

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 IPR2024-00119
U.S. Patent No. 11,415,760

**DECLARATION OF JAMES BRENNAN III, Ph.D.
IN SUPPORT OF PETITION FOR *INTER PARTES* REVIEW**

Mail Stop "PATENT BOARD"

Patent Trial and Appeal Board
U.S. Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313

TABLE OF CONTENTS

TABLE OF CONTENTS	i
TABLE OF MATERIALS CONSIDERED	iv
I. INTRODUCTION	1
A. Scope of Engagement	1
B. Compensation	1
C. Professional Qualifications and Experience	2
D. Education.....	5
E. Publications and Patents.....	5
F. Materials Considered	6
II. LEGAL STANDARDS FOR INVALIDITY	6
A. Obviousness.....	7
B. Miscellaneous	10
III. LEVEL OF ORDINARY SKILL IN THE ART	11
IV. BACKGROUND OF THE TECHNOLOGY	13
A. Data Centers	14
B. Optical Fiber Connector Technology	20
V. U.S. PATENT NO. 11,415,760	30
A. Overview and Background.....	30
B. Discussion of Certain Embodiments	33
C. Summary of Relevant Prosecution History	38
D. Claims of the '760 Patent.....	42
VI. CLAIM INTERPRETATION	49
VII. PRIOR ART	50
A. Overview of Raven	50
B. Overview of Kuffel.....	59
C. Overview of Wong.....	66
D. Overview of Gniadek.....	72
VIII. SUMMARY OF GROUNDS	74
IX. GROUND 1: RAVEN IN VIEW OF KUFFEL RENDERS OBVIOUS CLAIMS 1-10, 12, AND 14-17	75
A. Motivation to Combine	75

B.	Claim 1	91
C.	Claim 2	128
D.	Claim 3	131
E.	Claim 4	134
F.	Claim 5	140
G.	Claim 6	142
H.	Claim 7	145
I.	Claim 8	148
J.	Claim 9	150
K.	Claim 10	157
L.	Claim 12	159
M.	Claim 14	163
N.	Claim 15	165
O.	Claim 16	167
P.	Claim 17	170
X.	GROUND 2: RAVEN IN VIEW OF KUFFEL AND FURTHER IN VIEW OF GNIADEK RENDERS OBVIOUS CLAIM 13.	173
A.	Motivation to Combine	173
B.	Claim 13	178
XI.	GROUND 3: RAVEN IN VIEW OF KUFFEL AND FURTHER IN VIEW OF WONG RENDERS OBVIOUS CLAIM 13.	183
A.	Motivation to Combine	184
B.	Claim 13	188
XII.	GROUND 4: WONG RENDERS OBVIOUS CLAIMS 1-11 AND 15- 17.....	194
A.	Claim 1	195
B.	Claim 2	218
C.	Claim 3	221
D.	Claim 4	223
E.	Claim 5	226
F.	Claim 6	228
G.	Claim 7	230
H.	Claim 8	233

I.	Claim 9	235
J.	Claim 10	239
K.	Claim 11	242
L.	Claim 15	246
M.	Claim 16	247
N.	Claim 17	250
XIII.	GROUND 5: WONG IN VIEW OF KUFFEL RENDERS OBVIOUS CLAIMS 12 AND 13.....	252
A.	Motivation to Combine	252
B.	Claim 12	256
C.	Claim 13	259
XIV.	GROUND 6: WONG IN VIEW OF RAVEN RENDERS OBVIOUS CLAIM 14.	263
A.	Motivation to Combine	263
B.	Claim 14	267
XV.	GROUND 7: RAVEN IN VIEW OF KUFFEL RENDERS OBVIOUS CLAIM 10.	268
A.	Claim 10	268
XVI.	GROUND 8: WONG IN VIEW OF KUFFEL RENDERS OBVIOUS CLAIMS 10-11.....	270
A.	Claim 10	270
B.	Claim 11	272
XVII.	CONCLUSION	274

TABLE OF MATERIALS CONSIDERED

Exhibit Number	Description
1001	U.S. Patent No. 11,415,760 to Takano et al. (“’760 patent”)
1002	Prosecution History of U.S. Patent No. 11,415,760 (U.S. Application No. 17/494,291)
1003	International Publication No. WO 2014/057264 to Raven et al. (“Raven”)
1004	U.S. Patent No. 8,636,424 to Kuffel et al. (“Kuffel”)
1005	U.S. Patent No. 9,599,778 to Wong et al. (“Wong”)
1006	U.S. Patent No. 8,465,317 to Gniadek et al. (“Gniadek”)
1008	<i>Curriculum Vitae</i> of James Brennan III, Ph.D.
1009	Google Data Centers Gallery, accessed at https://www.google.com/about/datacenters/gallery/
1010	“19-Inch Rack,” <i>Lite-On</i> , accessed at https://liteon-cips.com/products/racks/19-inch-rack/
1011	“Rack Unit,” <i>Wikipedia</i> , accessed at https://en.wikipedia.org/wiki/Rack_unit
1012	“18 Port Rack Mount Fiber Enclosure,” <i>Computer Cable Store</i> , accessed at https://www.computercablestore.com/18-port-rack-mount-fiber-enclosure
1013	“What Is Optical Fiber Technology, and How Does It Work?,” <i>NAI</i> , accessed at https://www.nai-group.com/optical-fiber-technology-how-it-works/
1014	“Fiber Optic Adapter/Coupler Tutorial,” <i>FS Community</i> , accessed at https://community.fs.com/blog/fiber-optic-adaptercoupler-tutorial.html
1015	“MT Ferrules Overview,” Furukawa Electric, accessed at https://www.furukawa.co.jp/telecom/en/product/connector/product/mt.html .
1016	U.S. Patent No. 9,411,111 to Banal, Jr. et al.

Exhibit Number	Description
1017	U.S. Patent No. 8,556,646 to Kappla et al.
1018	U.S. Patent No. 6,796,715 to Chiu et al.
1019	“MPO Connector Kit – Product Specifications (Rev. 8),” <i>Nissin Kasei USA Corp.</i> , accessed at https://www.alternetivo.cz/img.asp?attid=798283
1020	Kant, K., “Data Center Evolution: A Tutorial on State of the Art, Issues, and Challenges,” <i>Computer Networks</i> , 53:2939-65 (2009)
1021	“Fiber Optic Rack Mount Enclosure, 3-Panel 1 RMS,” <i>Computer Cable Store</i> , accessed at https://www.computercablestore.com/fiber-optic-rack-mount-enclosure-3-panel-1-rms
1022	Wenke, I.G., “Report on Fiber Optic Cables,” <i>HSB Technical Report</i> (2015)
1023	Curran, M. & Shirk, B., “Basics of Fiber Optics”, accessed at https://www.fibersystems.com/pdf/whitepapers/Basics-of-Fiber-Optics.pdf (May 2016)
1024	“Fiber Optic Connector Tutorial,” <i>Fibermart</i> , accessed at https://www.fiber-mart.com/news/fiber-optic-connector-tutorial-a-848.html
1025	Satake, T., “The History of the MT and its Variations,” <i>IEEE Xplore</i> (2017)
1026	U.S. Patent No. 5,615,293 to Sayegh
1027	Childers, D., et al., “Multi-Fiber, MT Ferrule Endface Fiber Tip Displacement Model for Physical Contact Interconnects,” White Paper (2006)

I, James F. Brennan III, Ph.D., hereby declare:

I. INTRODUCTION

A. Scope of Engagement

1. I have been retained as an expert witness 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. 11,415,760 (the “’760 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. Exponent charges a rate of \$650 per hour for my time spent working on this IPR in 2023, and a rate of \$750 per hour for my time spent working on this IPR in 2024. 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 am a Principal in Exponent's Electrical Engineering and Computer Science practice where I have consulted on numerous projects, many relating to opto-mechanical device development, implementation, and function. I have worked for Exponent since January 2012. Throughout my career, I have built and utilized hundreds of electrical, electromechanical, laser, optical, and LED systems for myriad applications.

6. I hold an S.B. in electrical engineering and an S.M. in electrical engineering and computer science from the Massachusetts Institute of Technology, granted in 1987 and 1989, respectively. I also hold an Electrical Engineering degree from the Massachusetts Institute of Technology, which was granted in 1991. Throughout my graduate studies, I taught courses concerning electromagnetic field and wave theory and applications, including optical systems.

7. In 1995, I was granted a Ph.D. in physics and electrical engineering from the Massachusetts Institute of Technology. During research for my Ph.D., I designed and built electro-optical instrumentation to diagnose and treat human pathologies, including various cancers and arterial diseases. During this work, I built several investigational medical devices that utilized optical catheters, the majority of which involved the use of optical fibers to deliver light to and collect light from

locations within the body. I designed and manufactured custom optical fiber connectors, which often held several optical fibers, to interface these optical catheters with various diagnostic and therapeutic equipment. These systems were used at several locations such as the Cleveland Clinic Foundation, Leonard Morse Hospital, Massachusetts General Hospital, Leiden Hospital in Leiden, the Netherlands, and Erasmus University Medical Center in Rotterdam.

8. I was a Senior Research Specialist at 3M Company's Telecommunications Systems Division where I developed passive optical components that addressed the telecommunications and sensor industries, which became the cornerstone of the 3M Optical Components business unit. I invented a direct-write laser machining technology for producing fiber gratings of arbitrary reflectivity profiles and lengths, and utilized the method to make chromatic dispersion compensators for use in long-haul optical communications systems. I led teams that developed and sold products throughout the world, such as specialty optical fibers, pump stabilizers, dispersion compensators, optical connectors, junction boxes, and Bragg gratings. Many of these components were tested extensively on our optical communications testbed, which I built and maintained. I was on the team that transferred the manufacturing of many of these devices to Singapore facilities.

9. I was Vice President of Research and Development at Raydiance, Inc., where I staffed and led the entire development team and designed and built high-power fiber laser systems capable of producing ultrashort pulses at ablation-level energies for use in laser machining and surgery. This work resulted in several recognitions and awards for the product and the corporation, including the Red Herring 100 North America Award and recognition as a finalist in the “Most Innovative Company” category in the 2008 American Business Awards. These laser systems utilized highly specialized optical fibers and optical fiber amplifiers that required innovative optical connections between the various optical fiber components.

10. I previously served as the Chief Science Officer at Prescient Medical, Inc., where I led the development of an optical catheter system for the diagnosis of coronary artery disease by utilizing Raman spectroscopy, which incorporated laser light sources. Commercial multi-fiber connectors (MTP/MPO) were adapted to interface these optical catheters with custom spectroscopic equipment.

11. I have been an active researcher with more than 75 journal and conference papers and 5 book chapters published. I have been granted 34 United States patents, with several more pending. At various times in my career, I have been a member of the Optical Society of America (“OSA”), the International Society for

Optics and Photonics, and the Institute for Electrical and Electronics Engineers

(“IEEE”). I was a committee member of OSA’s 2007 conference on optical fiber communications and also a committee member of OSA’s Bragg Gratings, Photosensitivity, and Poling topical conference in 1999, 2001, and 2003. I have been a regular reviewer for IEEE Photonics Technology Letters, as well as several other journals.

12. I am on the American National Standards Institute’s (“ANSI”) subcommittee for ANSI Z136.3, “Safe Use of Lasers in Health Care,” ANSI Z136.9, “Safe Use of Lasers in Manufacturing Environments,” and ANSI Technical Subcommittee 1 (TSC1), “Biological Effects and Medical Surveillance of the Accredited Standards Committee (ASC Z136) on Laser Safety.”

13. My *curriculum vitae* is filed herewith as EX1008.

D. Education

14. A more detailed description of my education is included in my *curriculum vitae* filed herewith as EX1008.

E. Publications and Patents

15. A comprehensive list of publications and patents is included in my *curriculum vitae* filed herewith as EX1008.

F. Materials Considered

16. 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.

17. I also base my opinions on my education and professional experience in the field of electrical engineering and electro-optics.

18. 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

19. 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”).

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

21. I understand that a patent may be deemed invalid based on anticipation or obviousness over the prior art. I understand that to anticipate a claim under 35 U.S.C. § 102, a prior-art reference must disclose each and every element of the claim.

22. 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; or (ii) being obvious in view of the prior art. My understanding of each of these bases for invalidity is discussed in greater detail below.

23. 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.

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

A. Obviousness

25. 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. *See* 35 U.S.C.

§ 103. 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.

26. 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.

27. 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.

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

29. 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.

30. A prior-art reference can be said to teach away 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 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.

31. I understand that objective evidence of non-obviousness include (i) commercial success, (ii) long-felt but unresolved need, (iii) failure of others, (iv) skepticism by experts, and (v) unexpected results.

32. I have relied upon this understanding of the applicable legal standards in reaching my opinion set forth in this Declaration.

B. Miscellaneous

33. 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.

34. I also understand that the claims are to be construed according to the same claim construction standard that district courts use, wherein terms are given

their ordinary and customary meaning from the perspective of a POSITA at the time of the invention.

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

III. LEVEL OF ORDINARY SKILL IN THE ART

36. I understand that the level of ordinary skill may be reflected by the prior art of record and that 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.

37. I understand that there are multiple factors relevant to determining the level of ordinary skill in the pertinent art, including (1) the levels of education and experience of persons working in the field at the time of the invention; (2) the sophistication of the technology; (3) the types of problems encountered in the field; and (4) the prior-art solutions to those problems.

38. I am very familiar with the knowledge and capabilities that a POSITA would have possessed in the subject area in fiber optics. Specifically, my education and experience in the industry and with engineers practicing in the industry during the relevant time period allowed me to become personally familiar with the

knowledge and capabilities of a person of ordinary skill in the area of electro-optics. Unless otherwise stated, my testimony below refers to the knowledge of a POSITA in the field of electro-optics at the time of the earliest possible priority date of the '760 patent, which I understand is January 15, 2016.

39. In my opinion, a POSITA of the '760 patent at the time of its earliest possible priority date would have been a person having: (1) at least a bachelor's degree in mechanical engineering, electrical engineering, physics, or a related field and three years of experience in fiber optics and fiber optic connectors; (2) a master's degree in mechanical engineering, electrical engineering, physics, or a related field and at least one year of experience in fiber optics and fiber optic connectors; or (3) at least five years industry experience designing fiber optic connectors in lieu of a formal degree.

40. I believe such a POSITA would have been capable of understanding the '760 patent and the prior-art references discussed herein. This level of skill in the art would apply at the earliest possible priority date of the '760 patent, which I understand is January 15, 2016.

41. Based upon my education, training, and professional experience in the field of the claimed invention, I am familiar with the level and abilities of, and therefore qualify as, a POSITA at the time of the claimed invention. Additionally,

although my qualifications exceed those of the hypothetical POSITA defined above, my analysis and opinions regarding the '760 patent have been rendered from the perspective of a POSITA at the time of the invention.

42. My analysis is intended to reflect the '760 patent claims as of the earliest possible priority date, even if I use the present tense.

IV. BACKGROUND OF THE TECHNOLOGY

43. My discussion of the background of the technology is intended to provide some context for my later analysis of the '760 patent and prior art. This discussion provides a high-level overview of the components, but it is not intended to reflect the meaning of any particular term in a patent, which must be assessed in view of the specification and the context of the claim language. Rather, this is a general overview of fiber optic cables, connectors, adapters, and other components.

44. The technology at issue generally relates to fiber optic 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.

A. Data Centers

45. 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 '760 patent generally relates to details of the optical fiber connectors, which are used to connect optical fibers to equipment or other optical fibers, thus creating an optical fiber interconnection.

46. A data center is a facility that houses data storage and/or communication equipment used to provide a variety of services, including, for example, digitally housing Internet sites. *See* EX1020, 2939. Some large companies (*e.g.*, Google, Meta, or Amazon) operate their own data centers. Data centers may also house equipment for multiple companies or entities that lease or rent space or equipment in the data center. Here is a picture of the inside of a Google data center taken from its website:



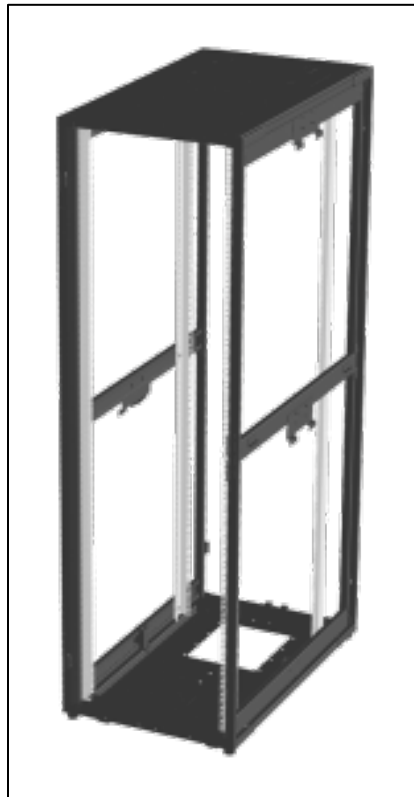
EX1009, 2, excerpt.



Organization of an example data center. *See* EX1020, 2940.

47. Data centers use “racks” to mount electrical equipment and optical fiber interconnection equipment, a row of which is shown above. *See* EX1020, 2940.

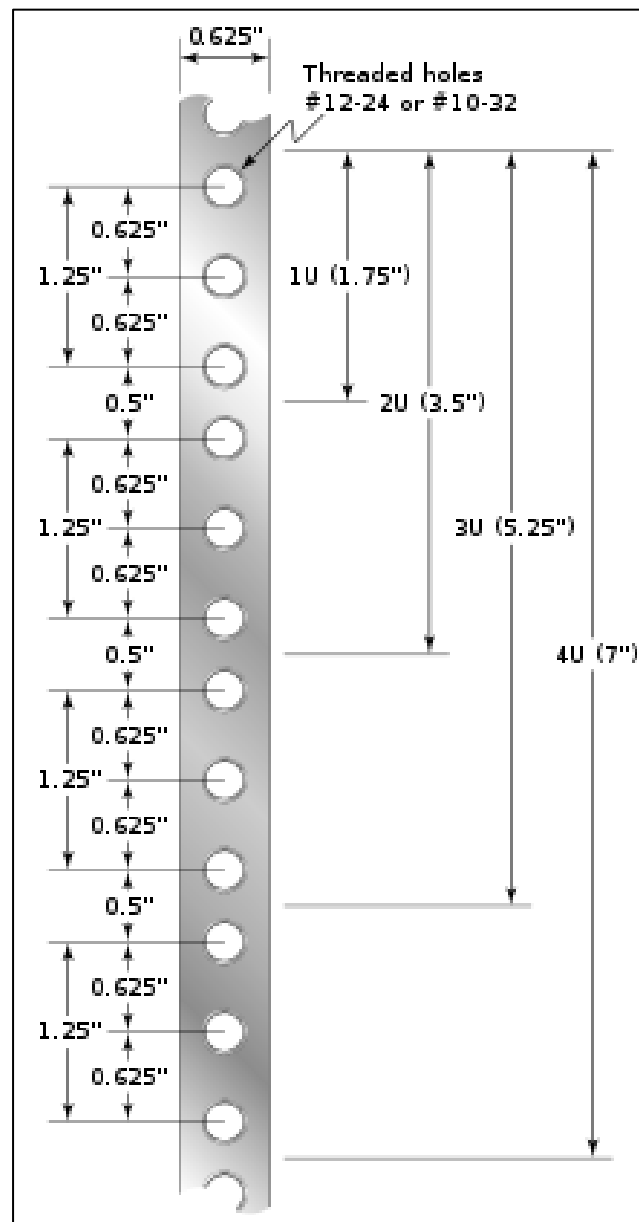
A rack is an open structure for mounting electrical or electronic equipment, including servers, switches and storage “bricks.” Data centers typically contain many such racks. Equipment is typically fastened to racks via mounting holes on the sides of the rack. Currently, racks are commonly 19 inches or 23 inches in width, but other dimensions are possible. The figure below shows a typical rack that may be found in a data center.



Example of a generic 19” rack that may be used in a data center. *See* EX1010, 2.

48. A rack unit or a “U” is a measurement of vertical space within a rack. *See* EX1020, 2940. For example, a base rack unit (*e.g.*, the height measurement) is

44.45 millimeters (1.75”), and a standard rack can take 42 1U modules. Enclosures, chassis, or frames that are mounted to a rack in a data center can aid in further compartmentalization of racks and can be configured to house equipment for connecting fiber optic cables. The following is an example illustration of rack unit measurements of a rack rail, including threaded holes for mounting equipment in the racks.



EX1011, 1.

49. An example of an enclosure used to house equipment for connecting fiber optic cables is shown below.

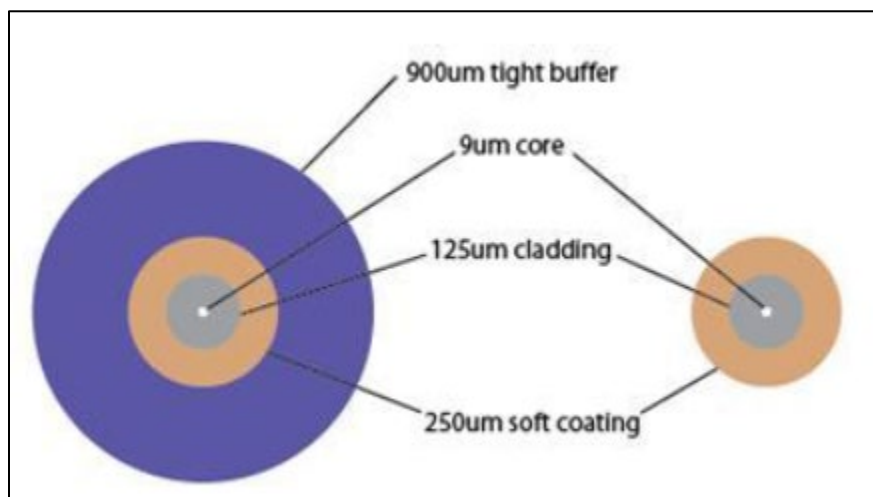


Example of an enclosure to house equipment for connecting fiber optic cables.
EX1021.

50. Maximizing use of physical space is important for optimizing costs of operating and maintaining data centers, and the fiber optic equipment typically included in housings that are mounted in equipment racks generally seek to provide a greater density of interconnections within a certain space to optimize use of space. When additional bandwidth is needed or desired, additional fiber optic equipment may be utilized in the data center to increase optical fiber port count, requiring more equipment rack space in a data center. Therefore, there is generally a desire to decrease the size (cross-sectional area) of the components that facilitate fiber optic connections. Certain types of optical connectors can aid in facilitating signal transmission while reducing physical space consumption.

B. Optical Fiber Connector Technology

51. In general terms, a fiber optic cable and assembly contain one or more optical fibers that are used to guide light signals through a silica glass fiber that is typically coupled to a transmitter on one end that converts electrical information into optical signals and a receiver on the other end that converts optical information into electrical information. The fiber itself is composed of a core that transmits light, a cladding, the next adjacent layer that confines the light within the core, and additional non-optical layers. The figure below shows an example of a common fiber core and cladding ratio, with and without a protective buffer used in optical communications.



Examples of common fiber cores and cladding diameters coated or uncoated. *See*

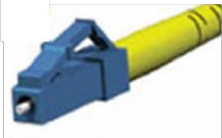
EX1022, 5.

52. Optical fibers and connectors themselves are generally small and compact. Additionally, fiber optic cables can include a varying number of optical fibers. Fiber optic connectors and adapters can be used to facilitate the connection of two optical fibers. While there are several methods of connecting fiber optic cables, physical contact connectors are perhaps most relevant to the '760 patent. Physical contact connectors employ a ferrule surrounding an embedded optical fiber. By physically pressing the ends of two ferrules together, an optical connection between two optical fibers can be created. A component, oftentimes a spring, is utilized to provide axial compliance when ferrules are pressed together and to ensure contact is maintained during use. *See* EX1023, 8. Fiber optic connectors and adapters can be a fast, efficient, and low-cost way to connect fiber optic cables, allowing for demountable connections. There are numerous options for fiber connectors, with variability in orientation, size, and mechanical components that engage the connection. *See* EX1023, 9.

53. In the context of this matter, fiber optic adapters (sockets) receive and mate those fiber optic connectors to support one or more fiber optic connections. Fiber optic adapters may come in different shapes, but they are all typically designed to achieve the same function—to join and align the connectors of two fiber optic cables. The two fiber optic cables may have one or more fiber ferrule(s) to

house all the fibers in each cable; connecting the two fiber optic cables is accomplished by mating the respective ferrules. A fiber optic adapter allows fiber optic cables to be attached to each other through different interfaces, allowing many devices to communicate at once.

54. Fiber optic connectors and adapters come in different standard forms and can be used to support connections of different numbers of optical fibers. For example, LC connectors terminate one or more optical fibers each in individual ferrules whereas MPO (Multi-Fiber Push-On/Pull-Off) connectors can terminate a greater number of fibers in a single ferrule. *See* Curran, 9. Both LC and MPO connectors are described in various recognized industry standards (*e.g.*, IEC standards or others that address connectors). MTP® is a type of MPO connector developed by US Conec (Petitioner). Fiber optic adapters can also be designed to connect a plurality of discrete fiber optic adapters, or one or more multi-fiber connectors. The figure below shows some common connector types.

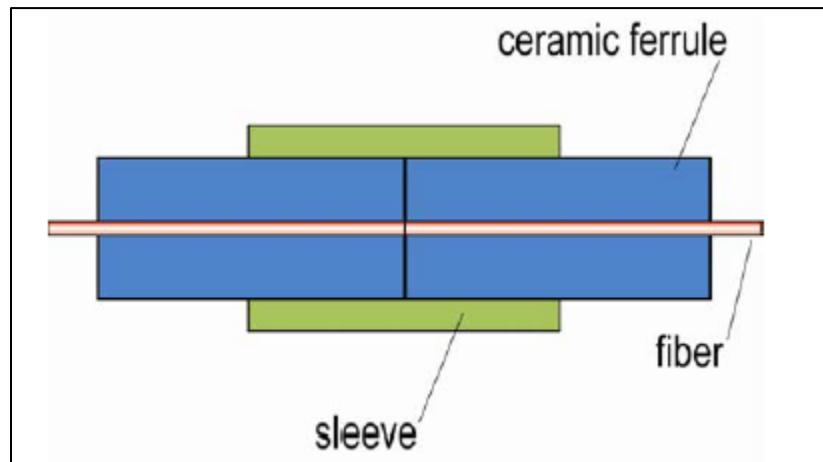
Common Connector Type	Diagram	Ferrule Size
FC - Ferrule Connector		2.5 mm
LC - Lucent Connector		1.25 mm
SC - Subscriber Connector		2.5 mm
ST – Straight Tip Connector		2.5 mm
MPO – Multi-Position Optical (also called MTP)		-

Common fiber optic connectors. *See* EX1023, 9; *see also* EX1024.

55. Alignment of each fiber core ensures proper light coupling. The fiber core itself is extremely small in diameter, often as small as or smaller than 10 μm . A fiber connector provides alignment of the fiber cores to ensure proper signal coupling.

56. Alignment is often achieved using a “butt-joint alignment” mechanism in which the ferrule both secures and aligns the fiber. Inside each fiber optic adapter is typically an alignment sleeve that serves to bring together the mating

single-fiber ferrules of the two connectors, as shown in the figure below. Additionally, as mentioned previously, oftentimes springs are utilized to provide axial compliance when ferrules are pressed together and to apply a compressive force for ensuring contact is maintained during use.



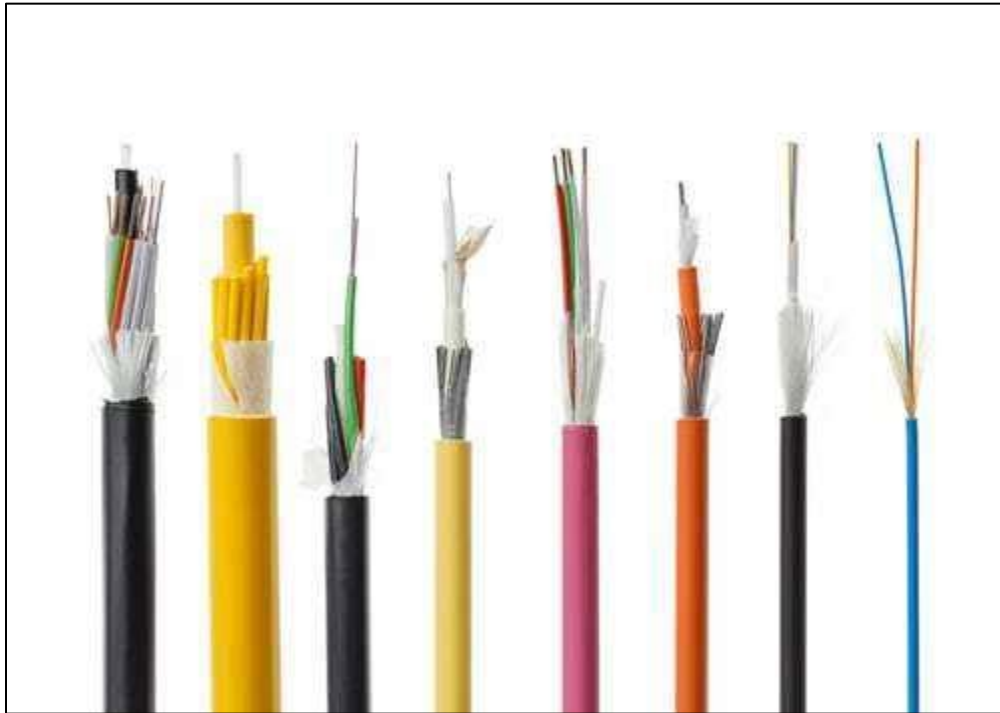
Physical connection between two joined fibers. *See* EX1023, 8.

57. A fiber optic enclosure is a box-like housing, chassis, or frame that can be mounted to a rack in a data center. A fiber optic enclosure can house equipment for making connections between fiber optic cables. Such equipment can take various forms, including, for example, modules, cassettes, adapter plates, and patch panels. An example of an enclosure used to house equipment for connecting fiber optic cables is shown below.



EX1012.

58. In general terms, a fiber optic cable and assembly contains one or more optical fibers that are used to carry light signals. The optical fibers are made of glass. Different types of fiber optic cables include a different number of optical fibers. For example, a simplex fiber optic cable includes a single optical fiber. A duplex fiber optic cable includes two optical fibers. A multi-fiber fiber optic cable includes two or more optical fibers. The following are illustrations of examples of fiber optic cables:



Various examples of single and multimode fiber optic cables. *See* EX1013,

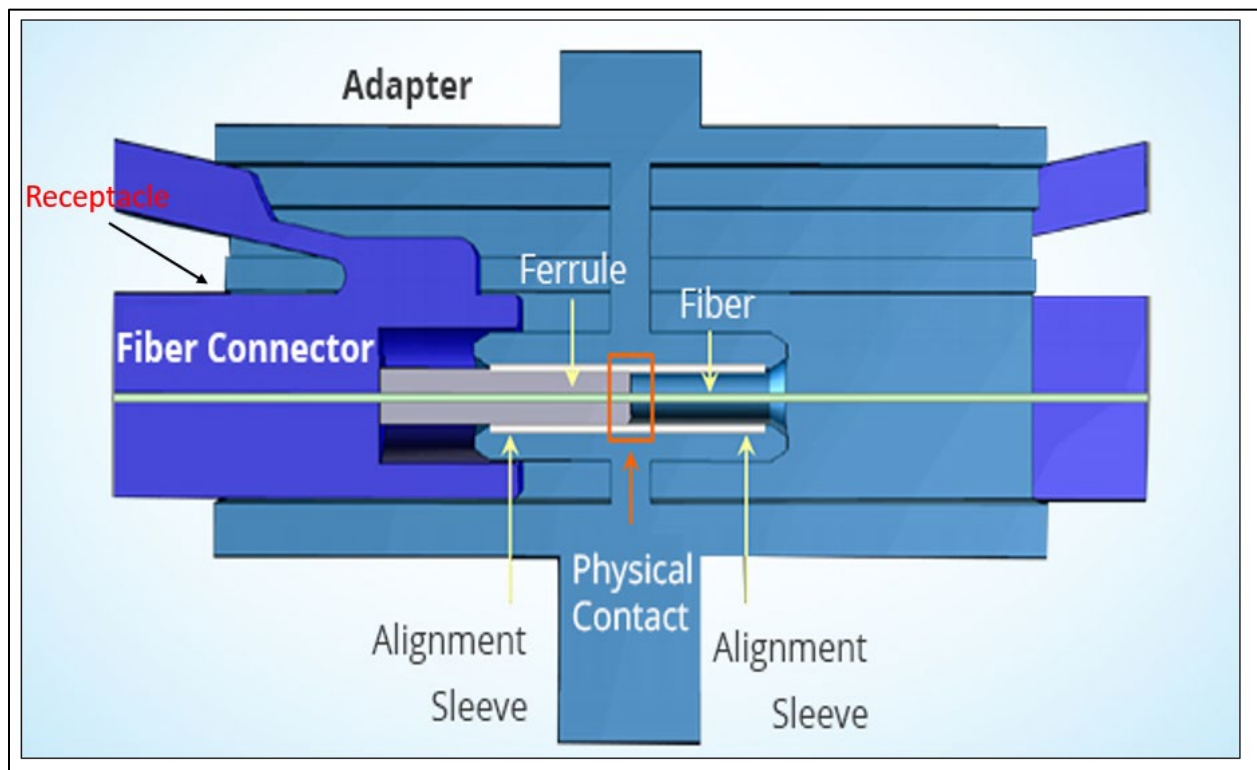
2.

59. Fiber optic connectors and adapters can be used to facilitate the connection of two fiber optic cables. For example, fiber optic connectors are (generally) standardized devices that can be attached to the terminal ends of fiber optic cables. Fiber optic adapters are receptacles that receive and mate those fiber optic connectors to support one or more fiber optic connections. Fiber optic connectors and adapters can be a fast and efficient way to connect fiber optic cables.

60. A fiber optic adapter is a small device having a receptacle for connecting fiber optic cables together. The receptacles for fiber optic adapters may

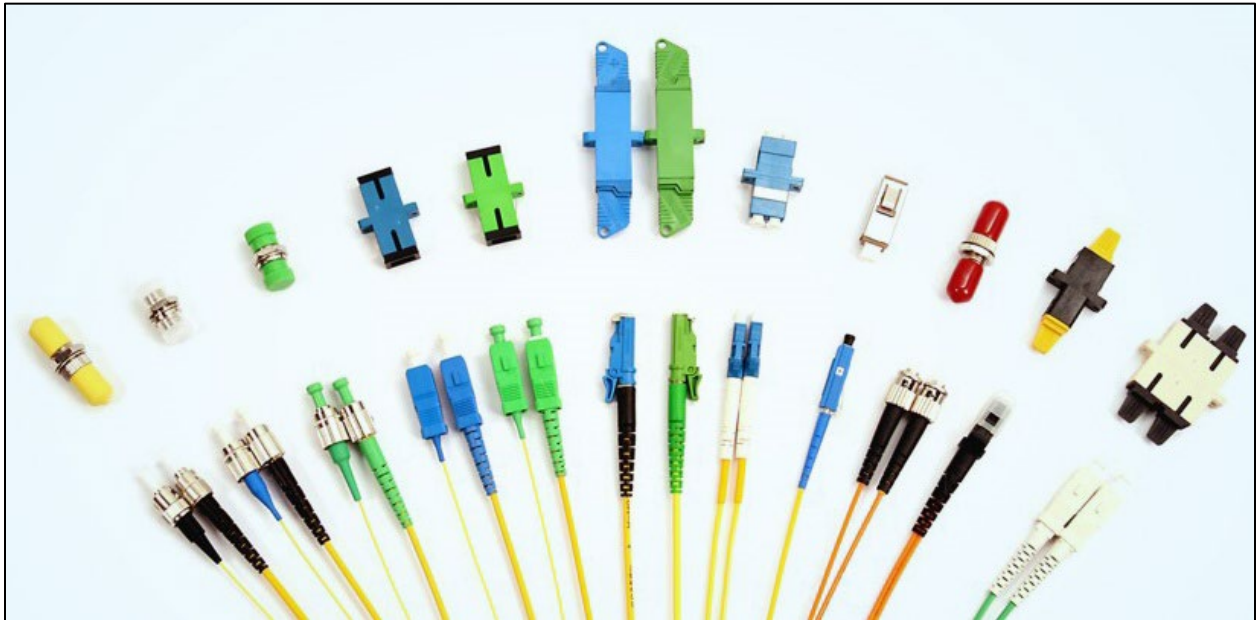
come in different shapes, but they are all typically designed to achieve the same function—to join and align the connectors of two fiber optic cables. A fiber optic adapter allows fiber optic cables to be attached to each other singly or in a large network, allowing many devices to communicate at once.

61. Generally speaking, the alignment of fiber optic cables in a receptacle of a fiber optic adapter is achieved by two components—the ferrule within each connector and the alignment sleeve within the receptacle. Many connectors are based on a 2.5-millimeter-diameter ferrule, in which a single fiber is located. The ferrule both secures and aligns the fiber. Inside the receptacle of each fiber optic adapter is typically an alignment sleeve. Its purpose is to bring together the ferrules of the two connectors within the adapter's sleeve and at its approximate midpoint. Below is an illustration of how the physical contact between fibers can be achieved in an adapter.



EX1014 (annotated).

62. Like fiber optic cables, fiber optic connectors and adapters also come in different standard forms and can be used to support connections of different numbers of optical fibers. For example, there are several different types of standardized fiber optic connectors and adapters, including SC, FC, ST, MT, MPO/MTP, and LC. The figure below shows various different adapters and connectors.



EX1014, 4.

63. MPO (Multi-Fiber Push-On/Pull-Off) connectors terminate between 4 to 48 fibers, with 12 and 24 being the most common configurations. MPO connectors are described in the following industry standard: FOCIS-5, Fiber Optic Connector Intermateability Standard – Type MPO, TIA/EIA-604-5-A (September 2001). MTP® is a brand of MPO connector developed by US Conec, Ltd (Petitioner).

64. LC connectors terminate one or more optical fibers. LC connectors are described in the industry standards such as, for example, Fiber Optic Connector Intermateability Standard (“FOCIS”) and IEC standards.

65. The fiber optic equipment typically included in an enclosure mounted in equipment racks generally seek to optimize use of space. *See* '760 patent, 1:29-42. The data rates that can be provided by equipment in a data center are governed by the connection bandwidth supported by the fiber optic equipment. The bandwidth is governed by the number of optical fiber ports included in the fiber optic equipment and the data rate capabilities of a transceiver connected to the optical fiber ports. When additional bandwidth is needed or desired, additional fiber optic equipment can be employed or scaled in the data center to increase optical fiber port count. However, increasing the number of optical fiber ports can require more equipment rack space in a data center. Therefore, there is generally a desire to decrease the size of the components that facilitate fiber optic connections, so that more components can be scaled in existing data centers to increase bandwidth. *See* '760 patent, 1:42-47.

V. U.S. PATENT NO. 11,415,760

A. Overview and Background

66. The '760 patent, titled "Narrow Width Adapters and Connectors with Pull Tab Release," issued on August 16, 2022. It was filed as U.S. Patent Application Serial No. 17/494,291 (the "'291 application") on October 5, 2021. The '760 patent is a continuation of U.S. Patent Application Serial No. 16/695,901 filed on November 26, 2019 (now U.S. Patent No. 11,152,748), which is a continuation of

U.S. Patent Application Serial No. 16/213,244 filed on December 7, 2018 (now U.S. Patent No. 10,520,690), which is a continuation of U.S. Patent Application Serial No. 15/044,838 filed on February 16, 2016 (now U.S. Patent No. 10,158,194), which is a continuation-in-part of U.S. Patent Application Serial No. 14/996,865 (the “’865 application”) filed on January 15, 2016 (now U.S. Patent No. 9,595,786). Based on the above, the earliest possible priority date for the ’760 patent is January 15, 2016. For purposes of this declaration, counsel has asked me to apply January 15, 2016 as the earliest possible priority date. However, I note that several features do not appear to be described in the specification of the ’865 application (nor in the ’760 patent’s specification), specifically the groove recited in claim 1.

67. The ’760 patent generally discloses fiber optic connectors having remote release. EX1001, Abstract. The ’760 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.” EX1001, 1:29-33.

68. The ’760 patent admits that “[c]ertain solutions have included deployment of high-density interconnect panels” which “may be designed to consolidate the increasing volume of interconnections necessary to support the fast-growing

networks into a compacted form factor, thereby increasing quality of service and decreasing costs such as floor space and support overhead.” EX1001, 1:34-40.

69. The ’760 patent describes that “[i]n communication networks, such as data centers and switching networks, numerous interconnections between mating connectors may be compacted into high-density panels,” and that “[p]anel and connector producers may optimize for such high densities by shrinking the connector size and/or the spacing between adjacent connectors on the panel.” EX1001, 1:42-47.

70. The ’760 patent recognizes, of course, that reducing the size of the connectors and/or spacing between adjacent connectors can create problems such as increasing the support costs, diminishing the quality of service, obstructing the release mechanisms of the connectors, overstressing the cables and connectors, compromising the integrity and/or reliability of the terminations, and potentially causing serious disruptions to network performance. *See* EX1001, 1:47-64. The ’760 patent also discusses SFP (Small Form Factor Pluggable) Transceivers (“also known as Ethernet switches and/or patching hubs”) which it acknowledges “are evolving daily to increase connection density due to limited space” in telecommunication infrastructures. EX1001, 2:8-13.

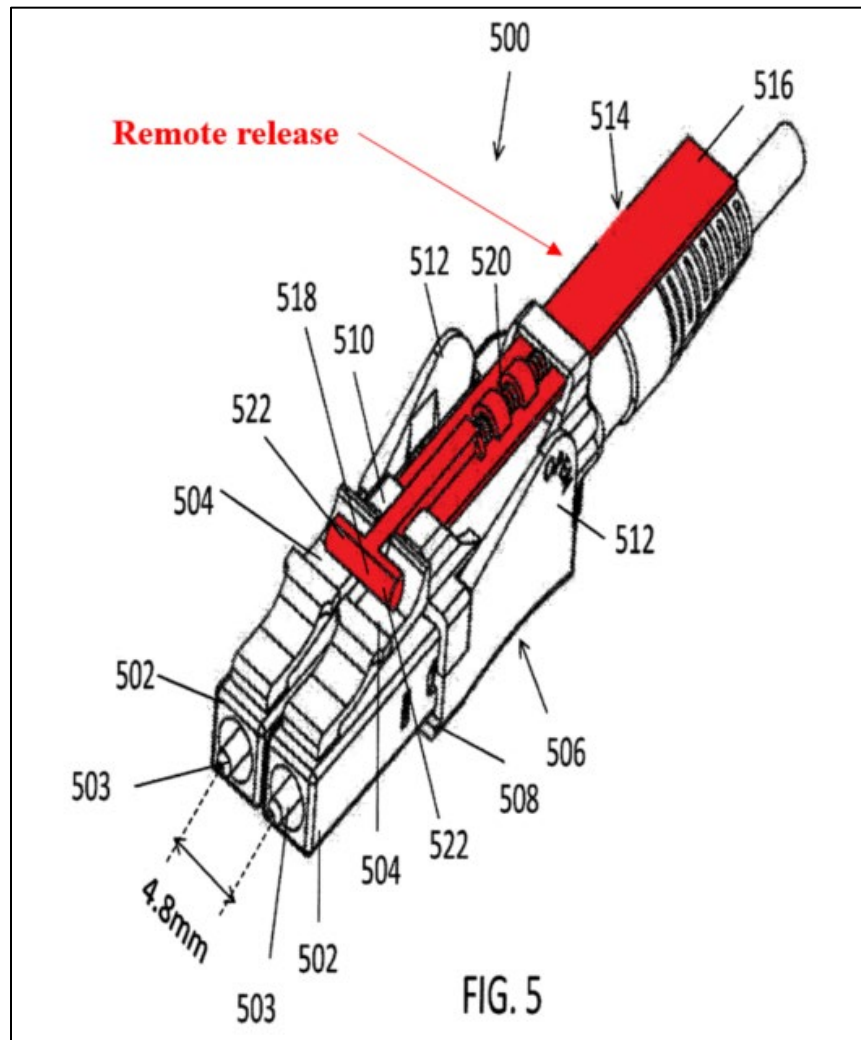
71. As an alternative solution to optimizing connectors for high density panels the '760 patent purported to disclose a remote release mechanism that allows a user to remove connectors that are closely spaced together on a high density panel without damaging surrounding connectors, accidentally disconnecting surrounding connectors, or disrupting transmissions through surrounding connectors. EX1001, 5:50-56. Such a remote release mechanism, however, is not new and known in the art.

B. Discussion of Certain Embodiments

72. The '760 patent includes 15 figures, many of which are directed to prior art fiber optic connectors and SFPs. *See generally* EX1001, 3:66-5:8, FIGs. 1–15.

73. It appears that Figure 5 and Figures 12A-12C are generally relevant to the claims of the '760 patent. Thus, I will discuss these figures in more detail herein.

74. Figures 5-8 show a connector with a remote release. Figure 5 is reproduced here for convenience.



EX1001, FIG 5 (annotated¹).

75. The '760 patent explains that connector 500 shown in Figure 5 is a duplex connector including two LC connectors 502, and each connector 502 has a

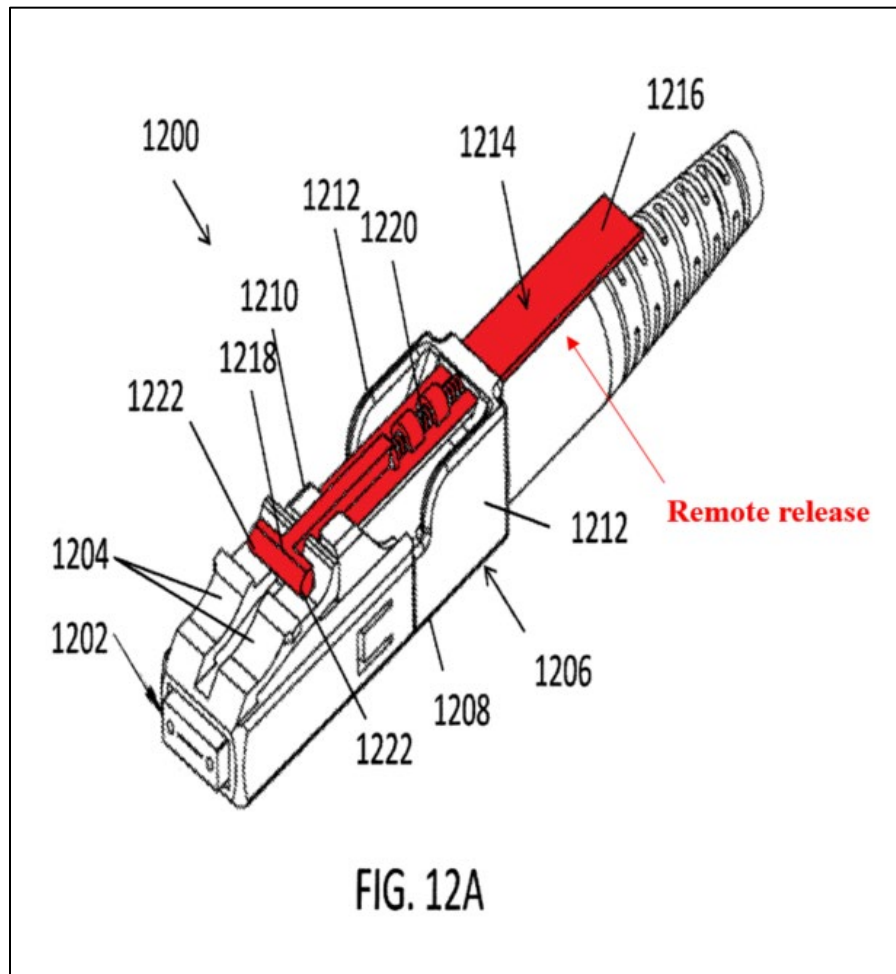
¹ All color annotations to figures in this declaration are added unless otherwise noted.

ferrule 503 and a latching arm 504. EX1001, 7:12-17. Connector 500 further includes a housing 506 having a bottom housing 508 and a top housing 510, bottom housing 508 including side walls 512. EX1001, 7:24-26.

76. Connector 500 also includes a pull tab 514 having distal end 516, proximal end 518, and spring 520. EX1001, 7:35-37. Spring 520 is “configured to provide a force such that the connector latching arms 504 return to the undisplaced position and thereby become fully engaged” inside an SFP’s recess. EX1001, 7:37-40. “Distal end 516 of the pull tab 514 may be pulled to remotely release the connector 500 from an SFP or adapter.” EX1001, 7:40-42.

77. Figure 5 of the ’760 patent depicts a “narrow pitch” connector 500 including LC ferrules. EX1001, 7:11-16. The ’760 patent indicates that “the connector pitch” of connector 500 may be 4.8 mm or “less than 6.25 mm and less than about 5.25 mm,” which it states are the pitch of conventional LC connectors. EX1001, 7:17-23. Figure 6 depicts that LC connector 502 has a width of 4.6 mm, which is less than an LC connector having a width of 5.6 mm. EX1001, 8:1-2, 6:23-25.

78. Figures 12A-12C show another connector with a remote release. Figure 12A is reproduced here for convenience.



EX1001, FIG. 12A (annotated).

79. The '760 patent explains that the connector 1200 of Figure 12A “further includes a housing 1206 having a bottom housing 1208 and a top housing 1210. The bottom housing 1208 includes side walls 1212.” EX1001, 8:53-55. Connector 1200 also includes “a pull tab 1214 having a distal end 1216, a proximal end 1218, and a spring 1220.” EX1001, 8:63-65. Spring 1220 is “configured to provide a force such that the connector latching arms 1204 return to the undisplaced position and thereby become fully engaged inside the SFP’s recess.” EX1001, 8:65-

9:1. The '760 patent further explains that the distal end 1216 of the pull tab 1214 may be pulled “to remotely release the connector 1200 from an SFP or adapter.” EX1001, 9:1-3.

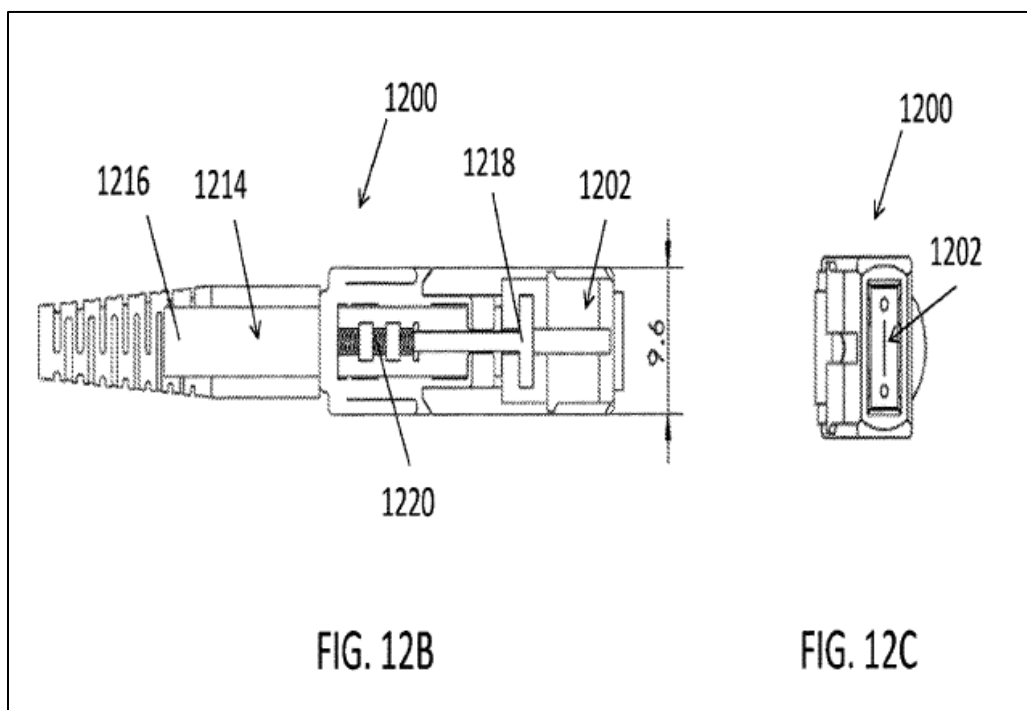
80. Figure 12A of the '760 patent depicts a “narrow width” connector 1200 including “a multi-fiber MT/MPO ferrule 1202”. EX1001, 8:40-43.

81. I know that the MT ferrule is a product made by Petitioner (US Conec) that certainly pre-dated the '760 patent, as I recall MT ferrules at least in the 1990s, and as further demonstrated by the Sayegh and Satake references. EX1025; EX1026, 4:55-58. A male MT ferrule is configured to hold a plurality of optical fibers that are aligned between first and second guide pins and a female MT ferrule is configured to hold a plurality of optical fibers that are aligned between first and second guide holes that receive the guide pins of a male MT ferrule. EX1025. For another example, authors from US Conec and Tyco Electronics released a white paper about MT ferrules in 2006, illustrating they were well-known over a decade prior to the '760 patent issuing. EX1027. Finally, there are other prior-art references in this declaration that also disclose using MT ferrules in fiber optic connectors. *See, e.g.*, EX1004, 5:17-22, FIGs. 3-5.

82. The connector 1200 depicted in Figure 12A includes two “extending members or latching arms 1204.” EX1001, 8:43-45. The '760 patent indicates that

“the connector width” of connector 1200 may be 9.6 mm or “less than that of the width of conventional multi-fiber connectors, for example less than the 12.4 mm of the conventional MPO connector shown in Fig. 10b.” EX1001, 8:46-52.

83. Figures 12B and 12C depict a top and front view of connector 1200 of Figure 12A, reproduced here for convenience. EX1001, 4:54-59.



EX1001, FIGs. 12B, 12C.

C. Summary of Relevant Prosecution History

84. I have reviewed the file history of the '760 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 patent law.

85. U.S. Application No. 17/494,291 (the “’291 Application”) was filed on October 5, 2021. As filed, the ’291 Application included twenty-two (22) claims, with claims 1 and 22 as the only independent claims. *See* EX1002, 0038-44.

86. The first, and only, Office Action issued on December 30, 2021. EX1002, 0083-110. The Office Action included a section addressing “Priority and Election” in which it stated that the application disclosed “two species of a fiber optic connector, e.g., Species A (illustrated in Figs. 5–8 and 12) and Species B (illustrated in Figs. 13–15).” EX1002, 0085. The Office Action explained that “Species A has a latch 504 *of a fiber optic connector* wherein the latch 504 is *pressed down* for disengagement (para. 0061 and 0062 of the instant specification), whereas Species B has a latch 1402 *of an adapter/SFP* wherein the latch 1402 is *lifted* for disengagement by using a ramp area 1502 of a pull tab (Fig. 15; para. 0077).” EX1002, 0085. The Office Action concluded that because the original claims “all recite ‘a depressible latching arm’ of the optical fiber connector...Applicant has in effect elected Species B by original presentation.” EX1002, 0086. I note that the Office did not distinguish different species for Figures 5–8 depicting an LC duplex connector and Figure 12 depicting an MPO connector.

87. The Office Action additionally rejected then pending independent claim 1 and various dependent claims on multiple grounds, including: (1) under 35 U.S.C. § 103 as being unpatentable over Crain (U.S. Patent No. 8,556,645) in view of Norris (U.S. Publication No. 2013/0022317 A1); and (2) under 35 U.S.C. § 103 over Watanabe (U.S. Publication No. 2017/0351037 A1) in view of Chien (U.S. Patent No. 9,048,568 B2); (3) under obviousness-type double patenting over co-pending U.S. Patent Application No. 17/342,220. EX1002, 0087-108. The Office Action indicated allegedly allowable subject matter in originally presented claim 7. EX1002, 0108-09.

88. In response to the Office Action, Applicant amended claim 1 to incorporate subject matter from originally presented claims 2, 5, 6, and 7. *Compare* EX1002, 236, *with* EX1002, 0038-40. In amending claim 1, Applicant incorporated the “wherein” language from each of claims 2, 5, and 7. *Compare* EX1002, 236, *with* EX1002, 0038-40. Additionally, Applicant revised the language of previously presented claim 6 (“wherein the remote release comprises a lower portion and an upper portion, the lower portion being wider than the upper portion”) to “wherein the remote release comprises a lower portion and a narrower portion above the lower portion, the lower portion being wider than the narrower portion.” *Compare* EX1002, 236, *with* EX1002, 0038-40.

89. Applicant submitted, in the Remarks, that the language of previously presented claims 6 and 7 were “edited slightly for clarity.” *Compare* EX1002, 236, *with* EX1002, 0038-40. Specifically, Applicant stated that “the term ‘upper portion’ of the latch release [was] replaced by ‘narrower portion of the latch release above the lower portion.’” *Compare* EX1002, 236, *with* EX1002, 0038-40. Applicant stated that “this change has no bearing on the finding of patentability.” *Compare* EX1002, 236, *with* EX1002, 0038-40.

90. Applicant additionally filed Remarks in response to the Office Action. EX1002, 0239-41. These Remarks include a response to the “Priority and Election” section of the Office Action. In the Remarks, Applicant states: “Applicant submits that ‘depressible’ means that the latch arm is pressed down (Species A), not that it is lifted up (Species B). Hence, Applicant submits that, to the extent there is an election by original presentation, it is of Species A, not Species B.” EX1002, 0239. As above, Species A was considered by the Office to be illustrated in Figs. 5–8 and 12. EX1002, 0251.

91. Applicant also filed a terminal disclaimer over U.S. Patent Application No. 17/342,220. EX1002, 0229.

92. A Notice of Allowance issued on April 12, 2022 accompanied by a Notice of Allowability. EX1002, 11, 15-20. The Notice of Allowability indicated

that the Terminal Disclaimer over U.S. Patent Application Serial No. 17/342,220 was accepted and obviated the double-patenting rejection. EX1002, 16. The Notice of Allowability additionally included amendments to each of claims 1, 13, 14, and 15. EX1002, 16-18. These amendments added the word “and” in claim 1 and altered the words “forward” to “toward the front end portion of the connector housing” (claims 13, 14) and “rearwardly” to “toward the rear end portion of the connector housing” (claim 15).

D. Claims of the '760 Patent

93. The '760 patent issued with 17 claims, of which claim 1 is the only independent claim. I reproduce the claims below for reference.

Claim 1 recites:

[1pre] An optical fiber connector configured for mating
with a receptacle, the optical fiber connector comprising:

[1.1] an MT ferrule configured to hold a plurality of optical fibers;

[1.2] a connector housing having a front end portion and a rear end portion spaced apart along a longitudinal axis, the connector housing configured to hold the MT ferrule such that

the MT ferrule is exposed through the front end portion for making an optical connection;

[1.3] a depressible latching arm connected to the connector housing for latching with the receptacle when the optical fiber connector is mated with the receptacle to releasably retain the optical fiber connector in the receptacle; and

[1.4] a remote release connected to the connector housing for movement relative to the connector housing along the longitudinal axis, the remote release being configured to be pulled rearward along the longitudinal axis to depress the depressible latching arm for releasing the optical fiber connector from the receptacle;

[1.5] wherein the connector housing has a generally rectangular perimeter including opposite first and second walls and opposite third and fourth walls, the depressible latching arm being located on an exterior of the first wall;

[1.6] wherein the first wall of the connector housing defines a groove, the remote release being slidably received in the groove;

[1.7] wherein the remote release comprises a lower portion and a narrower portion above the lower portion, the lower portion being wider than the narrower portion; and

[1.8] wherein the groove includes an inner portion and an outer portion, the inner portion being wider than the outer portion, the inner portion of the groove being configured to slidably receive the lower portion of the latch release and the outer portion of the groove being configured to slidably receive the narrower portion of the latch release such that the first wall releasably retains the latch release in the groove.

EX1001, 12:23-60.

Claim 2 recites:

[2] The optical fiber connector as set forth in claim 1, wherein the depressible latching arm has a front end portion and a rear end portion spaced apart along the longitudinal axis, the depressible latching arm extending transversely outward away from the first wall as the depressible latching arm extends longitudinally from the front end portion to the rear end portion.

EX1001, 12:61-67.

Claim 3 recites:

[3] The optical fiber connector as set forth in claim 2, wherein the optical fiber connector is free of depressible latching arms on an exterior of any of the second, third, and fourth walls. EX1001, 13:1-4.

Claim 4 recites:

[4] The optical fiber connector as set forth in claim 1, wherein the optical fiber connector is configured so that upon release of the remote release after being pulled rearward along the longitudinal axis to depress the depressible latching arm, the depressible latching arm resiliently returns toward an un-depressed position. EX1001, 13:5-10.

Claim 5 recites:

[5] The optical fiber connector as set forth in claim 1, wherein the depressible latching arm is a first depressible latching arm, the optical fiber connector further comprising a second depressible latching arm spaced apart from the first depressible latching arm. EX1001, 13:11-15.

Claim 6 recites:

[6] The optical fiber connector as set forth in claim 5, wherein the remote release is further configured to depress the second depressible latching arm when the remote release is pulled rearward along the longitudinal axis. EX1001, 13:16-19.

Claim 7 recites:

[7] The optical fiber connector as set forth in claim 5, wherein the remote release comprises a first edge for engaging the first depressible latching arm and a second edge for engaging the second depressible latching arm, the first and second edges being spaced apart from one another. EX1001, 13:20-24.

Claim 8 recites:

[8] The optical fiber connector as set forth in claim 7, wherein the remote release further comprises an elongate section between the first edge and the second edge. EX1001, 13:25-27.

Claim 9 recites:

[9] The optical fiber connector as set forth in claim 1, wherein the remote release comprises a front section and wherein the optical fiber connector is configured such that the

front section is yieldably biased along the longitudinal axis toward the front end portion of the connector housing. EX1001, 13:28-32.

Claim 10 recites:

[10] The optical fiber connector as set forth in claim 9, further comprising a resilient biasing member engaging the front section of the remote release to yieldably bias the remote release toward the front end portion of the connector housing. EX1001, 13:33-37.

Claim 11 recites:

[11] The optical fiber connector as set forth in claim 10, wherein the depressible latching arm is configured to engage the front section of the remote release at a first point of contact and the resilient biasing member is configured to engage the front section of the remote release at a second point of contact, the second point of contact being spaced apart from the first point of contact along the longitudinal axis toward the rear end portion of the connector housing. EX1001, 14:1-8.

Claim 12 recites:

[12] The optical fiber connector as set forth in claim 1, wherein the MT ferrule is configured to receive a plurality of fibers such that the fibers are spaced apart in a row that extends parallel to a fiber alignment axis, the MT ferrule comprising first and second guide pin openings spaced apart along the fiber alignment axis. EX1001, 14:9-14.

Claim 13 recites:

[13] The optical fiber connector as set forth in claim 12, wherein the optical fiber connector has an outer cross-sectional dimension along the fiber alignment axis and wherein the outer cross-sectional dimension is less than an outer cross-sectional dimension of a standard MPO connector along a fiber alignment axis of the standard MPO connector. EX1001, 14:15-21.

Claim 14 recites:

[14] The optical fiber connector as set forth in claim 1, wherein the connector housing is configured to enable a polarity of the optical fiber connector to be selectively reversed. EX1001, 14:22-25.

Claim 15 recites:

[15] An optical connection system comprising the optical fiber connector as set forth in claim 1 and a receptacle for mating with the optical fiber connector. EX1001, 14:26-28.

Claim 16 recites:

[16] The optical connection system as set forth in claim 15, wherein the receptacle comprises a rectangular perimeter wall. EX1001, 14:29-31.

Claim 17 recites:

[17] The optical connection system as set forth in claim 16, wherein the receptacle includes a recess, the depressible latching arm being configured to latch with the recess when the optical fiber connector and the receptacle are mated. EX1001, 14:32-35.

VI. CLAIM INTERPRETATION

94. 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.

95. 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.

96. I understand that Petitioner does not propose any claim constructions. I agree that no constructions are necessary to determine whether the prior art discussed below establishes the elements recited in the claims.

97. To the extent Patent Owner or the Board proposes any claim interpretation or construction not covered in this declaration, I reserve my right to review and potentially modify any opinions below in view of such constructions. However, it is my opinion that the prior art shows the claims to be unpatentable under any construction.

VII. PRIOR ART

A. Overview of Raven

98. International Publication No. WO 2014/057264 A2 is titled “Fibre Optic Connector Device.” EX1003, (54). The named inventors are Asher Raven, Nicholas Blockley, and Alan Keizer. EX1003, (72). International Publication No. WO 2014/057264 A2 (hereinafter “Raven”) published on April 17, 2014. EX1003, (43). This patent publication is based on International Application No. PCT/GB2013/052629, which was filed on October 9, 2013, EX1003, (21), (22), and claims priority to GB 1218194.7, filed October 10, 2012, (EX1003, (30)), which published November 21, 2012 as GB201218194D0.

99. I understand that Raven is prior art to the '760 patent based on my discussion of the legal standards above and discussions with counsel. In particular, I understand that Raven has a filing date at least three years prior to the earliest possible priority date of the '760 patent (January 15, 2016), and so Raven qualifies as prior art at least for this reason. Additionally, Raven was published prior to the earliest possible priority date of the '760 patent (January 15, 2016), and so I believe Raven also qualifies as prior art for this reason.

100. Similar to the '760 patent, Raven generally describes fiber optic connectors suitable for use in, for example, data communication systems. EX1003, 1:2-4. I therefore understand Raven to be analogous to the '760 patent. Raven explains the disclosure also relates to “a fibre optic cable assembly[] and a method for changing the polarity of first and second optical fibres in a fibre optic cable assembly.” EX1003, 1:2-4.

101. Raven explained—before the '760 patent—that, in data communications systems, fiber optic cables “are frequently used to connect between communications nodes.” EX1003, 1:5-6. Raven further describes that, within data communications systems, “transmitting cables [] have to connect with receiving ports [], and receiving cables [] have to connect with transmitting ports.” EX1003, 1:6-11. Raven identifies several issues with fiber optic connectors, including that “when [a

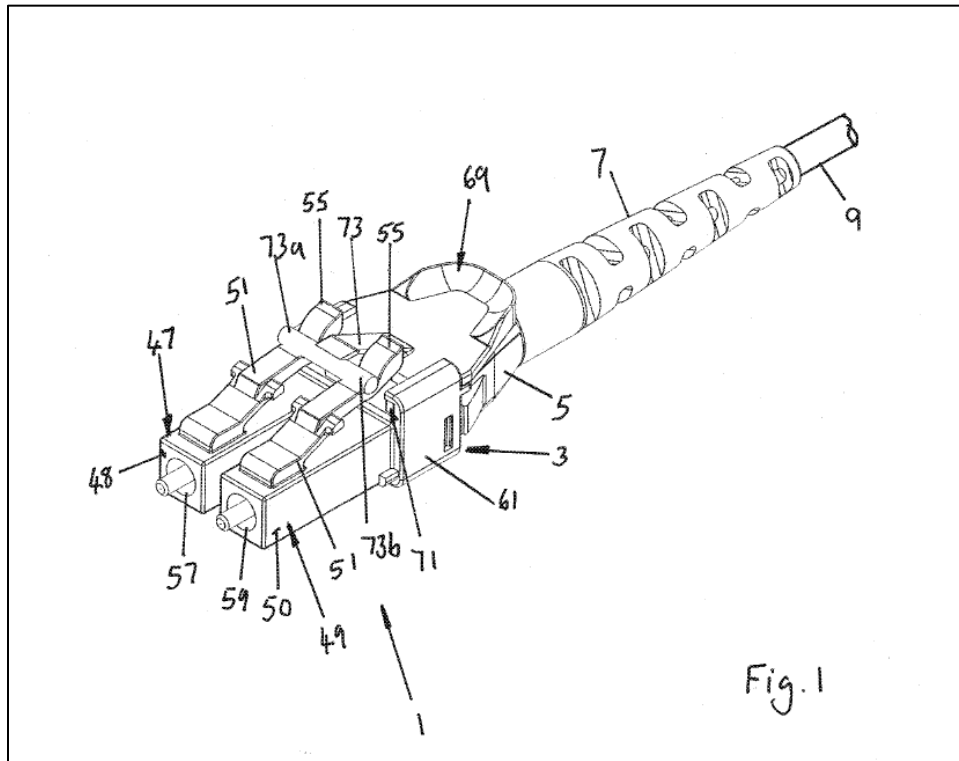
connector is] plugged into the receiving ports it can be difficult to remove the cable assembly.” EX1003, 1:27-28.

102. Raven explains that, because connectors are often plugged into a panel with a high density of connectors, limited space exists around each connector. EX1003, 1:28-2:1; *see also* EX1001, 1:34-47. Raven thus concludes that “it can be difficult for a user to manipulate the locking levers when removing the connector from the panel.” EX1003, 2:1-2; *see also* EX1001, 1:52-64. To address this issue, Raven discloses “a fiber optic cable assembly and a method for changing the polarity of first and second optical fibres” that also includes “an improved means of actuating the fibre optic connector locking levers.” EX1003, 2:10-11, 2:20-23.

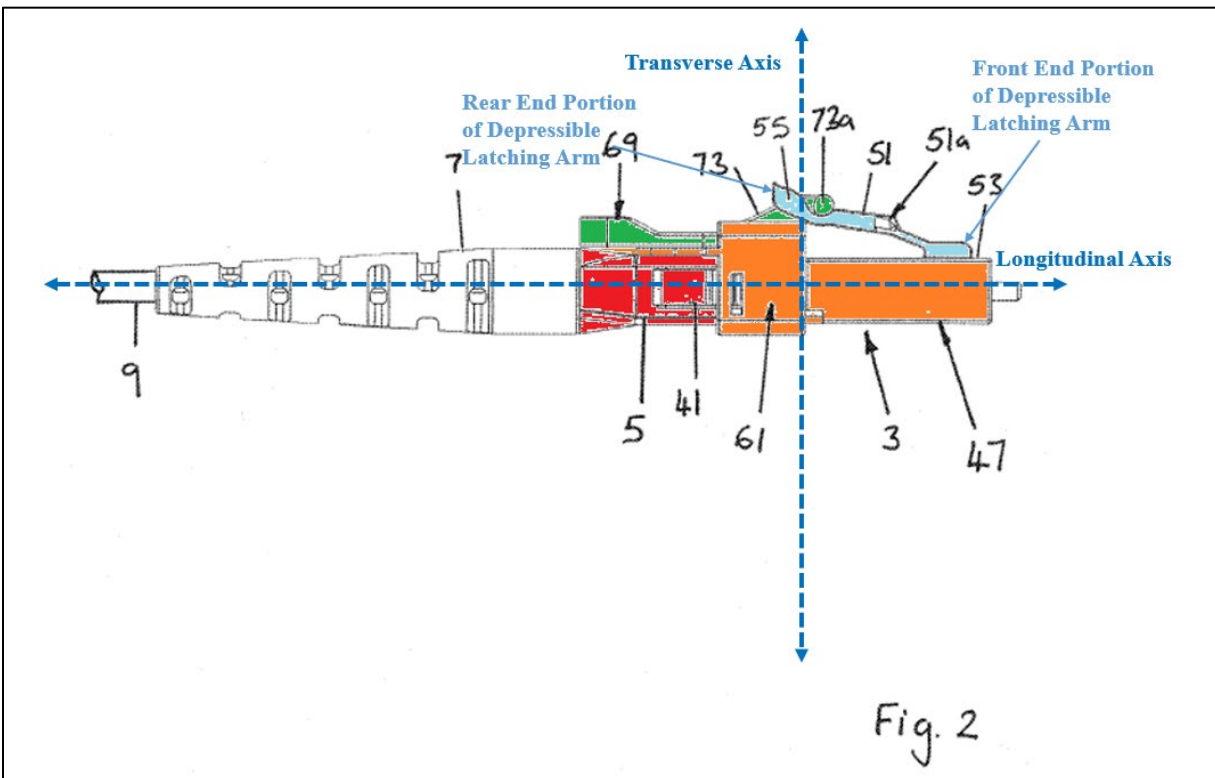
103. Raven additionally explains another known problem with fiber optic cable assemblies: “each assembly design tends to be bespoke for each different type of fibre optic connector.” EX1003, 2:12-13. Raven explains that this design limitation leads to increased manufacturing and assembly costs. EX1003, 2:13-14. Therefore, Raven states “[i]t is highly desirable to have a connector system that includes a connector body that can be used with several different types of fibre optic connectors in order to reduce manufacturing and assembly costs.” EX1003, 2:14-16; *see also* 2:20-23.

104. Therefore, I believe a POSITA would understand Raven to articulate a goal of designing a fiber optic connector that enables a user to change the polarity of the connector, as well as easily remove and insert a fiber optic connector into, e.g., the receptacle of an adapter or a port. EX1003, 2:20-23. I believe a POSITA would also understand Raven to articulate a goal of providing a design applicable to a variety of fiber optic cable assembly types to reduce manufacturing and assembly costs.

105. Raven discloses a fiber optic connector assembly (“fibre optic cable assembly 1”) and illustrates an embodiment of the disclosed connector of the duplex type in Figure 1, reproduced below, with a side view of the embodiment in Figure 2, reproduced and annotated below. EX1003, 13:22-24.



EX1003, FIG. 1.



EX1003, FIG. 2 (annotated).

106. Raven states “duplex fibre optic cable assembly 1 includes a leading end unit 3, a housing 5, a boot 7, and a fibre optic cable 9.” EX1003, 14:17-18.

Leading end unit 3 includes “first and second fibre optic connectors 47, 49.”

EX1003, 16:16-18. Raven explains that its leading end unit 3 “includes a connector part 61 that is arranged to connect the first and second fibre optic connectors 47, 49 together.” EX1003, 16:24-25. Latching levers 51 are attached to the upper surface of connector 47, 49. EX1003, 17:21-22. First and second fiber optic connectors 47, 49 each include a first body 48 and a second body 50, respectively. EX1003,

16:19-20. Each of first and second bodies 48, 50 includes a cavity arranged to receive inner bodies 25, 31 of housing 5, depicted in Figure 3. EX1003, 16:20-22.

107. Raven discloses a method for changing the polarity of first and second fiber optic connectors 47, 49. EX1003, 18:20-19:8. Specifically, Raven discloses that, to change the polarity of first and second ferrules 27, 33 with respect to first and second fiber optic connectors 47, 49, leading end unit 3 is separated from housing 5, rotated 180° about a longitudinal axis Z-Z, and reattached to housing 5 in a second orientation, “thereby changing the polarity of the transmitting and receiving fiber optic cables with respect to the complementary connector.” EX1003, 18:27-19:8.

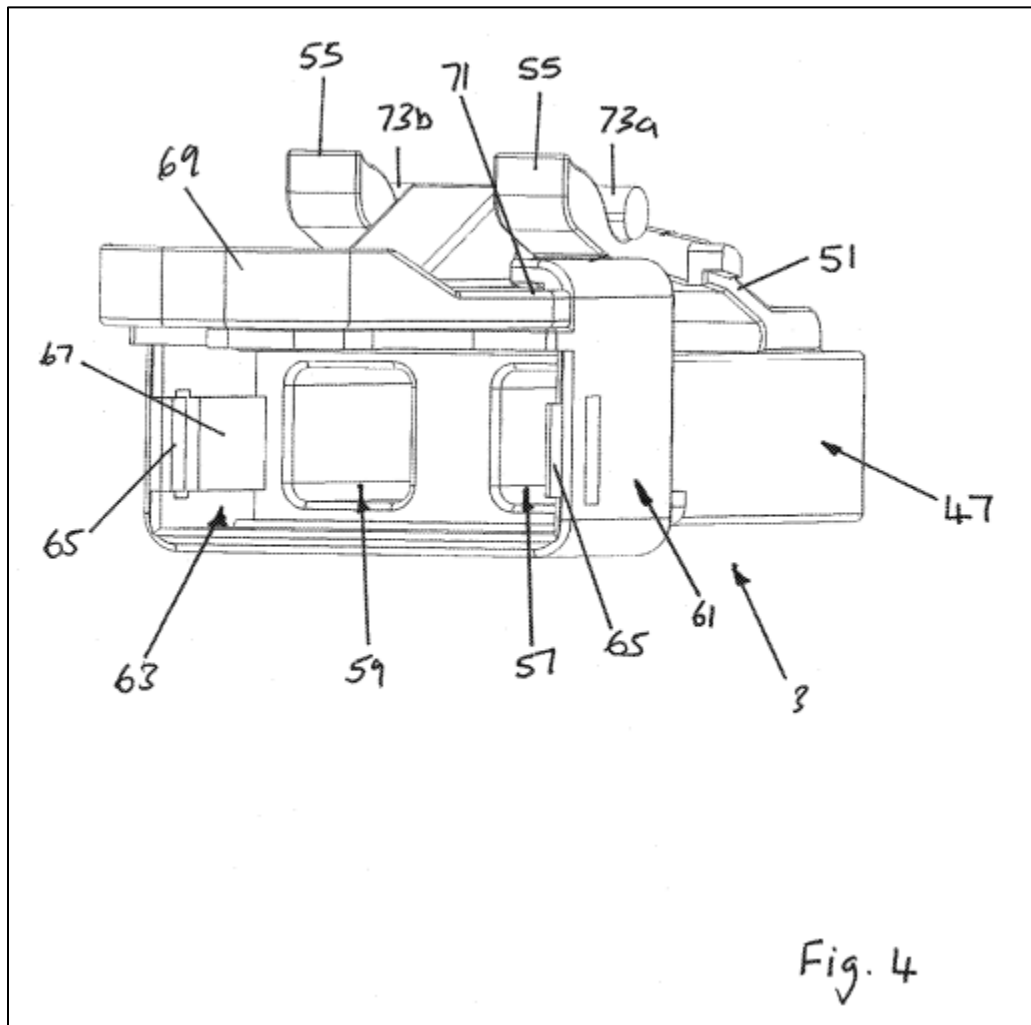
108. Each of first and second connectors 47, 49 includes a latching lever 51 attached to upper surface 53 of connectors 47, 49. EX1003, 17:16-22. Latching levers 51 “releasably lock the respective fibre optic connector device to a complementary connector device,” e.g., an adapter. EX1003, 17:16-18. Raven explains that “[e]ach latching lever 51 is arranged to engage a complementary formation”, which locks the fiber optic cable assembly 1 into a complementary connector device (e.g., an adapter). EX1003, 17:18-20.

109. Raven further explains that “each lever 51 is arranged in a cantilevered manner,” “is resilient,” and “can be moved from a locking position to an unlocked position []by pushing a free end 55 of the latching lever downwards towards the upper surface 53” of connectors 47, 49. EX1003, 17:21-26; *see also* EX1003, FIG. 2. Levers 51 return to the locked position when “[t]he resiliency of the latching levers 51 returns them to their rest positions when an actuating force is removed.” EX1003, 17:25-26.

110. Raven’s fiber optic connector device 1 also “includes a manually operable control 69 that is arranged to actuate the latching levers 51 on the first and second fibre optic connectors 47, 49 substantially simultaneously.” EX1003, 18:1-3. Raven further explains that manually operable control 69 slides with respect to leading end unit 3 between a position where levers 51 are locked and a position where levers 51 are unlocked. EX1003, 18:3-5.

111. Raven’s manually operable control 69 is configured to slide within grooves 71 formed within connector part 61 as demonstrated by Figure 4, reproduced below. EX1003, 18:6-7, FIG. 4. Manually operable control 69 includes an actuator 73 “that is attached to an upper surface 70 of the control” 69 and “includes actuator members 73a, 73b”. EX1003, 18:6-10. In operation, actuator members 73a, 73b move with manually operable control 69. EX1003, 18:10-12. Thus, when

a user slides manually operable control 69, latching levers 51 are pushed downwards toward upper surface 53 of fiber optic connectors 47, 49. EX1003, 18:10-12.



EX1003, FIG. 4.

112. Additionally, Raven discloses that “[i]nstead of using LC type fibre optic connectors, other fibre optic connector formats can be used” within fiber optic connector device 1 described therein. EX1003, 20:3-4. Indeed, Raven’s fiber

optic connector that includes manually operable control 69 to actuate latching levers 51 would be compatible with any fiber optic connector (or connector ferrule) type, as manually operable control 69 and latching levers 51 are provided exterior to a connector housing and does not affect the connection or alignment of the ferrule contained within the connector housing.

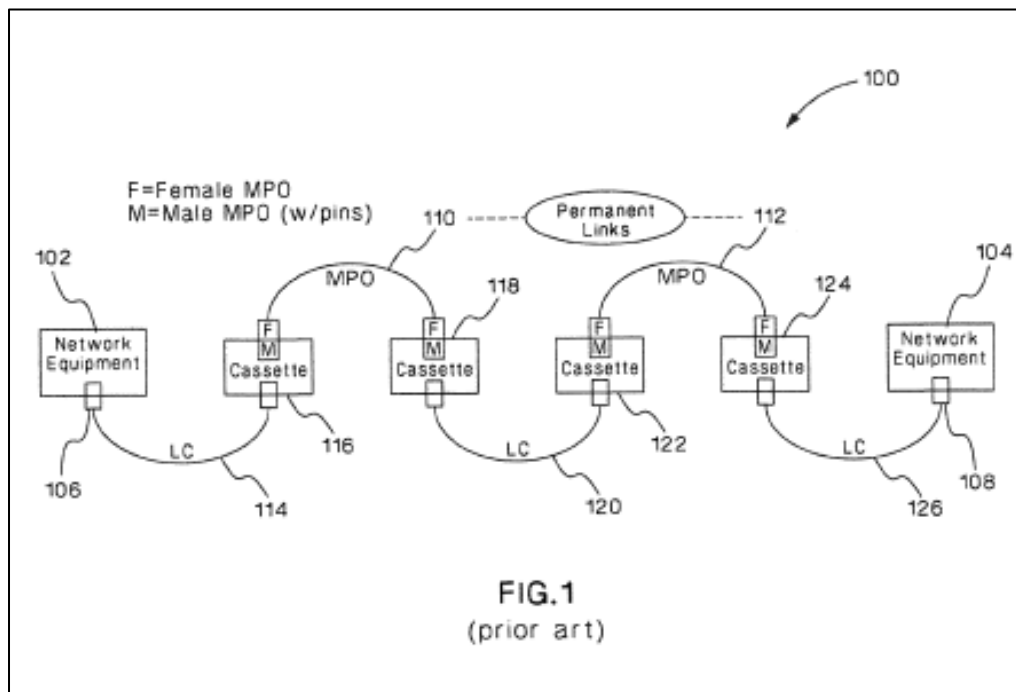
B. Overview of Kuffel

113. U.S. Patent No. 8,636,424 B2 is titled “Optical Communication Connector.” EX1004, (54). The named inventors are Gregory L. Kuffel and Joel D. Kwasny. EX1004, (75). U.S. Patent No. 8,636,424 B2 (hereinafter “Kuffel”) is issued on January 28, 2014. EX1004, (45). The patent’s application (12/909,974) that issued as Kuffel was filed on October 22, 2010 and was published as U.S. Publication No. 2012/0099822 A1 on April 26, 2012.

114. I understand that Kuffel is prior art to the ’760 patent based on discussion of the legal standards above and discussions with counsel. In particular, I understand that Kuffel has a filing date prior to the earliest possible priority date of the ’760 patent (January 15, 2016), and so Kuffel qualifies as prior art at least for this reason. Additionally, Kuffel published prior to the earliest possible priority date of the ’760 patent, and so I believe Kuffel also qualifies as prior art for this reason.

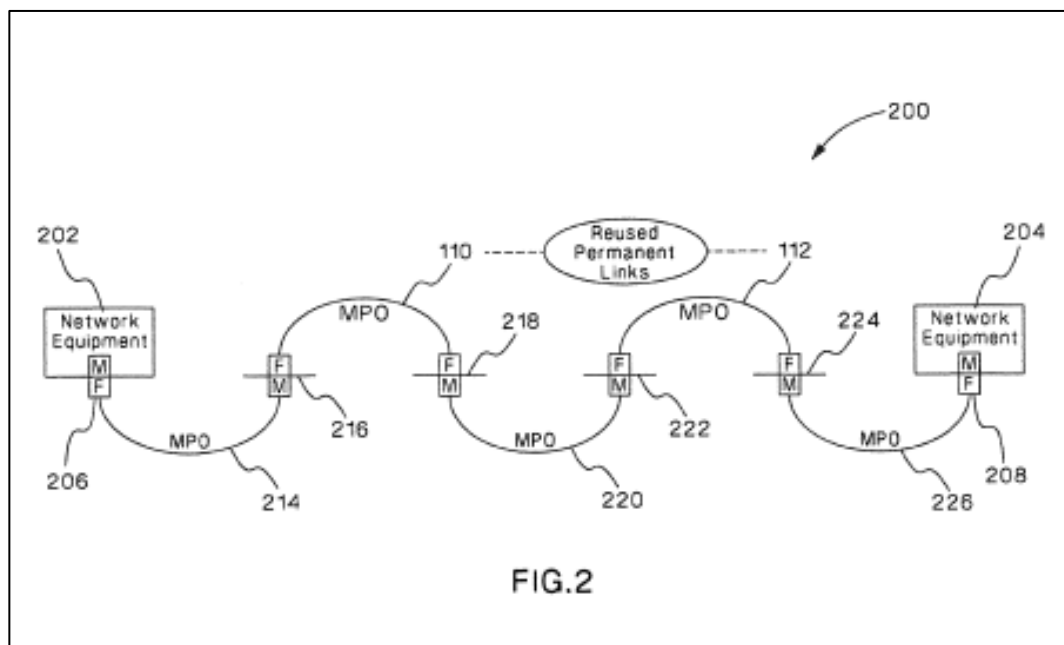
115. Kuffel generally discloses fiber optic connectors, and states that its disclosure “relates generally to communication connectors, and more particularly, to an optical communication connector.” EX1004, 1:5-7. I therefore understand Raven to be analogous to the ’760 patent. Kuffel explains that improvements in optical cabling technology require existing data centers to adapt to embrace newer technology. EX1004, 1:11-17. Kuffel further explains that “replacing an entire infrastructure[] is likely to be more costly (in equipment costs and installation man-hours) than a less-extensive upgrade, such as swapping out a limited number of components with upgraded components that are able to interface with the existing infrastructure.” EX1004, 1:18-26. Thus, Kuffel articulates a goal of providing “an optical communication connector that assists in reducing the cost of an upgrade and/or that assists in simplifying the upgrade.” EX1004, 1:46-48.

116. Kuffel discloses example fiber optic network equipment for a fiber optic network system, including fiber optic connectors of the LC type. EX1004, 3:44-4:7, FIG. 1. Kuffel explains that it would be desirable to upgrade the LC type connectors within an example fiber optic network system to MPO (“Multi-fiber Push-On)-type connectors. EX1004, 4:8-19. Figure 1 of Kuffel provides the example system 100 with LC type connectors to be upgraded.



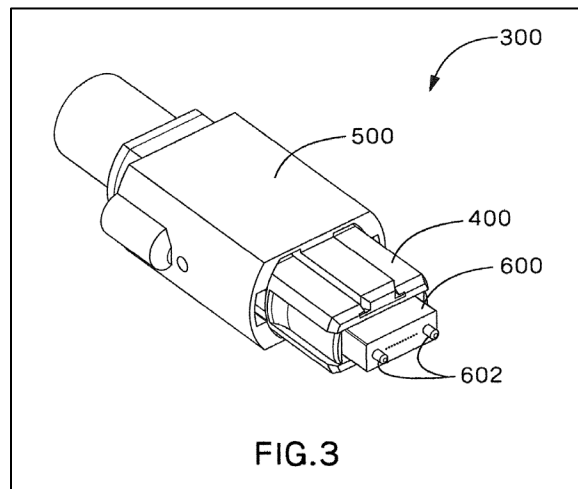
EX1004, FIG. 1.

117. Figure 2 of Kuffel depicts an upgraded system in which the LC type connectors are upgraded by MPO-type connectors.

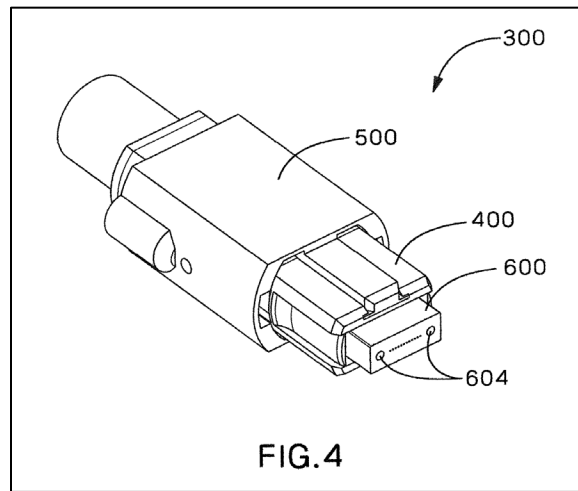


EX1004, FIG. 2.

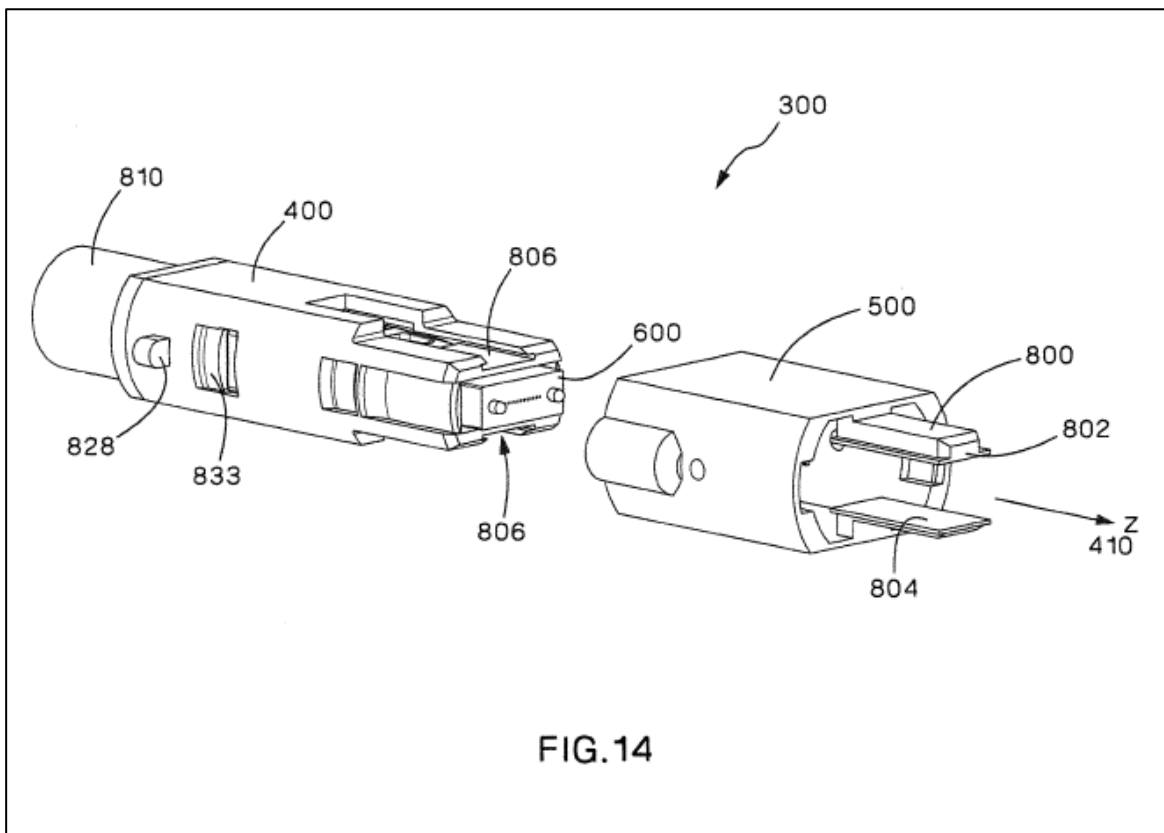
118. Kuffel further discloses a fiber optic connector system having an MPO connector 300. *See, e.g.*, EX1004, 5:16-27, FIGs. 3-5, 14. Kuffel explains MPO connector 300 includes a ferrule 600 “which contains optical fibers for communication.” EX1004, 5:16-22. Kuffel illustrates an MPO connector 300 having an inner housing assembly 400, an outer housing 500, and a ferrule 600 (which the POSITA would have understood to be an MT ferrule) containing an array of optical fibers disposed in a row between alignment pins 602 or alignment cavities pin 604. EX1004, 5:17-27, FIGs. 3-4.



EX1004, FIG. 3.

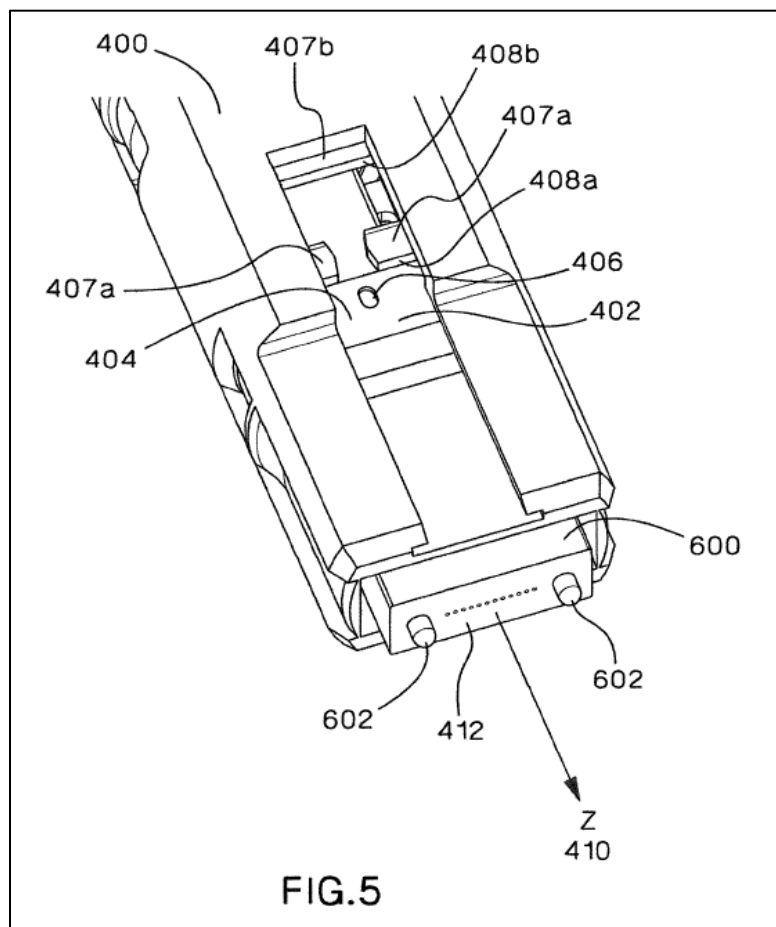


EX1004, FIG. 4.

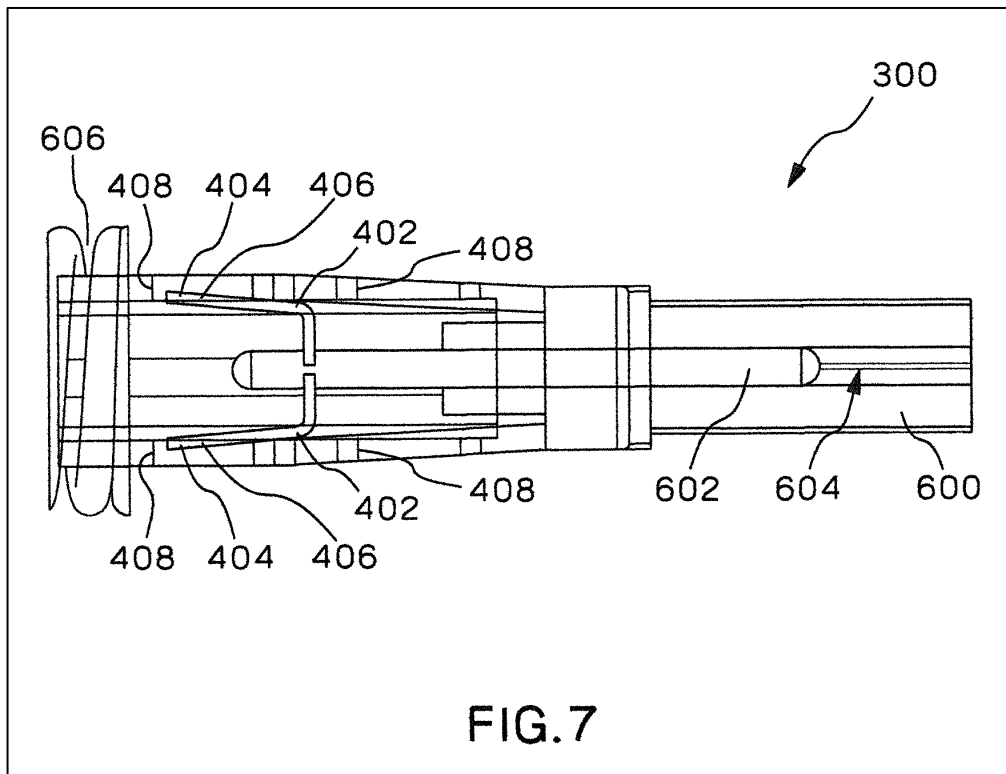


EX1004, FIG. 14.

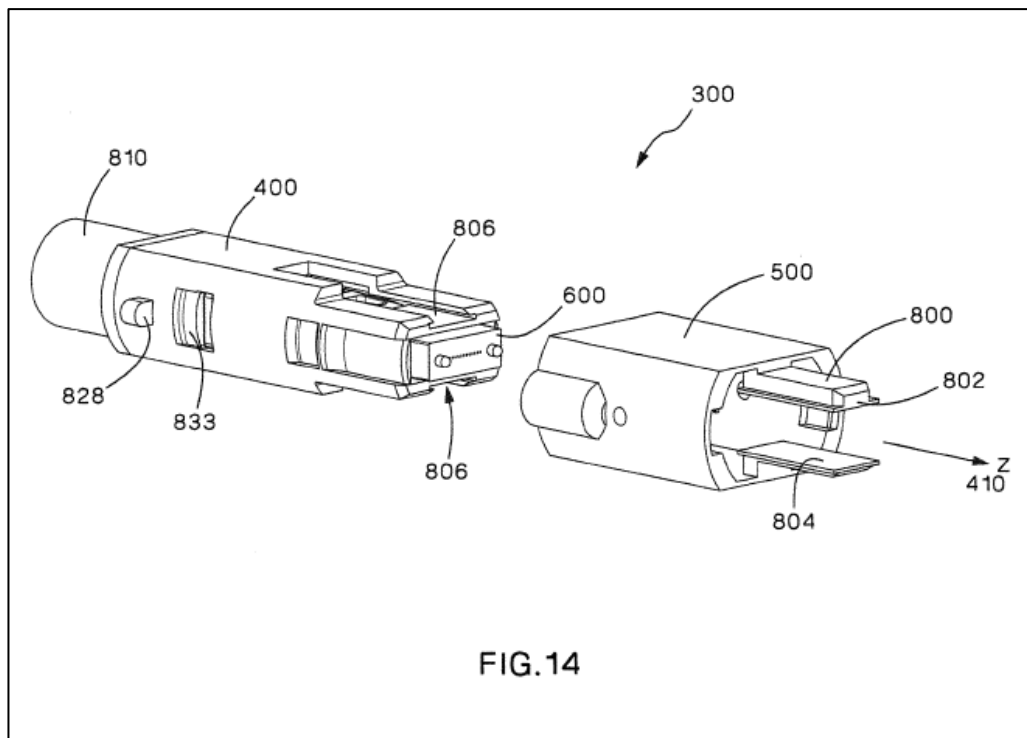
119. Kuffel illustrates an MPO connector, having ferrule 600 (which the POSITA would have understood to be an MT ferrule), having an array of fibers disposed in a row between guide pins 602. Kuffel's inner housing assembly 400 includes an MT ferrule 600, a spring 606, and a spring push assembly 810. EX1004, 7:61-8:10, FIGs. 7, 14. Spring 606 acts to load ferrule 600. EX1004, 8:11-15. Additionally, Kuffel's outer housing 500 includes two compression springs 820 for forcing outer housing 500 forward toward ferrule 600. EX1004, 8:30-48, FIG. 17.



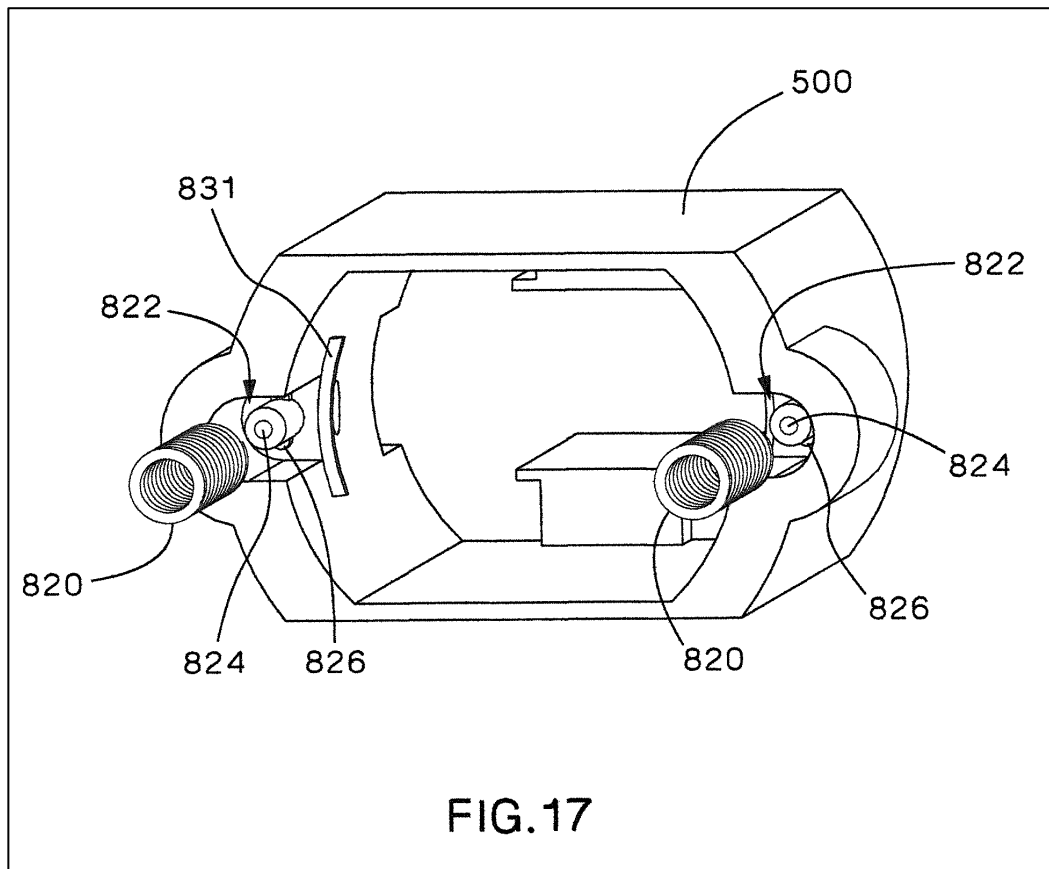
EX1004, FIG. 5.



EX1004, FIG. 7.



EX1004, FIG. 14.



EX1004, FIG. 17.

C. Overview of Wong

120. U.S. Patent No. 9,599,778 B2 is titled “Latching Connector with Remote Release.” EX1005, (54). The named inventors are Yim Wong and Cary Ruffner. EX1005, (72). U.S. Patent No. 9,599,778 B2 (hereinafter “Wong”) issued on March 21, 2017. EX1005, (45). The patent’s application (14/521,414) that issued as Wong was filed on October 22, 2014 and was published as U.S. Publication No. 2016/0116685 A1 on April 28, 2016. EX1005, (21), (22), (65).

121. I understand that Wong is prior art to the '760 patent based on discussion of the legal standards above and discussions with counsel. In particular, I understand that Wong has a filing date of October 22, 2014, which is prior to the earliest possible priority date of the '760 patent (January 15, 2016), and so Wong qualifies as prior art at least for this reason.

122. Similar to the '760 patent, Wong discloses cable assembly connectors for fiber optic transmission having “a remote release mechanism such that a user can remove cable assembly connectors that are closely spaced together on a high density panel.” EX1005, 3:66-4:2, 4:44-50.

123. Wong similarly recognizes the problem that, “[i]n a high-density panel configuration, adjacent connectors and cable assemblies may obstruct access to the individual release mechanisms,” and therefore “may impede the ability of an operator to minimize the stresses applied to the cables and the connectors.” EX1005, 1:29-33. Further, Wong states that “[o]verstressing the cables and connectors may produce latent defects, compromise the integrity and/or reliability of the terminations, and potentially cause serious disruptions to network performance.” EX1005, 1:37-41.

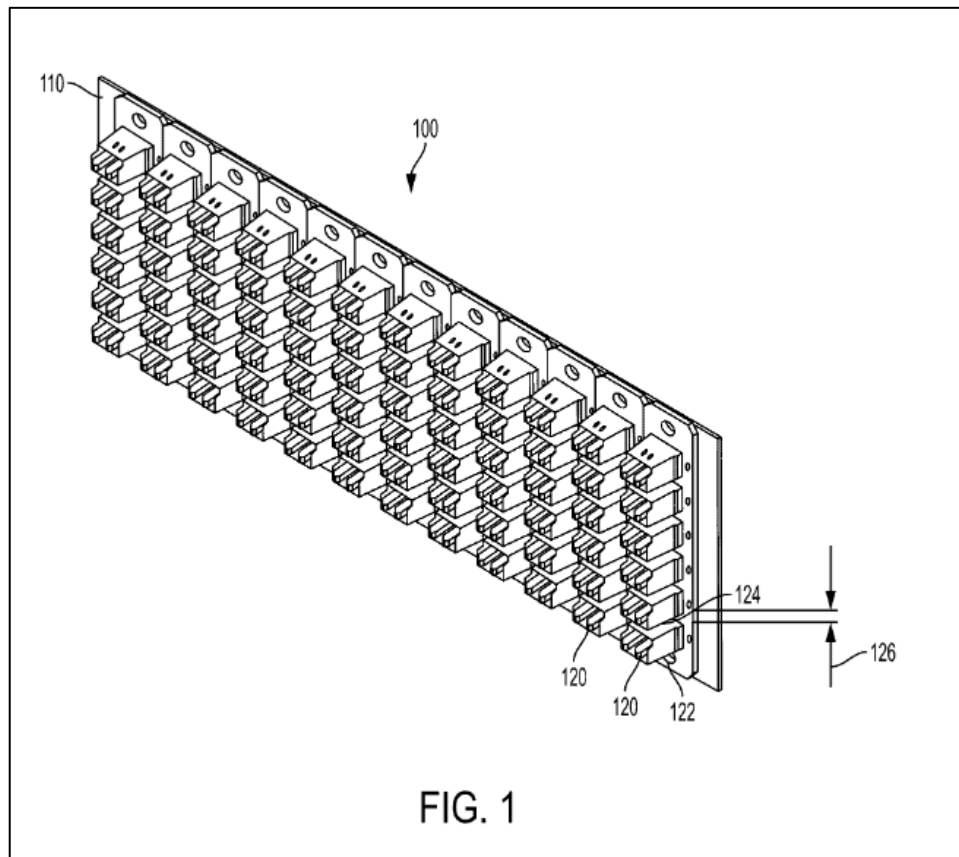
124. To address this issue, Wong discloses a remote release mechanism to “allow more cable assembly connectors to be inserted into mating connectors on a

board because the cable assembly connectors (and the mating connectors) can be installed closely together but still have the functionality to provide a user with an ability to remove individual connectors without hindrance, damaging adjacent connectors, knocking adjacent connectors out of the mating connectors, and/or the like.” EX1005, 18:41-49.

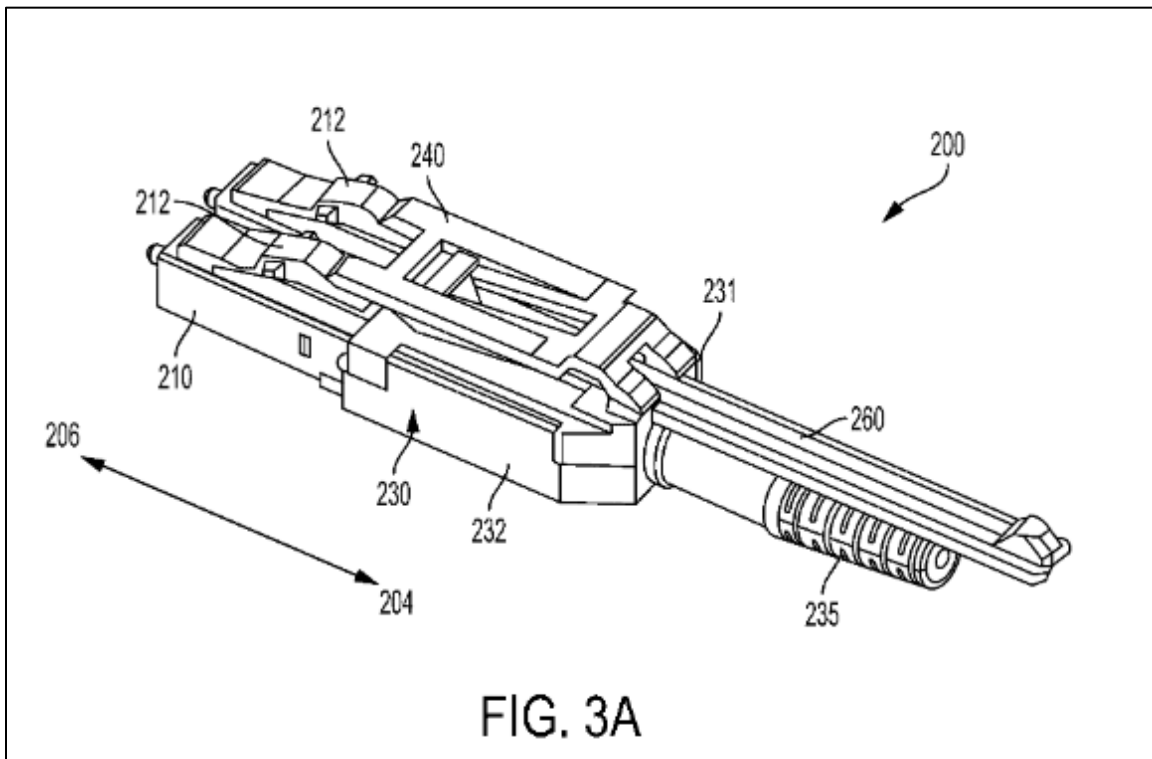
125. Wong also explains that the remote release mechanism can “integrate with existing cable assembly connectors and/or are similarly shaped and sized such that existing equipment can be used to connect signal conduits such as fiber optic cables and electrical conductors to high density panels.” EX1005, 4:40-44.

126. Therefore, I believe a POSITA would understand Wong to articulate a goal of designing a fiber optic connector with a remote release mechanism that enables a user to easily remove and insert the fiber optic connector into, *e.g.*, an adapter or a receptacle. I believe a POSITA would also understand Wong to articulate a goal of designing the remote release mechanism applicable to existing fiber optic cable assembly types.

127. Wong discloses a fiber optic connector assembly (“remote latch release connector assembly 200”) in Figure 3A, which is to be connected to an adapter (“coupler 120”) within a high density panel 100 in Figure 1. EX1005, 4:51-5:2, 7:11-16.



EX1005, FIG. 1.



EX1005, FIG. 3A.

128. Wong's remote latch release connector assembly 200 includes one or more cable assembly connectors 210 connected to a switchable housing 230 having one or more release members 240 and one or more pull tab assemblies 260.

EX1005, 7:18-22. Cable assembly connector 210 includes a connector housing 211 and a latching portion 212. EX1005, 7:43-45. Latching portion 212 has a first end that is attached to connector housing 211 and a second end that is not attached to connector housing 211. EX1005, 8:18-21.

129. Wong explains that latching portion 212 can latch with a mating connector 150 of coupler 120, and that release member 240 is shaped such that a portion of the release member may engage with latching portion 212 to cause latching portion 212 to unlatch from mating connector 150. EX1005, 8:24-42, 14:19-24. Wong further explains that pulling/moving pull tab assembly 260 rearward in the direction D_2 on Figure 10, causes a downward force F_2 to be exerted over release member 240, which in turn causes release member 240 to contact and/or press down on the latching portion 212, thereby unlatching from mating connector 150. EX1005, 18:25-40.

130. Wong further provides that the central shaft 262 of the pull tab assembly 260 can slide within an opening 246 so that pull tab assembly 260 is movable relative to the various portions of the remote latch connector 200 along a coupling axis. EX1005, 16:50-66. Opening 246 “may generally have a shape and/or size that corresponds to a cross-sectional shape and/or size” of pull tab assembly 260 extending therethrough. EX1005, 15:53-56.

131. Wong defines that cable assembly connector 210 “may be any suitable type now known or later developed, such as, for example, a ferrule connector (FC), a fiber distributed data interface (FDDI) connector, an LC connector, a mechanical

transfer (MT) connector, an SC connector, an SC duplex connector, or a straight tip (ST) connector.” EX1005, 4:3-8.

D. Overview of Gniadek

132. U.S. Patent No. 8,465,317 B2 is titled “Latching Connector with Remote Release.” EX1006, (54). The named inventors are Jeffrey Gniadek and Jimmy Jun-Fu Chang. EX1006, (75). U.S. Patent No. 8,465,317 B2 (hereinafter “Gniadek”) issued on June 18, 2013. EX1006, (45). The patent’s application (13/286,773) that issued as Gniadek was filed on November 1, 2011 and was published as U.S. Publication No. 2013/0089995 A1 on April 11, 2013. EX1006, (21), (22), (65).

133. I understand that Gniadek is prior art to the ’760 patent based on discussion of the legal standards above and discussions with counsel. In particular, I understand that Gniadek has a filing date at least four years prior to the earliest possible priority date of the ’760 patent (January 15, 2016), and so Gniadek qualifies as prior art at least for this reason. Additionally, Gniadek was published prior to the earliest possible priority date of the ’760 patent (January 15, 2016), and so Gniadek also qualifies as prior art for this reason.

134. Similar to the ’760 patent, Gniadek discloses cable assembly connectors for fiber optic transmission having a remote release mechanism in a form an

extender to receive a first force that is opposite to a coupling direction, and to disengage the connector from the mating connector. EX1006, 1:13-15, 1:44-52, 3:7-15.

135. Gniadek—like the '760 patent—explains that “network providers [seek] to find better ways to improve the quality of service at a lower cost.” EX1006, 1:17-19. Gniadek continues that one solution is to “deploy high-density interconnect panels” which may be “designed to consolidate the increasing volume of interconnections necessary to support the fast-growing networks into a compacted form factor, thereby increasing quality of service and decreasing costs such as floor space and support overhead.” EX1006, 1:20-28.

136. Gniadek describes that “[i]n communication networks, such as data centers and switching networks, numerous interconnections between mating connectors may be compacted into high-density panels,” and that “[p]anel and connector manufacturers optimize for such high densities by shrinking the connector size and/or the spacing between adjacent connectors on the panel.” EX1006, 1:31-36.

137. Gniadek similarly recognizes the problem that, “[i]n a high-density panel configuration, adjacent connectors and cable assemblies obstruct access to the individual release mechanisms,” and therefore may “impede[] the ability of an

operator to minimize the stresses applied to the cables and the connectors.”

EX1006, 1:61-65. Further, Gniadek states that “[o]verstressing the cables and connectors may introduce latent defects, compromise the integrity and/or reliability of the terminations, and potentially cause serious disruptions to the network performance.” EX1006, 2:2-5.

138. To address this issue, Gniadek discloses a remote release mechanism in a form of an extender to receive a first force that is opposite to a coupling direction, and to disengage the connector from the mating connector. EX1006, 3:7-12.

139. Therefore, I believe a POSITA would understand Gniadek to articulate a goal of designing a fiber optic connector with a remote release mechanism that enables a user to easily remove and insert the fiber optic connector into, *e.g.*, an adapter or a receptacle.

VIII. SUMMARY OF GROUNDS

140. In my opinion, the Challenged Claims are invalid as obvious in view of the prior art. This table summarize the grounds that I believe show invalidity:

Ground	Basis	Reference(s)	Claims
1	§ 103	Raven (EX1003) and Kuffel (EX1004)	1–10, 12, and 14–17
2	§ 103	Raven (EX1003), Kuffel (EX1004), and Gniadek (EX1006)	13

Ground	Basis	Reference(s)	Claims
3	§ 103	Raven (EX1003), Kuffel (EX1004), and Wong (EX1005)	13
4	§ 103	Wong (EX1005)	1–11 and 15–17
5	§ 103	Wong (EX1005) and Kuffel (EX1004)	12 and 13
6	§ 103	Wong (EX1005) and Raven (EX1003)	14
7	§ 103	Raven (EX1003) and Kuffel (EX1004)	10
8	§ 103	Wong (EX1005) and Kuffel (EX1004)	10 and 11

IX. GROUND 1: RAVEN IN VIEW OF KUFFEL RENDERS OBVIOUS CLAIMS 1-10, 12, AND 14-17.

141. It is my opinion that the combination of Raven and Kuffel renders obvious independent claim 1 of the '760 patent. Additionally, Raven in view of Kuffel renders obvious dependent claims 2–10, 12, and 14–17 of the '760 patent.

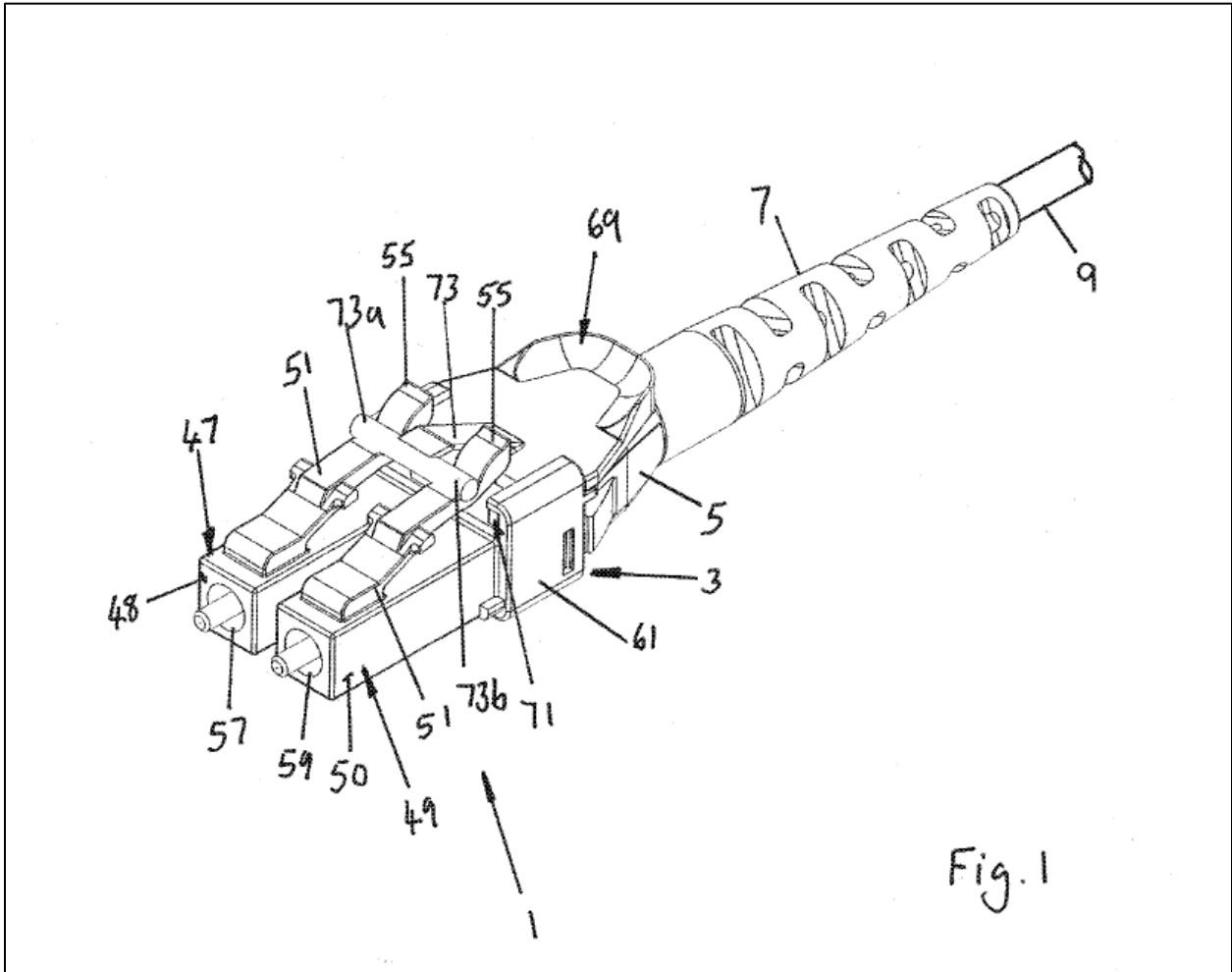
A. Motivation to Combine

1. Raven

142. Raven discloses fiber optic connectors suitable for use in, for example, data communication centers. EX1003, 1:2-4. Raven explains that when fiber optic connectors, for example “duplex type fibre optic connectors,” are plugged into the receiving ports, removal of the cable assembly can be difficult. EX1003,

1:27-28. Raven states that this difficulty is because connectors are usually plugged into a panel with a high density of connectors with limited space around each connector. EX1003, 1:28-2:1. “Thus it can be difficult for a user to manipulate the locking levers when removing the connector from the panel.” EX1003, 2:1-2.

143. To address this issue, Raven discloses “a fiber optic cable assembly and a method for changing the polarity of first and second optical fibres” that also includes “an improved means of actuating the fibre optic connector locking levers.” EX1003, 2:10-11, 2:20-23; *see also, e.g.*, EX1003, FIG. 1. Specifically, Raven describes “[e]ach of the first and second fibre optic connectors 47,49 includes a latching lever 51 that is arranged to releasably lock the respective fibre optic connector device to a complementary connector device”, and “[t]he device further includes a manually operable control 69 that is arranged to actuate the latching levers 51 on the first and second fibre optic connectors 47,49”. EX1003, 17:16-18, 18:1-2; *see also, e.g.*, EX1003, FIG. 1.



EX1003, FIG. 1, 18:3-19.

144. Raven also describes an additional problem with known fiber optic connectors: “that each assembly design tends to be bespoke for each different type of fibre optic connector.” EX1003, 2:12-13. Raven explains that such designs lead to increased costs in assembly and manufacturing. EX1003, 2:13-14. To address this issue, Raven discloses a connector system having a body that can be used with different types of fiber optic connectors and fiber optic ferrules. EX1003, 2:14-16.

145. Raven, however, does not expressly disclose an MT ferrule configured to hold a plurality of optical fibers.

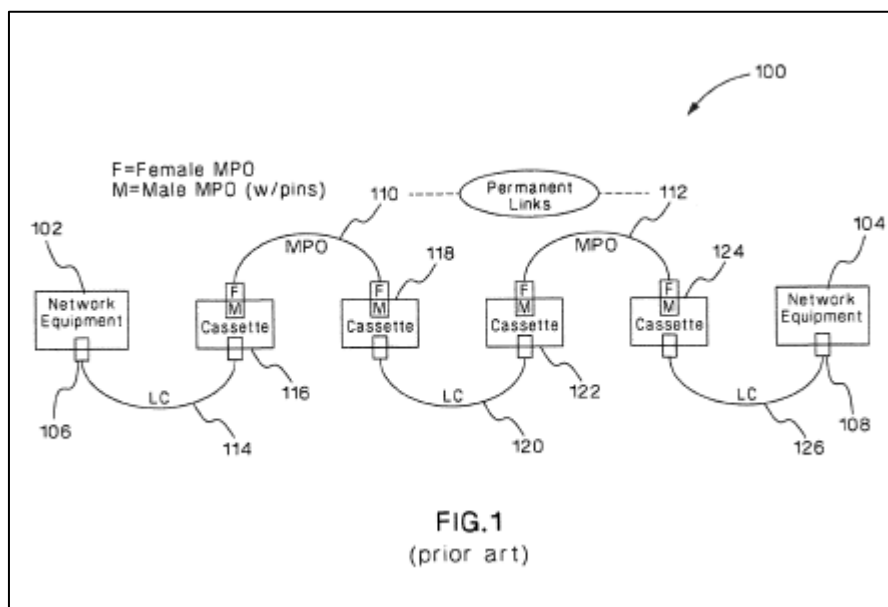
2. Kuffel

146. Similar to Raven, Kuffel discloses fiber optic connectors. EX1004, 1:5-7. Kuffel provides that its disclosure “relates generally to communication connectors, and more particularly, to an optical communication connector.” EX1004, 1:5-7. Kuffel explains that improvements in optical cabling technology require existing data centers to adapt to embrace newer technology. EX1004, 1:11-17. Kuffel further explains that “replacing an entire infrastructure[] is likely to be more costly (in equipment costs and installation man-hours) than a less-extensive upgrade, such as swapping out a limited number of components with upgraded components that are able to interface with the existing infrastructure.” EX1004, 1:19-26. Thus, Kuffel articulates a goal of providing “an optical communication connector that assists in reducing the cost of an upgrade and/or that assists in simplifying the upgrade.” EX1004, 1:46-48.

147. Kuffel discloses example fiber optic network equipment for a fiber optic network system, including fiber optic connectors of the LC type. EX1004, 3:44-4:7, FIG. 1. Kuffel explains that it would be desirable to upgrade the example system of Figure 1 to upgrade the LC components to MPO (“Multi-fiber Push-

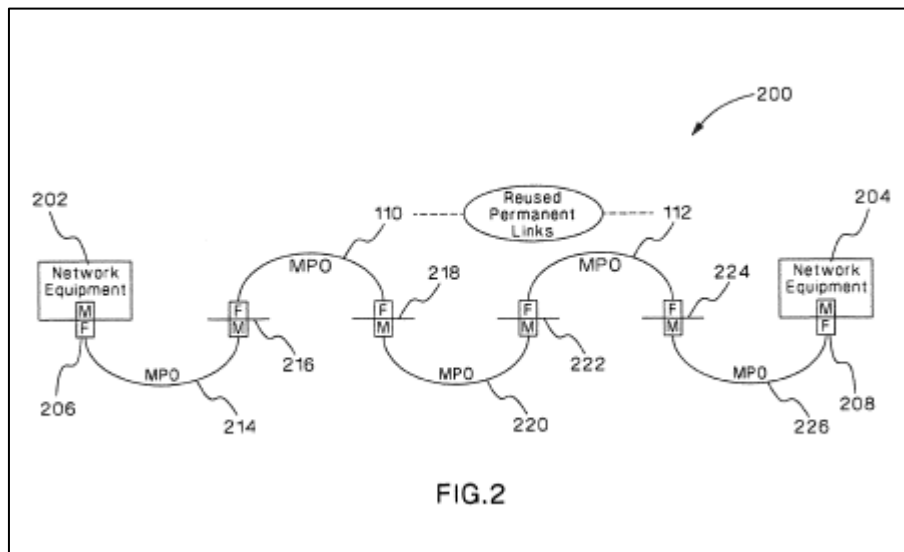
On”) components, which include MT ferrules. EX1004, 3:50-52, 4:8-19. A

POSITA would have understood that MPO connectors (which contain MT ferrules) are utilized to increase density (*e.g.*, decrease the space used for each of the optical fiber connections) within data transmission networks and therefore increase the bandwidth. EX1004, 4:8-14. Figure 1 of Kuffel provides the example system 100 to be upgraded:



EX1004, FIG. 1.

148. Figure 2 of Kuffel depicts an upgraded system in which the LC components are replaced by MPO components. A POSITA would have understood that MPO connectors (which contain MT ferrules) are utilized to increase density (*e.g.*, decrease the space used for each of the optical fiber connections) within data transmission networks and therefore increase the bandwidth. EX1004, 4:8-14.

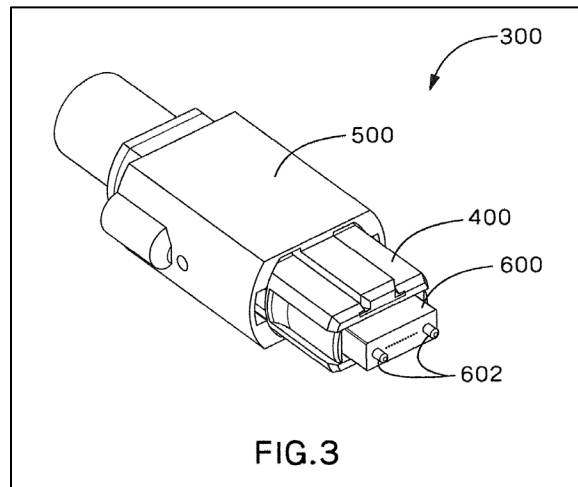


EX1004, FIG. 2.

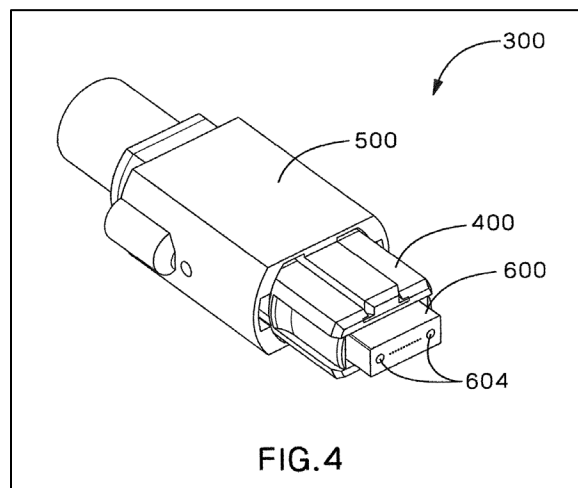
149. Kuffel explains that, in accordance with its disclosure, “an installer can change a gender of an optical communication connector, such as an MPO patchcord/trunk cable connector, from male to female (or vice versa) by removing an outer housing and retracting (or extending) alignment pins corresponding to the gender of the cable.” EX1004, 4:59-64. Thus, Kuffel explains, “*few unique component types are required*” which “will simplify the BOM, since there are fewer part number variations, due to the same cables (possibly with different length) being used.” EX1004, 4:64-67 (emphasis added throughout unless otherwise noted).

150. Kuffel illustrates an MPO connector 300 having an inner housing assembly 400, an outer housing 500, and a ferrule 600 (which the POSITA would have understood to be an MT ferrule) containing an array of optical fibers disposed

in a row between alignment pins 602 or alignment cavities pin 604. EX1004, 5:17-27, FIGs. 3-4.



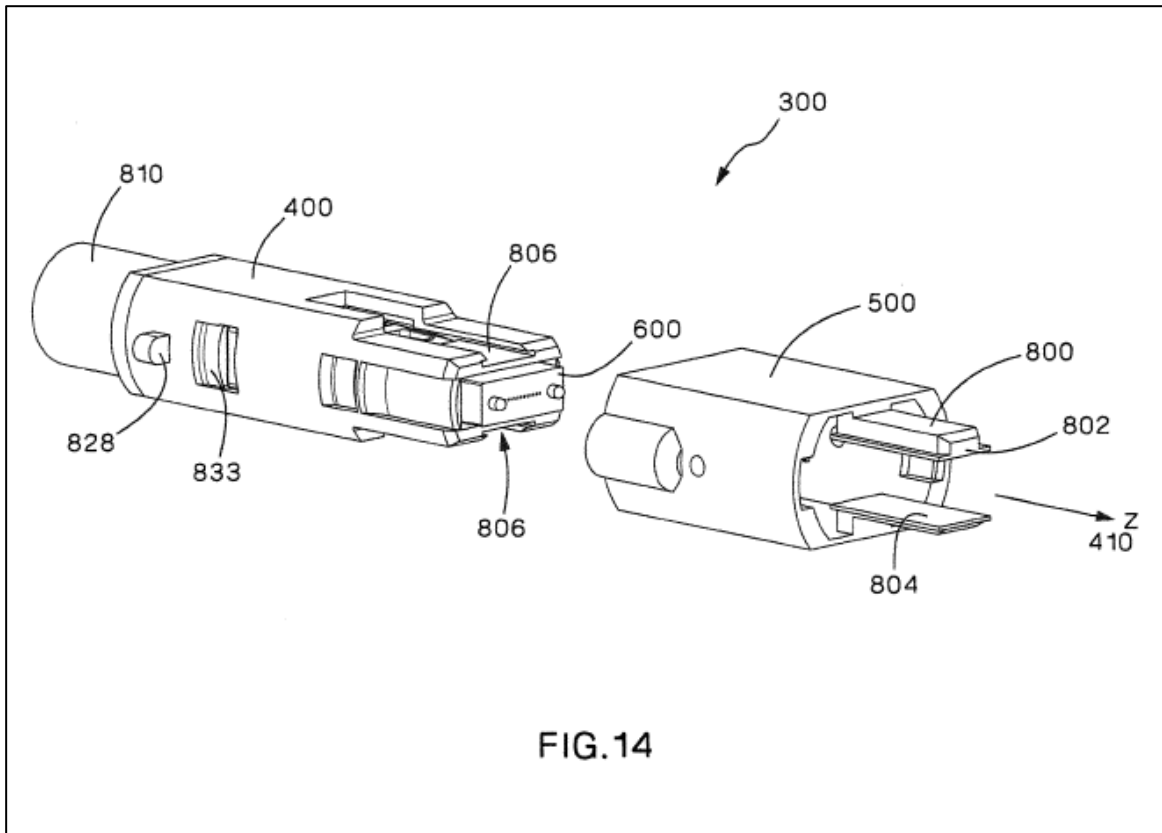
EX1004, FIG. 3.



EX1004, FIG. 4.

151. Kuffel discloses a fiber optic connector system having an MPO connector 300. *See, e.g.*, EX1004, 5:16-27, FIGs. 3-5, 14. Kuffel explains the MPO

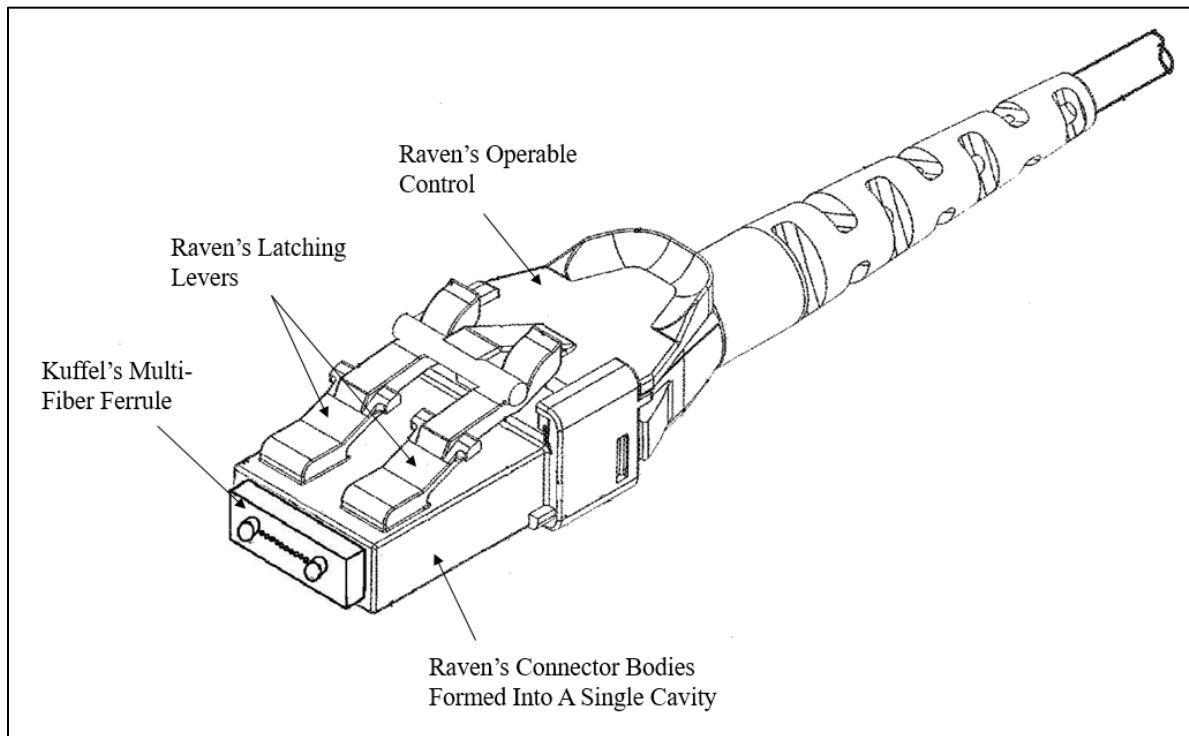
connector 300 includes a ferrule 600 “which contains optical fibers for communication.” EX1004, 5:16-22.



EX1004, FIG. 14.

3. Reasons to Combine

152. A POSITA would have found it obvious to modify Raven’s connector that includes two ferrules (*e.g.*, as shown in its duplex fiber optic cable assembly containing LC ferrules) protruding from the front end of the fiber optic connector to instead include an MT ferrule configured to hold a plurality of optical fibers as disclosed in Kuffel, as illustrated in the figure below.



EX1003, FIG. 1 (annotated, as modified with Kuffel).

153. The modification, as shown above, simply involves replacing Raven's two ferrules (*e.g.*, a duplex LC connector) with Kuffel's multi-fiber ferrule (*e.g.*, an MT ferrule). Raven's first body 48 and second body 50 would thus form a single housing with a single cavity to accommodate Kuffel's MT ferrule. This change is simply a substitution of a known element (Raven's single fiber ferrules) with another (Kuffel's multi-fiber ferrule). Moreover, the accommodation of an MT ferrule improves Raven's device in the same way as described in Kuffel (by interchanging existing components with upgraded components that also increase fiber density).

154. The modification, however, does not change any structure or function of Raven's latching lever or manually operable control, and therefore does not affect the principle operation of Raven's latching mechanisms, as accounted for in Raven's description.

155. There are numerous reasons why I believe a POSITA would have found this combination obvious, which I will explain, but at a high level, both duplex LC connectors (*e.g.*, dual-ferrule connectors) and MPO connectors (*e.g.*, containing MT ferrules) are common optic fiber system components that have been used for many years in the field by the same engineers solving the same problem. Swapping out one type of ferrule arrangement for another is something that a POSITA would have known how to do and would have been motivated to do with a reasonable expectation of success, at least based on the desired data transmission capacity and overall data transmission system design. Furthermore, no undue research or experimentation would have been required—this is a predictable solution based on simple mechanical principles.

156. Indeed the '760 patent itself discloses both "LC type duplex connectors," *see, e.g.*, EX1001, FIG. 5, as well as "MPO connectors" including a multi-fiber MT ferrule, *see, e.g.*, EX1001, FIG. 12A, and states that "[i]t will be readily understood that the aspects of the present disclosure, as generally described herein,

and illustrated in the Figures, can be arranged, substituted, combined, separated, and designed in a wide variety of different configurations.” *See, e.g.*, EX1001, 10:24-37; *see also* EX1001, 2:25-45.

157. Therefore, the ’760 patent appears to reflect an understanding consistent with mine – a POSITA would have known that swapping known connectors is obvious, *e.g.*, guided by the desire to increase bandwidth of optical fiber connections in the data center. Notably, it can be seen that the remote release mechanism disclosed in the ’760 patent, including latching arm 504 and pull tab 514 associated with the “LC type duplex connector,” *see, e.g.*, EX1001, FIG. 5, are interchangeable with the latching arms 1204 and pull tab 1214 associated with the “MPO connector” including a multi-fiber MT ferrule, *see, e.g.*, EX1001, FIG. 12A. As such, a POSITA would have found it further obvious to modify the “LC type duplex connectors” of Figure 5 with an “MPO connector” of Figure 12A (including an MT ferrule), or vice versa, with reasonable expectation of success. This is further supported by the Office’s previous consideration of Figures 5–8 and 12 as the same species. EX1002, 0085-86.

158. Nonetheless, I will provide at least three additional reasons a POSITA would have been motivated to combine Raven and Kuffel below.

159. First, a POSITA would have found this modification obvious based on the disclosures of Raven and Kuffel themselves. *See, e.g.*, EX1004, 3:34-4:67 (describing upgrading a system to replace LC connectors with MPO connectors). For example, Kuffel provides a specific motivation to replace LC connectors with MPO connectors, which include MT ferrules. EX1004, 3:34-4:67.

160. Further, a POSITA would have readily understood that Kuffel's fiber optic connectors with multi-fiber ferrules would provide improved communication – bringing higher transmission speeds and better reliability to existing data centers by upgrading components that are able to interface with the existing infrastructure. *See, e.g.*, EX1004, 1:11-26. That is, an MPO connector including an MT ferrule provides a higher density of optical fibers than a duplex connector consisting of two single fiber ferrules (*e.g.*, LC ferrules) because more optical fibers are included in a single ferrule.

161. Indeed, Kuffel explains that it is desirable to replace LC connectors with MPO connectors and discloses multiple optical fibers are provided in a single multi-fiber ferrule. *See, e.g.*, EX1004, 3:34-4:67 (explaining upgrading a system to replace LC connector components with MPO components), 5:17-27 (describing an MPO connector with a ferrule 600 containing “optical fibers for communication”). It is also common to replace an adapter receptacle for receiving LC connectors

with an adapter receptacle for receiving MPO connectors in such an upgrade—

Kuffel explains that a single adapter (*e.g.*, cassette 116, 118, 122, and 124) including both LC ports on a front side and MPO ports on a rear side accommodates both LC connectors and MPO connectors. EX1004, 3:64-4:2.

162. Moreover, Raven expressly contemplates substitution of the type of connector and explains that its disclosure could be implemented with fiber optic connector formats other than LC connectors. *See, e.g.*, EX1003, 20:3-4 (providing that “[i]nstead of using LC type fibre optic connectors, other fibre optic connector formats can be used, for example SC...etc”).

163. Second, in my opinion, a POSITA would have had reason to replace Raven’s duplex LC ferrule arrangement with Kuffel’s MT ferrule. A POSITA would have readily understood that these two choices are simple substitutes for one another that provide different connectivity options (*e.g.*, to connect two optical fibers using distinct ferrules or to connect a multitude of optical fibers using a single ferrule). Multi-fiber ferrules have been used in the industry for years, and selecting a duplex ferrule design or multi-fiber ferrule design is a simple substitution based on what type of connectors are desired to be used. I believe a POSITA would have known that standards organizations afforded manufacturers these type of design choices. *See* Section IV, above. The modification of Raven involves the simple

substitution of one known component for another, which will function in the same manner with predictable results.

164. Third, I believe a POSITA would have known that a multi-fiber or MPO ferrule provides a bandwidth benefit (*e.g.*, increased data transfer capacity) because the multi-fiber ferrule of Kuffel enables multiple optical fibers to be connected to transfer data, as opposed to only two optical fibers in the LC connector described in Raven. I believe this was generally known in the field at least in the 1990s, but certainly well before the time of the '760 patent. *See, e.g.*, EX1004, 4:8-57. Thus, a POSITA would have been motivated to modify Raven to incorporate a multi-fiber connector, such as the MPO connector including an MT ferrule described in Kuffel, when a higher-data capacity was desired than could be provided by a duplex ferrule design.

165. A POSITA would have readily understood that swapping a multi-fiber ferrule to replace a duplex ferrule design would have been obvious to try among a finite number of identifiable, predictable solutions with reasonable expectation of success because there are only a limited number (pursuant to standards in the industry) of ferrule configurations used in fiber optic connectors (single ferrule, dual ferrule, multi-fiber ferrule), and any one of these end ferrule connections can be utilized with reasonable expectation of success because the type of connection does

not affect other aspects of the connector, such as the latching mechanism of the connector with a respective receptacle. Such a combination is also a simple substitution of Raven's known duplex LC ferrule with Kuffel's known MT ferrule, with the predictable results of the advantages described above. Similarly, it is a known technique to improve Raven's device with the features of Kuffel's MPO connector, again as expressly disclosed by Kuffel and described above.

166. A POSITA would have had reasonable expectation of success in the combination of Raven and Kuffel as the modification involves the direct replacement of one known type of ferrule for another, which would have been readily implementable for someone having ordinary skill in the art as of the effective priority date of the '760 patent. Both Raven and Kuffel expressly acknowledge such a modification to the ferrule type would have been obvious and purposefully set forth components which the POSITA would understand how to apply to a variety of connector formats. *See, e.g.*, EX1003, 20:3-4; EX1004, 4:33-67. The combination retains Raven's latching mechanisms and merely replaces an interior component, which is a standard upgrade, according to Kuffel, that does not change the principle operation of Raven's latching mechanisms, as accounted for in Raven's description.

167. Finally, as explained above, I know that the MT ferrule is a product made by Petitioner (US Conec) that certainly pre-dated the '760 patent, as I recall MT ferrules at least in the 1990s, and as further demonstrated by the Sayegh and Satake references. EX1025; EX1026, 4:55-58. A male MT ferrule is configured to hold a plurality of optical fibers that are aligned between first and second guide pins and a female MT ferrule is configured to hold a plurality of optical fibers that are aligned between first and second guide holes that receive the guide pins of a male MT ferrule. EX1025. For another example, authors from US Conec and Tyco Electronics released a white paper about MT ferrules in 2006, illustrating they were well-known over a decade prior to the '760 patent issuing. EX1027. Finally, there are other prior-art references in this declaration that also disclose using MT ferrules in fiber optic connectors. *See, e.g.*, EX1004, 5:17-22, FIGs. 3-5.

168. Accordingly, it is my opinion that the modification of Raven's connector to include the multi-fiber ferrule disclosed in Kuffel would have been obvious to a POSITA. Throughout my analysis herein, when I refer to the combination of Raven and Kuffel, it is the above-described particular combination to which I refer, which involves replacing Raven's two ferrules (*e.g.*, a duplex LC connector) with Kuffel's multi-fiber ferrule (*e.g.*, an MT ferrule).

169. I now map the elements of the particular claims in this ground to the prior art.

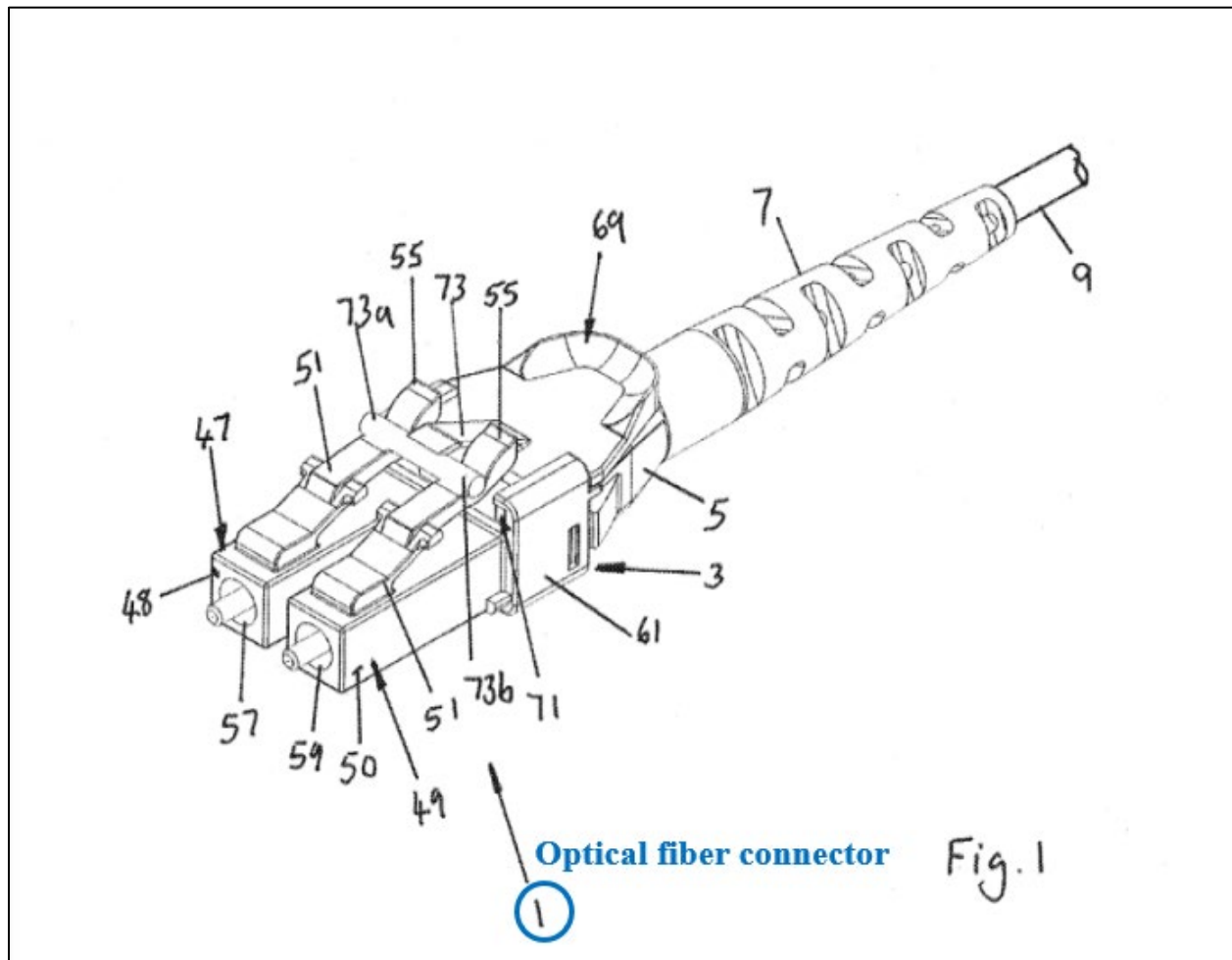
B. Claim 1

1. Preamble – “An optical fiber connector configured for mating with a receptacle, the optical fiber connector comprising”

170. It is my opinion that Raven in view of Kuffel discloses “[a]n optical fiber connector configured for mating with a receptacle, the optical fiber connector.”

171. I understand from counsel that a preamble is assumed to be non-limiting unless certain conditions are met, such as the preamble defining structure that is used in and necessary for the claimed invention. Here, in my opinion the preamble of Claim 1 is not limiting because it does not define any necessary structure or otherwise serve to limit Claim 1. Regardless, it is my opinion that Raven and Kuffel disclose the preamble.

172. Raven discloses an optical fiber connector configured for mating with a receptacle. EX1003, 1:2-4 (“The present invention relates to a connector device for a fibre optic cable...”). Raven discloses numerous embodiments of optical fiber connectors and claims fiber optic connectors. *See, e.g.*, EX1003, FIGs. 5-8, 12, cls. 1-38. For example, Raven illustrates an optical fiber connector in Figure 1.



EX1003, FIG. 1 (annotated).

173. A POSITA would have readily understood that Figure 1 shows an optical fiber connector 1 that is designed, for example, to be inserted into an adapter or receptacle. *See, e.g.,* EX1003, 1:5-19 (describing the plugging and unplugging of fiber optic connectors into receiving ports), 17:16-20 (explaining that fiber cable assembly 1 includes latching lever 51 to “engage a complementary formation,” such as, *e.g.,* an adapter). This is the same type of optical fiber connector as disclosed in the ’760 patent. *See, e.g.,* EX1001, Abstract, FIG. 5, 1:34-64 (explaining

the requirement for high-density panels in data centers and disclosing optical connectors), FIGs. 5, 8 (illustrating example embodiments of an optical fiber connector).

174. Further, the '760 patent illustrates that the term “receptacle” simply means a structure that receives each of the LC connectors or a single MPO connector. *See, e.g.*, EX1001, 5:64-6:12, 8:22-26, FIGs. 1A-1D (showing receptacles 102), FIG. 9 (showing receptacle 902). Raven discloses connectors “configured for mating with” receptacles and thus satisfies this claim element.

175. Similarly, Kuffel provides that its disclosure “relates generally to communication connectors, and more particularly, to an optical communication connector.” EX1004, 1:5-7.

176. Therefore, it is my opinion that Raven in view of Kuffel discloses claim element [1.P] of the '760 patent.

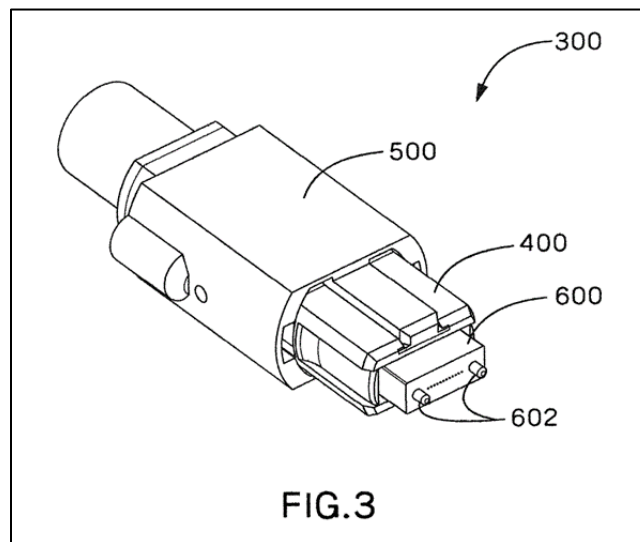
2. Element [1.1] – “an MT ferrule configured to hold a plurality of optical fibers”

177. It is my opinion that Raven in view of Kuffel renders obvious “an MT ferrule configured to hold a plurality of optical fibers.”

178. Raven does not appear to expressly disclose an MT ferrule configured to hold a plurality of optical fibers. However, Raven explicitly provides that “its general teachings are applicable to fibre optic cable assemblies having at least two

optical fibres.” EX1003, 19:28-20:2. MT ferrules were well known in the prior art, for example, as explicitly taught in Kuffel. *See* Sections V.B, VII.B.

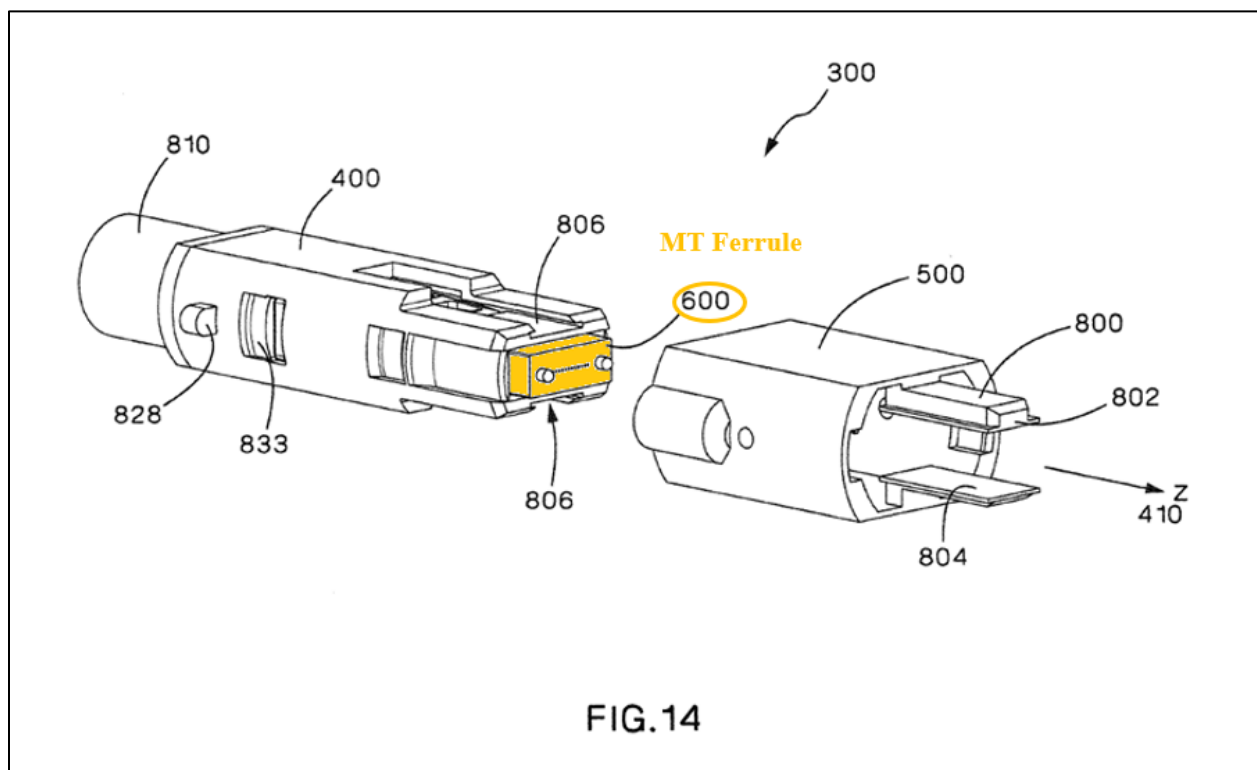
179. Kuffel discloses a fiber optic connector system having an MPO connector 300. EX1004, 5:17-27. Kuffel explains MPO connector 300 includes a ferrule 600 “which contains optical fibers for communication.” EX1004, 5:17-22. Kuffel illustrates an MPO connector, having ferrule 600 (which the POSITA would have understood to be an MT ferrule), having an array of fibers disposed in a row between guide pins 602. *See, e.g.*, EX1004, FIG. 3.



EX1004, FIG. 3.

180. In my opinion, Raven modified by Kuffel discloses an MT ferrule configured to hold a plurality of optical fibers.

181. Kuffel discloses various types of optical fiber connectors, including an MPO connector 300. *See, e.g.*, EX1004, 5:17-27. The MPO connector 300 of Kuffel comprises a ferrule 600 configured to hold a plurality of optical fibers. *See, e.g.*, EX1004, 5:17-27 (describing an MPO connector 300 having a ferrule 600 which contains multiple optical fibers), 6:36-53 (describing connector 300 with ferrule 600 as having multiple fibers within the connector), cls. 16-32 (claiming an optical communication connector comprising a ferrule through which multiple optical fibers pass). For example, Figure 14 shows an MT ferrule 600 configured to hold a plurality of fibers:



EX1004, FIG. 14 (annotated).

182. In my opinion, a POSITA would know MPO connectors have MT ferrules. This is very well known in the industry, and in my opinion, any POSITA with knowledge of fiber optic connectors would know MPO connectors have mechanical transfer (MT) ferrules.

183. Further, numerous articles in this field reflect that MPO connectors have MT ferrules. *See, e.g.*, EX1015 (“MT ferrules are key components of MPO connectors which are multi-fiber connectors with high-precision and high-density connection.”).

184. Thus, Kuffel’s ferrule 600 of MPO connector 300 discloses an MT ferrule. As discussed above in Section IX.A, it is my opinion that a POSITA would have found it obvious to modify Raven to include an MT ferrule as disclosed by Kuffel. In summary, the well-known use of multi-fiber ferrules increases the number of fiber connections in a single connector, therefore improving connector density and efficiency of the communication network. This would have motivated a POSITA to modify Raven’s connector to include an MT ferrule. A POSITA would have been able to make such a modification without undue experimentation and would have recognized that doing so would yield predictable results, as discussed above. *See* Section IX.A.

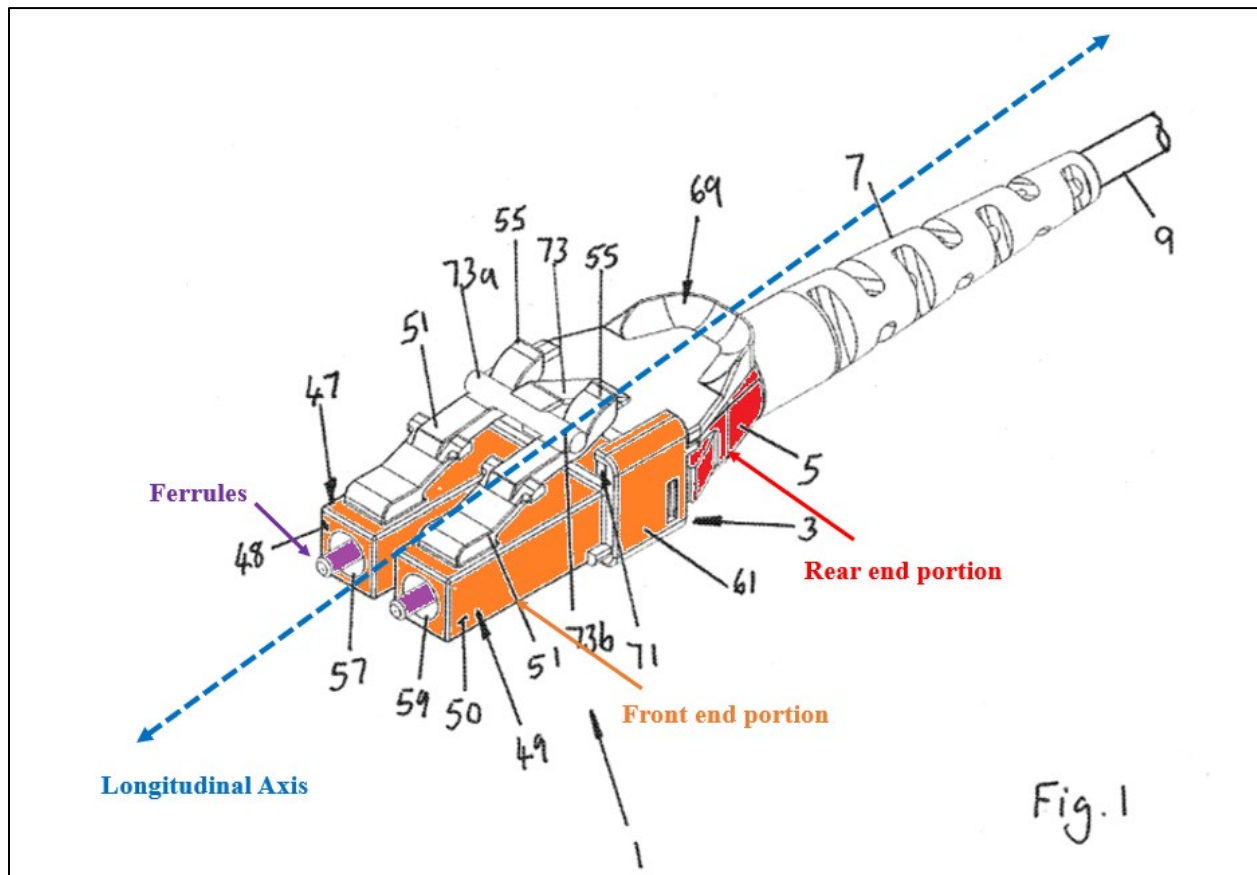
185. Accordingly, a POSITA would have understood that while Raven presents an optical connector for housing duplex LC ferrules, it is obvious to modify this connector to accommodate multi-fiber ferrules, such as MT ferrules, as presented in Kuffel. *See* Section IX.A. Therefore, a POSITA would have been motivated to substitute the MT ferrule of Kuffel into the optical connector of Raven, which would have resulted in a connector maintaining the functionality of Raven that accommodates an MT ferrule. Therefore, it is my opinion that Raven in view of Kuffel renders obvious claim element [1.1] and would have been obvious to combine, as I discuss in Section IX.A. As a POSITA would have found it obvious to substitute Raven’s dual-ferrule LC arrangement with Kuffel’s MT ferrules as I have explained above, in my opinion a POSITA would have found this claim element obvious based on the combined disclosures of Raven and Kuffel. *See* Section IX.A.

186. Therefore, it is my opinion that Raven in view of Kuffel renders obvious claim element [1.1] of the ’760 patent.

3. Element [1.2.1] – “a connector housing having a front end portion and a rear end portion spaced apart along a longitudinal axis”

187. It is my opinion that Raven in view of Kuffel renders obvious “a connector housing having a front end portion and a rear end portion spaced apart along a longitudinal axis.”

188. As shown below, Raven discloses a leading end unit 3 of connector 1 that attaches to and can be separated from housing 5. EX1003, 15:4-13. A POSITA would have understood that at least Raven's housing 5 and leading end unit 3 of connector 1 disclose a portion of the claimed "housing" of claim element [1.2.1].



EX1003, FIG. 1 (annotated).

189. Raven discloses a leading end unit 3 of connector 1 attaches to and can be separated from housing 5. EX1003, 15:4-13. A POSITA would have understood that at least Raven's housing 5 and leading end unit 3 of connector 1 disclose a portion of the claimed "housing" of Element [1.2.1].

190. Raven's "leading end unit 3 includes first and second fibre optic connectors 47, 49" that are "arranged substantially parallel to one another." EX1003, 16:16-18. Raven explains first fiber optic connector 47 includes a first body 48 and second fiber optic connector 49 includes a second body 50. EX1003, 16:19-20. First body 48 and second body 50 are each arranged to receive ferrules 27, 33 of inner bodies 25, 31 such that the ferrules protrude out of cavities 57 and 59 formed within first body 48 and second body 50, respectively. EX1003, 16:20-23. Additionally, Raven teaches "[t]he leading end unit 3 includes a connector part 61 that is arranged to connect first and second fibre optic connectors 47, 49 together." EX1003, 16:24-25.

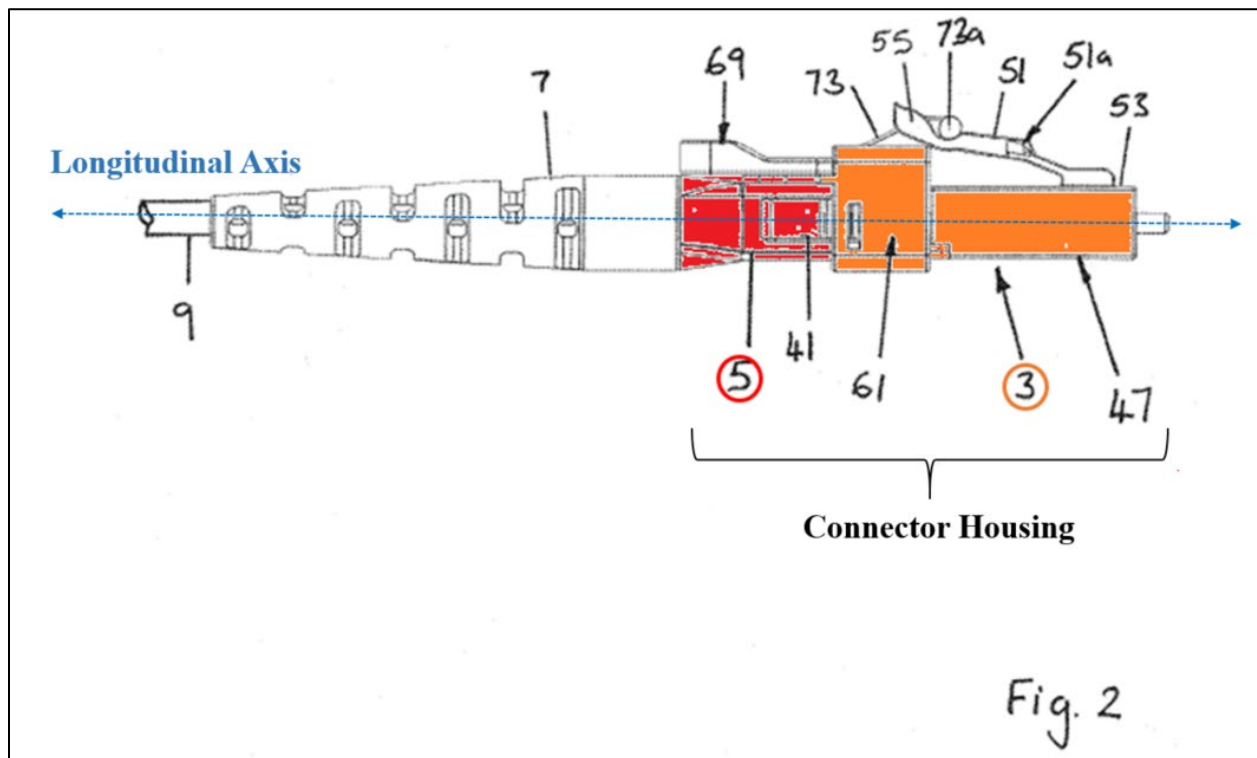
191. Raven's leading end unit 3 therefore acts as a front end portion of a housing and is configured to hold at least one ferrule that is exposed through front end unit 3, as illustrated in Figure 1, reproduced above.

192. Raven's housing 5 "comprises first and second parts 11, 13 that are arranged to snap fit together". EX1003, 14:19-20. Raven further explains housing

This exploded perspective view illustrates the assembly of a cable assembly. The components are labeled with reference numerals: 3 (cable jacket), 7 (braided shield), 11 (insulating sleeve), 13 (insulating sleeve), 15 (insulating sleeve), 17 (insulating sleeve), 19 (insulating sleeve), 21 (insulating sleeve), 23 (insulating sleeve), 25 (insulating sleeve), 26 (insulating sleeve), 27 (insulating sleeve), 28 (insulating sleeve), 29 (insulating sleeve), 31 (insulating sleeve), 32 (insulating sleeve), 33 (insulating sleeve), 34 (insulating sleeve), 35 (insulating sleeve), 36 (insulating sleeve), 37 (insulating sleeve), 38 (insulating sleeve), 39 (insulating sleeve), 40 (insulating sleeve), 41 (insulating sleeve), 42 (insulating sleeve), 43 (insulating sleeve), 44 (insulating sleeve), 45 (insulating sleeve), 46 (insulating sleeve), 47 (insulating sleeve), 48 (insulating sleeve), 49 (insulating sleeve), 50 (insulating sleeve), 51 (insulating sleeve), 52 (insulating sleeve), 53 (insulating sleeve), 54 (insulating sleeve), 55 (insulating sleeve), 56 (insulating sleeve), 57 (insulating sleeve), 58 (insulating sleeve), 59 (insulating sleeve), 60 (insulating sleeve), 61 (insulating sleeve), 62 (insulating sleeve), 63 (insulating sleeve), 64 (insulating sleeve), 65 (insulating sleeve), 66 (insulating sleeve), 67 (insulating sleeve), 68 (insulating sleeve), 69 (insulating sleeve), 70 (insulating sleeve), 71 (insulating sleeve), 72 (insulating sleeve), 73 (insulating sleeve), 74 (insulating sleeve), 75 (insulating sleeve), 76 (insulating sleeve), 77 (insulating sleeve), 78 (insulating sleeve), 79 (insulating sleeve), 80 (insulating sleeve), 81 (insulating sleeve), 82 (insulating sleeve), 83 (insulating sleeve), 84 (insulating sleeve), 85 (insulating sleeve), 86 (insulating sleeve), 87 (insulating sleeve), 88 (insulating sleeve), 89 (insulating sleeve), 90 (insulating sleeve), 91 (insulating sleeve), 92 (insulating sleeve), 93 (insulating sleeve), 94 (insulating sleeve), 95 (insulating sleeve), 96 (insulating sleeve), 97 (insulating sleeve), 98 (insulating sleeve), 99 (insulating sleeve), 100 (insulating sleeve).

100

193. Therefore, housing 5 of Raven discloses a rear end portion that is spaced apart from leading end unit 3 of Raven (disclosing a front end portion) along a longitudinal axis, as illustrated in Figure 1 above and Figure 2 below.



EX1003, FIG. 2 (annotated).

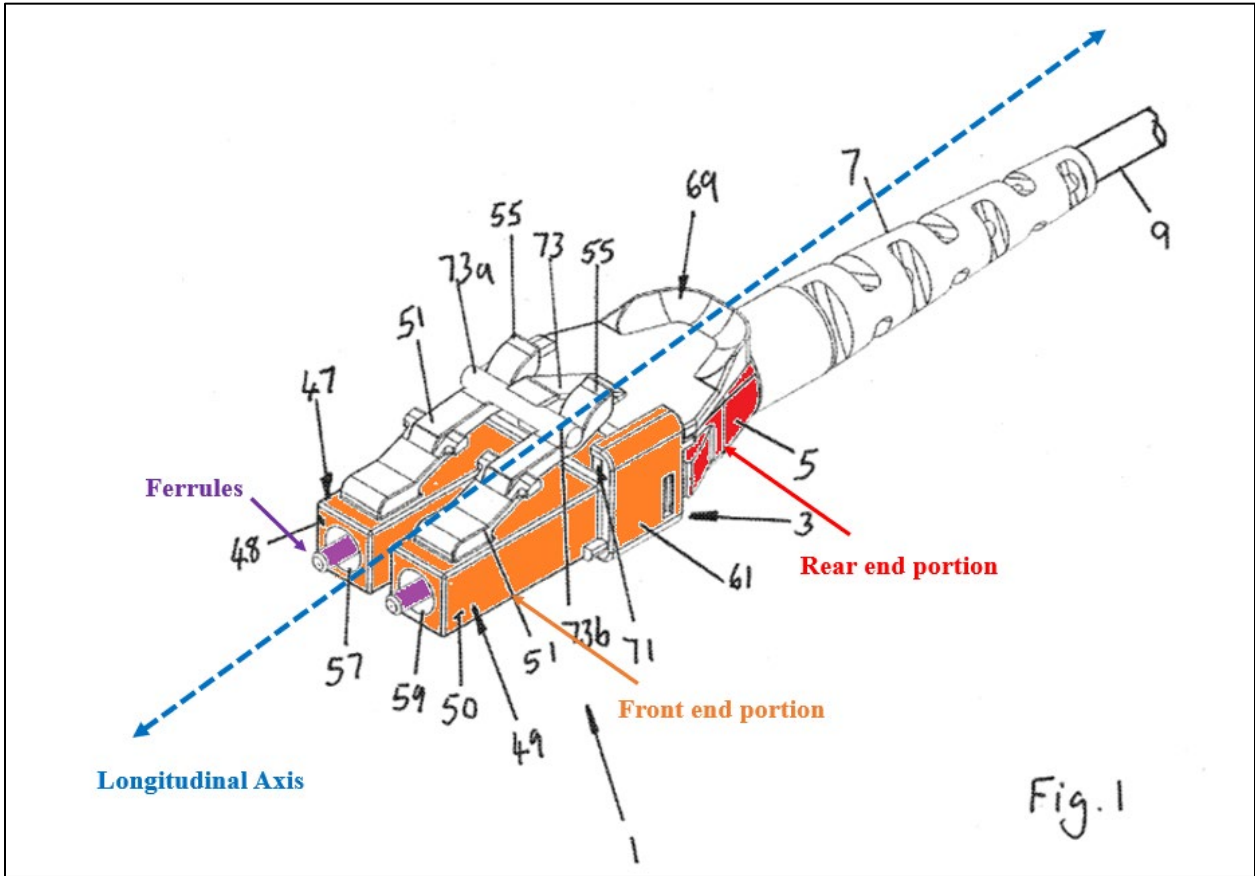
194. Accordingly, Raven discloses claim element [1.2.1]. In addition to Raven disclosing claim element [1.2.1], it would be clear to a POSITA that the combination of Raven and Kuffel (described in Section I.A) also renders obvious claim element [1.2.1]. That is, by substituting the MT ferrule of Kuffel into the optical connector of Raven, the additional claimed features of claim element [1.2.1] that are disclosed by Raven would be preserved in the specific combination of the

prior art. Thus, it is my opinion that the Raven-Kuffel MT ferrule optical connector renders obvious claim element [1.2.1].

4. Element [1.2.2] – “the connector housing configured to hold the MT ferrule such that the MT ferrule is exposed through the front end portion for making an optical connection”

195. It is my opinion that Raven in view of Kuffel renders obvious “the connector housing configured to hold the MT ferrule such that the MT ferrule is exposed through the front end portion for making an optical connection.”

196. Raven discloses “the connector housing configured to hold [a ferrule] such that [the ferrule] is exposed through the front end portion for making an optical connection,” and Raven modified by Kuffel renders obvious that the ferrule is an MT ferrule. *See* Section IX.A. As shown below, Raven’s leading end unit 3 of connector 1 has first and second fiber optic connectors 47, 49 arranged substantially parallel to one another. EX1003, 16:16-18. Raven explains that first fiber optic connector 47 includes a first body 48 and second fiber optic connector 49 includes a second body 50. EX1003, 16:19-20. First body 48 and second body 50 are each arranged to receive ferrules 27, 33 of inner bodies 25, 31 such that the ferrules protrude out of cavities 57 and 59 formed within first body 48 and second body 50, respectively. EX1003, 16:19-23.



EX1003, FIG. 1 (annotated).

197. Raven's leading end unit 3 therefore is configured to hold at least one ferrule such that the at least one ferrule is exposed through leading end unit 3, as illustrated in Figure 1 above.

198. Patent Owner may allege Raven does not expressly disclose a connector housing configured to hold an MT ferrule. However, Raven provides that “its general teachings are applicable to fibre optic cable assemblies having at least two optical fibres.” EX1003, 19:28-20:2. MT ferrules were well known in the prior art, for example, as explicitly taught in Kuffel. *See* Sections VII.B, IX.A.2.

199. Kuffel discloses a fiber optic connector system having an MPO connector 300. EX1004, 5:17-27. Kuffel explains MPO connector 300 includes a ferrule 600 “which contains optical fibers for communication.” EX1004, 5:17-22. Kuffel illustrates an MPO connector, having ferrule 600 (which the POSITA would have understood to be an MT ferrule), having an array of fibers disposed in a row between guide pins 602. *See, e.g.*, EX1004, FIG. 3.

200. As I discussed above, Kuffel discloses connectors of both the LC format and MPO format (which a POSITA would understand includes an MT ferrule). *See* Section IX.B.2 (Element [1.1]), *supra*; *see also* Section IX.A.

201. Like Raven, ferrule 600 (and alignment pins 602) extend outward from housing 400. EX1004, 5:17-22. As discussed above in Section IX.A, it is my opinion that a POSITA would have found it obvious to modify Raven to include an MT ferrule as disclosed by Kuffel. In summary, the well-known use of multi-fiber ferrules increases the number of fiber connections in a single connector, therefore improving connector density and efficiency of the communication network. This would have motivated a POSITA to modify Raven’s connector to include an MT ferrule. A POSITA would have been able to make such a modification without undue experimentation and would have recognized that doing so would yield predict-

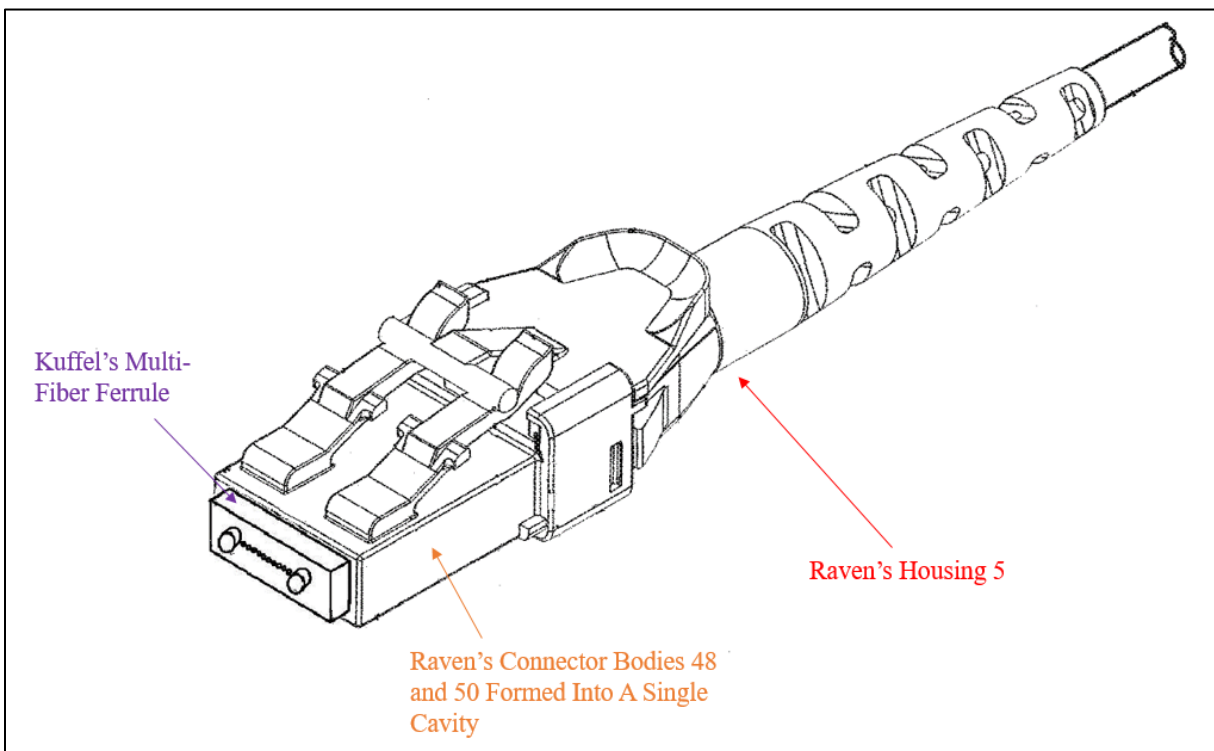
able results, as discussed above. *See* Section IX.A. Kuffel discloses an inner housing 400 having a trailing end aperture (extending out of housing 400 toward assembly 810) and a leading aperture through which an MT ferrule 600 extends.

EX1004, 7:43-8:29. Kuffel additionally discloses an outer housing 500 separable from inner housing 400 through which MT ferrule 600 extends. EX1004, 7:43-8:29. Similar to leading end unit 3 of Raven being rotatable 180 degrees about the longitudinal axis Z-Z and reattached to housing 5 of Raven, Kuffel explains that outer housing 500 can be rotated 180 degrees about the z-axis of ferrule 600 and inner housing assembly 400. *Compare see, e.g.*, EX1004, 7:61-8:10, FIGs. 13-17, *with* EX1003, 18:27-30, FIGs. 6, 7.

202. As I have explained above in Section IX.A, a POSITA would have found it obvious to modify Raven to accommodate Kuffel's multi-fiber ferrule arrangement, as shown in modified Figure 1 below. Moreover, a POSITA would have readily recognized how to modify leading end unit 3 of connector 1 of Raven to accommodate the MT ferrule of Kuffel rather than the dual-type ferrule of Raven (*e.g.*, by modifying the bodies 48 and 50 to be a singular body providing for an aperture sized to accommodate an MT ferrule). In my opinion, a POSITA would have similarly readily recognized how to modify housing 5 of Raven to be sized to accommodate an MT ferrule (*e.g.*, by modifying housing 5 to provide for a single

inner body sized to accommodate an MT ferrule rather than bodies 25, 31, include a single aperture to accommodate the singular body, and remove snapping features 11a, 13b). *See* Section IX.A.

203. A POSITA would have also recognized that the modification of Raven to accommodate Kuffel's multi-fiber ferrule arrangement is readily implementable, as it only involves routine upgrades to the interior of connector housing, and it does not change the principle operation of Raven's latching mechanism. *See* Section IX.A.



EX1003, FIG. 1 (annotated, as modified with Kuffel).

204. Accordingly, a POSITA would have understood that while Raven presents an optical connector for housing duplex LC ferrules, it is obvious to modify this connector to accommodate multi-fiber ferrules, such as MT ferrules, as presented in Kuffel. *See* Section IX.A. Therefore, a POSITA would have been motivated to substitute the MT ferrule of Kuffel into the optical connector of Raven, which would have resulted in a connector maintaining the functionality of Raven that accommodates an MT ferrule.

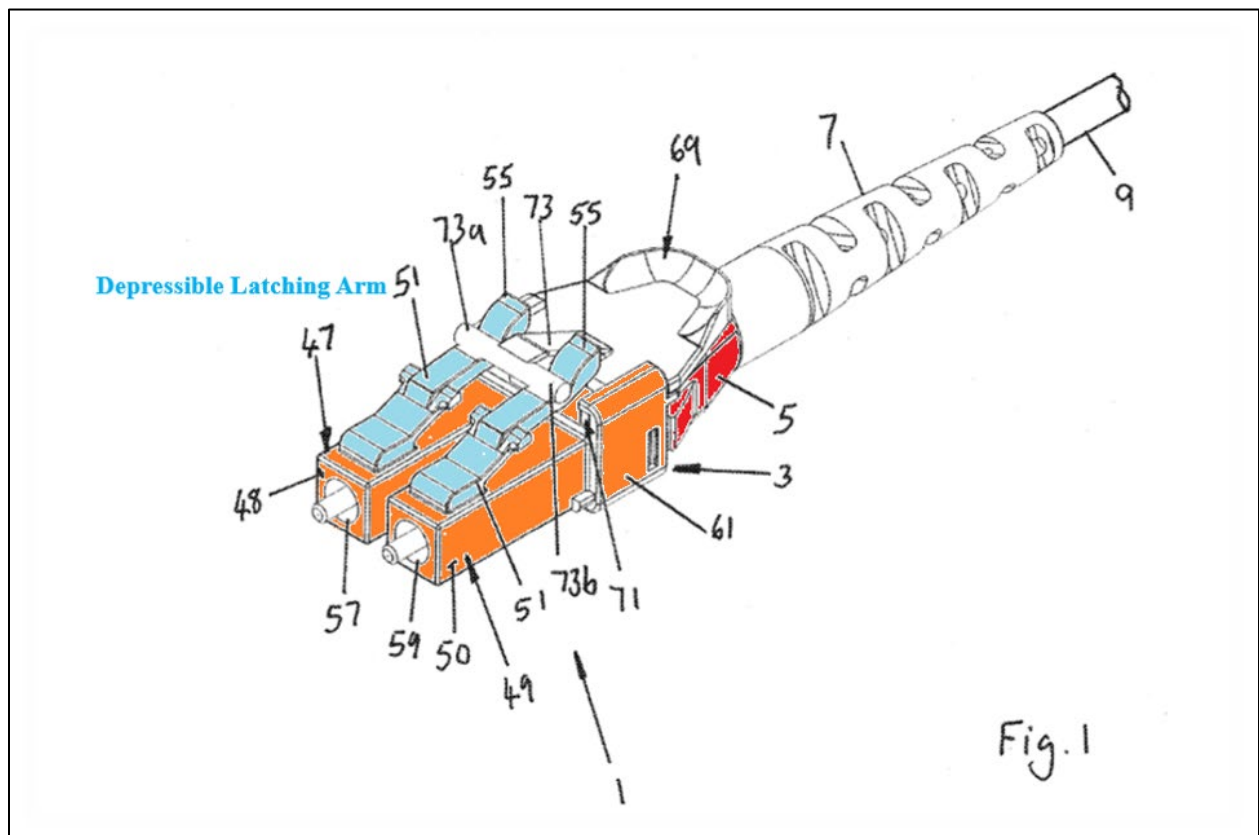
205. A POSITA would have recognized that such a modification would be advantageous and would allow housing 5 to be formed as a single unit like inner housing 400 of Kuffel (thus eliminating the need for manufacturing or reconfiguring multiple components 11, 13 and snap fit connectors 11a, 13b of housing 5). *See* Section IX.A.

206. A POSITA would have recognized that, advantageously, such a modification would have reduced the amount of components required for manufacturing housing 5 of Raven and provided for benefits including reduced potential for alignment error of components 11, 13 or failure of snap connectors 11a, 13b. I believe the POSITA would have been able to make such a modification without undue experimentation and would have recognized that doing so would yield predictable results, as discussed above. *See* Section IX.A.

207. Therefore, it is my opinion that Raven in view of Kuffel renders obvious claim element [1.2.2].

5. Element [1.3] – “a depressible latching arm connected to the connector housing for latching with the receptacle when the optical fiber connector is mated with the receptacle to releasably retain the optical fiber connector in the receptacle; and”

208. It is my opinion that Raven in view of Kuffel renders obvious “a depressible latching arm connected to the connector housing for latching with the receptacle when the optical fiber connector is mated with the receptacle to releasably retain the optical fiber connector in the receptacle.” *See, e.g., EX1003, FIG. 1.*



EX1003, FIG. 1 (annotated).

209. For example, Figure 1 of Raven illustrates a depressible latching arm (*e.g.*, latching lever 51) to be connected to the connector housing (*e.g.*, leading end unit 3 and housing 5). *See, e.g.*, EX1003, FIG. 1, 17:16-30 (“Each latching lever 51 is attached to an upper surface 53 of the connector 47, 49.”).

210. Raven additionally explains that each of first and second optical fiber connectors 47, 49 includes a latching lever 51 “that is arranged to releasably lock the respective fibre optic connector device to a complementary connector device.” EX1003, 17:16-18. The “complementary connector device” is a receptacle for mating with optical fiber connector 1, as discussed above. *See* Section IX.B.1 (claim element [1.P]), *supra*. Raven further describes the locking mechanism of latching lever 51 is “arranged to engage a complementary formation in order to lock the connector to the complementary connector.” EX1003, 17:18-20.

211. Specifically, Raven’s locking lever 51 can be moved from a locking position to an unlocking position by “pushing a free end 55 of the latching lever downwards towards the upper surface 53” of connector 47, 49. EX1003, 17:21-26. Raven notes that each latching lever 51 is arranged substantially in line with the longitudinal axis of its respective body 48, 50. *See, e.g.*, EX1003, 17:27-28, FIG. 1.

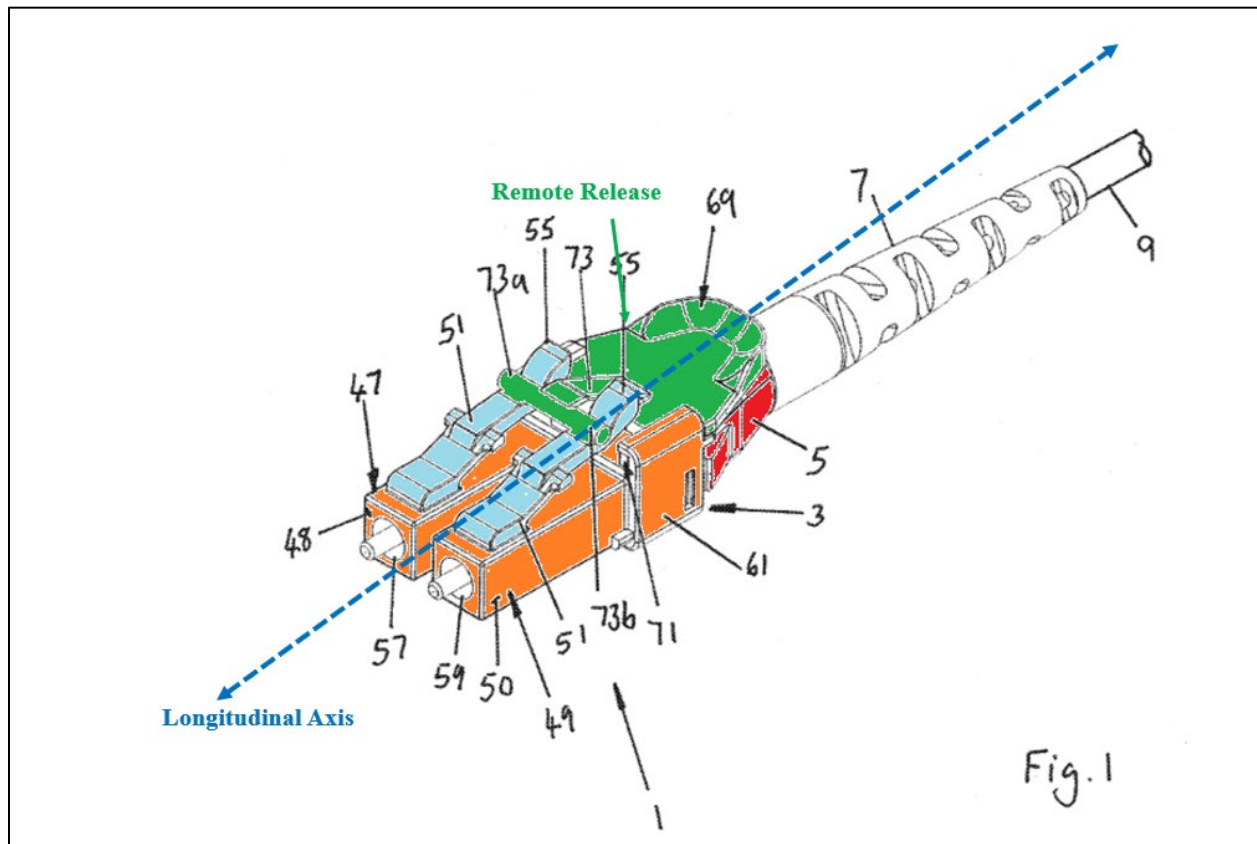
212. In my opinion, the purpose of latching lever 51 is to allow for latching with a device (*e.g.*, a receptacle). *See, e.g.*, EX1003, 1:5-19 (explaining that in data

communication systems fiber optic cables “are frequently used to connect between communications nodes” and that within such systems, cable connectors are received within complementary devices, e.g., complimentary receiving ports), 11:24-12:7 (explaining a connector device comprising optical fibers and a connector body arranged to be releasably locked to a complementary connector).

213. Therefore, it is my opinion that Raven in view of Kuffel renders obvious claim element [1.3].

6. Element [1.4] – “a remote release connected to the connector housing for movement relative to the connector housing along the longitudinal axis, the remote release being configured to be pulled rearward along the longitudinal axis to depress the depressible latching arm for releasing the optical fiber connector from the receptacle”

214. It is my opinion that Raven discloses “a remote release connected to the connector housing for movement relative to the connector housing along the longitudinal axis, the remote release being configured to be pulled rearward along the longitudinal axis to depress the depressible latching arm for releasing the optical fiber connector from the receptacle.” *See, e.g.*, EX1003, FIG. 1.



EX1003, FIG. 1 (annotated).

215. Raven explains that its fibre optic cable assembly 1 includes a manually operable control 69 “arranged to actuate the latching levers 51 . . . simultaneously.” EX1003, 14:15-16, 18:1-3. Raven further explains that “[t]he manually operable control 69 is arranged to slide with respect to the leading end unit 3 between a first position wherein the levers 51 are in a locking condition to a second position wherein the levers are in an unlocked condition.” EX1003, 18:3-5.

216. In operating the device of Raven, a user would slide manually operable control 69, including actuator 73 and actuator members 73a, 73b, to push a free

end 55 of the latching lever downwards toward the upper surface of connector bodies 48, 50. *See, e.g.*, EX1003, 17:16-28, 18:1-19, FIG. 1.

217. In my opinion, a POSITA would consider manually operable control 69, along with actuator 73 and actuator members 73a, 73b, to be a remote release. Together, they serve as a “remote release” because manually operable component 69 is remote relative to actuating members 73a, 73b, which contact and cause latching levers 51 to “release.” A POSITA would further understand manually operable control 69 is connected to the connector housing (*e.g.*, leading end unit 3) and is configured to move relative to the connector housing along the longitudinal axis in accordance with the description of Raven.

218. In addition to Raven disclosing claim element [1.4], it would be clear to a POSITA that the combination of Raven and Kuffel (described in Section IX.A) also renders obvious claim element [1.4]. That is, by substituting the MT ferrule of Kuffel into the optical connector of Raven, the additional claimed features of claim element [1.4] that are disclosed by Raven would be preserved in the specific combination of the prior art.

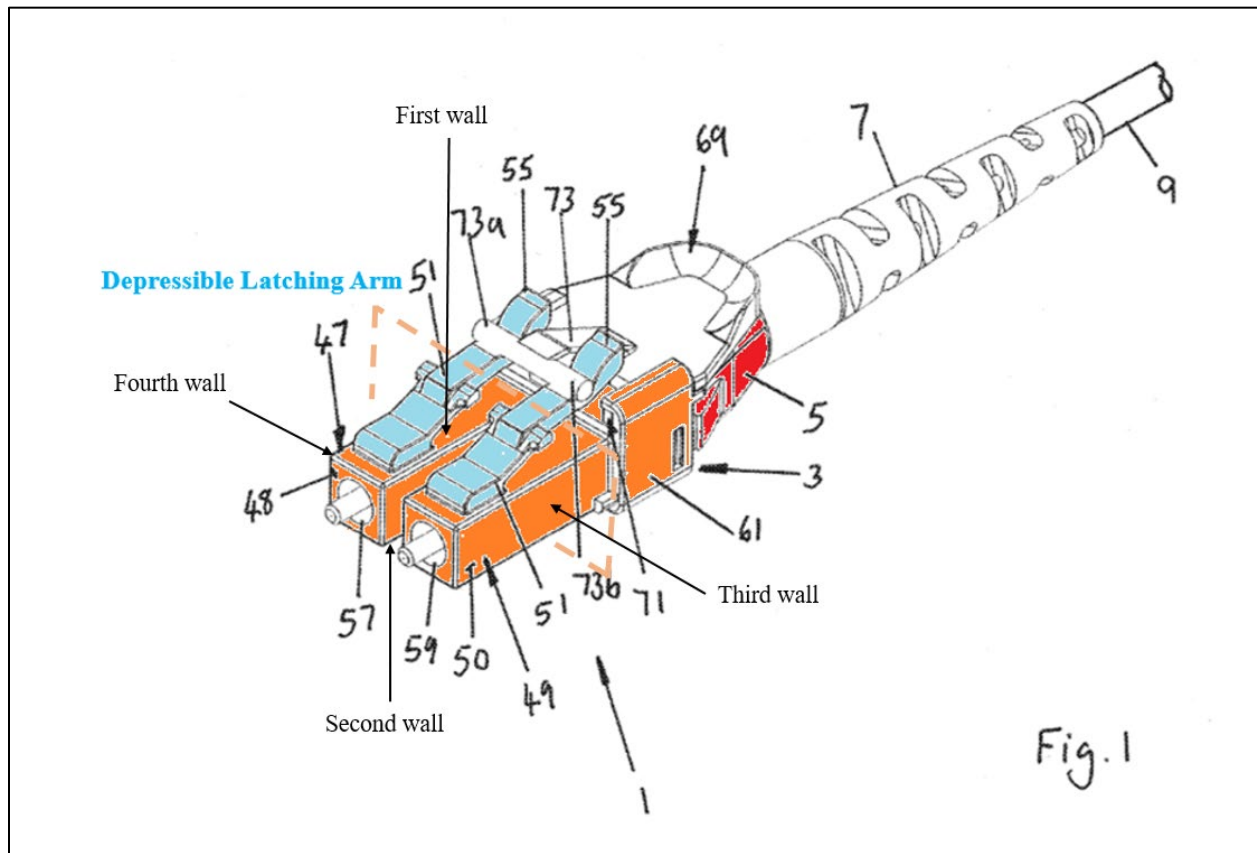
219. Therefore, it is my opinion that Raven in view of Kuffel renders obvious claim element [1.4].

7. Element [1.5] – “wherein the connector housing has a generally rectangular perimeter including opposite first and second walls and opposite

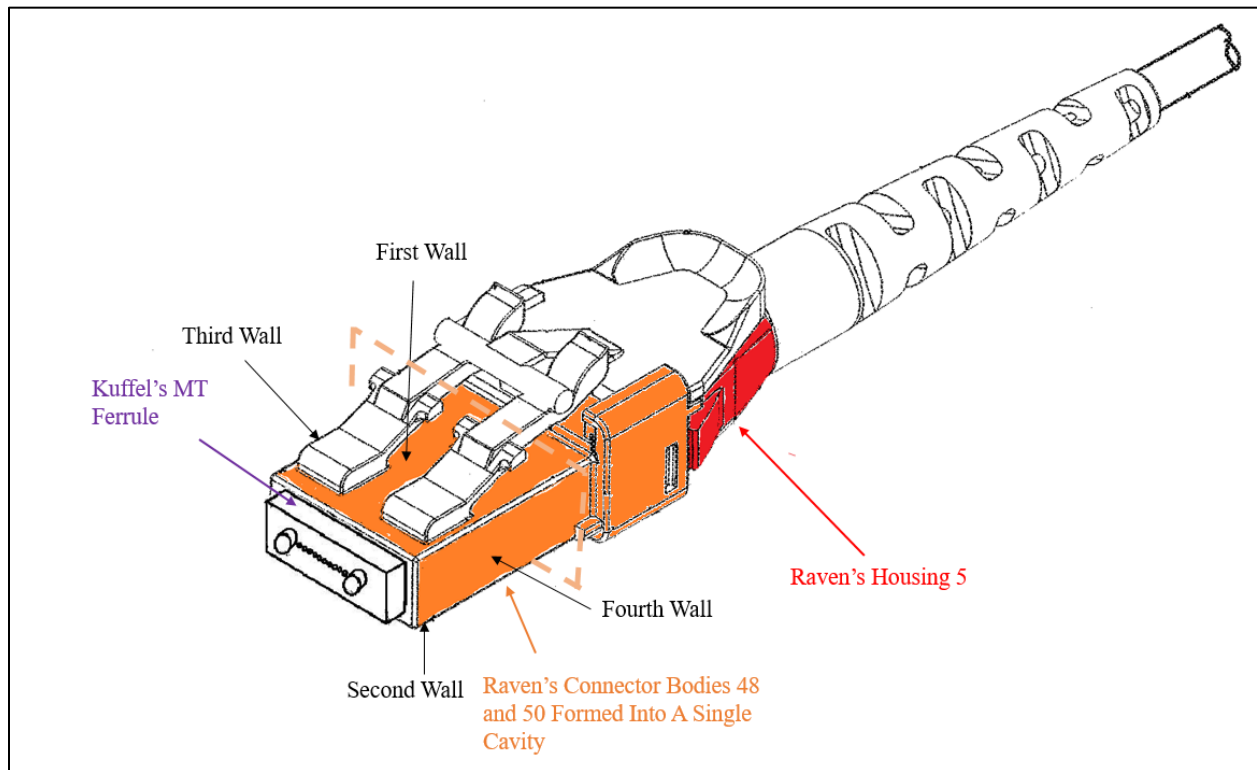
third and fourth walls, the depressible latching arm being located on an exterior of the first wall”

220. It is my opinion that Raven, as modified to accommodate the MT ferule of Kuffel (discussed in Section IX.A) by modifying the connector housing of Raven to have a singular body rather than bodies 48, 50, renders obvious “wherein the connector housing has a generally rectangular perimeter including opposite first and second walls and opposite third and fourth walls, the depressible latching arm being located on an exterior of the first wall.”

221. Specifically, as illustrated in Figure 1 of Raven modified with Kuffel, in Raven’s leading end unit 3, integrated bodies 48, 50 along with connector part 61 have a first wall on a top surface of modified bodies 48, 50, and a second wall opposite the first wall on an underside of integrated bodies 48, 50. The integrated bodies 48, 50 further have two side walls opposite of one another (*e.g.*, third and fourth walls).



EX1003, FIG. 1 (annotated).

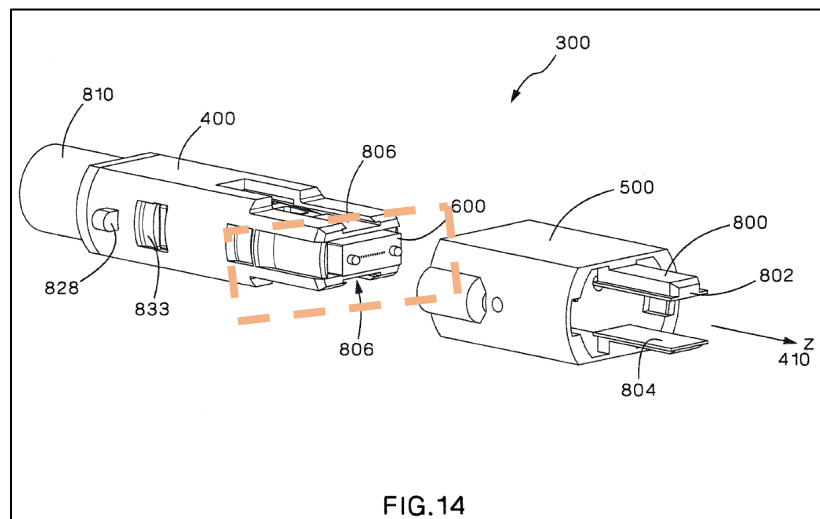


EX1003, FIG. 1 (annotated, modified with Kuffel).

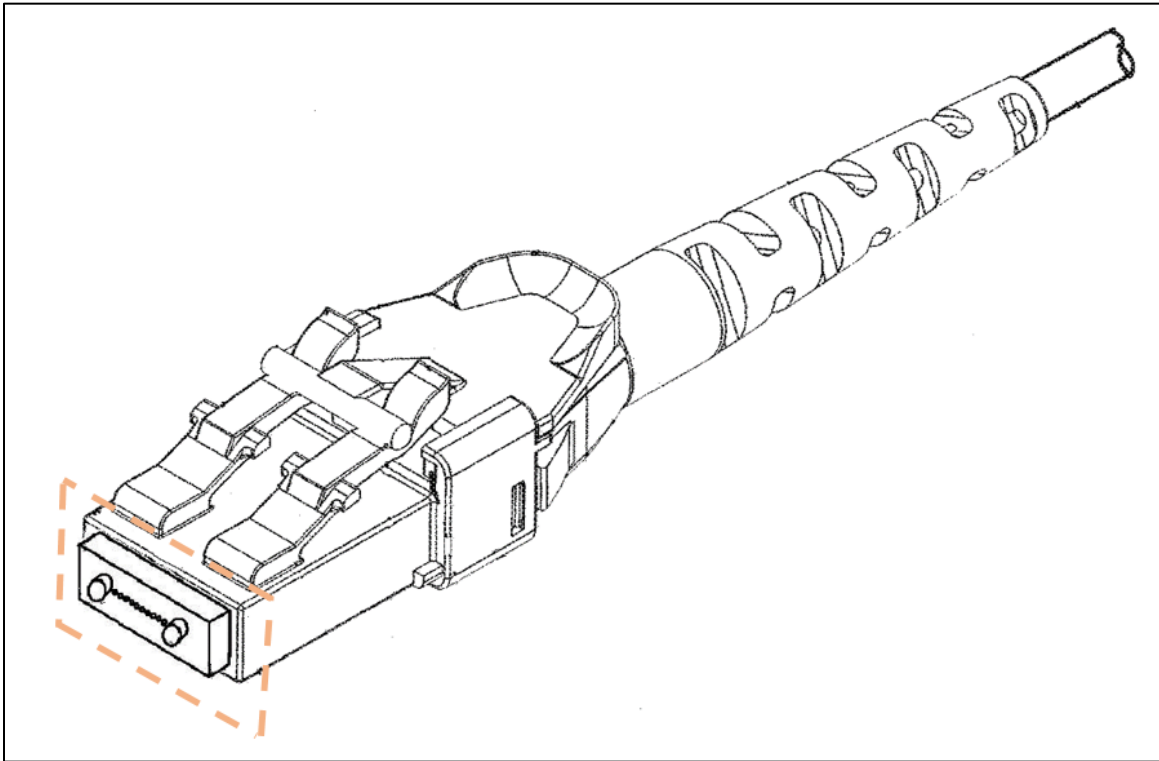
222. Raven explains that leading end unit 3 includes connector part 61 which is preferably formed integrally with connector parts 47, 49. EX1003, 16:24-26. Raven further explains that “connector part 61 provides an open-sided docking bay 63 that is arranged to be mounted onto the leading end of the housing 5,” and leading end unit 3 includes latching formations and additional features for releasably locking leading end unit 3 to housing 5. EX1003, 16:28-17:7. Thus, a POSITA would have understood that Raven’s first, second, third, and fourth walls illustrated in Figure 1 above apply to the entirety of Raven’s connector housing (*e.g.*, leading end unit 3 and housing 5).

223. Raven's latching lever 51 constitutes a depressible latching arm, as I explain above. Additionally, the depressible latching arm of Raven is disposed on an exterior of the first wall of leading end unit 3.

224. The connector housing of Raven has a generally rectangular perimeter, as depicted in the above-annotated Figure 1. Moreover, a POSITA would have readily understood that an MT ferrule has a generally rectangular perimeter, such that Raven's housing modified to accommodate Kuffel's MT ferrule would also be generally rectangular in nature as shown, *e.g.*, in annotated Figure 14 of Kuffel.



EX1004, FIG. 14 (annotated).



EX1003, FIG. 1 (annotated, modified with Kuffel).

225. Therefore, it is my opinion that Raven in view of Kuffel renders obvious claim element [1.5]. *See* Section IX.A.

8. Element [1.6] – “wherein the first wall of the connector housing defines a groove, the remote release being slidably received in the groove”

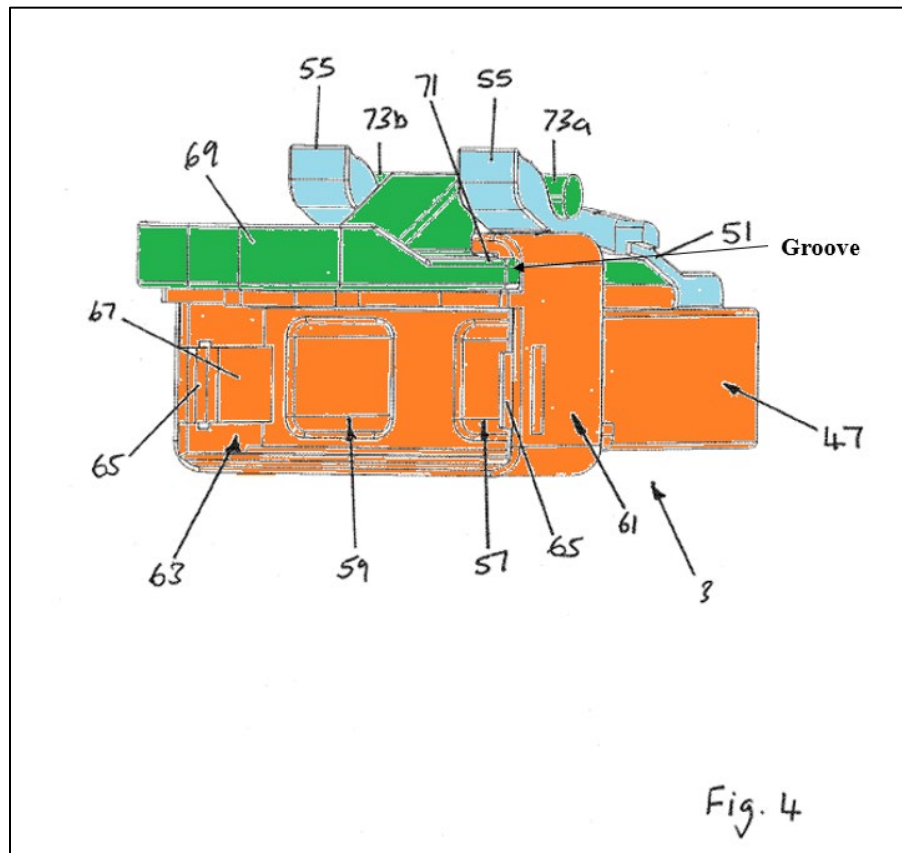
226. It is my opinion that Raven discloses “wherein the first wall of the connector housing defines a groove, the remote release being slidably received in the groove.”

227. Raven discloses a connector housing having a depressible latching arm disposed thereon, as explained above. The first wall of leading end unit 3 of Raven defines a groove between connector part 61 and two latching levers 51 into

228. Raven explains that “manually operable control 69 . . . is arranged to actuate latching levers 51 . . . substantially simultaneously.” EX1003, 18:1-3. Raven further explains that “manually operable control 69 is arranged to slide with respect to the leading end unit 3 between a first position wherein the levers 51 are in

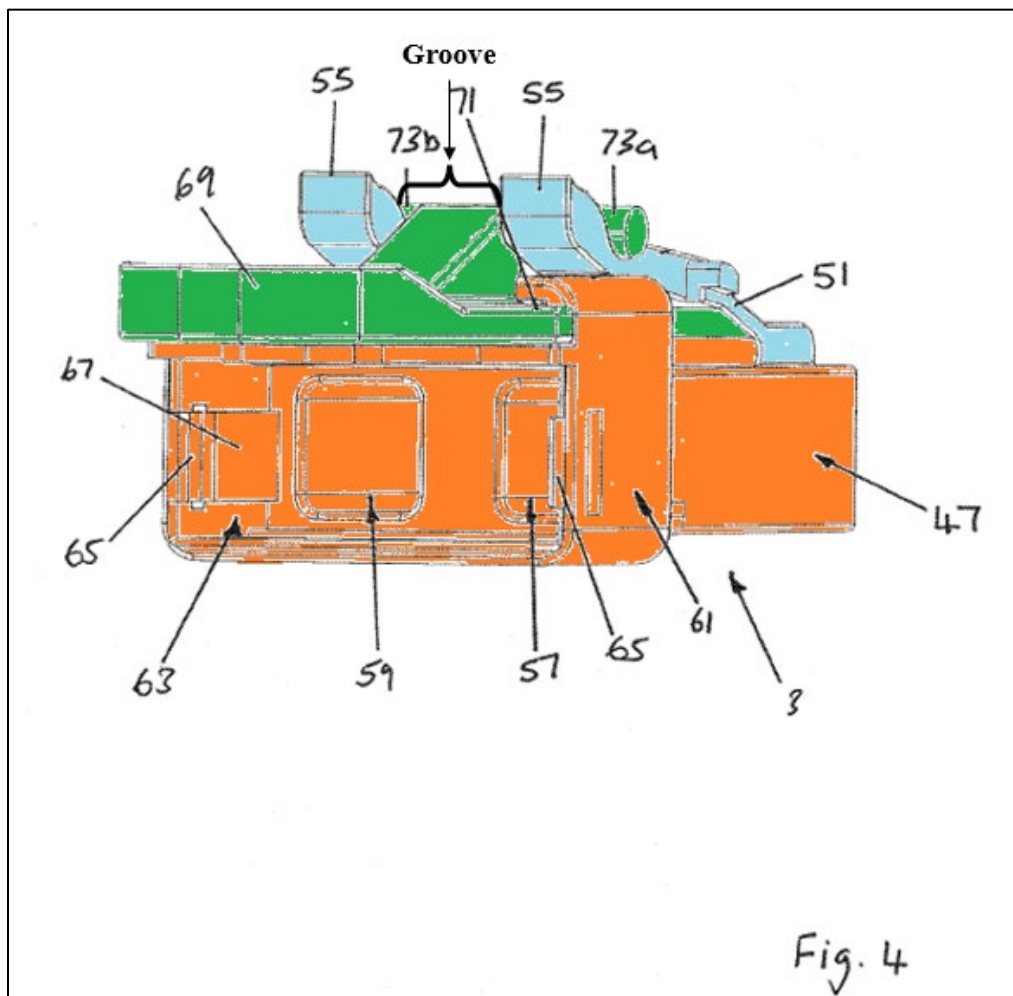
a locking condition to a second position wherein the levers are in an unlocked condition.” EX1003, 18:3-5.

229. Raven’s manually operable control 69 includes actuator 73 having actuator members 73a, 73b attached to a top surface of manually operable control 69. EX1003, 18:6-10. As described and illustrated in Figure 4 below, Raven’s manually operable control 69, having actuator 73, is slidably received within grooves 71 defined by connector piece 61. EX1003, 18:6-10. When Raven’s manually operable control 69 is slidably received by grooves 71, the bottom portion of manually operable control 69 slides into a wider portion of grooves 71 of connector piece 61, and the top portion of manually operable control 69 including actuator 73 (having members 73a and 73b) is slidably received within a narrower portion of grooves 71. EX1003, 18:6-19, FIG. 4.



EX1003, FIG. 4 (annotated).

230. Further, the first wall of Raven's connector housing also includes a narrower groove defined between the two latching levers 51 (including free ends 55), as also seen in Figure 4 below. This narrower groove slidably receives the narrow portion of actuator 73. And even with Kuffel's MT ferrule, these narrower/wider grooves are maintained in Raven's modified device.



EX1003, FIG. 4 (annotated).

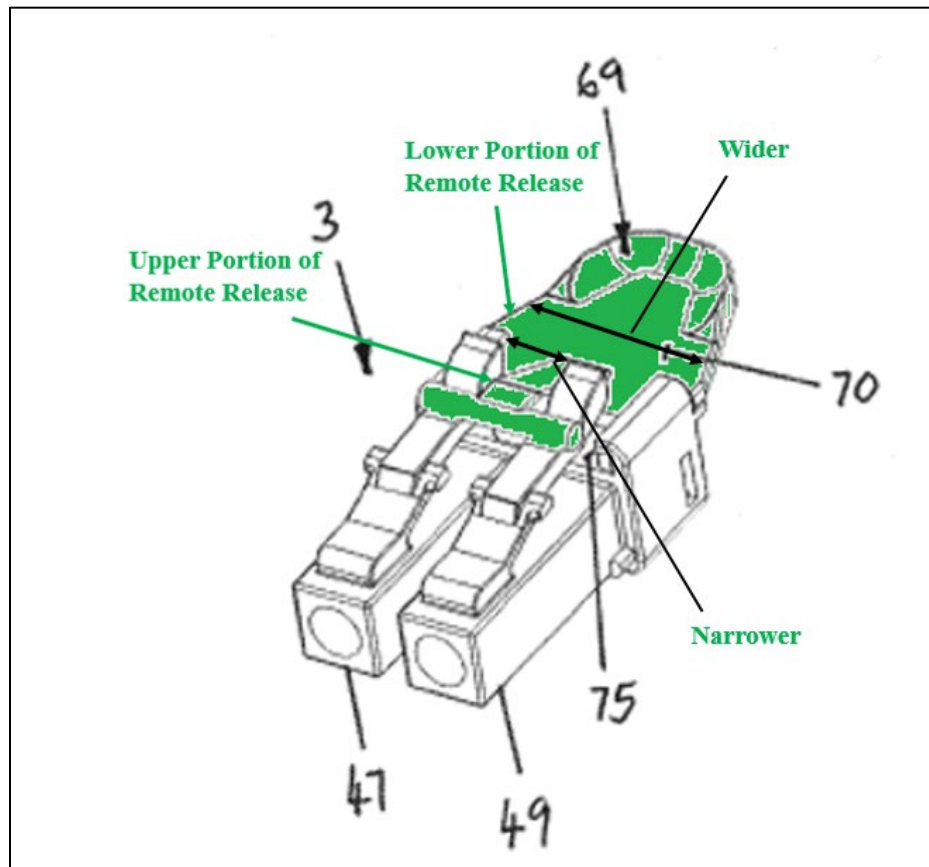
231. In addition to Raven disclosing claim element [1.6], it would be clear to a POSITA that the combination of Raven and Kuffel (described in Section IX.A) also renders obvious claim element [1.6]. That is, by substituting the MT ferrule of Kuffel into the optical connector of Raven, the additional claimed features of claim element [1.6] that are disclosed by Raven would be preserved in the specific combination of the prior art.

232. Therefore, it is my opinion that Raven in view of Kuffel renders obvious claim element [1.6].

9. Element [1.7] – “wherein the remote release comprises a lower portion and a narrower portion above the lower portion, the lower portion being wider than the narrower portion; and”

233. It is my opinion that Raven discloses “wherein the remote release comprises a lower portion and a narrower portion above the lower portion, the lower portion being wider than the narrower portion.”

234. Raven discloses a remote release (*e.g.*, manually operable control 69) which comprises a lower portion having an upper surface 70 to which actuator 73 is attached. *See, e.g.*, EX1003, 18:6-19, FIGs. 3, 4. Actuator 73 is located above upper surface 70 of manually operable control 69, to which actuator 73 is attached. EX1003, 18:6-19, FIGs. 3, 4. And actuator 73 is narrower than the lower portion of manually operable control 69, to which actuator 73 is attached. Said another way, manually operable control 69 including top surface 70 is wider than narrower portion 73.



EX1003, FIG. 3 (excerpt, annotated); *see also* EX1003, FIG. 2.

235. Therefore, it is my opinion that Raven discloses claim element [1.7].

10. Element [1.8] – “wherein the groove includes an inner portion and an outer portion, the inner portion being wider than the outer portion, the inner portion of the groove being configured to slidably receive the lower portion of the latch release and the outer portion of the groove being configured to slidably receive the narrower portion of the latch release such that the first wall releasably retains the latch release in the groove”

236. It is my opinion that Raven discloses “wherein the groove includes an inner portion and outer portion, the inner portion being wider than the outer portion, the inner portion of the groove being configured to slidably receive the lower

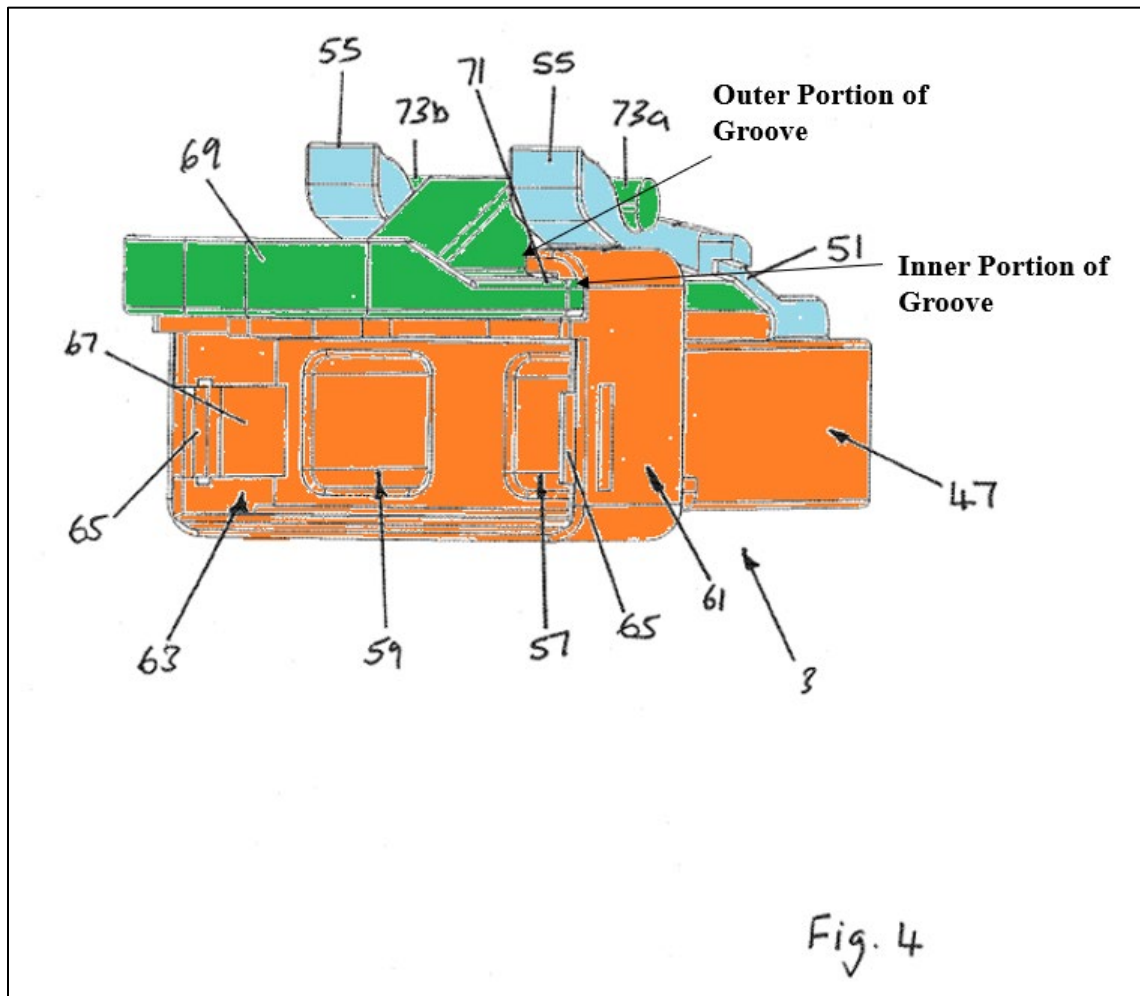
portion of the latch release and the outer portion of the groove being configured to slidably receive the narrower portion of the latch release such that the first wall releasably retains the latch release in the groove.”²

237. Grooves 71 of Raven are formed on the first wall of leading end unit 3. Grooves 71 have an inner portion (*e.g.*, innermost portion of connector piece 61 forming groove 71) and an outer portion (*e.g.*, outermost part of connector piece 61

² Because the claim language refers to the “lower portion of the latch release” and the “narrower portion of the latch release,” for the purposes of my analysis herein, I have assumed that the “latch release” is synonymous with the “remote release” identified in the preceding elements of claim 1, discussed above. I have not evaluated the “latch release” claim language interjected in this element with no context, and I do not offer an opinion that this language is definite; rather, the only way I can currently understand how to consider the prior art relative to this claim element is to make the assumption that the Patent Owner intended to recite “remote release” instead of “latch release.” I reserve the right to evaluate whether this language is in fact definite, however, should I be asked to do so at a later time. This applies to each instance where “remote release” or “latch release” is used both in the ’760 patent and this declaration.

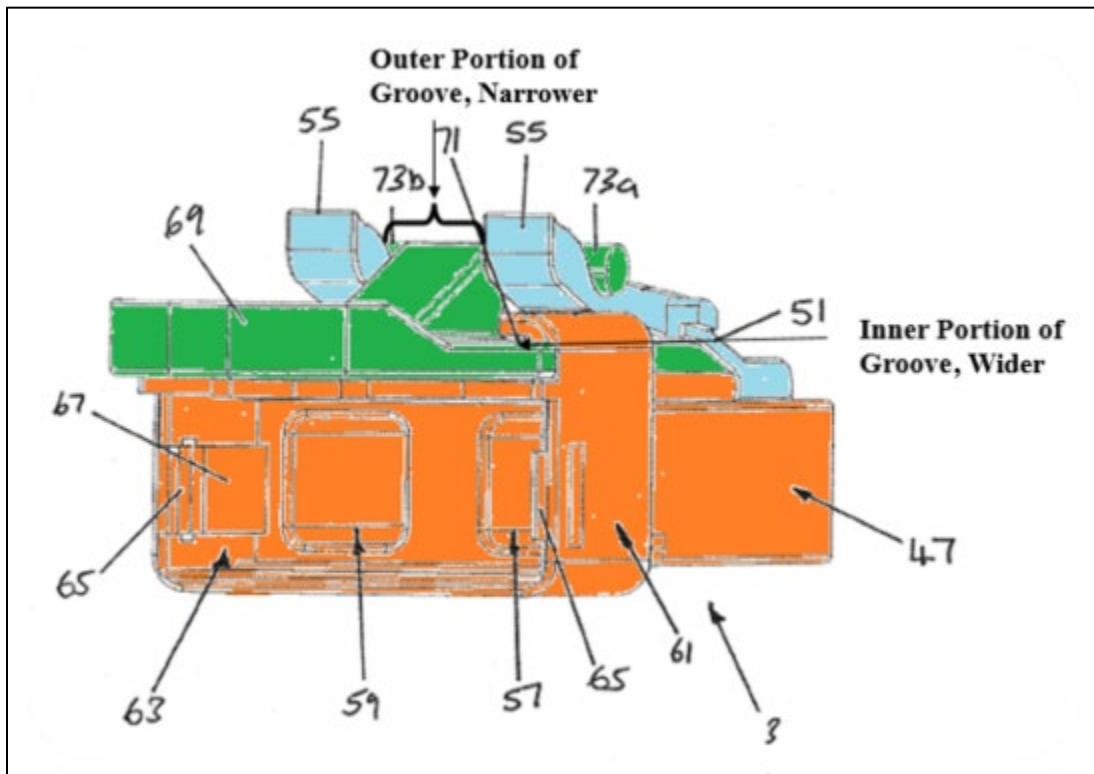
between which actuator 73 of manually operable control 69 slides into latches 55).

The inner portion of grooves 71 of Raven is wider than the outer portion and slidably receives the lower portion of the remote release (*e.g.*, manually operable control 69). The outer portion of grooves 71 is formed by the outer portion of connector piece 61 into which the narrower portion of the remote release (*e.g.*, actuator 73) is slidably received (*e.g.*, the actuator 73 is permitted to slidably move through the outer portion of the groove of Raven's connector). The grooves 71 are formed in connector piece 61 on the first wall of leading end unit 3 and releasably retain the remote release (*e.g.*, manually operable control 69).



EX1003, FIG. 4 (annotated).

238. Additionally, Raven discloses a narrower groove on the first wall defined between the two latching levers 51, which would also satisfy the “outer portion” language of this element, as illustrated in Figure 4 below.



EX1003, FIG. 4 (annotated).

239. The narrower groove defined by the outer portion of connector piece 61 or the narrower groove between latching levers 51 are both “outer” to the “inner” portion of the grooves 71 in the transverse direction. *See, e.g.*, EX1003, FIGs. 1, 2, 4. I do not see any definition or explanation in the ’760 patent about the meaning of the groove comprising an “outer portion” and an “inner portion,” but I believe the plain and ordinary meaning of these terms to encompass at least: (i) groove portions that are inner or outer from one another in the transverse direction; or (ii) groove portions that are inner or outer portions of the overall groove structure, as identified in my labeled diagrams above.

240. The outer portion of the groove of Raven I have labeled above in Figure 4 is “configured to slidably receive the narrower portion of the latch release such that the first wall releasably retains the latch release in the groove,” as recited in this element, because the narrower portion (the actuator 73) is slidably received in either the groove defined by the outer portion of connector piece 61 or the groove between latching levers 51, such that the first wall includes a groove that releasably retains actuator 73 at least in the lateral direction. *See* EX1003, FIG. 4. I believe this understanding complies with the plain and ordinary meaning of this claim language, and again, I note that I do not see any description in the ’760 patent about any particular meaning of “slidably receive” or “releasably retains.” *See generally* EX1001 (failing to use these terms a single time in the specification).

241. Therefore, it is my opinion that Raven discloses claim element [1.8].

242. In summary, Raven in view of Kuffel renders obvious independent claim 1 of the ’760 patent.

C. Claim 2

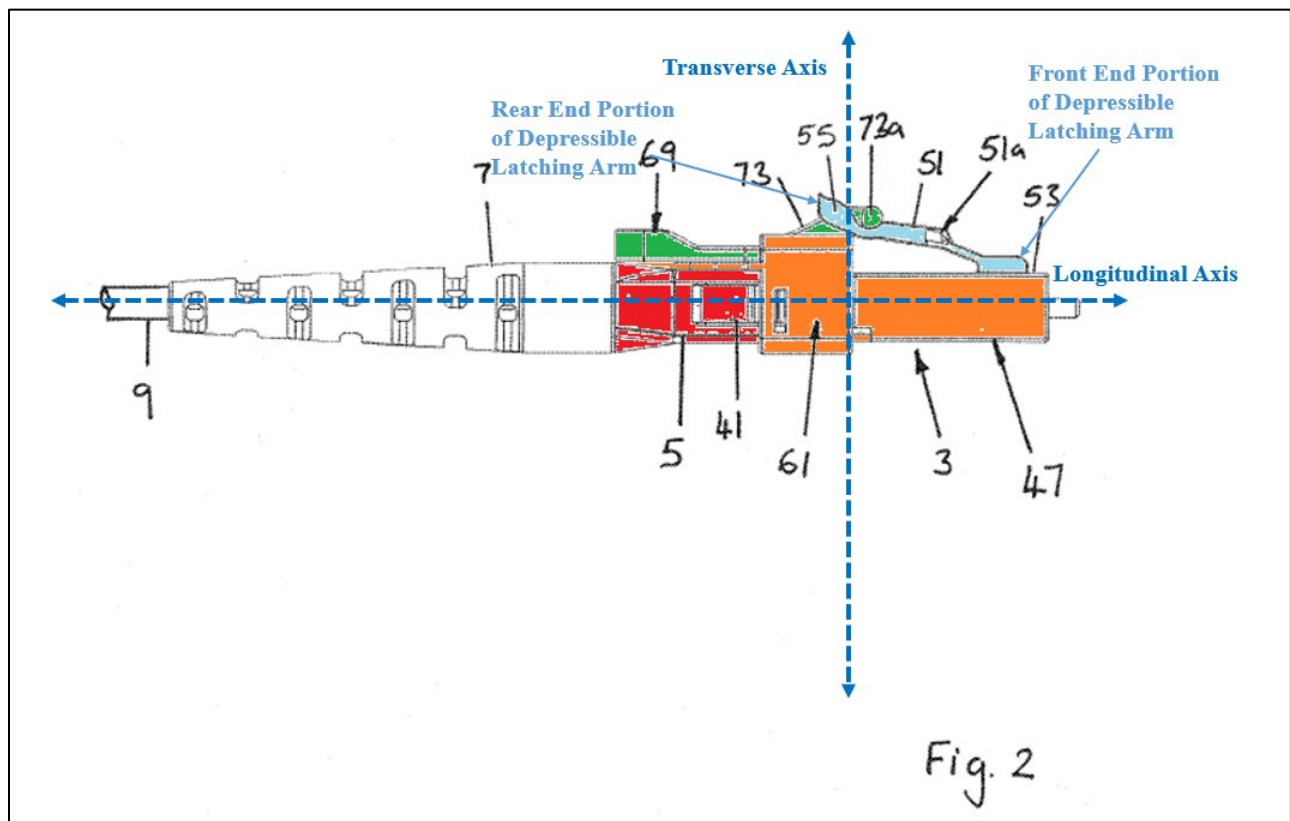
1. Preamble – “The optical fiber connector as set forth in claim 1, wherein”

243. Claim 2 depends upon claim 1, and for at least the reasons discussed above in reference to claim 1, Raven in view of Kuffel renders obvious claim 1. *See* Section IX.B.

244. Additionally, it is my opinion that Raven in view of Kuffel renders obvious “[t]he optical fiber connector as set forth in claim 1.”

2. Element [2.1] – “the depressible latching arm has a front end portion and a rear end portion spaced apart along the longitudinal axis, the depressible latching arm extending transversely outward away from the first wall as the depressible latching arm extends longitudinally from the front end portion to the rear end portion”

245. It is my opinion that Raven discloses “the depressible latching arm has a front end portion and a rear end portion spaced apart along the longitudinal axis, the depressible latching arm extending transversely outward away from the first wall as the depressible latching arm extends longitudinally from the front end portion to the rear end portion.” *See, e.g.,* EX1003, 17:16-18:19, FIGs. 1-3.



EX1003, FIG. 2 (annotated).

246. Raven's latching lever 51 discloses a depressible latching arm, and it is arranged substantially in line with the longitudinal axis of its respective body 48, 50. EX1003, 17:27-28. As shown in annotated Figure 2 above, latching lever 51 is attached to an upper surface 53 of connector body 47 (e.g., a first wall) and extends along the longitudinal axis. *See, e.g.*, EX1003, FIG. 2, 17:16-18:19. Latching lever 51 also extends outward away from upper surface 53 as it extends longitudinally from the front end portion of the housing (e.g., leading end unit 3) toward the rear end of the housing (e.g., housing 5). EX1003, FIG. 2, 17:16-18:19.

247. Therefore, it is my opinion that Raven discloses claim element [2.1].

248. In summary, Raven in view of Kuffel renders obvious Claim 2 of the '760 patent. *See* Section IX.A.

D. Claim 3

1. Preamble – “The optical fiber connector as set forth in claim 2, wherein”

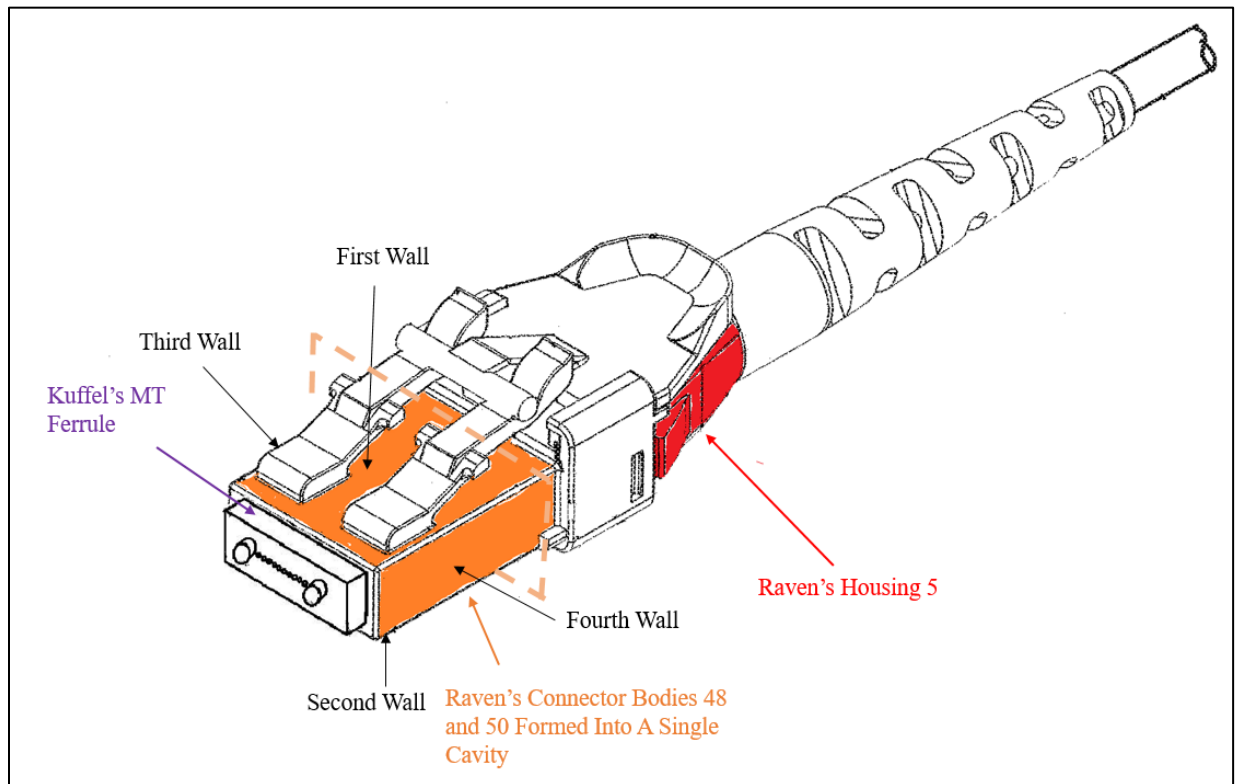
249. Claim 3 depends upon claim 2 and claim 1, and for at least the reasons discussed above in reference to claim 1 and claim 2, Raven in view of Kuffel renders obvious claim 1 and claim 2. *See* Sections IX.B-C.

250. Additionally, it is my opinion that Raven in view of Kuffel renders obvious “[t]he optical fiber connector as set forth in claim 2.”

2. Element [3.1] – “the optical fiber connector is free of depressible latching arms on an exterior of any of the second, third, and fourth walls”

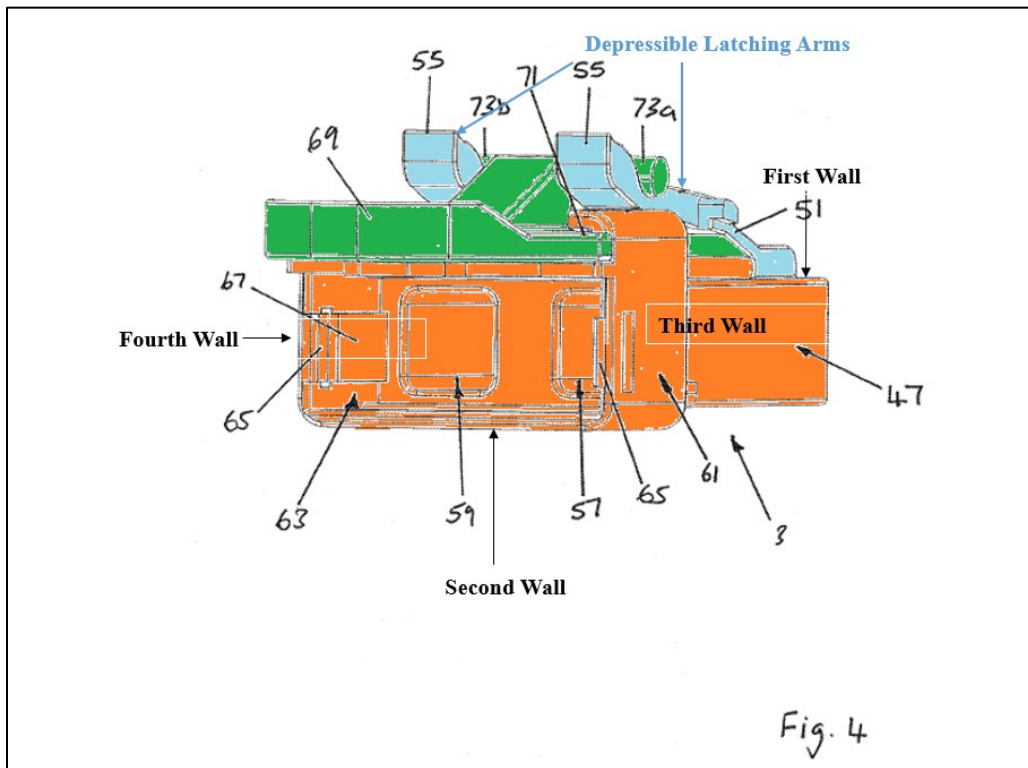
251. It is my opinion that Raven discloses “the optical fiber connector is free from depressible latching arms on an exterior of any of the second, third, and fourth walls.”

252. As explained above with reference to claim element [1.5], when modifying Raven to accommodate the MT ferrule of Kuffel (discussed above in Section IX.B.7), a POSITA would modify the connector housing of Raven to have a singular body rather than first and second bodies 48, 50, which would result in first, second, third, and fourth walls as illustrated in the modified Figure 1, annotated below. *See* Section IX.B.B.7

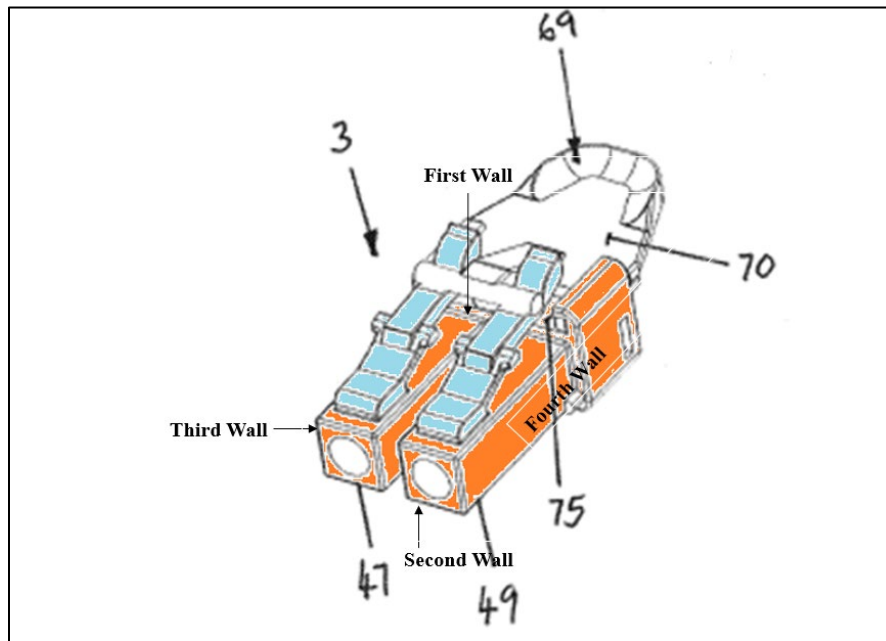


EX1003, FIG. 1 (annotated, modified with Kuffel).

253. A first wall of Raven constitutes an upper surface of connectors 47, 49 and connector bodies 48, 50 to which latching arms 51 are attached. *See, e.g.,* Section IX.B.7, *supra*. Side walls of connector bodies 48, 50 correspond to the claimed third and fourth walls. Section IX.B.7. Furthermore, as illustrated by Raven in Figures 3 and 4, reproduced below, latching levers 51, *e.g.,* depressible latching arms, are attached to the first wall of the connector device of Raven. EX1003, FIGs. 3, 4. Said another way, the second, third, and fourth walls of Raven are free from depressible latching arms. *See, e.g.,* EX1003, FIGs. 3, 4.



EX1003, FIG. 4 (annotated).



EX1003, FIG. 3 (excerpt, annotated).

254. Accordingly, Raven discloses claim element [3.1]. In addition to Raven disclosing claim element [3.1], it would be clear to a POSITA that the combination of Raven and Kuffel (described in Section IX.A) also renders obvious claim element [3.1]. That is, by substituting the MT ferrule of Kuffel into the optical connector of Raven, the additional claimed features of claim element [3.1] that are disclosed by Raven would be preserved in the specific combination of the prior art.

255. Therefore, it is my opinion that Raven discloses claim element [3.1] of the '760 patent.

256. In summary, Raven in view of Kuffel renders obvious claim 3 of the '760 patent.

E. Claim 4

1. Preamble – “The optical fiber connector as set forth in claim 1, wherein”

257. Claim 4 depends upon claim 1, and for at least the reasons discussed above in reference to claim 1, Raven in view of Kuffel renders obvious claim 1. *See* Section IX.B.

258. Additionally, it is my opinion that Raven in view of Kuffel renders obvious “[t]he optical fiber connector as set forth in claim 1.”

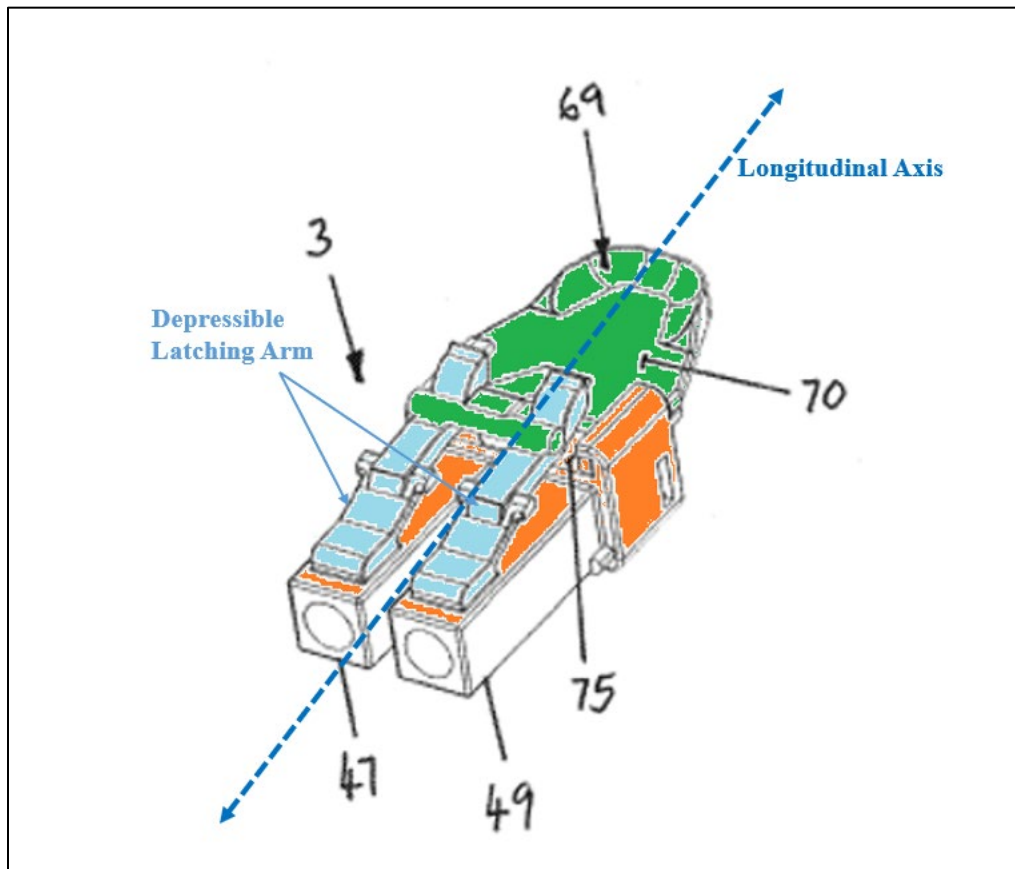
2. Element [4.1] – “the optical fiber connector is configured so that upon release of the remote release after being pulled rearward along the longitudinal axis to depress the depressible latching arm, the depressible latching arm resiliently returns toward an un-depressed position”

259. It is my opinion that Raven discloses “the optical fiber connector is configured so that that upon release of the remote release after being pulled rearward along the longitudinal axis to depress the depressible latching arm, the depressible latching arm resiliently returns toward an un-depressed position.”

260. Raven discloses a remote release (*e.g.*, manually operable control 69) configured to be pulled rearward along the longitudinal axis to depress the depressible latching arm, as I explained above in my analysis of claim element [1.4]. Section IX.B.6; EX1003, 18:6-19. A POSITA would have further understood Raven discloses that, upon release of the remote release (*e.g.*, manually operable control 69), the depressible latching arms (*e.g.*, latching levers 51) of Raven resiliently return toward an undepressed position.

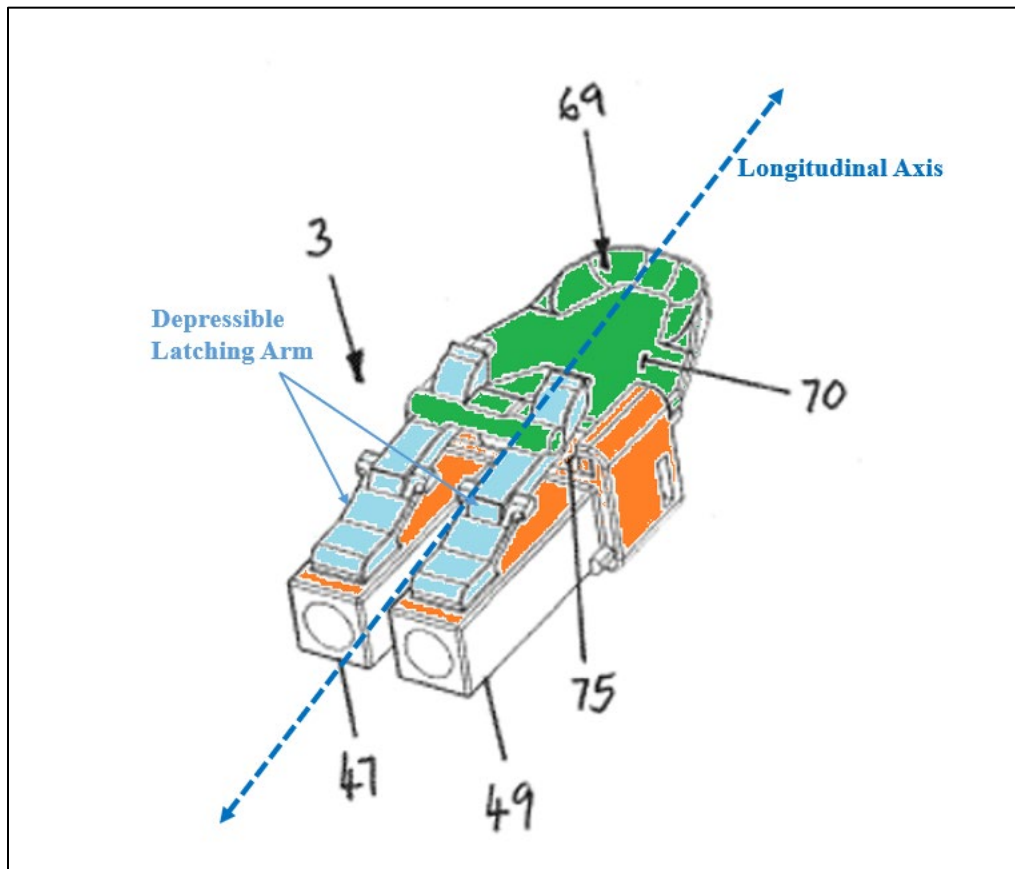
261. Specifically, the manually operable control 69 (*e.g.*, remote release) slides “with respect to the leading end unit 3 between a first position wherein the levers 51 are in a locking condition to a second position wherein the levers are in an unlocked condition.” EX1003, 18:3-5. Further, latching levers 51 (*e.g.*, depressible latching arm) are arranged in “a cantilevered manner”, “resilient”, and “can be moved from a locking position to an unlocked position. The unlocked position is

achieved by pushing a free end 55 of the latching lever downwards towards the upper surface 53. The resiliency of the latching levers 51 returns them to their rest positions when an actuating force is removed.” EX1003, 17:21-26, FIG. 3. Latching levers 51 are movable from a locked to unlocked position as a single unit (*e.g.*, simultaneously). EX1003, 17:21-18:5. And “[a]s the control 69 is moved towards the unlocking position, the upper surface 75 becomes exposed” and “latching levers 51 are depressed”. EX1003, 18:15-17. The unlocked position is achieved by pushing a free end 55 of latching lever 51 downwards towards upper surface 53, as manually operable control 69 slides rearward. EX1003, 17:23-24; *see also* EX1003, FIG. 4. Specifically, latching levers 51’s remote release (*e.g.*, manually operable control 69) slides “with respect to the leading end unit 3 between a first position wherein the levers 51 are in a locking condition to a second position wherein the levers are in an unlocked condition.” EX1003, 18:3-5. Raven’s actuator 73 disposed on a top surface of manually operable control 69 includes members 73a, 73b that move with manually operable control 69. EX1003, 18:6-19. And “[a]s the control 69 is moved towards the unlocking position, the upper surface 75 becomes exposed, the latching levers 51 are depressed and their lower surfaces engage the upper surface 75 of the connector part 61 and cannot be pushed down any further.” EX1003, 18:6-19.



EX1003, FIG. 3 (excerpt, annotated).

262. Thus, Raven discloses sliding its remote release (*e.g.*, manually operable control 69 having actuator 73 and actuator members 73a,b) *rearward* along the longitudinal axis of the connector exposes surface 75 and depresses the depressible latching arm (*e.g.*, latching levers 51) downward.



EX1003, FIG. 3 (excerpt, annotated).

263. Therefore, Raven discloses that sliding its remote release (*e.g.*, manually operable control 69 having actuator 73 and actuator members 73a, b) *rearward* along the longitudinal axis of the connector exposes surface 75 and depresses the depressible latching arm (*e.g.*, levers 51) downward, and that the “resiliency of the latching levers 51 returns them to their rest positions when an actuating force is removed.” EX1003, 17:25-26.

264. Raven discloses that “[t]he resiliency of the latching levers 51 returns them to their rest positions when an actuating force is removed.” EX1003, 17:25-

26; *see also*, *e.g.*, EX1003, 17:16-18:19, FIGs. 1-4. Raven explicitly states that each lever 51 is arranged in a cantilevered manner and is resilient. EX1003, 17:21-22. Thus, Raven discloses that upon remote release (*e.g.*, manually operable control 69) being pulled rearward along the longitudinal axis to depress the depressible latching arm (*e.g.*, latching levers 51), the depressible latching arm resiliently return toward an undepressed position.

265. Accordingly, Raven discloses claim element [4.1]. In addition to Raven disclosing claim element [4.1], it would be clear to a POSITA that the combination of Raven and Kuffel (described in Section IX.A) also renders obvious claim element [4.1]. That is, by substituting the MT ferrule of Kuffel into the optical connector of Raven, the additional claimed features of claim element [4.1] that are disclosed by Raven would be preserved in the specific combination of the prior art.

266. Therefore, it is my opinion that Raven discloses claim element [4.1] of the '760 patent.

267. In summary, Raven in view of Kuffel renders obvious Claim 4 of the '760 patent.

F. Claim 5

1. Preamble – “The optical fiber connector as set forth in claim 1, wherein”

268. Claim 5 depends upon claim 1, and for at least the reasons discussed above in reference to claim 1, Raven in view of Kuffel renders obvious claim 1.

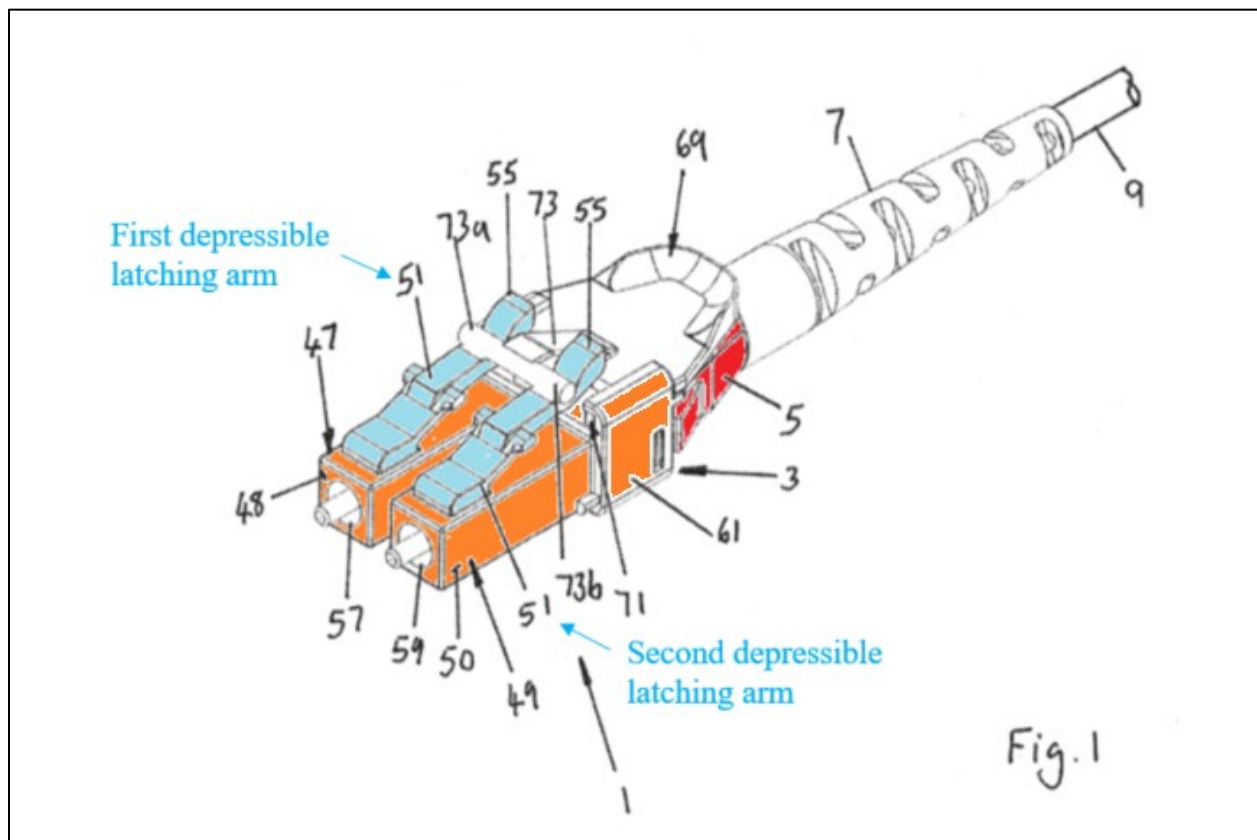
See Section IX.B.

269. Additionally, it is my opinion that Raven in view of Kuffel renders obvious “[t]he optical fiber connector as set forth in claim 1.”

2. Element [5.1] – “the depressible latching arm is a first depressible latching arm, the optical fiber connector further comprising a second depressible latching arm spaced apart from the first depressible latching arm”

270. It is my opinion that Raven discloses “the depressible latching arm is a first depressible latching arm, the optical fiber connector further comprising a second depressible latching arm spaced apart from the first depressible latching arm.”

271. Raven explains “[t]he leading end unit 3 includes first and second fibre optic connectors 47, 49” and that “[e]ach of the first and second fibre optic connectors 47, 49 includes a latching lever 51 that is arranged to releasably lock the respective fibre optic connector device to a complementary connector device.” EX1003, 16:16, 17:16-18, FIG. 1. “Each latching lever 51 is attached to an upper surface 53 of the connector 47, 49.” EX1003, 17:21.



EX1003, FIG. 1 (annotated).

272. Figure 1 of Raven, reproduced above, illustrates a first depressible latching arm and a depressible second latching arm (the respective latching lever 51 for first and second fiber optic connectors 47, 49).

273. Accordingly, Raven discloses claim element [5.1]. In addition to Raven disclosing claim element [5.1], it would be clear to a POSITA that the combination of Raven and Kuffel (described in Section IX.A) also renders obvious claim

element [5.1]. That is, by substituting the MT ferrule of Kuffel into the optical connector of Raven, the additional claimed features of claim element [5.1] that are disclosed by Raven would be preserved in the specific combination of the prior art.

274. Therefore, it is my opinion that Raven discloses claim element [5.1] of the '760 patent.

275. In summary, Raven in view of Kuffel renders obvious Claim 5 of the '760 patent.

G. Claim 6

1. Preamble – “The optical fiber connector as set forth in claim 5, wherein”

276. Claim 6 depends upon claim 5 and claim 1, and for at least the reasons discussed above in reference to claim 1 and claim 5, Raven in view of Kuffel renders obvious claim 1 and claim 5. *See* Sections IX.B., IX.F.

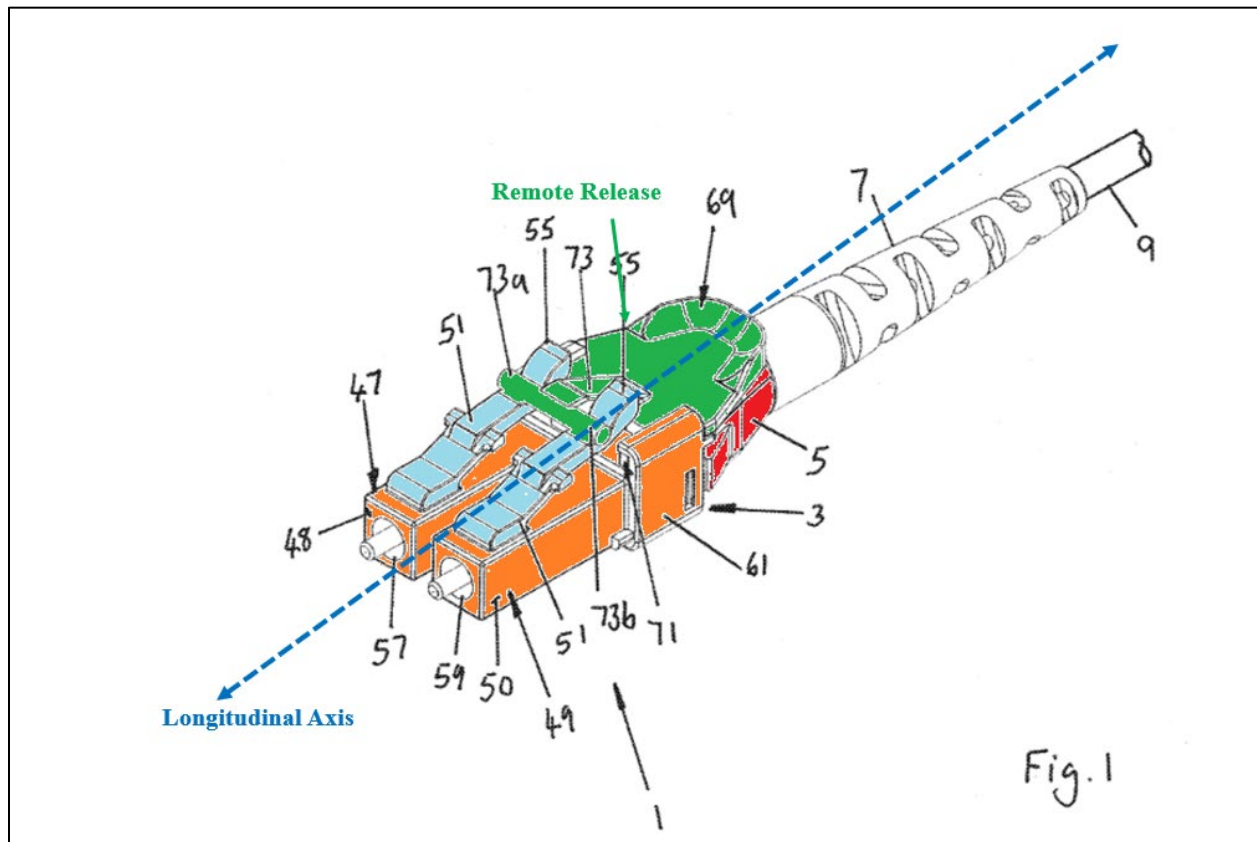
277. Additionally, it is my opinion that Raven in view of Kuffel renders obvious “the optical fiber connector as set forth in claim 5.”

2. Element [6.1] – “the remote release is further configured to depress the second depressible latching arm when the remote release is pulled rearward along the longitudinal axis”

278. It is my opinion that Raven discloses “the remote release is further configured to depress the second depressible latching arm when the remote release is pulled rearward along the longitudinal axis.”

279. Raven's latching levers 51 disclose a first depressible latching arm and a second depressible latching arm, as explained in my analysis of Claim 5. *See* Section IX.F. A POSITA would also have considered manually operable control 69 of Raven, along with actuator 73 and actuator members 73a, 73b, to be a remote release, as explained in my analysis of claim element [1.4]. *See* Section IX.B.B.6.

280. Raven further discloses manually operable control 69 is "arranged to actuate the latching levers 51 on the first and second fibre optic connectors 47, 49 substantially simultaneously." EX1003, 18:1-3. "The manually operable control 69 is arranged to slide with respect to the leading end unit 3 between a first position wherein the levers 51 are in a locking condition to a second position wherein the levers are in an unlocked condition." EX1003, 18:3-5.



EX1003, FIG. 1 (annotated).

281. I believe manually operable control 69 of Raven is configured to depress both the first depressible latching arm and the second depressible latching arm simultaneously, when the manually operable control 69 is pulled rearward along the longitudinal axis.

282. Accordingly, I believe Raven discloses claim element [6.1]. In addition to Raven disclosing claim element [6.1], it would be clear to a POSITA that the combination of Raven and Kuffel (described in Section IX.A) also renders obvious claim element [6.1]. That is, by substituting the MT ferrule of Kuffel into the

optical connector of Raven, the additional claimed features of claim element [6.1] that are disclosed by Raven would be preserved in the specific combination of the prior art.

283. Therefore, it is my opinion that Raven discloses claim element [6.1] of the '760 patent.

284. In summary, Raven in view of Kuffel renders obvious Claim 6 of the '760 patent.

H. Claim 7

1. Preamble – “The optical fiber connector as set forth in claim 5, wherein”

285. Claim 7 depends upon claim 5 and claim 1, and for at least the reasons discussed above in reference to claim 1 and claim 5, Raven in view of Kuffel renders obvious claim 1 and claim 5. *See* Sections IX.B., IX.F.

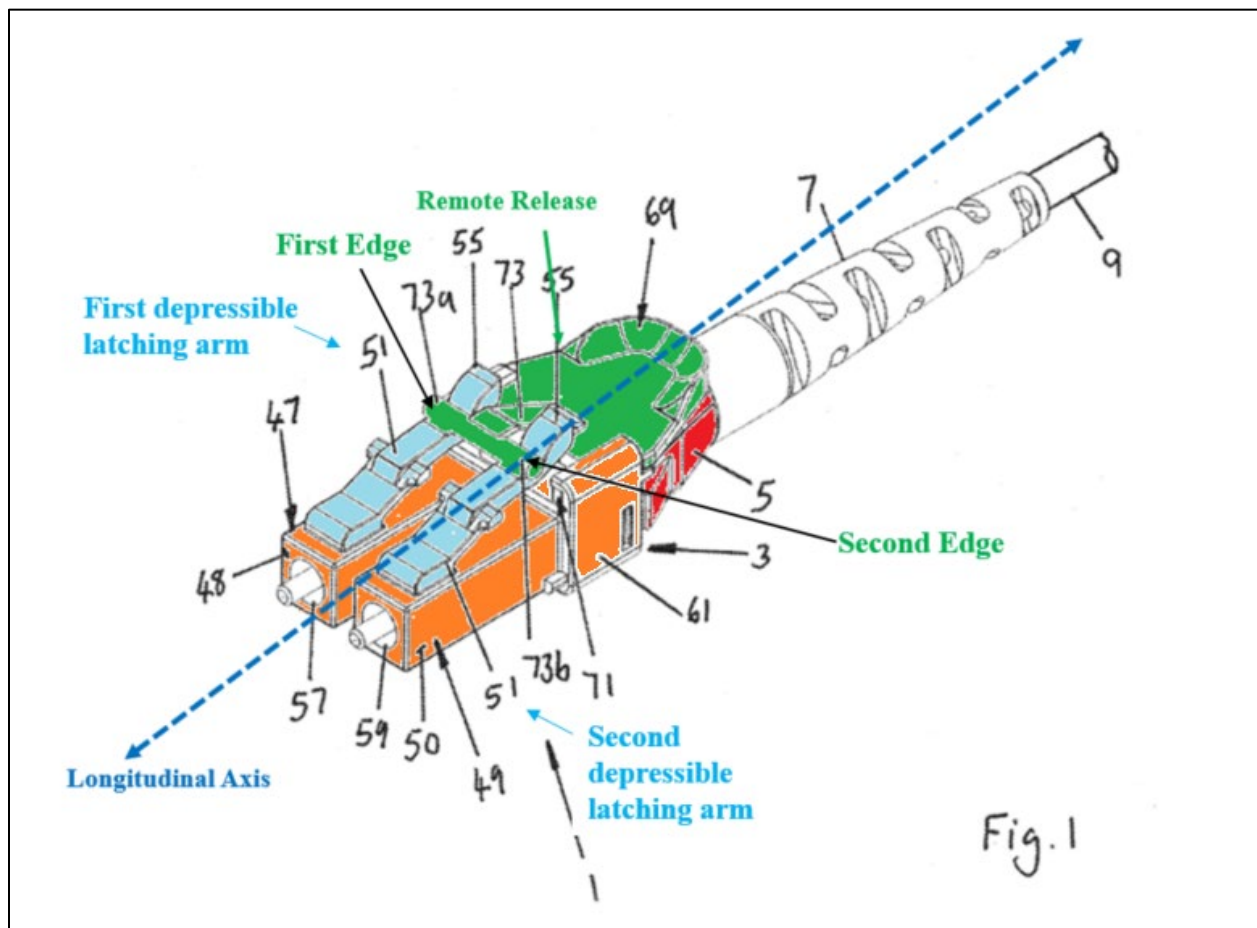
286. Additionally, it is my opinion that the combination of Raven and Kuffel renders obvious “[t]he optical fiber connector as set forth in claim 5.”

2. Element [7.1] – “the remote release comprises a first edge for engaging the first depressible latching arm and a second edge for engaging the

second depressible latching arm, the first and second edges being spaced apart from one another”

287. It is my opinion that Raven discloses “the remote release comprises a first edge for engaging the first depressible latching arm and a second edge for engaging the second depressible latching arm, the first and second edges being spaced apart from one another.”

288. Raven discloses that “manually operable control 69 includes an actuator 73 that is attached to an upper surface 70 of the control.” EX1003, 18:7-8. “The actuator 73 includes actuator members 73a, 73b that each sit on top of one of the latching levers 51.” EX1003, 18:8-9.



EX1003, FIG. 1 (annotated).

289. As illustrated in Figure 1, reproduced and annotated above, I believe the remote release (*e.g.*, manually operable control 69) comprises a first edge (*e.g.*, actuator member 73a) for engaging the first depressible latching arm (*e.g.*, latching lever 51 of connector 47) and a second edge (*e.g.*, actuator member 73b) for engaging the second depressible latching arm (*e.g.*, latching lever 51 of connector 49), and that the first and second edges are spaced apart from one another.

290. Accordingly, Raven discloses claim element [7.1]. In addition to Raven disclosing claim element [7.1], it would be clear to a POSITA that the combination of Raven and Kuffel (described in Section IX.A) also renders obvious claim element [7.1]. That is, by substituting the MT ferrule of Kuffel into the optical connector of Raven, the additional claimed features of claim element [7.1] that are disclosed by Raven would be preserved in the specific combination of the prior art.

291. Therefore, it is my opinion that Raven discloses claim element [7.1] of the '760 patent.

292. In summary, Raven in view of Kuffel renders obvious Claim 7 of the '760 patent.

I. Claim 8

1. Preamble – “The optical fiber connector as set forth in claim 7, wherein”

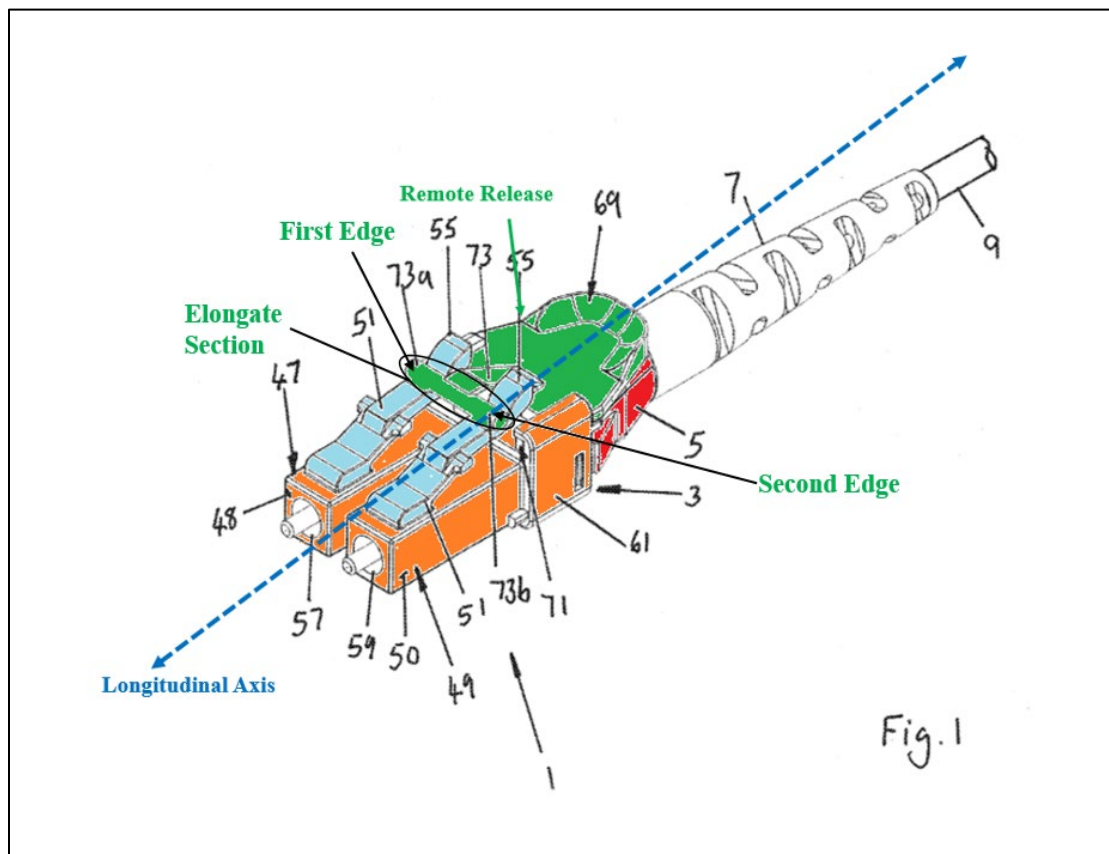
293. Claim 8 depends upon Claim 7, Claim 5 and Claim 1, and for at least the reasons discussed above in reference to Claim 1, Claim 5, and Claim 7, the combination of Raven and Kuffel renders obvious Claim 1, Claim 5, and Claim 7. *See* Sections IX.B, IX.F, IX.H.

294. Additionally, it is my opinion that Raven in view of Kuffel renders obvious “[t]he optical fiber connector as set forth in claim 7.”

2. Element [8.1] – “the remote release further comprises an elongate section between the first edge and the second edge”

295. It is my opinion that Raven discloses “the remote release further comprises an elongate section between the first edge and the second edge.”

296. Raven discloses that “manually operable control 69 includes an actuator 73 that is attached to an upper surface 70 of the control.” EX1003, 18:7-8. “The actuator 73 includes actuator members 73a, 73b that each sit on top of one of the latching levers 51.” EX1003, 18:8-9.



EX1003, FIG. 1 (annotated).

297. I believe Figure 1 of Raven to illustrate that actuator 73 of manually operable control 69 has an elongate section, and that the elongate section is between the first edge (*e.g.*, actuator member 73a) and the second edge (*e.g.*, actuator member 73b), as annotated above.

298. Accordingly, Raven discloses claim element [8.1]. In addition to Raven disclosing claim element [8.1], it would be clear to a POSITA that the combination of Raven and Kuffel (described in Section IX.A) also renders obvious claim element [8.1]. That is, by substituting the MT ferrule of Kuffel into the optical connector of Raven, the additional claimed features of claim element [8.1] that are disclosed by Raven would be preserved in the specific combination of the prior art.

299. Thus, it is my opinion that Raven discloses claim element [8.1] of the '760 patent.

300. In summary, Raven in view of Kuffel renders obvious Claim 8 of the '760 patent.

J. Claim 9

1. Preamble – “The optical fiber connector as set forth in claim 1, wherein”

301. Claim 9 depends upon claim 1, and for at least the reasons discussed above in reference to claim 1, Raven in view of Kuffel renders obvious claim 1.

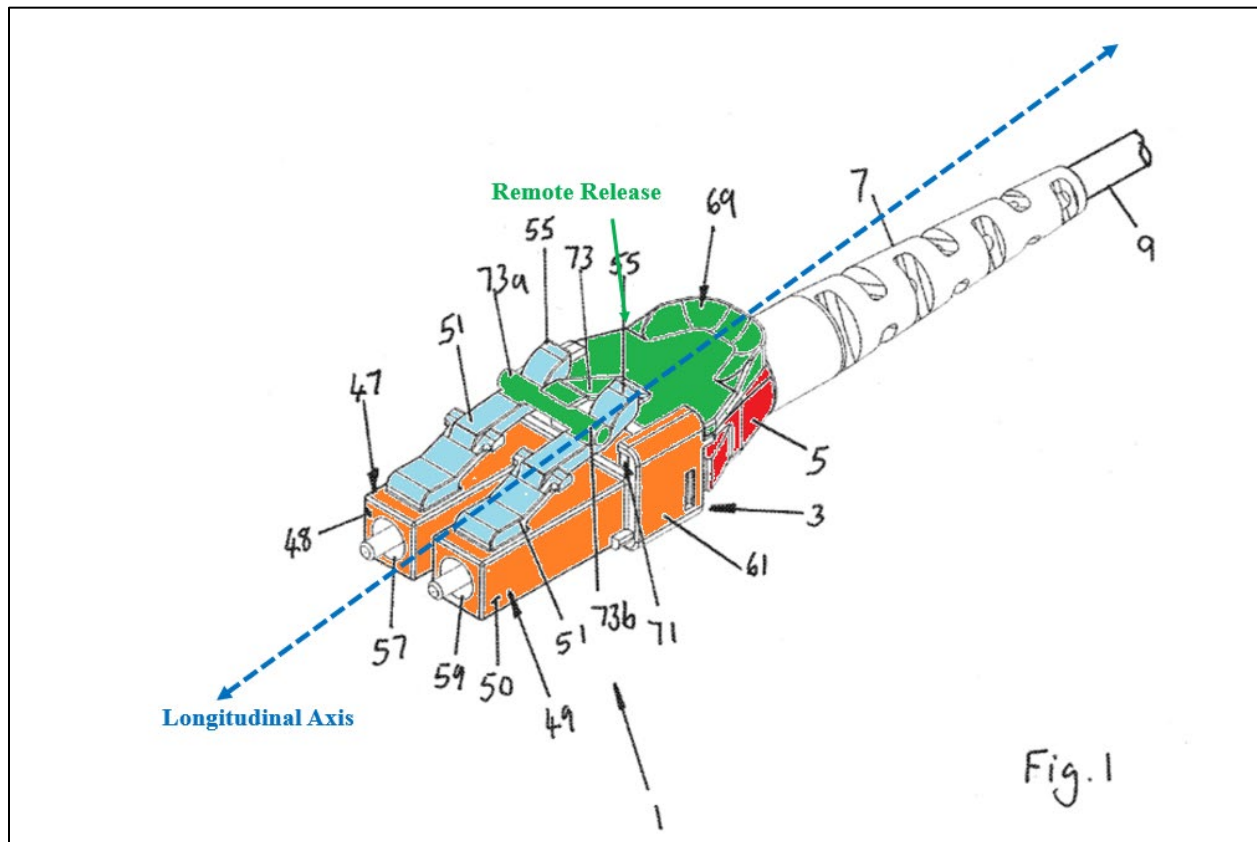
See Section IX.B.

302. It is my opinion that Raven in view of Kuffel renders obvious “[t]he optical fiber connector as set forth in claim 1.”

2. Element [9.1] – “the remote release comprises a front section and wherein the optical fiber connector is configured such that the front section is yieldably biased along the longitudinal axis toward the front end portion of the connector housing”

303. It is my opinion that Raven discloses “the remote release comprises a front section” and “the optical fiber connector is configured such that the front section is yieldably biased along the longitudinal axis toward the front end portion of the connector housing.”

304. Raven discloses a remote release (*e.g.*, manually operable control 69) configured to be pulled rearward along the longitudinal axis to depress the depressible latching arm (*e.g.*, lever 51), as I explained above with respect to claim element [1.4]. *See* Section IX.B.B.6. A POSITA would have further understood Figure 1 of Raven to illustrate that remote release (*e.g.*, manually operable control 69) comprises a front section including actuator 73, actuator member 73a, and actuator member 73b. *See, e.g.*, EX1003, FIG. 1.

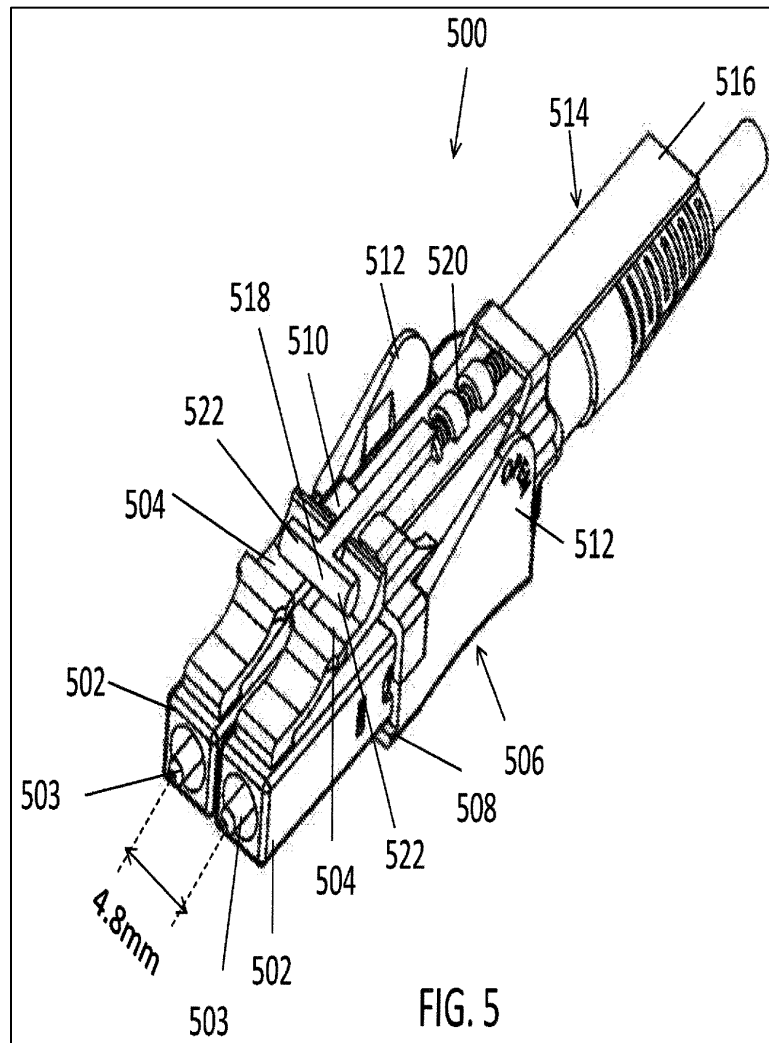


EX1003, FIG. 1 (annotated).

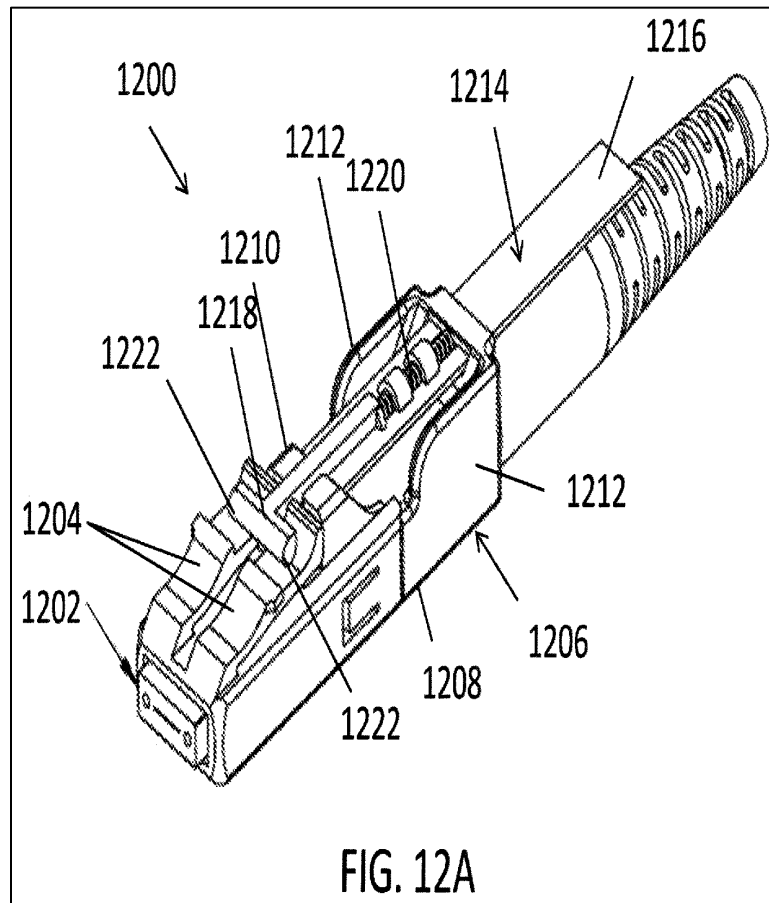
305. Raven also discloses that “[e]ach lever 51 is resilient” and “can be moved from a locking position to an unlocked position.” EX1003, 17:22-23. “The unlocked position is achieved by pushing a free end 55 of the latching lever downwards towards the upper surface 53. The resiliency of the latching levers 51 returns them to their rest positions when an actuating force is removed.” EX1003, 17:23-26. In my opinion, the “rest position” is the same as the “locking position,” and the “locking position” is upwards away from upper surface 53, opposite to the “unlocked position.”

306. Therefore, I believe Raven discloses that, upon release of the remote release (*e.g.*, manually operable control 69), the depressible latching arm (*e.g.*, lever 51) would resiliently return to the locking position upwardly away from upper surface 52, and because actuator member 73a and actuator member 73 of the remote release engage with the depressible latching arm, the remote release would return to the front end portion of the connector housing (*e.g.*, leading end unit 3) along the longitudinal axis. A POSITA therefore would have understood that Raven's depressible latching arm is yieldably biased to the locking position, and therefore Raven's remote release is also yieldably biased along the longitudinal axis toward the front end portion of the connector housing.

307. I note that the '760 patent appears to show a coil spring with reference number 520 in Figure 5, reproduced below, and reference number 1220 in Figure 12A, reproduced below. EX1001, 7:35-40, 8:63-9:1. However, the claim language does not require a spring—or any other positive structure—to “yieldably bias” the remote release along the longitudinal axis toward the front end portion of the connector housing. The coil springs shown in Figures 5 and 12A, reproduced below, are only exemplary embodiments of a structure that ensures the remote release would return to its undisplaced position and thereby become fully engaged inside the recess. *See, e.g.*, EX1001, 7:35-40, 8:63-9:1.



EX1001, FIG. 5.



EX1001, FIG. 12A.

308. To the extent Patent Owner argues—incorrectly—that claim element [9.1] requires a spring, it is well known in the art to use springs to bias components of a fiber optic connector in a forward direction. For example, Kuffel discloses using compressing coil springs 820 to bias its outer housing 500 (which is indeed a type of “remote release”) forward. EX1004, 8:32-45, FIG. 17.

309. As additional corroborating evidence, not needed for my opinion of obviousness, U.S. Patent No. 9,411,111 to Banal, Jr. et al. (“Banal”), published on

June 9, 2016 and filed on December 9, 2014, describes an optical connector using a leaf spring 500 (or other compression springs) to bias its slider 400 and handle 300 (corresponding to a remote release assembly) forward in a plug-in direction to maintain the engagement of the optical connector with its recess. EX1016, 4:37-41, 4:61-65, FIG. 3; *see also, e.g., generally*, EX1017; *see* EX1017, claim 1 (discussing actuation element 16 and spring element 48); EX1018, 22:44-56, FIGs. 29A-29I (relative to spring 2912).

310. Thus, while not necessary to invalidate the claims here, it would also have been obvious to a POSITA to include a spring (of any appropriate kind) in the optical fiber connector of Raven to even further bias the remote release (*e.g.*, manually operable control 69) forward to ensure the engagement with the corresponding recess.

311. Accordingly, I believe Raven, at minimum, would have rendered obvious the fiber optic connector containing the features of claim element [9.1]. In addition to Raven rendering obvious claim element [9.1], it would be clear to a POSITA that the combination of Raven and Kuffel (described in Section IX.A) also renders obvious claim element [9.1]. That is, by substituting the MT ferrule of Kuffel into the optical connector of Raven, the additional claimed features of claim

element [9.1] that are disclosed by Raven would be preserved in the specific combination of the prior art.

312. Therefore, it is my opinion that Raven renders obvious claim element [9.1] of the '760 patent.

313. In summary, Raven in view of Kuffel renders obvious claim 9 of the '760 patent. *See* Section IX.A.

K. Claim 10

1. Preamble – “The optical fiber connector as set forth in claim 9, further comprising”

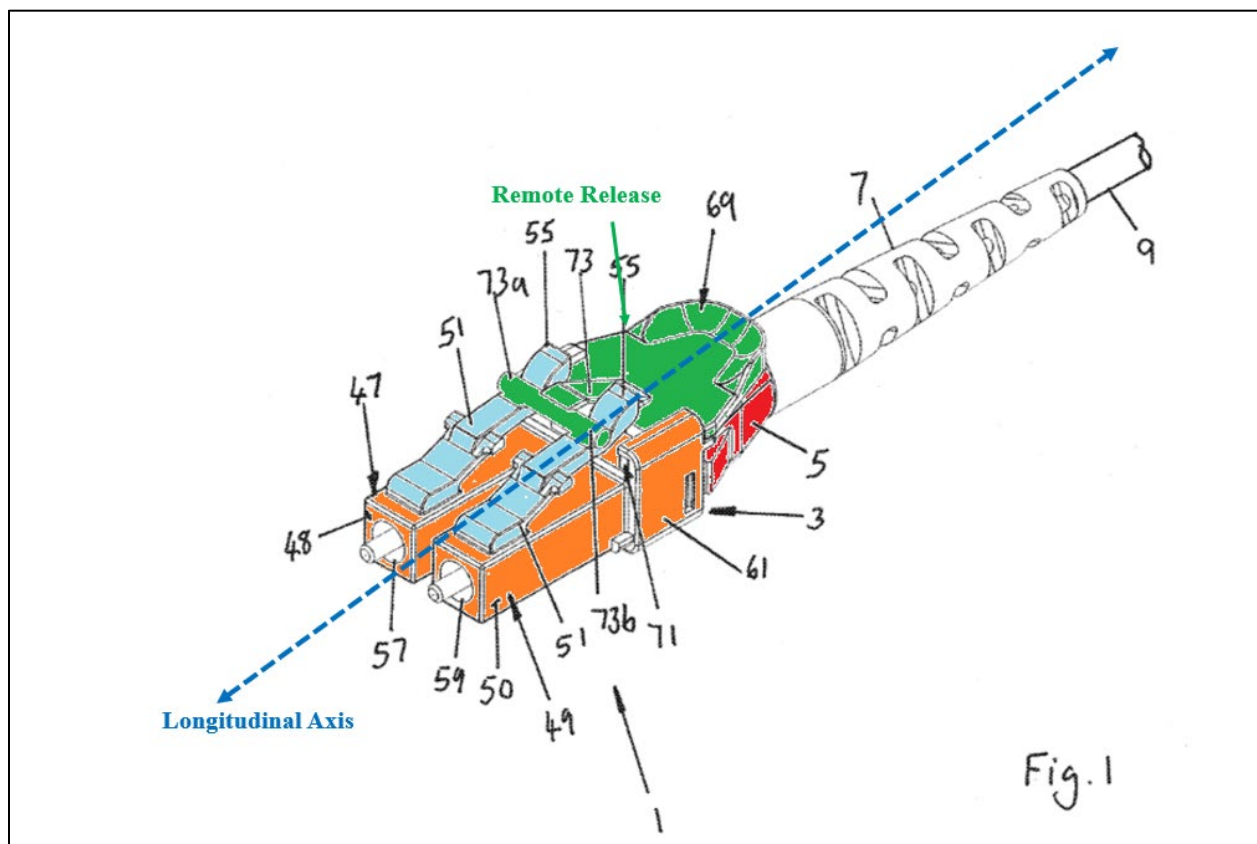
314. Claim 10 depends upon claim 9 and claim 1, and for at least the reasons discussed above in reference to claim 1 and claim 9, the Raven in view of Kuffel renders obvious claim 1 and claim 9. *See* Sections IX.B., IX.J.

315. Additionally, it is my opinion that Raven in view of Kuffel renders obvious “[t]he optical fiber connector as set forth in claim 9.”

2. Element [10.1] – “a resilient biasing member engaging the front section of the remote release to yieldably bias the remote release toward the front end portion of the connector housing”

316. It is my opinion that Raven discloses “a resilient biasing member engaging the front section of the remote release to yieldably bias the remote release toward the front end portion of the connector housing.”

317. As I explained above in my analysis of claim 9, Raven discloses that, upon release of the remote release (*e.g.*, manually operable control 69), the depressible latching arm (*e.g.*, lever 51) would resiliently return to the locking position upwardly away from upper surface 52, and because actuator member 73a and actuator member 73b of the remote release engage with the depressible latching arm, the remote release would return to the front end portion of the connector housing (*e.g.*, leading end unit 3) along the longitudinal axis.



EX1003, FIG. 1 (annotated).

318. Raven also discloses that “[e]ach lever 51 is resilient” and “can be moved from a locking position to an unlocked position.” EX1003, 17:22-23. Accordingly, I understand that Raven’s latching lever 51 is a resilient biasing member that yieldably biases the remote release (*e.g.*, manually operable control 69) toward the front end portion of the connector housing.

319. Therefore, it is my opinion that Raven discloses claim element [10.1].

320. In summary, Raven in view of Kuffel renders obvious Claim 10 of the ’760 patent. *See* Section IX.A.

L. Claim 12

1. Preamble – “The optical fiber connector as set forth in claim 1, wherein”

321. Claim 12 depends upon claim 1, and for at least the reasons discussed above in reference to claim 1, Raven in view of Kuffel renders obvious claim 1. *See* Section IX.B.

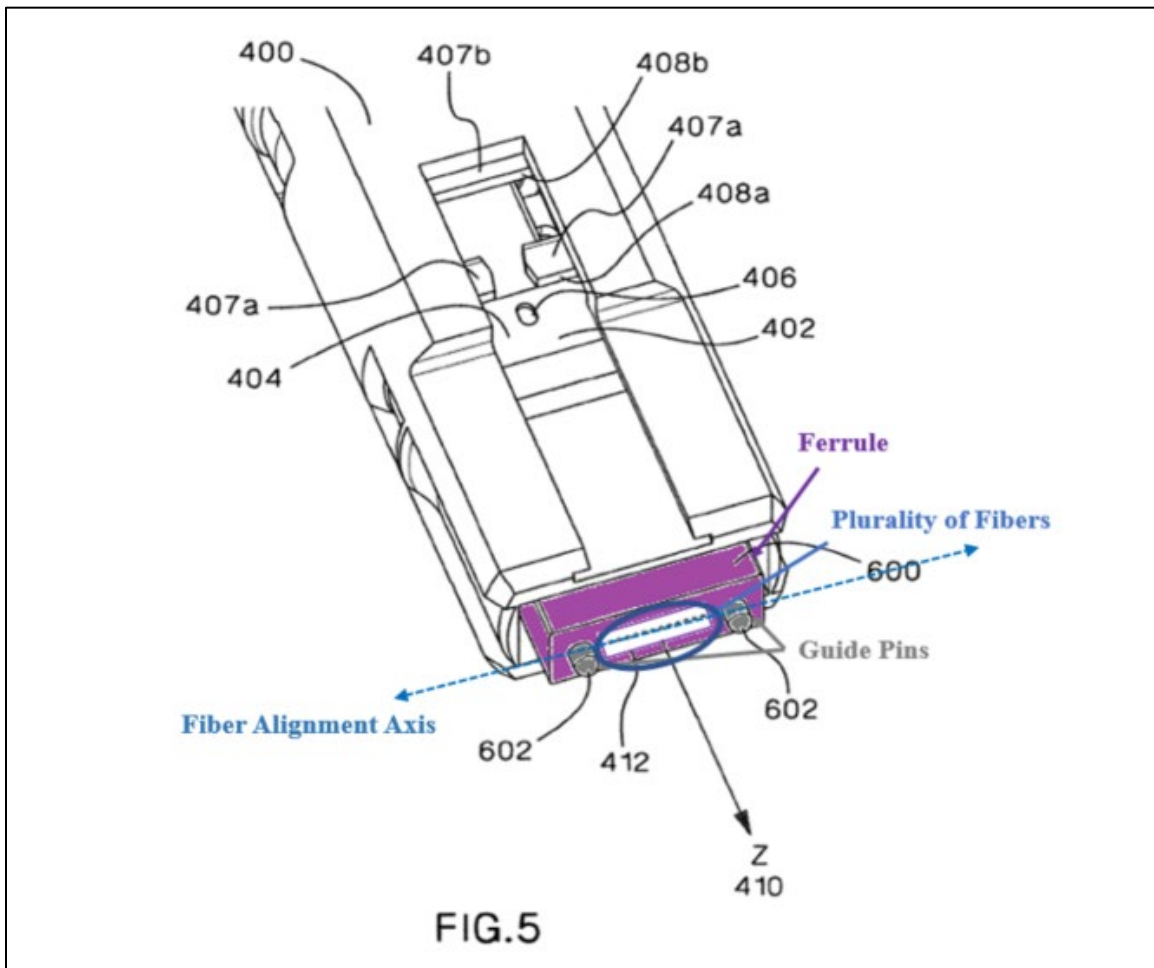
322. Additionally, it is my opinion that Raven in view of Kuffel renders obvious “[t]he optical fiber connector as set forth in claim 1.”

2. Element [12.1] – “the MT ferrule is configured to receive a plurality of fibers such that the fibers are spaced apart in a row that extends parallel to a fiber alignment axis, the MT ferrule comprising first and second guide pin openings spaced apart along the fiber alignment axis”

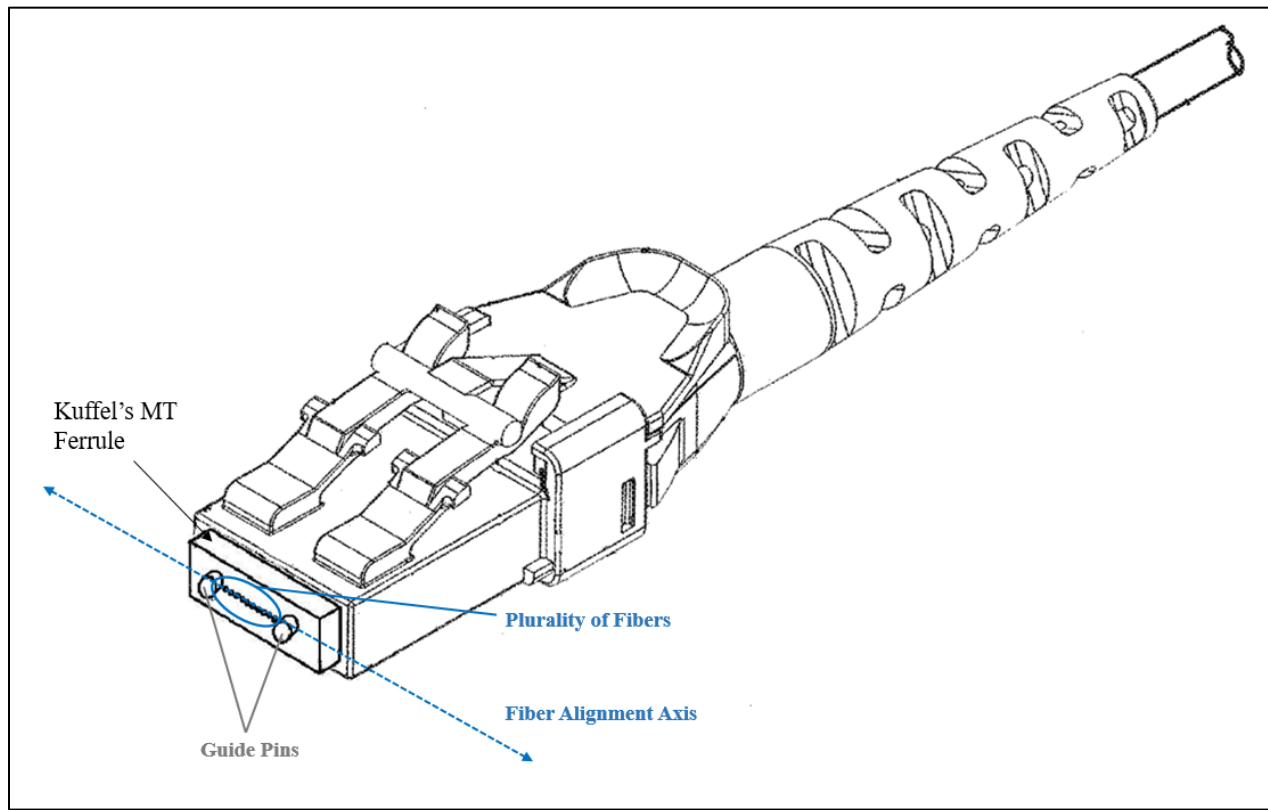
323. It is my opinion that Raven in view of Kuffel discloses “the MT ferrule is configured to receive a plurality of fibers such that the fibers are spaced

apart in a row that extends parallel to a fiber alignment axis, the MT ferrule comprising first and second guide pin openings spaced apart along the fiber alignment axis.”

324. Kuffel discloses an MPO connector 300 with a ferrule 600 and alignment pins 602. EX1004, 5:17-20, FIG. 5. As described above in reference to claim element [1.1], Kuffel’s ferrule 600 includes an MT Ferrule. *See* Section IX.B.B.2 (analyzing claim element [1.1]), *supra*. An MT ferrule is configured to receive a plurality of fibers such that the fibers are spaced apart in a row that extends parallel to a fiber alignment axis as shown in Figure 5 of Kuffel, reproduced and annotated below. Kuffel’s alignment pins 602 (*e.g.*, guide pins) are spaced apart along a fiber alignment axis on either side of the row of fibers extending parallel to the fiber alignment axis, as shown, *e.g.*, in Figure 5 of Kuffel.



EX1004, FIG. 5 (annotated).



EX1003, FIG. 1 (annotated, as modified with Kuffel).

325. Accordingly, in my opinion Kuffel discloses the MT ferrule with the features recited in Claim 12. As discussed above in Section IX.A, it is my opinion that a POSITA would have found it obvious to modify Raven to include an MT ferrule as disclosed by Kuffel. In summary, the well-known use of multi-fiber ferrules increases the number of fiber connections in a single connector, therefore improving connector density and efficiency of the communication network. This would have motivated a POSITA to modify Raven's connector to include an MT

ferrule. A POSITA would have been able to make such a modification without undue experimentation and would have recognized that doing so would yield predictable results, as discussed above. *See* Section IX.A.

326. Therefore, it is my opinion that Raven in view of Kuffel discloses claim element [12.1] of the '760 patent.

327. In summary, Raven in view of Kuffel renders obvious Claim 12 of the '760 patent.

M. Claim 14

1. Preamble – “The optical fiber connector as set forth in claim 1, wherein”

328. Claim 14 depends upon claim 1, and for at least the reasons discussed above in reference to claim 1, Raven in view of Kuffel renders obvious claim 1. *See* Section IX.B.

329. Additionally, it is my opinion that Raven in view of Kuffel renders obvious “[t]he optical fiber connector as set forth in claim 1.”

2. Element [14.1] – “the connector housing is configured to enable a polarity of the optical fiber connector to be selectively reversed”

330. It is my opinion that Raven discloses “the connector housing is configured to enable a polarity of the optical fiber connector to be selectively reversed.”

331. Raven discloses a method for changing the polarity of first and second fiber optic connectors 47, 49. EX1003, 18:20-19:8. Specifically, Raven discloses an initial condition where first fiber optic connector 47 is mounted over first inner body 25 and first ferrule 27, and second fiber optic connector 49 is mounted over second inner body 31 and second ferrule 33. EX1003, 18:22-26; *see also* EX1003, FIG. 1.

332. Raven further discloses that, to change the polarity of first and second ferrules 27, 33 with respect to first and second fiber optic connectors 47, 49, leading end unit 3 is separated from housing 5, rotated 180° about a longitudinal axis Z-Z, and reattached to housing 5 in a second orientation, “thereby changing the polarity of the transmitting and receiving fiber optic cables with respect to the complementary connector.” EX1003, 18:27-19:8, FIG. 6. In this second orientation, the polarity is reversed, with first inner body 25 and first ferrule 27 located in second fiber optic connector 49, and second inner body 31 and second ferrule 33 located in first fiber optic connector 47. EX1003, 18:30-19:4.

333. Accordingly, Raven discloses claim element [14.1]. In addition to Raven disclosing claim element [14.1], it would be clear to a POSITA that the combination of Raven and Kuffel (described in Section IX.A) also renders obvious claim element [14.1]. That is, by substituting the MT ferrule of Kuffel into the optical

connector of Raven, the additional claimed features of claim element [14.1] that are disclosed by Raven would be preserved in the specific combination of the prior art.

334. Therefore, it is my opinion that Raven discloses claim element [14.1] of the '760 patent.

335. In summary, Raven in view of Kuffel renders obvious Claim 14 of the '760 patent.

N. Claim 15

1. Preamble – “An optical connection system comprising”

336. Claim 15 depends upon claim 1, and for at least the reasons discussed above in reference to claim 1, Raven in view of Kuffel renders obvious claim 1. *See* Section IX.B.

337. Additionally, it is my opinion that Raven in view of Kuffel renders obvious “[a]n optical connection system.”

2. Element [15.1] – “the optical fiber connector as set forth in claim 1 and”

338. Claim 15 depends upon claim 1, and for at least the reasons discussed above in reference to claim 1, the combination of Raven in view of Kuffel renders obvious claim 1. *See* Section IX.B.

339. Additionally, it is my opinion that Raven in view of Kuffel renders obvious “the optical fiber connector as set forth in claim 1.”

3. Element [15.2] – “a receptacle for mating with the optical fiber connector”

340. It is my opinion that Raven discloses “a receptacle for mating with the optical fiber connector.”

341. Raven’s depressible latching arms (*e.g.*, latching levers 51) each include a locking formation 51a located on a mid-portion of locking lever 51. EX1003, 17:16-20. Each of latching levers 51 “is arranged to releasably lock the respective fibre optic connector device to a complementary connector device” and each latching lever “is arranged to engage a complementary formation in order to lock the connector to the complementary connector.” EX1003, 17:16-20.

342. Raven includes a complementary connector to which Raven is referring to be (*e.g.*, an adapter or a receiving port), as discussed in the background of Raven. EX1003, 1:1-19. A receiving port is a receptacle for mating with an optical fiber connector. *See, e.g.*, Section IX.B.1 (explaining how a POSITA would understand “receptacle” in the claims of the ’760 patent).

343. Accordingly, Raven discloses claim element [15.2]. In addition to Raven disclosing claim element [15.2], it would be clear to a POSITA that the combination of Raven and Kuffel (described in Section IX.A) also renders obvious claim

element [15.2]. That is, by substituting the MT ferrule of Kuffel into the optical connector of Raven, the additional claimed features of claim element [15.2] that are disclosed by Raven would be preserved in the specific combination of the prior art.

344. Therefore, it is my opinion that Raven discloses claim element [15.2] of the '760 patent.

345. In summary, Raven in view of Kuffel renders obvious Claim 15 of the '760 patent.

O. Claim 16

1. Preamble – “The optical connection system as set forth in claim 15, wherein”

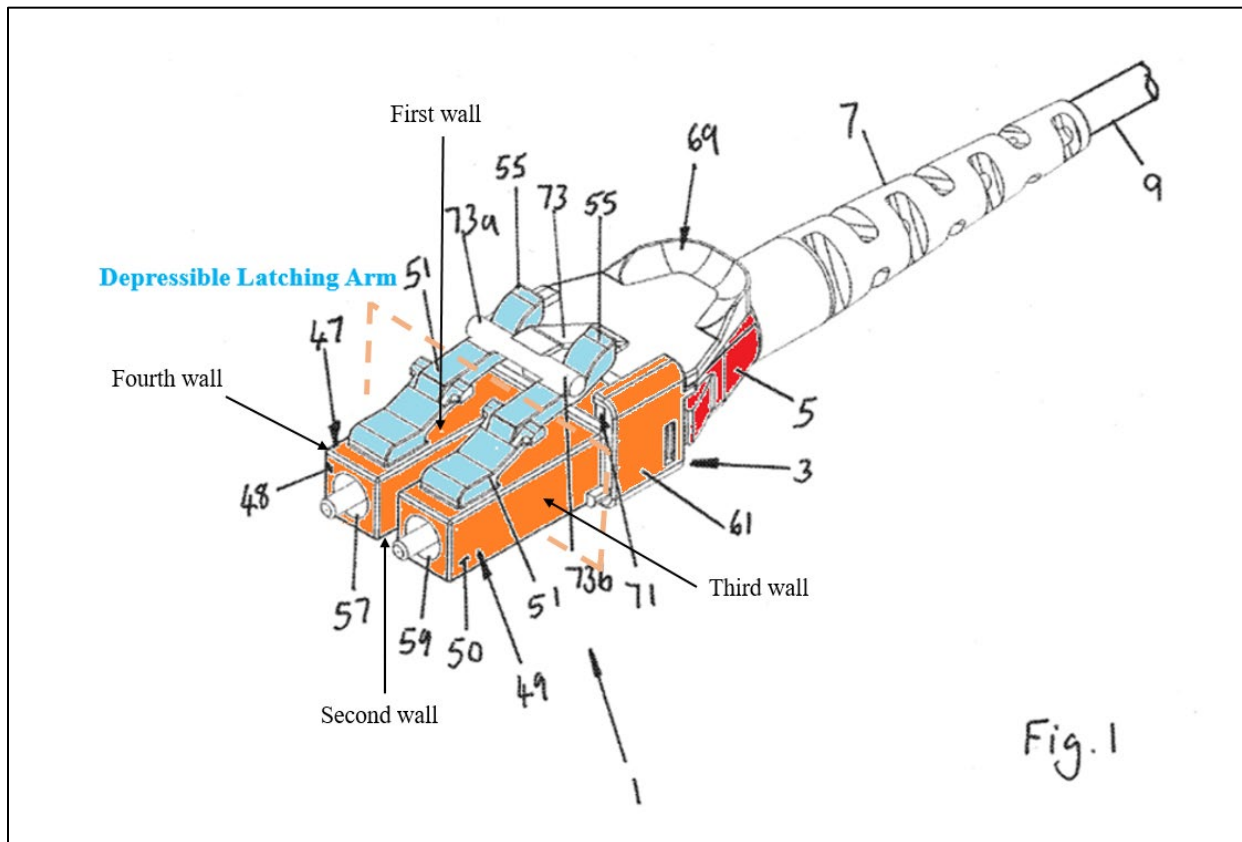
346. Claim 16 depends upon claim 15 and claim 1, and for at least the reasons discussed above in reference to claim 1 and claim 15, Raven in view of Kuffel renders obvious claim 1 and claim 15. *See* Sections IX.B, IX.N.

347. Additionally, it is my opinion that Raven in view of Kuffel renders obvious “[t]he optical connection system as set forth in claim 15.”

2. Element [16.1] – “the receptacle comprises a rectangular perimeter wall”

348. In my opinion, Raven discloses “the receptacle comprises a rectangular perimeter wall.” Additionally, in my opinion the receptacle of claim element [16.1] would have been obvious to a POSITA.

349. As discussed above in reference to claim element [1.5], Raven discloses a connector housing having “a generally rectangular perimeter.” *See*, Section IX.B.B.7. In my opinion, Raven’s receptacle for receiving the generally rectangular connector housing would have similarly comprised a generally rectangular perimeter wall to, *e.g.*, provide for proper alignment of the ferrules housed within Raven’s optical connector and a secure connection between the connector housing of the connector of Raven and the receiving port (even if it is not expressly shown or stated). A POSITA would have understood that Raven’s receptacle perimeter would have matched the connector housing.



EX1003, FIG. 1 (annotated).

350. To the extent Patent Owner argues—incorrectly—that Raven does not disclose a receptacle with a rectangular perimeter wall, a POSITA would have understood that such a corresponding shape would be used and that such a rectangular shape is extremely common in the industry.

351. Accordingly, in my opinion Raven discloses claim element [16.1], or at minimum would have rendered obvious the receptacle containing the features of claim element [16.1]. In addition to Raven rendering obvious claim element [16.1],

it would be clear to a POSITA that the combination of Raven and Kuffel (described in Section IX.A) also renders obvious claim element [16.1]. That is, by substituting the MT ferrule of Kuffel into the optical connector of Raven, the additional claimed features of claim element [16.1] that are disclosed by Raven would be preserved in the specific combination of the prior art.

352. Therefore, it is my opinion that Raven discloses claim element [16.1] of the '760 patent.

353. In summary, Raven in view of Kuffel renders obvious Claim 16 of the '760 patent.

P. Claim 17

1. Preamble – “The optical connection system as set forth in claim 16, wherein”

354. Claim 17 depends upon claim 16, claim 15 and claim 1, and for at least the reasons discussed above in reference to claim 1, claim 15, and claim 16, Raven in view of Kuffel renders obvious claim 1, claim 15, and claim 16. *See* Sections IX.B, IX.N, IX.O.

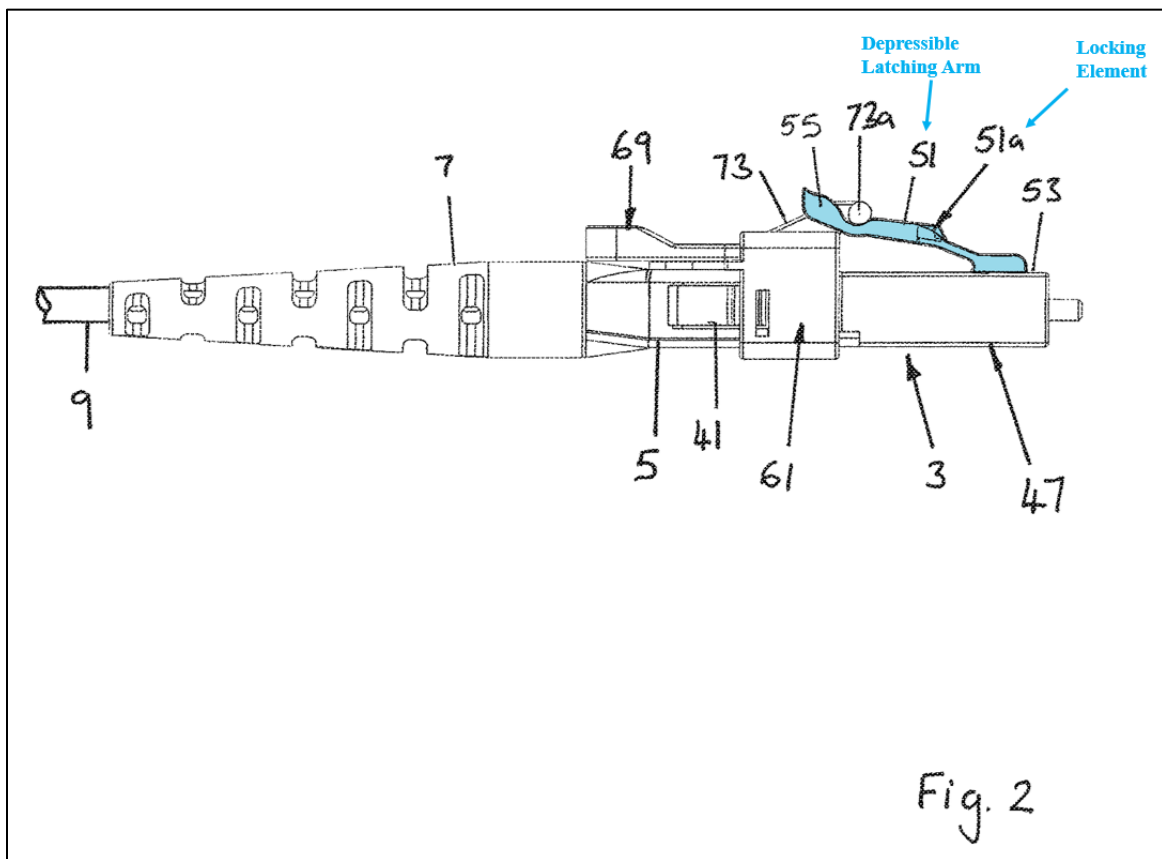
355. Additionally, it is my opinion that Raven in view of Kuffel renders obvious “[t]he optical connection system as set forth in claim 16.”

2. Element [17.1] – “the receptacle includes a recess, the depressible latching arm being configured to latch with the recess when the optical fiber connector and the receptacle are mated”

356. It is my opinion that Raven discloses “the receptacle includes a recess, the depressible latching arm being configured to latch with the recess when the optical fiber connector and the receptacle are mated.”

357. Raven’s depressible latching arms (*e.g.*, latching levers 51) each include a locking formation 51a located on a mid-portion of locking lever 51. EX1003, 17:16-20. Each of Raven’s latching levers 51 “is arranged to releasably lock the respective fibre optic connector device to a complementary connector device” and each latching lever “is arranged to engage a complementary formation in order to lock the connector to the complementary connector.” EX1003, 17:16-20.

358. Raven includes a complementary connector to which Raven is referring to be (*e.g.*, an adapter or a receiving port (receptacle)), as discussed in the background of Raven. EX1003, 1:1-19. A receiving port is a receptacle for mating with an optical fiber connector and a POSITA would have understood the complementary formation of the receiving port to have necessarily included a recess for engaging protruding elements 51a of latching levers 51. *See, e.g.*, EX1003, FIG. 2 (illustrating that locking formation of latching levers 51 includes a protruding locking formation 51a).



EX1003, FIG. 2 (annotated).

359. To the extent Patent Owner argues that Raven does not disclose a receptacle with a recess for mating with the optical fiber connector, a POSITA would have understood that such a corresponding shape would be used and that such a shape is extremely common in the industry.

360. Accordingly, in my opinion Raven discloses claim element [17.1], or at minimum would have rendered obvious the receptacle containing the features of claim element [17.1]. In addition to Raven rendering obvious claim element [17.1],

it would be clear to a POSITA that the combination of Raven and Kuffel (described in Section IX.A) also renders obvious claim element [17.1]. That is, by substituting the MT ferrule of Kuffel into the optical connector of Raven, the additional claimed features of claim element [17.1] that are disclosed by Raven would be preserved in the specific combination of the prior art.

361. Therefore, it is my opinion that Raven discloses claim element [17.1] of the '760 patent.

362. In summary, Raven in view of Kuffel renders obvious claim 17 of the '760 patent.

X. GROUND 2: RAVEN IN VIEW OF KUFFEL AND FURTHER IN VIEW OF GNIADEK RENDERS OBVIOUS CLAIM 13.

363. Raven in view of Kuffel and further in view of Gniadek renders obvious dependent claim 13 of the '760 patent.

364. It is my opinion that the combination of Raven and Kuffel further in view of Gniadek renders obvious dependent claim 13 of the '760 patent.

A. Motivation to Combine

1. Raven in view of Kuffel

365. Raven discloses a fiber optic cable assembly having a particular mechanism for actuating the fiber optic connector to be “releasably attachable to the housing assembly”. EX1003, 3:6-7. Specifically, Raven describes “[e]ach of

the first and second fibre optic connectors 47,49 includes a latching lever 51 that is arranged to releasably lock the respective fibre optic connector device to a complementary connector device”, and “[t]he device further includes a manually operable control 69 that is arranged to actuate the latching levers 51 on the first and second fibre optic connectors 47,49”. EX1003, 17:16-17, 18:1-2.

366. Kuffel discloses a fiber optic connector system having an MPO connector 300. EX1004, 5:17-27. Kuffel explains MPO connector 300 includes a ferrule 600 “which contains optical fibers for communication.” EX1004, 5:17-22. Kuffel illustrates an MPO connector, having ferrule 600 (which the POSITA would have understood to be an MT ferrule), having an array of fibers disposed in a row between guide pins 602. *See, e.g.*, EX1004, FIG. 3.

367. In Raven’s connector modified by Kuffel, as discussed above for Claim 1 in Ground 1, Raven’s leading end unit would be modified into a single housing with a single cavity to accommodate Kuffel’s MT multi-fiber ferrule. *See* Section IX.B.

2. Gniadek

368. Gniadek discloses a latching connector having “a lever...to selectively disengage the latching connector from the mating connector”. EX1006, 2:45-50.

369. Gniadek—like the '760 patent—explains that “network providers [seek] to find better ways to improve the quality of service at a lower cost.” EX1006, 1:17-19; *see also* EX1001, 1:30-33. Gniadek continues that one solution is to “deploy high-density interconnect panels” which “may be designed to consolidate the increasing volume of interconnections necessary to support the fast-growing networks into a compacted form factor, thereby increasing quality of service and decreasing costs such as floor space and support overhead.” EX1006, 1:20-28; *see also* EX1001, 1:34-40.

370. Gniadek describes that “[i]n communication networks, such as data centers and switching networks, numerous interconnections between mating connectors may be compacted into high-density panels,” and that “[p]anel and connector producers may optimize for such high densities by shrinking the connector size and/or the spacing between adjacent connectors on the panel.” EX1006, 1:31-39; *see also* EX1001, 1:42-47. Gniadek thus provides direct evidence as to the knowledge in the art to shrink the connector size to adapt the connector to a high-density panel. EX1006, 7:3-48.

3. Reasons to Combine

371. A POSITA would have been motivated to modify the Raven-Kuffel MT ferrule optical connector further in view of Gniadek to have “an outer cross-

sectional dimension along the fiber alignment axis outer cross-sectional dimension” that is “less than an outer cross-sectional dimension of a standard MPO along a fiber alignment axis of the standard MPO connector” to be compatible with smaller sized adapters and receptacles within a high-density panel. Additionally, Gniadek states that “[i]t should [] be clear that the dimensions of the mating connectors [] or the couplers [], as well as the distances in a panel [], on each side of the mating connector [] or coupler [], may vary dependent on the design.” EX1006, 7:49-52. This would improve marketability of the overall connector.

372. Gniadek describes that “[i]n communication networks, such as data centers and switching networks, numerous interconnections between mating connectors may be compacted into high-density panels,” and that “[p]anel and connector producers may optimize for such high densities by shrinking the connector size and/or the spacing between adjacent connectors on the panel.” EX1006, 1:31-39; *see also* EX1001, 1:42-47. Gniadek thus provides direct evidence of knowledge in the art to shrink the connector size to adapt the connector to a high-density panel. EX1006, 7:3-48.

373. Raven also identifies the same challenge with fiber optic connectors in a high-density panel. Raven explains that, because connectors are often plugged into a panel with a high density of connectors, limited space exists around each

connector. EX1003, 1:27-2:1. Raven thus concludes that “it can be difficult for a user to manipulate the locking levers when removing the connector from the panel.” EX1003, 2:1-2. To address this issue, Raven discloses a fiber optic cable assembly “that includes an improved means of actuating the fibre optic connector locking levers.” EX1003, 2:10-11.

374. Furthermore, shrinking the connector size and Raven’s remote release mechanism are two complementary solutions to the same problem – adapting connectors to a high-density panel. Therefore, a POSITA would have been motivated to combine the two solutions – shrinking the outer cross-sectional dimension of Raven’s remote release connector to fit a connector to an even higher density panel. A POSITA would have had a reasonable expectation of success making this modification because the structural changes were well within the skill of a POSITA.

375. A POSITA also would have understood how to shrink the outer cross-sectional dimension of Raven’s remote release connector. Shrinking the outer cross-sectional dimension of a connector reduces each dimension proportionally, which can achieve designing and manufacturing a smaller profile for the connector. Shrinking the outer cross-sectional dimension of Raven’s remote release

connector also has a reasonable expectation of success because reducing a dimension of Raven's connector does not interfere with its remote release mechanism. A POSITA would have understood that although the dimensions of Raven's remote release may also need to be reduced proportionally to the cross-sectional dimension, this would not affect the structure or the functionality of Raven's remote release.

B. Claim 13

1. Preamble – “The optical fiber connector as set forth in claim 12, wherein”

376. Claim 13 depends upon Claim 12 and Claim 1, and for at least the reasons discussed above in reference to Claim 1 and Claim 12, the combination of Raven and Kuffel renders obvious Claim 1 and Claim 12. *See* Sections IX.B, IX.L.

377. Additionally, it is my opinion that Raven in view of Kuffel and further in view of Gniadek renders obvious “[t]he optical fiber connector as set forth in claim 12.”

2. Element [13.1] – “the optical fiber connector has an outer cross-sectional dimension along the fiber alignment axis and wherein the outer cross-sectional dimension is less than an outer cross-sectional dimension of a

standard MPO connector along a fiber alignment axis of the standard MPO connector”

378. It is my opinion that Raven in view of Kuffel and further in view of Gniadek discloses “the optical fiber connector has an outer cross-sectional dimension along the fiber alignment axis and wherein the outer cross-sectional dimension is less than an outer cross-sectional dimension of a standard MPO connector along a fiber alignment axis of the standard MPO connector.”

379. Patent Owner may allege that Raven modified with Kuffel does not expressly disclose “an outer cross-sectional dimension along the fiber alignment axis and wherein the outer cross-sectional dimension is less than an outer cross-sectional dimension of a standard MPO connector along a fiber alignment axis of the standard MPO connector.” However, in my opinion, a POSITA would have found it obvious to modify the connector of Raven with Kuffel in view of Gniadek to have “an outer cross-sectional dimension along the fiber alignment axis and wherein the outer cross-sectional dimension is less than an outer cross-sectional dimension of a standard MPO connector along a fiber alignment axis of the standard MPO connector,” for at least the following reasons.

380. Gniadek—like the ’760 patent—explains that “network providers [seek] to find better ways to improve the quality of service at a lower cost.”

EX1006, 1:17-19; *see also* EX1001, 1:30-33. Gniadek continues that one solution

is to “deploy high-density interconnect panels” which “may be designed to consolidate the increasing volume of interconnections necessary to support the fast-growing networks into a compacted form factor, thereby increasing quality of service and decreasing costs such as floor space and support overhead.” EX1006, 1:20-28; *see also* EX1001, 1:34-40.

381. Gniadek describes that “[i]n communication networks, such as data centers and switching networks, numerous interconnections between mating connectors may be compacted into high-density panels,” and that “[p]anel and connector producers may optimize for such high densities by shrinking the connector size and/or the spacing between adjacent connectors on the panel.” EX1006, 1:31-39; 11:9-17; *see also* EX1001, 1:42-47. It is therefore known in the art to shrink the size of a connector to adapt for high density connection panels. Gniadek thus provides direct evidence of knowledge in the art to shrink the connector size to adapt the connector to a high-density panel. EX1006, 7:3-48.

382. While Gniadek also discloses that “shrinking the connector size and/or spacing increases the support cost and diminishes the quality of service,” EX1006, 1:36-40, it is noted that Gniadek does not claim that shrinking the connector size is incompatible with the disclosed remote release mechanism.

383. Because shrinking the connector size and a remote release mechanism are two solutions to the same problem: adapting connectors to a high-density panel, a POSITA would have found it obvious to combine the two solutions also shrink the outer cross-sectional dimension of a remote release connector to fit it to an even higher density panel. And because shrinking the connector size does not interfere with the remote release mechanism, the modification of Raven-Kuffel's remote release connector has a reasonable expectation of success.

384. Raven also identifies the same challenge with fiber optic connectors in a high-density panel. Raven explains that, because connectors are often plugged into a panel with a high density of connectors, limited space exists around each connector. EX1003, 1:27-2:1. Raven thus concludes that "it can be difficult for a user to manipulate the locking levers when removing the connector from the panel." EX1003, 2:1-2. To address this issue, Raven discloses a fiber optic cable assembly "that includes an improved means of actuating the fibre optic connector locking levers." EX1003, 2:10-11. Therefore, a POSITA would have been motivated to modify the Raven-Kuffel MT ferrule optical connector to have "an outer cross-sectional dimension along the fiber alignment axis and wherein the outer cross-sectional dimension is less than an outer cross-sectional dimension of a

standard MPO connector along a fiber alignment axis of the standard MPO connector”. Doing so would have been well within the skill of a POSITA because the modifications require only a structural redesign of the connector.

385. Shrinking the connector size and Raven’s remote release mechanism are two complimentary solutions to the same problem – adapting connectors to a high-density panel. Therefore, a POSITA would have been motivated to combine the two solutions – shrinking the outer cross-sectional dimension of Raven’s remote release connector to fit a connector to an even higher density panel.

386. A POSITA also would have understood how to shrink the outer cross-sectional dimension of Raven’s remote release connector. Shrinking the outer cross-sectional dimension of a connector reduces each dimension proportionally, which can achieve designing and manufacturing a smaller profile for the connector.

387. Shrinking the outer cross-sectional dimension of Raven’s remote release connector also has a reasonable expectation of success because reducing a dimension of Raven’s connector does not interfere with its remote release mechanism. A POSITA would have understood that although the dimensions of Raven’s remote release may also need to be reduced proportionally to the cross-sectional

dimension, this would not affect the structure or the functionality of Raven's remote release.

388. Accordingly, a POSITA would have understood that while the Raven-Kuffel MT ferrule optical connector houses a standard MT ferrule, it is obvious that the connector can be further modified to have "an outer cross-sectional dimension along the fiber alignment axis and wherein the outer cross-sectional dimension is less than an outer cross-sectional dimension of a standard MPO connector along a fiber alignment axis of the standard MPO connector". Therefore, it is my opinion that Raven and Kuffel, further in view of Gniadek renders obvious Claim 13 of the '760 Patent and would have been obvious to combine as I discuss in Section X.A.

389. Therefore, it is my opinion that Raven in view of Kuffel and further in view of Gniadek discloses claim element [13.1] of the '760 patent.

390. In summary, Raven in view of Kuffel and in further view of Gniadek renders obvious claim 13 of the '760 patent.

XI. GROUND 3: RAVEN IN VIEW OF KUFFEL AND FURTHER IN VIEW OF WONG RENDERS OBVIOUS CLAIM 13.

391. Raven in view of Kuffel and further in view of Wong renders obvious dependent claim 13 of the '760 patent.

392. It is my opinion that the combination of Raven and Kuffel further in view of Wong renders obvious dependent claim 13 of the '760 patent.

A. Motivation to Combine

1. Raven in view of Kuffel

393. Raven discloses a fiber optic cable assembly having a particular mechanism for actuating the fiber optic connector to be “releasably attachable to the housing assembly”. EX1003, 3:6-7. Specifically, Raven describes “[e]ach of the first and second fibre optic connectors 47,49 includes a latching lever 51 that is arranged to releasably lock the respective fibre optic connector device to a complementary connector device”, and “[t]he device further includes a manually operable control 69 that is arranged to actuate the latching levers 51 on the first and second fibre optic connectors 47,49”. EX1003, 17:16-17, 18:1-2.

394. Kuffel discloses a fiber optic connector system having an MPO connector 300. EX1004, 5:17-27. Kuffel explains MPO connector 300 includes a ferrule 600 “which contains optical fibers for communication.” EX1004, 5:17-22. Kuffel illustrates an MPO connector, having ferrule 600 (which the POSITA would have understood to be an MT ferrule), having an array of fibers disposed in a row between guide pins 602. *See, e.g.*, EX1004, FIG. 3.

395. In Raven’s connector modified by Kuffel, as discussed above for Claim 1 in Ground 1, Raven’s leading end unit would be modified into a single housing with a single cavity to accommodate Kuffel’s MT multi-fiber ferrule. *See* Section IX.B.

2. Wong

396. Wong discloses cable assembly connectors for fiber optic transmission having “a remote release mechanism such that a user can remove cable assembly connectors that are closely spaced together on a high density panel”. EX1005, 3:66-4:2, 4:44-50.

397. Wong—like the ’760 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.” EX1005, 1:6-10; *see also* EX1001, 1:31-33. Wong continues that “[c]ertain solutions have included deployment of high-density interconnect panels” which “may be designed to consolidate the increasing volume of interconnections necessary to support the fast-growing networks into a compacted form factor, thereby increasing quality of service and decreasing costs such as floor space and support overhead.” EX1005, 1:11-17; *see also* EX1001, 1:34-40.

398. Wong describes that “[i]n communication networks, such as data centers and switching networks, numerous interconnections between mating connectors may be compacted into high-density panels,” and that “[p]anel and connector producers may optimize for such high densities by shrinking the connector size and/or the spacing between adjacent connectors on the panel.” EX1005, 1:18-24; *see also* EX1001, 1:42-47. Wong thus provides direct evidence as to the

knowledge in the art to shrink the connector size to adapt the connector to a high-density panel.

3. Reasons to Combine

399. A POSITA would have been motivated to modify the Raven-Kuffel MT ferrule optical connector further in view of Wong to have “an outer cross-sectional dimension along the fiber alignment axis outer cross-sectional dimension” that is “less than an outer cross-sectional dimension of a standard MPO along a fiber alignment axis of the standard MPO connector” to be compatible with smaller sized adapters and receptacles within a high-density panel. Additionally, Wong states that “[t]hose having ordinary skill in the art will recognize that [] the dimensions of the mating connectors [] or the couplers [], as well as the distances in a panel [], on each side of the mating connector or connector, may vary dependent on the design.” EX1005, 7:4-11. This would improve marketability of the overall connector.

400. Wong describes that “[i]n communication networks, such as data centers and switching networks, numerous interconnections between mating connectors may be compacted into high-density panels,” and that “[p]anel and connector producers may optimize for such high densities by shrinking the connector size and/or the spacing between adjacent connectors on the panel.” EX1005, 1:19-24,

11:9-17; *see also* EX1001, 1:42-47. Wong thus provides direct evidence of knowledge in the art to shrink the connector size to adapt the connector to a high-density panel.

401. Raven also identifies the same challenge with fiber optic connectors in a high-density panel. Raven explains that, because connectors are often plugged into a panel with a high density of connectors, limited space exists around each connector. EX1003, 1:27-2:1. Raven thus concludes that “it can be difficult for a user to manipulate the locking levers when removing the connector from the panel.” EX1003, 2:1-2. To address this issue, Raven discloses a fiber optic cable assembly “that includes an improved means of actuating the fibre optic connector locking levers.” EX1003, 2:10-11.

402. Furthermore, shrinking the connector size and Raven’s remote release mechanism are two complementary solutions to the same problem – adapting connectors to a high-density panel. Therefore, a POSITA would have been motivated to combine the two solutions – shrinking the outer cross-sectional dimension of Raven’s remote release connector to fit a connector to an even higher density panel. A POSITA would have had a reasonable expectation of success making this modification because the structural changes were well within the skill of a POSITA.

403. A POSITA also would have understood how to shrink the outer cross-sectional dimension of Raven’s remote release connector. Shrinking the outer cross-sectional dimension of a connector reduces each dimension proportionally, which can achieve designing and manufacturing a smaller profile for the connector. Shrinking the outer cross-sectional dimension of Raven’s remote release connector also has a reasonable expectation of success because reducing a dimension of Raven’s connector does not interfere with its remote release mechanism. A POSITA would have understood that although the dimensions of Raven’s remote release may also need to be reduced proportionally to the cross-sectional dimension, this would not affect the structure or the functionality of Raven’s remote release.

B. Claim 13

1. Preamble – “The optical fiber connector as set forth in claim 12, wherein”

404. Claim 13 depends upon claim 12 and claim 1, and for at least the reasons discussed above in reference to claim 1 and claim 12, the combination of Raven and Kuffel renders obvious claim 1 and claim 12. *See* Sections IX.B, IX.L.

405. Additionally, it is my opinion that Raven in view of Kuffel and further in view of Wong renders obvious “[t]he optical fiber connector as set forth in claim 12.”

2. Element [13.1] – “the optical fiber connector has an outer cross-sectional dimension along the fiber alignment axis and wherein the outer cross-sectional dimension is less than an outer cross-sectional dimension of a standard MPO connector along a fiber alignment axis of the standard MPO connector”

406. It is my opinion that Raven in view of Kuffel and further in view of Wong discloses “the optical fiber connector has an outer cross-sectional dimension along the fiber alignment axis and wherein the outer cross-sectional dimension is less than an outer cross-sectional dimension of a standard MPO connector along a fiber alignment axis of the standard MPO connector.”

407. Patent Owner may allege that Raven modified with Kuffel does not expressly disclose “an outer cross-sectional dimension along the fiber alignment axis and wherein the outer cross-sectional dimension is less than an outer cross-sectional dimension of a standard MPO connector along a fiber alignment axis of the standard MPO connector.” However, in my opinion, a POSITA would have found it obvious to modify the connector of Raven with Kuffel in view of Wong to have “an outer cross-sectional dimension along the fiber alignment axis and wherein the outer cross-sectional dimension is less than an outer cross-sectional dimension of a standard MPO connector along a fiber alignment axis of the standard MPO connector,” for at least the following reasons.

408. Wong—like the ’760 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.” EX1005, 1:6-10; *see also* EX1001, 1:30-33. Wong continues to describe that “[c]ertain solutions have included deployment of high-density interconnect panels” which “may be designed to consolidate the increasing volume of interconnections necessary to support the fast-growing networks into a compacted form factor, thereby increasing quality of service and decreasing costs such as floor space and support overhead.” EX1005, 1:11-17; *see also* EX1001, 1:34-40.

409. Wong describes that “[i]n communication networks, such as data centers and switching networks, numerous interconnections between mating connectors may be compacted into high-density panels,” and that “[p]anel and connector producers may optimize for such high densities by shrinking the connector size and/or the spacing between adjacent connectors on the panel.” EX1005, 1:19-24; 11:9-17; *see also* EX1001, 1:42-47. Wong thus provides direct evidence of knowledge in the art to shrink the connector size to adapt the connector to a high-density panel.

410. Wong further discloses that the connector housing (e.g. switchable housing 230) can have “a width W_1 of about 1 mm to about 10 cm, including, for example, about 1 mm, about 2 mm, about 3 mm, about 4 mm, about 5 mm, about 6 mm, about 7 mm, about 8 mm, about 9 mm, about 1 cm, [...], or any value or

range between any two of these values (including endpoints).” EX1005, 11:9-17.

Therefore, Wong’s connector as disclosed can have a width less than approximately 12.4 mm, which is the width of a standard MPO connector. A POSITA would also have understood that the height and the width of a connector are changed proportionally to each other, so that when Wong’s connector has a width less than that of a standard MPO connector, it also has a height less than that of a standard MPO connector. Therefore, the cross-sectional dimension of Wong’s connector is also less than the cross-sectional dimension of a standard MPO connector.

411. Wong further discloses that it is known in communication networks where numerous interconnections between mating connectors may be compacted into high-density panels: “[p]anel and connector producers may optimize for such high densities by shrinking the connector size and/or the spacing between adjacent connectors on the panel.” EX1005, 1:19-24. It is therefore known in the art to shrink the size of a connector to adapt for high density connection panels. Wong thus provides direct evidence as to the knowledge in the art to shrink the connector size to adapt the connector to a high-density panel.

412. While Wong also discloses that “shrinking the connector size and/or spacing may also increase the support cost and diminish the quality of service,”

EX1005, 1:24-28, it is noted that Wong does not claim that shrinking the connector size is incompatible with the disclosed remote release mechanism.

413. Because shrinking the connector size and a remote release mechanism are two solutions to the same problem: adapting connectors to a high-density panel, a POSITA would have found it obvious to combine the two solutions also shrink the outer cross-sectional dimension of Wong's remote release connector to fit it to an even higher density panel. And because shrinking the connector size does not interfere with the remote release mechanism, the modification of Wong's remote release connector has a reasonable expectation of success.

414. Raven also identifies the same challenge with fiber optic connectors in a high-density panel. Raven explains that, because connectors are often plugged into a panel with a high density of connectors, limited space exists around each connector. EX1003, 1:27-2:1. Raven thus concludes that "it can be difficult for a user to manipulate the locking levers when removing the connector from the panel." EX1003, 2:1-2. To address this issue, Raven discloses a fiber optic cable assembly "that includes an improved means of actuating the fibre optic connector locking levers." EX1003, 2:10-11. Therefore, a POSITA would have been motivated to modify the Raven-Kuffel MT ferrule optical connector to have "an outer cross-sectional dimension along the fiber alignment axis and wherein the outer

cross-sectional dimension is less than an outer cross-sectional dimension of a standard MPO connector along a fiber alignment axis of the standard MPO connector”. Doing so would have been well within the skill of a POSITA because the modifications require only a structural redesign of the connector.

415. Shrinking the connector size and Raven’s remote release mechanism are two complementary solutions to the same problem – adapting connectors to a high-density panel. Therefore, a POSITA would have been motivated to combine the two solutions – shrinking the outer cross-sectional dimension of Raven’s remote release connector to fit a connector to an even higher density panel.

416. A POSITA also would have understood how to shrink the outer cross-sectional dimension of Raven’s remote release connector. Shrinking the outer cross-sectional dimension of a connector reduces each dimension proportionally, which can achieve designing and manufacturing a smaller profile for the connector.

417. Shrinking the outer cross-sectional dimension of Raven’s remote release connector also has a reasonable expectation of success because reducing a dimension of Raven’s connector does not interfere with its remote release mechanism. A POSITA would have understood that although the dimensions of Raven’s remote release may also need to be reduced proportionally to the cross-sectional

dimension, this would not affect the structure or the functionality of Raven's remote release.

418. Accordingly, a POSITA would have understood that while the Raven-Kuffel MT ferrule optical connector houses a standard MT ferrule, it is obvious that the connector can be further modified to have "an outer cross-sectional dimension along the fiber alignment axis and wherein the outer cross-sectional dimension is less than an outer cross-sectional dimension of a standard MPO connector along a fiber alignment axis of the standard MPO connector". Therefore, it is my opinion that Raven and Kuffel, further in view of Wong renders obvious Claim 13 of the '760 Patent and would have been obvious to combine as I discuss in Section XI.A.

419. Therefore, it is my opinion that Raven in view of Kuffel and further in view of Wong discloses claim element [13.1] of the '760 patent.

420. In summary, Raven in view of Kuffel and in further view of Wong renders obvious claim 13 of the '760 patent.

XII. GROUND 4: WONG RENDERS OBVIOUS CLAIMS 1-11 AND 15-17.

421. It is my opinion that Wong renders obvious independent claim 1, and dependent claims 2–11 and 15–17 of the '760 patent.

A. Claim 1

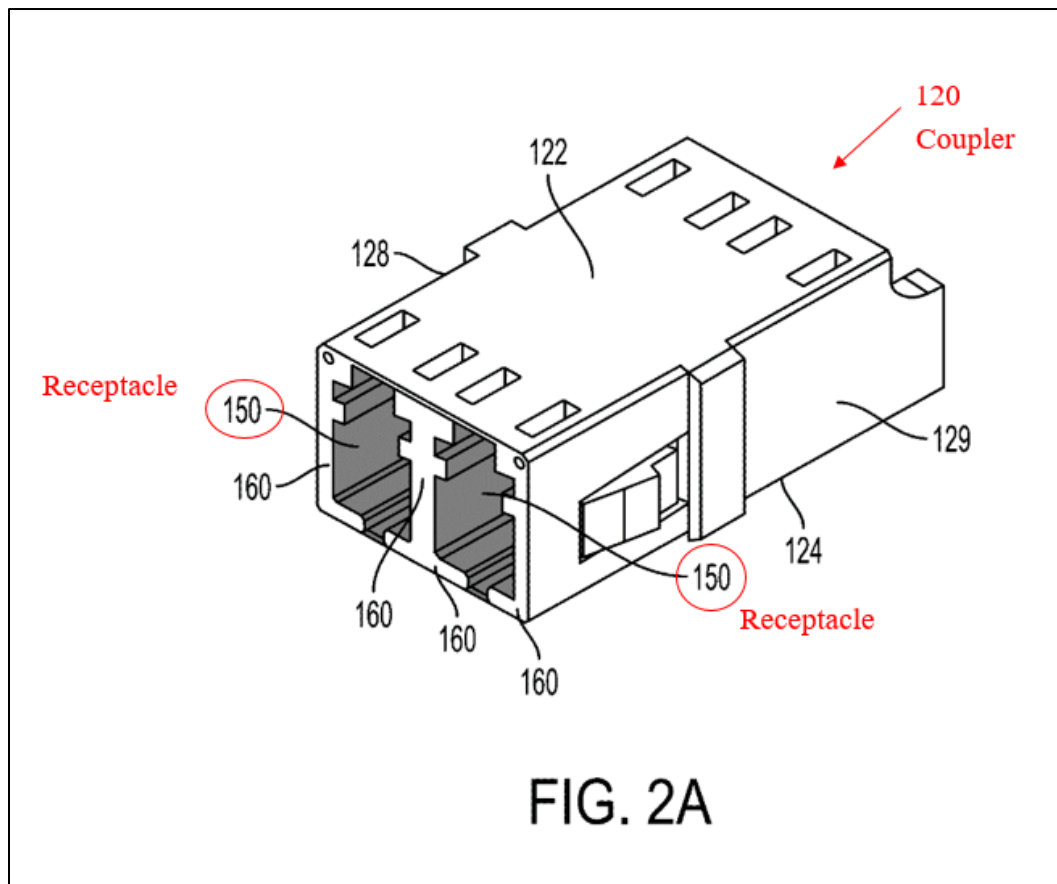
1. Preamble – “An optical fiber connector configured for mating with a receptacle, the optical fiber connector comprising:”

422. It is my opinion that Wong discloses “an optical fiber connector configured for mating with a receptacle.”

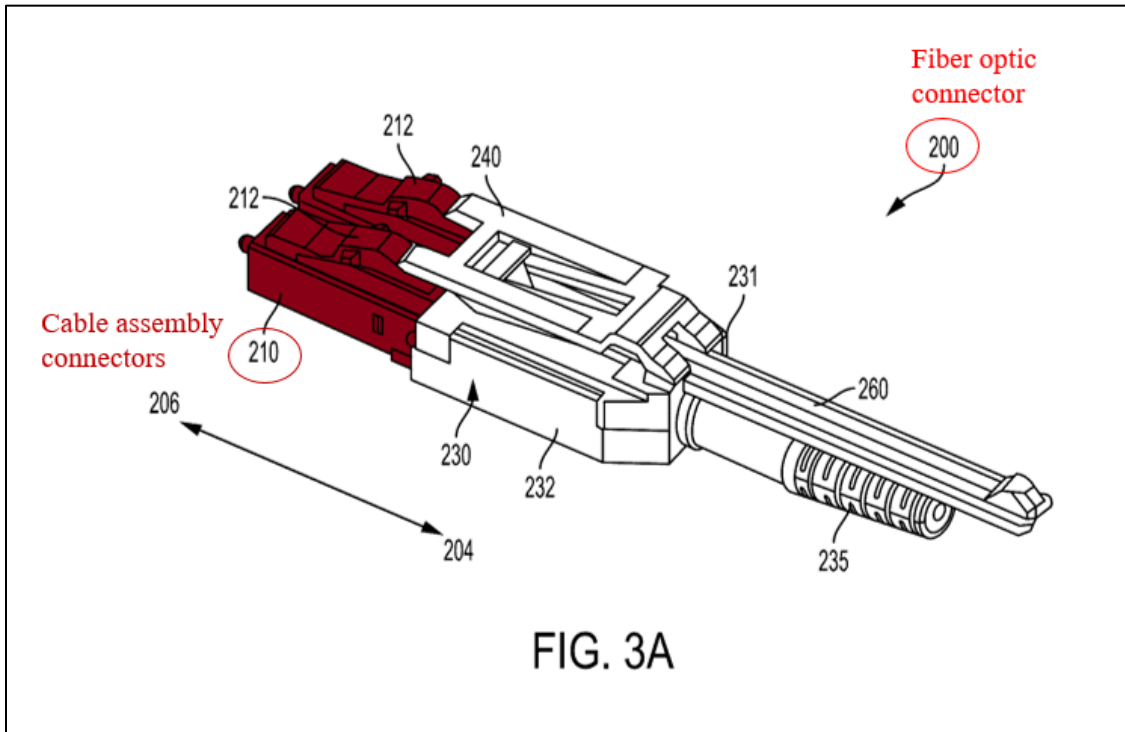
423. Wong states “the present disclosure relates generally to devices that integrate with existing cable assembly connectors and/or are similarly shaped and sized such that existing equipment can be used to connect signal conduits such as fiber optic cables and electrical conductors to high density panels.” EX1005, 4:40-44.

424. Wong discloses a fiber optic connector (“remote latch release connector assembly 200”), including “one or more cable assembly connectors 210”), as shown in Figure 3A reproduced below, that “may be configured to connect to the mating connector 150”, as shown in Figure 2A reproduced below. EX1005, 7:11-22. Wong also defines a cable assembly connector 210 to be “a device and/or components thereof that connects a first module or cable to a second module or cable” which “may be configured for fiber optic transmission or electrical signal transmission.” EX1005, 3:66-4:2.

425. Wong's remote latch release connector assembly 200 further includes "one or more cable assembly connectors 210," which is to be connected to receptacles ("mating connectors 150") of an adapter ("coupler 120"). EX1005, 4:51-5:2, 7:17-21, FIG. 2A.



EX1005, FIG. 2A (annotated).



EX1005, FIG. 3A (annotated).

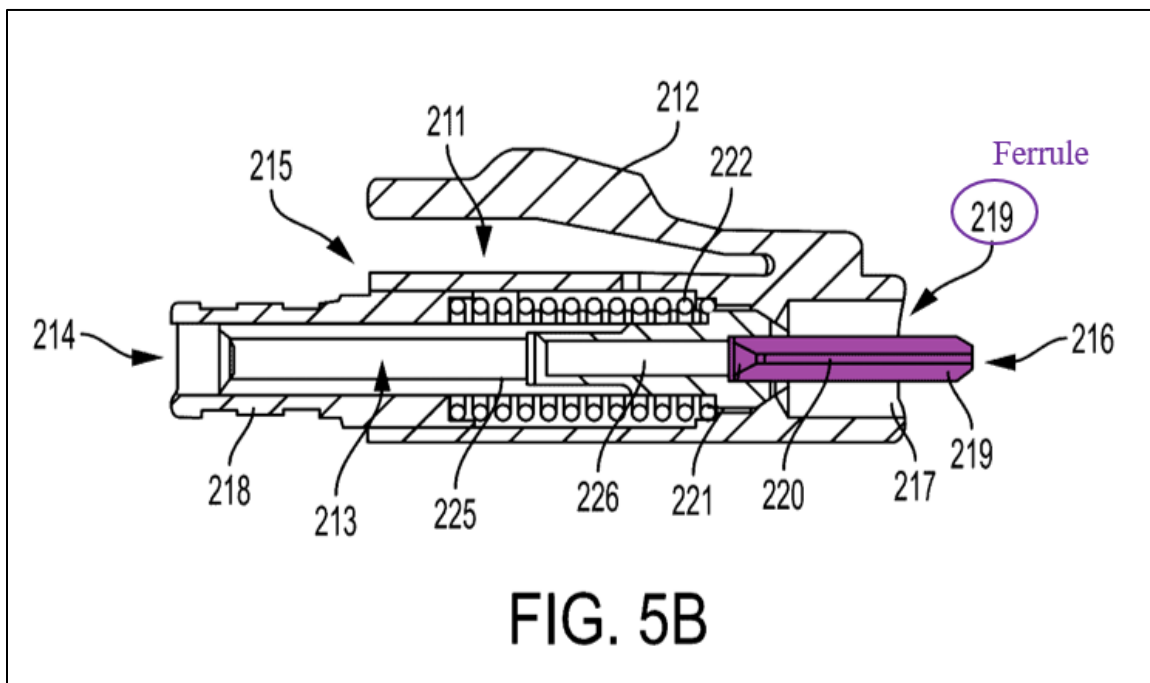
426. Wong also defines a cable assembly connector 210 to be “a device and/or components thereof that connects a first module or cable to a second module or cable, and may be configured for fiber optic transmission or electrical signal transmission.” EX1005, 3:66-4:2

427. Therefore, it is my opinion that Wong discloses claim element [1.P] of the '760 patent.

2. Element [1.1] – “an MT ferrule configured to hold a plurality of optical fibers”

428. It is my opinion that Wong discloses “an MT ferrule configured to hold a plurality of optical fibers.”

429. Wong discloses that cable assembly connector 210 includes a second opening 216 “configured to receive and hold a ferrule 219 in a generally longitudinal alignment with the bore 213.” EX1005, 9:41-43.



EX1005, FIG. 5B (annotated).

430. Wong explains that its connector (*e.g.*, cable assembly connector 210) “may be any suitable type now known or later developed, such as, for example, a ferrule connector (FC), a fiber distributed data interface (FDDI) connector, an LC connector, a mechanical transfer (MT) connector, an SC connector, an SC duplex connector, or a straight tip (ST) connector.” EX1005, 4:3-8, 7:57-8:2. Accordingly,

the connector type of cable assembly connector 210 is not limited to what is shown in the Figures, and Wong's ferrule 219 includes providing for an MT ferrule.

431. Further, MT ferrules are components of MPO connectors, which are multi-fiber connectors configured to hold a plurality of optical fibers.

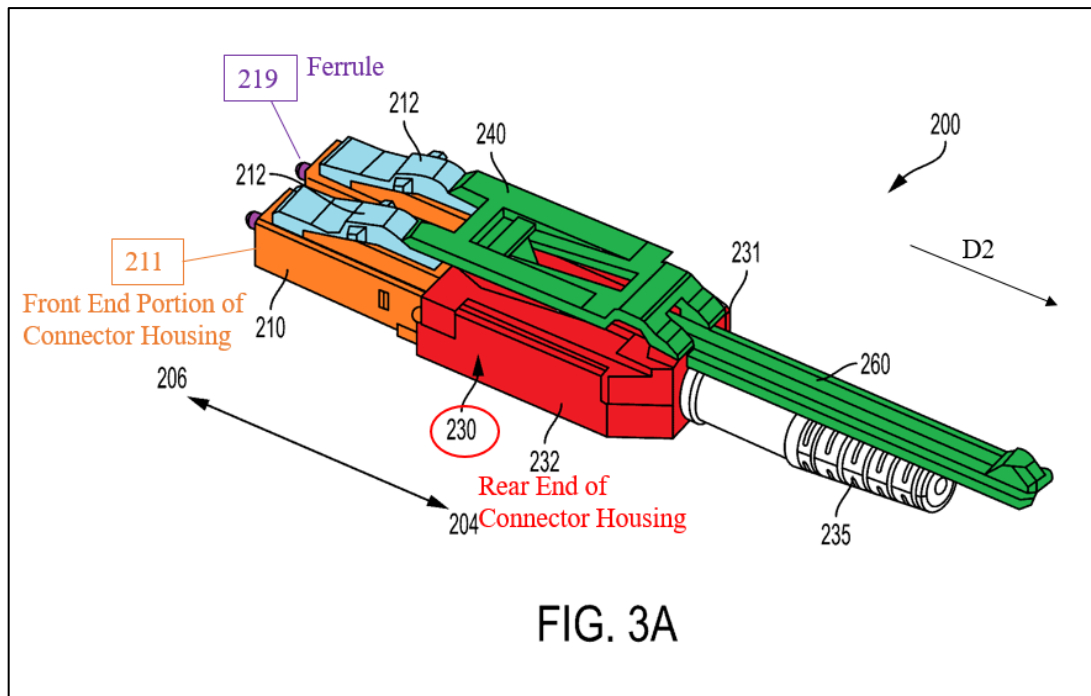
432. Therefore, it is my opinion that Wong discloses claim element [1.1] of the '760 patent.

3. Element [1.2] – “a connector housing having a front end portion and a rear end portion spaced apart along a longitudinal axis, the connector housing configured to hold the MT ferrule such that the MT ferrule is exposed through the front end portion for making an optical connection;”

433. It is my opinion that Wong discloses “a connector housing having a front end portion and a rear end portion spaced apart along a longitudinal axis, the connector housing configured to hold the MT ferrule such that the MT ferrule is exposed through the front end portion for making an optical connection.”

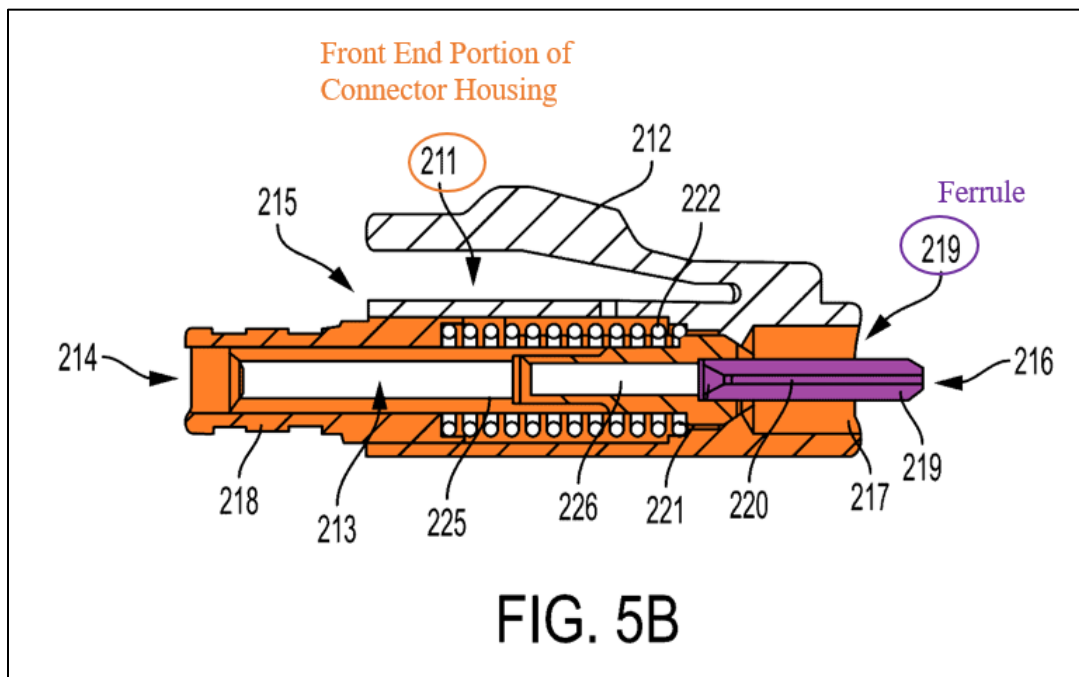
434. Further, Wong discloses that “remote latch release connector assembly 200 may generally include one or more cable assembly connectors 210 connected to a switchable housing 230 having one or more release members 240 and one or more pull tab assemblies 260.” EX1005, 7:17-21. Further, Wong explains that “cable assembly connector 210 may include, for example, a connector housing 211 and a latching portion 212.” EX1005, 7:43-45. Additionally, “cable assembly

connector 210 may include a bore 213 therethrough, thereby forming a first opening 214 at a first end 215 and a second opening 216 at a second end 217.” EX1005, 7:45-49 “Second opening 216 may be configured to receive and hold a ferrule 219 in a generally longitudinal alignment with the bore 213.” EX1005, 9:41-43.



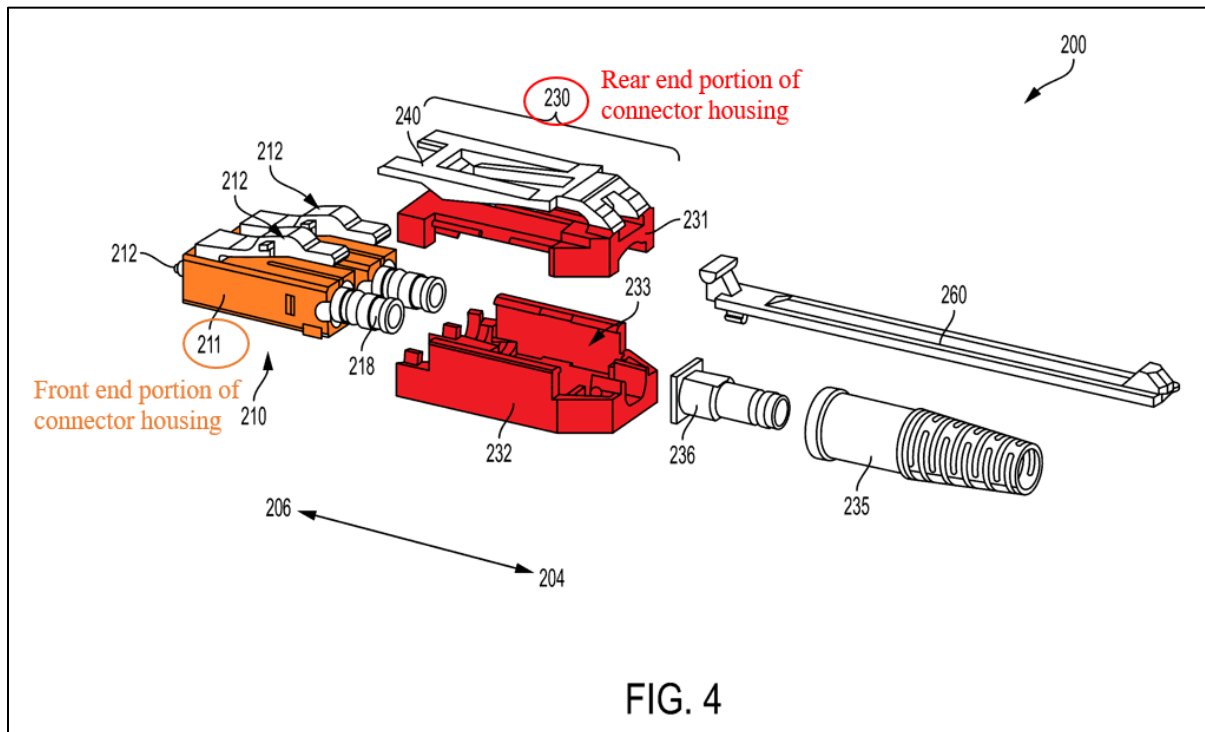
EX1005, FIG. 3A (annotated).

435. As I discussed above in Section XII.A.2 with reference to claim element [1.1], ferrule 219 discloses an MT ferrule. Further, as shown in Figure 5B reproduced below, ferrule 219 is exposed through connector housing 211 for making an optical connection.



EX1005, FIG. 5B (annotated).

436. With regard to switchable housing 230, Wong further explains that it “may include a switchable housing top 231 and a switchable housing bottom 232,” and “the switchable housing top 231 may be joined with the switchable housing bottom 232 to form the switchable housing 230.” EX1005, 10:22-28, FIG. 4.



EX1005, FIG. 4 (annotated).

437. In my opinion, Wong’s connector housing 211 and switchable housing 230 together form a connector housing, with connector housing 211 corresponding to the claimed front end portion and switchable housing 230 corresponding to the claimed rear end portion, and the MT ferrule (e.g. ferrule 219) is held within, and exposed through, connector housing 211 for making an optical connection.

438. It is noted that the claim language does not limit the “connector housing” to a unitary structure. To the extent that the Patent Owner argues that the “connector housing” is a unitary structure, I believe a POSITA would have found it

obvious to modify Wong's teaching to form a unitary housing from Wong's connector housing 211 and switchable housing 230.

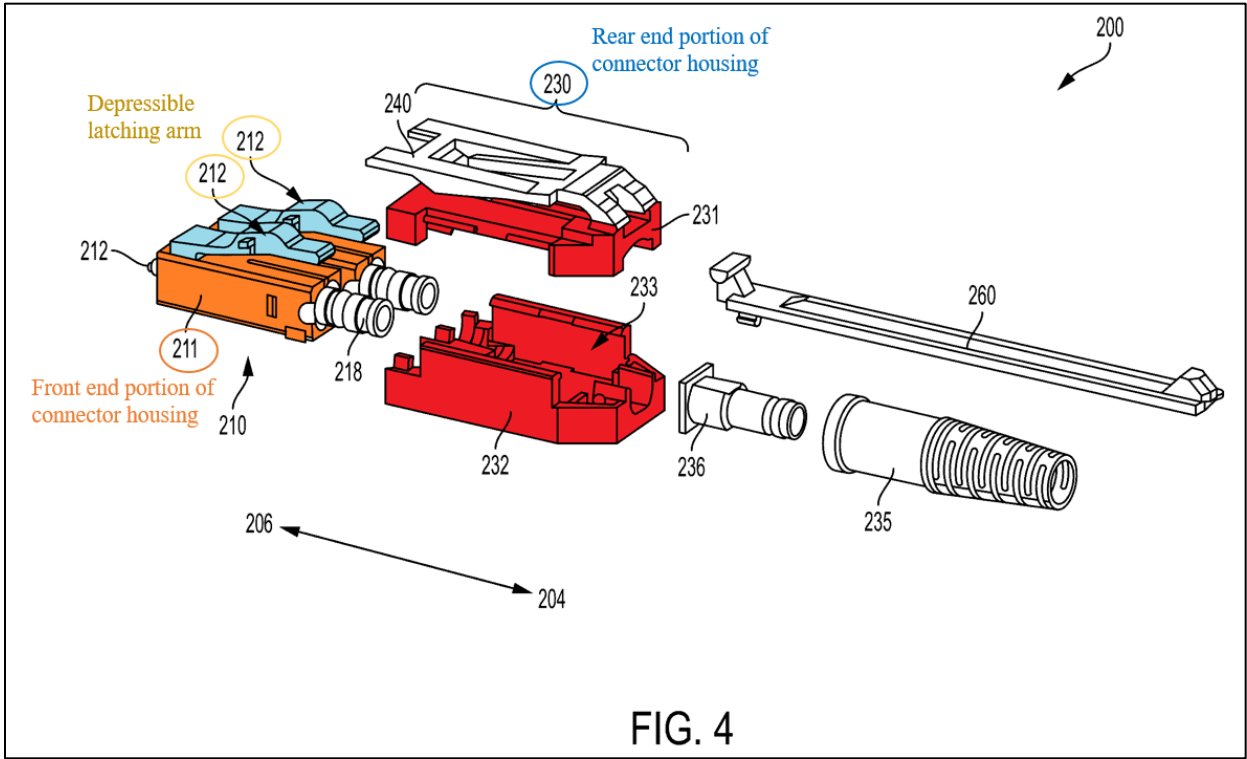
439. A POSITA would have recognized that such a modification provides the benefits of reducing the amount of components required for remote latch release connector assembly 200 of Wong and reducing potential for alignment error between connector housing 211 and switchable housing 230.

440. Therefore, it is my opinion that Wong discloses claim element [1.2] of the '760 patent.

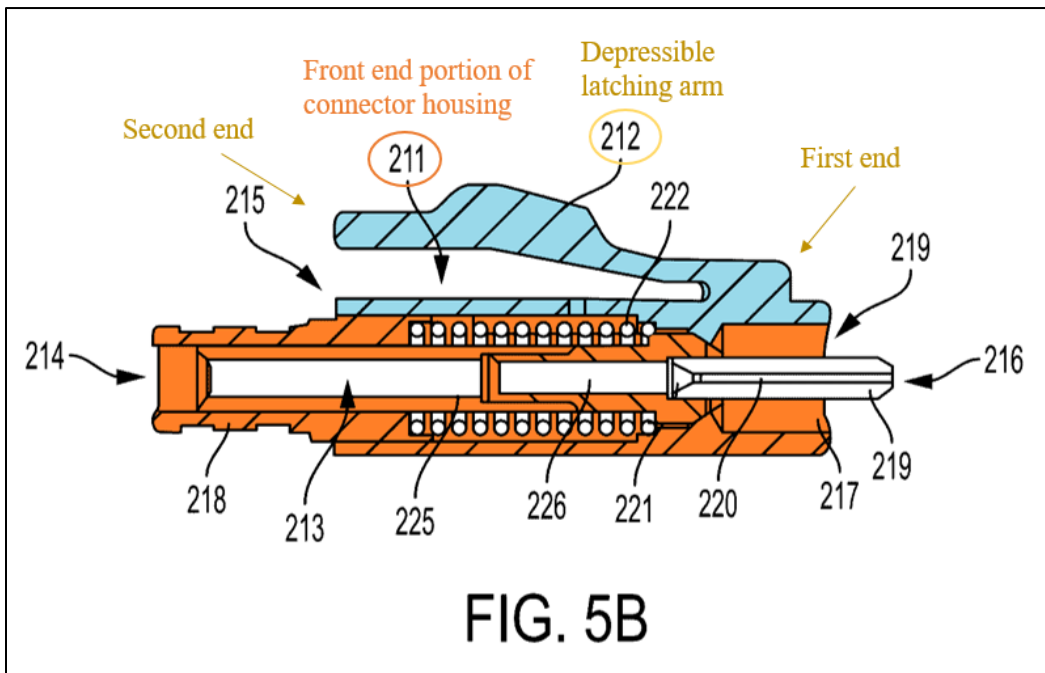
4. Element [1.3] – “a depressible latching arm connected to the connector housing for latching with the receptacle when the optical fiber connector is mated with the receptacle to releasably retain the optical fiber connector in the receptacle; and”

441. It is my opinion that Wong discloses “a depressible latching arm connected to the connector housing for latching with the receptacle when the optical fiber connector is mated with the receptacle to releasably retain the optical fiber connector in the receptacle.”

442. Wong's cable assembly connector 210 includes a connector housing 211 and a latching portion 212. EX1005, 7:43-45, FIG. 4. Wong describes that “the latching portion 212 may have a first end that is attached to the connector housing 211 and a second end that is not attached to the connector housing.”. EX1005, 8:18-21, FIG. 5B.



EX1005, FIG. 4 (annotated).



EX1005, FIG. 5B (annotated).

443. Wong further explains that, as cable assembly connector 210 is coupled into mating connector 150, latching portion 212 is first compressed between a top rail 170 and a bottom rail 180 of mating connector 150. Then, when latching portion 212 passes top rail 170 and bottom rail 180, latching portion 212 becomes “sandwiched between the respective top rail and bottom rail”, thus “trapping the latching portion” into respective trap 190 such that “cable assembly connector 210 is said to be engaged with mating connector 150.” EX1005, 8:21-42. Further, cable assembly connector 210 may be disengaged from mating connector 150 by compressing latching portion 212. EX1005, 8:43-46.

444. Therefore, I believe Wong’s latching portion 212 is a depressible latching arm connected to the connector housing (*e.g.*, connector housing 211) for latching with the receptacle (*e.g.*, mating connector 150) when the optical fiber connector is mated with the receptacle to releasably retain the optical fiber connector in the receptacle.

445. Therefore, it is my opinion that Wong discloses claim element [1.3] of the ’760 patent.

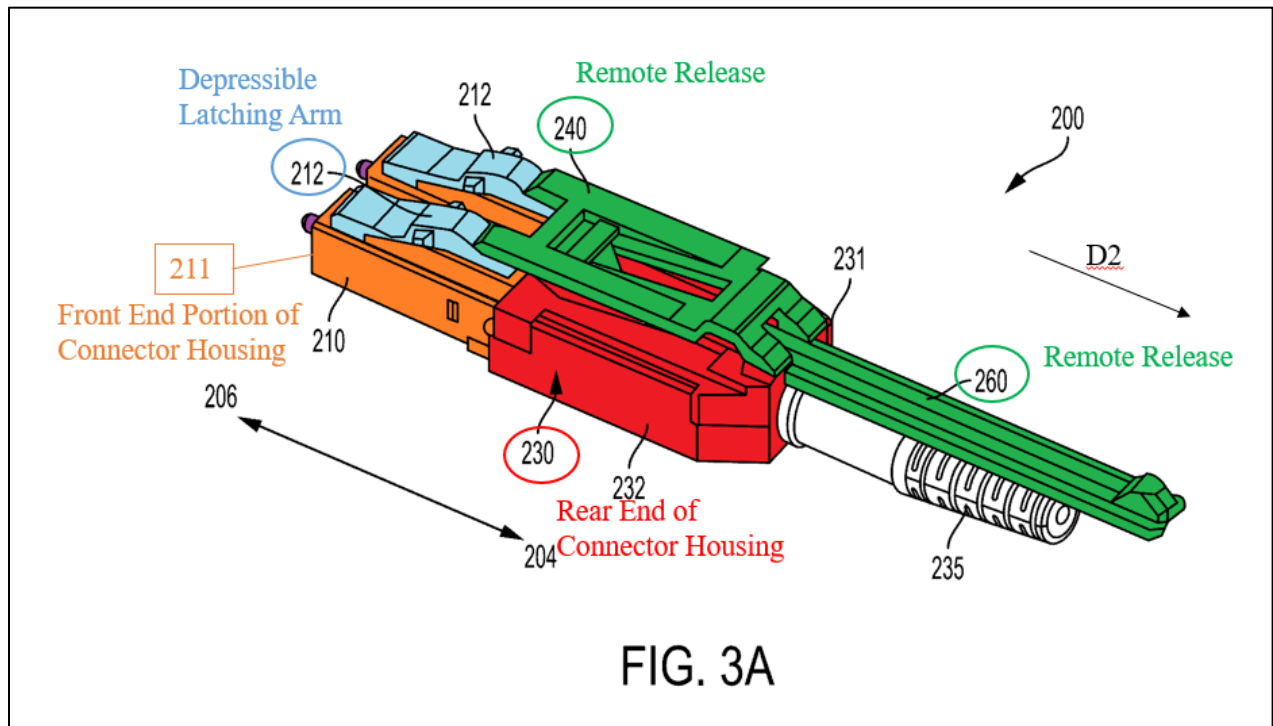
5. Element [1.4] – “a remote release connected to the connector housing for movement relative to the connector housing along the longitudinal

axis, the remote release being configured to be pulled rearward along the longitudinal axis to depress the depressible latching arm for releasing the optical fiber connector from the receptacle;”

446. It is my opinion that Wong discloses “a remote release connected to the connector housing for movement relative to the connector housing along the longitudinal axis, the remote release being configured to be pulled rearward along the longitudinal axis to depress the depressible latching arm for releasing the optical fiber connector from the receptacle.”

447. Wong’s remote latch release connector assembly 200 includes “one or more cable assembly connectors 210 connected to a switchable housing 230 having one or more release members 240 and one or more pull tab assemblies 260.”

EX1005, 7:17-21. Wong describes release member 240 is shaped such that a portion of release member 240 (for example, second segment 242) may engage with latching portion 212 of cable assembly connector 210 to cause latching portion 212 to unlatch. EX1005, 14:19-24. Pull tab assembly 260 is movable in a longitudinal direction to actuate release member 240. EX1005, 15:66-16:8.

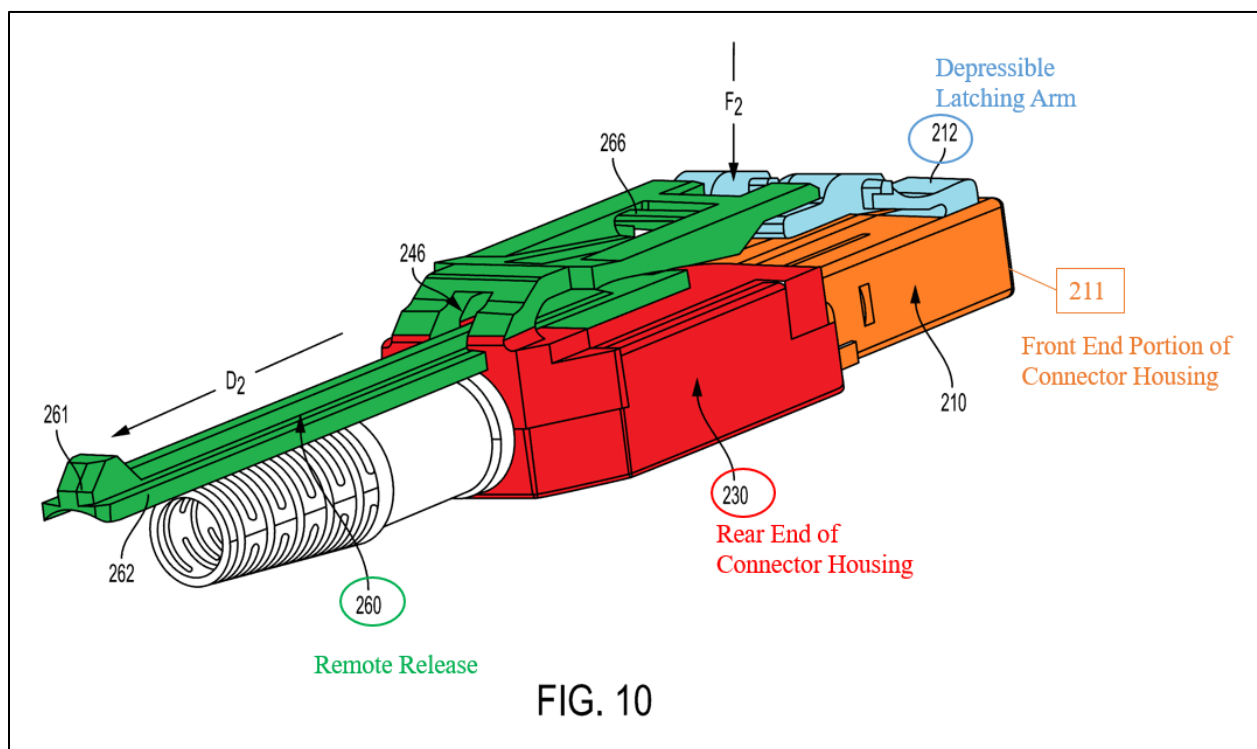


EX1005, FIG. 3A (annotated).

448. Specifically, pull tab assembly 260 moves in a second direction D_2 that is generally away from mating connector 150 to “cause the crossbar 266 to move over a higher area of the third segment 243 of the release member 240 (e.g., an area of the release member that is furthest away from the switchable housing 230).” EX1005, 18:26-32.

449. Therefore, second direction D_2 is a rearward direction along the longitudinal direction because it is away from mating connector 150 and the front end portion of connector housing.

450. A downward force F_2 , as shown in Figure 10 below, is then exacted over the release member 240 (e.g., a force that biases the release member towards the switchable housing 230) to cause the second segment 242 of the release member 240 to contact and/or press down on the latching portion 212, thereby unlatching the cable assembly connector 210 from the board. EX1005, 18:32-40, FIG. 10.



EX1005, FIG. 10 (annotated).

451. Therefore, I believe Wong's release member 240 and pull tab assembly 260 together form a remote release, with release member 240 connected to

connector housing (*e.g.*, switchable housing 230) and pull tab assembly 260 configured to be pulled rearward along the longitudinal axis to depress the depressible latching arm (*e.g.*, latching portion 212).

452. It is noted that the claim language does not limit the “remote release” to a unitary structure. To the extent that the Patent Owner argues, incorrectly, that the “remote release” is a unitary structure, I believe a POSITA would have found that Wong’s release member 240 and pull tab assembly 260 form a unitary structure, as they cannot be separated from each other. Wong discloses that its release member 240 includes a channel 247 having a width W_C that generally corresponds to a width of a protrusion 267 of pull tab assembly 260, such that protrusion 267 can extend through channel 247. EX1005, 15:23-42. Further, protrusion 267 has a crossbar 266 extending perpendicularly from the protrusion 267 and having a distance C that is greater than width W_C of channel 247, thereby ensuring that protrusion 267 remains protruding through channel 247 without slipping out. EX1005, 17:35-45.

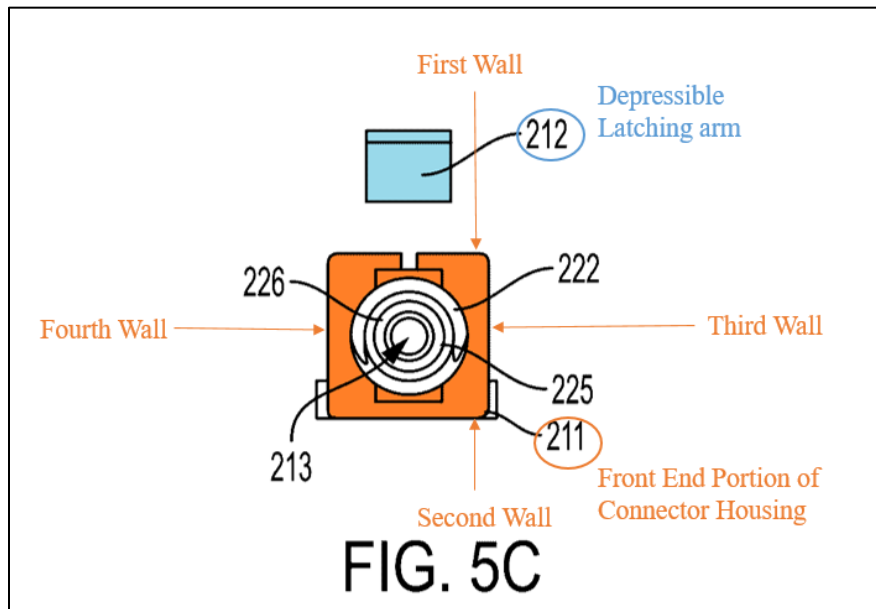
453. Because protrusion 267 of pull tab assembly 260 remains protruding through release member 240 and is prevented from slipping out of release member 240, release member 240 and pull tab assembly 260 cannot be separated from each other and therefore form a unitary structure.

454. Therefore, it is my opinion that Wong discloses claim element [1.4] of the '760 patent.

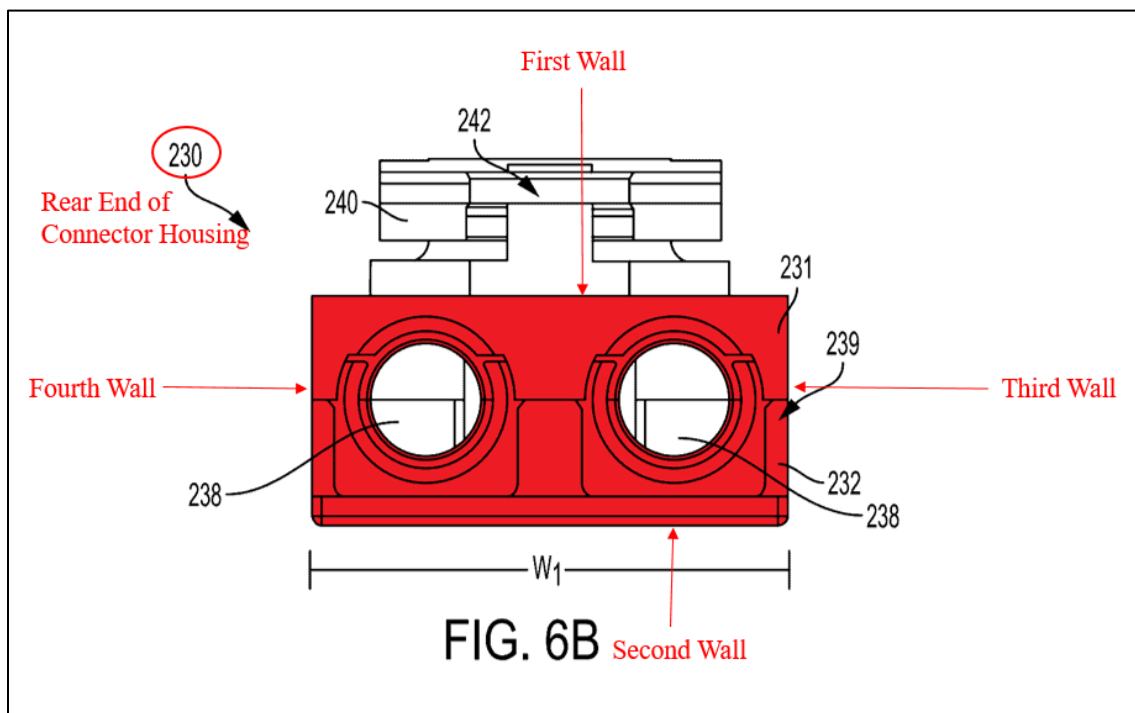
6. Element [1.5] – “wherein the connector housing has a generally rectangular perimeter including opposite first and second walls and opposite third and fourth walls, the depressible latching arm being located on an exterior of the first wall;”

455. It is my opinion that Wong discloses “wherein the connector housing has a generally rectangular perimeter including opposite first and second walls and opposite third and fourth walls, the depressible latching arm being located on an exterior of the first wall.”

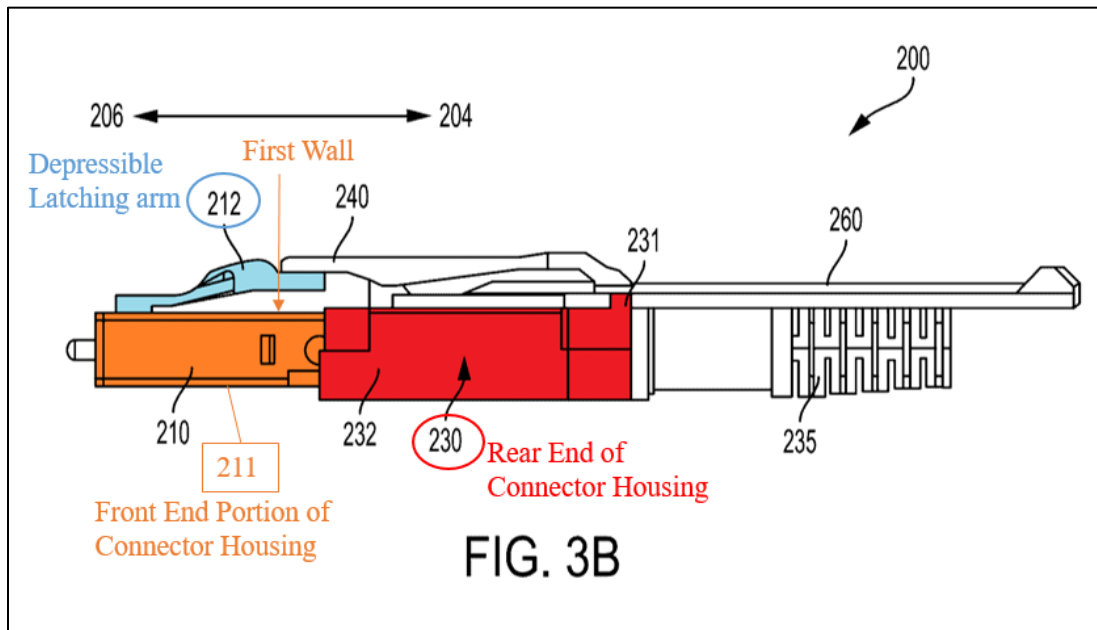
456. As I discussed above in Section XII.A.3 with respect to claim element [1.2], Wong discloses a connector housing comprising connector housing 211 is a front end portion and switchable housing 230 is a rear end portion. *See* Section XII.A.3 (claim element [1.2]), *supra*. Further, connector housing 211 and switchable housing 230, independently or integrally, have a generally rectangular perimeter including opposite first and second walls and opposite third and fourth walls, as shown in Figures 5C and 6B reproduced below, and the depressible latching arm (*e.g.*, latching portion 212) is located on an exterior of the first wall, as shown in Figure 3B reproduced below.



EX1005, FIG. 5C (annotated).



EX1005, FIG. 6B (annotated).



EX1005, FIG. 3B (annotated).

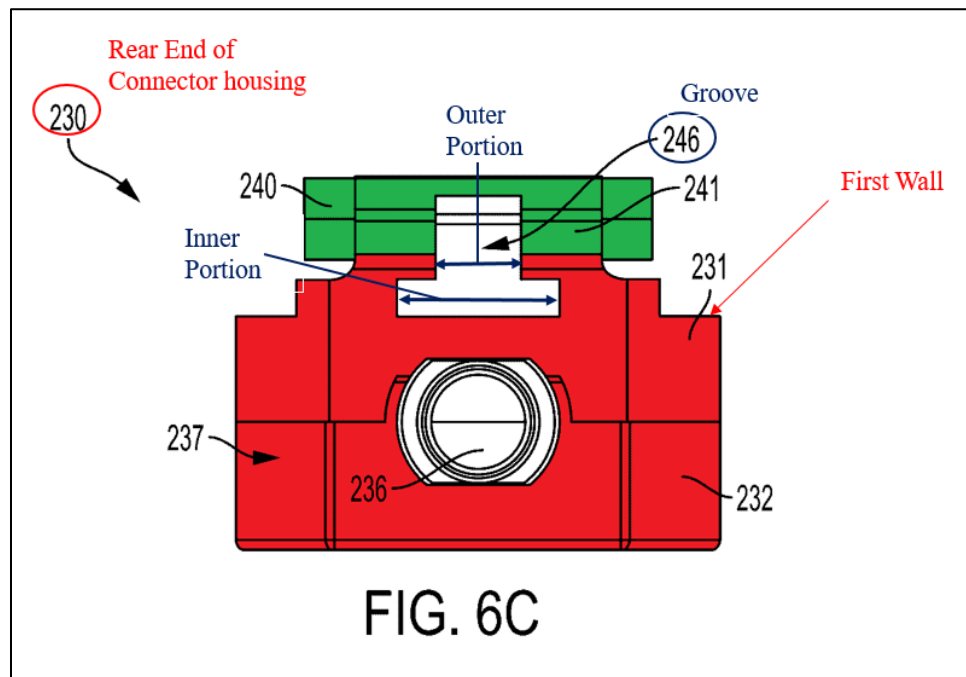
457. Therefore, it is my opinion that Wong discloses claim element [1.5] of the '760 patent.

7. Element [1.6] – “wherein the first wall of the connector housing defines a groove, the remote release being slidably received in the groove”

458. It is my opinion that Wong discloses “wherein the first wall of the connector housing defines a groove, the remote release being slidably received in the groove.”

459. Wong discloses that its release member 240 includes a first segment 241 with “an opening 246 therethrough”, as shown in Figure 6C reproduced below. EX1005, 15:49-51. Additionally, Wong describes that opening 246 provides “a space for which a portion of a pull tab may extend” and has “a shape and/or size that corresponds to a cross-sectional shape and/or size of a pull tab extending

therethrough.” EX1005, 15:50-56. Therefore, I believe Wong’s opening 246 is a groove defined on the first wall of the connector housing (e.g., switchable housing 230).



EX1005, FIG. 6C (annotated).

460. Wong also discloses that its pull tab assembly 260 includes a central shaft 262 having a cross sectional shape and size that generally corresponds to opening 246 of first segment 241 of release member 240. EX1005, 16:50-62. Further, Wong states “central shaft 262 may be inserted into the opening 246 [] such that pull tab assembly 260 is movable relative to the various portions of remote latch connector 200 along a coupling axis.” EX1005, 16:62-66.

461. Therefore, I believe Wong's opening 246 is a groove that slidably receives the remote release (*e.g.*, release member 240 and pull tab assembly 260).

462. Therefore, Wong it is my opinion that discloses claim element [1.6].

8. Element [1.7] – “wherein the remote release comprises a lower portion and a narrower portion above the lower portion, the lower portion being wider than the narrower portion; and”

463. It is my opinion that Wong discloses “wherein the remote release comprises a lower portion and a narrower portion above the lower portion, the lower portion being wider than the narrower portion.”

464. As I discussed above in Section XIIA.5 with respect to claim element [1.4], Wong's release member 240 and pull tab assembly 260 together form a remote release. *See* Section XII.A.5 (claim element [1.4]), *supra*. Wong also discloses that its pull tab assembly 260 includes a central shaft 262 having a cross sectional shape and size that generally corresponds to opening 246 of first segment 241 of release member 240. EX1005, 16:50-62. Wong's central shaft 262 includes a lower portion and a narrower portion above the lower portion, the lower portion being wider than the narrower portion, as shown in Figure 7A reproduced below.



EX1005, FIG. 7A (annotated).

465. Wong also discloses that second end 263 of pull tab assembly 260 includes a protrusion 267 that protrudes from central shaft 262. EX1005, 17:19-23, FIG. 7C. Therefore, Wong's central shaft 262 discloses a lower portion, and protrusion 267 discloses a second narrower portion above the lower portion.



EX1005, FIG. 7C (annotated).

466. Therefore, it is my opinion that Wong discloses claim element [1.7] of the '760 patent.

9. Element [1.8] – “wherein the groove includes an inner portion and an outer portion, the inner portion being wider than the outer portion, the inner portion of the groove being configured to slidably receive the lower portion of the latch release and the outer portion of the groove being configured to slidably receive the narrower portion of the latch release such that the first wall releasably retains the latch release in the groove.”

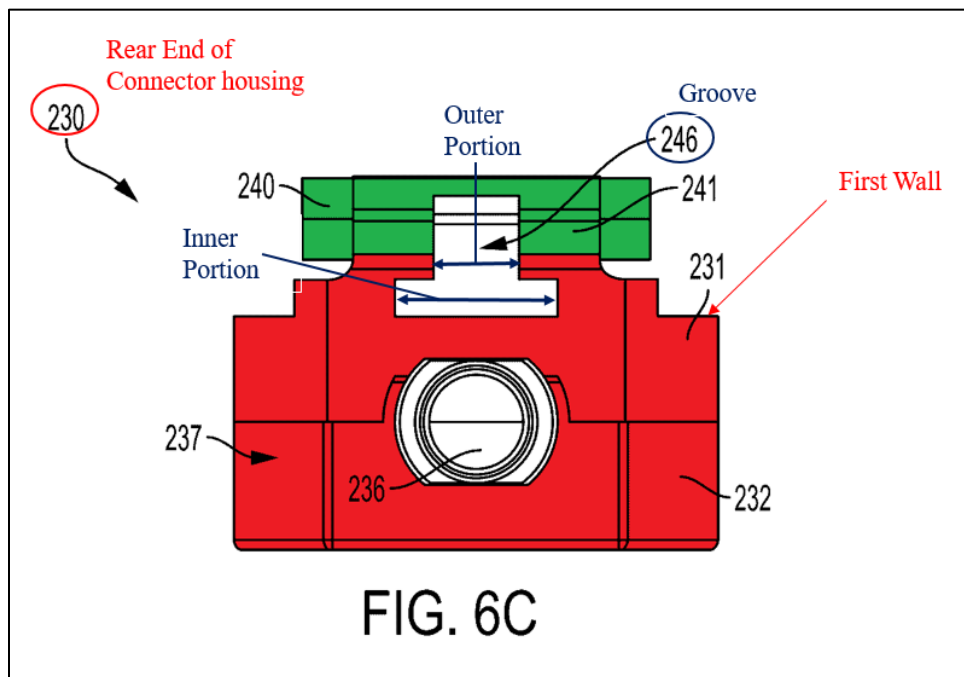
467. It is my opinion that Wong discloses “wherein the groove includes an inner portion and an outer portion, the inner portion being wider than the outer portion, the inner portion of the groove being configured to slidably receive the lower portion of the latch release and the outer portion of the groove being configured to slidably receive the narrower portion of the latch release such that the first wall releasably retains the latch release in the groove.”

468. As I discussed above in Section XII.A.6 with respect to claim element [1.5], Wong’s opening 246 discloses a groove and provides a space for which a portion of pull tab assembly 260 may extend, and generally has a shape and/or size that corresponds to a cross-sectional shape and/or size of pull tab assembly 260 extending therethrough. EX1005, 15:49-56.

469. Also as discussed above in Section XII.A.8 with respect to claim element [1.7], Wong’s central shaft 262 of pull tab assembly 260 discloses a lower

portion and a first narrower portion above the lower portion, and Wong's protrusion 267 also discloses a second narrower portion above the lower portion.

470. As shown in Figure 6C reproduced below, Wong's opening 246 is a groove that includes an inner portion and an outer portion, with the inner portion being wider than the outer portion. Further, because opening 246 provides a space for which a portion of pull tab assembly 260 may extend and generally has a shape and/or size that corresponds to a cross-sectional shape and/or size of pull tab assembly 260 extending therethrough, the inner portion of the groove is configured to slidably receive the lower portion of the remote release (*e.g.*, release member 240 and pull tab assembly 260), and that the outer portion of the groove is configured to slidably receive the narrower portion of the latch release, such that the first wall releasably retains the remote release in the groove. EX1005, 17:19:34.



EX1005, FIG. 6C (annotated).

471. Accordingly, it is my opinion that Wong discloses claim element [1.8] of the '760 patent.

472. In summary, for at least the reasons discussed above, I believe a POSITA would have recognized that Wong renders obvious each of the features of Claim 1 of the '760 patent. As such, it is my opinion that the entirety of Claim 1 of the '760 Patent is rendered obvious.

B. Claim 2

1. Preamble – “The optical fiber connector as set forth in claim 1, wherein”

473. Claim 2 depends upon claim 1, and for at least the reasons discussed above in reference to claim 1, Wong renders obvious claim 1. *See* Section XII.A.

474. Additionally, it is my opinion that Wong renders obvious “[t]he optical fiber connector as set forth in claim 1.”

2. Element [2.1] – “the depressible latching arm has a front end portion and a rear end portion spaced apart along the longitudinal axis, the depressible latching arm extending transversely outward away from the first wall as the depressible latching arm extends longitudinally from the front end portion to the rear end portion.”

475. It is my opinion that Wong discloses that “the depressible latching arm has a front end portion and a rear end portion spaced apart along the longitudinal axis, the depressible latching arm extending transversely outward away from the first wall as the depressible latching arm extends longitudinally from the front end portion to the rear end portion.”

476. Wong discloses that depressible latching arm (*e.g.*, latching portion 212) has “a first end that is attached to connector housing 211 and a second end that is not attached to connector housing.” EX1005, 8:18-21. The first end corresponds to a front end portion of the depressible latching arm attached to the connector housing and the second end corresponds to a rear end portion of the depressible latching arm.

477. Additionally, as shown in Figure 5B, the depressible latching arm extends transversely outward away from the first wall of the connector housing (*e.g.*,

478. Accordingly, it is my opinion that Wong discloses claim element [2.1] of the '760 patent.

220

C. Claim 3

1. Preamble – “The optical fiber connector as set forth in claim 2, wherein”

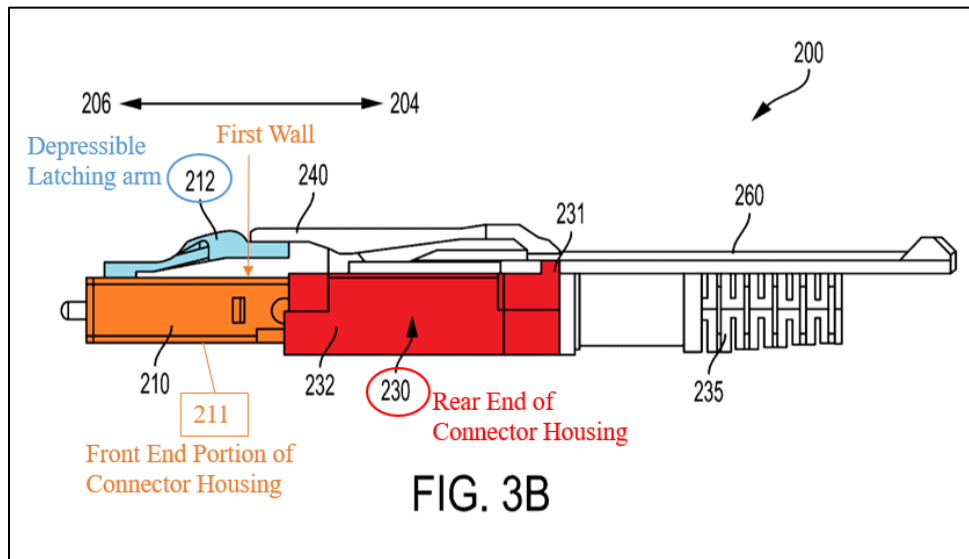
480. Claim 3 depends upon claim 2 and claim 1, and for at least the reasons discussed above in reference to claim 1 and claim 2, Wong renders obvious claim 1 and claim 2. *See* Sections XII.A-B.

481. Additionally, it is my opinion that Wong renders obvious “[t]he optical fiber connector as set forth in claim 2.”

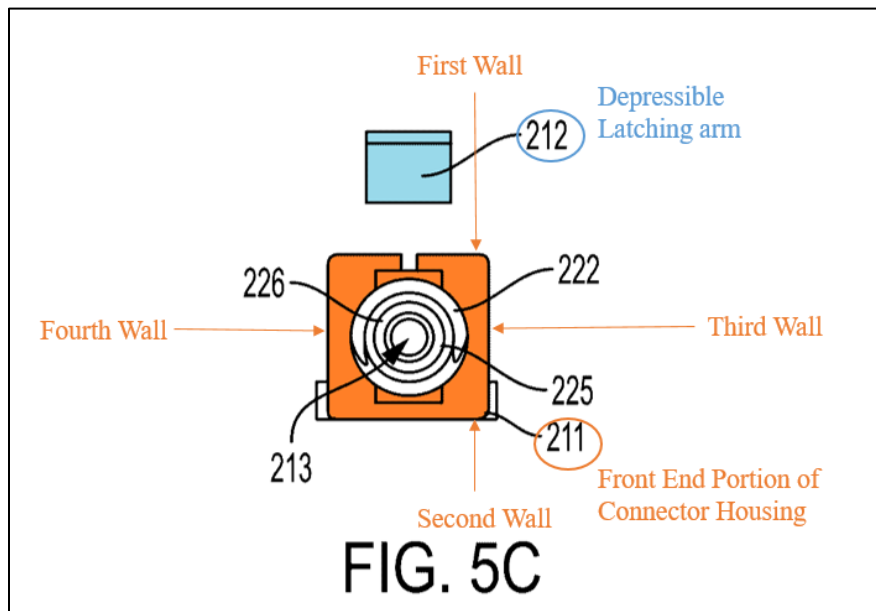
2. Element [3.1] – “the optical fiber connector is free of depressible latching arms on an exterior of any of the second, third, and fourth walls.”

482. In my opinion, Wong discloses that “the optical fiber connector is free from depressible latching arms on an exterior of any of the second, third, and fourth walls.”

483. As discussed above in Section XII.A.6 with respect to claim element [1.5], Wong discloses a connector housing having a generally rectangular perimeter including opposite first and second walls and opposite third and fourth walls. Figures 3B and 5C, reproduced below, illustrate that a depressible latching arm (*e.g.*, latching portion 212) is provided only on the first wall. Wong’s second, third, and fourth walls are all free of a depressible latching arm.



EX1005, FIG. 3B (annotated).



EX1005, FIG. 5C (annotated).

484. Accordingly, it is my opinion that Wong discloses claim element [3.1].

485. In summary, Wong renders obvious Claim 3 of the '760 patent.

D. Claim 4

1. Preamble – “The optical fiber connector as set forth in claim 1, wherein”

486. Claim 4 depends upon claim 1, and for at least the reasons discussed above in reference to claim 1, Wong renders obvious claim 1. *See* Section XII.A.

487. Additionally, it is my opinion that Wong renders obvious “[t]he optical fiber connector as set forth in claim 1.”

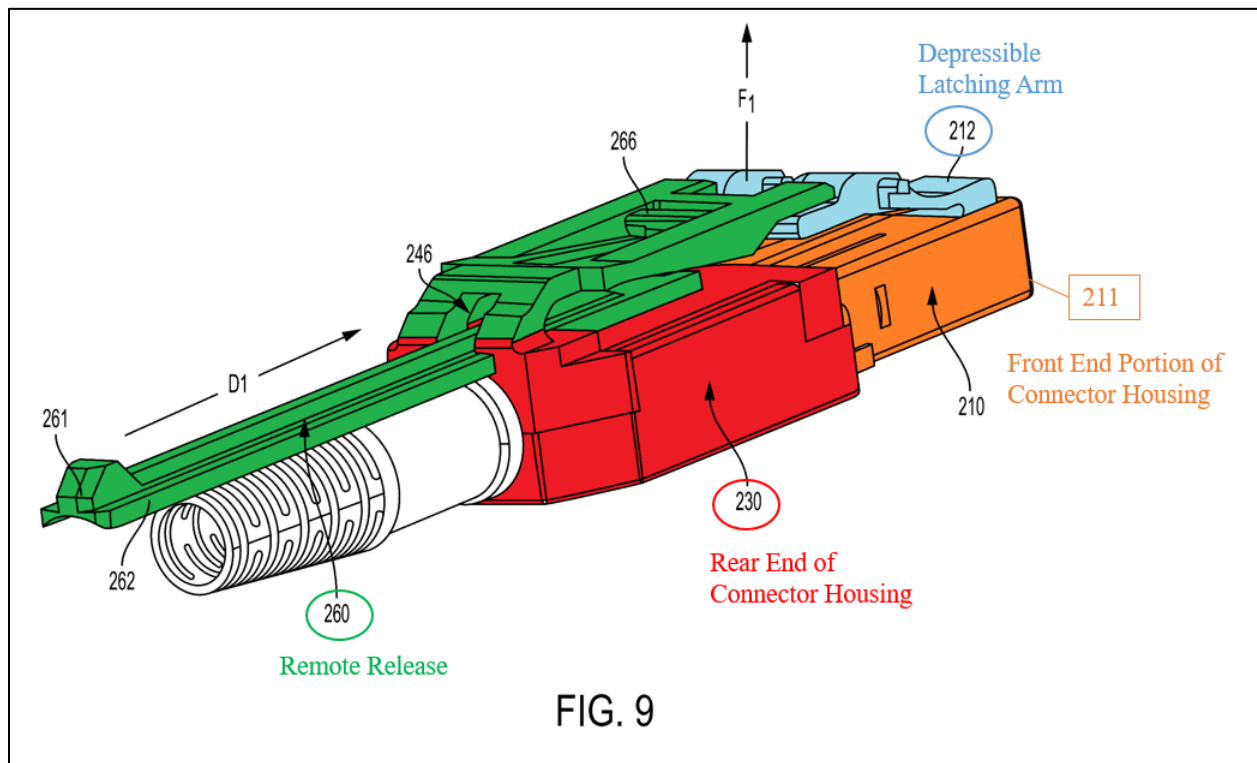
2. Element [4.1] – “the optical fiber connector is configured so that upon release of the remote release after being pulled rearward along the longitudinal axis to depress the depressible latching arm, the depressible latching arm resiliently returns toward an un-depressed position.”

488. In my opinion, Wong discloses that “the optical fiber connector is configured so that upon release of the remote release after being pulled rearward along the longitudinal axis to depress the depressible latching arm, the depressible latching arm resiliently returns toward an un-depressed position.”

489. In Figure 9, Wong discloses a resting state and/or a state where the remote latch release assembly is inserted into a board. EX1005, 17:66-18:2. In such a resting state, pull tab assembly 260 may be pushed forward in a first direction D1 (*e.g.*, towards the board/cable assembly connectors) such that crossbar 266 does not cause a vertical force on release member 240 and/or allows release member 240 to be in a resting position. EX1005, 18:2-7. Therefore, release member 240 is not exacting a force on latching portion 212 of cable assembly connector 210, or is

exacting a force that is minimal or insignificant enough to press down on latching portion 212 to effect release of cable assembly connector 210 from the board.

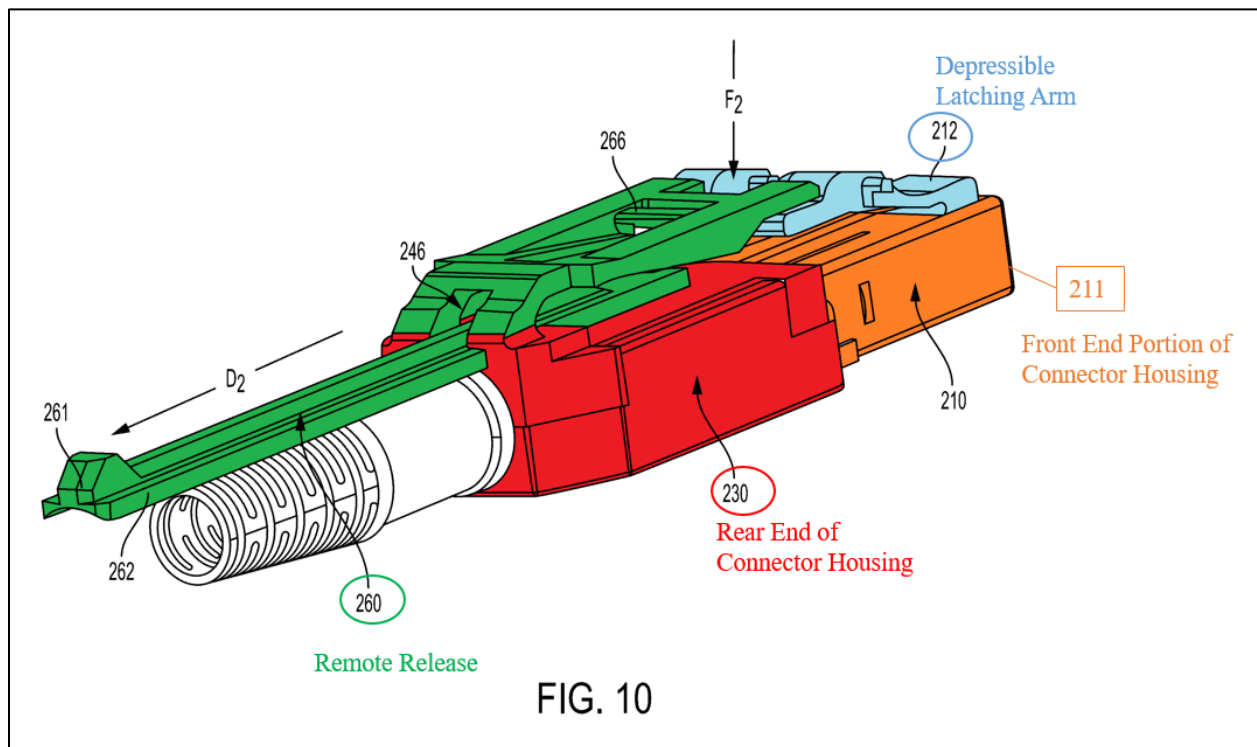
EX1005, 18:7-13. The position of pull tab assembly 260 allows for a biasing upward vertical force F_1 on release member 240 such that second segment 242 (or similar portion) of release member 240 is lifted off of latching portion 212 of cable assembly connector 210. EX1005, 18:19-24.



EX1005, FIG. 9 (annotated).

490. Additionally, in Figure 10 reproduced below, Wong discloses an actuated state where pull tab assembly 260 is moved in a second direction D_2 that is generally away from the board. EX1005, 18:25-28. Such a movement of pull tab

assembly 260 may cause crossbar 266 to move over a higher area of third segment 243 of release member 240 (*e.g.*, an area of the release member that is furthest away from switchable housing 230). EX1005, 18:28-32. Due to the distance protrusion 267 extends through channel 247, crossbar 266 causes a downward force F_2 to be exerted over release member 240 (*e.g.*, a force that biases the release member towards switchable housing 230). EX1005, 18:32-36. Downward force F_2 causes second segment 242 of release member 240 to contact and/or press down on latching portion 212, thereby unlatching cable assembly connector 210 from the board. EX1005, 18:36-40.



EX1005, FIG. 10 (annotated).

491. Therefore, I believe a POSITA would understand that upon release of remote release (*e.g.*, release member 240 and pull tab assembly 260) from the actuated state shown in Figure 10, the remote release returns to the resting state shown in Figure 9, where downward force F_2 is removed, and the remote release no longer contacts or presses down on the depressible latching arm (*e.g.*, latching portion 212). Accordingly, the depressible latching arm would resiliently return toward the un-depressed position of the resting state.

492. Accordingly, it is my opinion that Wong discloses claim element [4.1] of the '760 patent, or at minimum would have rendered obvious the features disclosed in claim element [4.1] of the '760 patent.

493. In summary, Wong renders obvious Claim 4 of the '760 patent.

E. Claim 5

1. Preamble – “The optical fiber connector as set forth in claim 1, wherein”

494. Claim 5 depends upon claim 1, and for at least the reasons discussed above in reference to claim 1, Wong renders obvious claim 1. *See* Section XII.A.

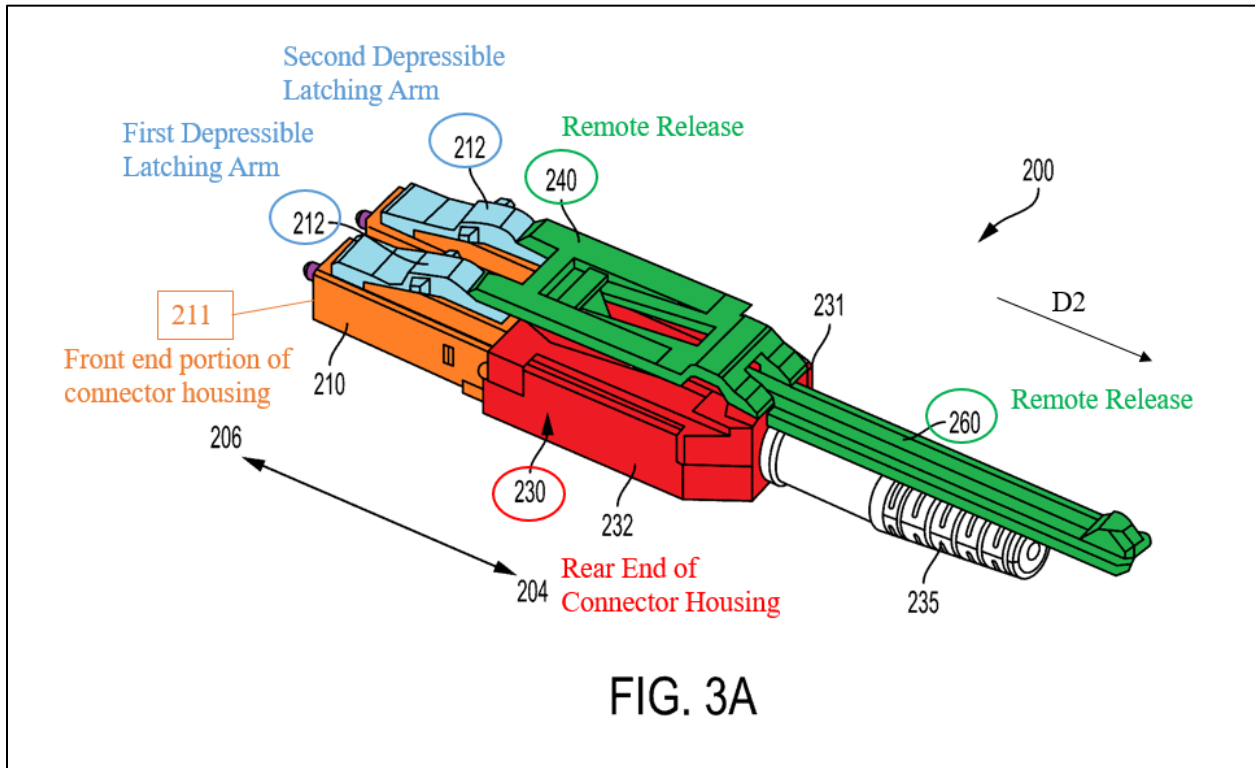
495. Additionally, it is my opinion that Wong renders obvious “[t]he optical fiber connector as set forth in claim 1.”

2. Element [5.1] – “the depressible latching arm is a first depressible latching arm, the optical fiber connector further comprising a second depressible latching arm spaced apart from the first depressible latching arm”

496. In my opinion, Wong discloses that “the depressible latching arm is a first depressible latching arm, the optical fiber connector further comprising a second depressible latching arm spaced apart from the first depressible latching arm.”

497. Wong discloses that “remote latch release connector assembly 200 may be a multi-port connector assembly having a plurality of cable assembly connectors 210 connected to a switchable housing 230 having a plurality of release members 240 and a plurality of pull tab assemblies 260.” EX1005, 7:22-27. As one exemplary embodiment, Figure 3A reproduced below, depicts “two cable assembly connectors 210, a single release member 240, and a single pull tab assembly 260. EX1005, 7:27-31. Further, each cable assembly connector 210 includes a connector housing 211 and a latching portion 212. EX1005, 7:43-45.

498. Wong’s Figure 3A depicts an optical fiber connector comprising a first depressible latching arm and a second depressible latching arm spaced apart from the first depressible latching arm.



EX1005, FIG. 3A (annotated).

499. Accordingly, it is my opinion that Wong discloses claim element [5.1] of the '760 patent.

500. In summary, Wong renders obvious Claim 5 of the '760 patent.

F. Claim 6

1. Preamble – “The optical fiber connector as set forth in claim 5, wherein”

501. Claim 6 depends upon claim 5 and claim 1, and for at least the reasons discussed above in reference to claim 1 and claim 5, Wong renders obvious claim 1 and claim 5. *See* Sections XII.A, XII.E.

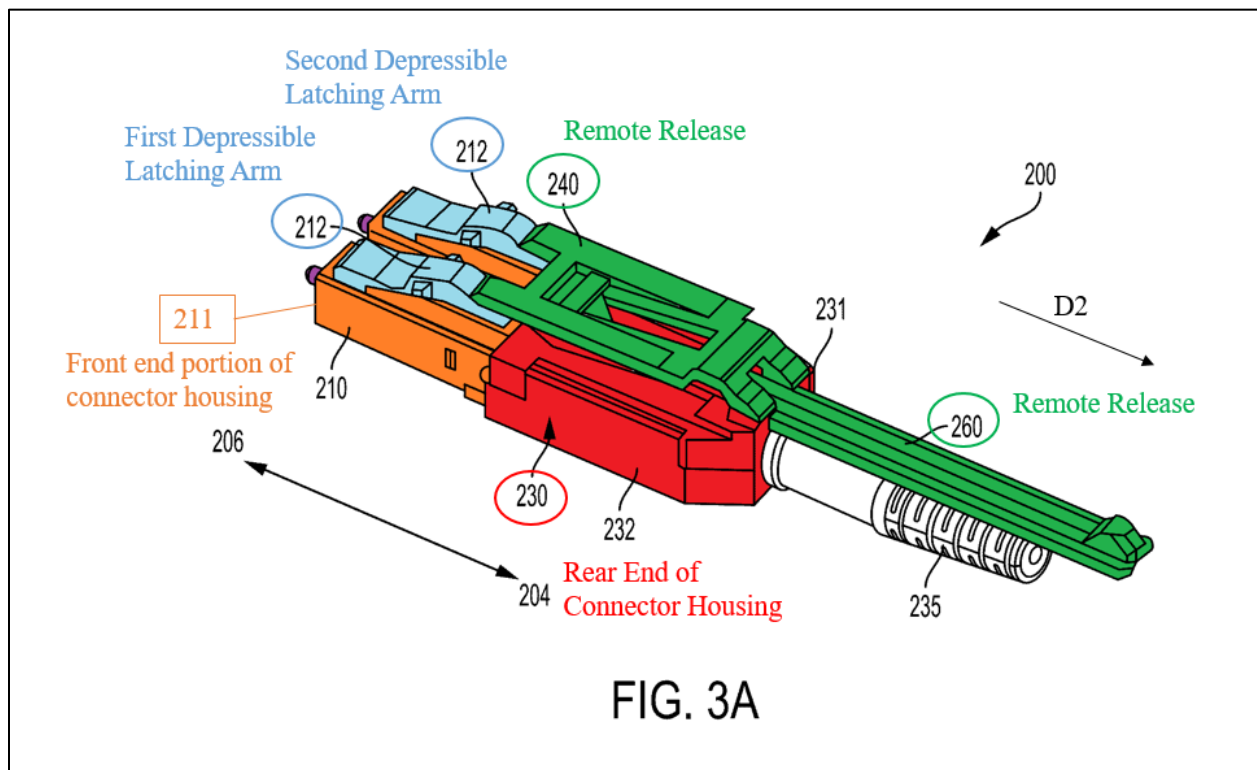
502. Additionally, it is my opinion that Wong renders obvious “[t]he optical fiber connector as set forth in claim 5.”

2. Element [6.1] – “the remote release is further configured to depress the second depressible latching arm when the remote release is pulled rearward along the longitudinal axis.”

503. In my opinion, Wong discloses that “the remote release is further configured to depress the second depressible latching arm when the remote release is pulled rearward along the longitudinal axis.”

504. Wong discloses that switchable housing 230 may incorporate a release member 240 for a plurality of cable assembly connectors 210 with which release member 240 engages. For example, as shown in Figure 4, a single release member 240 is incorporated with switchable housing 230 and configured to engage with two cable assembly connectors 210. EX1005, 13:28-35.

505. When Wong’s remote release (*e.g.*, pull tab assembly 260) is pulled rearward along the longitudinal axis, the remote release (*e.g.*, release member 240) can depress the second depressible latching arm in the same way as it depresses the first depressible latching arm.



EX1005, FIG. 3A (annotated).

506. Therefore, it is my opinion that Wong discloses claim element [6.1] of the '760 patent.

507. In summary, Wong renders obvious Claim 6 of the '760 patent.

G. Claim 7

1. Preamble – “The optical fiber connector as set forth in claim 5, wherein”

508. Claim 7 depends upon claim 5 and claim 1, and for at least the reasons discussed above in reference to claim 1 and claim 5, Wong renders obvious claim 1 and claim 5. *See* Sections XII.A, XII.E.

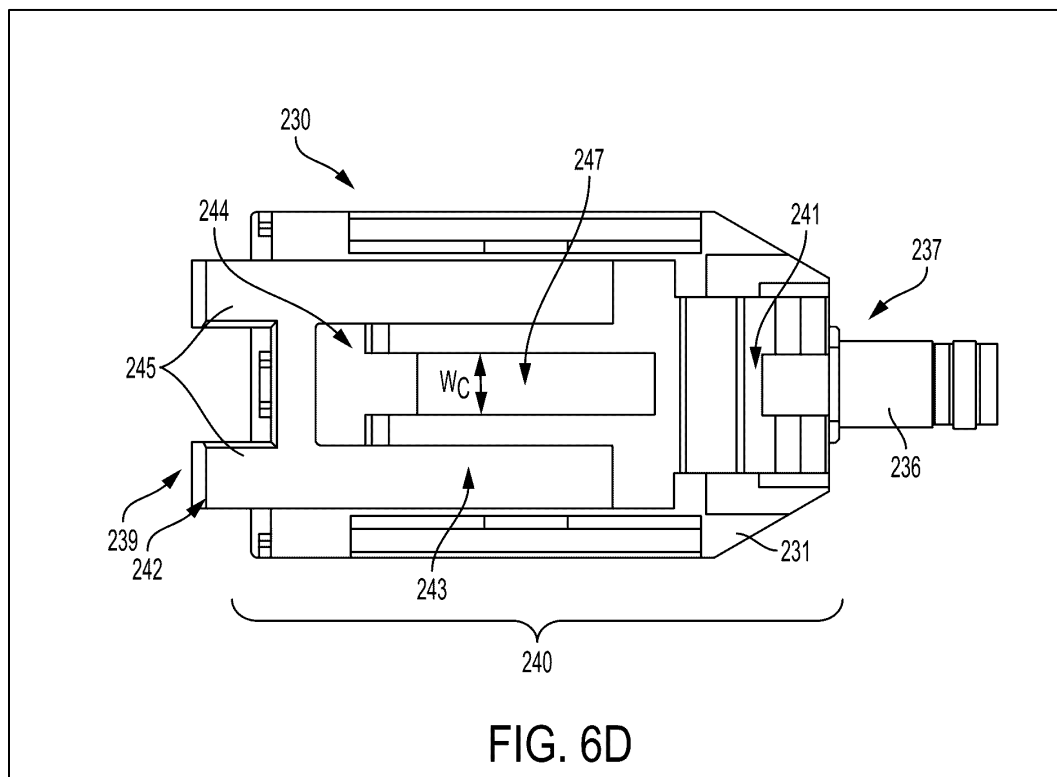
509. Additionally, it is my opinion that Wong renders obvious “[t]he optical fiber connector as set forth in claim 5.”

2. Element [7.1] – “the remote release comprises a first edge for engaging the first depressible latching arm and a second edge for engaging the second depressible latching arm, the first and second edges being spaced apart from one another.”

510. In my opinion, Wong discloses that “the remote release comprises a first edge for engaging the first depressible latching arm and a second edge for engaging the second depressible latching arm, the first and second edges being spaced apart from one another.”

511. Wong discloses that “the second segment 242 of the release member 240 may include one or more prongs, tabs, or the like 245 that are configured to engage with latching portion 212 of cable assembly connector 210 [].” EX1005, 15:4-8. Thus, the number of prongs, tabs, or the like 245 may correspond to the number of cable assembly connectors 210 with which release member 240 engages. EX1005, 15:8-11. For example, if a single release member 240 is configured to engage with two cable assembly connectors 210, second segment 242 may contain two prongs, tabs, or the like 245 where each prong, tab, or the like 245 corresponds to the latching portion 212 of one of cable assembly connectors 210. EX1005, 15:8-16.

512. Thus, Wong's prongs, tabs, or the like 245 of release member 240, depicted in Figure 6D reproduced below, disclose a first edge for engaging the first depressible latching arm and a second edge for engaging the second depressible latching arm, that are spaced apart from one another, as demonstrated in Figure 3A below.



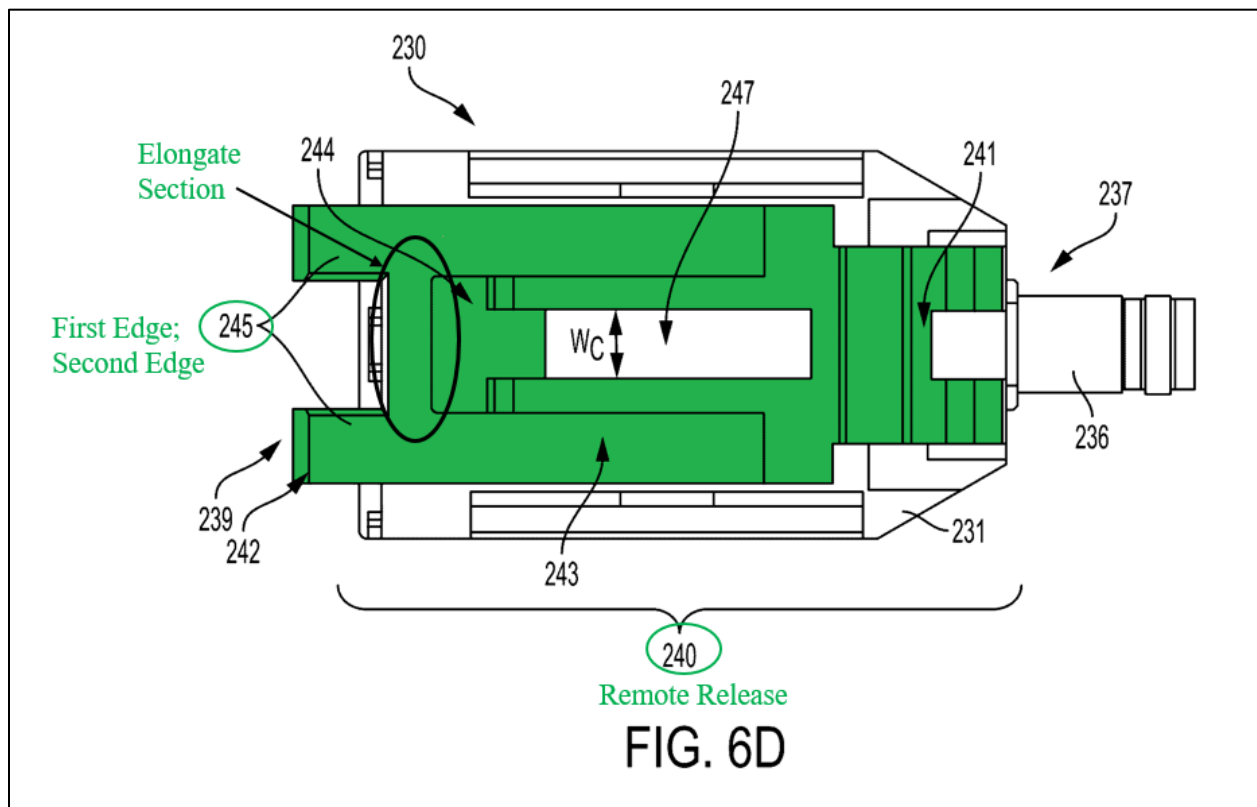
EX1005, FIG. 6D.

516. Additionally, it is my opinion that Wong renders obvious “[t]he optical fiber connector as set forth in claim 7.”

2. Element [8.1] – “the remote release further comprises an elongate section between the first edge and the second edge”

517. It is my opinion that Wong discloses “the remote release further comprises an elongate section between the first edge and the second edge.”

518. As shown in Figure 6D, reproduced below, Wong depicts that there is an elongate section between the first edge and the second edge.



EX1005, FIG. 6D (annotated).

519. Accordingly, it is my opinion that Wong discloses claim element [8.1] of the '760 patent.

520. In summary, Wong renders obvious Claim 8 of the '760 patent.

I. Claim 9

1. Preamble – “The optical fiber connector as set forth in claim 1, wherein”

521. Claim 9 depends upon Claim 1, and for at least the reasons discussed above in reference to Claim 1, Wong renders obvious Claim 1. *See* Section XII.A.

522. Additionally, it is my opinion that Wong renders obvious “[t]he optical fiber connector as set forth in claim 1.”

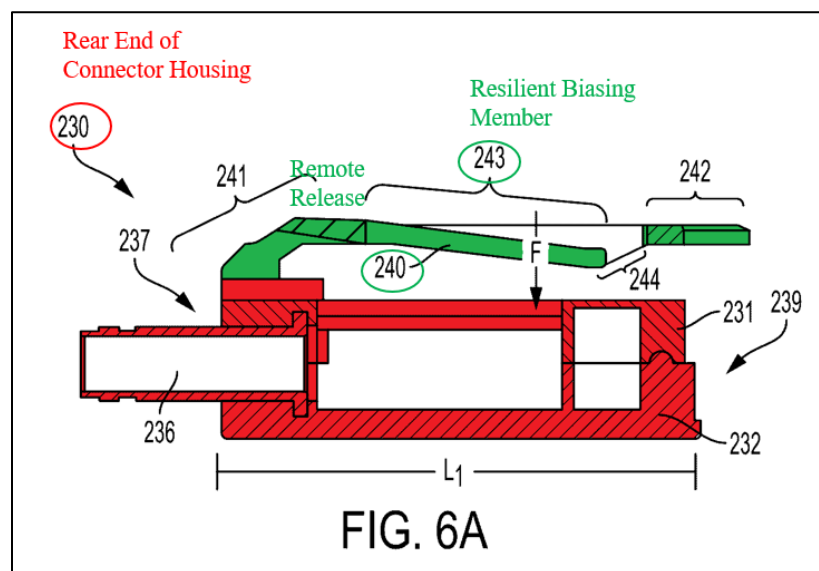
2. Element [9.1] – “the remote release comprises a front section and wherein the optical fiber connector is configured such that the front section is yieldably biased along the longitudinal axis toward the front end portion of the connector housing”

523. In my opinion, Wong discloses that “the remote release comprises a front section and wherein the optical fiber connector is configured such that the front section is yieldably biased along the longitudinal axis toward the front end portion of the connector housing.”

524. As I discussed above in Section XII.D with respect to Claim 4, upon release of the remote release (*e.g.*, release member 240 and pull tab assembly 260) from the actuated state shown in Figure 10, the remote release returns to the resting state shown in Figure 9, where the depressible latching arm (*e.g.*, latching portion

212) resiliently returns toward the un-depressed position. And because in the resting state, a biasing upward vertical force F_1 acts on release member 240 such that second segment 242 (or similar portion) of release member 240 is lifted off of latching portion 212 of cable assembly connector 210A, the remote release (*e.g.*, pull tab assembly 260) is caused to resiliently move forward in first direction D_1 as it returns to the resting state. EX1005, 17:66-18:24.

525. Wong also explains that release member 240 includes a third segment 243, which may extend from a proximal point where it contacts distal point of first segment 241 to a distal point in a direction that is substantially parallel to and slightly towards switchable housing 230. EX1005, 14:28-32.



EX1005, FIG. 6A (annotated).

526. Third segment 243, as illustrated above in Figure 6A, is a sloped component extending in a longitudinal direction along the connector, with a higher end connected to first segment 241 and a lower end approaching towards the front end portion of the connector housing (*e.g.*, first end 239 of the switchable housing 230). EX1005, 12:58-60, 14:28-32 . Therefore, when a force is not applied to move the remote release rearward, for example when released from the actuated state shown in Figure 10, crossbar 266 of pull tab assembly 260 would be yieldably biased towards the lower end of third segment 243.

527. Applicant notes that the '760 Patent appears to show a coil spring with reference number 520 in Figure 5 and reference number 1220 in Figure 12. However, the claim language does not require a spring—or any other positive structure—to make the remote release yieldably biased along the longitudinal axis toward the front end portion of the connector housing, and the coil springs shown in Figures 5 and 12 are only exemplary embodiments of a structure that ensures the remote release would return to its undisplaced position and thereby become fully engaged inside the recess. *See, e.g.*, EX1001, 7:36-40, 8:64-9:1.

528. To the extent Patent Owner argues—incorrectly—that Element [9.1] requires a spring, it is well known in the art to use springs to bias components of a fiber optic connector in a forward direction. For example, Kuffel discloses using

compressing coil springs 820 to bias its outer housing 500 (which is indeed a type of “remote release”) forward. EX1004, 8:32-45, FIG. 17.

529. As additional corroborating evidence, not needed for my opinion of obviousness, U.S. Patent No. 9,411,111 to Banal, Jr. et al. (“Banal”), published on June 9, 2016 and filed on December 9, 2014, describes an optical connector using a leaf spring 500 (or other compression springs) to bias its slider 400 and handle 300 (corresponding to a remote release assembly) forward in a plug-in direction to maintain the engagement of the optical connector with its recess. EX1016, 4:37-41, 4:61-65, FIG. 3. *See also, e.g., generally, EX1017; see EX1017, Claim 1 (discussing actuation element 16 and spring element 48); EX1018, FIGs. 29A-29I (relative to spring 2912).*

530. Accordingly, while not necessary to invalidate the claims here, it would have been obvious to a POSITA to include a spring (of any appropriate kind) in the optical fiber connector of Wong to bias the remote release (*e.g.*, pull tab assembly 260) forward to ensure the engagement with the corresponding recess.

531. Accordingly, it is my opinion that Wong discloses claim element [9.1] of the ’760 patent, or at minimum would have rendered obvious the fiber optic connector containing the features of claim element [9.1] of the ’760 patent.

532. In summary, Wong renders obvious Claim 9 of the '760 patent.

J. Claim 10

1. Preamble – “The optical fiber connector as set forth in claim 9, further comprising”

533. Claim 10 depends upon claim 9 and claim 1, and for at least the reasons discussed above in reference to claim 1 and claim 9, Wong renders obvious claim 1 and claim 9. *See* Sections XII.A, XII.I.

534. Additionally, it is my opinion that Wong renders obvious “[t]he optical fiber connector as set forth in claim 9.”

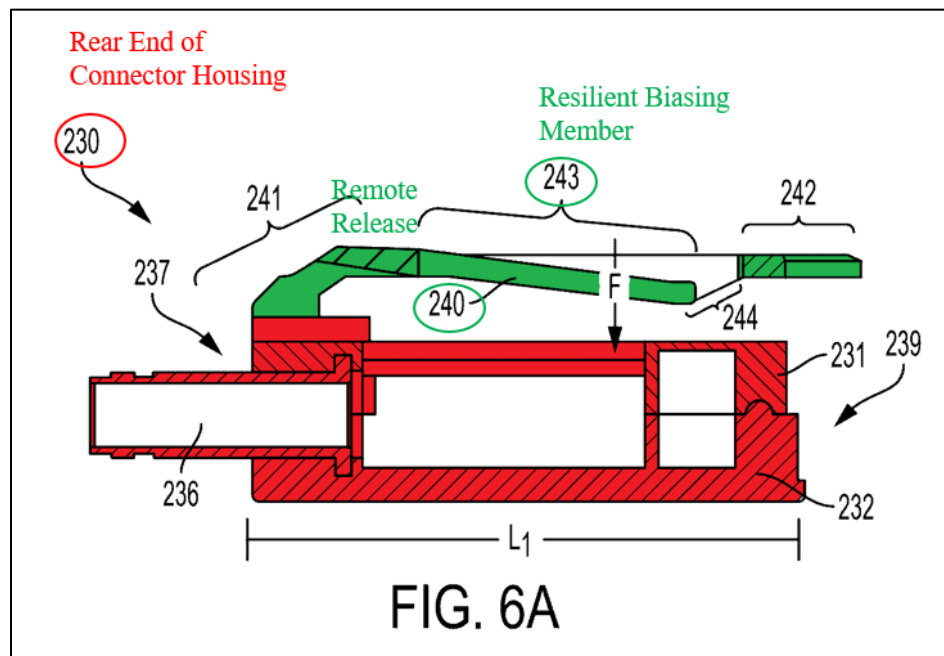
2. Element [10.1] – “a resilient biasing member engaging the front section of the remote release to yieldably bias the remote release toward the front end portion of the connector housing.”

535. In my opinion, Wong discloses “a resilient biasing member engaging the front section of the remote release to yieldably bias the remote release toward the front end portion of the connector housing.”

536. As I discussed above in Section XII.I with respect to Claim 9, Wong’s third segment 243 of release member 240 is a sloped component extending in a longitudinal direction along the connector, with a higher end connected to first segment 241 and a lower end approaching towards the front end portion of the connector housing (*e.g.*, first end 239 of the switchable housing 230). EX1005, 12:58-

60, 14:28-32. Further, Wong describes that in an actuated state, “the pull tab assembly 260 may be moved in a second direction [] that is generally away from the board. Such a movement of the pull tab assembly may cause the crossbar 266 to move over a higher area of the third segment 243 of the release member 240 (e.g., an area of the release member that is furthest away from the switchable housing 230). Due to the distance the protrusion 267 extends through the channel 247, the crossbar 266 may cause a downward force [] to be exacted over the release member 240, (e.g., a force that biases the release member towards the switchable housing 230). The downward force F may cause the second segment 242 of the release member 240 to contact and/or press down on the latching portion 212, thereby unlatching the cable assembly connector 210 from the board.” EX1005, 18:25-40.

537. Therefore, I believe third segment 243 of release member 240 is a resilient biasing member engaging the front section of the remote release (e.g., crossbar 266 of pull tab assembly 260) to yieldably bias the remote release toward the front end portion of the connector housing.



EX1005, FIG. 6A (annotated).

538. However, I note that the '760 Patent appears to show a spring with reference number 520 in Figure 5, reproduced below, and reference number 1220 in Figure 12A, reproduced below. EX1001, 7:35-40, 8:63-9:1. However, the claim language does not require a spring—or any other positive structure—to “yieldably bias” the remote release along the longitudinal axis toward the front end portion of the connector housing, and the coil springs shown in Figures 5 and 12A, reproduced below, are only exemplary embodiments of a structure that ensures the remote release would return to an un-displaced position and thereby become fully engaged inside the recess. To the extent Patent Owner argues that claim element

[10.1] requires a spring, I provide additional evidence of obviousness of this feature below in Ground 7. *See* Section E.4.

539. Accordingly, it is my opinion that Wong discloses, or at minimum would have rendered obvious, claim element [10.1] of the '760 patent.

540. In summary, Wong renders obvious Claim 10 of the '760 patent.

K. Claim 11

1. Preamble – “The optical fiber connector as set forth in claim 10, wherein”

541. Claim 11 depends upon claim 10, claim 9, and claim 1, and for at least the reasons discussed above in reference to claim 1, claim 9, and claim 10, Wong renders obvious claim 1, claim 9, and claim 10. *See* Sections XII.A, XII.I, XII.J.

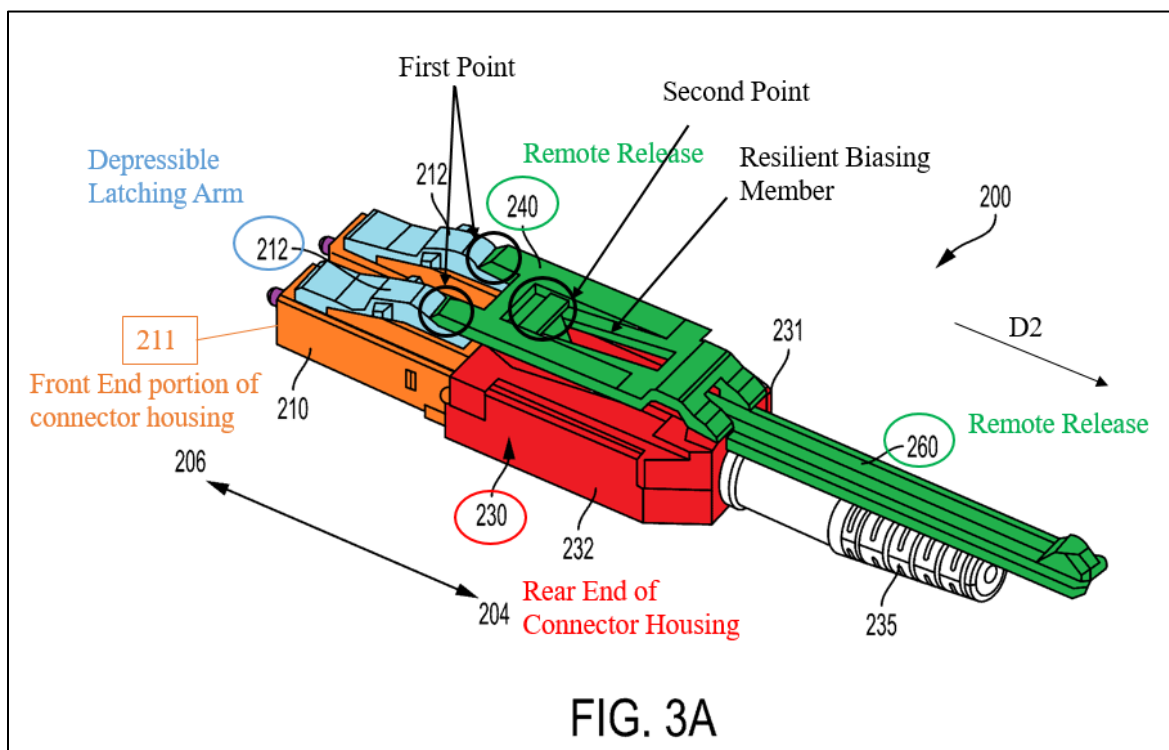
542. Additionally, it is my opinion that Wong renders obvious “[t]he optical fiber connector as set forth in claim 10.”

2. Element [11.1] – “the depressible latching arm is configured to engage the front section of the remote release at a first point of contact and the resilient biasing member is configured to engage the front section of the remote release at a second point of contact, the second point of contact being spaced apart from the first point of contact along the longitudinal axis toward the rear end portion of the connector housing”

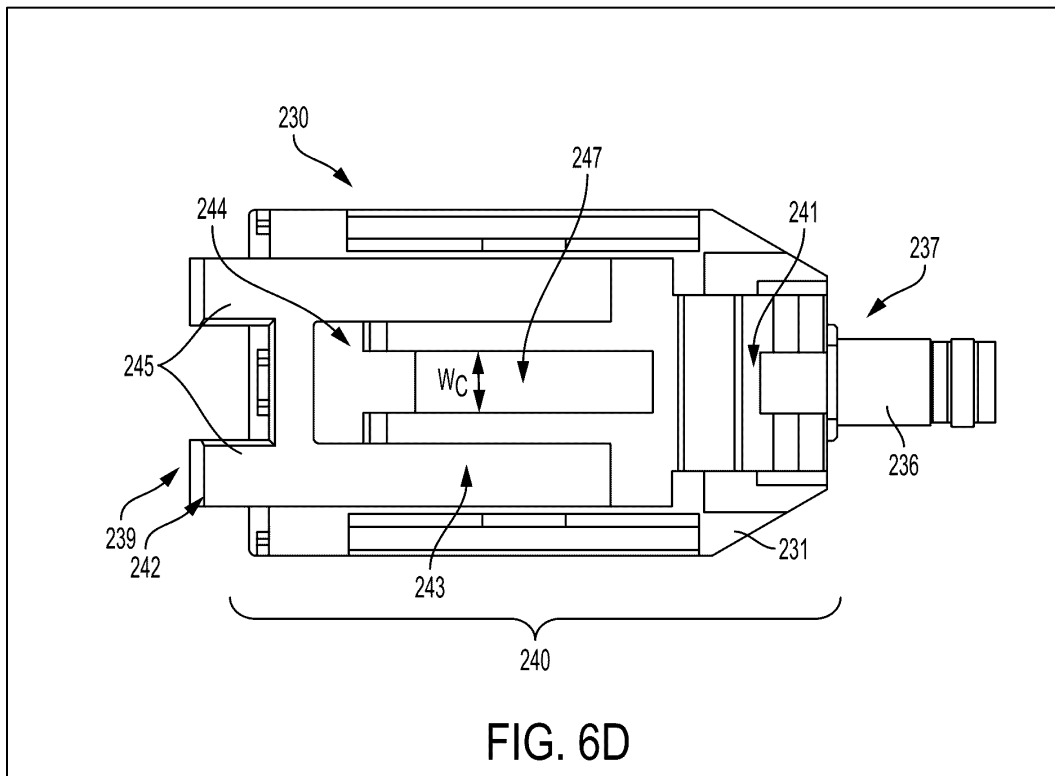
543. For at least the reasons above, in my opinion Wong discloses that “the depressible latching arm is configured to engage the front section of the remote release at a first point of contact and the resilient biasing member is configured to engage the front section of the remote release at a second point of contact, the second

point of contact being spaced apart from the first point of contact along the longitudinal axis toward the rear end portion of the connector housing.”

544. Figure 3A of Wong, reproduced below, illustrates that the depressible latching arm is configured to engage the front section of the remote release at a first point of contact (e.g., prongs, tabs, or the like 245 shown in Figure 6D reproduced below) and that the resilient biasing member (e.g., third segment 243 of release member 240) is configured to engage the front section of the remote release at a second point of contact (e.g., crossbar 266).



EX1005, FIG. 3A (annotated).



EX1005, FIG. 6D.

545. The first point of contact and the second point of contact are both within the front section of the remote release. Prongs, tabs, or the like 245 are the front of release member 240 and crossbar 266 are the front of pull tab assembly 260. Additionally, as shown in Figure 3A, the second point of contact is spaced apart from the first point of contact along the longitudinal axis toward the rear end portion of the connector housing.

546. To the extent Patent Owner argues that claim element [11.1] requires “the resilient biasing member” to be a spring, it would have been obvious to a

POSITA to include the spring to engage Wong's remote release (*e.g.*, pull tab assembly 260) at a point further towards the rear of the connector housing than where Wong's depressible latching arm engages the remote release (*e.g.*, release members 240). Further, it is well known in the art to use springs to bias components of a fiber optic connector in a forward direction. For example, Kuffel discloses using compressing coil springs 820 to bias its outer housing 500 (which is indeed a type of "remote release") forward. EX1004, 8:32-45.

547. As additional corroborating evidence, not needed for my opinion of obviousness, U.S. Patent No. 9,411,111 to Banal, Jr. et al. ("Banal"), published on June 9, 2016 and filed on December 9, 2014, describes an optical connector using a leaf spring 500 (or other compression springs) to bias its slider 400 and handle 300 (corresponding to a remote release assembly) forward in a plug-in direction to maintain the engagement of the optical connector with its recess. EX1016, 4:37-41, 4:61-65; *see also, e.g.*, EX1017, Claim 1; EX1018, 22:44-56.

548. Accordingly, it is my opinion that Wong discloses, or at minimum would have rendered obvious, claim element [11.1] of the '760 patent.

549. In summary, Wong renders obvious Claim 11 of the '760 patent.

L. Claim 15

1. Preamble – “An optical connection system comprising”

550. Claim 15 depends upon claim 1, and for at least the reasons discussed above in reference to claim 1, Wong renders obvious claim 1. *See* Section XII.A.

551. Additionally, it is my opinion that Wong renders obvious “[a]n optical connection system comprising the optical fiber connector as set forth in claim 1.”

2. Element [15.1] – “the optical fiber connector as set forth in claim 1 and”

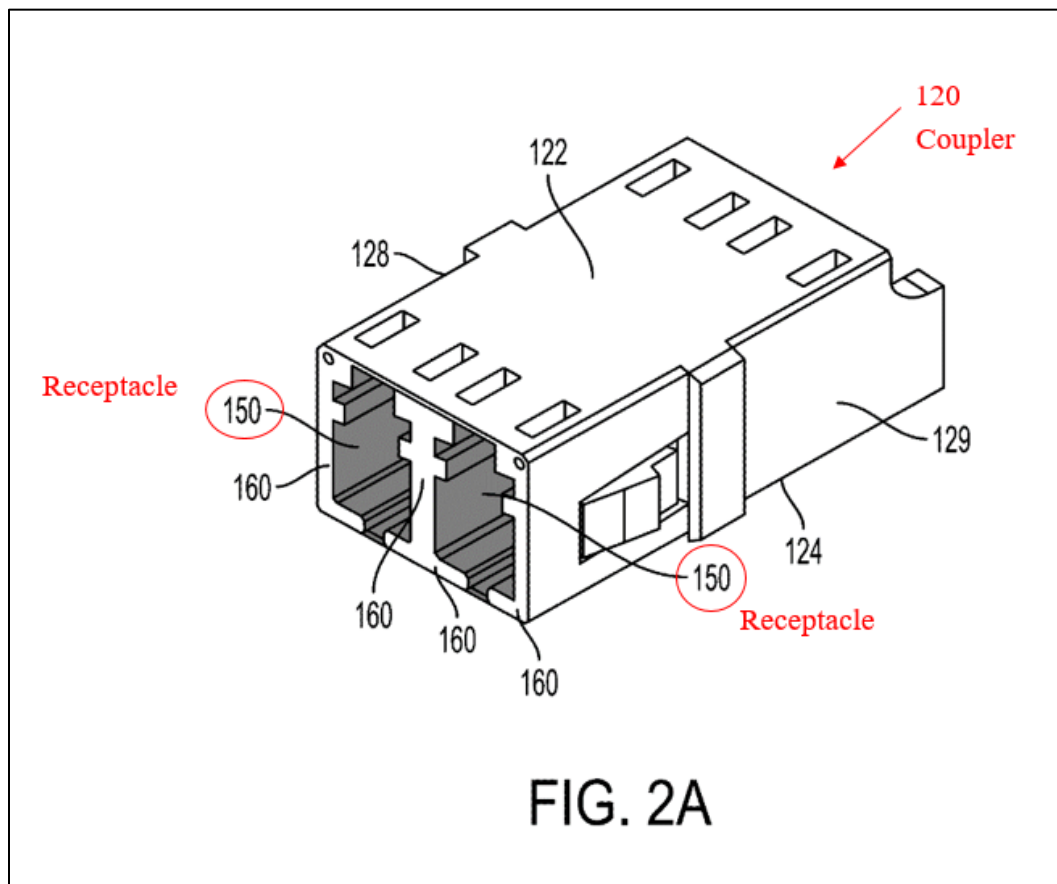
552. Claim 15 depends upon claim 1, and for at least the reasons discussed above in reference to claim 1, Wong renders obvious claim 1. *See* Section XII.A.

553. Additionally, it is my opinion that Wong renders obvious “[t]he optical fiber connector as set forth in claim 1.”

3. Element [15.2] – “a receptacle for mating with the optical fiber connector”

554. For at least the reasons below, in my opinion, Wong discloses “a receptacle for mating with the optical fiber connector.”

555. Wong discloses a coupler 120 that includes mating connector 150 for which remote latch release connector assembly 200 can connect to. EX1005, 5:1-2, 7:11-16, FIG. 2A. Therefore, mating connector 150 is a receptacle for mating with the optical fiber connector (*e.g.*, release connector assembly 200).



EX1005, FIG. 2A (annotated).

556. Therefore, it is my opinion that Wong discloses claim element [15.2] of the '760 patent.

557. In summary, Wong renders obvious Claim 15 of the '760 patent.

M. Claim 16

1. Preamble – “The optical connection system as set forth in claim 15, wherein”

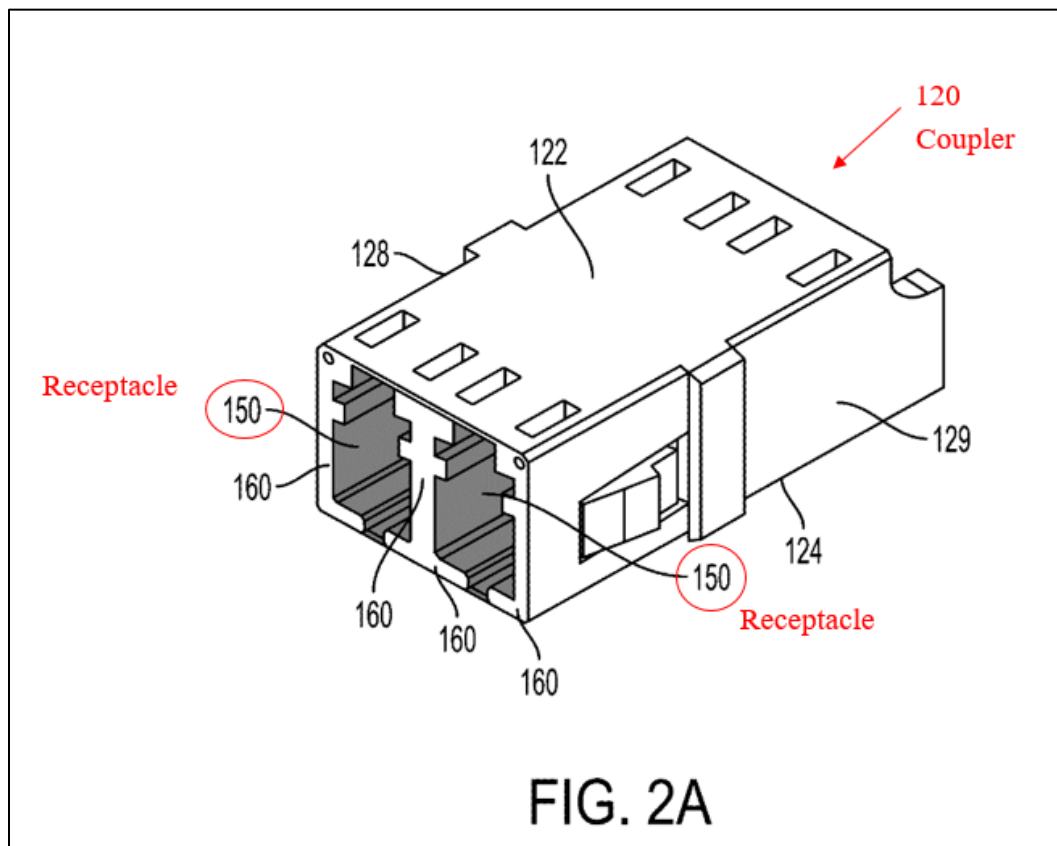
558. Claim 16 depends upon claim 15 and claim 1, and for at least the reasons discussed above in reference to claim 1 and claim 15, Wong renders obvious claim 1 and claim 15. *See* Sections XII.A, XII.L.

559. Additionally, it is my opinion that Wong renders obvious “[t]he optical connection system as set forth in claim 15.”

2. Element [16.1] – “the receptacle comprises a rectangular perimeter wall.”

560. In my opinion, Wong discloses that “the receptacle comprises a rectangular perimeter wall.”

561. Wong discloses “mating connector 150 may include conical, circular, tube-like, square-like, spherical, or rectangular components or shapes.” EX1005, 5:16-19. Therefore, a POSITA would have therefore understood that receptacle mating connector 150 can have rectangular perimeter wall, as illustrated in Figure 2A reproduced below.



EX1005, FIG. 2A (annotated).

562. Further, as discussed above in Section XII.A.6 with respect to claim element [1.5], Wong discloses a connector housing having “a generally rectangular perimeter.” In my opinion a POSITA would have readily understood that a receptacle for receiving the generally rectangular connector housing of Wong would have similarly comprised a generally rectangular perimeter wall to, *e.g.*, provide for a secure connection between the connector housing of the connector of Wong and the receiving port.

563. Accordingly, it is my opinion that Wong discloses claim element [16.1] of the '760 patent.

564. In summary, Wong renders obvious Claim 16 of the '760 patent.

N. Claim 17

1. Preamble – “The optical connection system as set forth in claim 16, wherein”

565. Claim 17 depends upon claim 16, claim 15 and claim 1, and for at least the reasons discussed above in reference to claim 1, claim 15, and claim 16, Wong renders obvious claim 1, claim 15, and claim 16. *See* Sections XII.A, XII.L-M.

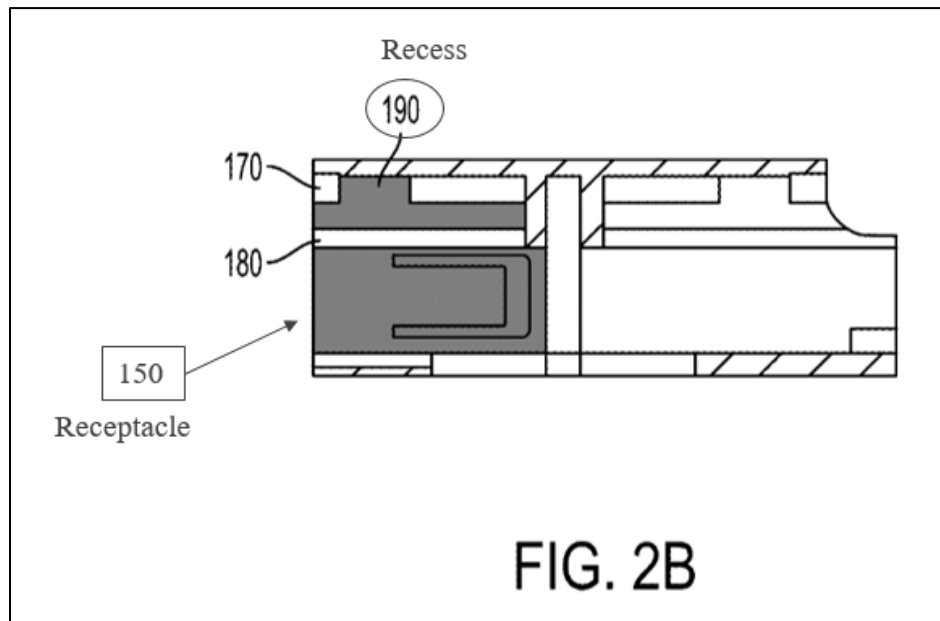
566. Additionally, it is my opinion that Wong renders obvious “[t]he optical connection system as set forth in claim 16.”

2. Element [17.1] – “the receptacle includes a recess, the depressible latching arm being configured to latch with the recess when the optical fiber connector and the receptacle are mated.”

567. In my opinion, Wong discloses that “the receptacle includes a recess, the depressible latching arm being configured to latch with the recess when the optical fiber connector and the receptacle are mated.”

568. Wong discloses that “[e]ach mating connector 150 may include symmetrical sidewalls 160,” and “[e]ach sidewall 160 may be attached to and include a

top rail 170, a bottom rail 180, and a trap 190.” EX1005, 5:2-5. Further, Wong describes that when the connector is engaged with mating connector 150, the depressible latching arm (*e.g.*, latching portion 212) crosses into trap 190, thereby trapping latching portion 212 in trap 190. EX1005, 8:37-42.



EX1005, FIG. 2B.

569. Thus, I believe Wong’s trap 190 is a recess, and the depressible latching arm is configured to latch with the recess when the optical fiber connector and the receptacle are mated.

570. Accordingly, it is my opinion that Wong discloses claim element [17.1] of the ’760 patent.

571. In summary, Wong renders obvious Claim 17 of the ’760 patent.

XIII. GROUND 5: WONG IN VIEW OF KUFFEL RENDERS OBVIOUS CLAIMS 12 AND 13.

572. Wong in view of Kuffel renders obvious dependent claims 12 and 13 of the '760 patent.

A. Motivation to Combine**1. Wong**

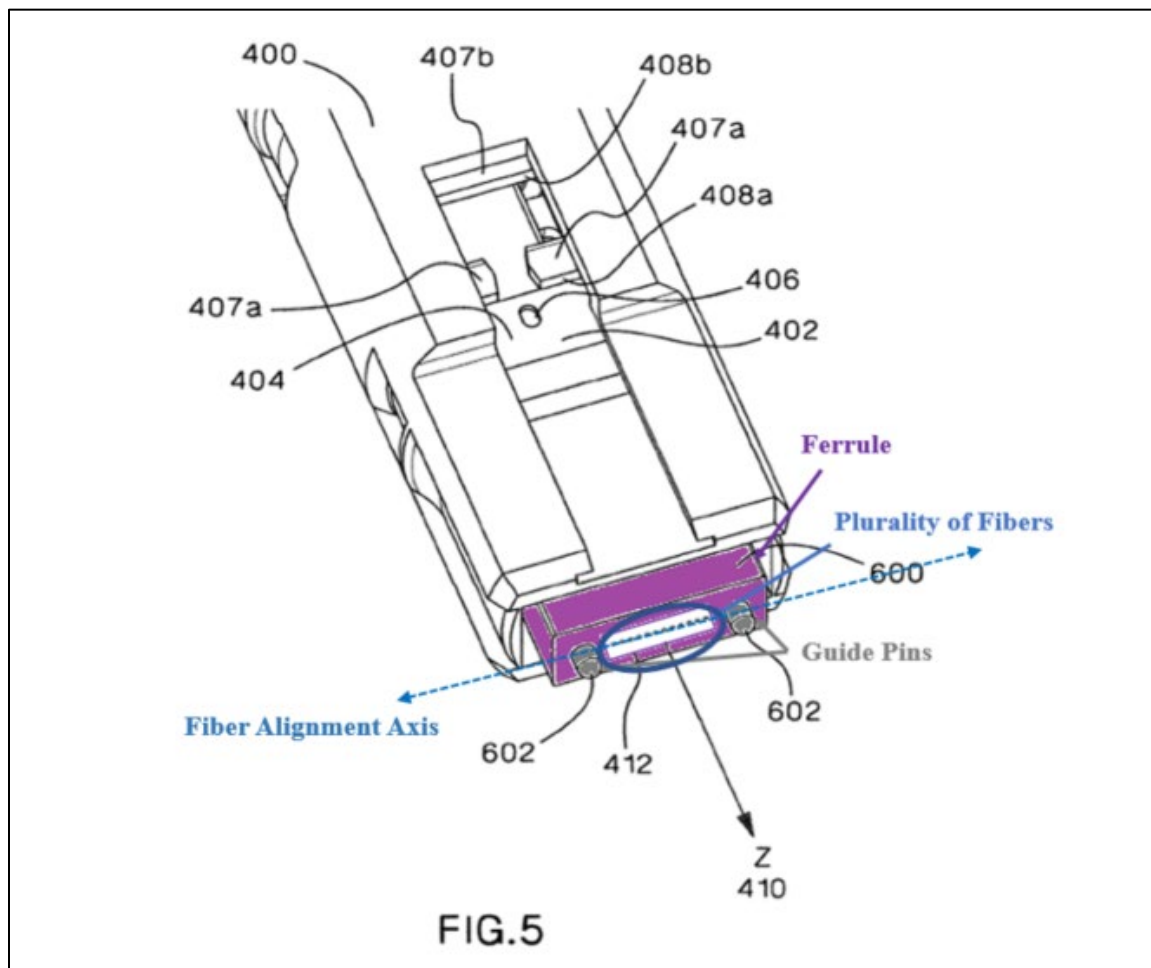
573. Wong discloses that the connector (*e.g.*, cable assembly connector 210) “may be any suitable type now known or later developed, such as, for example, a ferrule connector (FC), a fiber distributed data interface (FDDI) connector, an LC connector, a mechanical transfer (MT) connector, an SC connector, an SC duplex connector, or a straight tip (ST) connector.” EX1005, 4:3-8, 7:56-8:2. Accordingly, the connector type of cable assembly connector 210 is not limited what is shown in the figures, and ferrule 219 can be an MT ferrule. A POSITA would also have understood that an MT ferrule is configured to receive a plurality of fibers.

574. Wong, however, may be alleged to not expressly disclose that the fibers of the MT ferrule are spaced apart in a row that extends parallel to a fiber alignment axis, or that the MT ferrule comprising first and second guide pin openings spaced apart along the fiber alignment axis.

575. But art such as Kuffel confirms this state of the art and that this is the case with MT ferrules.

2. Kuffel

576. Kuffel discloses an MPO type connector. EX1004, 5:17-42, FIGs. 3-5. A POSITA would have understood ferrule 600 of the connector of Kuffel to include an MT Ferrule. EX1004, 5:17-42, FIGs. 3-5; *see also* Section IX.B.2. The MT ferrule of Kuffel (like all MT ferrules, including disclosed in Wong) is configured to receive a plurality of fibers such that the fibers are spaced apart in a row that extends parallel to a fiber alignment axis as shown, *e.g.*, in FIG. 5 of Kuffel, and has guide pins 602 spaced apart along a fiber alignment axis on either side of the row of fibers extending parallel to the fiber alignment axis, as shown, *e.g.*, in FIG. 5 of Kuffel.



EX1004, FIG. 5 (annotated).

3. Reasons to Combine

577. A POSITA would have found it obvious to modify Wong's connector to include MT ferrules with the MT ferrule having fibers spaced apart in a row that extends parallel to a fiber alignment axis and first and second guide pin openings spaced apart along the fiber alignment axis, as disclosed in Kuffel.

578. The modification simply involves swapping out Wong's ferrules (e.g., an MT multi-fiber ferrule) with Kuffel's MT multi-fiber ferrule. The two connector

housings 211 Wong would thus form into a single housing with a single cavity to accommodate Kuffel's MT multi-fiber ferrule. This change is simply a substitution of a known element (Wong's MT multi-fiber ferrule) with another (Kuffel's MT multi-fiber ferrule).

579. The modification, however, does not change any structure or function of Wong's latching portion 212, release member 240, or pull tab assembly 260, and therefore does not affect the principle operation of Wong's remote release mechanism, as accounted for in Wong's description.

580. A POSITA would have found this combination obvious because as Wong already discloses that its cable assembly connector 210 may include an MT multi-fiber ferrule, EX1005, 4:3-8; 7:56-8:2, a POSIAT would have been motivated to incorporate any known configuration of MT multi-fiber ferrule (e.g., Kuffel's MT multi-fiber ferrule) based on the desired data transmission capacity and overall data transmission system design would have been. A POSITA would have readily understood that Kuffel's MT multi-fiber ferrule is one of the MT multi-fiber ferrules contemplated by Wong, or a simple substitute that provides different connectivity options to any MT multi-fiber ferrule contemplated by Wong.

581. A POSITA would have had reasonable expectation of success in the combination of Wong and Kuffel as the modification involves the direct replacement of one known type of MT multi-fiber ferrule for another, which would have been readily implementable for someone having ordinary skill in the art as of the effective priority date of the '760 patent. Further, the combination retains Wong's remote release mechanism and merely replaces an interior component, which is a standard upgrade according to Kuffel, that does not change the principle operation of Wong's remote release mechanism, as accounted for in Wong description.

B. Claim 12

1. Preamble – “The optical fiber connector as set forth in claim 1, wherein”

582. Claim 12 depends upon claim 1, and for at least the reasons discussed above in reference to claim 1, Wong renders obvious claim 1. See Section XII.A.

583. Additionally, it is my opinion that Wong in view of Kuffel renders obvious “[t]he optical fiber connector as set forth in claim 1.”

2. Element [12.1] – “the MT ferrule is configured to receive a plurality of fibers such that the fibers are spaced apart in a row that extends parallel to a fiber alignment axis, the MT ferrule comprising first and second guide pin openings spaced apart along the fiber alignment axis.”

584. In my opinion, Wong in view of Kuffel discloses that “the MT ferrule is configured to receive a plurality of fibers such that the fibers are spaced apart in

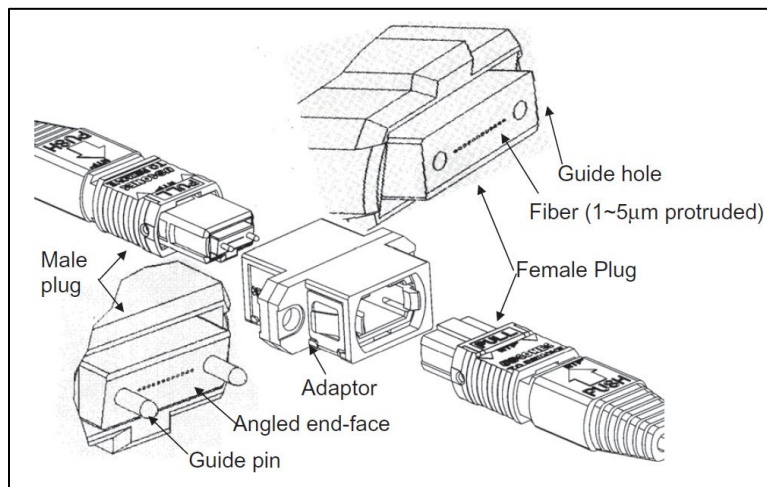
a row that extends parallel to a fiber alignment axis, the MT ferrule comprising first and second guide pin openings spaced apart along the fiber alignment axis.”

585. As discussed above, Kuffel’s MT ferrule is configured to receive a plurality of fibers such that the fibers are spaced apart in a row that extends parallel to a fiber alignment axis as shown, *e.g.*, in FIG. 5 of Kuffel, and has guide pins 602 spaced apart along a fiber alignment axis on either side of the row of fibers extending parallel to the fiber alignment axis, as shown, *e.g.*, in FIG. 5 of Kuffel. Section XIII.A.2.

586. A POSITA would have found it obvious to modify Wong’s connector to include MT ferrules with the MT ferrule having fibers spaced apart in a row that extends parallel to a fiber alignment axis and first and second guide pin openings spaced apart along the fiber alignment axis, as disclosed in Kuffel. Section XIII.A.

587. Additionally, as explained above in Section V, a POSITA would have understood that a female MT ferrule is configured to receive a plurality of fibers that are spaced apart between first and second guide pin openings, *e.g.*, the plurality of fibers are spaced apart “in a row that extends parallel to a fiber alignment axis” between “first and second guide pin openings spaced apart along the fiber alignment axis.” As demonstrated by the Sayegh and Satake references cited herein, MT ferrules originated at least in the 1990s. EX1025; EX1026, 4:55-58. A

female MT ferrule is configured to receive a plurality of optical fibres that are aligned between first and second guide holes, as demonstrated in Figure 9 of the Satake reference, reproduced below, illustrating the 8F-APC-MPO connector introduced in 1991. EX1025, FIG. 9. For another example, authors from US Conec and Tyco Electronics released a white paper about MT ferrules in 2006, illustrating they were well-known over a decade prior to the '760 Patent. EX1027.



EX1025, FIG. 9.

588. Accordingly, it is my opinion that the modification of Wong's connector to include the MT multi-fiber ferrule disclosed in Kuffel would have been obvious to a POSITA.

589. Accordingly, Wong in view of Kuffel renders obvious claim element [12.1] of the '760 patent.

590. In summary, Wong in view of Kuffel renders obvious Claim 12 of the '760 patent.

C. Claim 13

1. Preamble – “The optical fiber connector as set forth in claim 12, wherein”

591. Claim 13 depends upon claim 12 and claim 1, and for at least the reasons discussed above in reference to claim 1 and claim 12, Wong renders obvious claim 1 and Wong in view of Kuffel renders obvious claim 12. *See* Sections XII.A, XIII.B. Wong in view of Kuffel renders obvious claim 12. *See* Section XIII.B.

592. Additionally, it is my opinion that Wong in view of Kuffel discloses “[t]he optical fiber connector as set forth in claim 12.”

2. Element [13.1] – “the optical fiber connector has an outer cross-sectional dimension along the fiber alignment axis and wherein the outer cross-sectional dimension is less than an outer cross-sectional dimension of a standard MPO connector along a fiber alignment axis of the standard MPO connector.”

593. In my opinion, Wong discloses “the optical fiber connector has an outer cross-sectional dimension along the fiber alignment axis and wherein the outer cross-sectional dimension is less than an outer cross-sectional dimension of a standard MPO connector along a fiber alignment axis of the standard MPO connector.” And in my opinion, a POSITA would have found it obvious to modify the

connector of Wong modified with Kuffel to have “an outer cross-sectional dimension along the fiber alignment axis outer cross-sectional dimension” that is “less than an outer cross-sectional dimension of a standard MPO along a fiber alignment axis of the standard MPO connector.”

594. As discussed before, Wong modified with Kuffel discloses an MPO connector having an MT ferrule. *See* Claim 12, *supra*. A standard MPO connector has a width along the fiber alignment axis is approximately 12.6 mm. EX1019, 6-7 (showing the standard dimensions for an MPO connector.)

595. Wong further discloses that the connector housing (e.g. switchable housing 230) can have “a width W_1 of about 1 mm to about 10 cm, including, for example, about 1 mm, about 2 mm, about 3 mm, about 4 mm, about 5 mm, about 6 mm, about 7 mm, about 8 mm, about 9 mm, about 1 cm ...or any value or range between any two of these values (including endpoints).” EX1005, 11:9-17. Therefore, Wong’s connector as disclosed can have a width less than approximately 12.4 mm, which is the width of a standard MPO connector. A POSITA would also have understood that the height and the width of a connector are changed proportionally to each other, so that when Wong’s connector has a width less than that of a stand-

ard MPO connector, it also has a height less than that of a standard MPO connector. Therefore, the cross-sectional dimension of Wong's connector is also less than the cross-sectional dimension of a standard MPO connector.

596. To the extent that Patent Owner argues that the disclosed width of Wong's connector housing does not apply to a MPO connector, Wong further discloses that it is known in communication networks where numerous interconnections between mating connectors may be compacted into high-density panels: “[p]anel and connector producers may optimize for such high densities by shrinking the connector size and/or the spacing between adjacent connectors on the panel.” EX1005, 1:19-24. It is therefore known in the art to shrink the size of a connector to adapt for high density connection panels. Wong thus provides direct evidence as to the knowledge in the art to shrink the connector size to adapt the connector to a high-density panel.

597. Wong—like the '760 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.” EX1005, 1:6-10; *see also* EX1001, 1:31-33. Wong continues that “[c]ertain solutions have included deployment of high-density interconnect

panels” which “may be designed to consolidate the increasing volume of interconnections necessary to support the fast-growing networks into a compacted form factor, thereby increasing quality of service and decreasing costs such as floor space and support overhead.” EX1005, 1:11-17; *see also* EX1001, 1:34-40.

598. While Wong also discloses that “shrinking the connector size and/or spacing may also increase the support cost and diminish the quality of service,” EX1005, 1:24-28; *see also* EX1005, 4:44-50, it is noted that Wong does *not* claim that shrinking the connector size is incompatible with the disclosed remote release mechanism. And that is because it would not.

599. Because shrinking the connector size and a remote release mechanism are two solutions to the same problem – adapting connectors to a high-density panel, a POSITA would have found it obvious to combine the two solutions also shrink the outer cross-sectional dimension of Wong’s remote release connector to fit it to an even higher density panel. And because shrinking the connector size does not interfere with the remote release mechanism, the modification of Wong’s remote release connector has a reasonable expectation of success.

600. Accordingly, in my opinion Wong discloses claim element [13.1] of the ’760 patent.

601. In summary, Wong in view of Kuffel renders obvious claim 13 of the '760 patent.

XIV. GROUND 6: WONG IN VIEW OF RAVEN RENDERS OBVIOUS CLAIM 14.

602. Wong in view of Raven renders obvious dependent claim 14 of the '760 patent.

A. Motivation to Combine

1. Wong

603. Wong discloses that its connector housing (*e.g.*, switchable housing 230) includes a switchable housing top 231 and a switchable housing bottom 232 joined together. EX1005, 10:22-28.

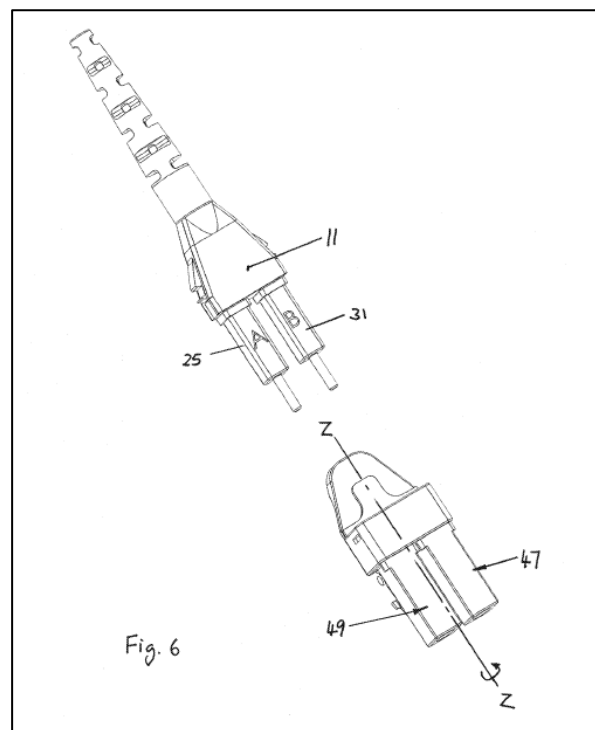
604. Patent Owner may allege that Wong does not expressly disclose that its connector housing can enable a polarity of the optical fiber connector to be selectively reversed, but a POSITA would have understood that Raven provides for exactly that, as discussed below.

2. Raven

605. Raven discloses a method for changing the polarity of first and second fiber optic connectors 47, 49. EX1003, 18:20-19:8. Specifically, Raven discloses an initial condition where first fibre optic connector 47 is mounted over first inner body 25 and first ferrule 27, and second fibre optic connector 49 is mounted over

second inner body 31 and second ferrule 33. EX1003, 18:22-26; *see also* EX1003, FIG. 1.

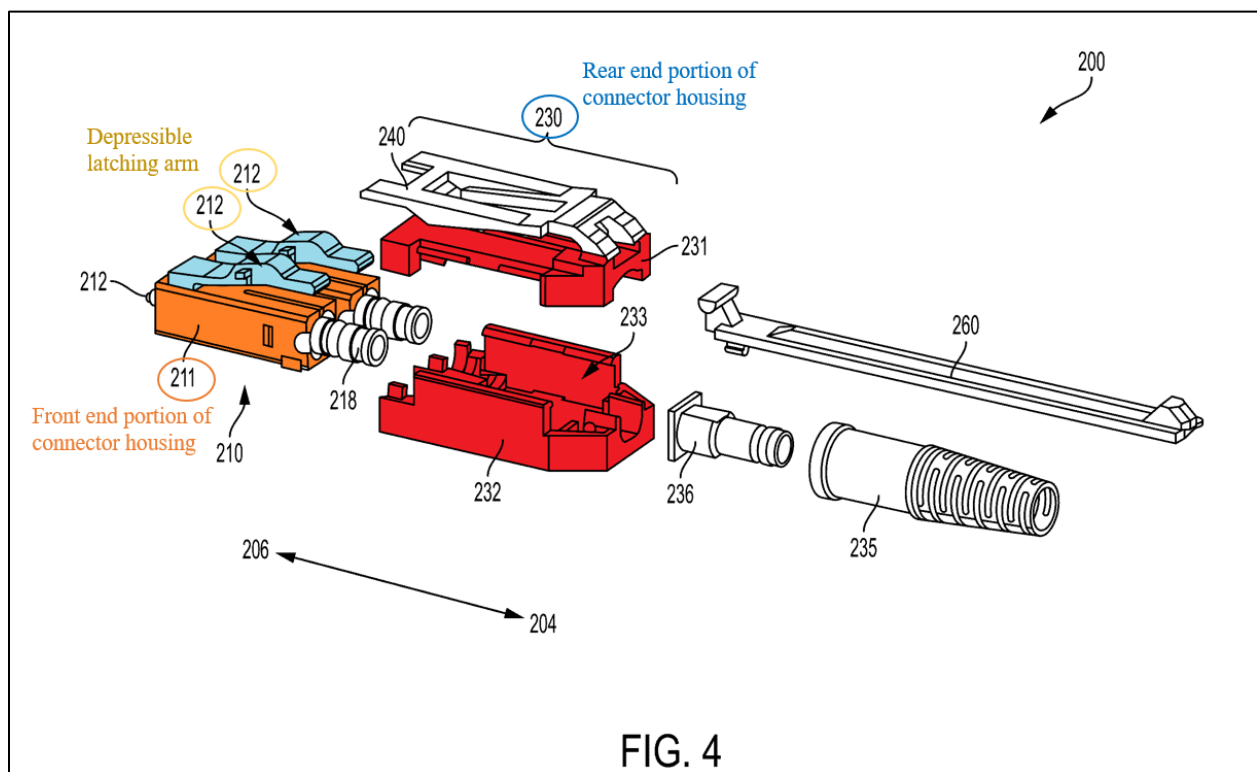
606. Raven further discloses that, to change the polarity of first and second ferrules 27, 33 with respect to first and second fiber optic connectors 47, 49, leading end unit 3 is separated from housing 5, rotated 180° about a longitudinal axis Z-Z, and reattached to housing 5 in a second orientation. EX1003, 18:27-30. In this second orientation, the polarity is reversed, with first inner body 25 and first ferrule 27 located in second fibre optic connector 49, and second inner body 31 and second ferrule 33 located in first fibre optic connector 47. EX1003, 18:30-19:4; FIG. 6.



EX1003, FIG. 6.

3. Reasons to Combine

607. Similar to Raven, Wong discloses that its connector housing (e.g., switchable housing 230) includes a switchable housing top 231 and a switchable housing bottom 232 joined together. EX1005, 10:22-28. In my opinion, based on Figure 4 of Wong, when switchable housing top 231 and switchable housing bottom 232 are separated, the front end portion (e.g., connector housing 211) can be rotated 180° about a longitudinal axis 204-206, such that the polarity of ferrules 212 in each connector housing 211 is reversed.



EX1005, FIG. 4 (annotated).

608. Additionally, in order to preserve the functionality and engagement of latching portions 212 with release member 240 and pull tab assembly 260, switchable housing top 231, switchable housing bottom 232, and pull tab assembly 260 would also be rotated 180° about longitudinal axis 204-206, such that switchable housing top 231 and pull tab assembly 260 would now be on the bottom of the connector assembly 200 and switchable housing bottom 232 would now be on the top of the connector assembly 200.

609. A POSITA would have been motivated to make the modification of Wong in view of Raven because the ability to reverse polarity makes an optical connector applicable to more connection types, thereby cutting down on manufacturing and assembly costs. EX1003, 2:14-16, 2:20-23.

610. A POSITA also would have had reasonable expectation of success in the combination of Wong and Raven, as the modification only requires separating the rear end portion of Wong's connector housing, which is a function already disclosed by Wong, and rotating front end portion 211, switchable housing top 231, switchable housing bottom 232, and the pull tab assembly 260 of Wong. Additionally, the modification does not alter the structure of Wong's connector housing, latching mechanism, and remote release mechanism. Therefore, no undue research

or experimentation would have been required to make the modification as this is a predictable solution in rotating elements 180°.

B. Claim 14

1. Preamble – “The optical fiber connector as set forth in claim 1, wherein”

611. Claim 14 depends upon claim 1, and for at least the reasons discussed above in reference to claim 1, Wong renders obvious claim 1. *See* Section XII.A.

612. Additionally, It is my opinion that Wong in view of Raven discloses “the optical fiber connector as set forth in claim 1.”

2. Element [14.1] – “wherein the connector housing is configured to enable a polarity of the optical fiber connector to be selectively reversed”

613. It is my opinion that Wong in view of Raven discloses “wherein the connector housing is configured to enable a polarity of the optical fiber connector to be selectively reversed.”

614. As discussed above, a POSITA would have found it obvious to modify the connector housing of Wong, in view of Raven, to enable a polarity of the optical fiber connector to be selectively reversed. *See* Section, XIV.A.

615. Accordingly, Wong modified with Raven discloses claim element [14.1].

616. In summary, Wong in view of Raven renders obvious Claim 14 of the ’760 patent.

XV. GROUND 7: RAVEN IN VIEW OF KUFFEL RENDERS OBVIOUS CLAIM 10.

A. Claim 10

1. Preamble – “The optical fiber connector as set forth in claim 9, further comprising”

617. Claim 10 depends upon claim 9 and claim 1, and for at least the reasons discussed above in reference to claim 1 and claim 9, the combination of Raven and Kuffel renders obvious claim 1 and claim 9. *See* Sections IX.B, IX.J. Additionally, it is my opinion that Raven discloses “[t]he optical fiber connector as set forth in claim 9.”

2. Element [10.1] – “a resilient biasing member engaging the front section of the remote release to yieldably bias the remote release toward the front end portion of the connector housing”

618. It is my opinion that Raven in view of Kuffel renders obvious “a resilient biasing member engaging the front section of the remote release to yieldably bias the remote release toward the front end portion of the connector housing.” *See* Sections IX.K.2, XII.J.2.

619. Applicant notes that the ’760 patent appears to show a coil spring with reference number 520 in Figure 5 and reference number 1220 in Figure 12. However, the claim language does not require a spring—or any other positive structure—to make the remote release yieldably biased along the longitudinal axis toward the front end portion of the connector housing, and the coil springs shown in

Figures 5 are 12 are only exemplary embodiments of a structure that ensures the remote release would return to its undisplaced position and thereby become fully engaged inside the recess. *See, e.g.*, EX1001, 7:36-40, 8:64-9:1.

620. To the extent Patent Owner argues—incorrectly—that claim element [10.1] requires a spring, it is well known in the art to use springs to bias components of a fiber optic connector in a forward direction. For example, Kuffel discloses using compressing coil springs 820 to bias its outer housing 500 (which is indeed a type of “remote release”) forward. EX1004, 8:32-45, FIG. 17.

621. As additional corroborating evidence, not needed for my opinion of obviousness, U.S. Patent No. 9,411,111 to Banal, Jr. et al. (“Banal”), published on June 9, 2016 and filed on December 9, 2014, describes an optical connector using a leaf spring 500 (or other compression springs) to bias its slider 400 and handle 300 (corresponding to a remote release assembly) forward in a plug-in direction to maintain the engagement of the optical connector with its recess. EX1016, 4:37-41, 4:61-65, FIG. 3. *See also, e.g., generally*, EX1017; *see* EX1017, claim 1 (discussing actuation element 16 and spring element 48); EX1018, FIGs. 29A-29I (relative to spring 2912).

622. Accordingly, while not necessary to invalidate the claims here, it would also have been obvious to a POSITA to include a spring (of any appropriate

kind) in the optical fiber connector of Raven to even further bias the remote release (e.g., manually operable control 69) forward to ensure the engagement with the corresponding recess.

623. Therefore, it is my opinion that Raven in view of Kuffel renders obvious claim element [10.1] of the '760 patent.

624. In summary, Raven in view of Kuffel renders obvious Claim 10 of the '760 patent.

XVI. GROUND 8: WONG IN VIEW OF KUFFEL RENDERS OBVIOUS CLAIMS 10-11.

A. Claim 10

1. Preamble – “The optical fiber connector as set forth in claim 9, further comprising”

625. Claim 10 depends upon claim 9 and claim 1, and for at least the reasons discussed above in reference to claim 1 and claim 9, the combination of Wong renders obvious claim 1 and claim 9. *See* Sections XII.A, XII.I.

626. Additionally, it is my opinion that Wong in view of Kuffel discloses “the optical fiber connector as set forth in claim 9.”

2. Element [10.1] – “a resilient biasing member engaging the front section of the remote release to yieldably bias the remote release toward the front end portion of the connector housing”

627. It is my opinion that Wong discloses “a resilient biasing member engaging the front section of the remote release to yieldably bias the remote release toward the front end portion of the connector housing.” Section XII.J.2.

628. Applicant notes that the ’760 patent appears to show a coil spring with reference number 520 in Figure 5 and reference number 1220 in Figure 12. However, the claim language does not require a spring—or any other positive structure—to make the remote release yieldably biased along the longitudinal axis toward the front end portion of the connector housing, and the coil springs shown in Figures 5 and 12 are only exemplary embodiments of a structure that ensures the remote release would return to its undisplaced position and thereby become fully engaged inside the recess. *See, e.g.*, EX1001, 7:36-40, 8:64-9:1.

629. To the extent Patent Owner argues—incorrectly—that claim element [10.1] requires a spring, it is well known in the art to use springs to bias components of a fiber optic connector in a forward direction. For example, Kuffel discloses using compressing coil springs 820 to bias its outer housing 500 (which is indeed a type of “remote release”) forward. EX1004, 8:32-45, FIG. 17.

630. As additional corroborating evidence, not needed for my opinion of obviousness, U.S. Patent No. 9,411,111 to Banal, Jr. et al. (“Banal”), published on

June 9, 2016 and filed on December 9, 2014, describes an optical connector using a leaf spring 500 (or other compression springs) to bias its slider 400 and handle 300 (corresponding to a remote release assembly) forward in a plug-in direction to maintain the engagement of the optical connector with its recess. EX1016, 4:37-41, 4:61-65, FIG. 3. *See also, e.g., generally*, EX1017; *see* EX1017, claim 1 (discussing actuation element 16 and spring element 48); EX1018, 22:44-56, FIGs. 29A-29I (relative to spring 2912).

631. Accordingly, while not necessary to invalidate the claims here, it would have been obvious to a POSITA to include a spring (of any appropriate kind) in the optical fiber connector of Wong to engage a front section of the remote release (e.g., pull tab assembly 260) and yieldably bias it forward to ensure the engagement with the corresponding recess.

632. Therefore, it is my opinion that Wong in view of Kuffel renders obvious claim element [10.1] of the '760 patent. In summary, Wong in view of Kuffel renders obvious claim 10 of the '760 patent

B. Claim 11

1. Preamble – “The optical fiber connector as set forth in claim 10, further comprising”

633. Kindly refer to claim 10 above. Sections IX.K, XII.J, XV.A.

634. It is my opinion that Wong in view of Kuffel renders obvious “[t]he optical fiber connector as set forth in claim 10.”

2. Element [11.1] – “the depressible latching arm is configured to engage the front section of the remote release at a first point of contact and the resilient biasing member is configured to engage the front section of the remote release at a second point of contact, the second point of contact being spaced apart from the first point of contact along the longitudinal axis toward the rear end portion of the connector housing”

635. It is my opinion that Wong discloses “the depressible latching arm is configured to engage the front section of the remote release at a first point of contact and the resilient biasing member is configured to engage the front section of the remote release at a second point of contact, the second point of contact being spaced apart from the first point of contact along the longitudinal axis toward the rear end portion of the connector housing.” Section XII.J.2.

636. To the extent Patent Owner argues, incorrectly, that claim element [11.1] requires a spring, it would have been obvious to a POSITA to include the spring discussed in Section XVI.A to engage Wong’s remote release (*e.g.*, pull tab assembly 260) at a point further towards the rear of the connector housing than where Wong’s depressible latching arm engages the remote release (*e.g.*, release members 240). *See* Section XII.J.2.

637. Therefore, it is my opinion that Wong in view of Kuffel renders obvious claim element [11.1] of the '760 patent. In summary, Wong in view of Kuffel renders obvious claim 11 of the '760 patent.

XVII.CONCLUSION

638. 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 '760 patent based at least on the discussed prior art.

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.

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: January 3, 2024 James F. Brennan III
James F. Brennan III, Ph.D.