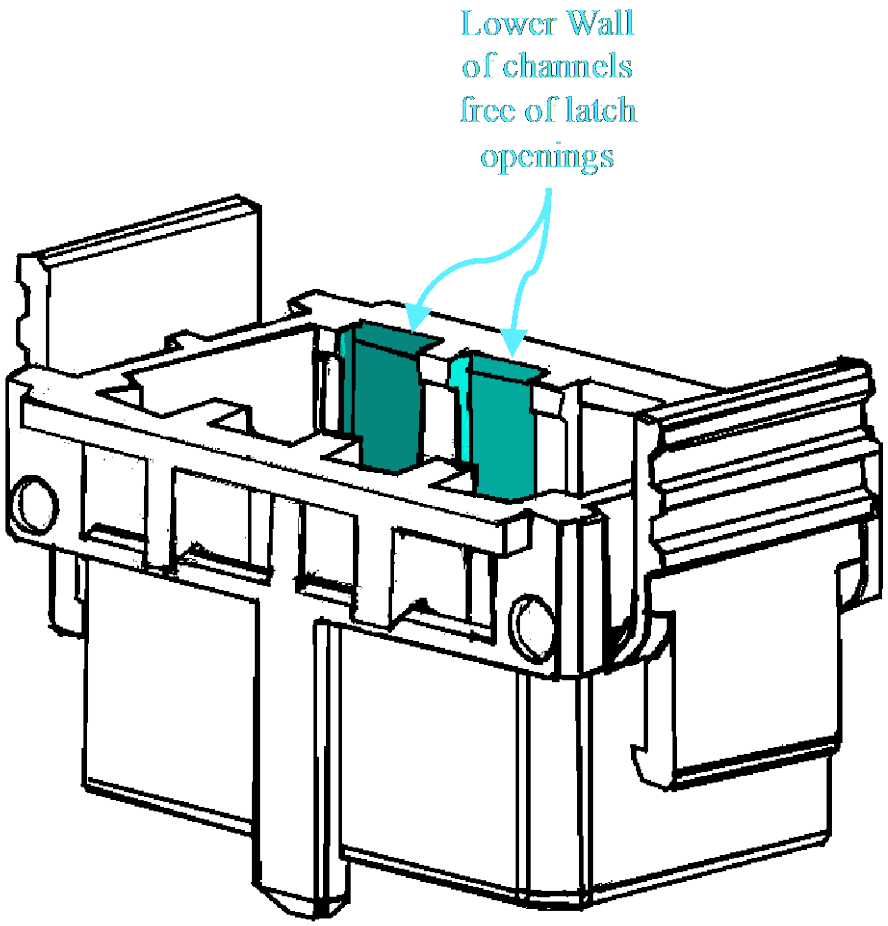
by respective channels in the plug 200. Nguyen further discloses a release mechanism configured to cooperate with the plug portion of the adapter to depress the latch arm and unlatch the optical fiber connector from the adapter.

267. Accordingly, Nguyen discloses element [3.3] of claim 3.

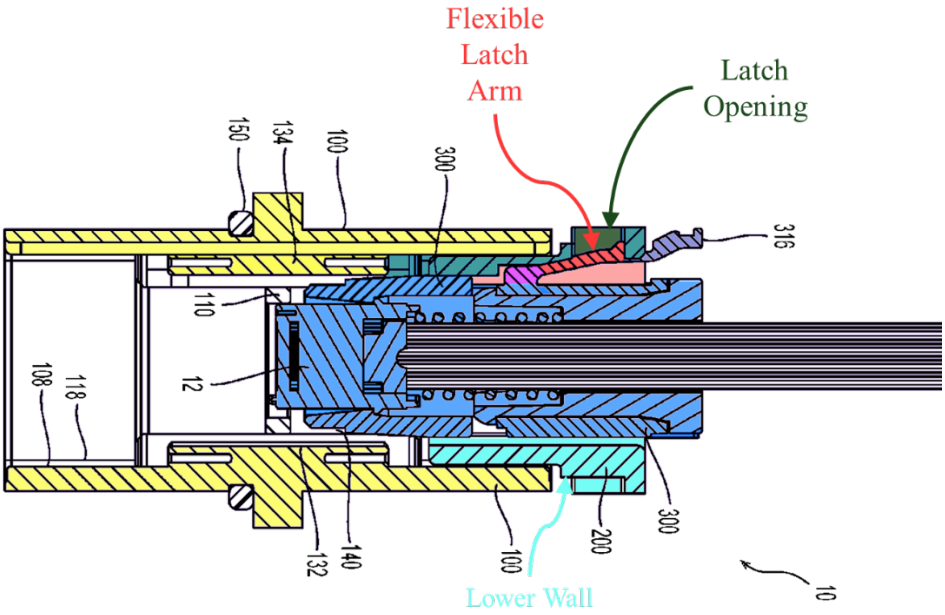
D. Claim 6 – "The adapter as set forth in claim 2, wherein the lower wall is free of latch openings"

268. In my opinion, a POSITA would have understood that the lower wall of Nguyen's adapter is free of latch openings. [*See* Nguyen, FIGs. 2 and 9.] Therefore, I believe Nguyen anticipates claim 6.

269. As shown below in annotated form, Figures 2 and 9 of Nguyen illustrate all of the aspects of claim 6. For example, Figure 9 illustrates a cross-sectional view of an adapter and connector assembly in which the lower wall of the adapter is visibly free of latch openings.



Nguyen, FIG. 2 (cropped, annotated).



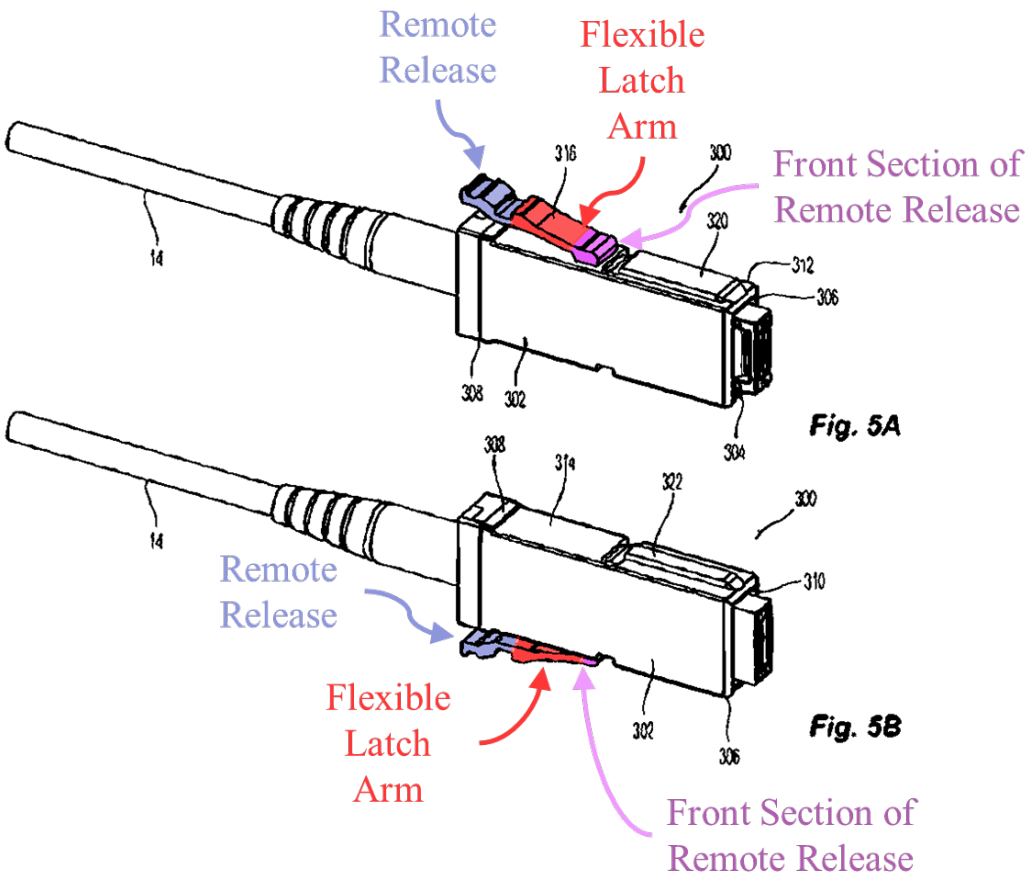
Nguyen, FIG. 9 (annotated).

270. Accordingly, I believe that a POSITA would have understood Nguyen discloses claim 6.

E. Claim 7 – "The adapter as set forth in claim 2, wherein the lower wall is configured to slidably engage each of the first and second optical fiber connectors without latching."

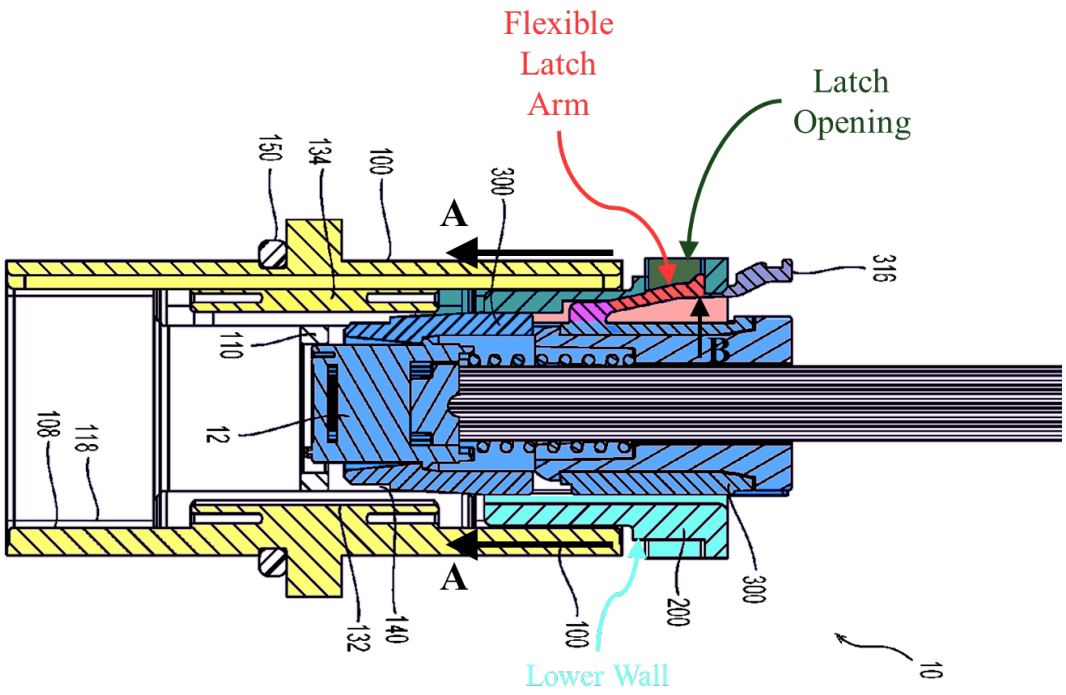
271. In my opinion, a POSITA would have understood that the lower wall of Nguyen's adapter is configured to slidably engage two optical fiber connectors without latching. [*See* Nguyen, FIGs. 5A, 5B and 9.] Therefore, I believe Nguyen anticipates claim 7.

272. For example, a POSITA would have understood that the lower wall is configured to slidably engage with the first and second optical fiber connectors because Nguyen's ferrule holders 300 only include one latch 316, which engages with the upper wall and not the lower wall. [*See* Nguyen, FIGs. 5A, 5B (annotated versions provided below).] Therefore, a POSITA would have understood that the latch receptacles 232 are only provided on one wall of the plug 200, *i.e.*, on the upper wall as shown in Figure 9 below.



Nguyen, FIGs. 5A, 5B (annotated).

273. Annotated Figure 9 below illustrates a cross-sectional view of an adapter assembly with an optical fiber connector fully engaged with a channel of the adapter. A POSITA would have understood that the optical fiber connectors slide into the adapter in the horizontal direction of arrows A and the flexible latch arm moves in the vertical direction of arrow B in order to latch with the latch opening in the upper wall. A POSITA would have further understood, based on annotated Figure 9, that the lower wall of the adapter slidably engages with the connector.



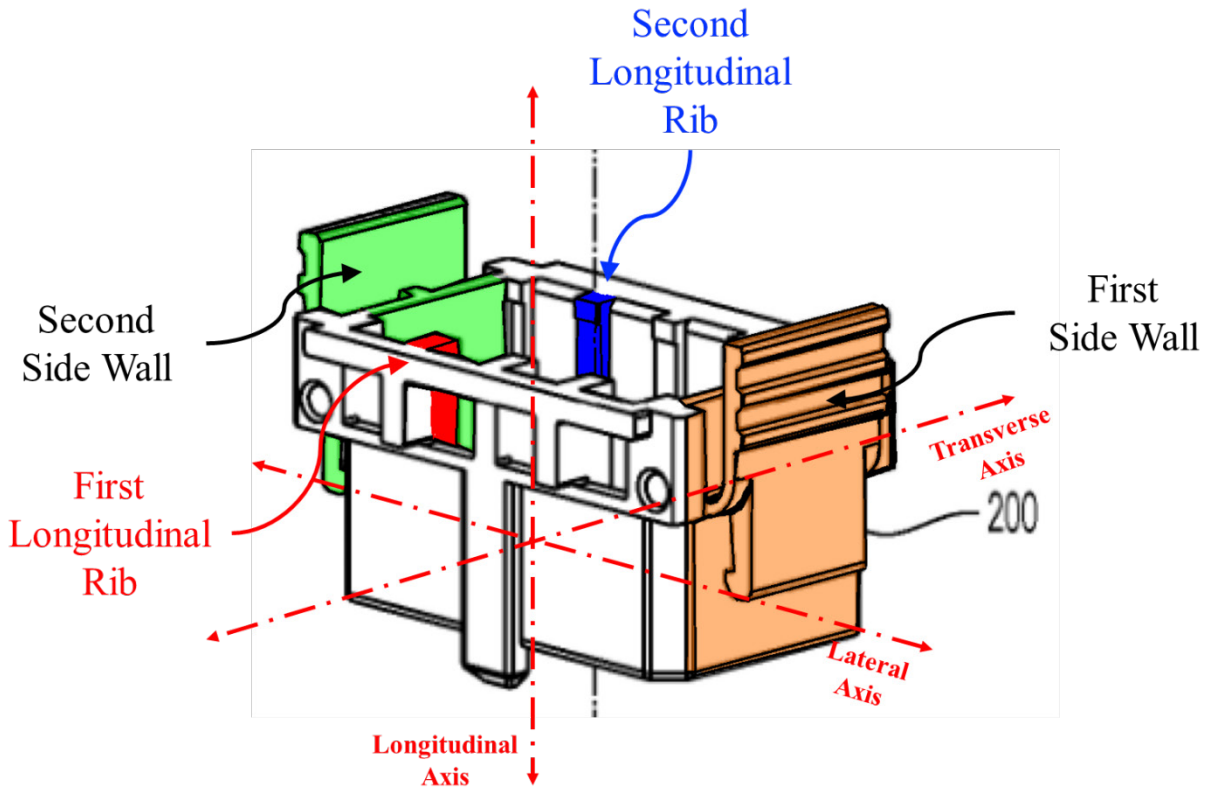
Nguyen, FIG. 9 (annotated).

274. Accordingly, I believe that a POSITA would have understood Nguyen discloses claim 7.

F. Claim 8 – "The adapter as set forth in claim 1, wherein the first longitudinal rib has a first height along the transverse axis and the second longitudinal rib has a second height along the transverse axis, the first height being greater than the second height."

275. In my opinion, a POSITA would have understood that Nguyen's first longitudinal rib on the upper wall has a first height along the transverse axis that is greater than the second longitudinal rib's second height along the same axis. [*See, e.g.*, Nguyen, FIG. 2.] For example, Nguyen's Figure 2, which I have annotated

below, illustrates ribs of visibly different heights with the first rib on the upper wall having a visibly greater height:



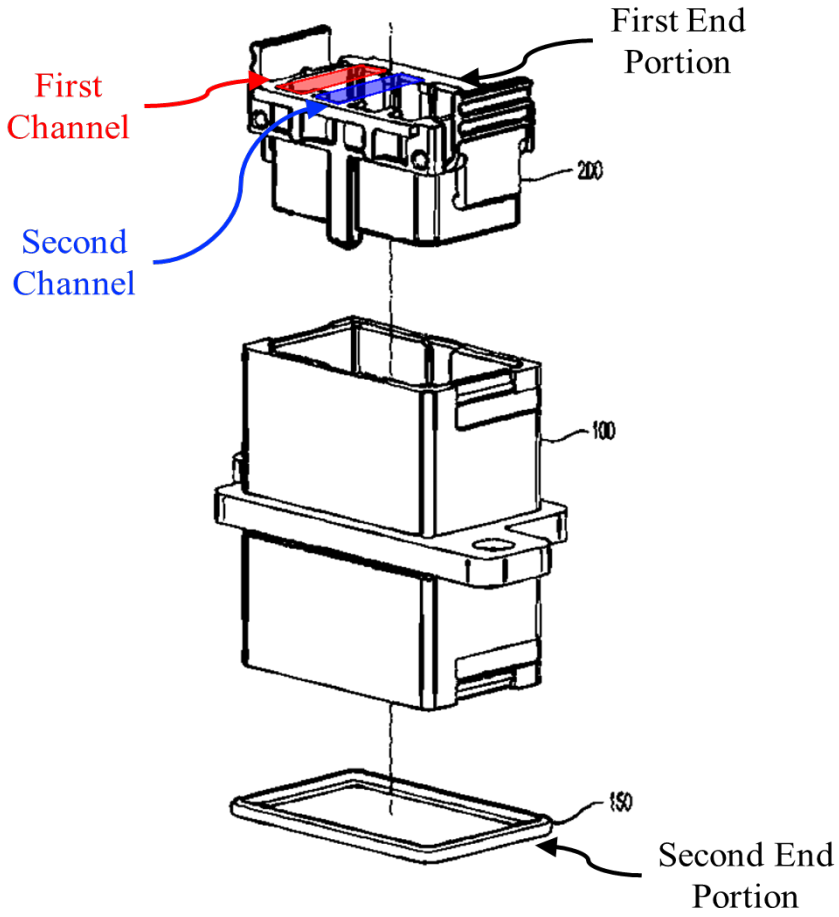
Nguyen, FIG. 2 (cropped, annotated).

276. Accordingly, I believe that a POSITA would have understood Nguyen discloses claim 8.

G. Claim 9 – "The adapter as set forth in claim 1, wherein each of the first and second channels opens through the first end portion of the outer housing."

277. In my opinion, a POSITA would have understood Nguyen discloses two channels that open through the first end portion of the outer housing. [*See, e.g.*, Nguyen, ¶¶28, FIGs. 1 and 2.] Below, I have marked up Figure 2 to show the first

and second channels opening up toward the first end of the plug 200, but these features may also be seen in Figure 1.



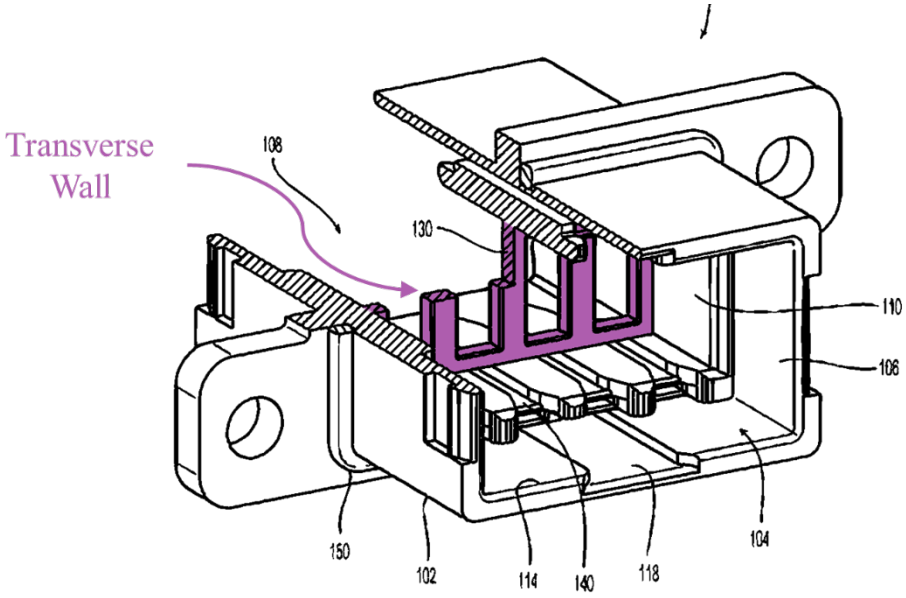
Nguyen, FIG. 2 (cropped, annotated).

278. Accordingly, I believe that a POSITA would have understood Nguyen discloses claim 9.

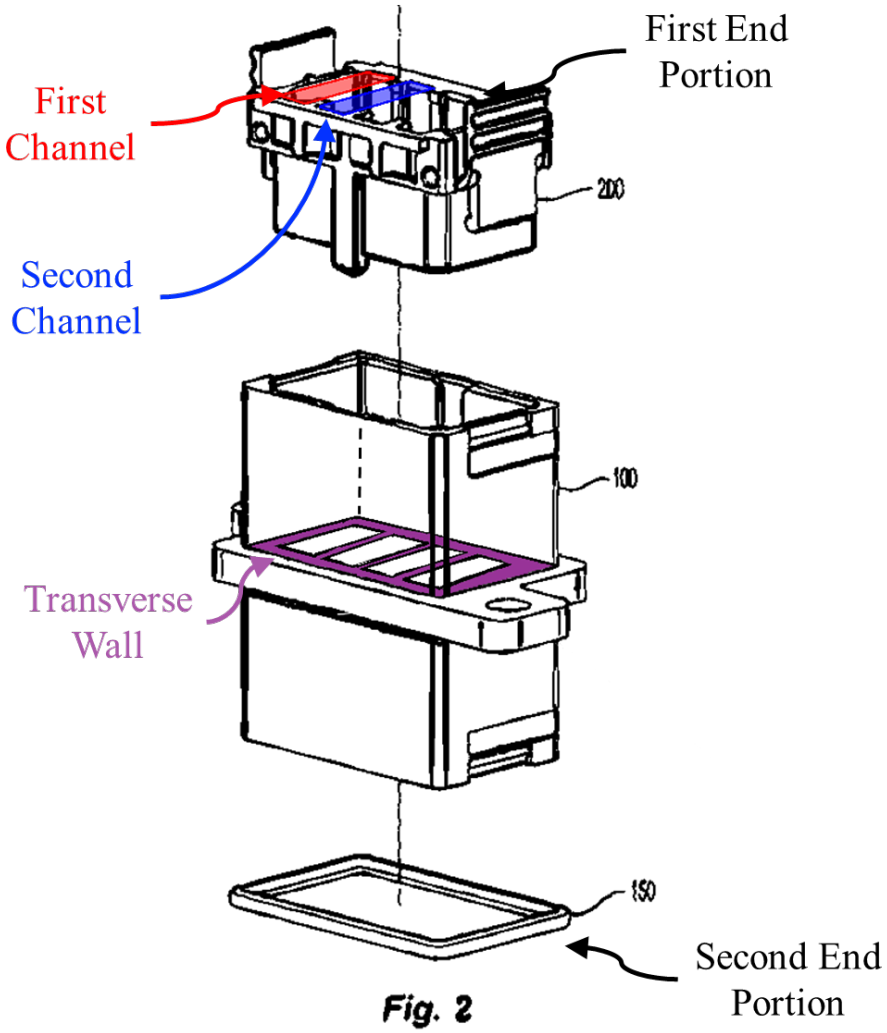
H. Claim 10 – "The adapter set forth in claim 9, further comprising a transverse wall extending between the upper wall and the lower wall at a location longitudinally spaced apart from the first end portion of the outer housing."

279. In my opinion, a POSITA would have understood Nguyen discloses a transverse wall (wall 130) extending between the upper and lower wall at a

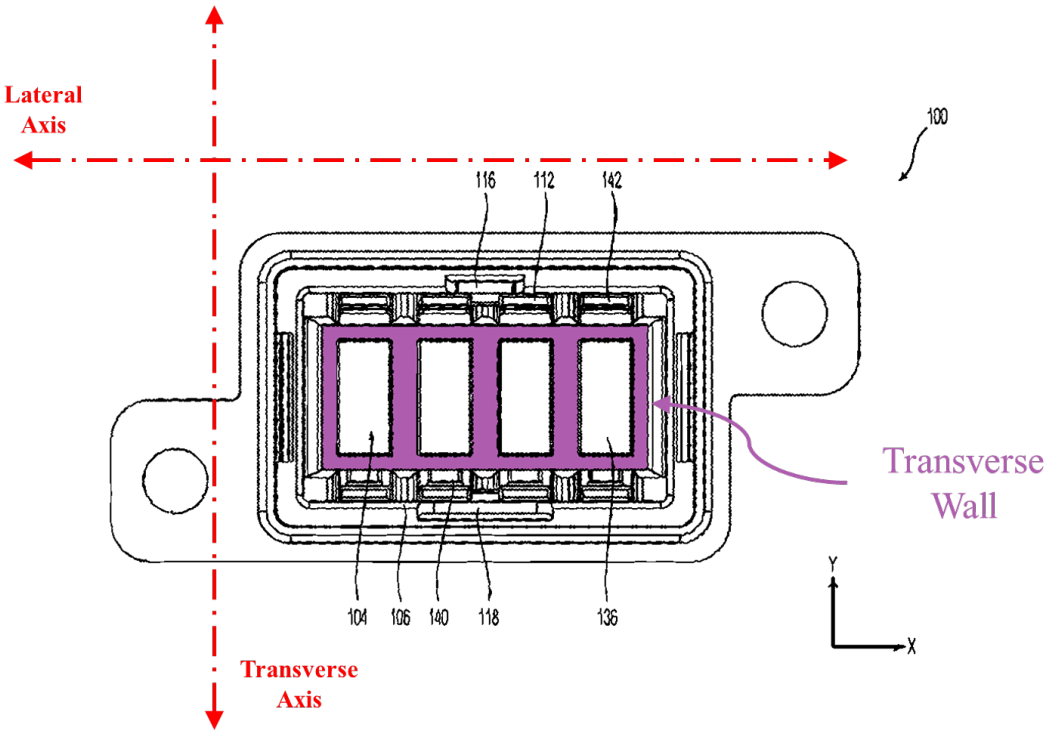
location longitudinally spaced from the first end portion of the housing. [*See* Nguyen, ¶33, FIGs. 2-4.] The annotated versions of Figures 2-4 of Nguyen below show the transverse wall 130 that is a part of adapter 100.



Nguyen, FIG. 3 (annotated).



Nguyen, FIG. 2 (cropped, annotated).



Nguyen, FIG. 4 (annotated).

280. In my opinion, the above two figures collectively illustrate how the transverse wall 130 is at a location longitudinally spaced apart from the first end portion of the outer housing (*i.e.*, because it is in the middle of the housing and is spaced apart from the first end portion in the longitudinal direction). [*See also* Nguyen, ¶33 (explaining the wall 130 divides the center portion 110 in half).]

281. Further, I believe a POSITA would have understood Nguyen's wall 130 extends between the upper wall and the lower wall of the adapter 100 because the wall 130 includes structure that is between the upper wall and the lower wall (*e.g.*, as I have identified above regarding claim 1, *see* Section XI.A.2. above) in the transverse direction.

282. Accordingly, I believe that a POSITA would have understood Nguyen discloses claim 10.

I. Claim 13 – "The adapter set forth in claim 1, wherein each of the optical fiber connectors is a multi-fiber connector comprising a multi-fiber ferrule."

283. In my opinion, a POSITA would have understood Nguyen discloses an adapter for mating with fiber optic connectors, wherein each of the fiber optical connectors is a multi-fiber connector comprising a multi-fiber ferrule. [*See, e.g.*, Nguyen, ¶26, FIGs. 1, 5C.]

284. For example, Nguyen explains "ferrules 12 are typically multi-fiber ferrules, particularly MT type ferrules, but the present invention may include other types of ferrules. The ferrules 12 are disposed within the ferrule holder 300 and have optical fibers 14 secured therein." [*Id.*, ¶26.] Figures 5A-6C of Nguyen all show examples of a multi-fiber connector that comprises a multi-fiber ferrule. [*Id.*, FIGs. 5A-6C.]

285. Accordingly, I believe that a POSITA would have understood Nguyen discloses claim 13.

XI. GROUND 3: NGUYEN IN VIEW OF LEE RENDER CLAIMS 3-5, 8, AND 10-12 OBVIOUS

286. I believe that Nguyen in view of Lee renders obvious dependent claims 3-5, 8, and 10-12 of '836 Patent for the reasons stated below. Nguyen discloses the elements of base claims 1 and 2 as discussed above. Further, while I

believe Nguyen discloses claims 3-5 (which merely recite capabilities of the adapter) and 10 as explained above, I also believe the combined disclosures of Nguyen and Lee render claims 3-5 and 10-12 obvious to the extent that Patent Owner disputes that Nguyen discloses any of these claimed features.

A. Motivation to Combine

287. I believe that a POSITA would have found it obvious to modify Nguyen's adapter to (1) accommodate optical fiber connectors that employ handles configured to remotely release connectors from the adapter, and (2) include slots in the transverse wall halfway between the two ends of the adapter, and sleeve holders that employ sockets to mate with cylindrically shaped ferrules.

288. At a high level, both Nguyen and Lee disclose an adapter for mating with optical fiber connectors in optic fiber system components that have been used for many years in the field. Swapping certain adapter features for others (like the ability to accommodate a particular remote release mechanism or the shape of sockets) is something that any POSITA would have known how to do, and been motivated to do, based on the desired connector density and compatibility with various types of connector form factors.

1. Optical fiber connectors

289. In my opinion, a POSITA would have had reason to enhance Nguyen's connectors with Lee's connector elements to employ long handles

configured to remotely release connectors from the adapter. The long-reach remote release feature provides convenience and serves the overall purpose of Nguyen (*i.e.*, tightly packing fiber optic ferrules together and proving ease of maintenance) because Lee's long handle allows a user to disengage the latch arm further away from the adapter, as opposed to the latch arms of Nguyen which require a user to be closer to the adapter.

290. Therefore, a POSITA would have been motivated to modify Nguyen to incorporate Lee's long handle and remote release feature to provide a system that is easy to assemble and maintain.

291. A POSITA would have readily understood that enhancing a connector without a long remote release feature to include a long remote release feature would have been obvious to try among a finite number of identifiable, predictable solutions for remote release designs with reasonable expectation of success because there are only a limited number of connector release configurations used in fiber optic connectors. Any one of these connections can be utilized with reasonable expectation of success because they are simple mechanical devices that behave in known and predictable ways.

292. The modification of Nguyen required to use Lee's remote release involves the substitution of the ferrule holder of Nguyen's connector, which comprises the release mechanism, with the handle portion of Lee, which includes

"a housing portion 32 in which the inner connector body 24 is received and a grip portion 34 extending rearwardly from the housing portion 32." [Lee, ¶30.] This modification amounts to the simple substitution of one known component for another, which will function as expected with predictable results.

293. In my opinion, a POSITA would have had reason to enhance Nguyen's connectors with Lee's connector elements. A POSITA would have readily understood that these two choices are simple substitutes for one another that provide different connection-release options (*i.e.*, to use a connector with a long remote release or not). Remote releases have been used in the industry for years, and a POSITA would have understood that selecting a remote release connector design to pair with the adapter is simply a matter of design choice based on what type of connectors are desired to be used.

294. A POSITA would have had reasonable expectation of success, as this modification involves the direct enhancement of one known type of connector using components from another with similar elements, which would have been readily implementable for someone having ordinary skill in the art as of the effective priority date of the '836 Patent. Lee's connector is in the same orientation as Nguyen's, and the simple substitution would have led to predictable results. The combination retains Nguyen's latching mechanisms and merely replaces an interior component that does not change the principle of operation in Nguyen.

295. Accordingly, it is my opinion that the modification of Nguyen's connector handle with remote release features disclosed in Lee would have been obvious to a POSITA.

2. Transverse wall

296. In my opinion, a POSITA would have had reason to modify Nguyen's adapter to include slots and replace Nguyen's wall with Lee's sleeve holders to employ sockets to mate with cylindrically-shaped ferrules and position the slots halfway between the two ends of the adapter.

297. The use of Lee's sleeve holders are easy to maintain (*i.e.*, appear removable and can be used with mating dust caps to prevent contaminants from entering in to the adapter), because Lee's sleeve holders are able to snap into place and are shaped to coordinate with dust caps, as opposed to Nguyen's immobile wall.

298. Therefore, a POSITA would have been motivated to modify the Nguyen adapter assembly to incorporate Lee's sleeve holders and slots to provide a system that is easy to assemble and maintain.

299. A POSITA would have readily understood that swapping a non-removable wall with a removable one would have been obvious to try among a finite number of identifiable (*i.e.*, removable versus non removable), predictable solutions with reasonable expectation of success because there are only a very

limited number of transverse wall configurations used in adapters for fiber optics, and any one of these ferrule connections can be utilized with reasonable expectation of success because the type of connection does not affect any other aspects of operation.

300. Thus, the modification of Nguyen involves the simple substitution of one known component for another, which will function in the same manner with predictable results.

301. In my opinion, Nguyen's adapter assembly is modular and could be easily combined with different components or use modified components without affecting other modular components of the adapter assembly. [*See, e.g.*, Nguyen, FIG. 2.] The '836 Patent defines the use of "a" and "an" as "one or more." [*See, e.g.,* EX1001, 6:15-17 and 17:7-23.] Thus, one or more modular components can make up "an outer housing" and a POSITA would know that the modularity would mean that it is designed to be combinable and modifiable. A POSITA would appreciate the advantage of modifying the outer housing here to incorporate Lee's sleeve holders and slots in order to gain the benefit of Lee's design in furthering the goals of Nguyen: providing a system that is easy to assemble and use.

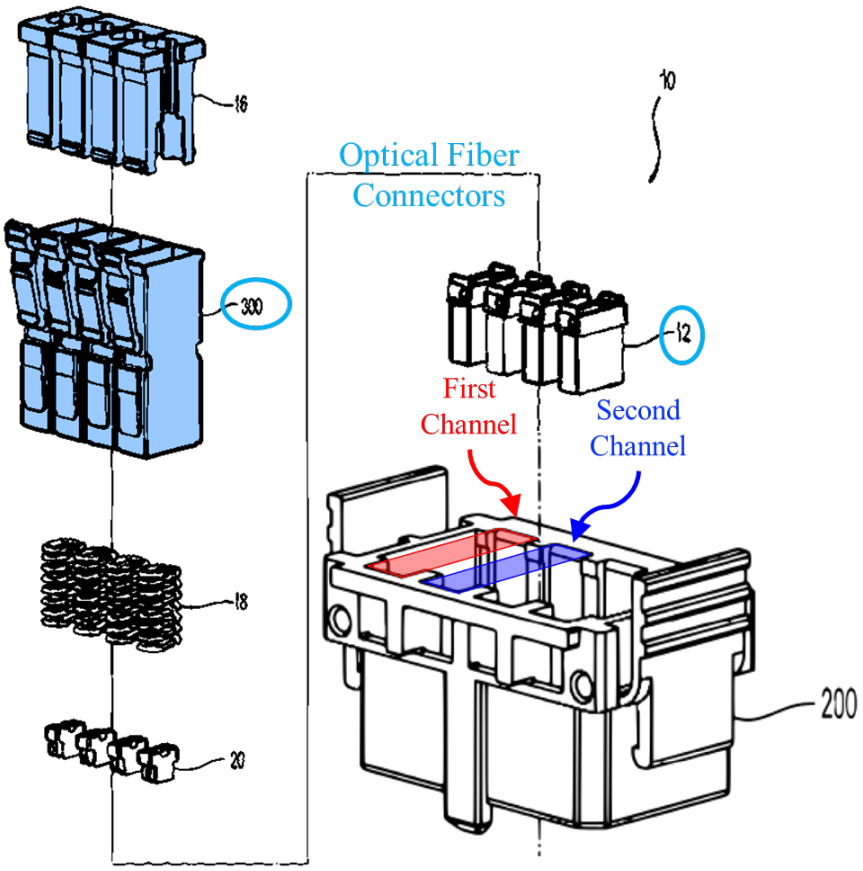
302. Accordingly, it is my opinion that the replacement of Nguyen's wall with Lee's sleeve holders would have been obvious to a POSITA.

B. Claim 3

1. Element [3.1] – "The adapter as set forth in claim 2, wherein the adapter is configured to receive a first one of the optical fiber connectors in the first channel and a second one of the optical fiber connectors in the second channel such that:"

303. In my opinion, a POSITA would have understood Nguyen discloses a combined adapter 100 and plug 200 as an adapter that is configured to receive optical fiber connecters that include at least ferrules 12 and ferrule holders 300 in its respective channels. Therefore, I believe Nguyen discloses element 3.1 of claim 3.

304. For example, Nguyen explains that "ferrules 12 are disposed within the ferrule holder 300 and have optical fibers 14 secured therein" and that "the ferrules holders 300 are inserted into the plug 200." [Nguyen, ¶26.] Further, I believe a POSITA would have understood that Figure 2, as I have annotated below, illustrates that the ferrules holders 300 and ferrules 12 are received by respective channels in the plug 200.



Nguyen, FIG. 2 (cropped, annotated).

305. Accordingly, I believe that a POSITA would have understood Nguyen discloses element [3.1].

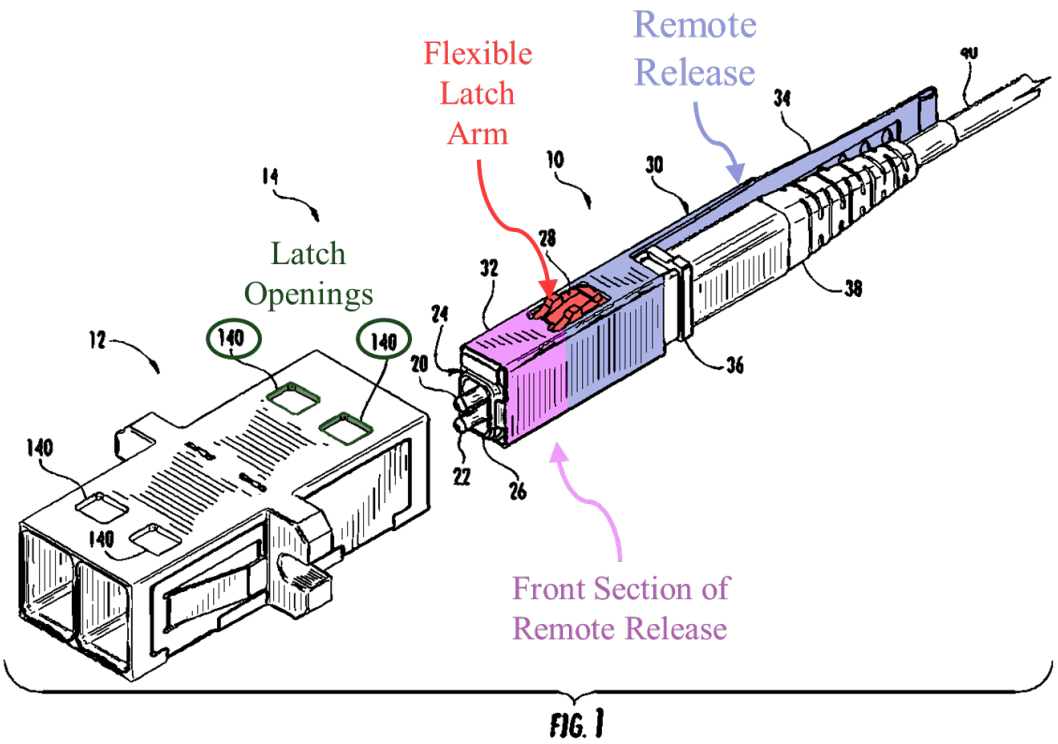
2. Element [3.2] – "a flexible latch arm of the first optical fiber connector is latched with the first latch opening and a front section of a remote release of the first optical fiber connector is received in the first channel at a location spaced apart from the first latch opening along the longitudinal axis toward the second end portion of the outer housing"

306. Although I believe Nguyen's flexible latch arm teaches this feature, to the extent Patent Owner argues that Nguyen's release mechanism is not "remote" enough to satisfy the claim, the feature is explicit in Lee.

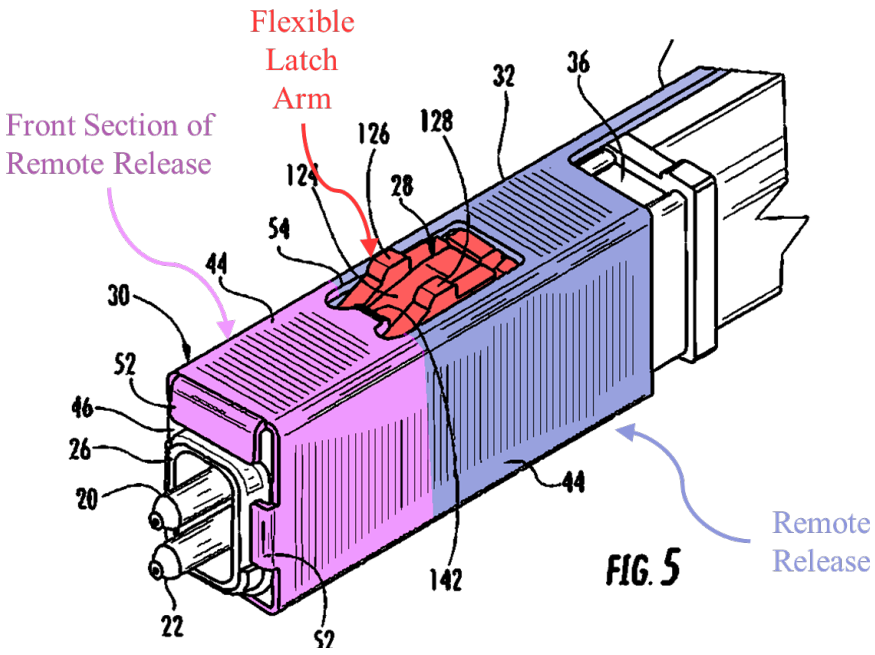
307. Lee discloses a flexible latch arm of a first optical fiber connector is latched with the first latch opening of the adapter and a front section of a remote release is received in the first channel and is spaced apart from the first latch opening toward the second end portion of the outer housing. [*See* Lee, ¶¶5, 6, 29, 30, FIGs. 1, 5, 9, 10, and 12-14.]

308. For example, Lee explains that its fiber optical connector 10 includes a latch arm 28, with latching features 126, 128 that can engage an opening 140 of adapter 12, and a handle 30 that includes a housing portion 32 and that "can move relative to the inner connector body 24 so that the housing portion 32 can cause the latch arm 28 to flex toward the inner connector body 24." [*Id.*, ¶30.]

309. Further, I believe a POSITA would have understood that Figures 1, 5, and 14, as I have annotated below, illustrate a first optical fiber connector 10 that includes a latch 28 having latching features 126, 128 that engage with a latch opening 140 of adapter 12 and a first portion of handle 30 that is located further inside the channel than the latch opening 140.



Lee, FIG. 1 (annotated).



Lee, FIG. 5 (annotated).

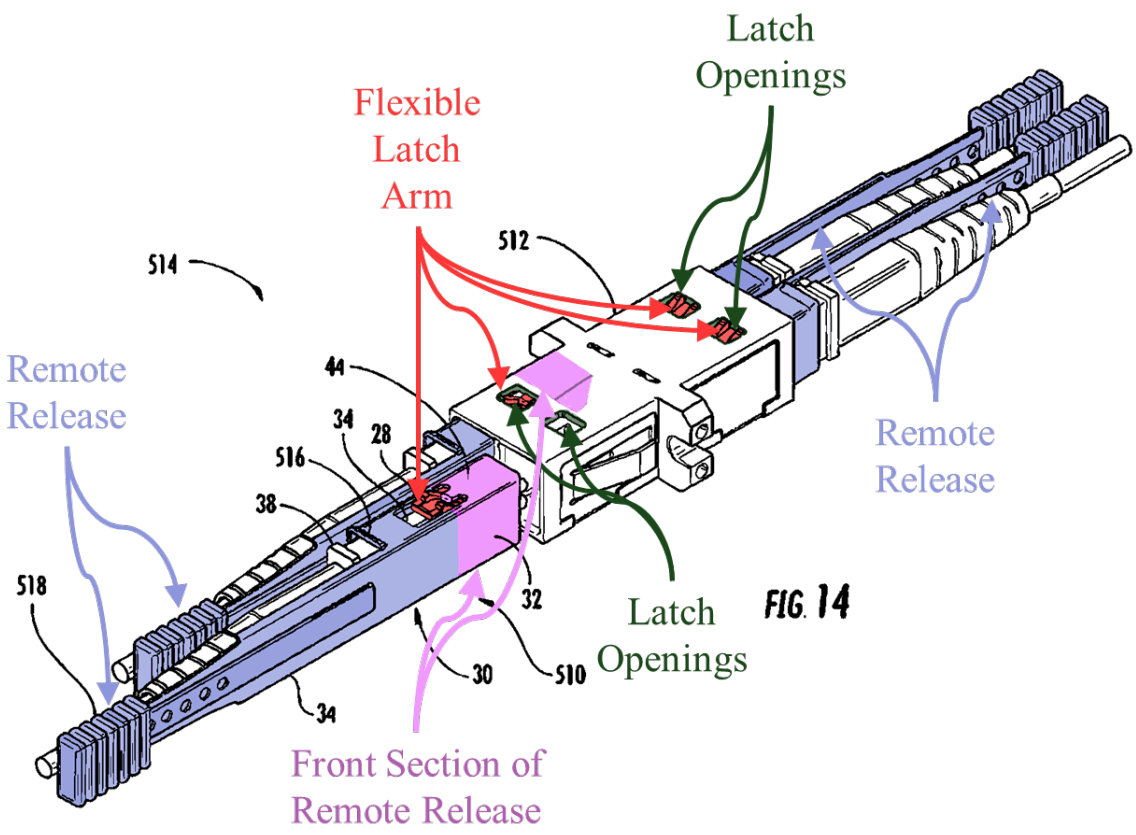


FIG. 14

Lee, FIG. 14 (annotated).

310. Accordingly, I believe that a POSITA would have understood Nguyen in view of Lee discloses element [3.2] and would have been obvious to combine as discussed above.

3. Element [3.3] – "a flexible latch arm of the second optical fiber connector is latched with the second latch opening and a front section of a remote release of the second optical fiber connector is received in the first channel at a location

spaced apart from the second latch opening along the longitudinal axis toward the second end portion of the outer housing"

311. Although I believe Nguyen's flexible latch arm teaches this feature, to the extent Patent Owner argues that Nguyen's release mechanism is not "remote" enough to satisfy the claim, the feature is clearly present in Lee.

312. Lee discloses a second flexible latch arm of a second optical fiber connector is latched with the first latch opening of the adapter and a front section of a remote release is received in the first chancel and is spaced apart from the second latch opening toward the second end portion of the outer housing. [*See* Lee, ¶¶5, 6, 29, 30, FIGs. 1, 5, 9, 10, 12-14.]

313. I believe a POSITA would have understood that FIGs. 1, 5, and 14, as I have annotated above with respect to element 3.2, illustrate a second optical fiber connector 10 that includes a latch 28 having latching features 126, 128 that engage with a latch opening 140 of adapter 12 and a first portion of handle 30 as a remote release that is located further in the channel than the opening 140.

314. Accordingly, I believe that a POSITA would have understood Nguyen in view of Lee discloses element [3.3] and would have been obvious to combine as discussed above.

C. Claim 4 – "The adapter set forth in claim 3, wherein the first channel is configured to allow the front section of the remote release of the first optical fiber connector to slide along the flexible

latch arm of the first optical fiber connector within the first channel toward the first end portion of the outer housing to depress the flexible latch arm of the first optical fiber connector and wherein the second channel is configured to allow the front section of the remote release of the second optical fiber connector to slide along the flexible latch arm of the second optical fiber connector within the second channel toward the first end portion of the outer housing to depress the flexible latch arm of the second optical fiber connector."

315. I believe the combination of Nguyen and Lee discloses a first and second channel of an adapter configured to allow the front section of the remote release to slide along the flexible latch arm of each of the first and second optical fiber connectors, respectively, such that the flexible latch arms of the first and second connectors are depressed.

316. In my opinion, both Nguyen and Lee disclose an adapter having a first and second channel configured to accept a first and second optical fiber connector, respectively. Nguyen does not disclose that each of the first and second channels of the adapter is configured to allow the front section of the remote release to slide along the flexible latch arm of each of the first and second optical fiber connectors, respectively, such that the flexible latch arm of the first and second connectors are depressed. Lee does disclose these features.

317. In my opinion, a POSITA would have understood Lee discloses two channels configured to respectively allow front sections of remote releases of two

optical fiber connectors to slide along respective flexible latch arms of the two optical fiber connectors. [*See* Lee, FIGs. 5, 9, 10, 14, ¶¶60, 63, and 65.]

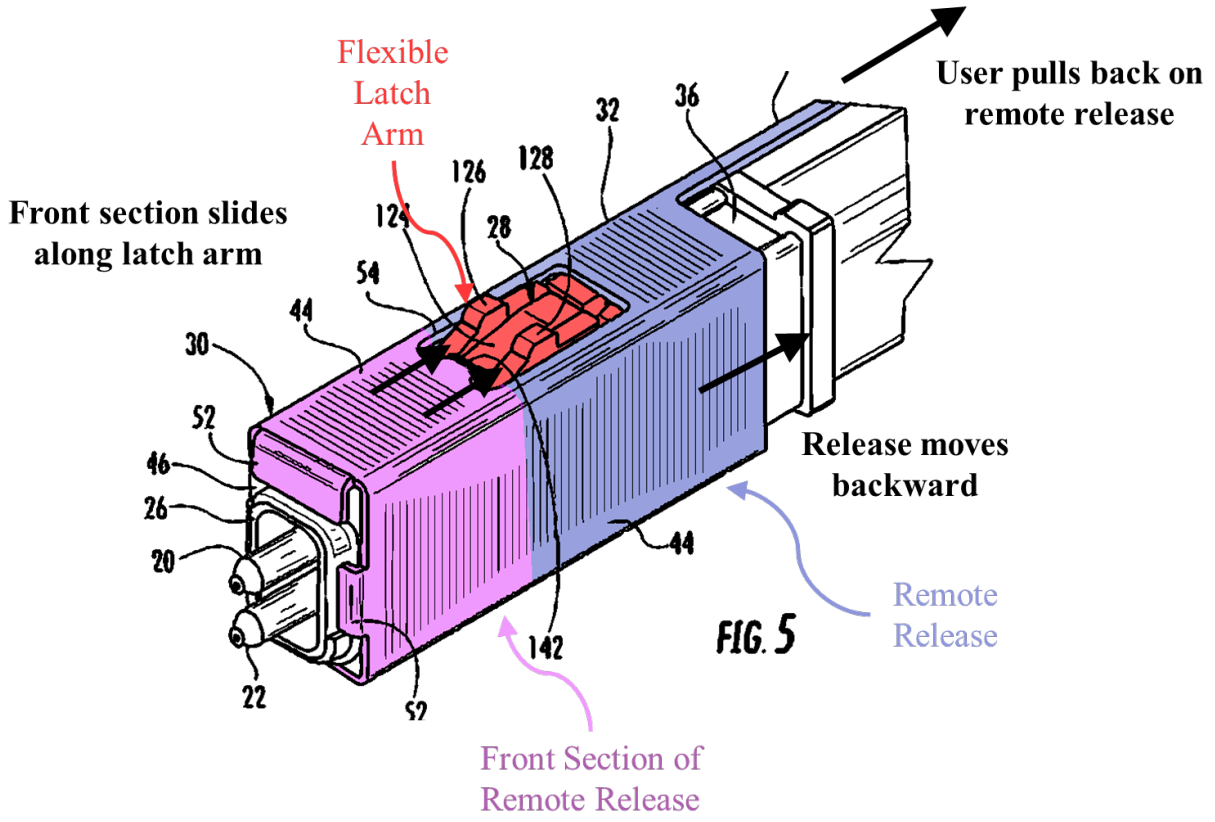
318. For example, Lee explains that its adapter 12 has ports 182 that define passageways and generally have shapes that correspond to the housing portion 32 of handle 30 of connector 10, which can be inserted into the passageways. [*See id*., ¶¶60 and 63.]

319. Additionally, Lee explains and illustrates that the front section of housing portion 32 of connector 10 may slide along ramp 124 of latch arm 128 toward the first end portion of the adapter 12 "causing latch arm 28 to flex back toward the inner connector body 24, which in turn causes the first and second latching features 124, 126 to disengage the latching features 140 on the adapter body 180." [*Id*., ¶65.]

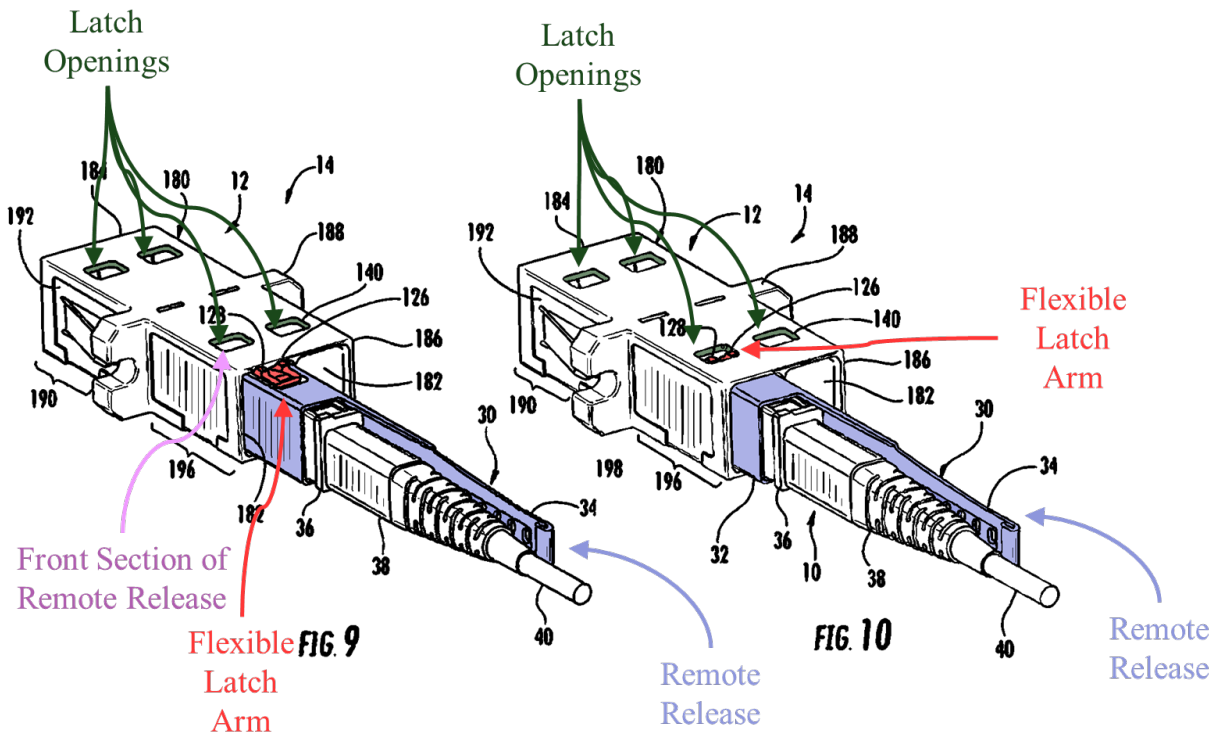
320. Further, I believe a POSITA would have understood that Figures 5, 9, 10, and 14 collectively illustrate channels configured in this way, *e.g.*, as annotated below with respect to Figures 5, 9, 10, and 14.

321. As illustrated below on an annotated version of Lee Figure 5, the user pulls back on the rear section of the remote release. This force causes the body of the remote release to move backward, away from the adapter and away from the inner portions of the connector that are latched to the adapter via the flexible latch arm 28. This backward relative motion causes the front section of the remote

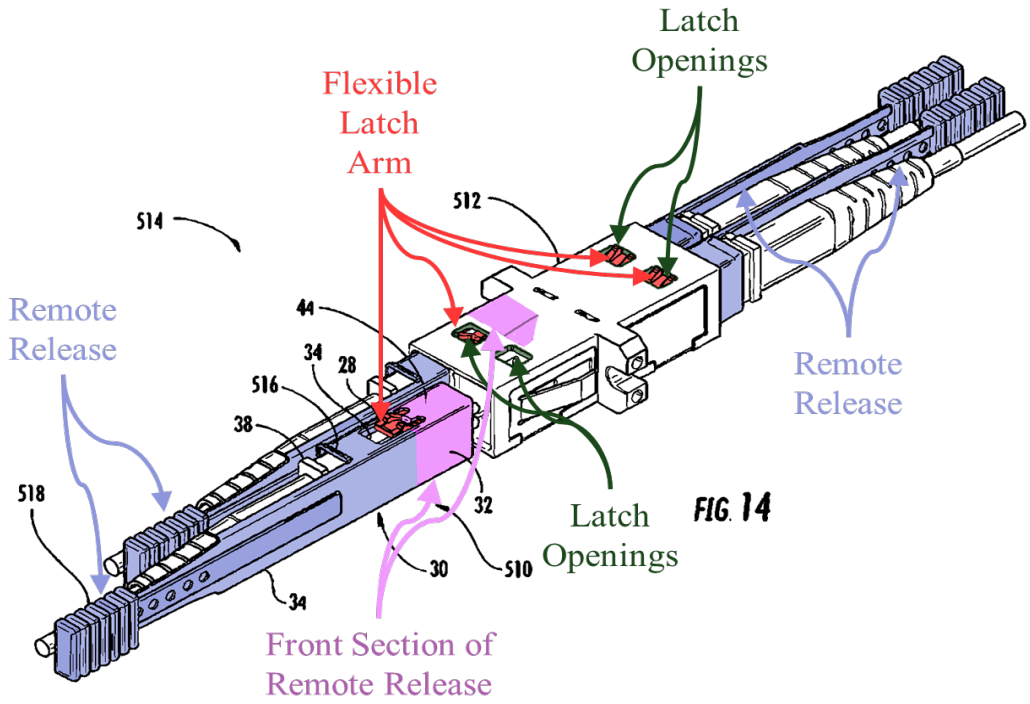
release to slide along the top surface of the latch arm. Given the sloped surface of the latch arm, the backward sliding motion applies a downward force to the latch arm that bends it downward and causes it to unlatch from the latch openings.



Lee, FIG. 5 (annotated)



Lee, FIGs. 9 and 10 (annotated).



Lee, FIG. 14 (annotated).

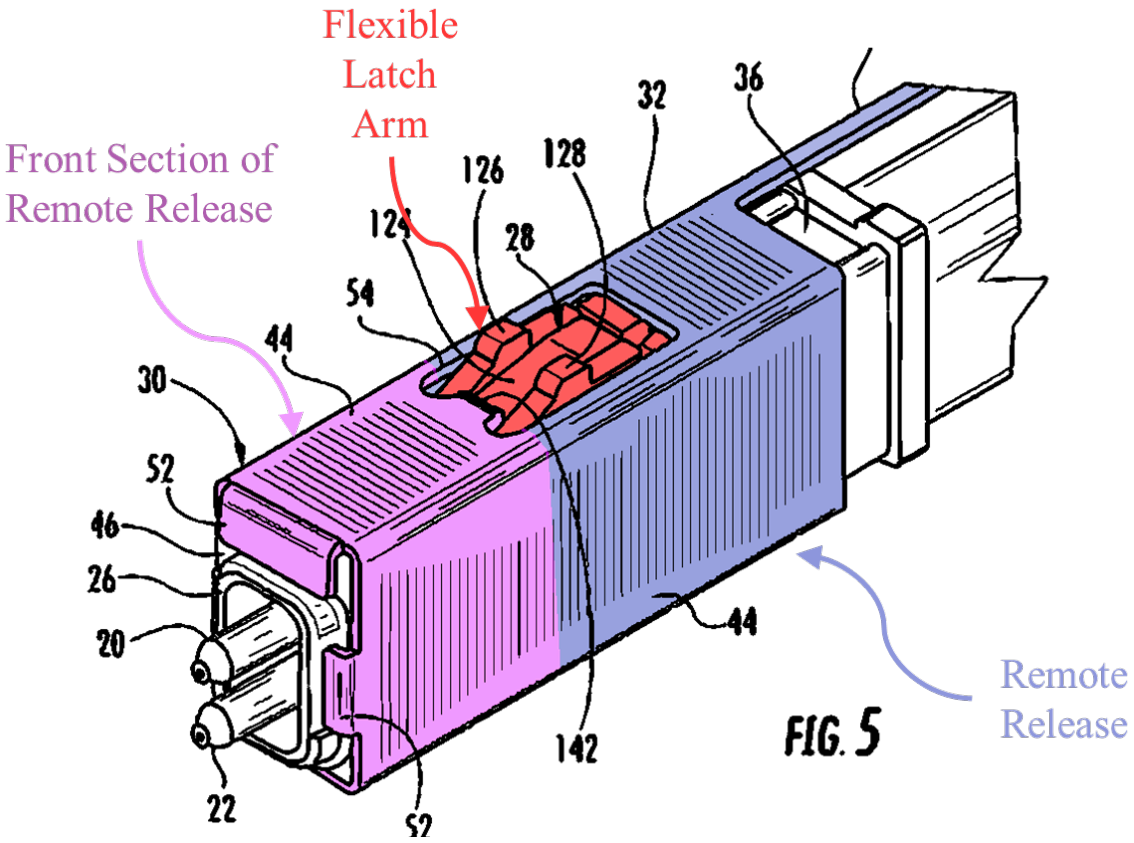
322. Accordingly, I believe that a POSITA would have understood Nguyen in view of Lee discloses claim 4 and that they would have been obvious to combine as discussed above.

D. Claim 5 – "The adapter set forth in claim 4, wherein the upper wall is configured to unlatch from the flexible latch arm of the first optical fiber connector when the flexible latch arm of the first optical fiber connector is depressed and the upper wall is configured to unlatch from the flexible latch arm of the second optical fiber connector when the flexible latch arm of the second optical fiber connector is depressed."

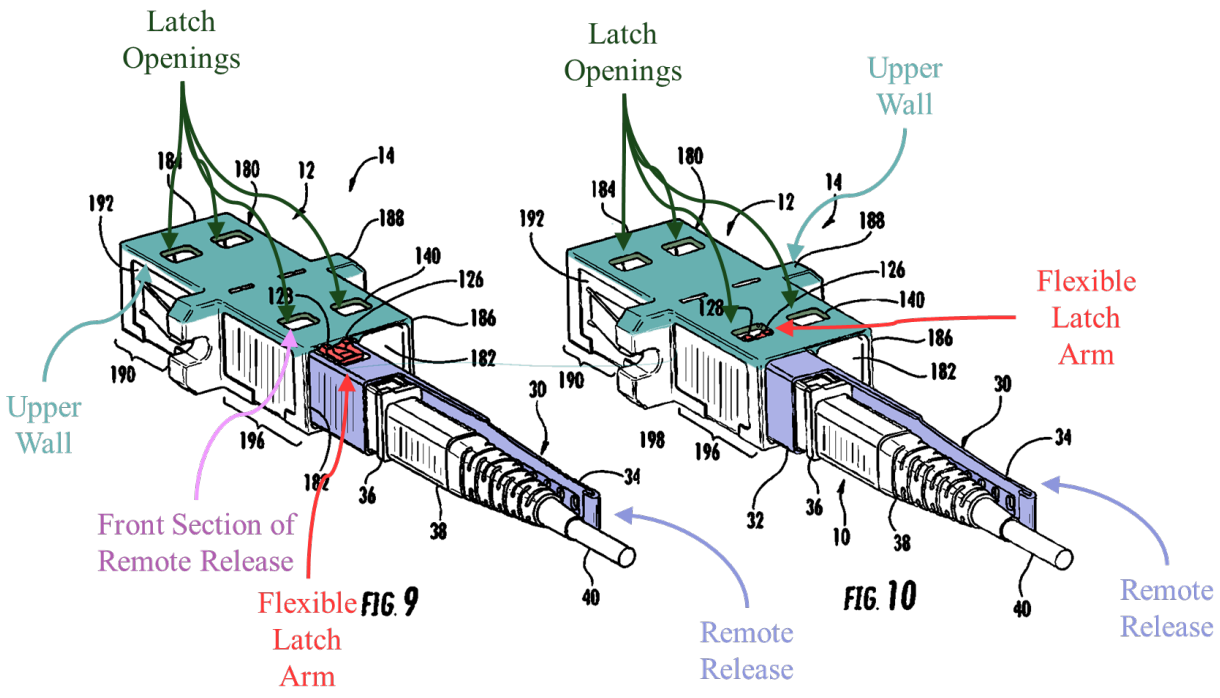
323. In my opinion, a POSITA would have understood that Lee's adapter 12 includes an upper wall (top of adapter) that is configured to unlatch (latching feature 140) from flexible latch arms (latch arm 28) when flexible latch arms of the fiber optical connectors 10 are depressed.

324. Additionally, Lee explains "when the handle 30 is pulled rearwardly, the pushing feature 142 on the housing portion 32 contacts and slides along the ramp 124 of the latch arm 128." [Lee, ¶65.] "This results in the housing portion 32 causing the latch arm 28 to flex back toward the inner connector body 24, which in turn causes the first and second latching features 124, 126 to disengage the latching feature 140 on the adapter body 180." [*Id*.] This description of the latching mechanism, which is also depicted in annotated FIG. 5 below, discloses that unlatching occurs when latch arm 28 is depressed toward inner connector body 24.

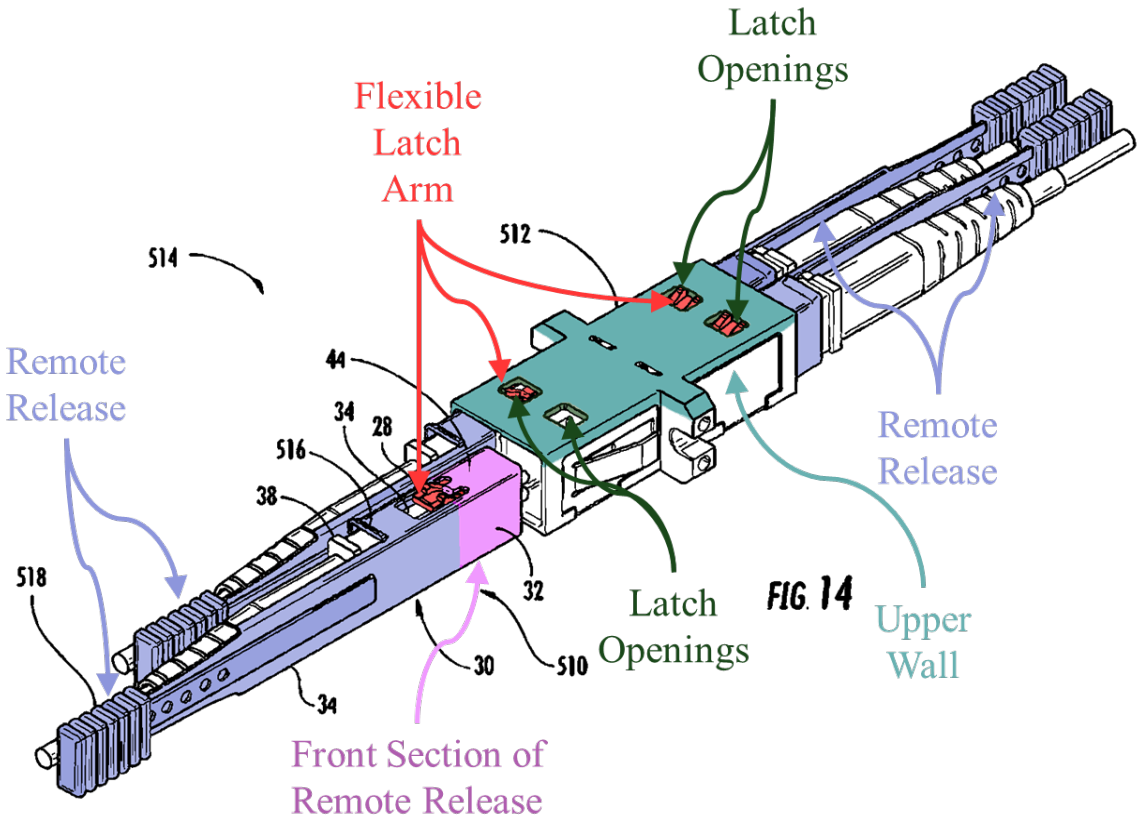
325. I believe a POSITA would have understood that, for example, the annotated versions of Figures 5, 9, 10, and 14 of Lee provided below illustrate the unlatching limitations of claim 5.



Lee, FIG. 5 (annotated).



Lee, FIGs. 9, 10 (annotated).



Lee, FIG. 14 (annotated).

326. Accordingly, I believe that a POSITA would have understood Nguyen in view of Lee discloses claim 5 and they would have been obvious to combine as discussed above.

E. Claim 8 – "The adapter set forth in claim 1, wherein the first longitudinal rib has a first height along the transverse axis and the second longitudinal rib has a second height along the transverse axis, the first height being greater than the second height."

327. I believe that, to the extent Patent Owner contends that Nguyen does not expressly disclose this limitation through its depiction of the ribs, it nonetheless renders obvious dependent claim 8 of '836 Patent for the reasons stated below, especially in view of the teachings of Lee.

328. To the extent Patent Owner argues Nguyen Figure 2 does not show clearly enough that the first longitudinal rib has a greater height in the transverse dimension than the second longitudinal rib [See Ground 1, claim 8], I believe a POSITA would have nonetheless found it obvious for the first longitudinal rib to have a greater height in the transverse direction than the second rib, especially in view of the teachings of Lee. There are several reasons I believe sizing the first rib to have a larger transverse height would have been obvious.

329. As an initial matter, there are only three possible choices for the rib heights: 1) the first rib is taller than the second rib, 2) The second rib is taller than the first rib, and 3) the ribs are the same height. Therefore, making the first rib taller is an obvious design choice.

330. Furthermore, I believe a POSITA would have known the ribs help define the channels for the fiber optic connectors. For example, they provided alignment features that help guide the connector into the adapter. While it is important that the ribs define unique channels to receive each fiber optic connector, the exact dimension of the rib in the transverse direction is not particularly critical. Nguyen does provide such ribs. Contrastingly, Lee shows channels separated by longitudinal walls running the entirety of the transverse direction. Effectively, longitudinal ribs are longitudinal walls that are interrupted in the transverse dimension instead of being completely continuous structures from the top to the bottom. Lee thus illustrates that a POSITA could extend the height of either or both of Nguyen's longitudinal ribs as much as desired, including the entire distance between the upper and lower walls.

331. Given the teachings of Nguyen and Lee, I believe a POSITA would have found it obvious to form Nguyen's ribs such that the upper rib has a greater height than the lower rib. I understand that limitations related merely to size are typically not sufficient to patentably distinguish over the prior art, especially where there is no difference in form or function (and certainly no unexpected results). That is the case here, as sizing the upper rib to be slightly taller in the transverse direction would not change the operation in any respect of Nguyen's adapter. This

is an obvious variant of Nguyen's rib heights that would have had reasonable expectation of success. Indeed, doing so was well known in the art at the time.

332. In addition to being a known solution, there is a structural reason why a POSITA would use a rib on the upper wall that is slightly larger than the lower rib. Using a larger upper rib provides a more robust structure in the area of the adapter that includes the holes that form the latch receptacles 232. A POSITA would have known that providing holes in the upper wall will weaken the structural integrity of the upper surface of the plug 200, at least to a minor degree, as compared to the lower surface. Therefore, providing a slightly larger rib in this area will increase the rigidity of the upper wall and result in a more robust overall support structure.

333. A POSITA would have further known that the type of adapters/plugs disclosed in Nguyen are plastic components made by known techniques such as using molds or 3D printing, and so modifying the size of any of the dimensions is easily accomplished (e.g., by correspondingly adjusting the mold or the 3D printing instructions) with reasonable expectation of success.

334. Therefore, I believe a POSITA would have understood Nguyen renders claim 8 obvious.

F. Claim 10 – "The adapter set forth in claim 9, further comprising a transverse wall extending between the upper wall and the lower

wall at a location longitudinally spaced apart from the first end portion of the outer housing."

335. Nguyen's adapter has a transverse wall, as discussed above. However, I will note that this feature may be more explicitly taught in Lee.

336. In my opinion, a POSITA would have understood Lee discloses a transverse wall (sleeve holder 200) extending between the upper and lower wall at a location longitudinally spaced from the first end portion of the housing. [*See* Lee, ¶62, FIGs. 8.]

337. For example, Lee describes that "[t]wo sleeve holders 200 are provided in the embodiment shown, one for each port 182" where "[e]ach sleeve holder 200 may be inserted into the corresponding port 182 and then snapped or otherwise secured in place in the adapter body 180" at slots 206. [*Id*., ¶62.] "The slots 206 are generally located half way between the first and second ends 184, 186, similar to the flange 188." [*Id*.]

338. Figure 8 of Lee, shown in annotated form below, provides an exploded view of adapter 12 with sleeve holders 200 that snap into place at 206 when assembled. Once they are snapped into place, they form a transverse wall extending between the upper and lower walls.

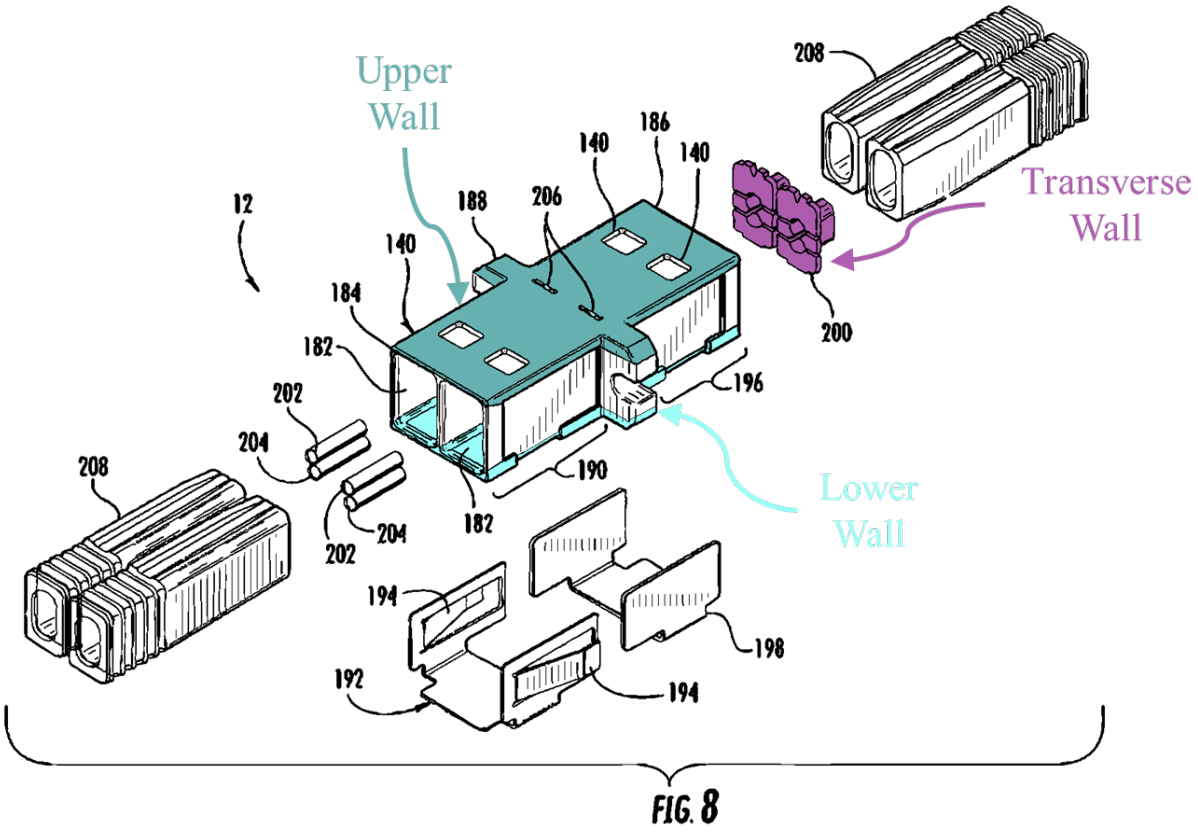


FIG. 8

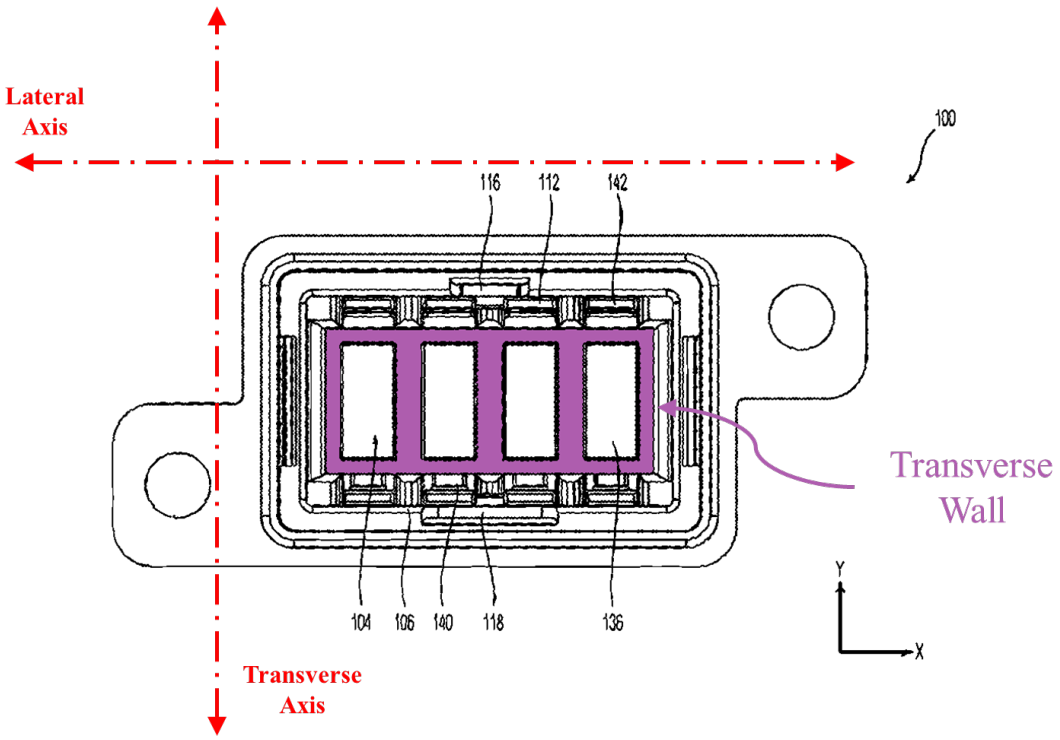
Lee, FIG. 8 (annotated).

339. Accordingly, I believe that a POSITA would have understood Nguyen in view of Lee discloses claim 10 and they would have been obvious to combine as discussed above.

G. Claim 11 – "The adapter set forth in claim 10, wherein the transverse wall includes a socket in each of the first and second channels configured to receive a ferrule of one of the optical fiber connectors."

340. In my opinion, a POSITA would have understood that Nguyen discloses an adapter having a transverse wall that includes a socket in each of the first and second channels configured to receive a ferrule of one of the optical fiber

connectors. For example, Nguyen describes that transverse wall 130 "has a plurality of openings 136 that are sized to allow the ferrules 12 to pass therethrough to engage a corresponding ferrule 12." [Nguyen, ¶33.] Additionally, Figure 4 of Nguyen, shown below in annotated form, depicts the transverse wall of Nguyen's adapter with a socket in each channel for receiving a ferrule of an optical fiber connector. Although there are 4 sockets, two of the sockets are located in each of the first and second channels.



Nguyen FIG. 4 (annotated).

341. Therefore, a POSITA would understand that Nguyen teaches the additional limitation in claim 11.

H. Claim 12 – "The adapter set forth in claim 11, wherein the socket in each of the first and second channels comprises a pair of cylindrical sockets in each of the first and second channels, each pair of sockets configured to receive a pair of cylindrical ferrules of one of the optical fiber connectors."

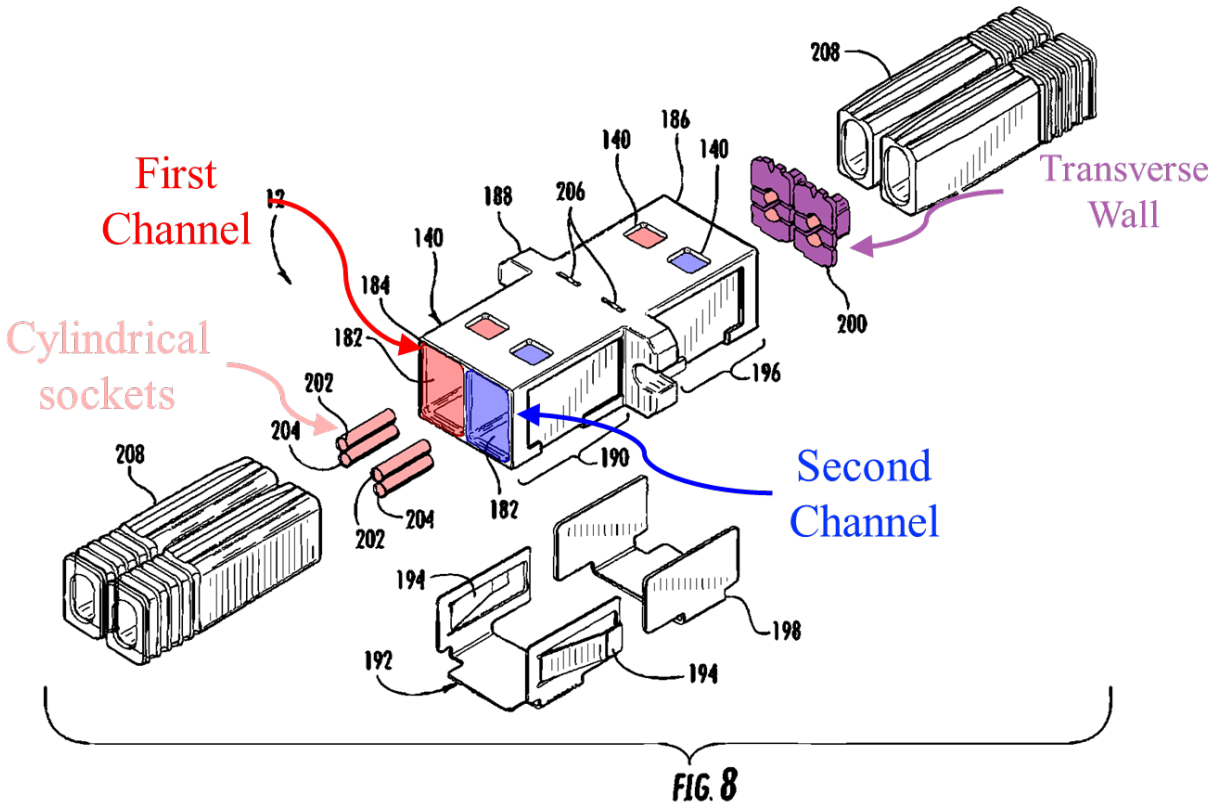
342. As discussed above, Nguyen discloses a transverse wall with sockets for receiving ferrules of optical fiber connectors. Nguyen's sockets, as shown in Figure 4, appear to be rectangular rather than cylindrical. However, the shape of the sockets is simply a design choice and cylindrical sockets are expressly disclosed in Lee.

343. In my opinion, a POSITA would have understood Lee discloses a transverse wall that includes sockets (first and second sleeves 202, 204) in each of the channels 182 configured to receive a ferrule (ferrules 20, 22) of one of the optical connectors (optical fiber connector 10). [*See, e.g.*, Lee, ¶36, 62, FIG. 8.]

344. For example, Lee explains "first and second sleeves 202, 204 that are positioned by the sleeve holders 200 are used to align the first and second ferrules 20, 22 of the connector 10 with similarly-shaped ferrules of a mating component (e.g., another connector), as will be apparent based on the description below." [*Id.*, ¶62.]

345. Lee further explains that "[t]he first and second ferrules 20, 22 in the embodiment shown are cylindrical." [*Id.*, ¶36.]

346. As shown below in annotated form, Lee Figure 8 also illustrates the sockets are cylindrical, receive ferrules, and are placed in respective channels, and secured in those channels by snap fit connections in slots 206.



Lee, FIG. 8 (annotated).

347. Accordingly, I believe that a POSITA would have understood Nguyen in view of Lee discloses claim 12 and would have been obvious to combine as discussed above.

XII. GROUND 4: CLAIM 1-2 and 6-12 OF THE '836 PATENT ARE ANTICIPATED BY NAKAGAWA.

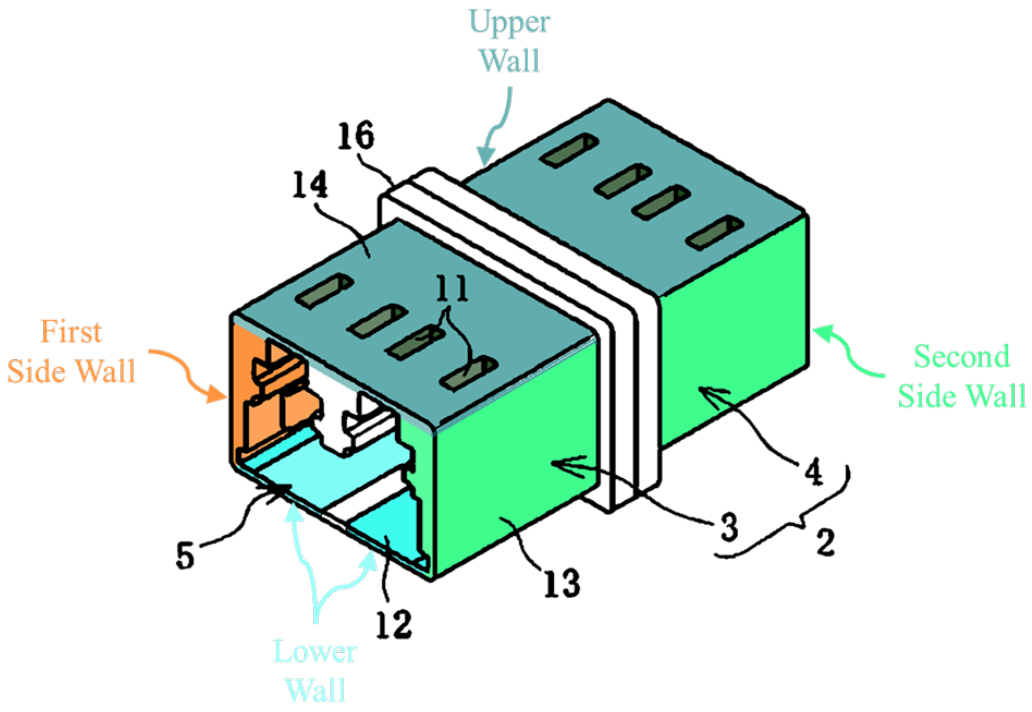
348. I believe that a POSITA would have understood that Nakagawa expressly discloses all the limitations of claims 1-2 and 6-12 of the '836 Patent.

A. Claim 1

1. Preamble – "An adapter for mating with optical fiber connectors, the adapter comprising:"

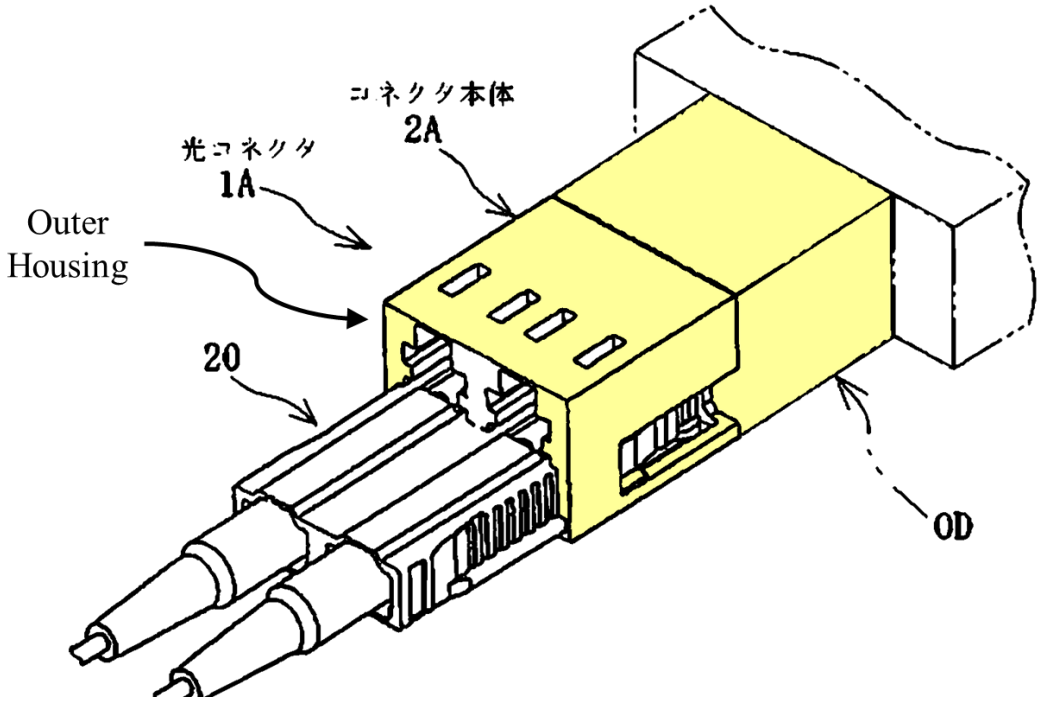
349. Even if the preamble is limiting, I believe Nakagawa discloses an adapter for mating with optical fiber connectors.

350. For example, Figure 1 of Nakagawa, shown below in annotated form, illustrates an adapter for mating with optical fiber connectors. [*See, e.g.*, Nakagawa, FIG. 1.]



Nakagawa, FIG. 1 (annotated).

351. Additionally, FIG. 13 of Nakagawa, provided below in annotated form, illustrates the adapter of FIG.1 mated with two optical fiber connectors.



Nakagawa, FIG. 13 (annotated).

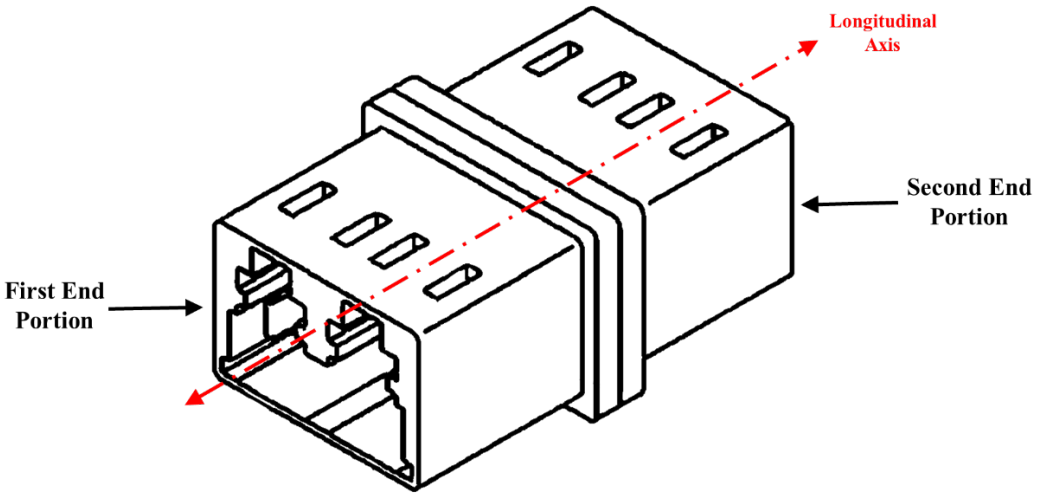
352. Accordingly, I believe Nakagawa discloses the preamble of claim 1.

2. Element [1.1] – "an outer housing having a first end portion and a second end portion spaced apart along a longitudinal axis, the outer housing comprising a first side wall and a second side wall spaced apart along a lateral axis perpendicular to the longitudinal axis, the outer housing having a width extending along the lateral axis from the first side wall to the second side wall, the outer housing comprising a upper wall and a lower wall spaced apart along a transverse

axis oriented perpendicular to the lateral axis and perpendicular to the longitudinal axis"

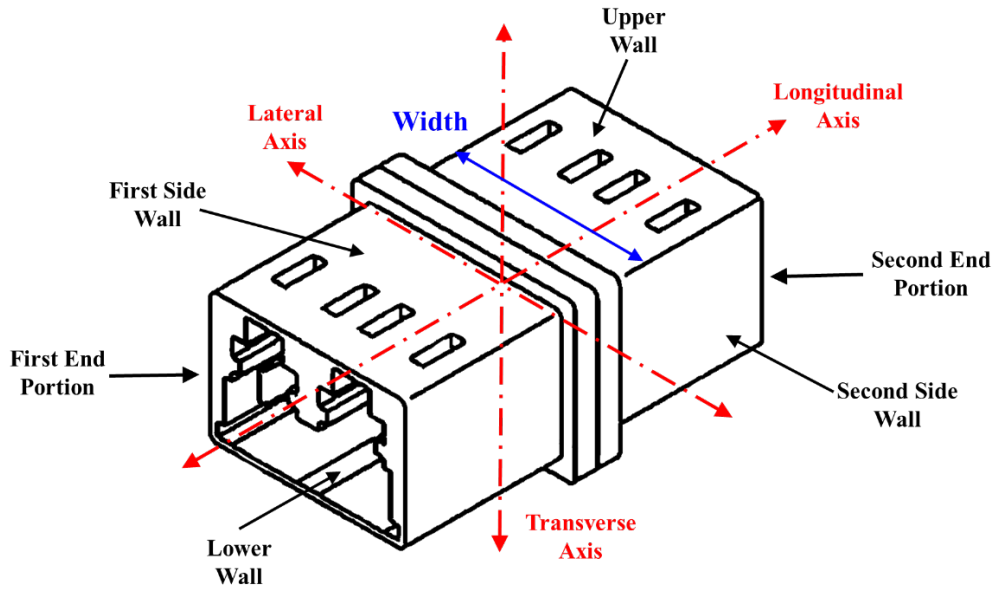
353. Nakagawa discloses an adapter with "an outer housing having a first end portion and a second end portion spaced apart along a longitudinal axis, the outer housing comprising a first side wall and a second side wall spaced apart along a lateral axis perpendicular to the longitudinal axis, the outer housing having a width extending along the lateral axis from the first side wall to the second side wall, the outer housing comprising a upper wall and a lower wall spaced apart along a transverse axis oriented perpendicular to the lateral axis and perpendicular to the longitudinal axis."

354. As shown above in the other grounds, the limitations of Element 1.1 are easily shown in three simple steps. Recall from the section above that provided an overview of the '836 patent, that this limitation is practiced by a rectangular box. The adapter presented in Nakagawa is very much like a rectangular box and similarly teaches this limitation. For example, the first limitation of element 1.1 (an outer **housing** having a first end portion and a second end portion spaced apart along a longitudinal axis) is illustrated by the annotated version of Nakagawa FIG. 1 provided below.



Nakagawa FIG. 1 - First limitation of Element 1.1 (annotated).

355. The requirements of the second limitation of Element 1.1 (the outer housing comprising a first side wall and a second side wall spaced apart along a lateral axis perpendicular to the longitudinal axis, the outer housing having a width extending along the lateral axis from the first side wall to the second side wall) are overlaid on the annotated version of Nakagawa Fig. 1 provided below.



Nakagawa FIG. 1 – First, second and third limitations of Element 1.1 (annotated).

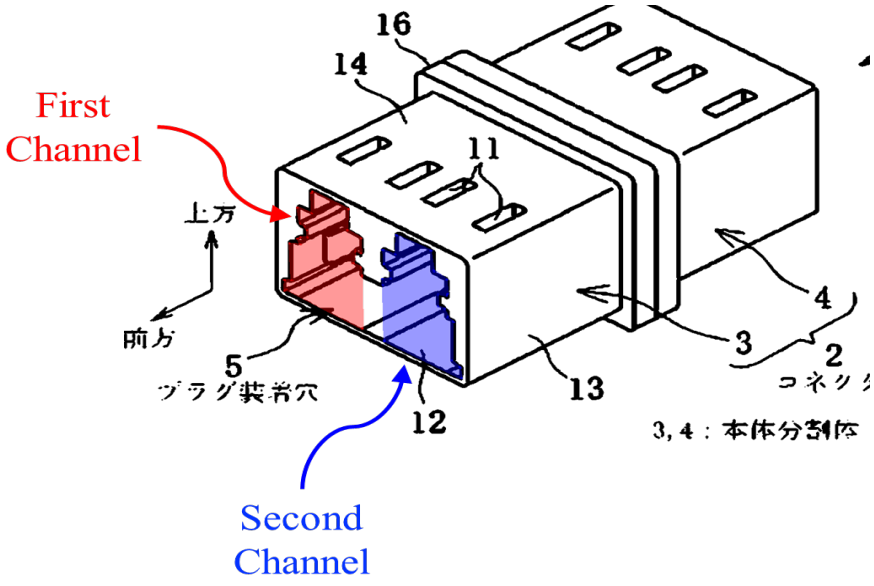
356. The requirements of the third, and final, limitation of Element 1.1 (the outer housing comprising a upper wall and a lower wall spaced apart along a transverse axis oriented perpendicular to the lateral axis and perpendicular to the longitudinal axis) are overlaid on the annotated version of Nakagawa Fig. 1 provided below.

357. Accordingly, I believe Nakagawa discloses all the features of element [1.1] of claim 1.

3. Element [1.2] – "each of the upper wall and the lower wall having an inner surface, the outer housing defining a plurality of channels spaced apart along the width, each of the channels being configured to receive an optical fiber connector, the plurality of channels including first and second channels"

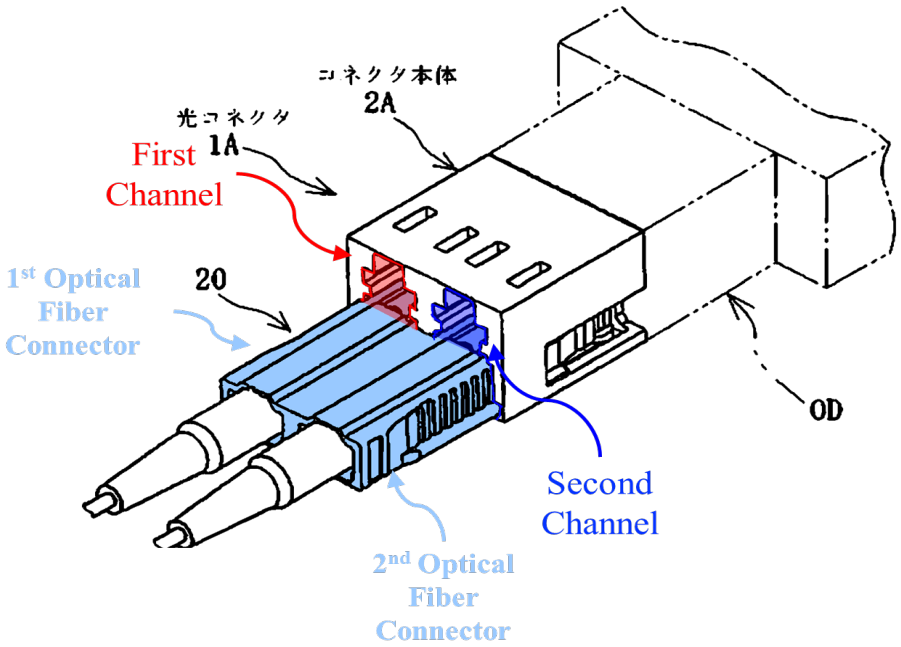
358. I believe Nakagawa discloses this element of claim 1.

359. For example, Figure 1 of Nakagawa, shown below in annotated form, illustrates an adapter with "each of the upper wall and the lower wall having an inner surface, the outer housing defining a plurality of channels spaced apart along the width, each of the channels being configured to receive an optical fiber connector, the plurality of channels including first and second channels" as recited in element [1.2] of claim 1.



Nakagawa, FIG. 1 (annotated).

360. Additionally, Figure 13, shown below in annotated form, illustrates the adapter of Figure 1 with a first and second optical fiber connector received into the first and second channels of the adapter.



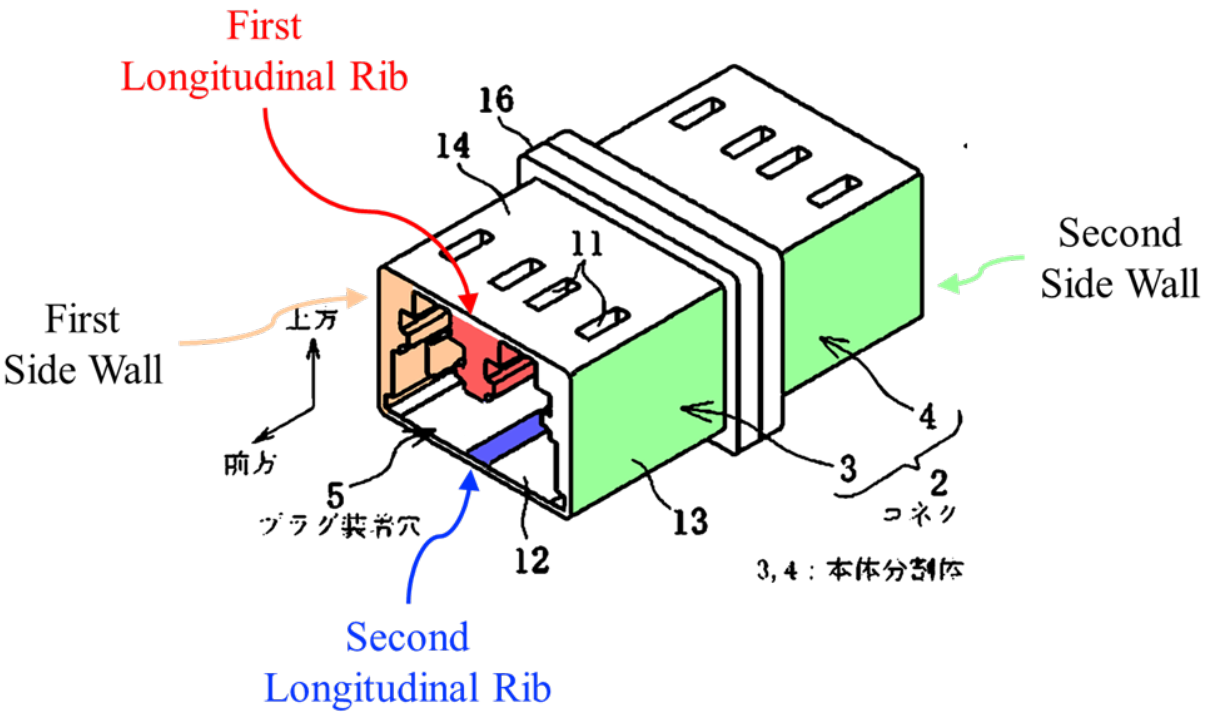
Nakagawa, FIG. 13 (annotated).

361. Accordingly, I believe Nakagawa discloses all the features of element [1.2] of claim 1.

4. Element [1.3] – "a first longitudinal rib formed on the inner surface of the upper wall at a location spaced apart along the width of the outer housing between the first side wall and the second side wall and a second rib formed on the inner surface of the lower wall at a location spaced apart along the width of the outer housing between the first side wall and the second side wall, the first and second ribs being aligned along the width of the outer housing, the first rib being spaced apart from the second rib along the transverse axis by a transverse gap"

362. I believe Nakagawa discloses "a first longitudinal rib formed on the inner surface of the upper wall at a location spaced apart along the width of the outer housing between the first side wall and the second side wall and a second rib formed on the inner surface of the lower wall at a location spaced apart along the width of the outer housing between the fist side wall and the second side wall, the first and second ribs being aligned along the width of the outer housing, the first rib being spaced apart from the second rib along the transverse axis by a transverse gap," as recited in claim 1.

363. For example, Figure 1 of Nakagawa, shown below in annotated form, illustrates an adapter including a first longitudinal rib on the upper wall and a second longitudinal rib on the lower wall.



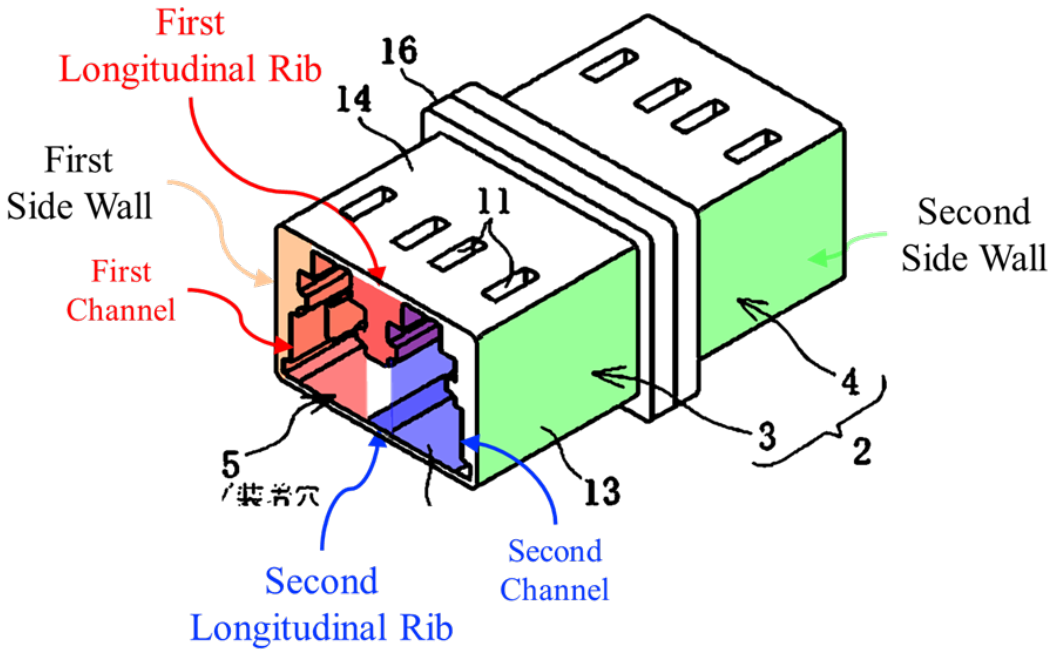
Nakagawa, FIG. 1 (annotated).

364. Accordingly, I believe Nakagawa discloses element [1.3] of claim 1.

5. Element [1.4] – "wherein the first longitudinal rib and the second longitudinal rib are located between the first and second channels"

365. I believe Nakagawa discloses an adapter wherein the first and second longitudinal rib are located between the first and second channels.

366. For example, Figure 1 below illustrates a first and second channel with a first and second longitudinal rib located between the channels.

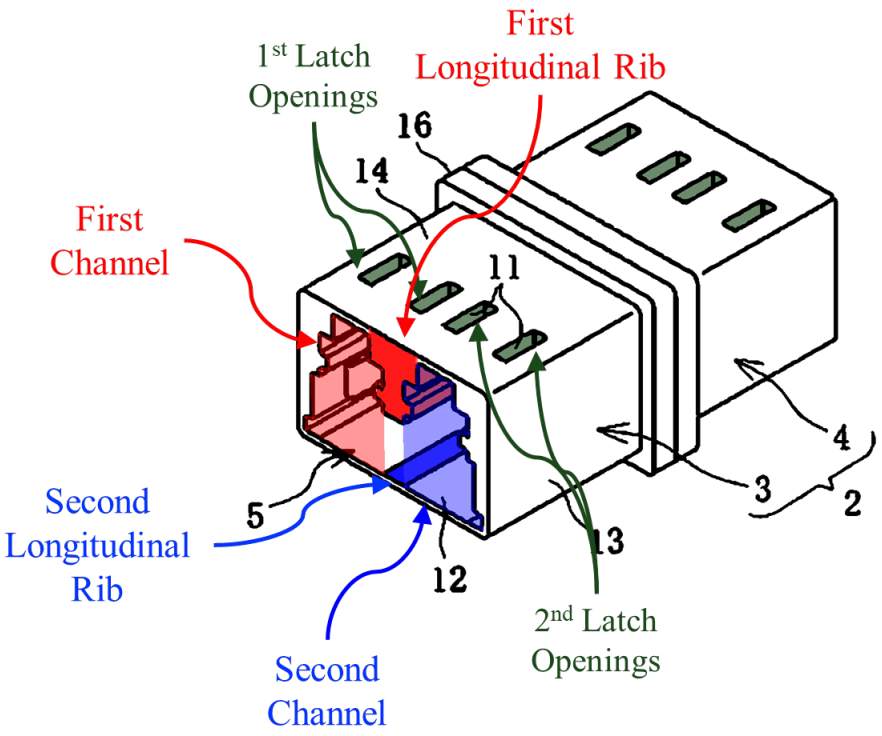


Nakagawa, FIG. 1 (annotated).

367. Accordingly, I believe Nakagawa discloses all the features of element [1.4] of claim 1 and consequently anticipates claim 1.

B. Claim 2 – "The adapter set forth in claim 1, wherein the upper wall comprises a first latch opening aligned with the first channel and a second latch opening aligned with the second channel, the first rib being spaced apart between the first latch opening and the second latch opening along the width."

368. I believe Nakagawa discloses an adapter wherein the upper wall comprises a first and second latch opening aligned with the first and second channels respectively. Nakagawa further discloses the first longitudinal rib of the adapter being spaced apart between the first second latch openings along the width. [*See e.g.,* Nakagawa, FIG. 1.] Annotated Figure 1 below illustrates these features with the relevant elements identified.

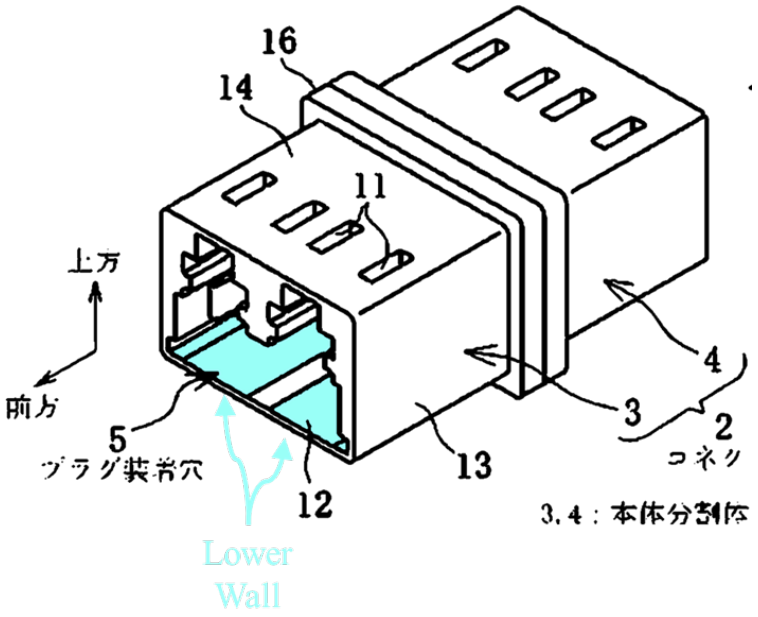


Nakagawa, FIG. 1 (annotated).

369. Accordingly, I believe Nakagawa discloses all the elements of claim 2.

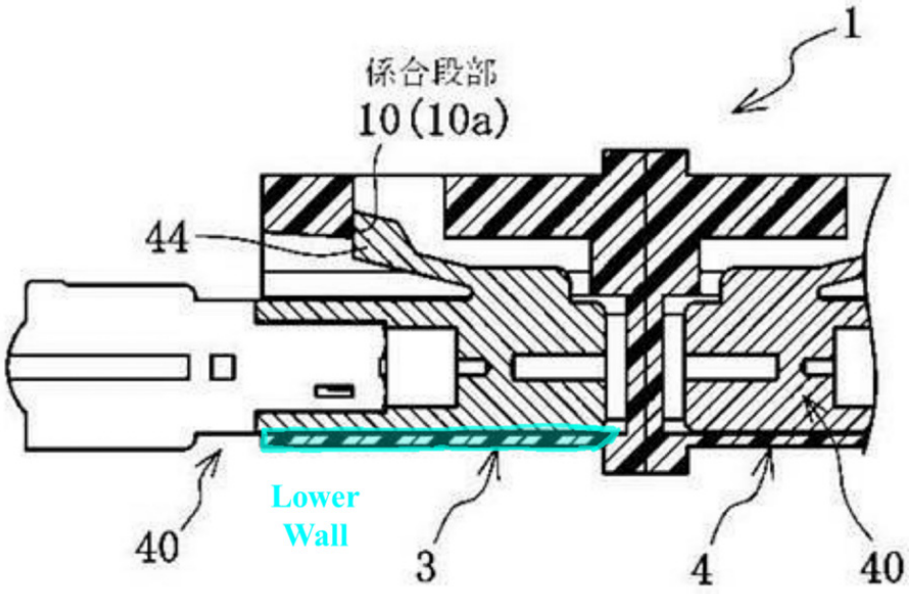
C. Claims 6 & 7 – "The adapter set forth in claim 2, wherein the lower wall is free of latch openings." and "The adapter set forth in claim 2, wherein the lower wall is configured to slidably engage each of the first and second optical fiber connectors without latching."

370. I believe Nakagawa discloses an adapter wherein the "lower wall is free of latch openings" and is "configured to slidably engage each of the first and second optical fiber connectors without latching" as recited in claims 6 and 7. For example, annotated Figure 1 of Nakagawa below illustrates an adapter having a lower wall that is free of latch openings.



Nakagawa, FIG. 1 (annotated).

371. Additionally, Figure 12, provided below in annotated form, illustrates a cross-sectional view of the adapter of Figure 1. The cross section shows that the lower wall is flat and without openings.



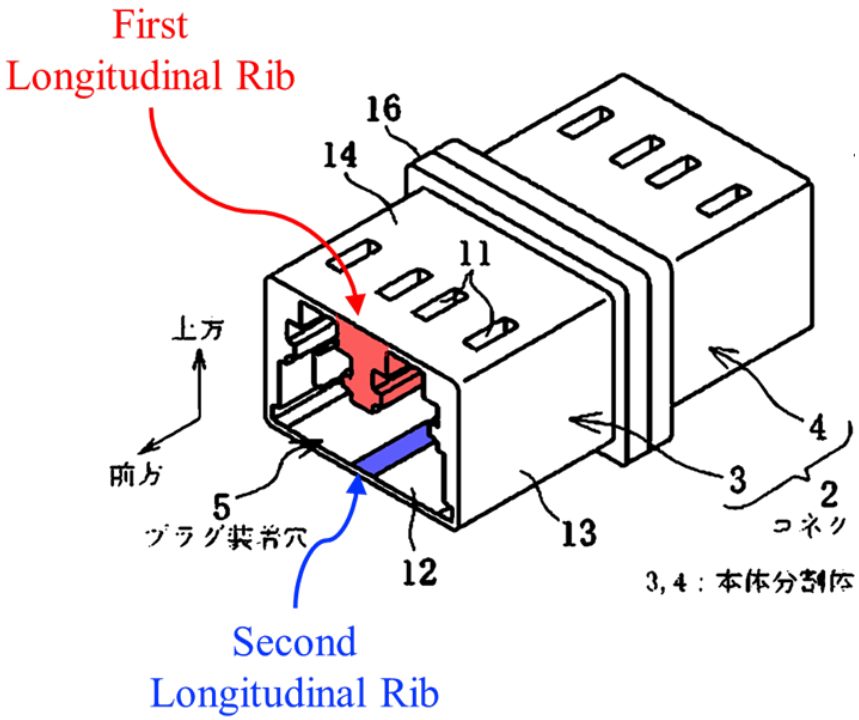
Nakagawa, FIG. 12 (annotated).

372. Accordingly, I believe Nakagawa discloses all the features of claim 6 and 7.

D. Claim 8 – "The adapter set forth in claim 1, wherein the first longitudinal rib has a first height along the transverse axis and the second longitudinal rib has a second height along the transverse axis, the first height being greater than the second height"

373. I believe Nakagawa discloses a first and second longitudinal rib wherein the first rib has a first height along the transverse axis that is greater than the height of the second rib in the transverse axis.

374. For example, Figure 1 of Nakagawa has been annotated below to identify the relevant features. The first longitudinal rib is unmistakably visibly greater in height than the second longitudinal rib.

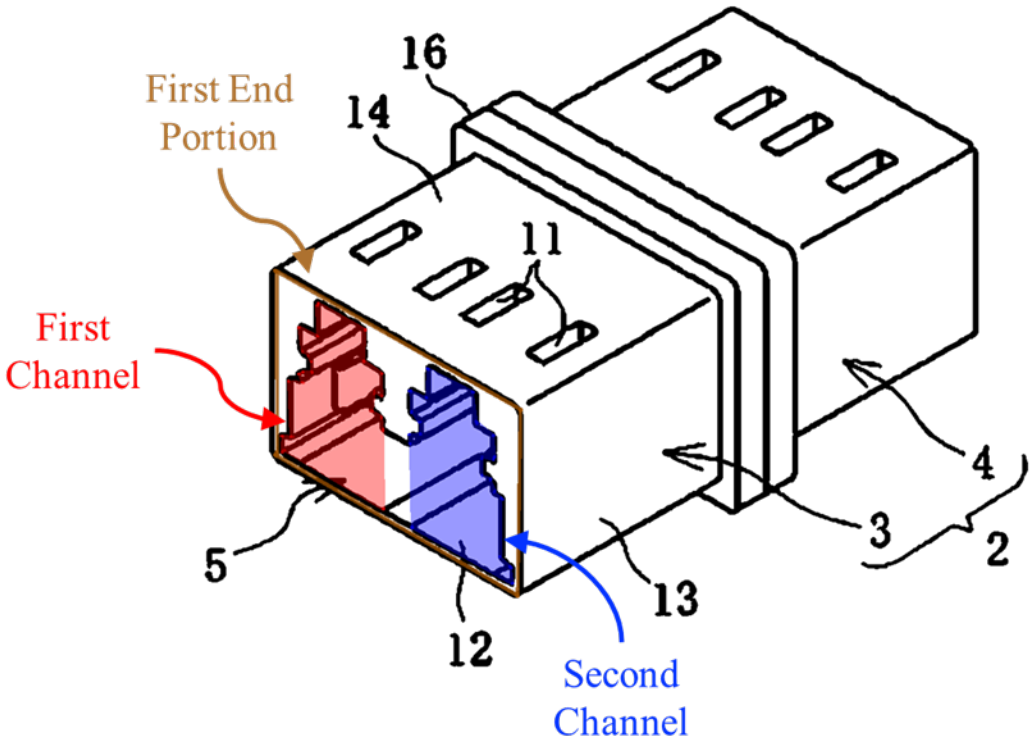


Nakagawa, FIG. 1 (annotated).

375. Accordingly, I believe Nakagawa discloses all the features claim 8.

E. Claim 9 – "The adapter set forth in claim 1, wherein each of the first and second channels opens through the first end portion of the outer housing"

376. I believe Nakagawa discloses an adapter wherein each of the first and second channels open through the first end portion of the outer housing. This feature is illustrated in annotated Figure 1 below.



Nakagawa, FIG. 1 (annotated).

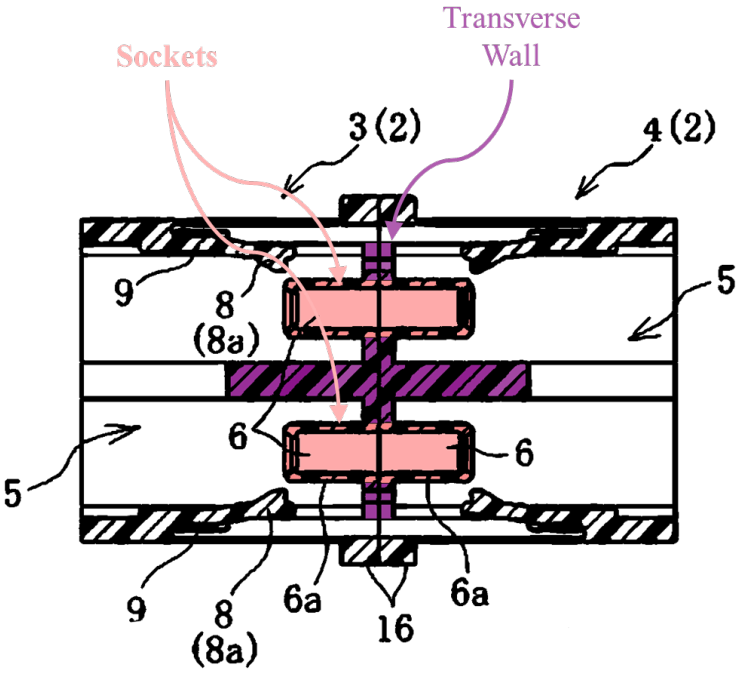
377. Accordingly, I believe Nakagawa discloses the features of claim 9.

F. Claim 10 – "The adapter set forth in claim 9, further comprising a transverse wall extending between the upper wall and the lower

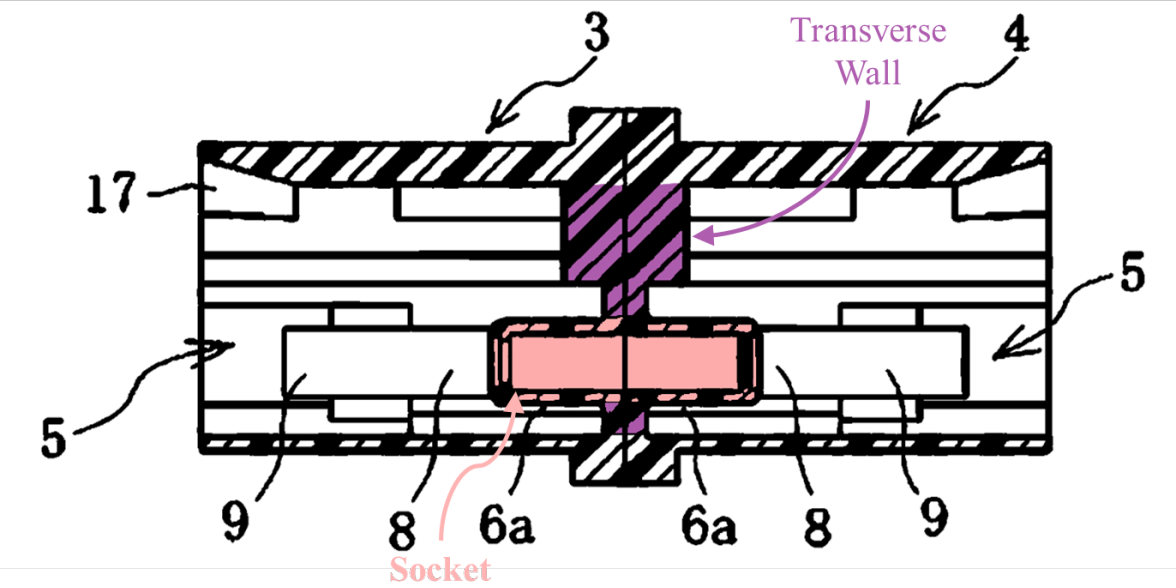
wall at a location longitudinally spaced apart from the first end portion of the outer housing"

378. I believe Nakagawa discloses an adapter "comprising a transverse wall extending between the upper wall and the lower wall at a location longitudinally spaced apart from the first end portion of the outer housing" as recited in claim 10.

379. For example, Figures 3 and 4 illustrate a transverse wall that extends between the upper and lower walls and located longitudinally spaced apart from first end portion of the outer housing. Both Figures 3 and 4 show a latitudinal and longitudinal cross-section view of the adapter. Figures 3 and 4 have been annotated below to identify the transverse wall in relation to other features of the adapter.



Nakagawa, FIG. 3 (annotated).



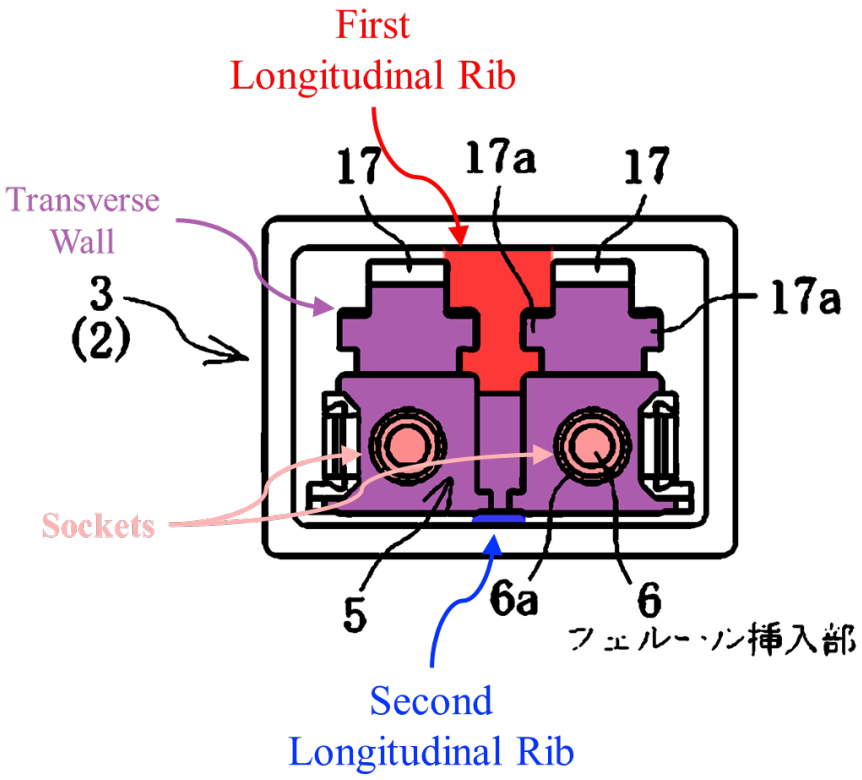
Nakagawa, FIG. 4 (annotated).

380. Accordingly, I believe Nakagawa discloses all the elements of claim 10.

G. Claim 11 & 12 – "The adapter set forth in claim 10, wherein the transverse wall includes a socket in each of the first and second channels configured to receive a ferrule of one of the optical fiber connectors" and "The adapter set forth in claim 11, wherein the socket in each of the first and second channels comprises a pair of cylindrical sockets in each of the first and second channels, each pair of sockets configured to receive a pair of cylindrical ferrules of one of the optical fiber connectors"

381. I believe Nakagawa discloses an adapter comprising a transverse wall, the transverse wall including a cylindrical socket in each of the first and second channels configured to receive a cylindrical ferrule of one of the optical fiber connectors," as recited in claim 11.

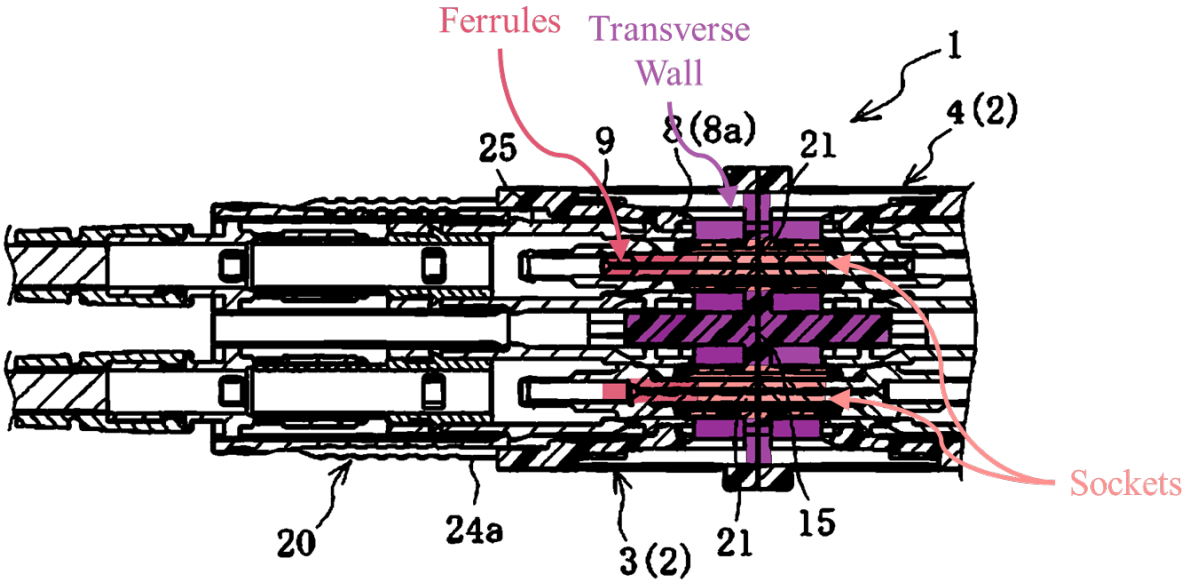
382. For example, Figure 2 of Nakagawa, provided below in annotated form, illustrates a front view of the adapter such that the socket in the first and second channels configured to receive a ferrule of one of the optical fiber connectors is visible at the location of the transverse wall.



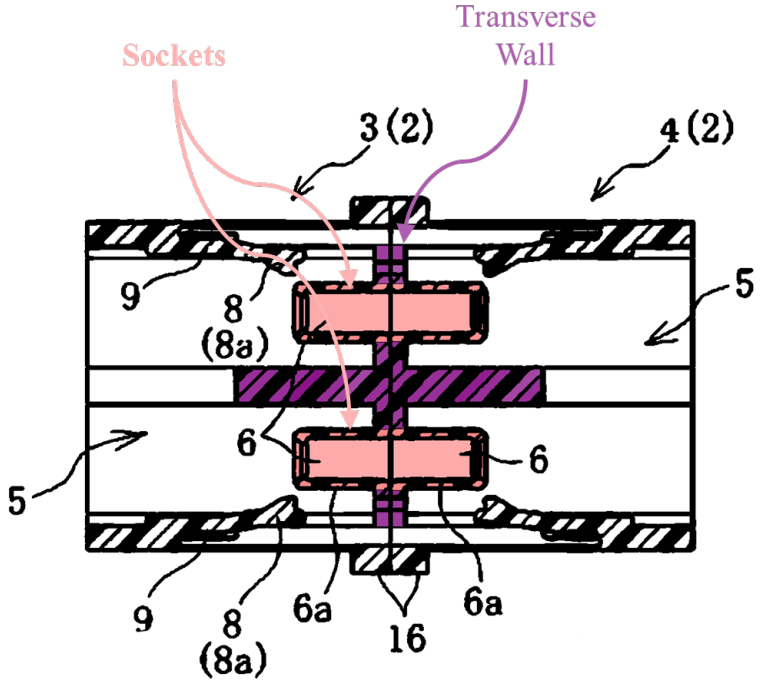
Nakagawa, FIG. 2 (annotated).

383. Additionally, Figures 3 and 10, provided below in annotated form, illustrate cross-sectional views of the adapter. Figure 10 additionally illustrates the adapter mated with a first and second optical fiber connector in the first and second channels respectively. This figure also shows that the transverse wall includes

cylindrical sockets that align with the first and second channels and receive the cylindrical ferrules of the first and second connectors.



Nakagawa, FIG. 10 (annotated).



Nakagawa, FIG. 3 (annotated).

384. Accordingly, I believe Nakagawa discloses all the features of claims 11 and 12.

XIII. GROUND 5: CLAIMS 3-5 AND 13 OF THE '836 PATENT ARE OBVIOUS OVER NAKAGAWA IN VIEW OF DEJONG.

385. I believe that a POSITA would have understood that the limitations in dependent claims 3-5 and 13 of the '836 Patent would have been obvious based on Nakagawa in view of deJong.

A. Motivation to Combine

386. I believe a POSITA would have found it obvious to combine Nakagawa and deJong to arrive at the subject matter of the claims addressed below. Specifically, I believe a POSITA would have found it obvious to modify Nakagawa's optical connector assembly to include an optical fiber connector with a push-pull mechanism as disclosed in deJong.

387. A POSITA would be motivated to make this combination in order to utilize the advantages of the push-pull mechanism of deJong's connector in Nakagawa's duplex adapter-connector assembly. While Nakagawa's duplex adapter-connector assembly includes a connector with a latching mechanism to facilitate the connecting and releasing of the connector from the adapter, the mechanism is not optimized for ease of use in high-density setups. As such, a POSITA would have been motivated to replace Nakagawa's fiber optic connectors

with those disclosed in deJong in order to make Nakagawa's adapter-connector assembly better suited for a high-density setup.

388. A POSITA would have understood that modifying an adapter that can accommodate two types of optical connectors to be optimized for use in a high-density setup would greatly increase the versatility of the adapter.

389. As noted above, Nakagawa's adapter is designed to accommodate both MU and LC type connectors and deJong explains that although "illustrated as an LC connector the concepts disclosed are applicable to other suitable latching push-pull fiber optic connectors." As such, a POSITA would have understood that Nakagawa's duplex adapter-connector assembly could be modified by enhancing the connector with the duplex connector elements disclosed in deJong without changing the functionality of the assembly.

390. This modification of Nakagawa involves the simple substitution of one known component for another, which will function in the same manner with predictable results.

391. A POSITA would have had reasonable expectation of success, as this modification involves the enhancement of one known type of connector with elements from another, which would have been readily implementable for someone having ordinary skill in the art as of the effective priority date of the '836 Patent.

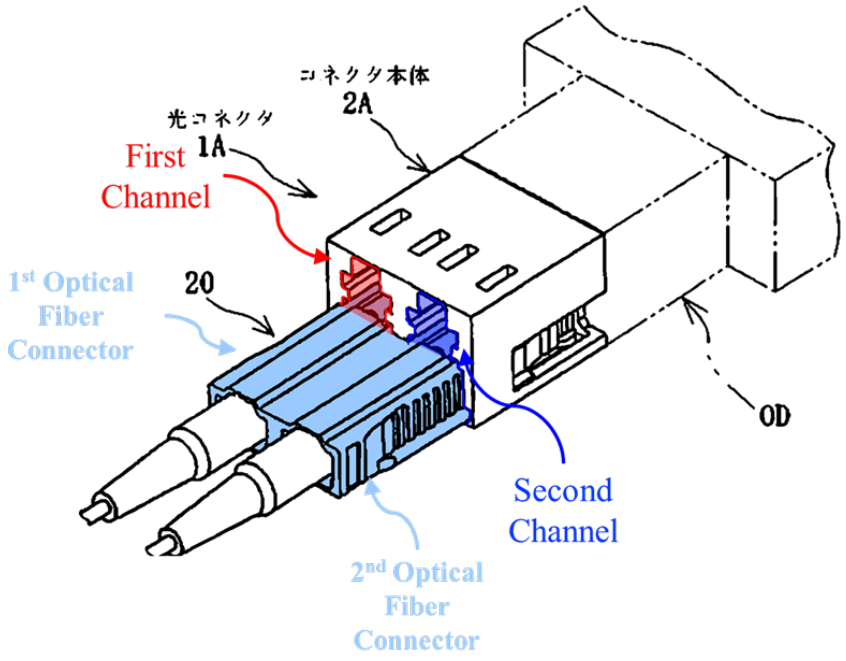
392. The duplex connector disclosed in deJong is in the same orientation as that disclosed in Nakagawa. Additionally, the latching of deJong's connector to the adapter occurs in a similar manner as that disclosed in Nakagawa. The main distinction between the latching mechanisms disclosed in Nakagawa and deJong is the manner in which the mechanism is actuated. A POSITA would have readily understood the manner of actuation of the latching mechanism of Nakagawa could be replaced by that of deJong without a need to significantly modify Nakagawa's adapter because the manner of actuation is a feature of the connector.

393. Accordingly, the modification of Nakagawa's connector to utilize the push-pull feature disclosed in deJong would have been obvious to a POSITA.

B. Claim 3

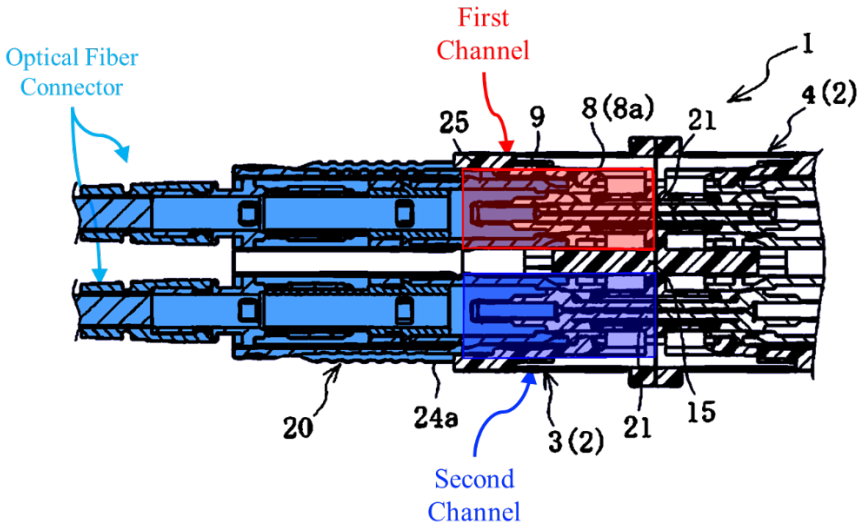
1. Element [3.1] – "The adapter set forth in claim 2, wherein the adapter is configured to receive a first one of the optical fiber connectors in the first channel and a second one of the optical fiber connectors in the second channel such that:"

394. I believe Nakagawa discloses an adapter configured to receive a first optical fiber connector in the first channel and a second optical fiber connector in the second channel. For example, Figure 13 of Nakagawa, shown below in annotated form, illustrates the adapter of Figure 1 with a first and second optical fiber connector being received by the first and second channels of the adapter respectively. [*See e.g.,* Nakagawa, FIG. 13.]



Nakagawa, FIG. 13 (annotated).

395. Additionally, Figure 10 of Nakagawa, shown below in annotated form, illustrates a transverse cross-sectional view of the adapter and optical fiber connector assembly. The figure shows how the first and second optical fiber connectors are received into the first and second channels.

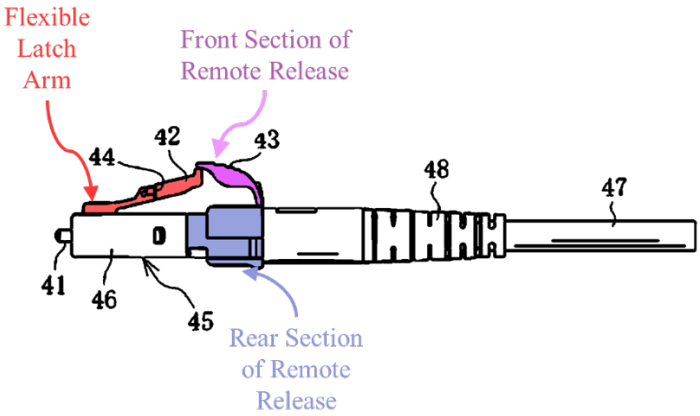


Nakagawa, FIG. 10 (annotated).

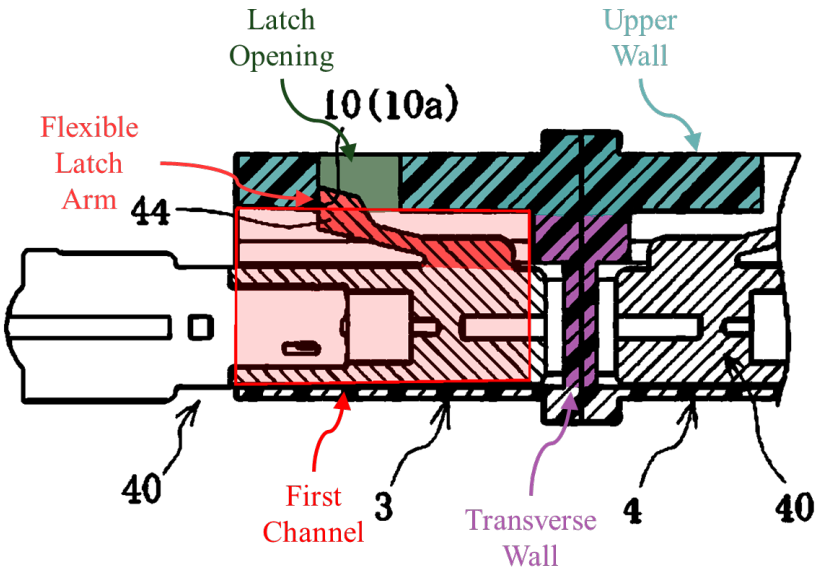
396. Accordingly, I believe Nakagawa discloses the features of element [3.1] of claim 3.

2. Element [3.2] – "a flexible latch arm of the first optical fiber connector is latched with the first latch opening and a front section of a remote release of the first optical fiber connector is received in the first channel at a location spaced apart from the first latch opening along the longitudinal axis toward the second end portion of the outer housing"

397. I believe Nakagawa discloses a first optical fiber connector with a flexible latch arm that is latched with the first latch opening. For example, Figure 8 of Nakagawa illustrates an optical fiber connector with a flexible latch arm that is configured to latch with the first latch opening of the adapter. [*See, e.g.*, Nakagawa, FIG. 8.] Furthermore, Figure 12 of Nakagawa illustrates a cross sectional view of the optical fiber connector of Figure 8 received by a first channel of an adapter such that the flexible latch arm is latched with the first latch opening of the adapter. Figures 8 and 12 have been annotated below to identify these features.



Nakagawa, FIG. 8 (annotated).



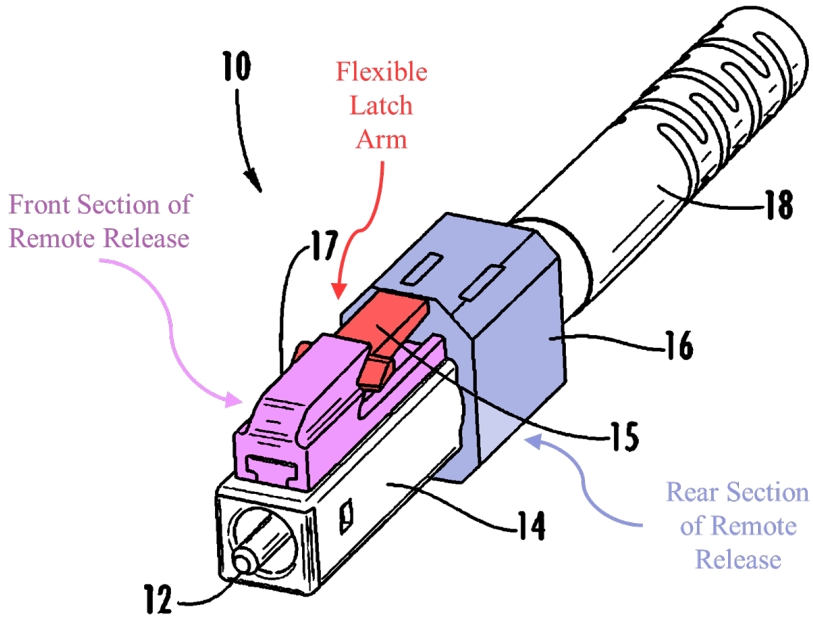
Nakagaw, FIG. 12 (annotated).

398. Nakagawa does not expressly disclose a front section of a remote release of the first optical fiber connector that is received in the first channel at a location spaced apart from the first latch opening along the longitudinal axis toward the second end portion of the outer housing. However, deJong does disclose this feature.

399. For example, deJong explains that "[d]ecoupling member 17 includes one or more retaining features 17b disposed on the rearward end of the arms for attaching decoupling member 17 to shroud 16." [deJong, ¶23.] deJong further explains that "as fiber optic connector 10 is pushed into the adapter" the shroud 16 is pushed into a forward position allowing the latch 15 to slide into the adapter such that "the latch is pushed downward to and then springs upward to engage

complimentary geometry on the adapter or the like for securing the same." [*Id.*, ¶24.]

400. Additionally, Figures 1 and 4 of deJong illustrate an optical fiber connector with a remote release portion and the same optical fiber connector with the remote release mechanism positioned as it would be when inserted into an adapter such that the front section of the remote release is received in the first channel at a location spaced apart from the first latch opening. Figures 1 and 4 have been annotated below to identify the relevant features of the latch and remote release.



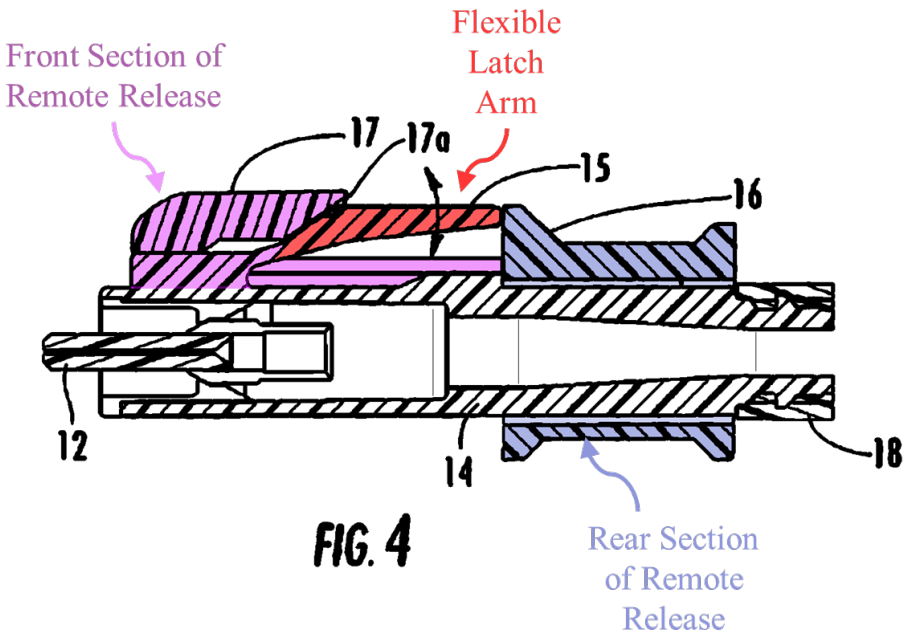


FIG. 4

deJong, FIGs. 1 and 4 (annotated).

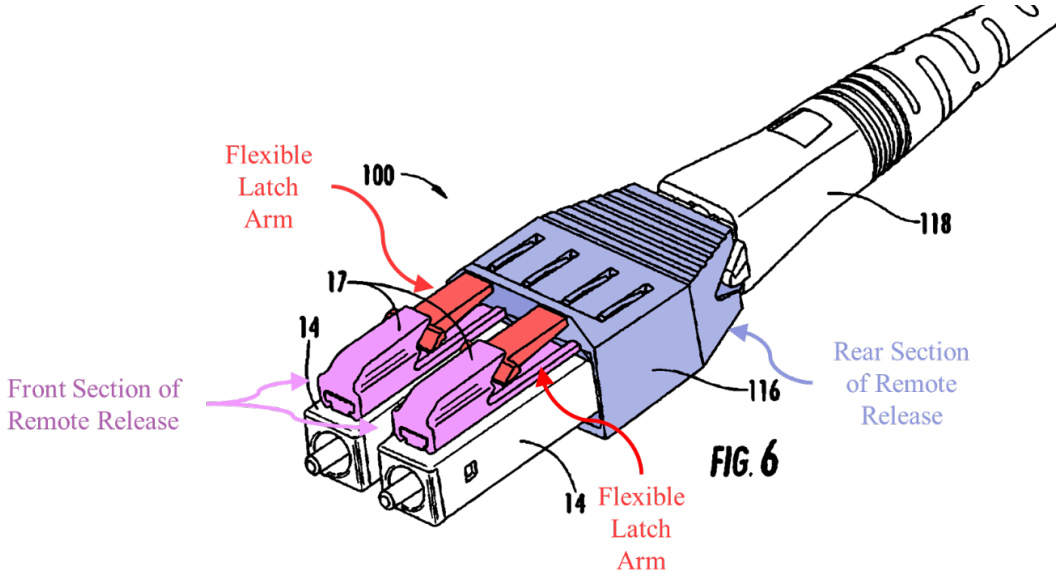
401. Accordingly, I believe the combination of Nakagawa and deJong discloses all the features of element [3.2] of claim 3, and would have been obvious to combine as I discussed above.

3. Element [3.3] – "a flexible latch arm of the second optical fiber connector is latched with the second latch opening and a front section of a remote release of the second optical fiber connector is received in the [second] channel at a location spaced apart from the second latch opening along the longitudinal axis toward the second end portion of the outer housing"

402. As discussed above, the combination of Nakagawa and deJong discloses a flexible latch arm of an optical fiber connector that is latched with the a latch opening and a front section of a remote release of the optical fiber connector is received in a channel of the adapter at a location spaced apart from the latch

opening along the longitudinal axis toward the second end portion of the outer housing.

403. Additionally, Nakagawa discloses an adapter with a first and second channel configured to receive a first and second optical fiber connector, while both Nakagawa and deJong disclose a first and second optical fiber connector. As such, it would have been obvious to a POSITA to combine the duplex adapter of Nakagawa with the duplex connector of deJong, as illustrated in annotated Figure 6 of deJong provided below. A POSITA would be motivated to make this combination in order to utilize the improved push-pull mechanism of deJong's connector in a duplex adapter-connector assembly.



deJong, FIG. 6 (annotated).

404. Accordingly, I believe the combination of Nakagawa and deJong discloses element [3.3] of claim 3, and would have been obvious to combine as I discuss above.

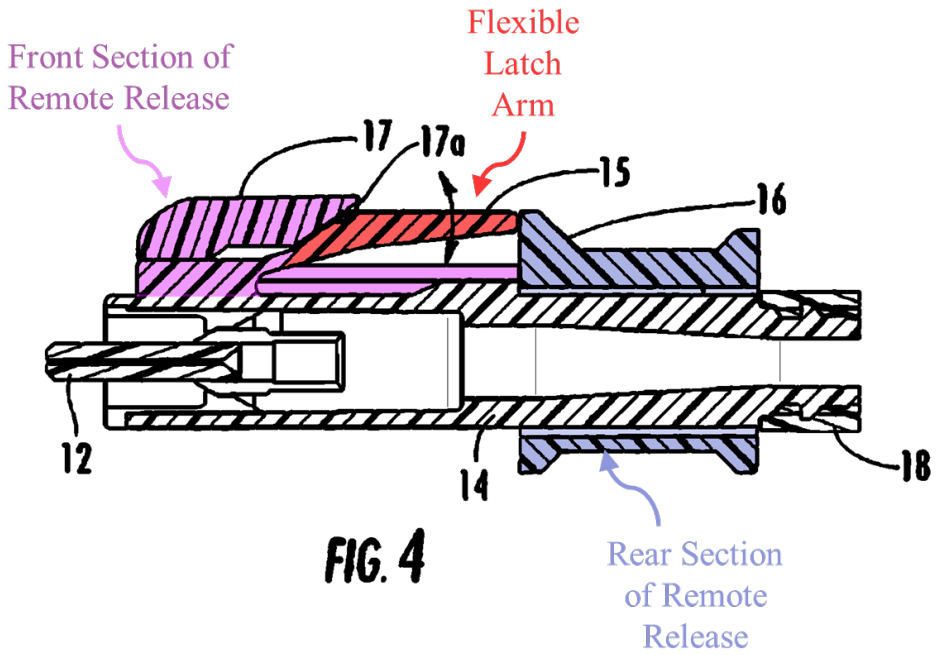
C. Claim 4 – "The adapter set forth in claim 3, wherein the first channel is configured to allow the front section of the remote release of the first optical fiber connector to slide along the flexible latch arm of the first optical fiber connector within the first channel toward the first end portion of the outer housing to depress the flexible latch arm of the first optical fiber connector and wherein the second channel is configured to allow the front section of the remote release of the second optical fiber connector to slide along the flexible latch arm of the second optical fiber connector within the second channel toward the first end portion of the outer housing to depress the flexible latch arm of the second optical fiber connector."

405. As discussed above Nakagawa discloses a duplex adapter having a first and second channel configured to receive a first and second optical fiber connector respectively. Nakagawa further discloses that the adapter is configured to latch with the flexible latch arm of a first and second optical fiber connector via a first and second latch opening.

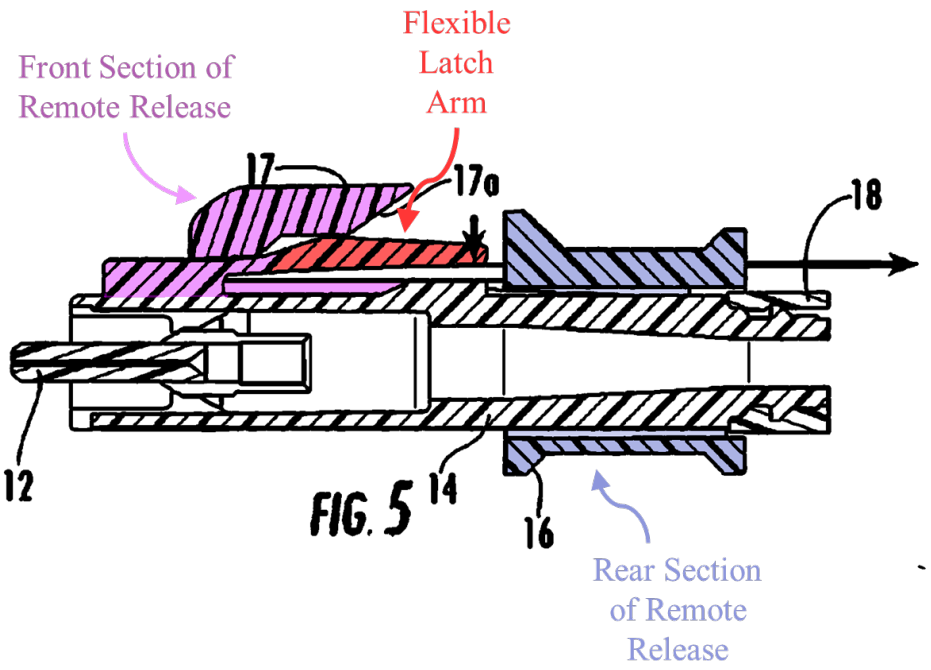
406. Nakagawa does not expressly disclose that the first and second channels of the adapter are configured to allow the front section of the remote release of a first and second optical fiber connector to slide along the flexible latch arms of the connectors within the first and second channels toward the first end portion of the outer housing to depress the flexible latch arm of the first and second

optical fiber connectors. However, deJong does explicitly teach optical fiber connectors with such a remote release and flexible latch arm interaction.

407. For example, deJong describes that when the optical fiber connector 10 is pulled out of the adapter, the decoupling member 17 is pulled into the rearward position such that "the latch 15 of housing 14 is pushed downward as shown, thereby releasing the latch 15 from the adapter." [deJong, ¶25.] This feature can also be seen in annotated Figures 4 and 5 of deJong below.



deJong, FIG. 4 (annotated).



deJong, FIG. 5 (annotated).

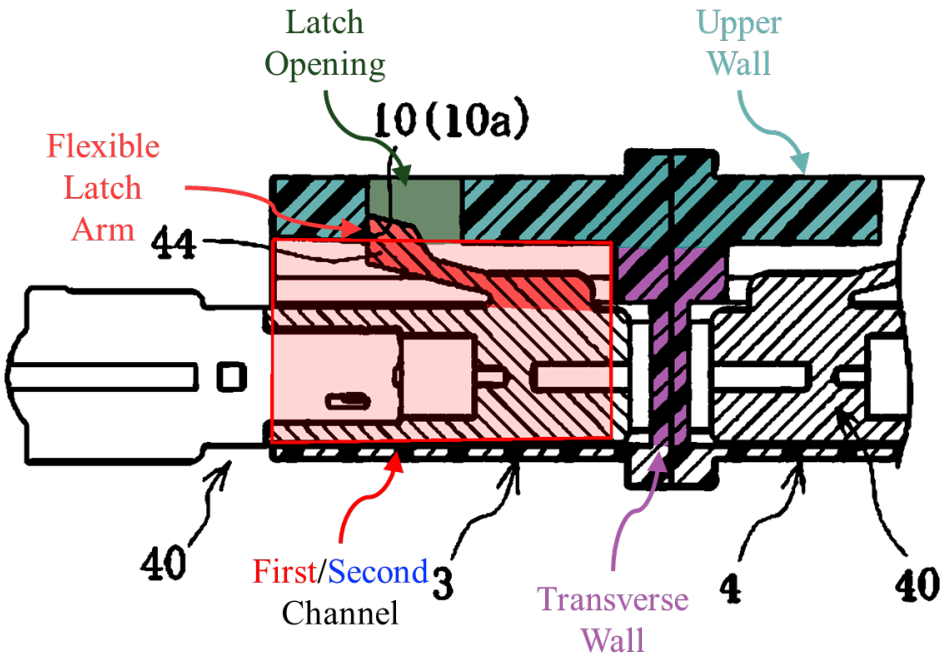
408. Accordingly, I believe Nakagawa in view of deJong discloses all the features of claim 4 and are obvious to combine as discussed above.

D. Claim 5 – "The adapter set forth in claim 4, wherein the upper wall is configured to unlatch from the flexible latch arm of the first optical fiber connector when the flexible latch arm of the first optical fiber connector is depressed and the upper wall is configured to unlatch from the flexible latch arm of the second optical fiber connector when the flexible latch arm of the second optical fiber connector is depressed."

409. I believe Nakagawa discloses an adapter having an upper wall "wherein the upper wall is configured to unlatch from the flexible latch arm of the first optical fiber connector when the flexible latch arm of the first optical fiber connector is depressed and the upper wall is configured to unlatch from the flexible latch arm of the second optical fiber connector when the flexible latch arm of the

second optical fiber connector is depressed" as recited in claim 5. Figures 11 and 12 of Nakagawa illustrate this feature.

410. For example, Figure 12, provided below in annotated form, depicts a cross-sectional view of the adapter with an optical fiber connected in one of the first or second channels such that the flexible latch arm of the connector is latched to one of the first or second latch openings.



Nakagawa, FIG. 12 (annotated).

411. Accordingly, I believe Nakagawa discloses all the elements of claim 5.

E. Claim 13 – "The adapter set forth in claim 1, wherein each of the optical fiber connectors is a multi-fiber connector comprising a multi-fiber ferrule."

412. Nakagawa does not expressly disclose a multi-fiber ferrule, but I believe deJong explicitly does teach the limitations of claim 13.

413. deJong discloses multi-fiber optical fiber connectors comprising a multi-fiber ferrule. For example, deJong explains that some embodiments may include "variations of fiber optic connectors include ferrules having a multi-fiber ferrule." [deJong, ¶28.]

414. I believe a POSITA would be motivated to modify Nakagawa's connectors to accommodate multi-fiber ferrules to allow for use in applications that require high bandwidth. Furthermore, a POSITA would have readily understood that the use of multi-fiber ferrules is one that is common and well understood and thus this modification would have a reasonable expectation of success.

415. Accordingly, I believe Nakagawa in view of deJong discloses the features of claim 13, which a POSITA would have found obvious to combine as discussed above.

XIV. CONCLUSION

416. For at least the reasons set forth above, I am of the opinion the Challenged Claims would have been obvious to a POSITA at the time of invention of the '836 Patent based at least on the discussed prior art.

417. I understand that this Declaration is to be filed as evidence in a contested IPR proceeding before the Patent Trial and Appeal Board. I acknowledge that I may be subject to cross-examination in the case and that cross-examination will take place within the United States. If cross-examination is required of me, I will appear for cross-examination within the United States during the time allotted for cross-examination.

418. I hereby declare under penalty of perjury that the foregoing is true and correct, that all statements made herein of my own knowledge are true, and that all statements made on 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 are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001 and may jeopardize the validity of the application or any patent issuing thereon. If called to testify as to the truth of the matters stated herein, I could and would testify competently.

Date: 12/30/23

William Singhose, Ph.D.