

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

**PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 11,415,760**

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TABLE OF CONTENTS

I.	INTRODUCTION	1
II.	'760 PATENT.....	2
	A. Prosecution History Summary	4
	B. Level of Ordinary Skill in the Art	5
	C. Claim Construction	5
III.	APPLIED REFERENCES	6
	A. Raven.....	6
	B. Kuffel	9
	C. Wong	10
	D. Gniadek	13
IV.	IDENTIFICATION OF CHALLENGE (37 C.F.R. § 42.104(B)).....	13
V.	GROUND 1: RAVEN IN VIEW OF KUFFEL RENDERS OBVIOUS CLAIMS 1-10, 12, AND 14-17.....	14
	A. Claim 1	14
	1. A POSITA would have been motivated to combine Raven and Kuffel with a reasonable expectation of success.	14
	(a) Raven.....	14
	(b) Kuffel	16
	(c) Motivation to Combine	17
	2. [1.P]	23
	3. [1.1]	25
	4. [1.2.1]	26
	5. [1.2.2]	29
	6. [1.3]	32
	7. [1.4]	33
	8. [1.5]	35
	9. [1.6]	39
	10. [1.7]	41
	11. [1.8]	42

B.	Dependent claims.....	46
1.	Claim 2	46
2.	Claim 3	47
3.	Claim 4	49
4.	Claim 5	50
5.	Claim 6	51
6.	Claim 7	52
7.	Claim 8	53
8.	Claim 9	54
9.	Claim 10	56
10.	Claim 12	57
11.	Claim 14	59
12.	Claim 15	60
13.	Claim 16	60
14.	Claim 17	61
VI.	GROUND 2: RAVEN-KUFFEL FURTHER IN VIEW OF GNIADEK RENDERS OBVIOUS CLAIM 13.	62
VII.	GROUND 3: RAVEN-KUFFEL FURTHER IN VIEW OF WONG RENDERS OBVIOUS CLAIM 13.	65
VIII.	GROUND 4: WONG RENDERS OBVIOUS CLAIMS 1–11 AND 15– 17.....	67
A.	Claim 1	67
1.	[1.P].....	67
2.	[1.1]	69
3.	[1.2.1]/[1.2.2].....	70
4.	[1.3]	74
5.	[1.4]	76
6.	[1.5]	79
7.	[1.6]	81
8.	[1.7]	82

9.	[1.8]	83
B.	Dependent claims	84
1.	Claim 2	84
2.	Claim 3	86
3.	Claim 4	87
4.	Claim 5	89
5.	Claim 6	91
6.	Claim 7	92
7.	Claim 8	92
8.	Claim 9	93
9.	Claim 10	95
10.	Claim 11	95
11.	Claim 15	97
12.	Claim 16	97
13.	Claim 17	99
IX.	GROUND 5: WONG IN VIEW OF KUFFEL RENDERS OBVIOUS CLAIMS 12 AND 13.....	99
A.	Claim 12	99
1.	Wong	100
2.	Kuffel	100
3.	Motivation to Combine	101
B.	Claim 13	103
X.	GROUND 6: WONG IN VIEW OF RAVEN RENDERS OBVIOUS CLAIM 14.	105
A.	Claim 14	105
1.	Wong	105
2.	Raven.....	106
3.	Motivation to Combine	106
XI.	GROUND 7: RAVEN IN VIEW OF KUFFEL RENDERS OBVIOUS CLAIM 10.	108

A.	Claim 10	108
XII.	GROUND 8: WONG IN VIEW OF KUFFEL RENDERS OBVIOUS CLAIMS 10–11.	109
A.	Claim 10	109
B.	Claim 11	110
XIII.	THE BOARD SHOULD NOT EXERCISE ITS DISCRETION TO DENY THE PETITION.	110
A.	The Board should not deny the Petition under <i>Fintiv</i>	110
XIV.	MANDATORY NOTICES (37 C.F.R. § 42.8(a)(1))	111
XV.	APPENDIX A: CHALLENGED CLAIMS	113

PETITIONER'S EXHIBIT LIST

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”)
1007	Declaration of James F. Brennan III, Ph.D.
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. INTRODUCTION

Petitioner US Conec Ltd., requests IPR institution and cancellation of U.S. Patent No. 11,415,760 (“the ’760 patent”; EX1001) claims 1–17 to Senko Advanced Components, Inc. (“PO”). The ’760 patent claims well-known optical fiber connectors with a remote release. Petitioner’s expert, Dr. James Brennan III, has over 20 years of experience in optical fiber connector design, and his testimony supports the Grounds presented. EX1007, ¶¶1-18.

Optical fiber (or fiber optic) connectors are attached to terminal ends of fiber optic cables. Fiber optic adapters are receptacles that receive and mate those connectors to support fiber optic connections. Alignment of fiber optic cables is generally achieved by two components—a ferrule and an alignment sleeve within the receptacle. The ferrule both secures and aligns the fiber. EX1007, ¶¶43-65.

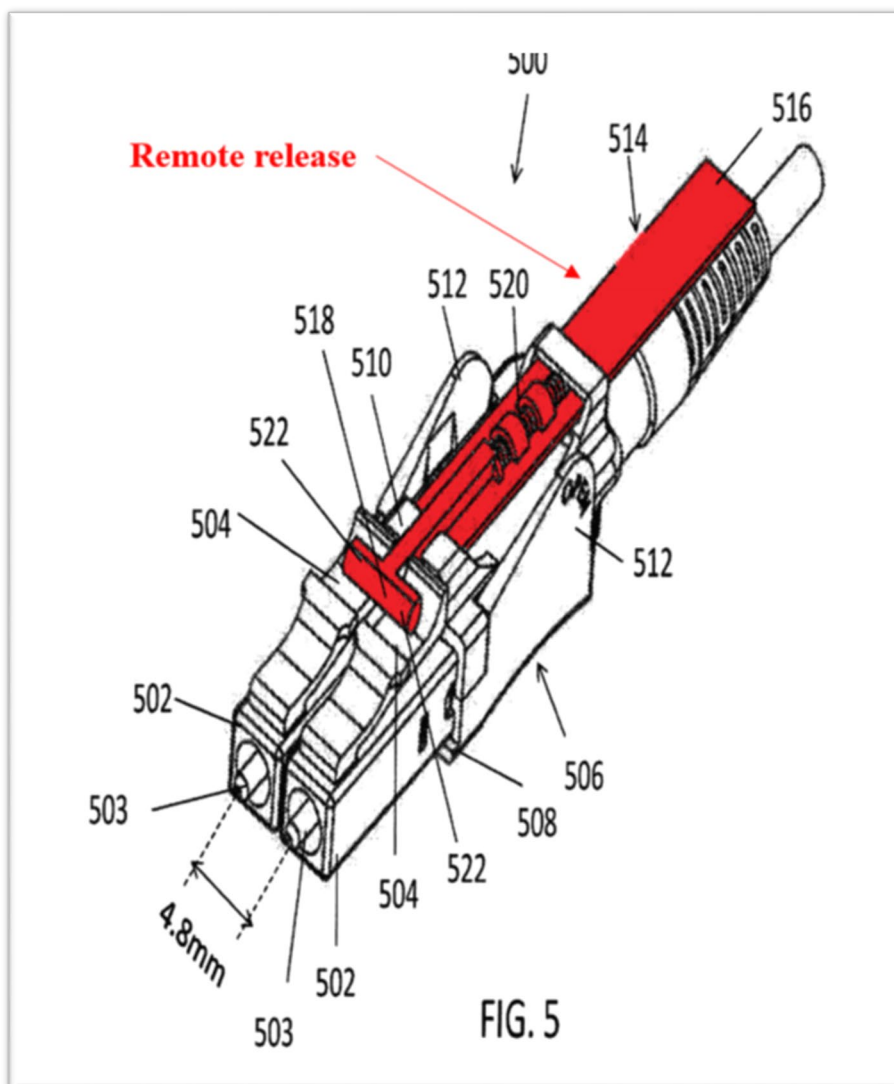
Fiber optic equipment, including connectors, typically seek to optimize space utilization. When additional bandwidth is desired, additional equipment is scaled to increase optical fiber port count, increasing space. Therefore, there has always been a desire to decrease component size, so that more components can be scaled in existing data centers. And unfortunately for PO, each of the claimed features for decreasing size to increase density was already taught in the prior art. EX1007, ¶¶43-65.

II. '760 PATENT

The '760 patent claims optical fiber connectors having well-known remote release. EX1003, 17:1-18:30.

Claim 1 recites an “optical fiber connector configured for mating with a receptacle, the optical fiber connector comprising” a known MT ferrule, a connector housing, a depressible latching arm, and a remote release. No claim feature conveys patentability, and the dependent claims merely add more known features, e.g., a second latching arm, standard receptacles, etc. EX1001, 12:23-60; EX1007, ¶¶66-71.

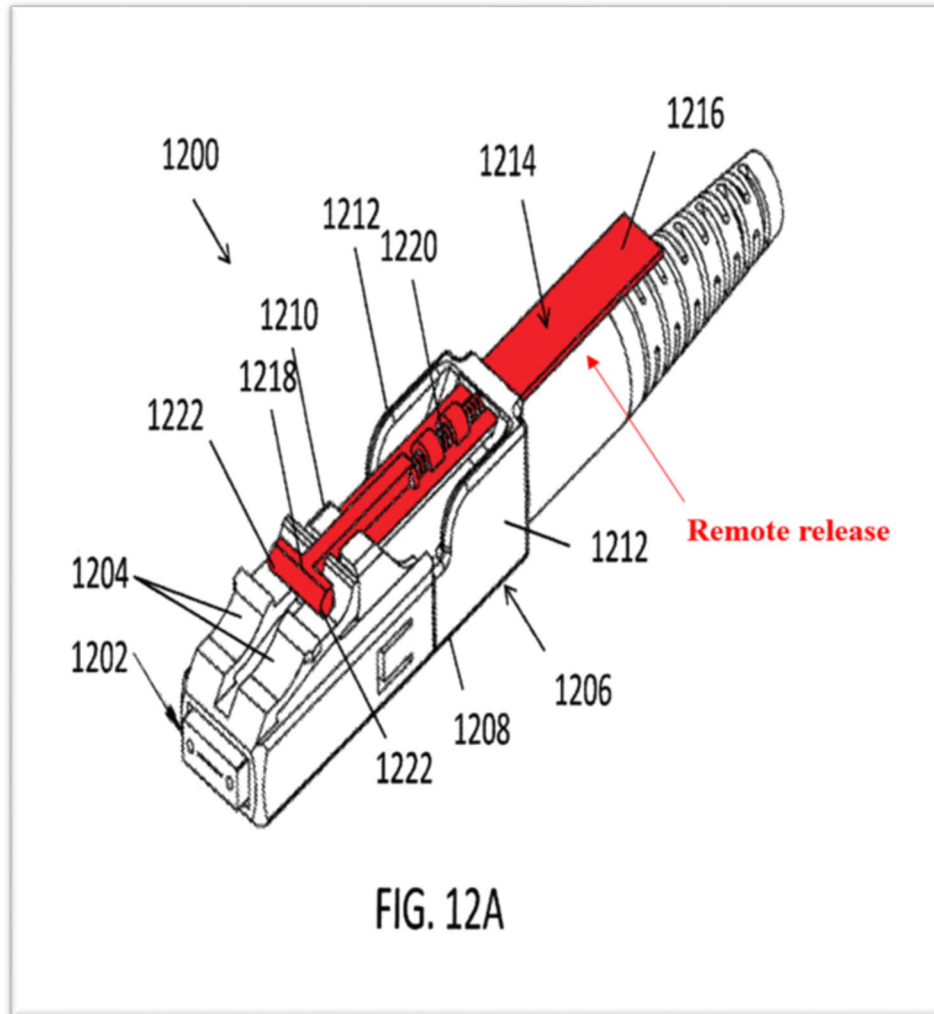
Figure 5 shows a remote release:



EX1001, FIG. 5 (annotated).

Connector 500 includes LC connectors 502—each connector 502 has ferrule 503 and latching arm 504. EX1001, 7:12-17. Distal end 516 of pull tab 514 is pulled “to remotely release the connector 500 from an SFP or adapter.” EX1001, 7:35-42; EX1007, ¶¶72-77.

Figure 12A shows another connector/remote release:



EX1001, FIG. 12A (annotated).

Just like Figure 5, distal end 1216 of pull tab 1214 is pulled “to remotely release the connector 1200.” EX1001, 8:63-9:3; EX1007, ¶¶78-83.

A. Prosecution History Summary

The singular Office Action explained that “Species A (illustrated in Figs. 5–8 and 12) . . . has a latch 504 *of a fiber optic connector* wherein the latch 504 is *pressed down* for disengagement..., whereas Species B (illustrated in Figs. 13–15) 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[.]” EX1002, 0085. The Office Action concluded that Applicant elected Species B by original presentation. EX1002, 0086.

In response, Applicant submitted that “‘depressible’ means that the latch arm is pressed down (Species A), not that it is lifted up (Species B),” EX1002, 0239, and acknowledged that “to the extent there is an election by original presentation, it is of Species A, not Species B.” EX1002, 0239; EX1007, ¶¶84-92

B. Level of Ordinary Skill in the Art

A person of ordinary skill (POSITA) would typically have had (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. EX1007, ¶¶36-42.

C. Claim Construction

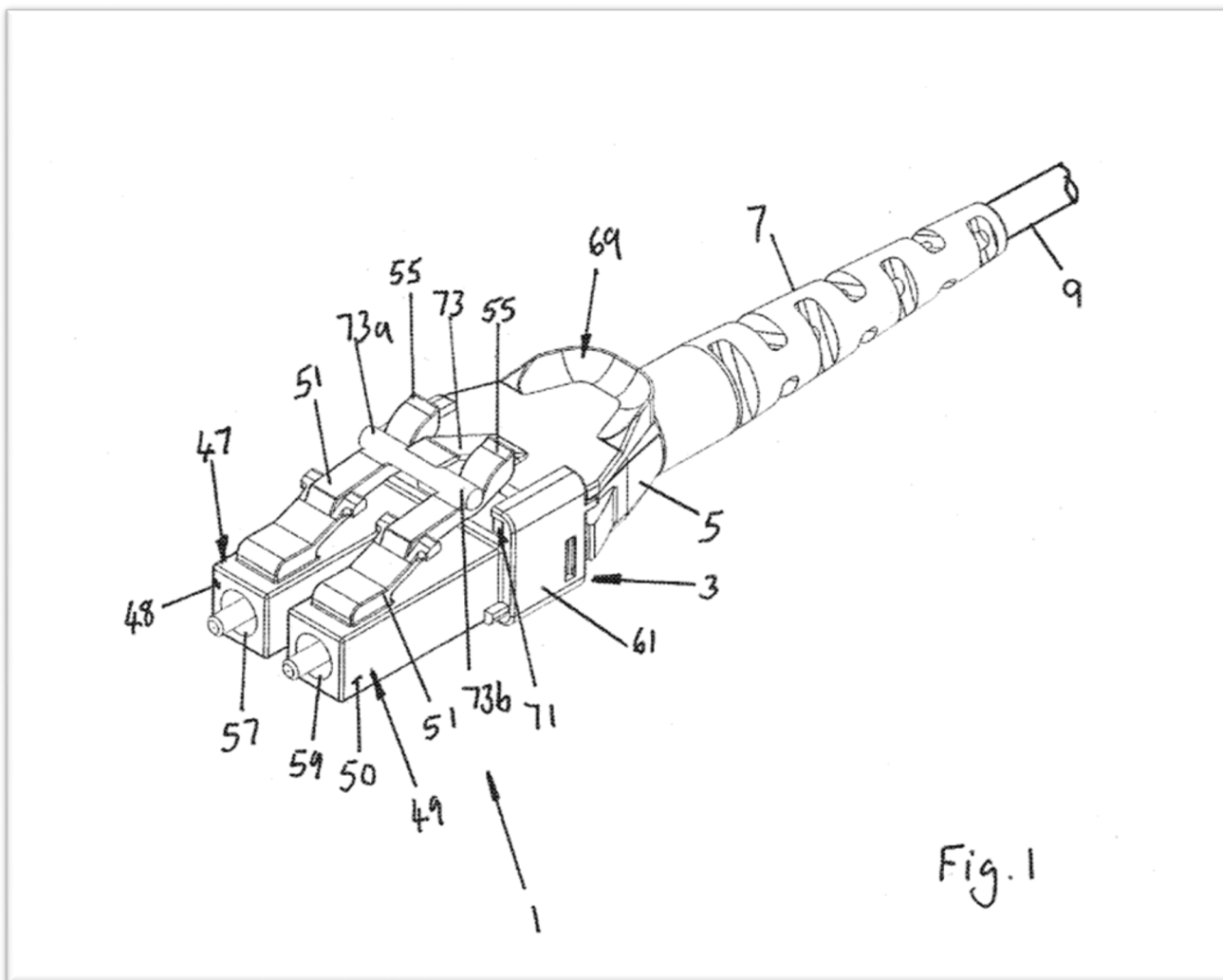
This Petition affords all terms their ordinary and customary meaning. EX1007, ¶¶94-97.

III. APPLIED REFERENCES

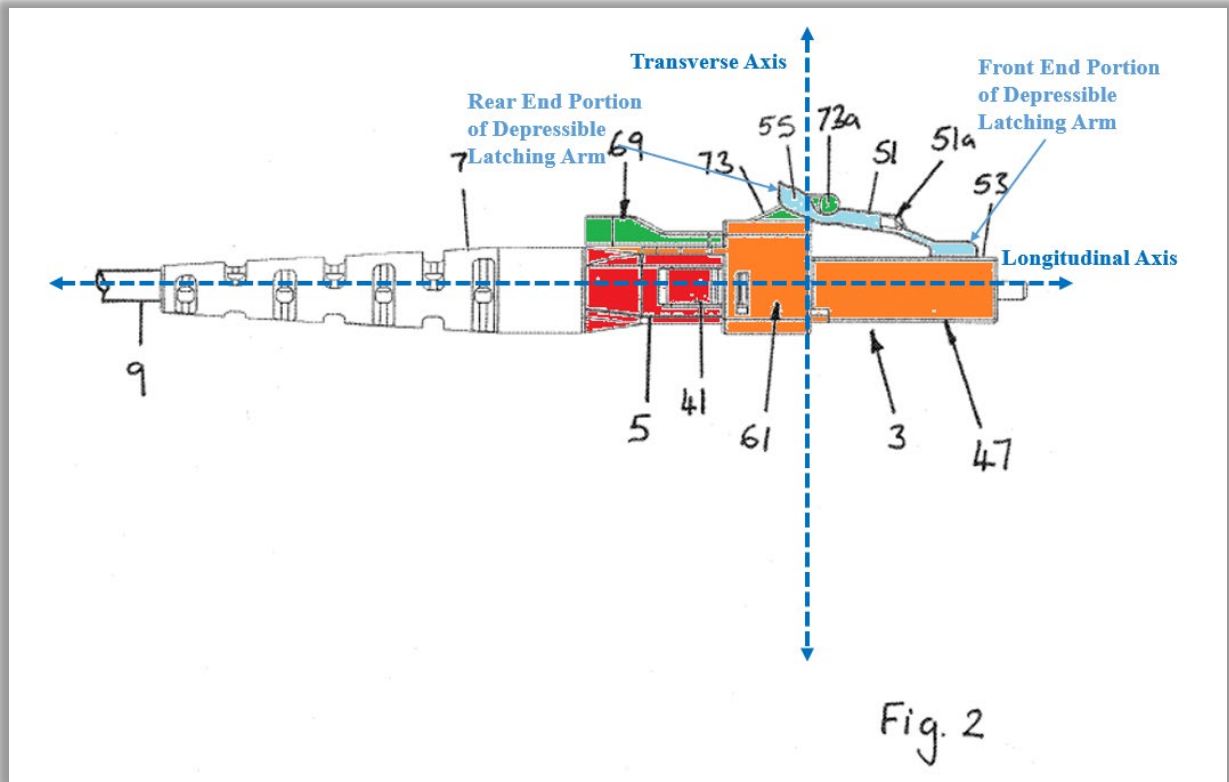
A. Raven

Raven describes optical fiber connectors. EX1003, 1:2-4. Raven acknowledges that when connectors plug into a panel with high connector density, it can be difficult to remove the cable assembly. EX1003, 1:27-2:1. To address this, Raven discloses “an improved means of actuating the fibre optic connector locking levers”—a remote release. EX1003, 2:10-11, FIGs. 1-4; EX1007, ¶¶98-102. Raven also aims to provide “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, 2:20-23; EX1007, ¶¶103-104.

Raven’s connector is shown in Figures 1 and 2:



EX1003, FIG. 1.



EX1003, FIG. 2 (annotated); EX1007, ¶105.

Assembly 1 includes leading end unit 3, housing 5, boot 7, and a fiber optic cable 9. EX1003, 14:15-16. Each of first and second connectors 47, 49 includes latching lever 51. EX1003, 17:16-20, 16:16-18. Levers 51 “releasably lock the respective fibre optic connector device” to a complimentary device (e.g., an adapter). EX1003, 17:16-20; EX1007, ¶¶106-108.

Levers 51 are resilient, and are moved from a locked position to an unlocked position by pushing free end 55 of the latching lever downwards. EX1003, 17:21-26, FIG. 2. Levers 51 return to the locked position when their “resiliency . . . returns

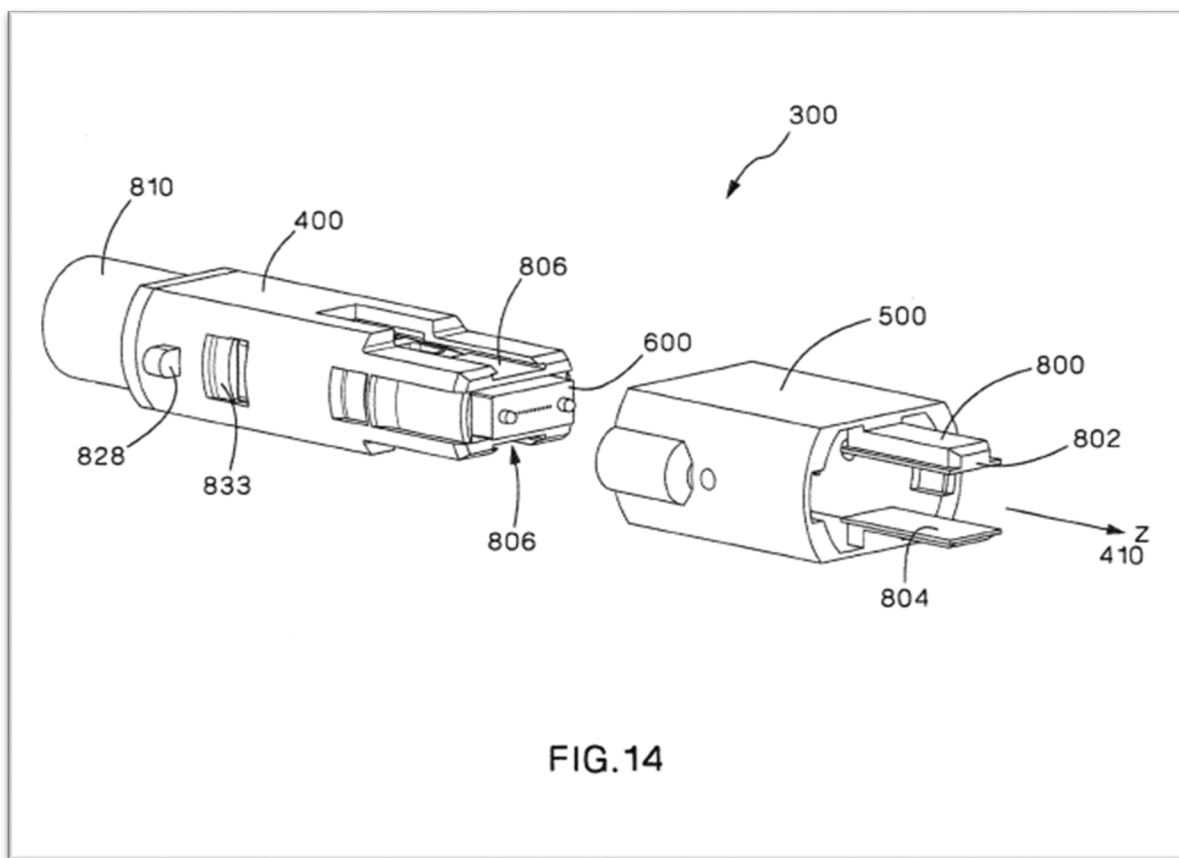
them to their rest positions when an actuating force is removed.” EX1003, 17:21-26, FIG. 2; EX1007, ¶109.

Raven’s “manually operable control 69 . . . is arranged to actuate the latching levers 51.” EX1003, 18:1-3. Control 69 slides within grooves formed in connector part 61, with respect to leading end unit 3 between a position where levers 51 are locked to a position where levers 51 are unlocked. EX1003, 18:3-7; EX1007, ¶110. Actuator 73 includes actuator member 73a, 73b—it is attached to upper surface 70 of control 69. EX1003, 18:6-10. When a user slides control 69, levers 51 are pushed downwards toward upper surface 53 of connectors 47, 49. EX1003, 18:10-12; EX1007, ¶110.

Raven further provides that “[i]nstead of using LC type fibre optic connectors, other fibre optic connector formats can be used.” EX1003, 20:3-4; EX1007, ¶112.

B. Kuffel

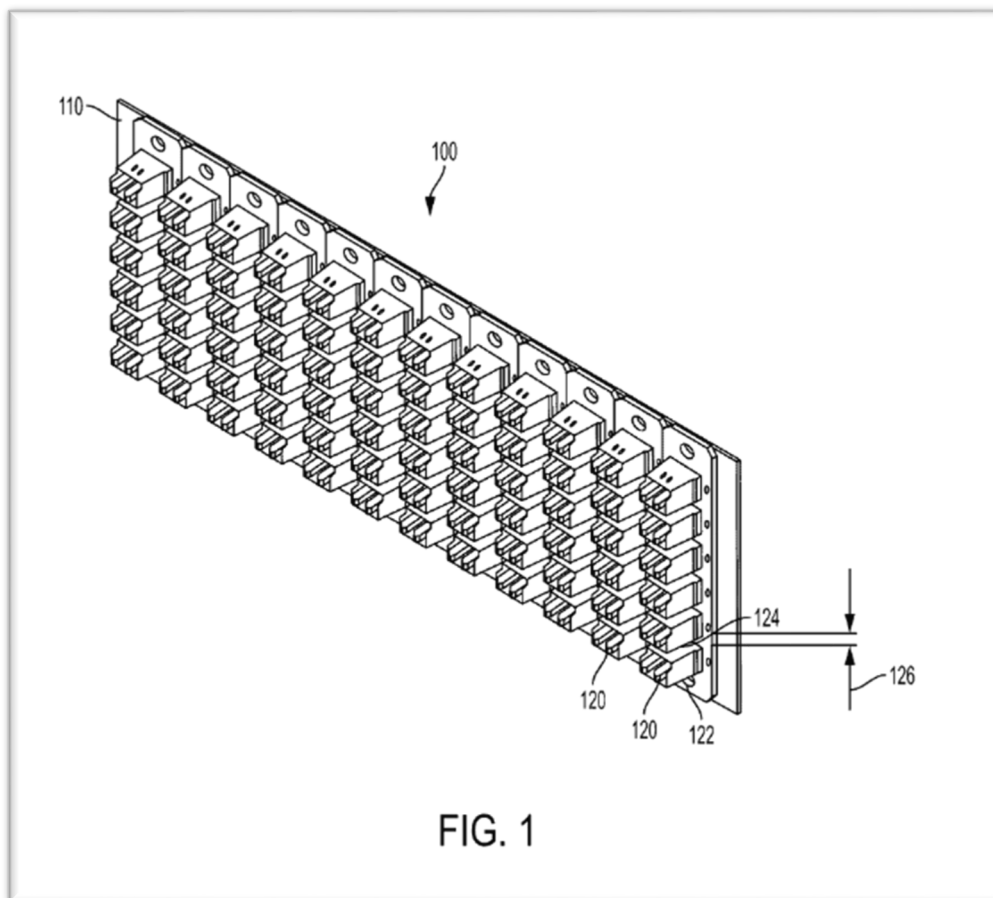
Kuffel explains the desirability to upgrade its system of Figure 1 from LC connectors to MPO connectors. EX1004, 4:8-19, 3:44-4:7, FIG. 1. EX1007, ¶¶113-117. Kuffel also discloses connector 300 including ferrule 600, which contains optical fibers for communication. EX1004, 5:16-27, FIGs. 3-5, 14; EX1007, ¶¶118-119.



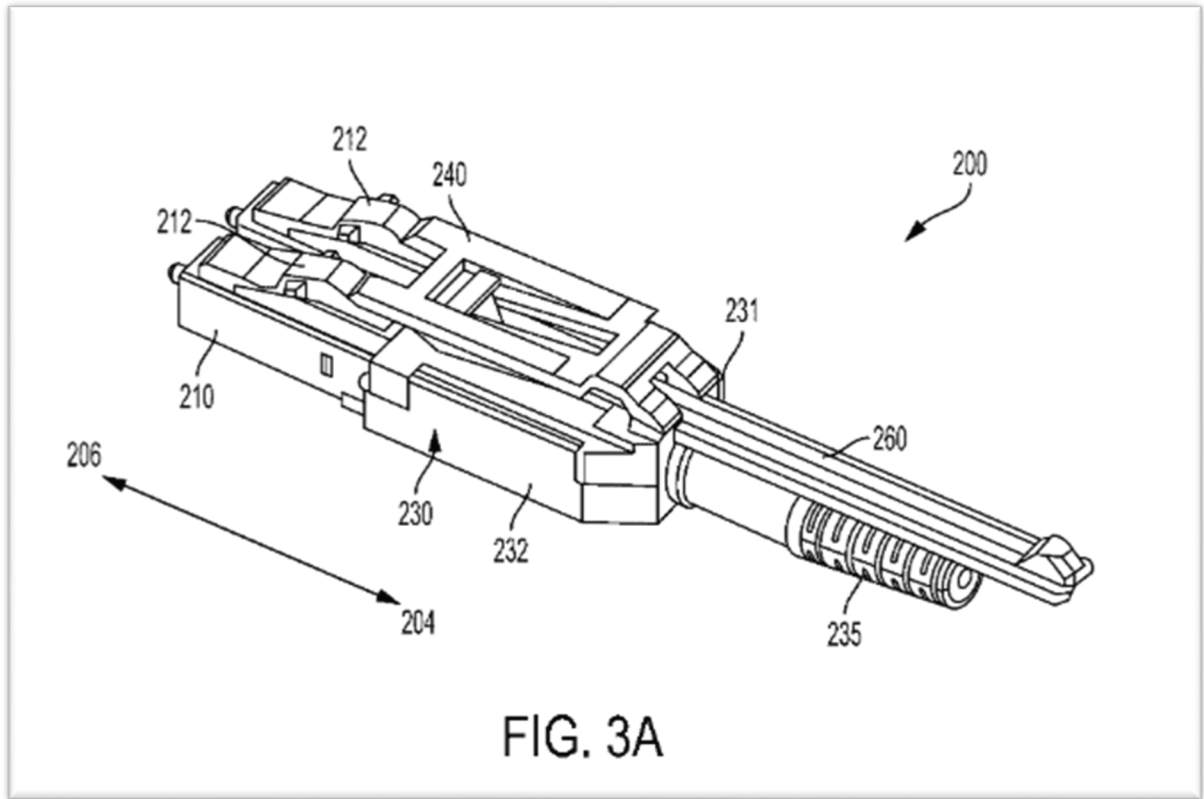
EX1004, FIG. 14.

C. Wong

Wong also discloses a remote release for optical fiber connectors. EX1005, 18:41-49; EX1007, ¶¶120-121. Wong’s “remote latch release connector assembly 200” in Figure 3A, is connected to an adapter (“coupler 120”) within high density panel 100 in Figure 1. EX1005, 4:51-5:2, 7:11-16; EX1007, ¶¶122-126.



EX1005, FIG. 1.



EX1005, FIG. 3A.

Latching portion 212 latches with mating connector 150 of coupler 120, and release member 240 is shaped such that a portion of the release member engages with portion 212, causing portion 212 to latch/unlatch from connector 150. EX1005, 8:24-42, 14:19-24; EX1007, ¶¶127-129. Pulling pull tab assembly 260 causes downward force F_2 on member 240, which in turn causes member 240 to contact and/or press down on portion 212, thereby unlatching from connector 150. EX1005, 18:25-40; EX1007, ¶129.

Pull tab assembly 260 slides within opening 246 so that assembly 260 is movable relative to the various portions of remote latch connector 200. EX1005,

16:62-66. Opening 246 has a shape/size that generally corresponds to a cross-sectional shape/size of assembly 260 extending therethrough. EX1005, 15:53-56; EX1007, ¶¶130-131.

D. Gniadek

Gniadek discloses cable assembly connectors for fiber optic transmission having a remote release mechanism. EX1006, 1:13-15, 3:7-12; EX1007, ¶¶132-134. Gniadek explains that high-density interconnect panels are deployed to improve the quality of network service. EX1006, 1:17-28. Therefore, “[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; EX1007, ¶¶135-139.

IV. IDENTIFICATION OF CHALLENGE (37 C.F.R. § 42.104(B))

Ground	References	Basis	Claims
1	Raven, Kuffel	§103	1-10, 12, and 14-17
2	Raven, Kuffel, and Gniadek	§103	13
3	Raven, Kuffel, and Wong	§103	13
4	Wong	§103	1-11 and 15-17
5	Wong, Kuffel	§103	12 and 13
6	Wong, Raven	§103	14
7	Raven, Kuffel	§103	10
8	Wong, Kuffel	§103	10 and 11

The earliest possible priority date of the '760 patent is January 15, 2016, and the art presented is prior art under §§ 102(a)(1) and/or 102(a)(2):

- Raven, International Publication No. WO 2014/057264 (EX1003);
- Kuffel, U.S. Patent No. 8,636,424 (EX1004);
- Gniadek, U.S. Patent No. 8,465,317 (EX1006);
- Wong, U.S. Patent No. 9,599,778 (EX1005).

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

For each obviousness analysis, Petitioner provides analysis for why it would have been obvious to a POSITA at the time of the alleged invention to combine or modify the references discussed. This analysis includes: how a POSITA would combine the references, why a POSITA would combine the references, why a POSITA would have an expectation of success when making the combination, and for many of the combinations, one or more *KSR* rationales.

A. Claim 1

1. A POSITA would have been motivated to combine Raven and Kuffel with a reasonable expectation of success.

(a) Raven

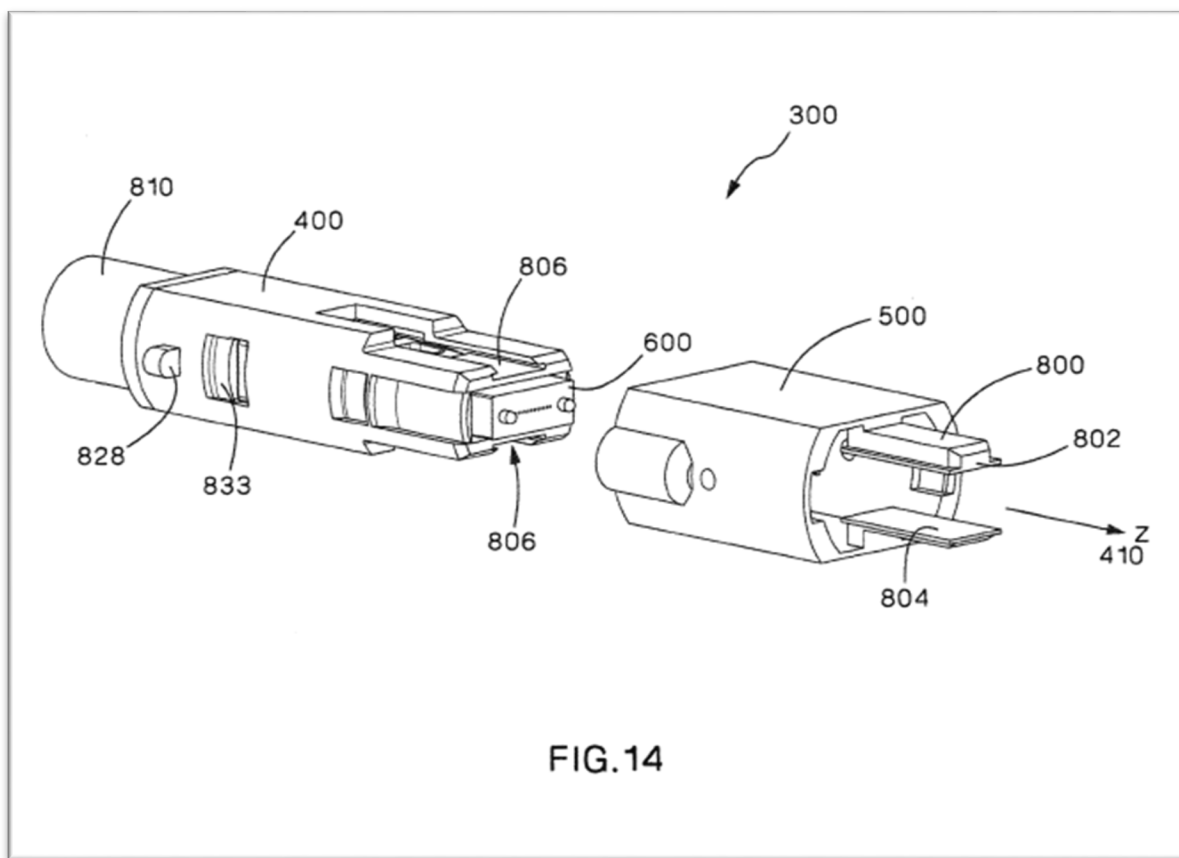
Raven explains that when fiber optic connectors are plugged into a panel with high connector density, removal of the cable assembly can be difficult. EX1003, 3:28-4:2. To address this, Raven provides a remote release. EX1003, 4:10-12, FIG. 1; EX1007, ¶¶140-143.

(b) Kuffel

Kuffel explains that improvements in optical cabling technology require existing data centers to adapt to embrace newer technology, and explains the desirability of upgrading LC components to MPO components, which include MT ferrules. EX1004, 1:11-17; EX1007, ¶¶146-149.

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; EX1007, ¶147; EX1015; EX1025; EX1027.

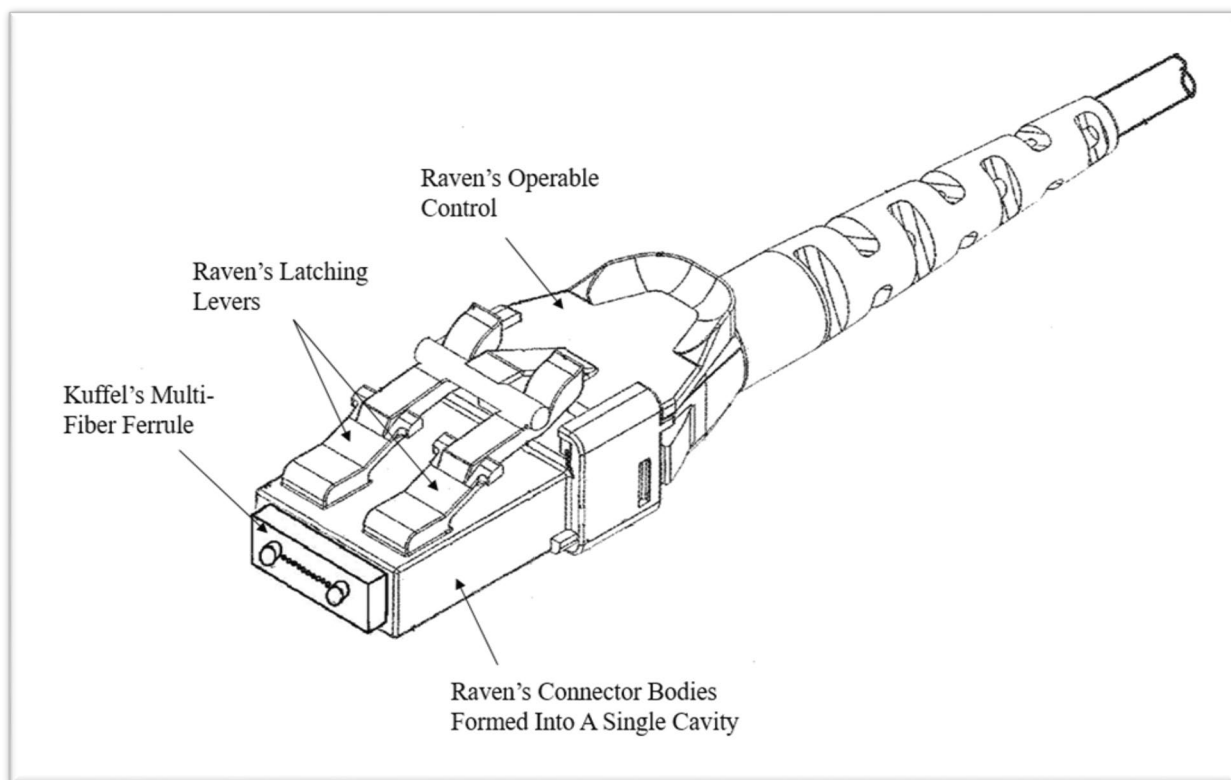
Kuffel's MPO connector 300 includes a ferrule 600 "which contains optical fibers for communication." EX1004, 5:16-27, FIGs. 3-5, 14. EX1007, ¶¶150-151.



EX1004, FIG. 14.

(c) Motivation to Combine

A POSITA would have found it obvious to modify Raven's connector that includes two ferrules (e.g., as shown in its LC connector) 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's Figure 1. EX1007, ¶152.



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

The modification simply uses Kuffel's MT ferrule for Raven's ferrules (e.g., an LC connector). EX1007, ¶153. Raven's first/second bodies 48/50 would thus form into a single housing with a cavity to accommodate Kuffel's MT ferrule. This change is simply a substitution of a known element (Raven's ferrules, single fiber) with another (Kuffel's MT, multi-fiber ferrule). This technique (using MT multi-fiber ferrules) improves Raven's device in the same way as described in Kuffel. EX1007, ¶153.

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. EX1007, ¶154.

There are numerous reasons why a POSITA would have found this combination obvious. At a high level, both LC connectors (*e.g.*, dual-ferrule connectors) and MPO connectors (*e.g.*, multi-fiber ferrule connectors) are common optic fiber system components that have been used for many years in the field by the same engineers solving the same problem. Modifying 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. EX1007, ¶155. And no undue research or experimentation would have been required—this is a predictable solution based on simple mechanical principles. EX1007, ¶155.

Indeed the '760 patent itself discloses both LC and MPO connectors (with MT ferrules). EX1001, 2:25-45, 10:24-37. In this way, the '760 patent appears to reflect the understanding that a POSITA would have known that modifying known connectors is obvious, *e.g.*, guided by the desired number and arrangement of optical fiber connections in the data center. EX1007, ¶¶156-157; EX1015; EX1025; EX1027. Notably, latching arm 504/1204 and pull tab 514/1214 are interchangeable for the LC connector, EX1001, FIG. 5, and the "MPO connector" (with MT ferrule)

(EX1001, FIG. 12A), such that a POSITA would have found it further obvious to modify the “LC type duplex connectors” of Figure 5 with an “MPO connector” of Figure 12 (MT ferrule), or vice versa, with a reasonable expectation of success. The Office’s previous consideration of Figures 5-8 and 12 as the same species further supports this. EX1002, 0085-86; EX1007, ¶157.

There are at least three additional reasons a POSITA would have been motivated to combine Raven and Kuffel.

First, a POSITA would have found this modification obvious based on the disclosures of Raven and Kuffel themselves. EX1004, 3:34-4:67 (describing upgrading a system to replace LC connectors with MPO connectors). Kuffel provides a specific motivation to replace LC connectors with MPO connectors, which include MT ferrules. EX1004, 3:34-4:67; EX1007, ¶159. A POSITA would have readily understood that Kuffel’s fiber optic connectors with multi-fiber ferrules would provide improved communication – bringing higher transmission speeds with additional fibers and better reliability to existing data centers using older technology. EX1004, 1:11-18; EX1007, ¶160.

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. EX1004, 3:34-4:67 (explaining upgrading a system to replace LC connector components with MPO components), 5:17-27 (describing an MPO 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. EX1004, 3:64-4:2; EX1007, ¶161.

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. 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.”). EX1007, ¶162.

Second, 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 dual-ferrule design or multi-fiber ferrule design is simple substitution based on what type of connectors are desired to be used. EX1007, ¶163; EX1025; EX1026, 4:55-58; EX1027. The modification of Raven involves the simple substitution of one known component for another, which will function in the same manner with predictable results, *e.g.*, because a POSITA would have known that fiber optic standards organizations at this time allowed the substitution of exactly these type of ferrules. EX1007, ¶163.

Third, 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. EX1007, ¶164. This was generally known in the field at least in the 1990s, but certainly well before the time of the '760 patent. EX1004, 4:8-57. Thus, a POSITA would have been motivated to modify Raven to incorporate a multi-fiber connector, such as in the MPO connector of Kuffel, when a higher-data capacity was desired than could be provided by a dual-ferrule design. EX1007, ¶164.

A POSITA would have readily understood that using a multi-fiber ferrule for a dual-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 very 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 ferrule with Kuffel's MT ferrule, with the predictable results of the advantages. Similarly, it is a known technique to improve Raven's LC

device with Kuffel's MPO features, again as expressly disclosed by Kuffel.

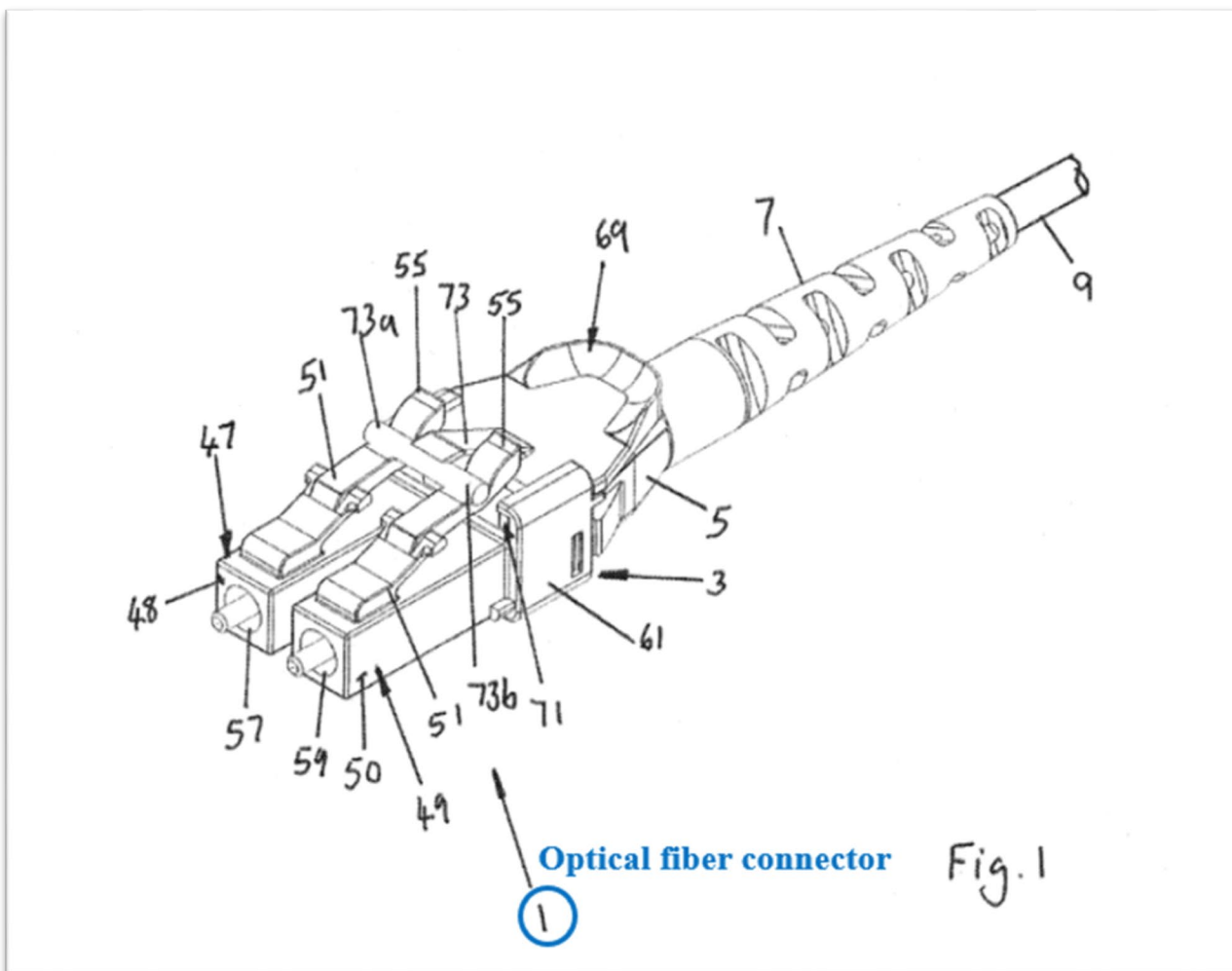
EX1007, ¶165.

A POSITA would have had reasonable expectation of success in the combination of Raven and Kuffel, as it involves the direct replacement of one known type of ferrule for another, which would have been readily implementable for a POSITA at the time 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. EX1003, 20:3-4; EX1004, 4:33-67; EX1007, ¶167. 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. EX1007, ¶167.

Accordingly, the modification of Raven's connector to include the multi-fiber ferrule disclosed in Kuffel would have been obvious to a POSITA. EX1007, ¶¶168-169.

2. [1.P]

Raven discloses [1.P]. EX1003, 1:1-4, claims 1-39, FIGs. 5-8, 12. EX1007, ¶¶170-176.



EX1003, FIG. 1 (annotated).

Raven's Figure 1 shows an optical fiber connector 1 inserts into an adapter. EX1003, 1:5-19 (describing the plugging and unplugging into receiving ports), 17:16-20 (explaining that the fiber cable assembly 1 includes latching lever 51 to “engage a complementary formation” such as an adapter); EX1007, ¶¶172-173. This is the same type of optical fiber connector as disclosed in the '760 patent. EX1001, Abstract, 1:34-64, FIGs. 5, 8; EX1007, ¶173.

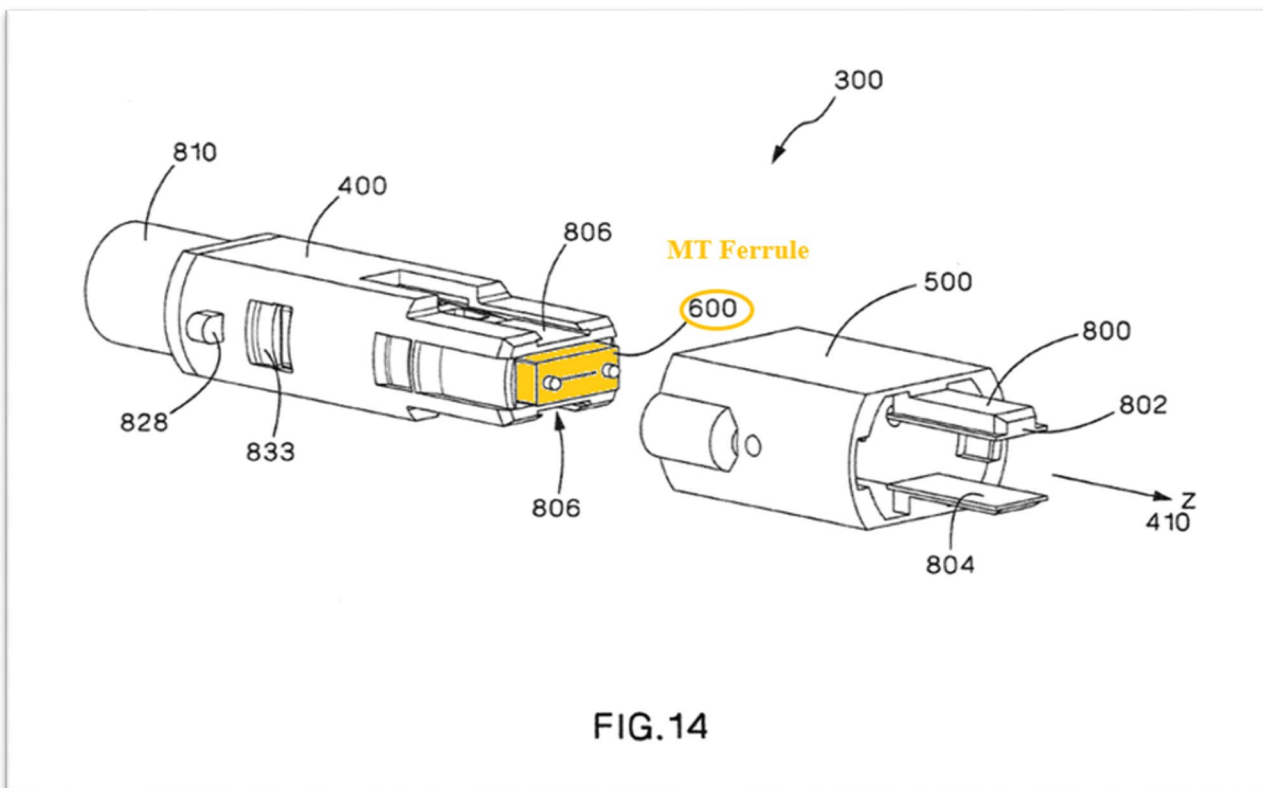
Further, the '760 patent illustrates that the term “receptacle” simply means that structure that receives each of the LC connectors or a single MPO connector. EX1001, 5:64-6:12, 8:22-26, FIGs. 1A-1D (receptacles 102), 9 (receptacle 902). Raven discloses connectors “configured for mating with” receptacles and thus satisfies this claim element. EX1007, ¶¶174-175.

Accordingly, Raven discloses [1P].

3. [1.1]

Raven-Kuffel discloses an MT ferrule configured to hold a plurality of optical fibers. PO may allege Raven does not expressly disclose an MT ferrule, but 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; EX1007, ¶¶177-186.

Kuffel’s MPO connector 300 comprises MT ferrule 600 configured to hold a plurality of optical fibers. EX1004, 5:17-27, 6:36-53, claims 16-32. Kuffel’s Figure 14 shows MT ferrule 600:



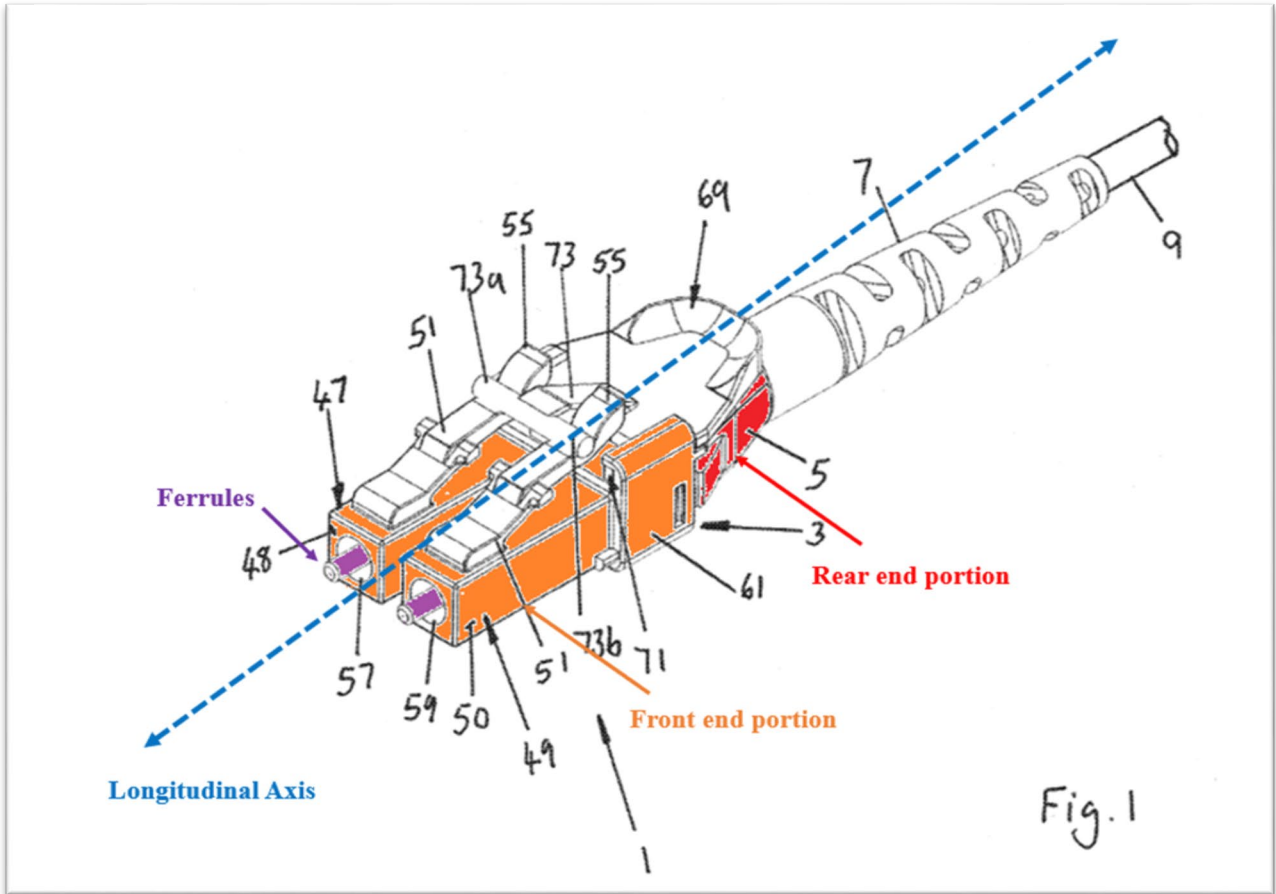
EX1004, FIG. 14 (annotated).

A POSITA would know MPO connectors have MT ferrules. EX1007, ¶¶179-184. Thus, Kuffel's ferrule 600 of MPO connector 300 discloses an MT ferrule.

Accordingly, Raven-Kuffel discloses [1.1] to modify Raven's dual-ferrule LC arrangement with Kuffel's MT ferrules, and this combination would have been obvious. Section V.A.1; EX1007, ¶185.

4. [1.2.1]

Raven 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 [a ferrule] such that [the ferrule] is exposed through the front end portion for making an optical connection." EX1007, ¶¶187-194.



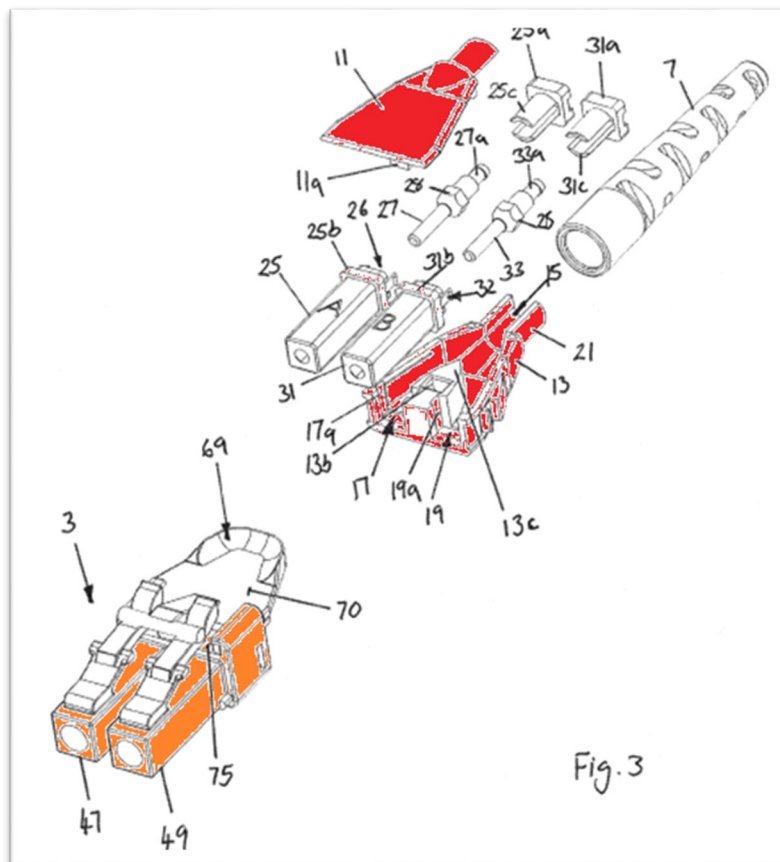
EX1003, FIG. 1 (annotated).

Raven's leading end unit 3 of connector 1 attaches to/separates 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 [1.2.1]. EX1007, ¶¶188-189.

First and second fiber optic connectors 47, 49 each include first and second bodies 48, 50. EX1003, 16:16-20. First and second bodies 48, 50 are each arranged to receive respective ferrules 27, 33. EX1003, 16:20-23.

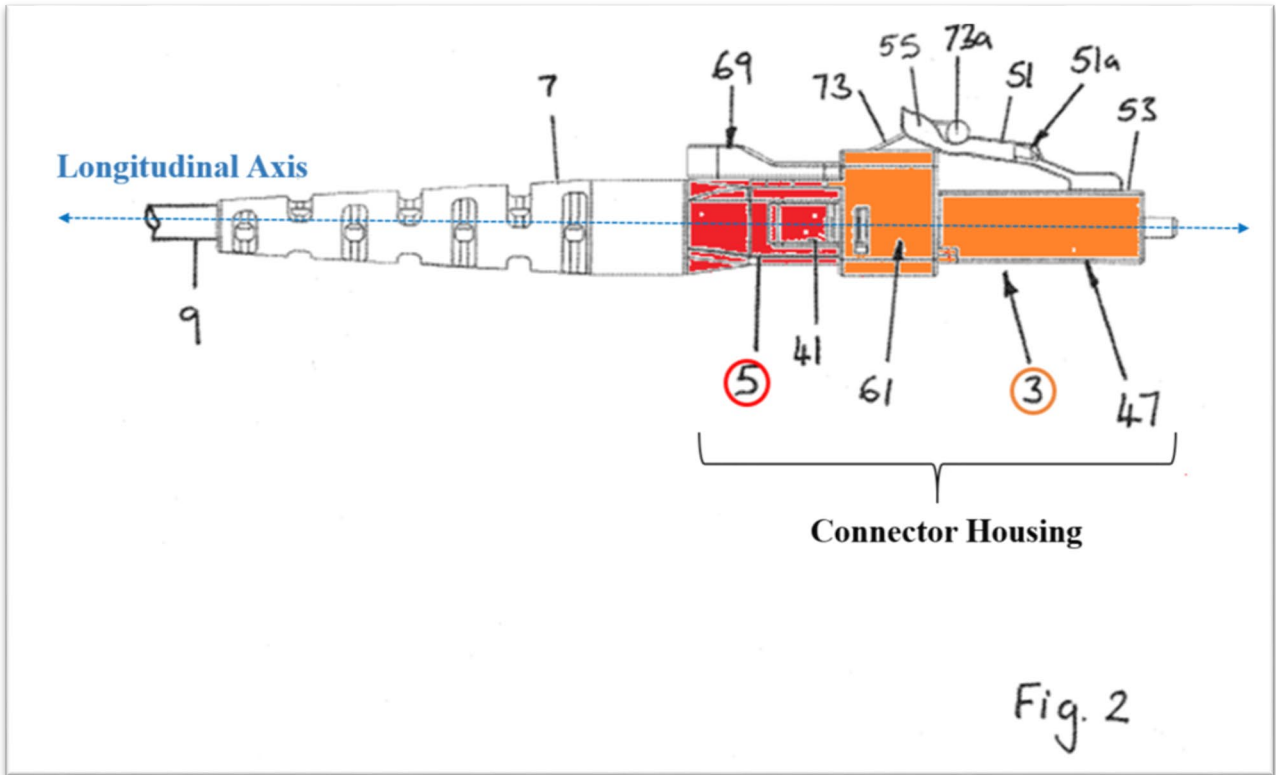
Raven's leading end unit 3 therefore acts as a front end portion of a housing configured to hold at least one ferrule such that the at least one ferrule is exposed through the front end unit 3, as illustrated in Figure 1. EX1003, 16:20-23; EX1007, ¶¶190-191.

Raven's housing 5 comprises first and second parts 11, 13 that are arranged to snap fit together. EX1003, 14:19-24. Raven's housing 5 and first and second inner bodies 25, 31 together provide a housing assembly configured to engage with the lead end unit 3. EX1003, 15:3-16:15; EX1007, ¶192.



EX1003, FIG. 3 (annotated).

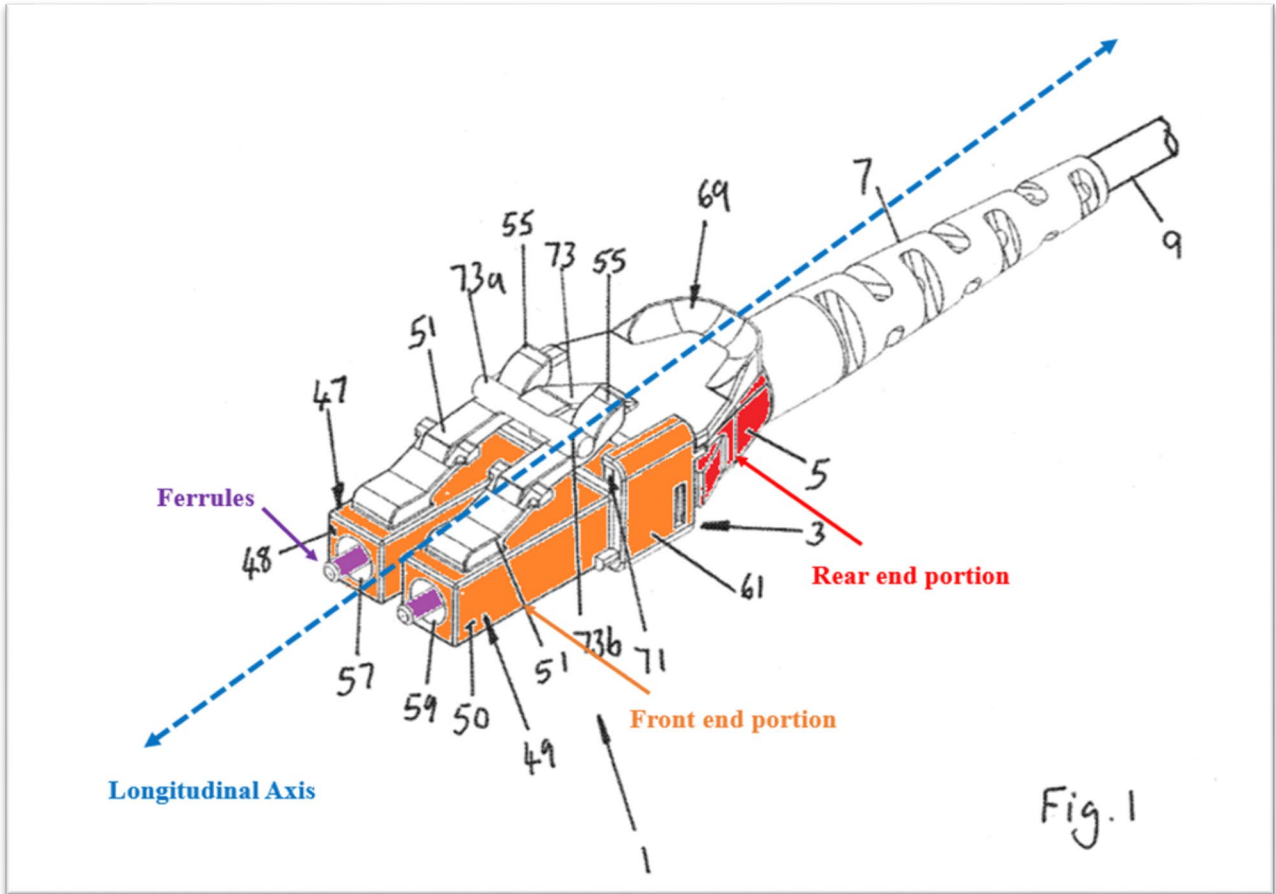
Accordingly, Raven's housing 5 is a rear-end portion of the housing, spaced apart from the front-end portion of leading end unit 3 along a longitudinal axis, as illustrated in Figure 1 and Figure 2.



EX1003, FIG. 2 (annotated); *see also* EX1007, ¶193.

5. [1.2.2]

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-Kuffel renders obvious that the ferrule is an MT ferrule. Section V.A.1; EX1007, ¶¶195-207.



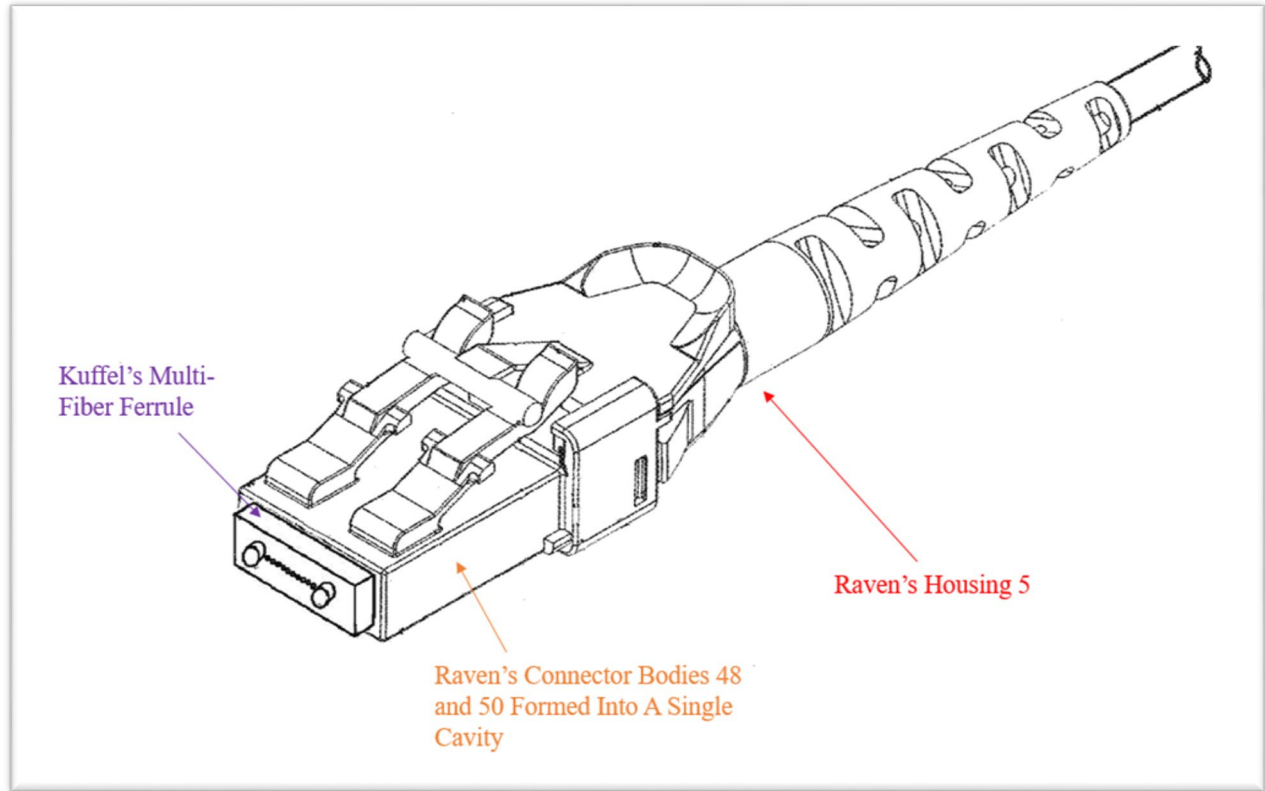
EX1003, FIG. 1 (annotated).

Raven's first and second bodies 48, 50 are each arranged to receive ferrules 27, 33 such that the ferrules protrude from them. EX1003, 16:20-23; EX1007, ¶196.

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. EX1007, ¶¶197.

PO may argue Raven does not expressly disclose a connector housing configured to hold an MT ferrule, but a POSITA would have found it obvious to

modify Raven to accommodate Kuffel's multi-fiber ferrule arrangement, as shown in annotated Figure 1. Section V.A.1; EX1007, ¶¶198-204.



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

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 the multiple components 11, 13 and snap fit connectors 11a, 13b of housing 5).

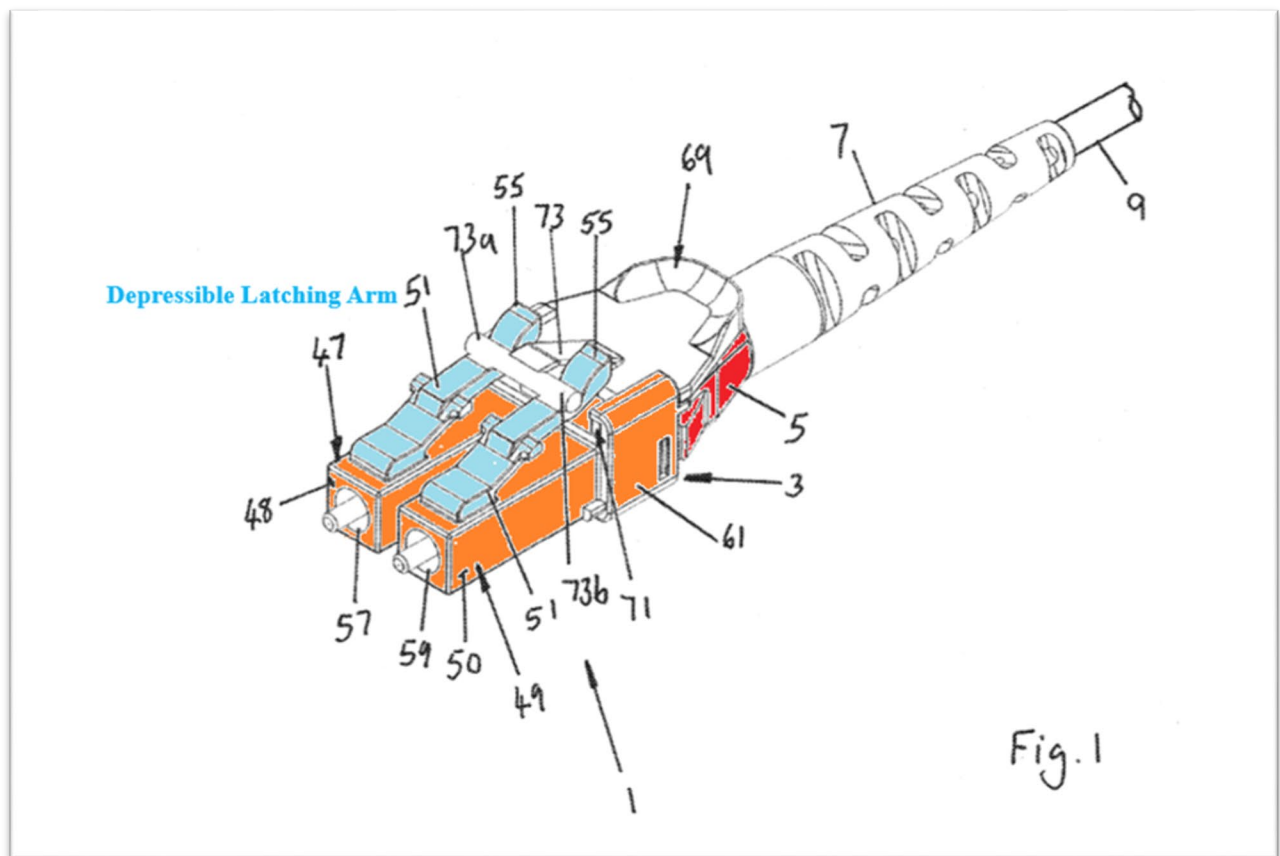
Section V.A.1; EX1007, ¶205.

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. 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. Section V.A.1; EX1007, ¶206.

6. [1.3]

Raven discloses [1.3]. EX1003, FIG. 1; EX1007, ¶¶208-213.



EX1003, FIG. 1 (annotated).

Raven's Figure 1 shows a depressible latching arm (e.g., latching lever 51) connected to the connector housing (e.g., lead end unit 3 and housing 5). EX1003, FIG. 1, 17:16-28; EX1007, ¶209.

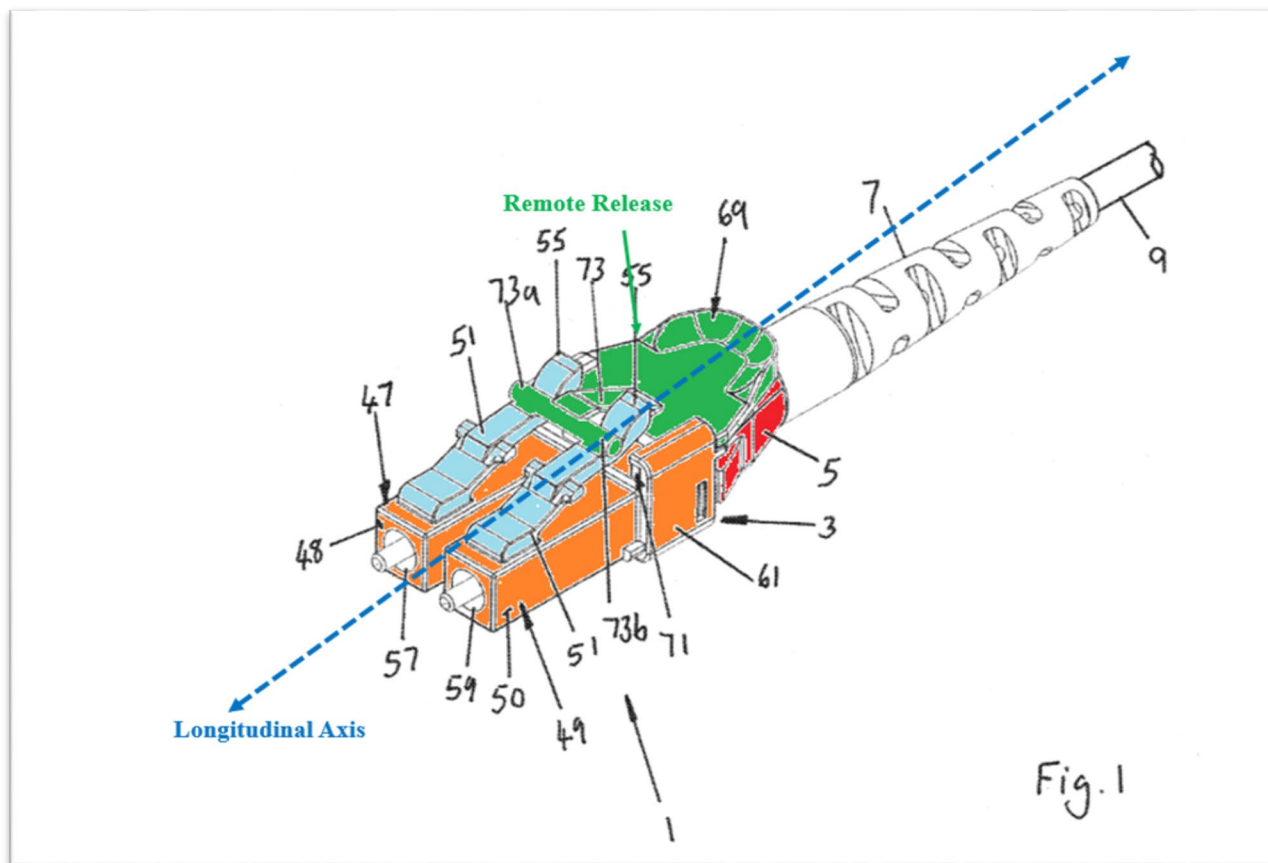
Raven's latching lever 51 "is arranged to releasably lock the respective fibre optic connector device to a complementary connector device." EX1003, 17:16-18. The "complementary connector device" is a receptacle for mating with optical fiber connector 1. EX1001, [1.P]; EX1007, ¶210.

Specifically, Raven's locking lever 51 moves 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. Latching lever 51 is arranged in line with the longitudinal axis of its respective body 48, 50. EX1003, 17:27-28, FIG. 1; EX1007, ¶211. Latching lever 51 allows for latching with a receptacle. EX1003, 1:5-19, 11:24-12:7; EX1007, ¶212.

Accordingly, Raven discloses [1.3].

7. [1.4]

Raven discloses [1.4]. EX1007, ¶¶214-219.



EX1003, FIG. 1 (annotated); *see also* EX1007, ¶214.

Raven's manually operable control 69 is "arranged to actuate the latching levers 51." EX1003, 18:1-3. It "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 position." EX1003, 18:3-5; EX1007, ¶215.

Users slide manually operable control 69, including actuator 73 and actuator members 73a, 73b, to push free end 55 of the latching lever downwards toward the upper surface of the connector bodies 48, 50. EX1003, 17:16-28, 18:1-19, FIG. 1; EX1007, ¶216. A POSITA would consider manually operable control 69, along with

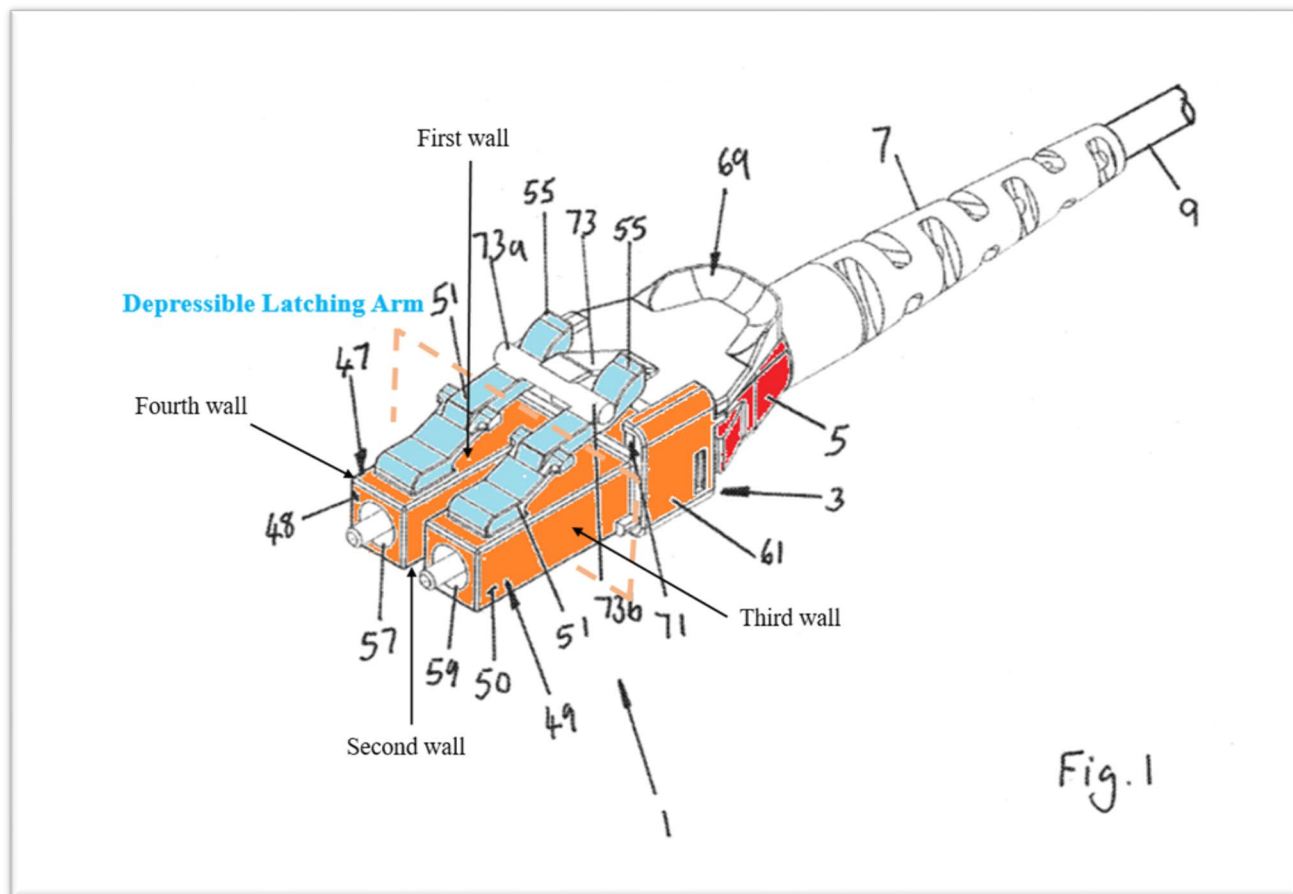
actuator 73 and actuator members 73a, 73b, to be a remote release. EX1007, ¶217.

Together, they serve as a “remote release” because manually operable component 69 is remote relative to actuating members 73a, 73b, which contact and cause the latching levers 51 to “release.” A POSITA would further understand the manually operable control 69 is connected to the connector housing (e.g., lead end unit 3) and is configured to move relative to the connector housing along the longitudinal axis in accordance with the description of Raven. EX1007, ¶217.

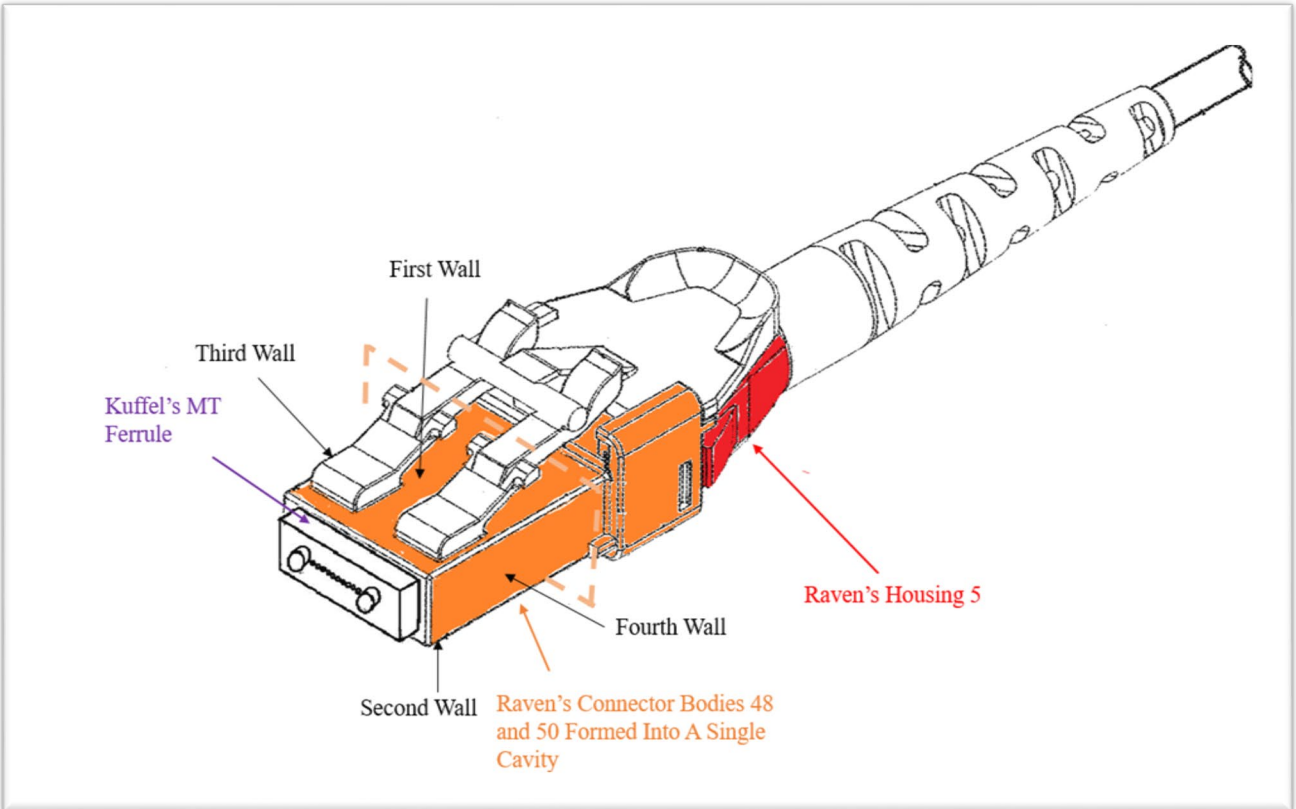
8. [1.5]

Raven discloses [1.5]. EX1007, ¶¶220-225.

Specifically, as illustrated in Raven Figure 1 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, the second wall is opposite the first wall on an underside of integrated bodies 48, 50, and 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); *see also* EX1007, ¶221.

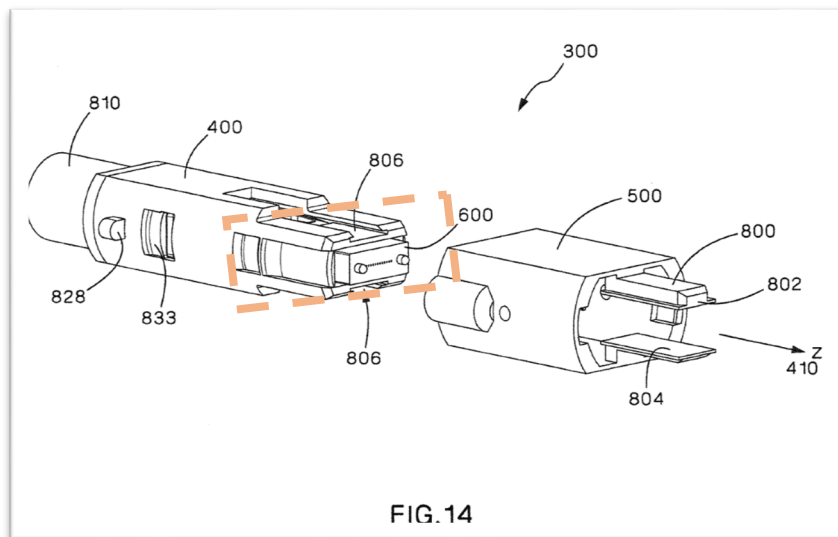
Raven's first, second, third, and fourth walls illustrated in Figure 1 apply to the entirety of Raven's connector housing (e.g., leading end unit 3 and housing 5).

EX1003, FIG. 1, 16:24-26, 17:1-7; EX1007, ¶222.

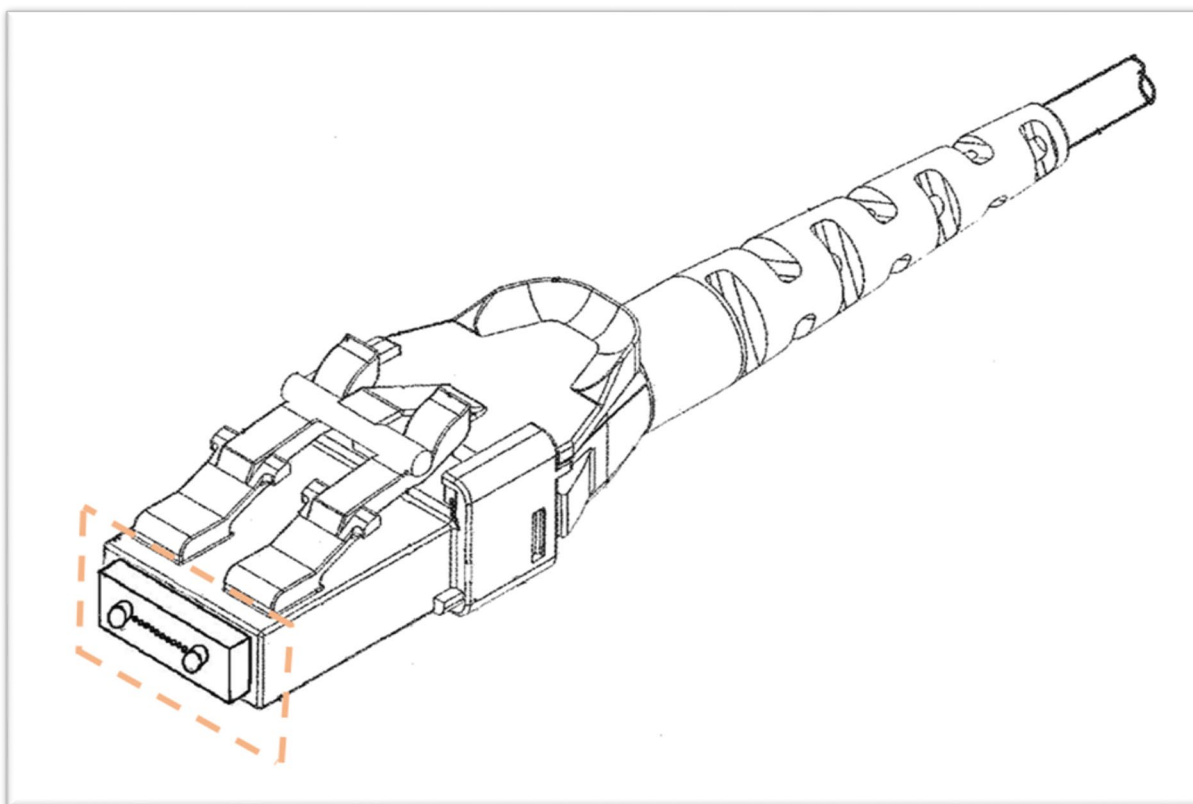
Raven's latching levers 51 constitute depressible latching arms, and are disposed on an exterior of the first wall of leading end unit 3. EX1007, ¶223.

Raven's connector housing has a generally rectangular perimeter, as depicted in the annotated Figure 1. Moreover, a POSITA would have readily understood that an MT ferrule has a generally rectangular perimeter and thus, Raven's housing

modified to accommodate Kuffel's MT ferrule would also be generally rectangular in nature as shown, e.g., in Kuffel's Figure 14. EX1007, ¶224.



EX1004, FIG. 14 (annotated).

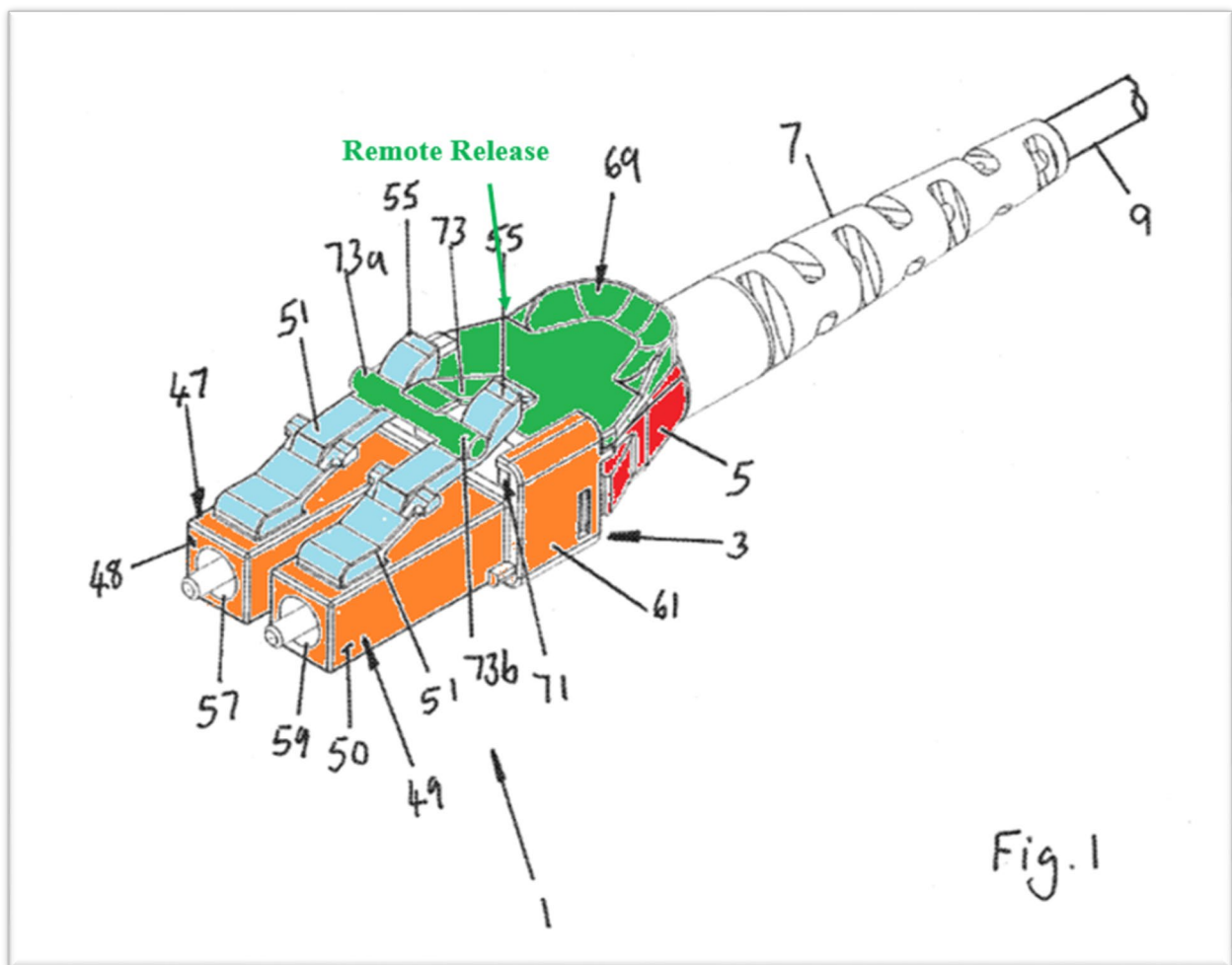


EX1003, FIG. 1 (modified with Kuffel).

9. [1.6]

Raven discloses [1.6]. EX1007, ¶¶226-232.

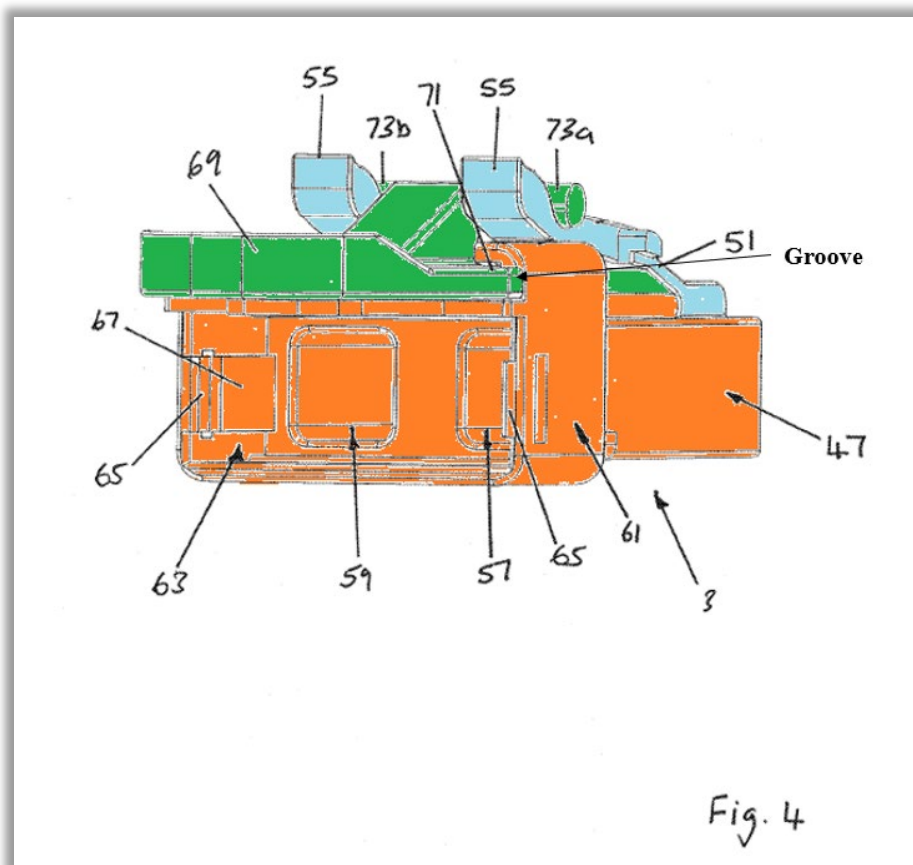
Raven's first wall of the leading end unit 3 defines a groove between connector part 61 and two latching levers 51 into which actuator 73 of manually operable control 69 and manually operable control 69 are slidably received.



EX1003, FIG. 1 (annotated); EX1007, ¶¶227-228.

Raven's Figure 4 shows how manually operable control 69, having actuator 73, is slidably received within grooves 71 defined by connector piece 61. EX1003,

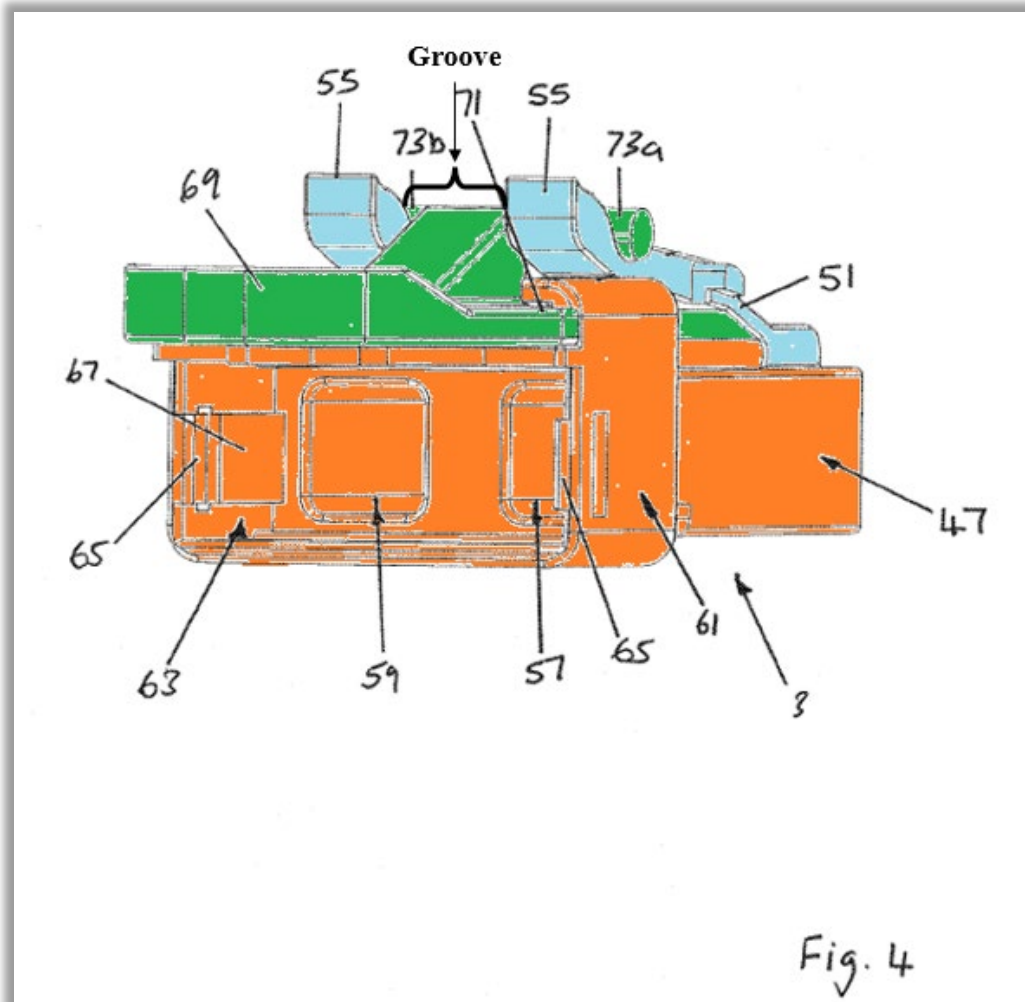
18:6-10. Raven's manually operable control 69 is slidably received by grooves 71—the bottom portion of manually operable control 69 slides into a wider portion of grooves 71 of connector piece 61, and the top portion of manually operable control 69, including actuator 73 (having members 73a and 73b), is slidably received within a narrower portion of grooves 71. EX1003, 18:6-19, FIG. 4.



EX1003, FIG. 4 (annotated); EX1007, ¶¶228-229.

The first wall of Raven's connector housing also includes a narrower groove defined between the two latching levers 51 (including the free ends 55), as also seen in Figure 4. This narrower groove slidably receives the narrow portion of the actuator 73.

And even with Kuffel's MT ferrule, these narrower/wider grooves are maintained in Raven's modified device. EX1007, ¶230.



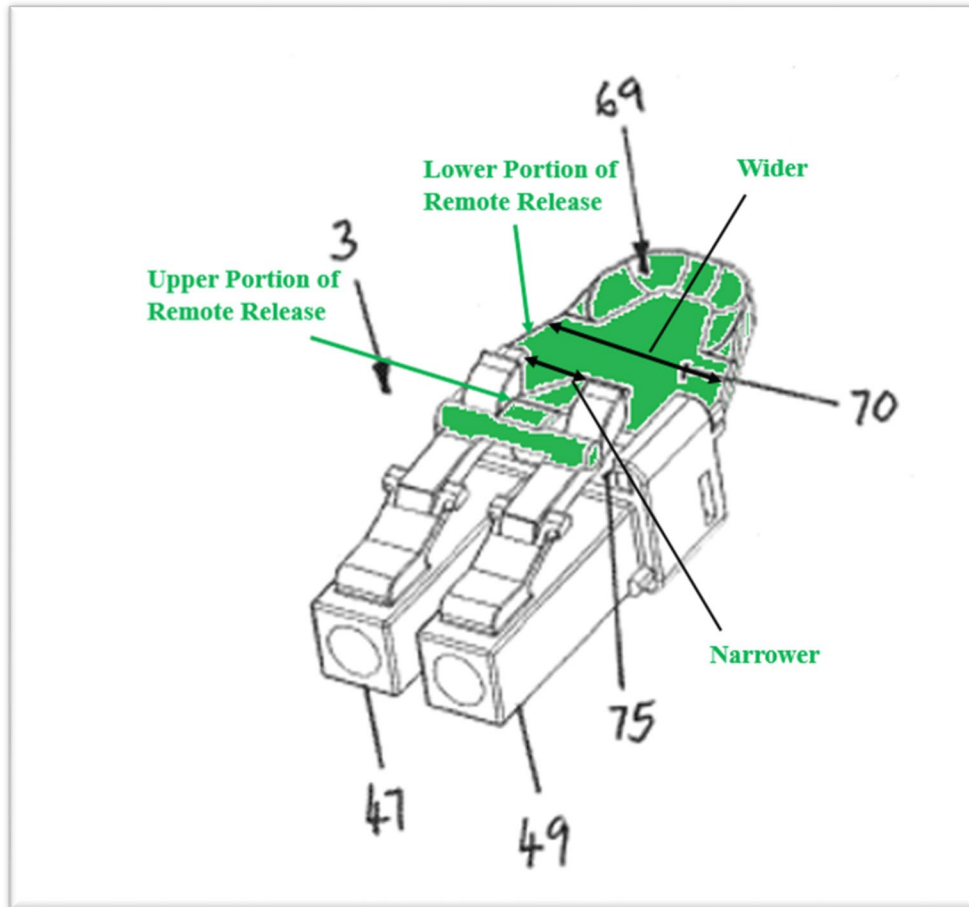
EX1003, FIG. 4 (annotated); EX1007, ¶230.

10. [1.7]

Raven discloses [1.7]. EX1007, ¶¶233-235.

Raven's remote release (e.g., manually operable control 69) includes a lower portion having an upper surface 70 to which actuator 73 is attached. EX1003, 18:6-19, FIGs. 3, 4. Actuator 73 is located above upper surface 70 of the manually

operable control 69 to which it 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 it is attached. Said another way, manually operable control 69, including top surface 70, is wider than narrower portion 73. EX1007, ¶234.



EX1003, FIG. 3 (cropped, annotated); EX1007, ¶234.

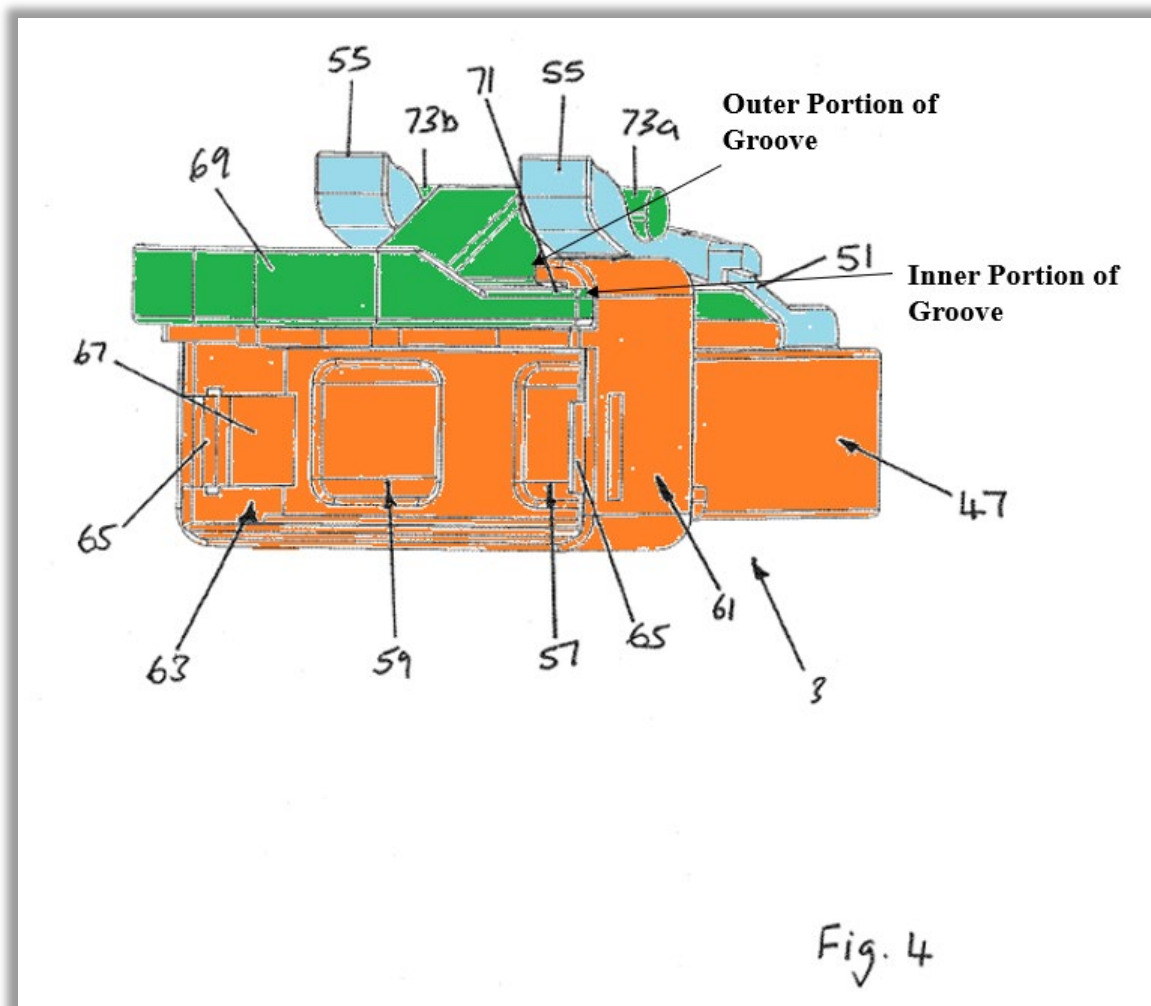
11. [1.8]

Raven discloses [1.8]. EX1007, ¶¶236-242.

Raven's grooves 71 are formed on the first wall of leading edge unit 3.

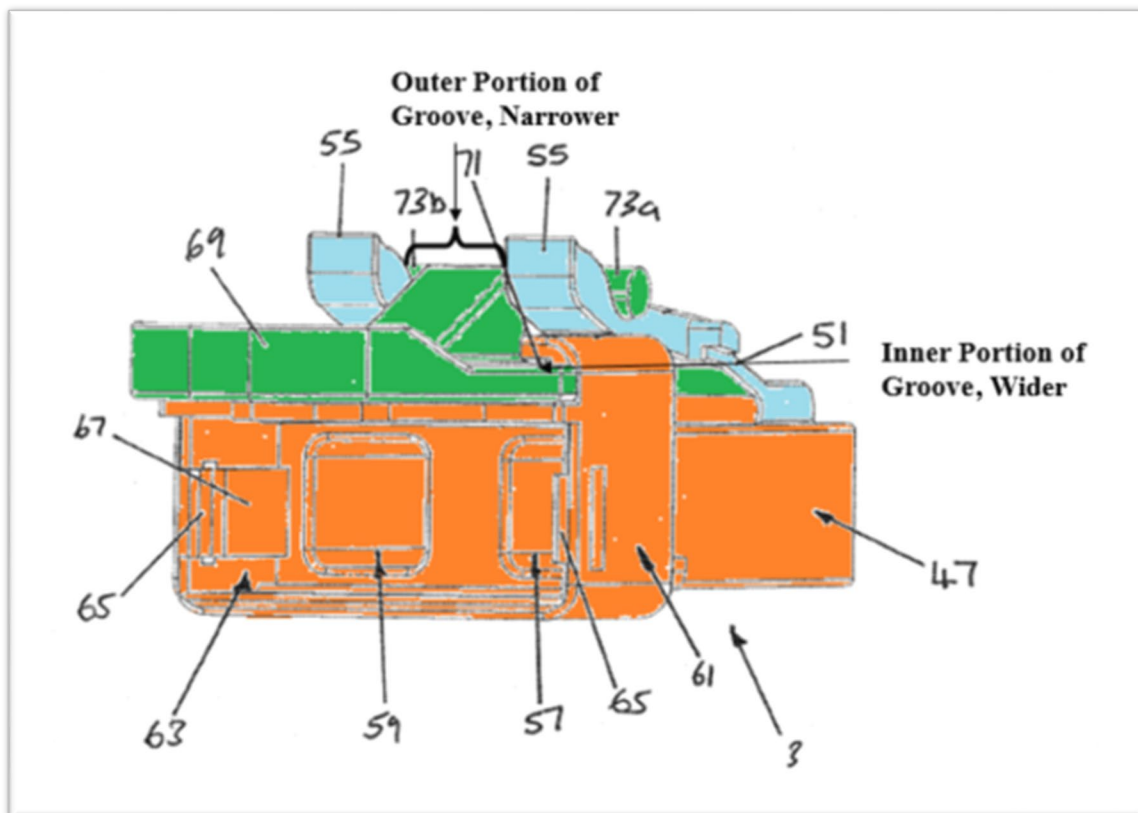
Grooves 71 have an inner portion (e.g., innermost portion of connector piece 61

forming groove 71) and an outer portion (e.g., outermost part of connector piece 61 between which actuator 73 of manually operable control 69 slides into latches 55). EX1003, FIG. 4; EX1007, ¶237. 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). Grooves 71 are formed in connector piece 61 on the first wall of leading edge unit 3 and releasably retain the remote release (e.g., manually operable control 69). EX1003, FIG. 4; EX1007, ¶237.



EX1003, FIG. 4 (annotated).

Additionally, Raven discloses a narrower groove on the first wall defined between the two latching levers 51, which also satisfies the “outer portion” language of [1.8].



EX1003, FIG. 4 (annotated); EX1007, ¶238.

The narrower groove defined by the outer portion of connector piece 61 or the narrower groove between the latching levers 51 are both “outer” to the “inner” portion of grooves 71 (transverse direction). EX1003, FIGs. 1, 2, 4.

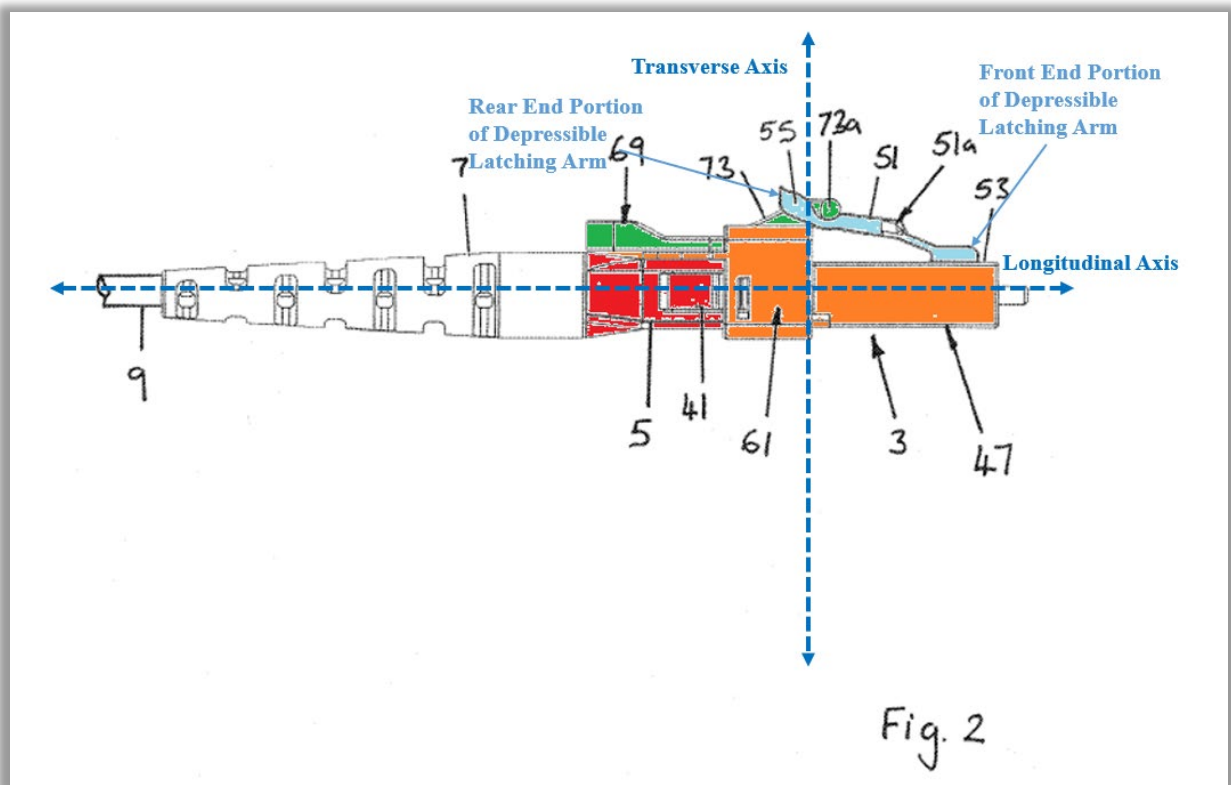
The ’760 patent provides no definition or explanation of a groove comprising an “outer portion”/“inner portion,” but the plain and ordinary meaning of these terms encompasses at least: (i) groove portions that are inner or outer one another in the transverse direction; or (ii) groove portions that are inner or outer portions of the overall groove structure. EX1003, FIG. 4; EX1007, ¶239.

The outer portion of Raven's groove 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," EX1001, [1.8], because the narrower portion (the actuator 73) is slidably received in both the groove defined by the outer portion of connector piece 61 and the groove between the latching levers 51, such that the first wall includes a groove that releasably retains the actuator 73 at least in the lateral direction. EX1003, FIG. 4; EX1007, ¶240.

B. Dependent claims

1. Claim 2

Raven discloses [2.1]. EX1003, 17:16-18:19, FIGs. 1-3. EX1007, ¶¶243-248.



EX1003, FIG. 2 (annotated); EX1007, ¶245.

Latching lever 51 (depressible latching arm) is arranged substantially in line with the longitudinal axis of its respective body 48, 50. EX1003, 17:27-28. Latching lever 51 is attached to an upper surface 53 of connector body 47 (e.g., first wall), extending transversely along the longitudinal axis. EX1003, FIG. 2, 17:16-18:19. Latching lever 51 also extends transversely 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; EX1007, ¶246.

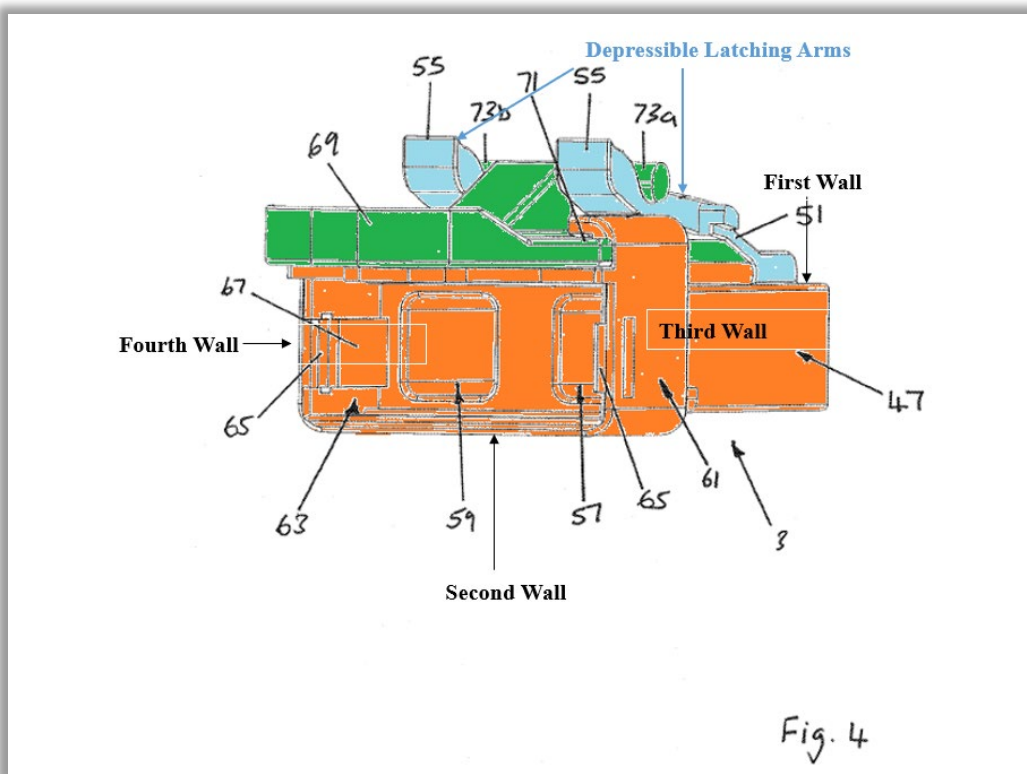
2. Claim 3

Raven discloses [3.1]. EX1007, ¶¶249-256.

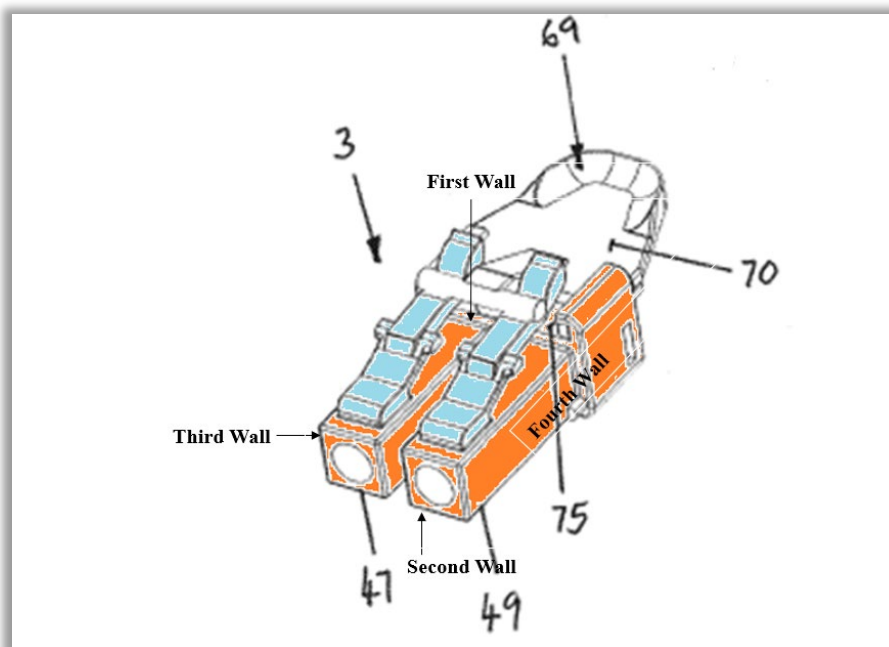
Raven's upper surface of connectors 47, 49 and connector bodies 48, 50 to which latching arms 51 are attached constitutes a first wall, as described in [1.5].

Section V.A.8; EX1007, ¶¶252-253. Side walls of connector bodies 48, 50 correspond to the claimed third and fourth walls. Section V.A.8; EX1007, ¶253.

And Raven's latching arms 51 are attached to a first wall of the connector device of Raven. Said another way, the second, third, and fourth walls of Raven are free from depressible latching arms. EX1003, FIGs. 3, 4.



EX1003, FIG. 4 (annotated).

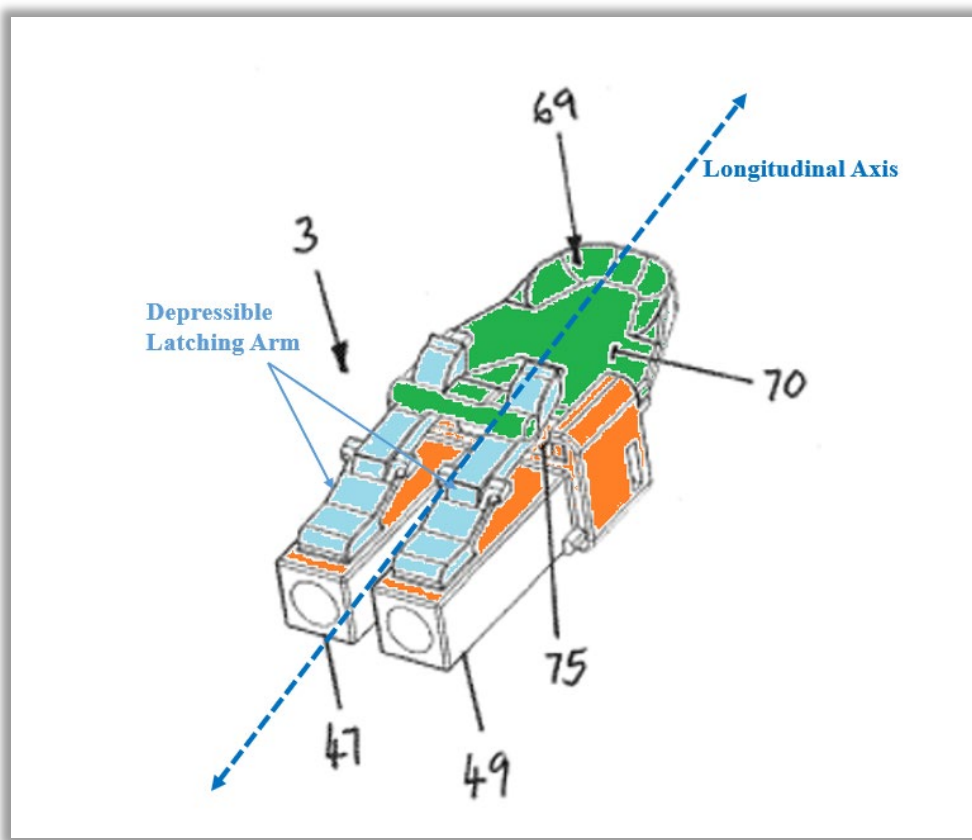


EX1003, FIG. 3 (cropped, annotated); EX1007, ¶253.

3. Claim 4

Raven discloses [4.1]. EX1007, ¶¶257-267.

Specifically, Raven discloses a remote release, as described in [1.4]. Section V.A.7. And, upon release of the remote release (e.g., manually operable control 69), Raven's depressible latching arms (e.g., levers 51) resiliently return toward an undepressed position. EX1003, 17:2-18, FIG. 4; EX1007, ¶260. Sliding Raven's 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.



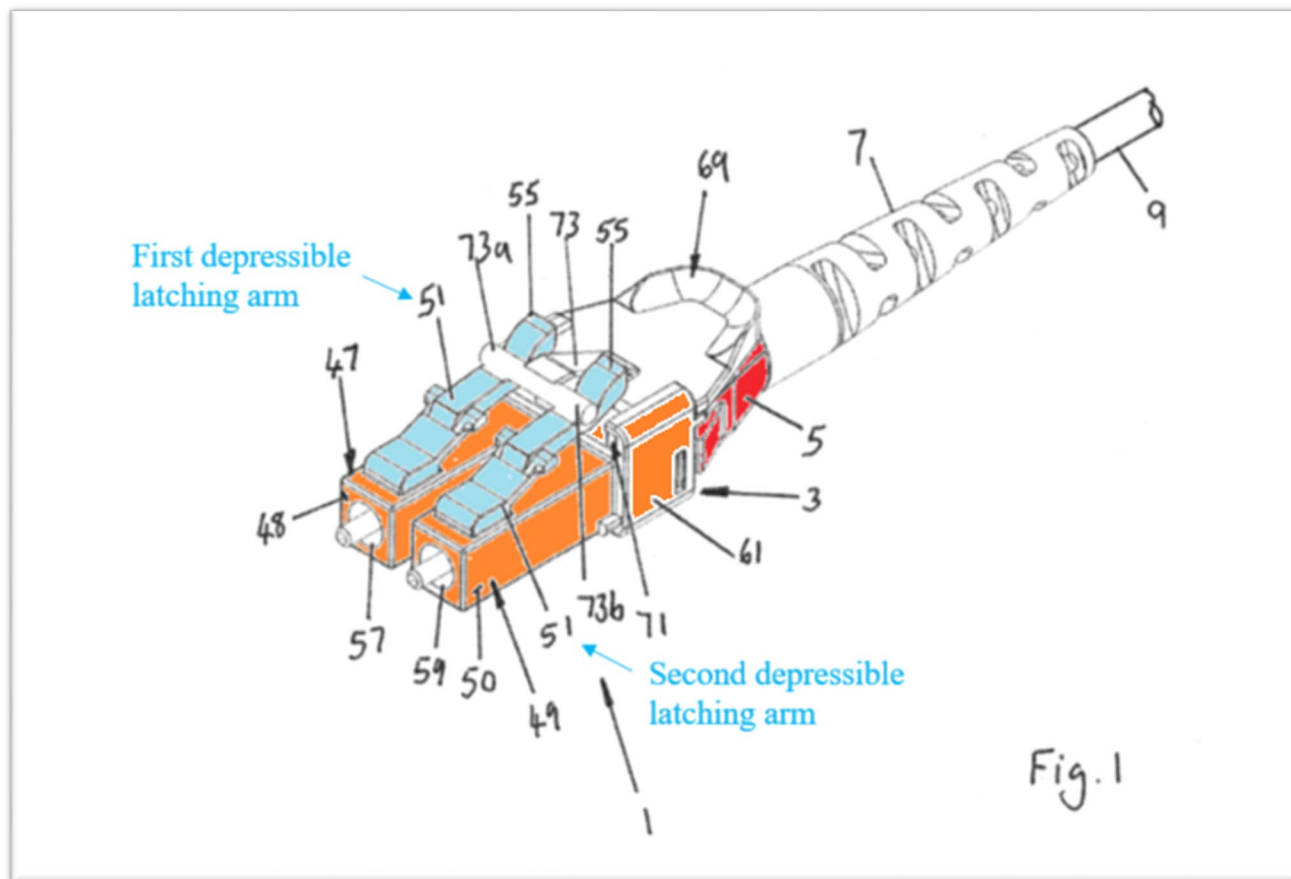
EX1003, FIG. 3 (cropped, annotated).

“The resiliency of the latching levers 51 returns them to their rest positions when an actuating force is removed.” EX1003, 17:16-22, 17:25-26, FIGs. 1-4; EX1007, ¶¶261-264.

4. Claim 5

Raven discloses [5.1]. EX1007, ¶¶268-275.

Raven includes “first and second fibre optic connectors 47, 49,” that each include latching lever 51 “that is arranged to releasably lock the respective fibre optic connector device to a complementary connector device.” EX1003, 16:16-19, 17:16-18, FIG. 1. “Each latching lever 51 is attached to an upper surface 53 of the connector 47, 49.” EX1003, 17:21; EX1007, ¶¶271-272.

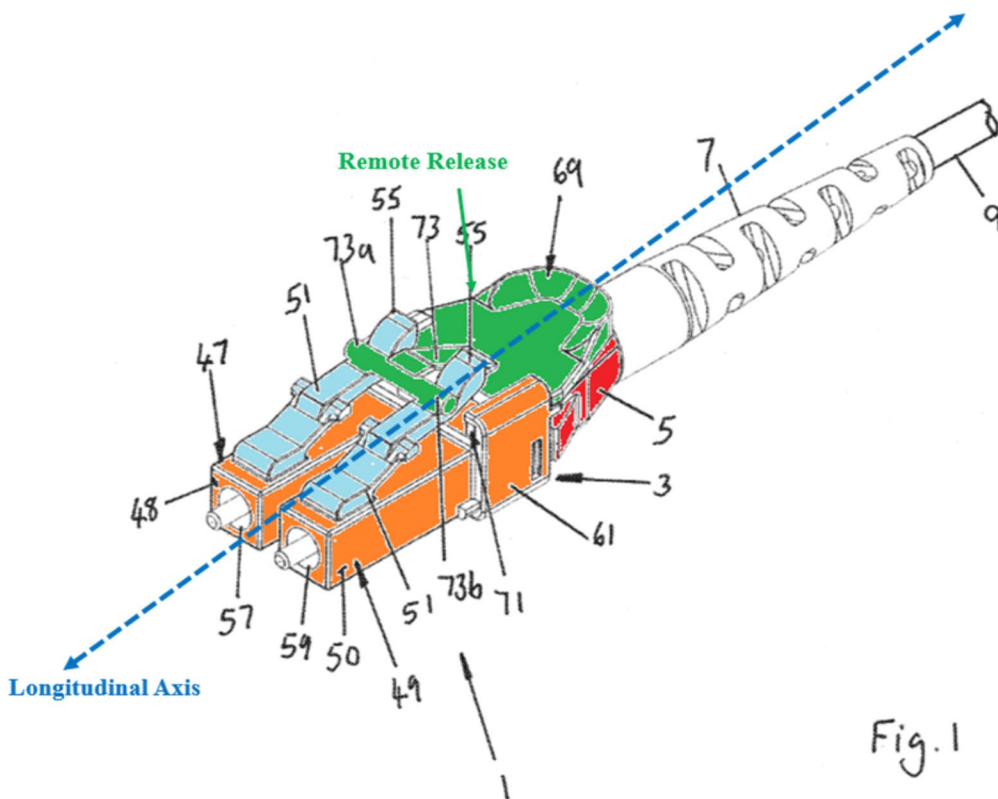


EX1003, FIG. 1 (annotated); EX1007, ¶271.

5. Claim 6

Raven discloses [6.1]. EX1007, ¶¶276-284.

Raven's remote release (manually operable control 69) is "arranged to actuate the latching levers 51 on the first and second fibre optic connectors 47, 49 substantially simultaneously" when pulled rearward. 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; EX1007, ¶¶279-281; Sections V.A.7, V.B.4.



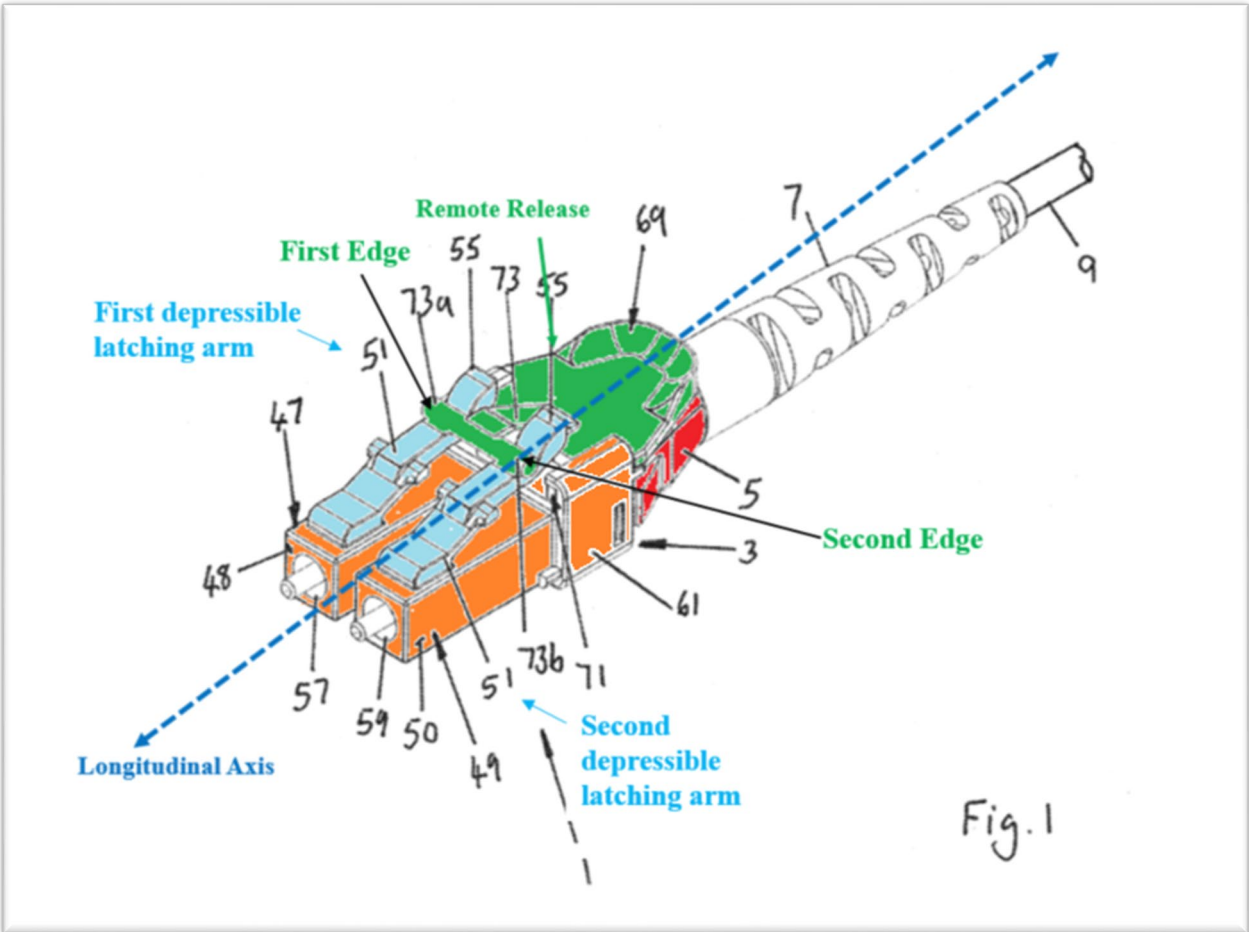
EX1003, FIG. 1 (annotated); EX1007, ¶280.

6. Claim 7

Raven discloses [7.1]. EX1007, ¶¶285-292.

Raven's actuator 73 "is attached to an upper surface 70 of the control."

EX1003, 18:7-8. “[A]ctuator members 73a, 73b [] each sit on top of one of the latching levers 51.” EX1003, 18:8-9.



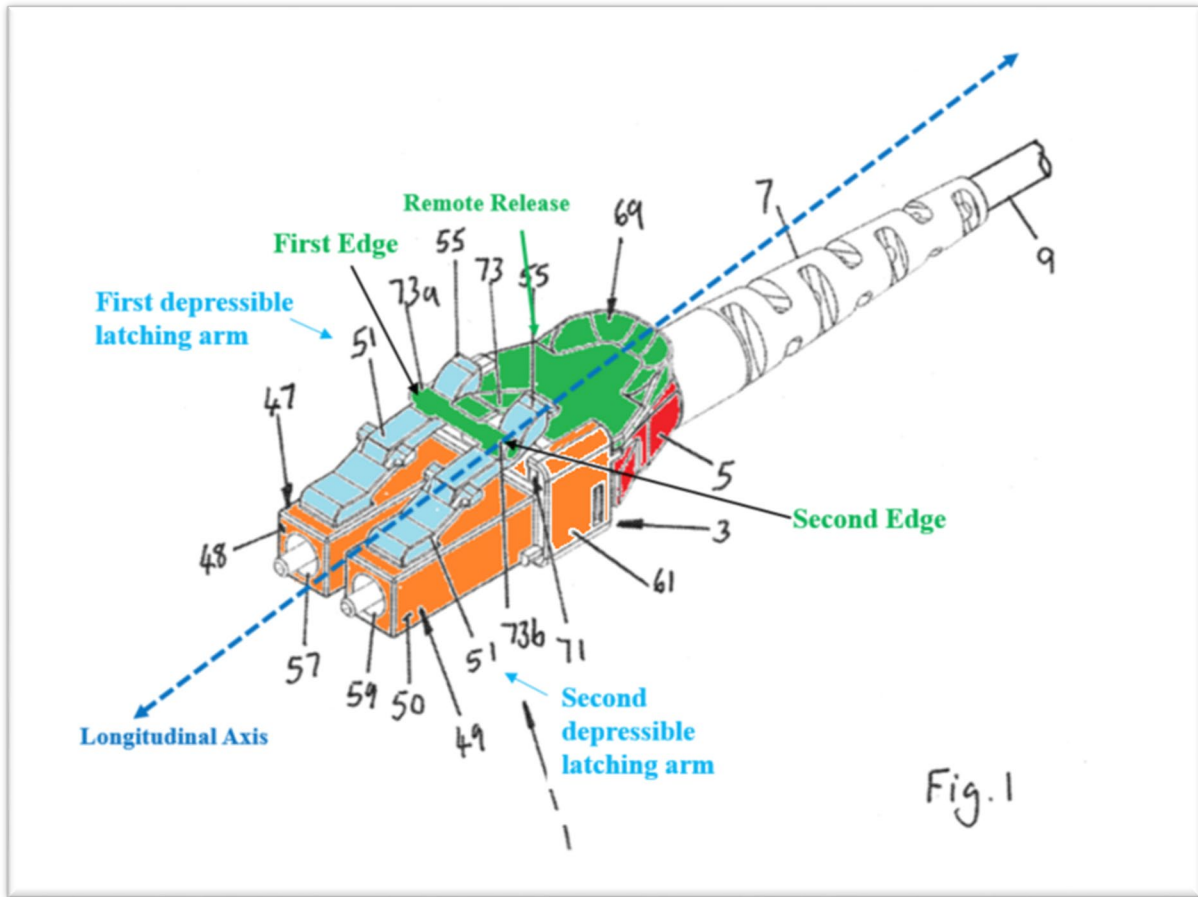
EX1003, FIG. 1 (annotated); EX1007, ¶288.

As shown, Raven's remote release includes 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 the first and second edges are spaced apart from one another. EX1007, ¶289.

7. Claim 8

Raven discloses [8.1]. EX1007, ¶¶293-300.

Raven's Figure 1 illustrates that actuator 73 of manually operable control 69 has an elongate section, and that actuator 73 is between the first edge (e.g., actuator member 73a) and the second edge (e.g., actuator member 73b). EX1003, FIG. 1, 18:7-10.

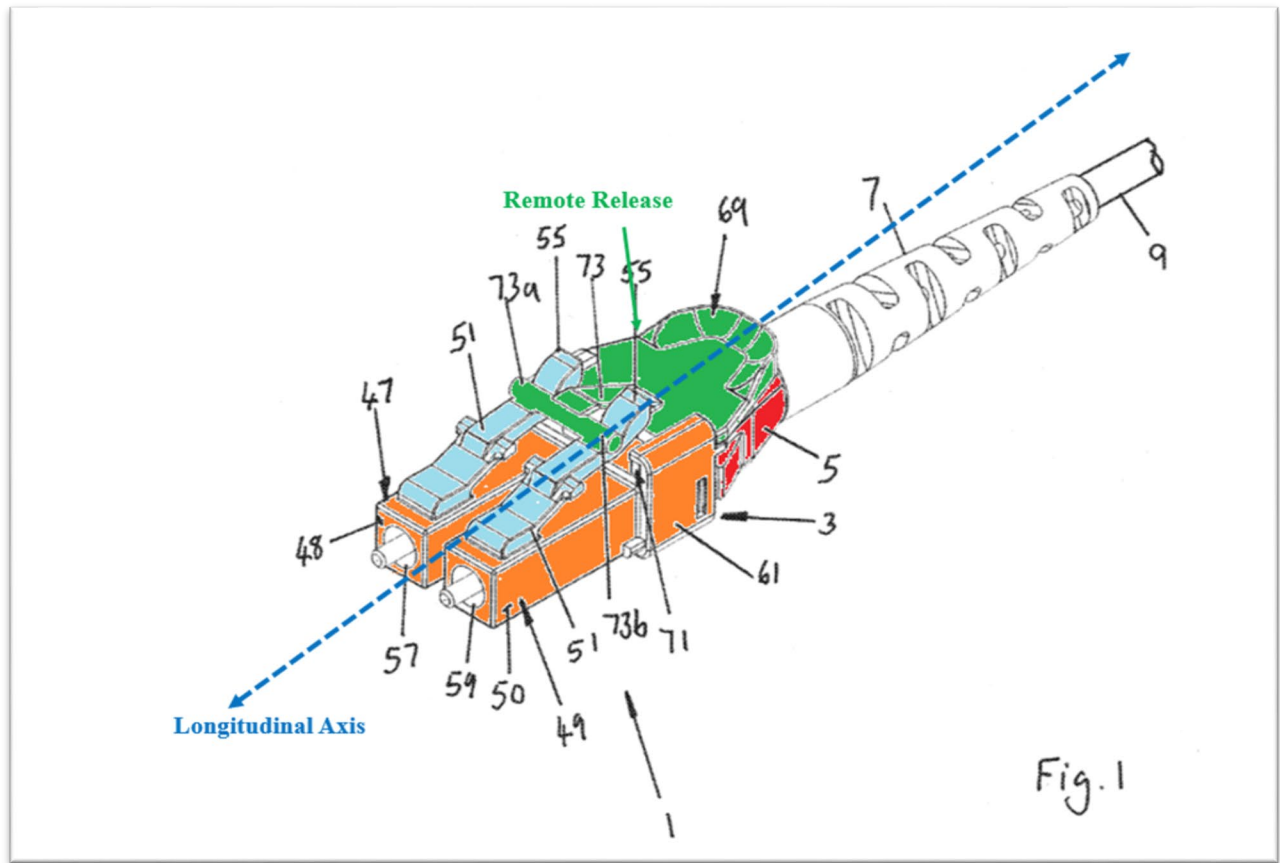


EX1003, FIG. 1 (annotated); EX1007, ¶296.

8. Claim 9

Raven discloses [9.1]. EX1007, ¶¶301-313.

Raven's Figure 1 shows remote release (e.g., manually operable control 69) comprises a front section including actuator 73, actuator member 73a, and actuator member 73b.



EX1003, FIG. 1 (annotated); EX1007, ¶304.

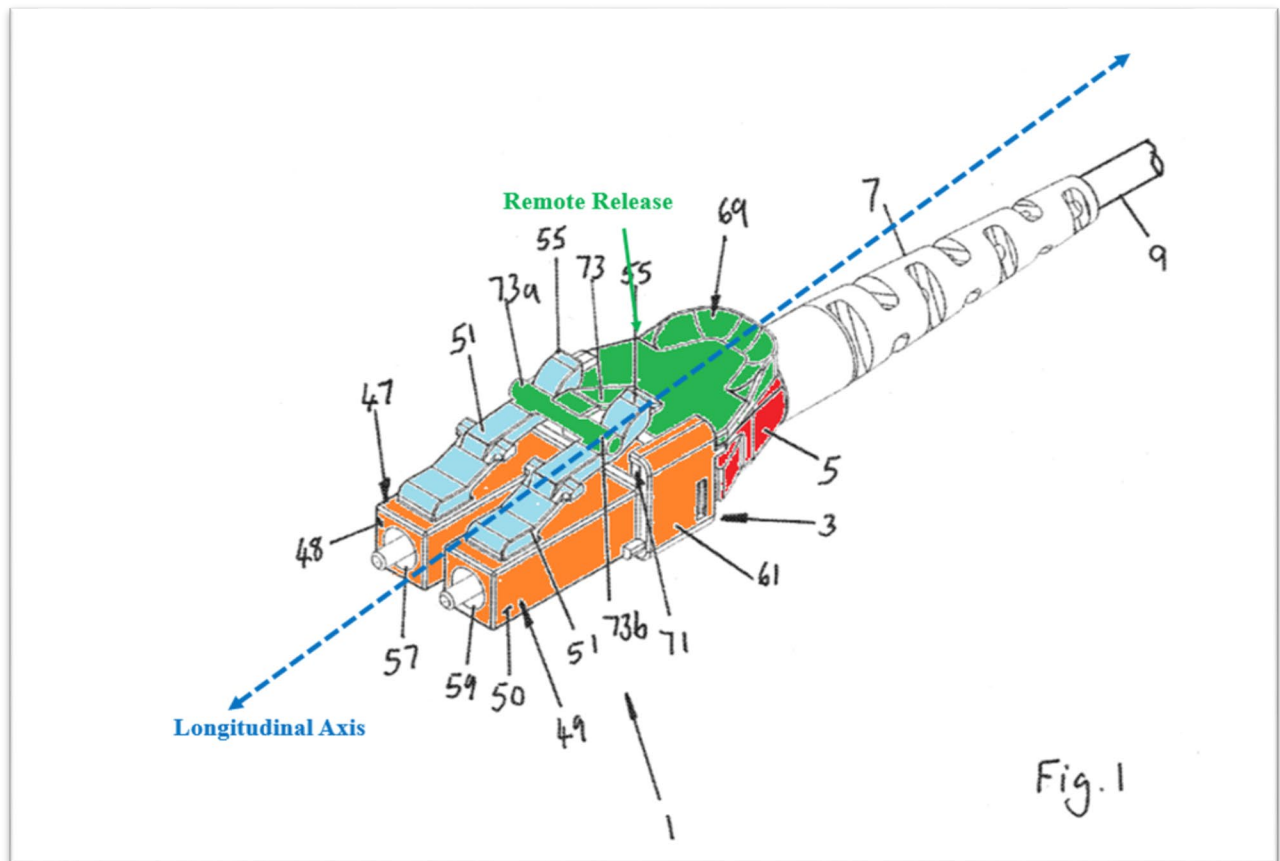
“Each lever 51 is resilient” and “can be moved from a locking position to an unlocked position.” EX1003, 17:22-23. “The unlocked position is achieved by pushing a free end 55 of the latching lever downwards towards the upper surface 53. The resiliency of the latching levers 51 returns them to their rest positions when an actuating force is removed.” EX1003, 17:23-26.

Upon release of Raven's remote release, the depressible latching arm (e.g., lever 51) would resiliently return to the locking position toward the front end portion of the connector housing (e.g., leading end unit 3) along the longitudinal axis to which it is yieldably biased. EX1007, ¶¶305-306.

9. Claim 10

Raven discloses [10.1]. EX1007, ¶¶314-320.

Raven's remote release resiliently returns to the locking position, returning toward the front end portion of the connector housing (e.g., leading end unit 3) along the longitudinal axis.



EX1003, FIG. 1 (annotated); EX1007, ¶317.

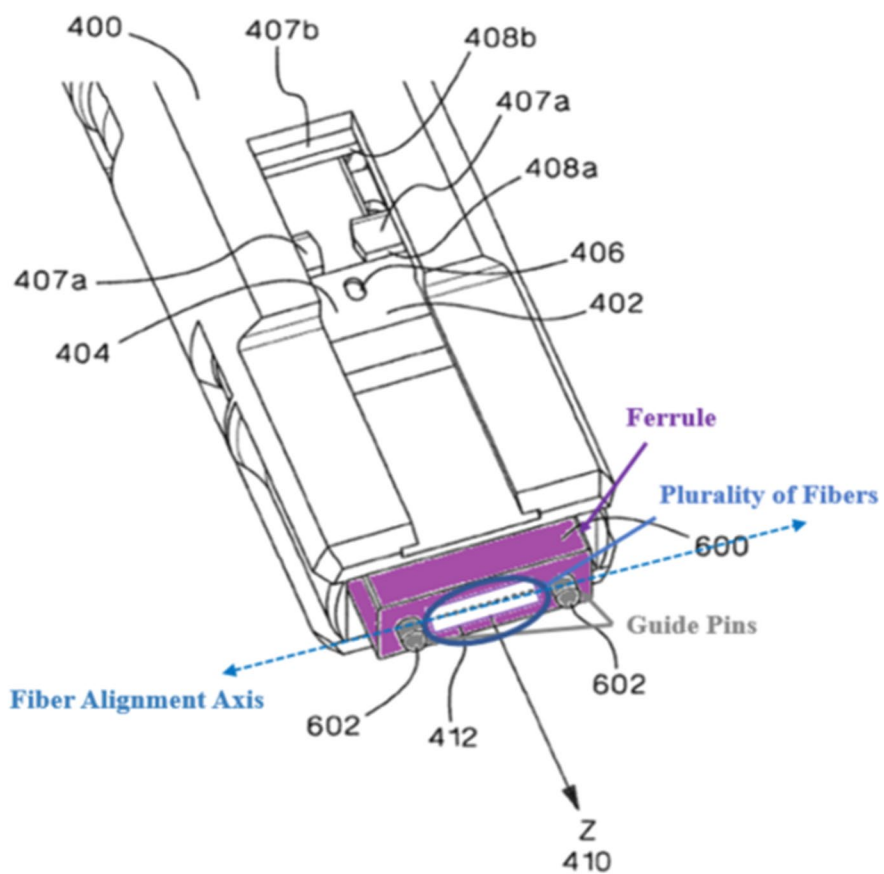
“Each lever 51 is resilient” and moves “from a locking position to an unlocked position.” EX1003, 17:22-24. Accordingly, Raven’s lever 51 serves as a resilient biasing member that yieldably biases the remote release (e.g., manually operable control 69) toward the front end portion of the connector housing. EX1003, 17:22-24; EX1007, ¶318.

The ’760 patent appears to show a coil spring (520 in Figure 5; 1220 in Figure 12). Claim 10 does not require any spring to make the remote release yieldably biased—springs shown are exemplary structures that allow the remote release to return to its undisplaced position. EX1001, 7:36-40, 8:64-9:1; EX1007, ¶¶307, 619.

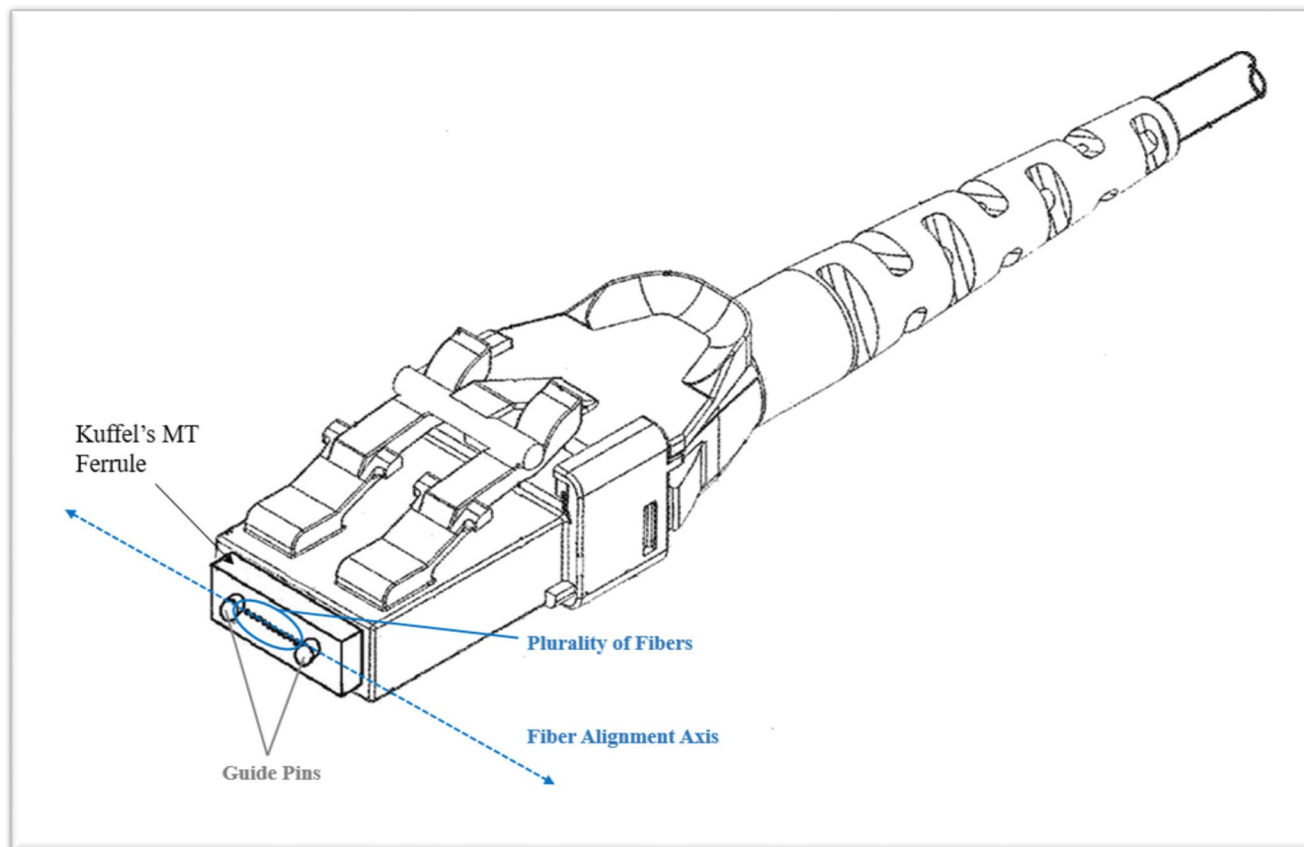
10. Claim 12

Raven-Kuffel discloses [12.1]. EX1007, ¶¶321-327.

An MT ferrule receives fibers such that the fibers are spaced apart in a row that extends parallel to a fiber alignment axis, as shown in Kuffel’s Figure 5. Kuffel’s guide pins 602 are spaced apart along a fiber alignment axis on either side of the row of fibers extending parallel to the fiber alignment axis. EX1004, 5:17-42, FIGs. 3-5; Section V.A.3; EX1007, ¶¶324-325.



EX1004, FIG. 5 (annotated).



EX1003, FIG. 1 (annotated, as modified with Kuffel); EX1007, ¶324; Section V.A.1.

11. Claim 14

Raven discloses [14.1]. EX1007, ¶¶328-335.

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, 18:20-19:8, FIG. 1; EX1007, ¶¶331-332. In this second orientation, the polarity is reversed. EX1003, 18:30-19:4; EX1007, ¶332.

12. Claim 15

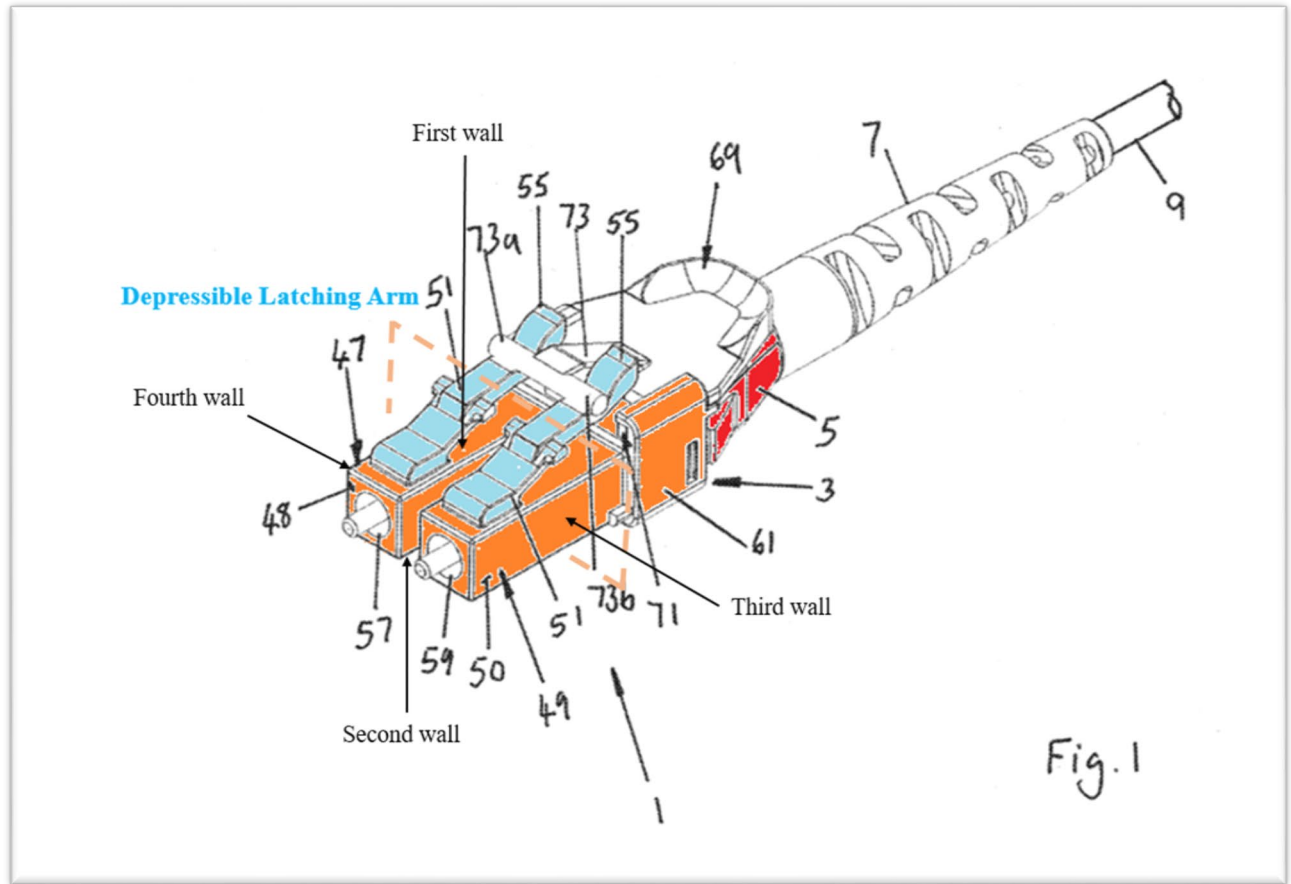
Raven discloses [15.2]. EX1007, ¶¶336-345.

Each of Raven's latching levers 51 are "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. And the "complimentary connector" is, e.g., an adapter or a receiving port, as discussed in Raven's background. EX1003, 1:1-19. A receiving port is a receptacle for mating with an optical fiber connector. Section V.A.2 (explaining how a POSITA would understand "receptacle" in the claims of the '760 patent); EX1007, ¶¶341-343.

13. Claim 16

Raven discloses [16.1]. Section V.A.8; EX1007, ¶¶346-353.

Raven's receptacle for receiving the generally rectangular connector housing of Raven 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 Raven and the receiving port. A POSITA would have understood that Raven's receptacle perimeter would have matched the connector housing. EX1007, ¶349.



EX1003, FIG. 1 (annotated).

To the extent PO 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 this industry. EX1007, ¶350.

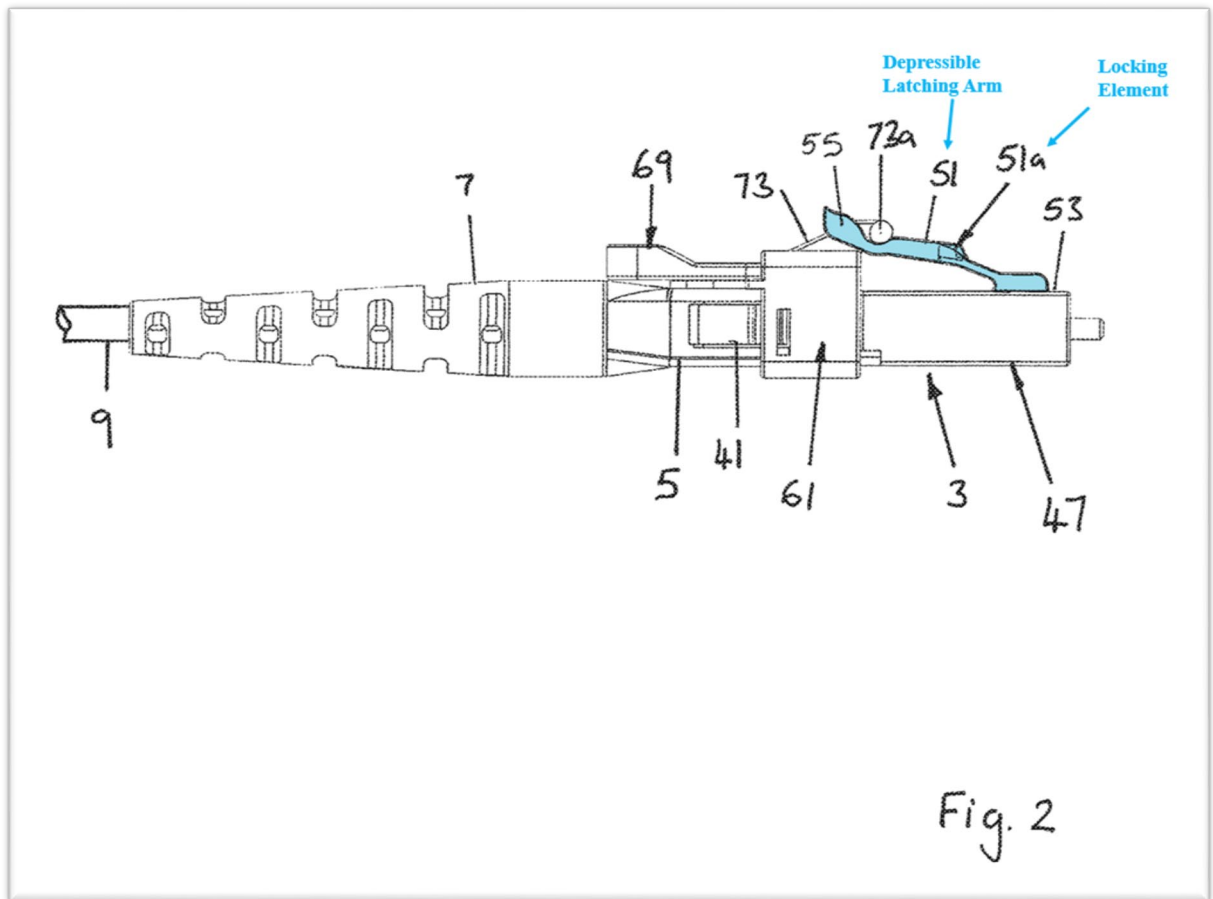
14. Claim 17

Raven discloses [17.1]. EX1007, ¶¶354-362.

Each of Raven’s latching levers 51 are “arranged to releasably lock the respective fiber optic connector device to a complementary connector device” and that each latching lever “is arranged to engage a complementary formation in order

to lock the connector to the complementary connector.” EX1003, 17:16-20, 1:1-19,

FIG. 2. Raven’s complimentary formation of the receiving port necessarily includes a recess for engaging protruding elements 51a of latching levers 51. EX1003, FIG. 2 (illustrating that the locking formation of latching levers 51 includes a protruding locking formation 51a).



EX1003, FIG. 2 (annotated); EX1007, ¶358.

**VI. GROUND 2: RAVEN-KUFFEL FURTHER IN VIEW OF GNIADEK
RENDERS OBVIOUS CLAIM 13.**

PO may allege that Raven-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, a POSITA would have found it obvious to modify the connector of Raven-Kuffel in view of Gniadek to meet this dimensional feature. EX1007, ¶¶363-390.

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; 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; EX1001, 1:34-40; EX1007, ¶380.

“In communication networks, such as data centers and switching networks, numerous interconnections between mating connectors may be compacted into high-density panels,” and “[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; 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; EX1007, ¶¶381-383.

Similarly, 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. 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. 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-Kuffel’s remote release connector to fit a connector to an even higher density panel. EX1007, ¶¶383-385.

A POSITA also would have understood how to shrink the outer cross-sectional dimension of Raven-Kuffel’s remote release connector. Shrinking the outer cross-sectional dimension of a connector only reduces each dimension proportionally, which can be achieved by simply designing and manufacturing a smaller profile for the connector. EX1007, ¶386.

Shrinking the outer cross-sectional dimension of Raven-Kuffel’s remote release connector also has a reasonable expectation of success because reducing a dimension of Raven-Kuffel’s connector does not interfere with its remote release

mechanism. EX1007, ¶386. A POSITA would have understood that although the dimensions of Raven-Kuffel'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-Kuffel's remote release. EX1007, ¶387.

Accordingly, Raven-Kuffel in view of Gniadek renders Claim 13 obvious.

VII. GROUND 3: RAVEN-KUFFEL FURTHER IN VIEW OF WONG RENDERS OBVIOUS CLAIM 13.

As above, PO may allege that Raven-Kuffel does not expressly disclose [13.1]. However, a POSITA would also have found it obvious to modify the connector of Raven-Kuffel in view of Wong to meet this dimensional feature. EX1007, ¶¶391-420.

Wong—like the '760 patent—explains that “network providers [seek] to continuously find ways to improve quality of service while reducing cost.” EX1005, 1:6-10; EX1001, 1:30-33. 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; EX1001, 1:34-40; EX1007, ¶408.

“In communication networks, such as data centers and switching networks, numerous interconnections between mating connectors may be compacted into high-

density panels,” and “[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; 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. EX1007, ¶¶409-413.

Similarly, 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. 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. 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-Kuffel’s remote release connector to fit a connector to an even higher density panel. EX1007, ¶414.

A POSITA also would have understood how to shrink the outer cross-sectional dimension of Raven-Kuffel’s remote release connector. Shrinking the outer cross-sectional dimension of a connector only reduces each dimension

proportionally, which can be achieved by simply designing and manufacturing a smaller profile for the connector. EX1007, ¶¶415-416.

Shrinking the outer cross-sectional dimension of Raven-Kuffel's remote release connector also has a reasonable expectation of success because reducing a dimension of Raven-Kuffel's connector does not interfere with its remote release mechanism. EX1007, ¶416. A POSITA would have understood that although the dimensions of Raven-Kuffel'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-Kuffel's remote release. EX1007, ¶¶417-418.

Accordingly, Raven-Kuffel in view of Wong renders Claim 13 obvious.

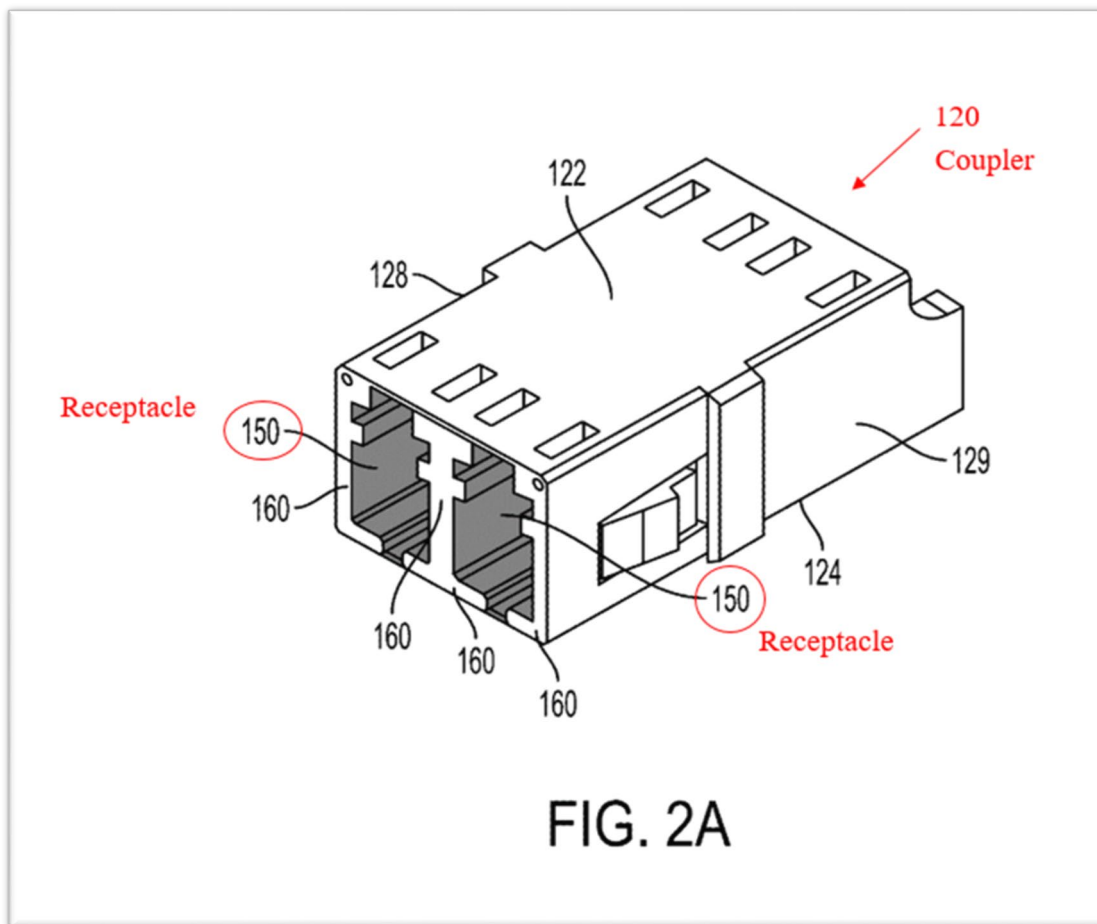
VIII. GROUND 4: WONG RENDERS OBVIOUS CLAIMS 1–11 AND 15–17.

A. Claim 1

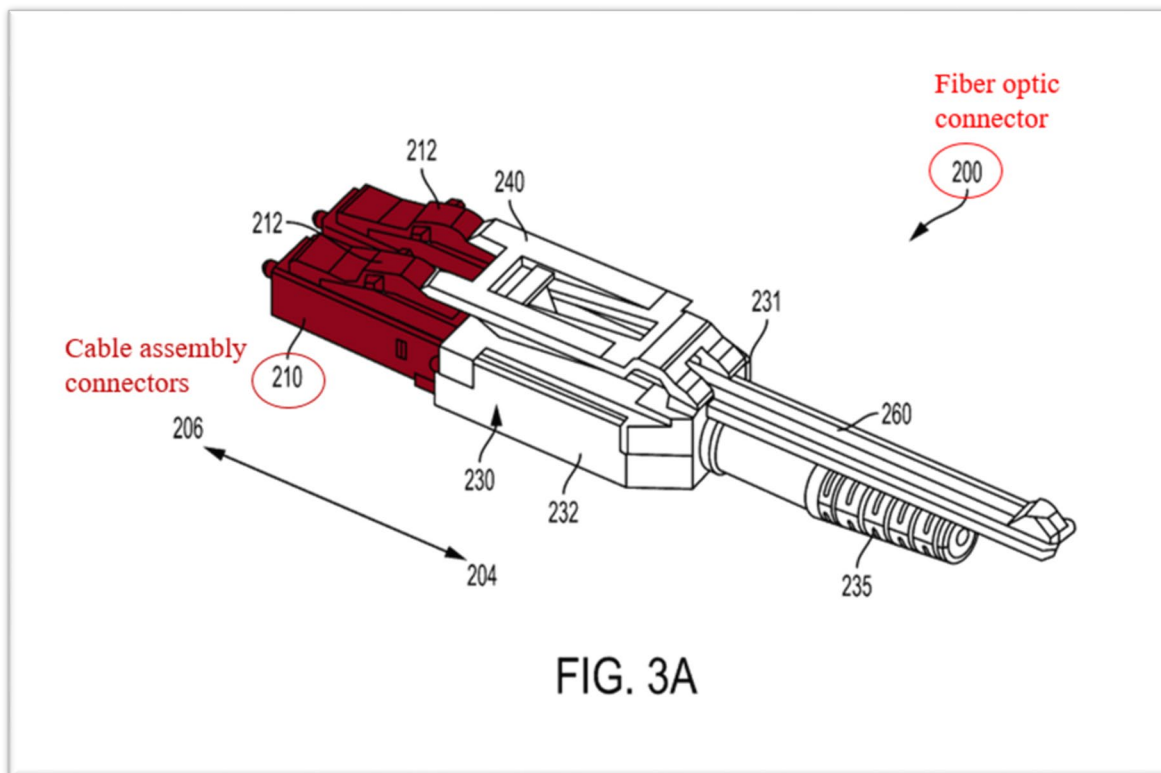
1. [1.P]

Wong discloses [1.P]. EX1007, ¶¶421-427.

Wong discloses a fiber optic connector (“remote latch release connector assembly 200”), as shown in Figure 3A. EX1005, 7:11-14, 4:40-44. Wong's remote latch release connector assembly 200 further includes one or more cable assembly connectors 210, which connect to receptacles (“mating connectors 150”) of an adapter (“coupler 120”), as shown in Figure 2A. EX1005, 4:51-5:2, 7:17-21.



EX1005, FIG. 2A (annotated); EX1007, ¶425.



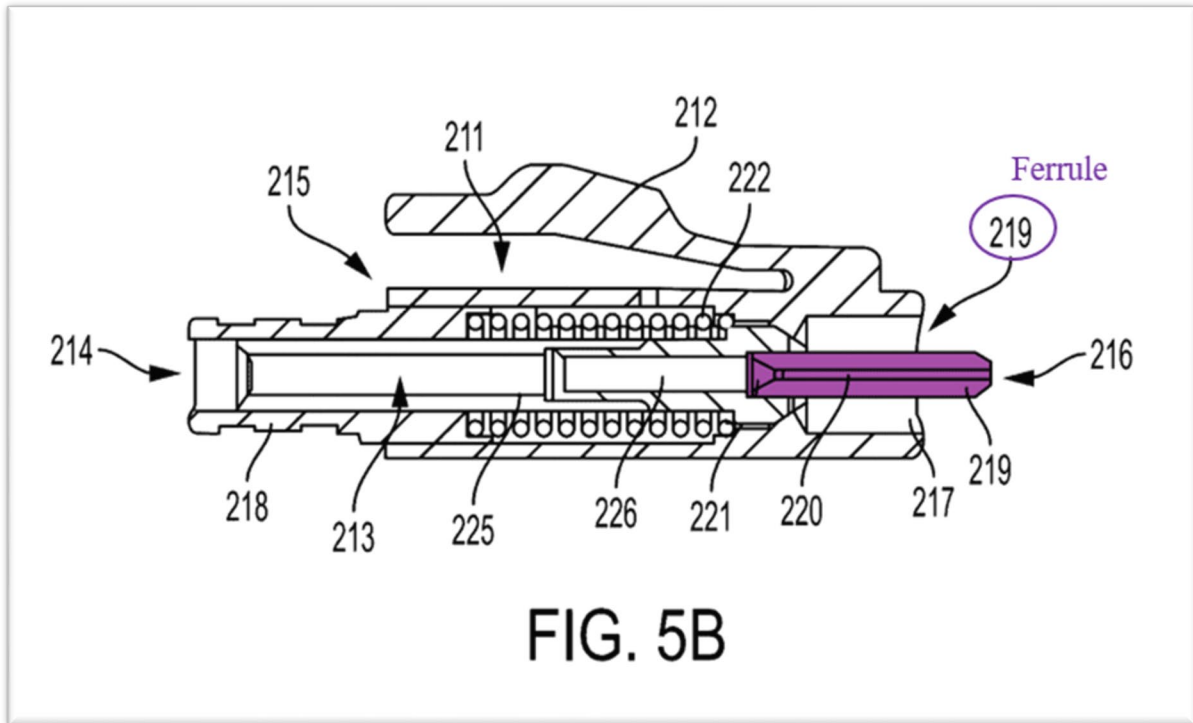
EX1005, FIG. 3A (annotated); EX1007, ¶425.

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; EX1007, ¶426.

2. [1.1]

Wong discloses [1.1]. EX1007, ¶¶428-432.

Wong shows ferrule 219 in a generally longitudinal alignment with the, e.g., bore 213 in Figure 5:

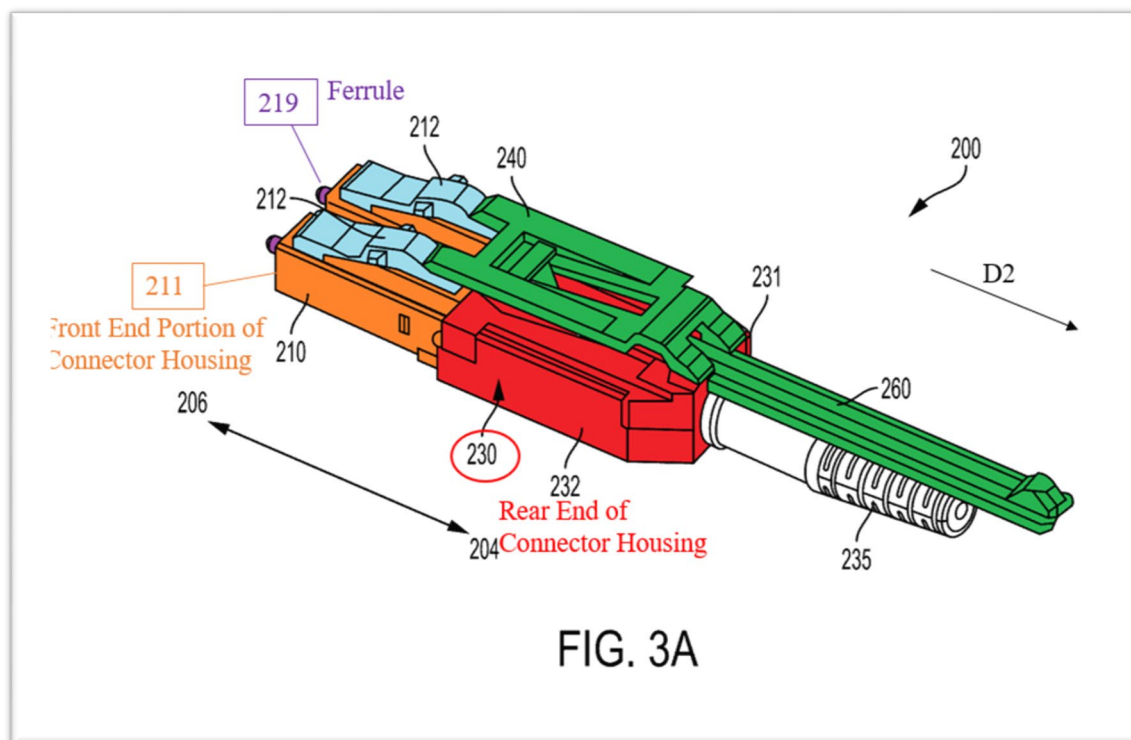


EX1005, FIG. 5B (annotated); EX1005, 9:41-43; EX1007, ¶429.

Wong's connector "may be any suitable type now known or later developed," including an MT ferrule. EX1005, 4:3-8, 7:57-8:2; EX1007, ¶430. 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 (MT ferrules are configured to hold a plurality of optical fibers). EX1007, ¶¶430-431.

3. [1.2.1]/[1.2.2]

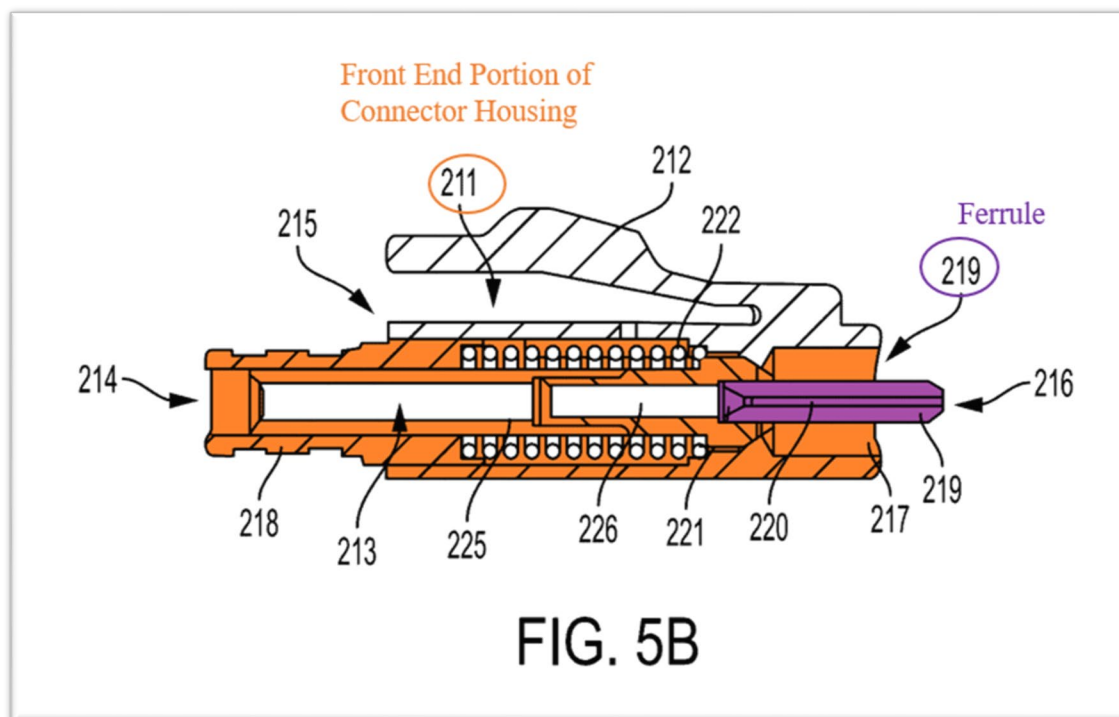
Wong discloses [1.2.1]/[1.2.2], as illustrated in Figure 3A. EX1007, ¶¶433-440.



EX1005, FIG. 3A (annotated); EX1007, ¶434.

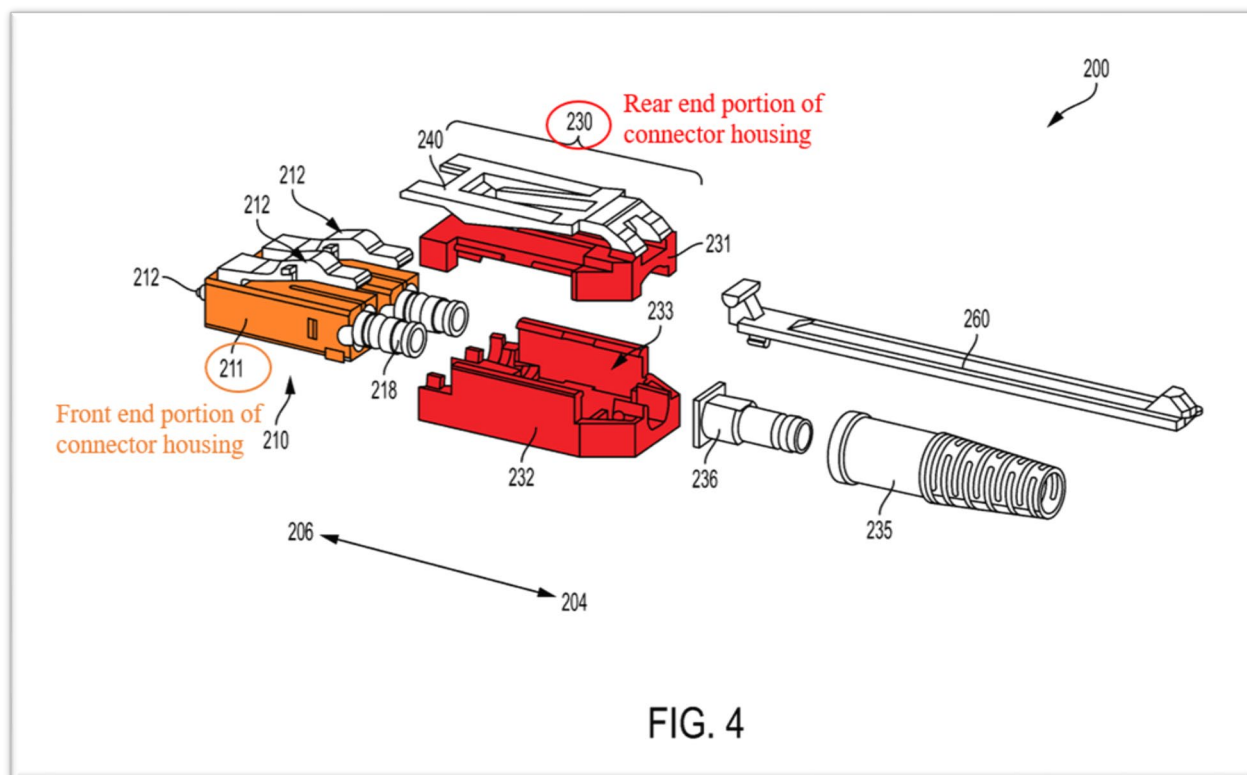
Wong discloses that “remote latch release connector assembly 200 may generally include one or more cable assembly connectors 210 connected to a switchable housing 230 having one or more release members 240 and one or more pull tab assemblies 260.” EX1005, 7:17-21. And Wong’s “cable assembly connector 210 . . . includes a connector housing 211 and a latching portion 212.” EX1005, 7:43-49. Second opening 216 receives and holds ferrule 219 in longitudinal alignment with bore 213. EX1005, 9:41-43; EX1007, ¶434.

Ferrule 219 discloses an MT ferrule. Section VIII.A.2; EX1001, [1.1]; EX1007, ¶435. Further, as shown in Figure 5B, ferrule 219 is exposed through connector housing 211 for making an optical connection.



EX1005, FIG. 5B (annotated); EX1007, ¶435.

Wong’s “switchable housing top 231 may be joined with the switchable housing bottom 232 to form the switchable housing 230.” EX1005, 10:22-28.



EX1005, FIG. 4 (annotated).

Wong's connector housing 211 and switchable housing 230 together form a connector housing, with connector housing 211 as a front-end portion and switchable housing 230 as a 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. EX1007, ¶¶436-437.

Claim 1 does not limit "connector housing" to a unitary structure. To the extent that the PO argues, incorrectly, that "connector housing" is a unitary structure, a POSITA would have found it obvious to modify Wong's teaching to form Wong's connector housing 211 and switchable housing 230 to be a unitary structure. EX1007, ¶438. 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.

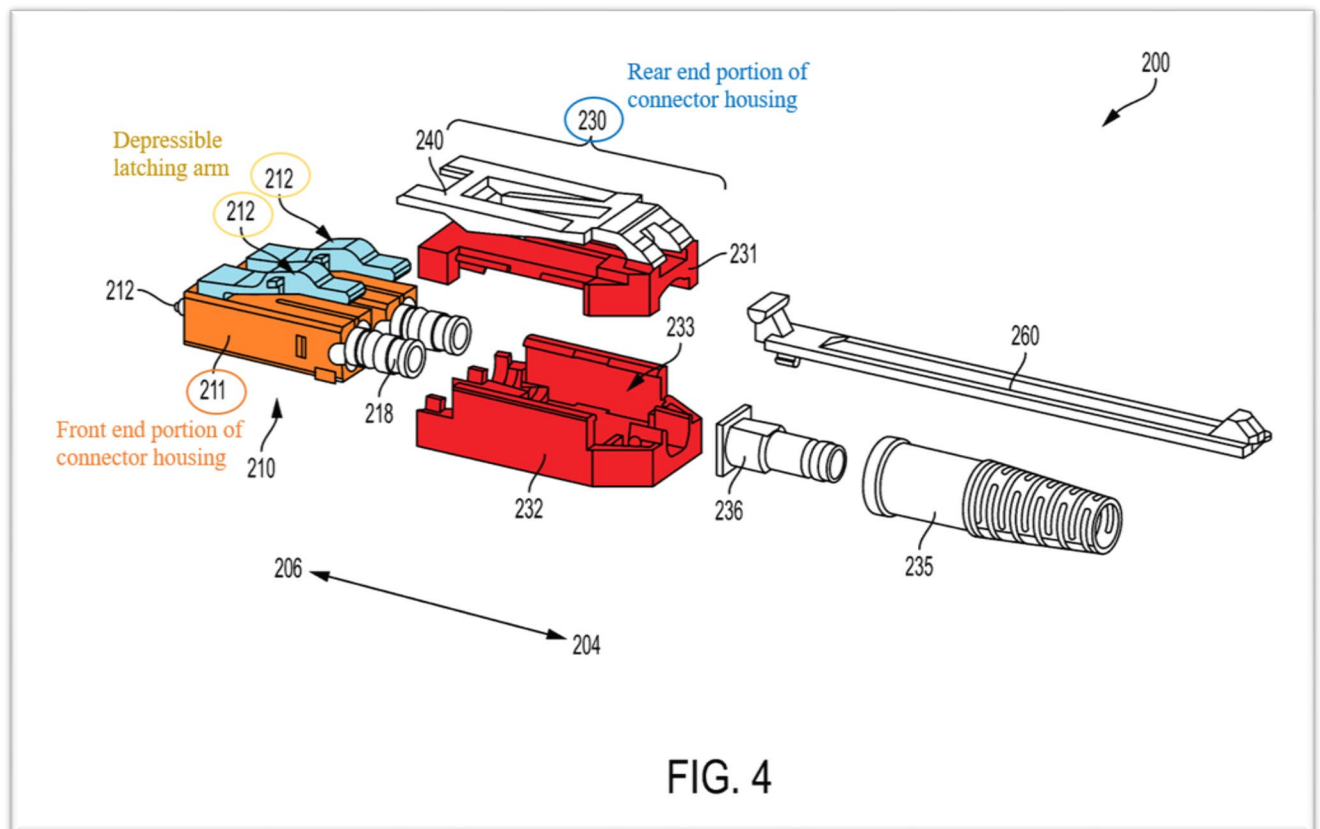
EX1007, ¶439.

4. [1.3]

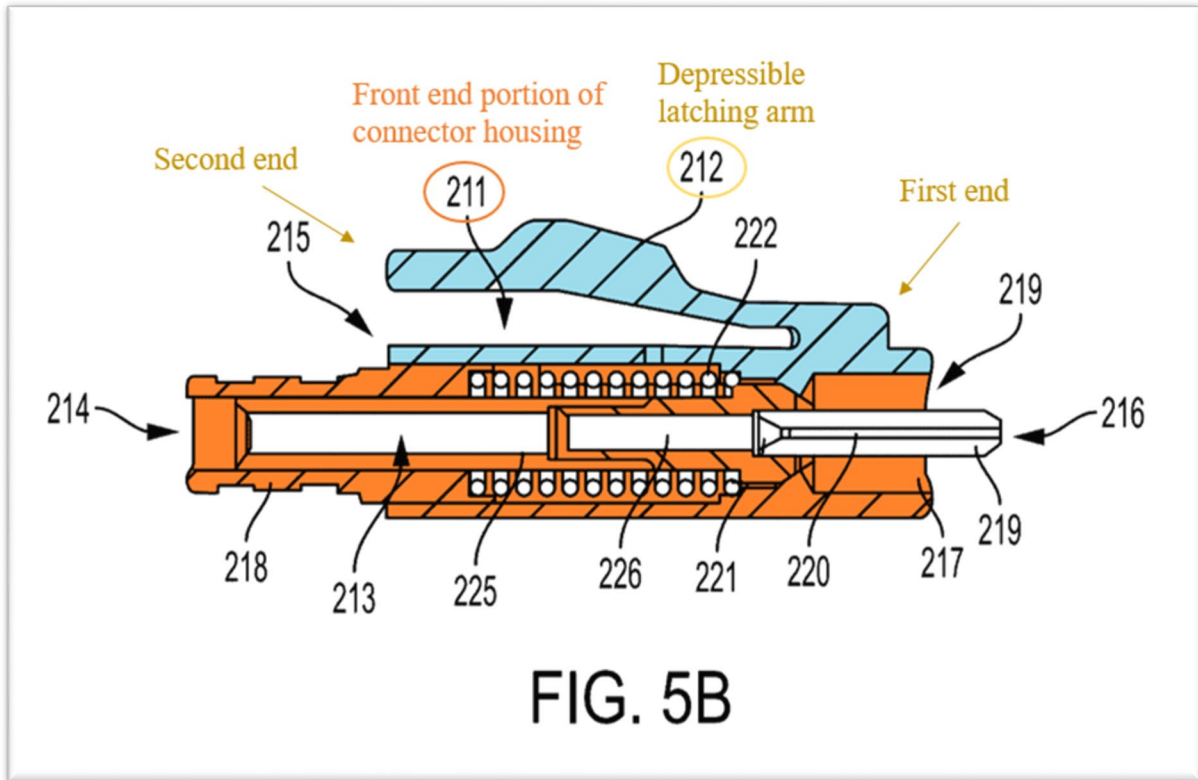
Wong discloses [1.3]. EX1007, ¶¶441-445.

Wong's 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.



EX1005, FIG. 4 (annotated); EX1007, ¶442.



EX1005, FIG. 5B (annotated); EX1007, ¶442.

As cable assembly connector 210 is coupled with mating connector 150, latching portion 212 is first compressed between top rail 170 and bottom rail 180 of mating connector 150, and then when latching portion 212 passes top rail 170 and bottom rail 180, latching portion 212 becomes decompressed and is trapped in a trap 190, such that cable assembly connector 210 is said to be engaged with mating connector 150. EX1005, 8:21-42. Cable assembly connector 210 may be disengaged from mating connector 150 by compressing the latching portion 212. EX1005, 8:43-46; EX1007, ¶443.

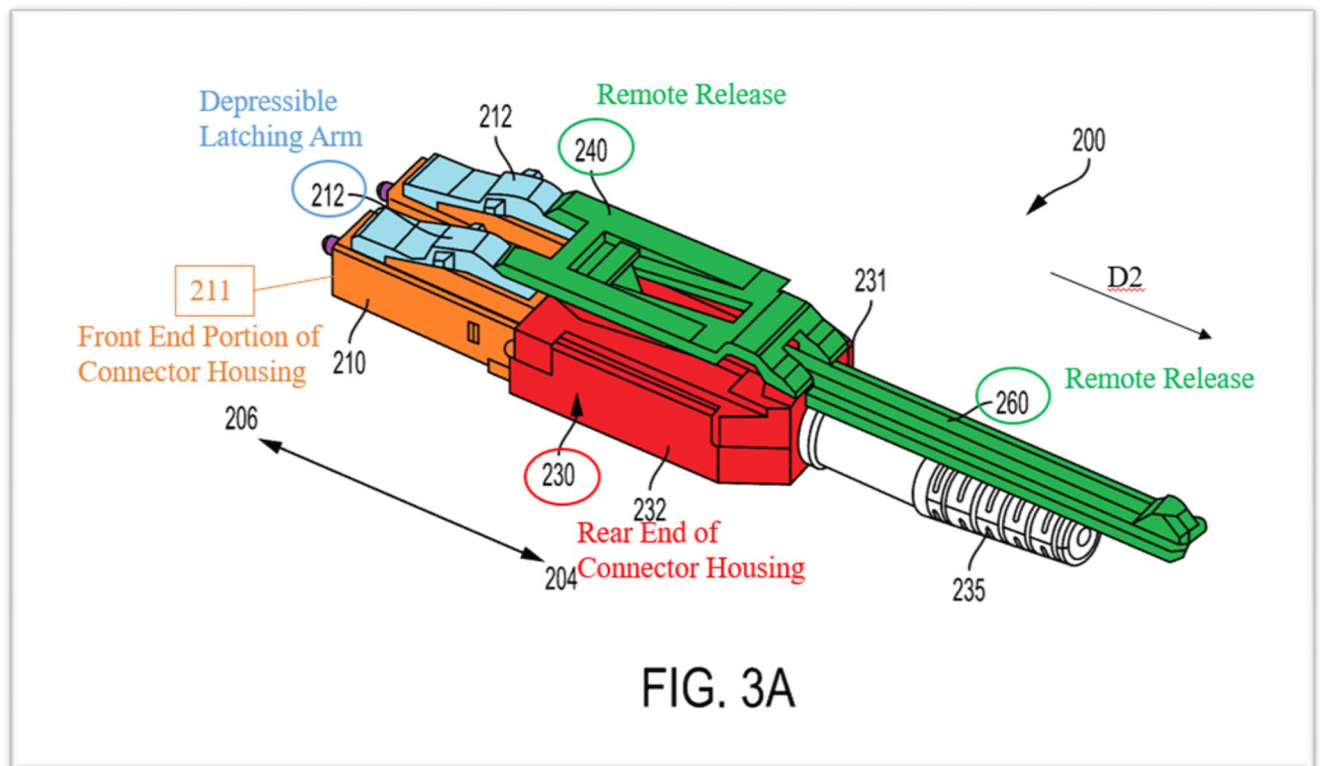
Thus, Wong's latching portion 212 is a depressible latching arm connected to the connector housing (e.g., connector housing 211) for latching with the receptacle

(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. EX1007, ¶444.

5. [1.4]

Wong discloses [1.4]. EX1007, ¶¶446-454.

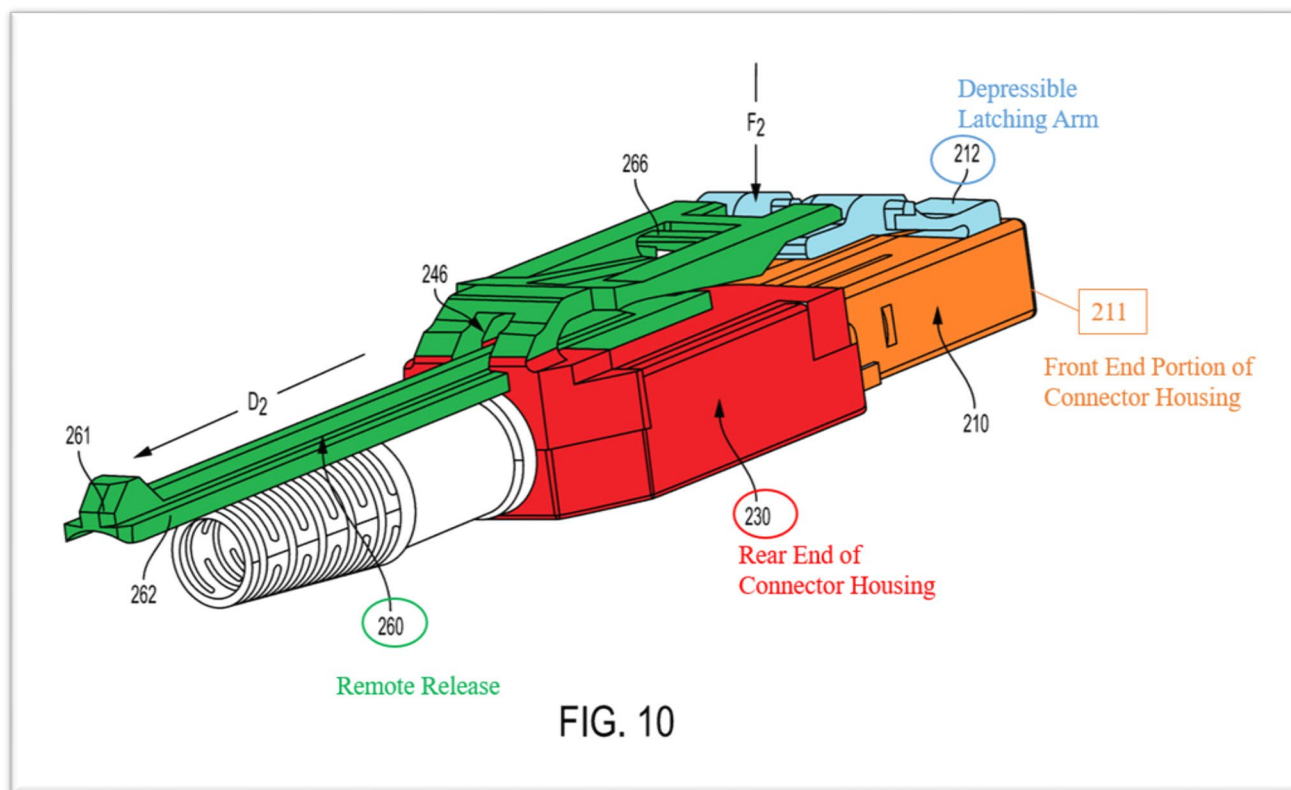
Wong's release member 240 is be shaped such that a portion of release member 240 (e.g., second segment 242) may engage with latching portion 212 of the cable assembly connector 210 to cause the latching portion to unlatch. EX1005, 14:19-24, 7:17-21. Pull tab assembly 260 is movable in a longitudinal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



EX1005, FIG. 3A (annotated); EX1007, ¶447.

Pull tab assembly 260 moves along D_2 , generally away from mating connector 150. EX1005, 18:25-32. This causes 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, 18:25-32. D_2 is rearward along the longitudinal direction because it is away from mating connector 150 and the front-end portion of the connector housing. EX1007, ¶¶448-449.

Wong's Figure 10 shows downward force F_2 , exacted over the release member 240 (e.g., a force that biases the release member towards the switchable housing 230), causing 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, 18:32-40.



EX1005, FIG. 10 (annotated); EX1007, ¶450.

Wong's release member 240 and pull tab assembly 260 thus together form a remote release, with release member 240 connected to connector housing (e.g., switchable housing 230) and with pull tab assembly 260 configured to be pulled rearward along the longitudinal axis to depress the depressible latching arm (e.g., latching portion 212). EX1007, ¶451.

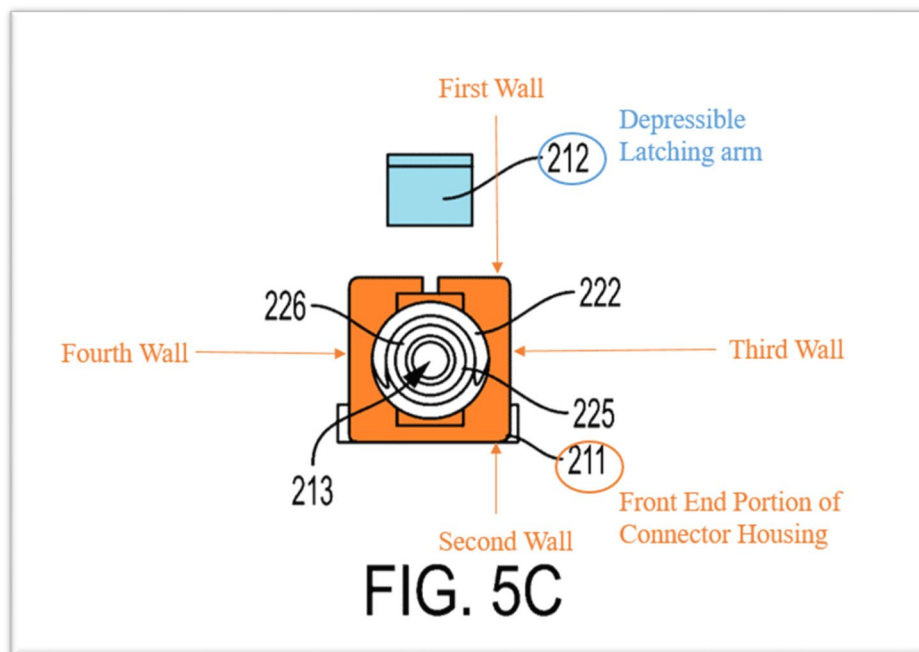
Claim 1 does not limit "remote release" to a unitary structure. To the extent that the PO argues, incorrectly, that "remote release" is a unitary structure, a POSITA would have found that Wong's release member 240 and pull tab assembly 260 *do* form a unitary structure, as they cannot be separated from each other. That is, 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. EX1005, 15:23-42, 17:35-45; EX1007, ¶¶452-454.

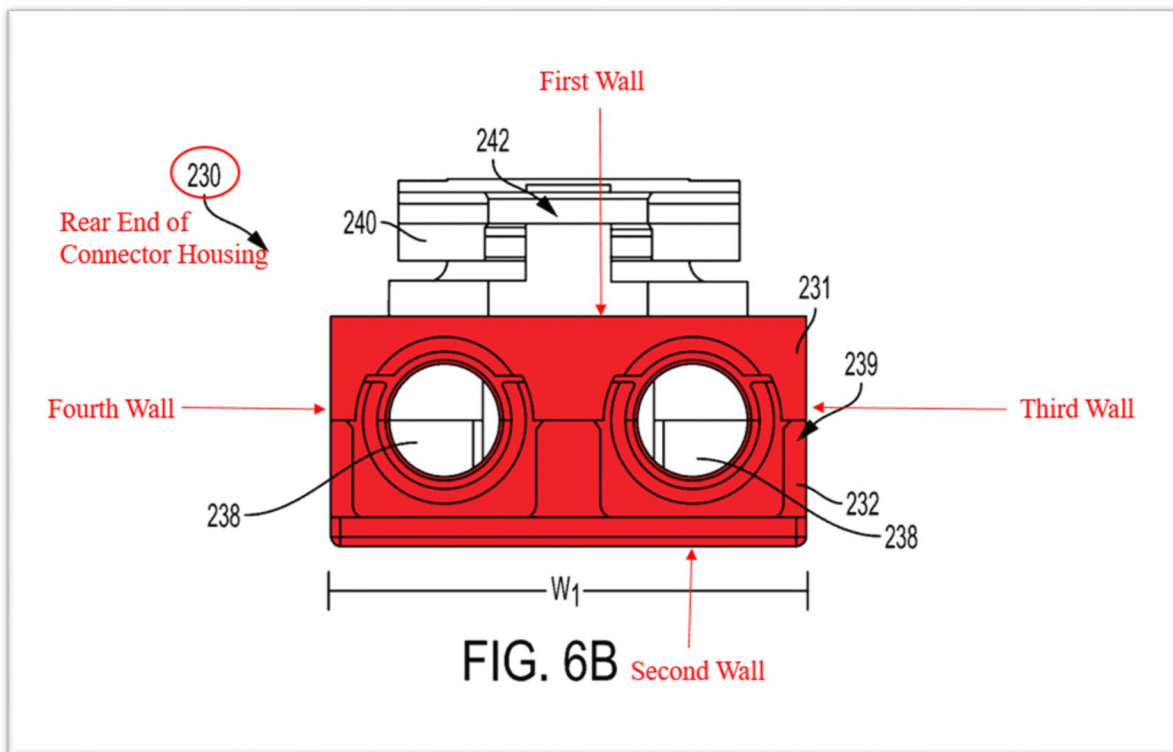
6. [1.5]

Wong discloses [1.5]. EX1007, ¶¶455-457.

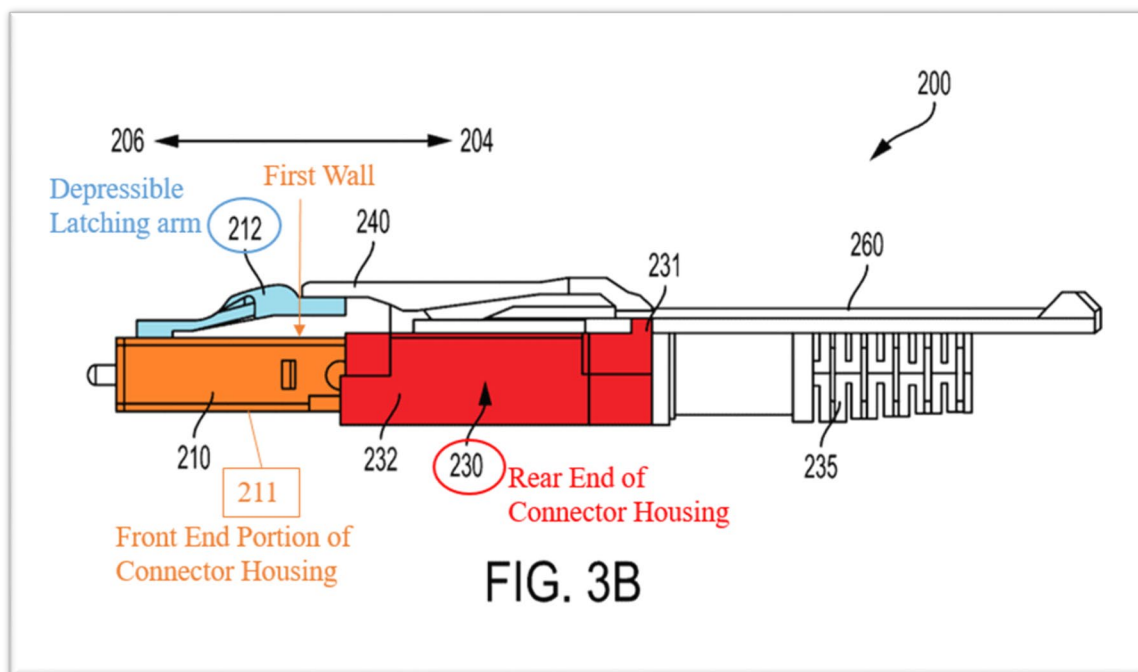
Wong's connector housing 211 and switchable housing 230, independently or integrally, have a generally rectangular perimeter including opposite first and second walls and opposite third and fourth walls, as shown in Figures 5C and 6B, and depressible latching arm (e.g., latching portion 212) that is located on an exterior of the first wall, as shown in Figure 3B.



EX1005, FIG. 5C (annotated); EX1007, ¶456.



EX1005, FIG. 6B (annotated); EX1007, ¶456.

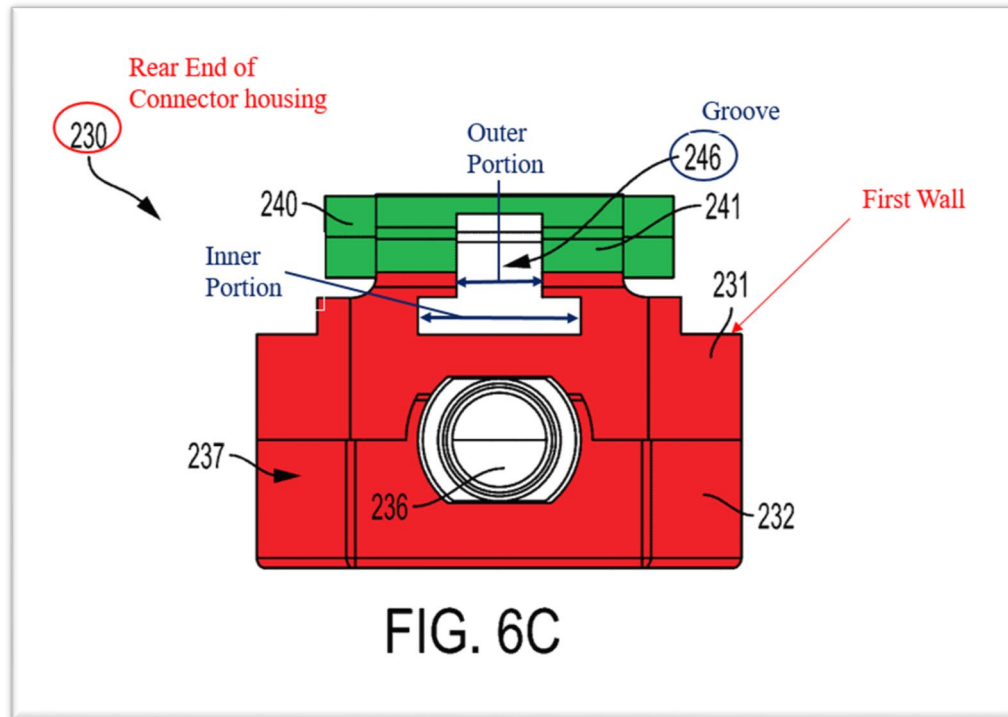


EX1005, FIG. 3B (annotated); EX1007, ¶456.

7. [1.6]

Wong discloses [1.6]. EX1007, ¶¶458-462.

Wong's opening 246 is a groove defined on the first wall of the connector housing (e.g., switchable housing 230). EX1005, 15:49-56, FIG. 6C.



EX1005, FIG. 6C (annotated); EX1007, ¶459.

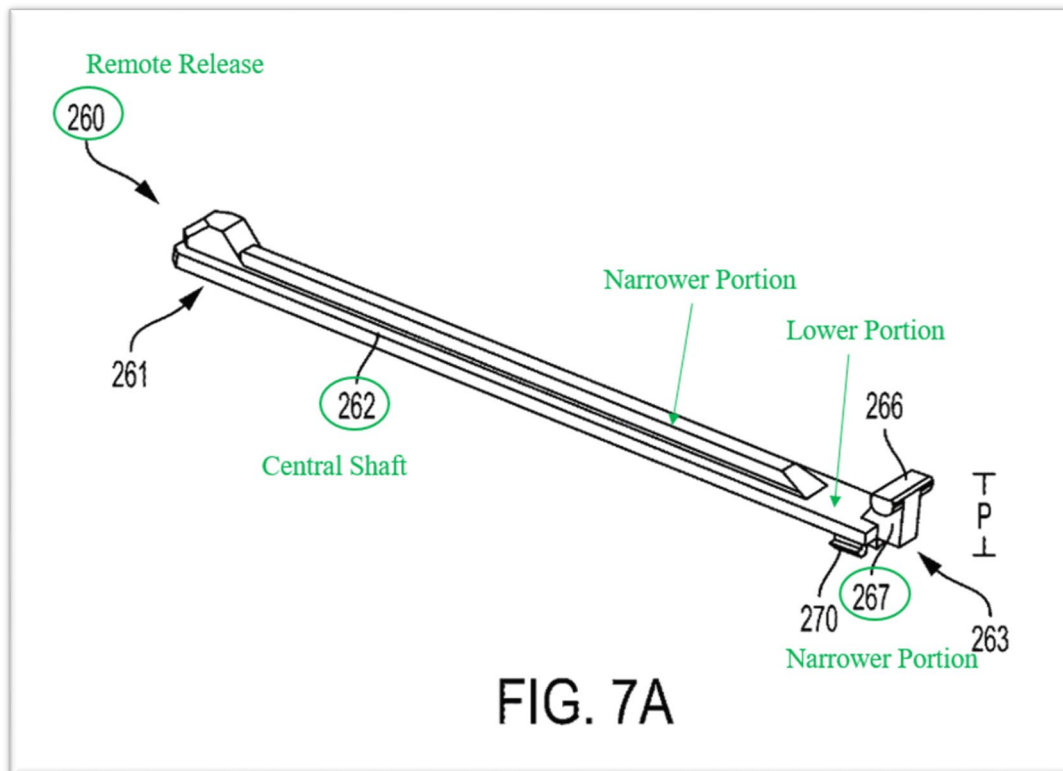
Wong's pull tab assembly 260 includes central shaft 262 having a cross-sectional shape and size that generally corresponds to opening 246 of first segment 241 of release member 240. EX1005, 16:50-62. Thus, central shaft 262 may be inserted into opening 246 such that pull tab assembly 260 is movable relative to the various portions of remote latch connector 200 along a coupling axis

while being slidably received in opening 246. EX1005, 16:62-66; EX1007, ¶¶460-461.

8. [1.7]

Wong discloses [1.7]. EX1007, ¶¶463-466.

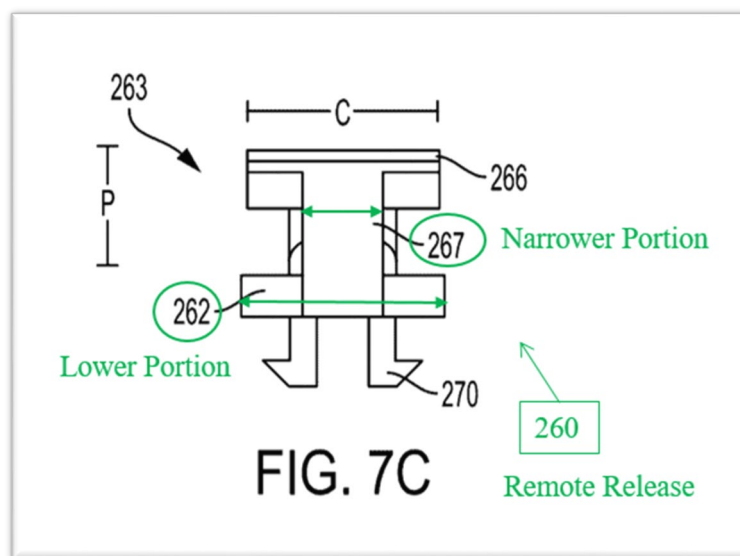
Wong's central shaft 262 of its pull tab assembly 260 includes a lower portion and a narrower portion above the lower portion, the lower portion being wider than the narrower portion, as shown in Figure 7A.



EX1005, FIG. 7A (annotated); EX1007, ¶464.

Second end 263 of the pull tab assembly 260 includes protrusion 267 that protrudes from central shaft 262. EX1005, 17:19-23. Wong's central shaft 262

discloses a lower portion, and protrusion 267 discloses a narrower portion above the lower portion.



EX1005, FIG. 7C (annotated); EX1007, ¶465.

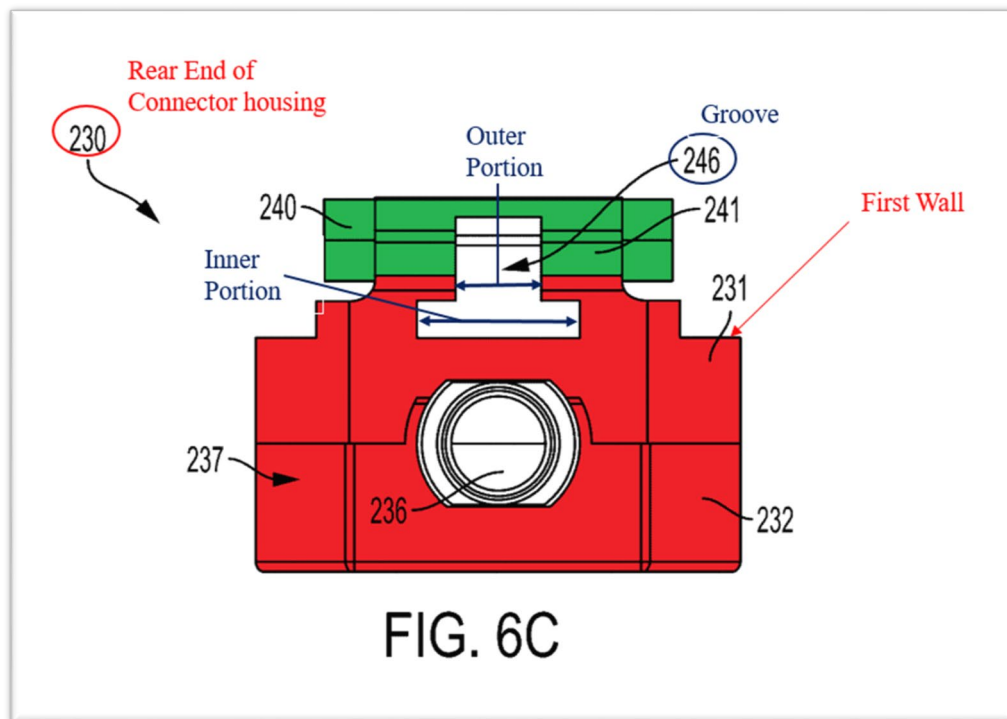
9. [1.8]

Wong discloses [1.8]. EX1007, ¶¶467-472.

Wong's opening 246 discloses a groove. Section VIII.A.6. Opening 246 provides a space through 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. EX1007, ¶468.

Wong's central shaft 262 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. Section VIII.A.8. EX1007, ¶469.

As shown in Figure 6C, 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. EX1007, ¶470. As shown, the inner portion of the groove is configured to slidably receive the lower portion of the remote release (e.g., pull tab assembly 260), and 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.



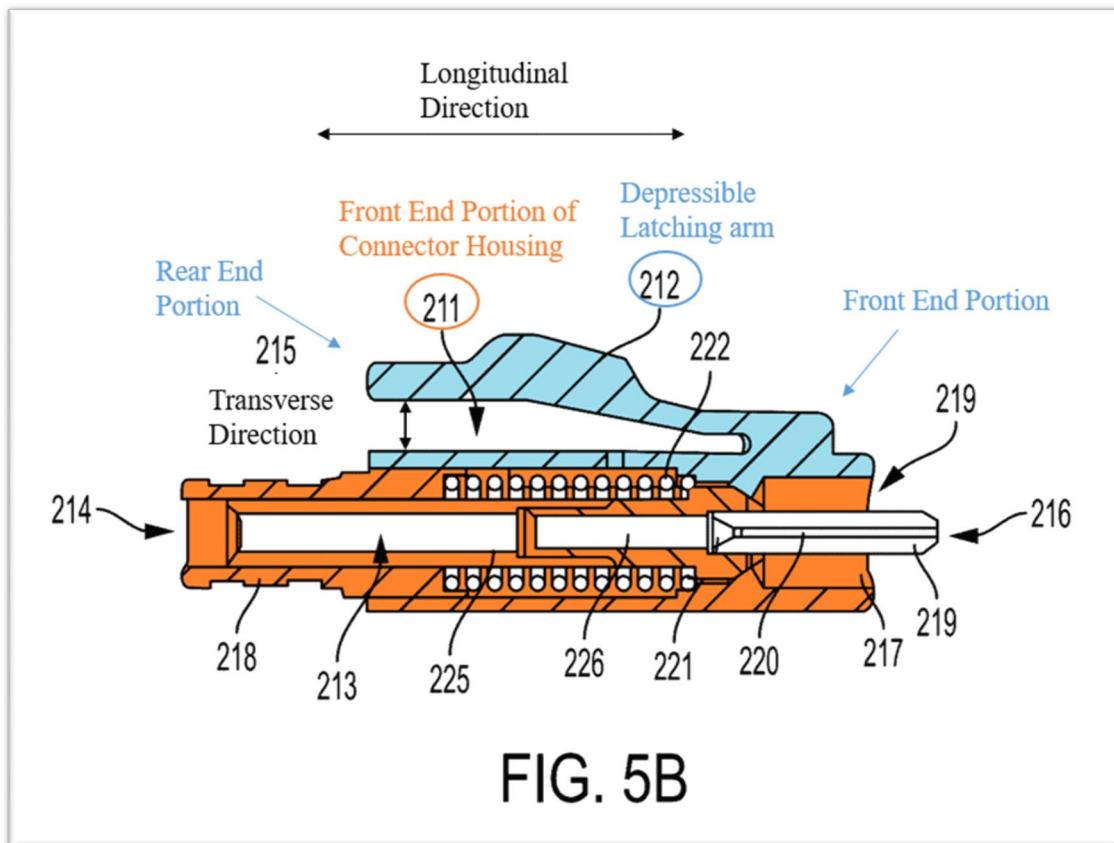
EX1005, FIG. 6C (annotated); EX1007, ¶470.

B. Dependent claims

1. Claim 2

Wong discloses [2.1]. EX1007, ¶¶473-479.

Wong's 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 211. EX1005, 8:18-21. The first end is a front-end portion of the depressible latching arm attached to the connector housing and the second end is a rear-end portion of the depressible latching arm. Wong's depressible latching arm extends transversely outward away from the first wall of the connector housing (e.g., connector housing 211) as the depressible latching arm extends longitudinally from the front-end portion to the rear-end portion.

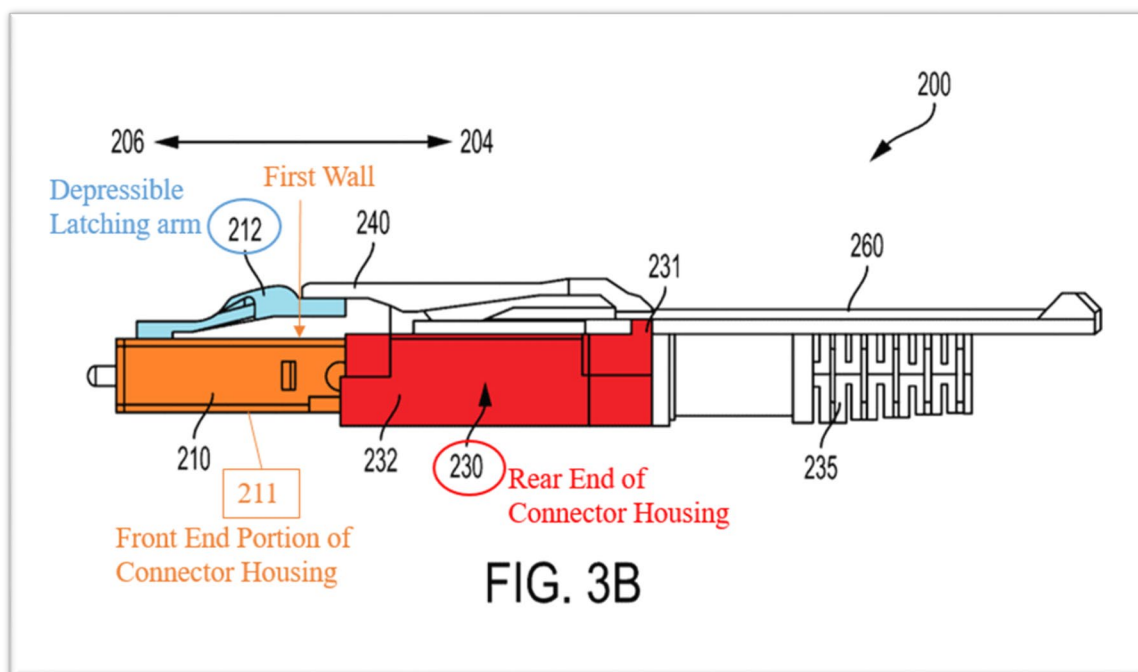


EX1005, FIG. 5B; EX1007, ¶477.

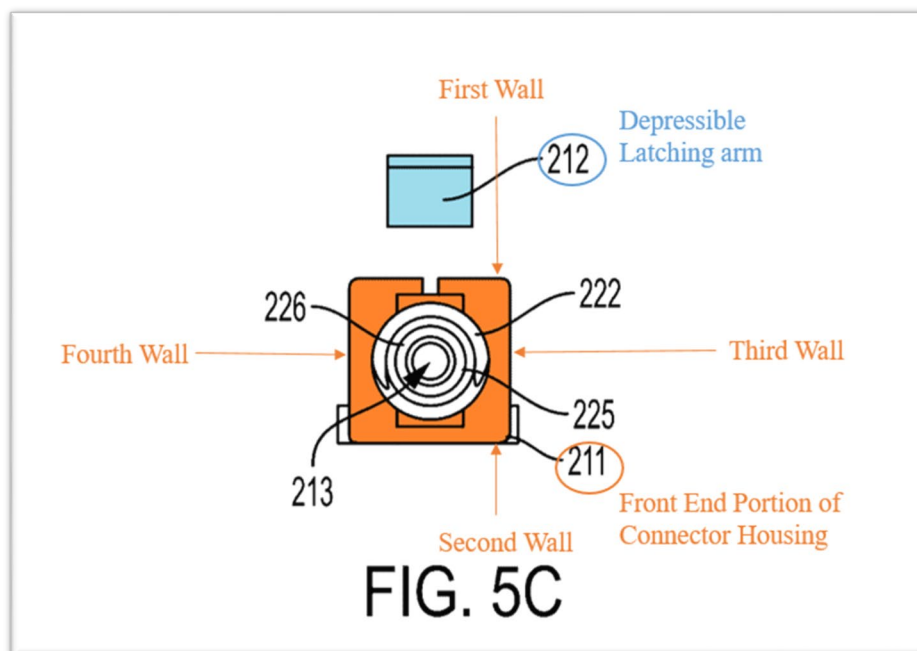
2. Claim 3

Wong discloses [3.1]. EX1007, ¶¶480-485.

Wong's Figures 3B and 5C show that its 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); EX1007, ¶483.

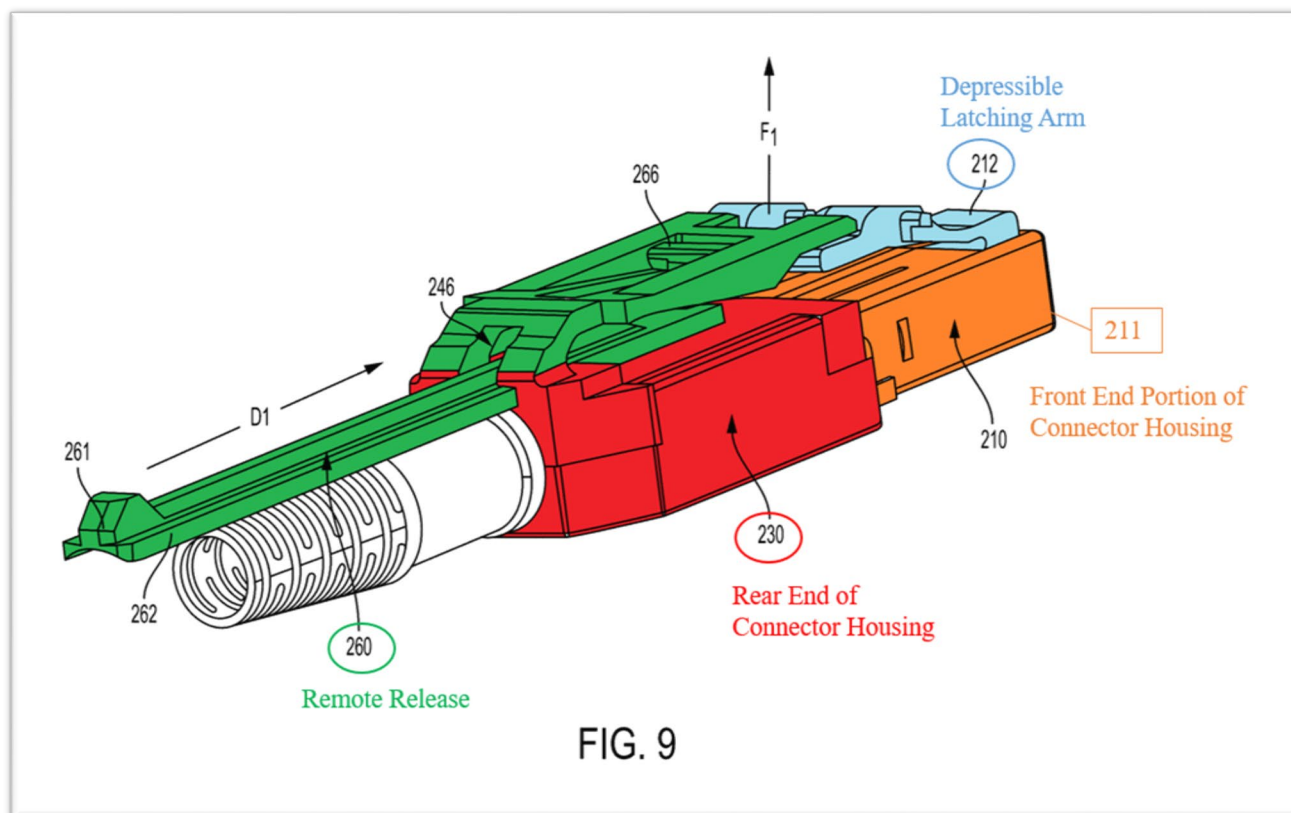


EX1005, FIG. 5C (annotated); EX1007, ¶483.

3. Claim 4

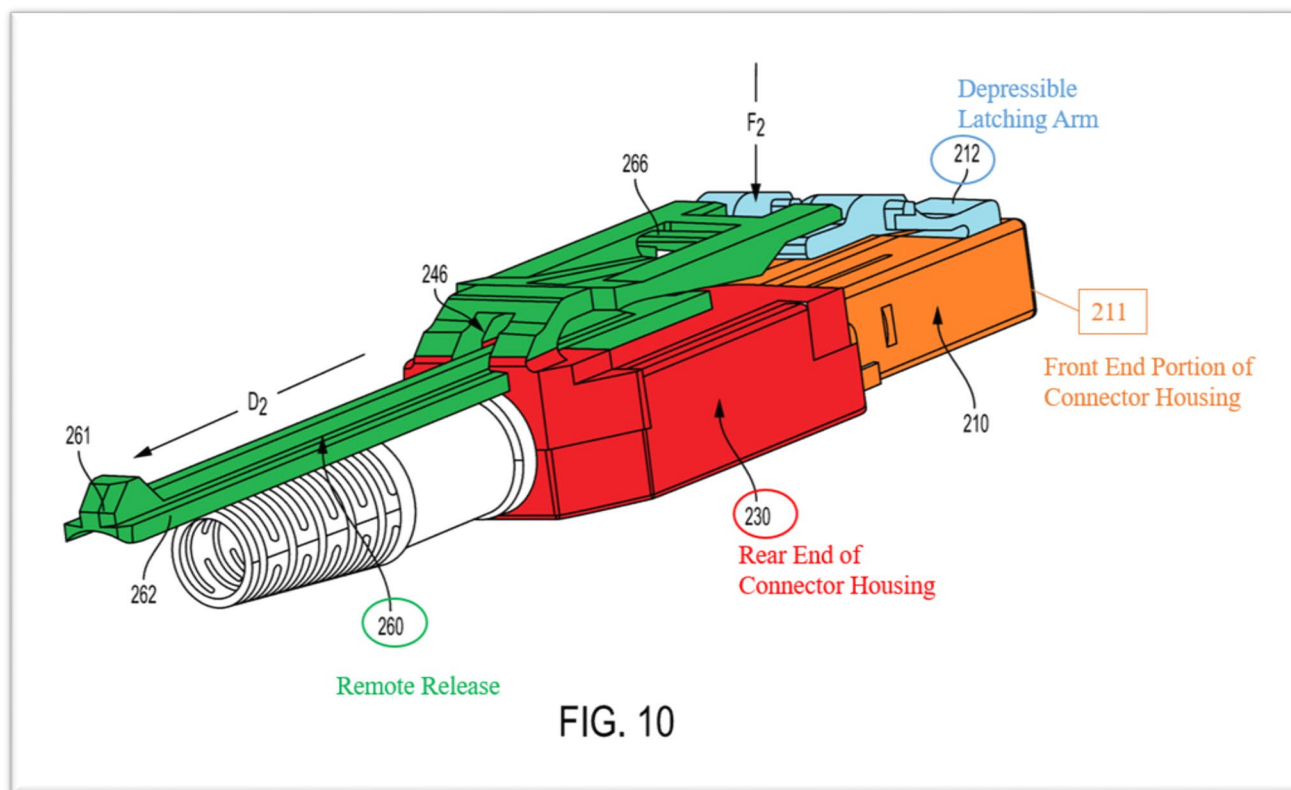
Wong discloses [4.1]. EX1007, ¶¶486-493.

In Figure 9, Wong discloses a resting state and/or a state where the remote latch release assembly is inserted into a board. EX1005, 17:66-18:13. The position of pull tab assembly 260 allows for a biasing upward vertical force F1 on release member 240 such that second segment 242 (or a 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); EX1007, ¶489.

Wong's Figure 10 shows an actuated state where pull tab assembly 260 is moved along D_2 generally away from the board. EX1005, 18:25-32. "Due to the distance the protrusion 267 extends through the channel 247, the crossbar 266 may cause a downward force F_2 to be exacted over the release member 240" (e.g., "a force that biases the release member towards the 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 the latching portion 212, thereby unlatching cable assembly connector 210 from the board. EX1005, 18:36-40.



EX1005, FIG. 10 (annotated); EX1007, ¶490.

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). EX1007, ¶¶491-492. Accordingly, Wong's depressible latching arm would resiliently return toward the un-depressed position of the resting state.

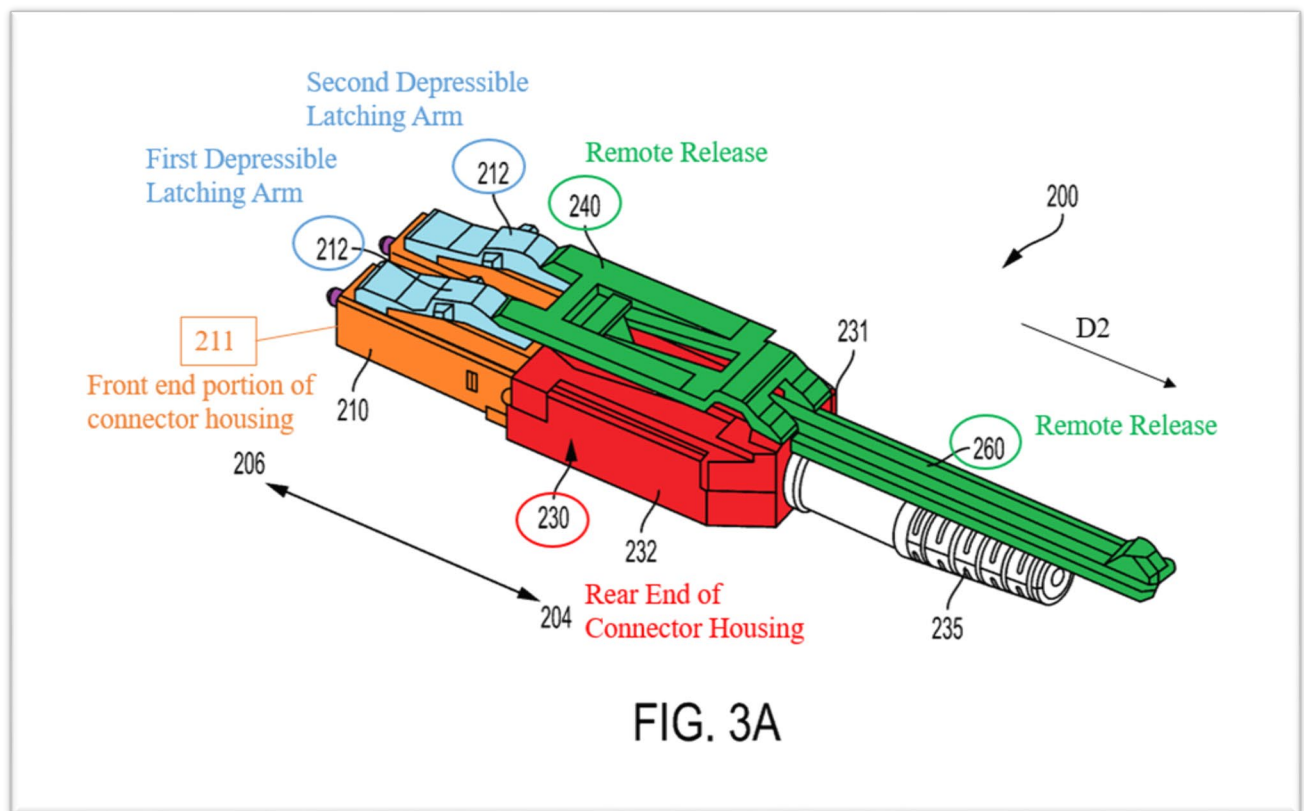
4. Claim 5

Wong discloses [5.1]. EX1007, ¶¶494-500.

Wong expressly discloses “a plurality of release members 240[,] a plurality of pull tab assemblies 260,” and a plurality of latching portions 212. EX1005, 7:22-45.

Wong’s Figure 3A depicts two cable assembly connectors 210, a single release member 240, and a single pull tab assembly 260. EX1005, 7:27-31. Each cable assembly connector 210 includes a connector housing 211 and a latching portion 212. EX1005, 7:43-45; EX1007, ¶497.

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); EX1007, ¶498.

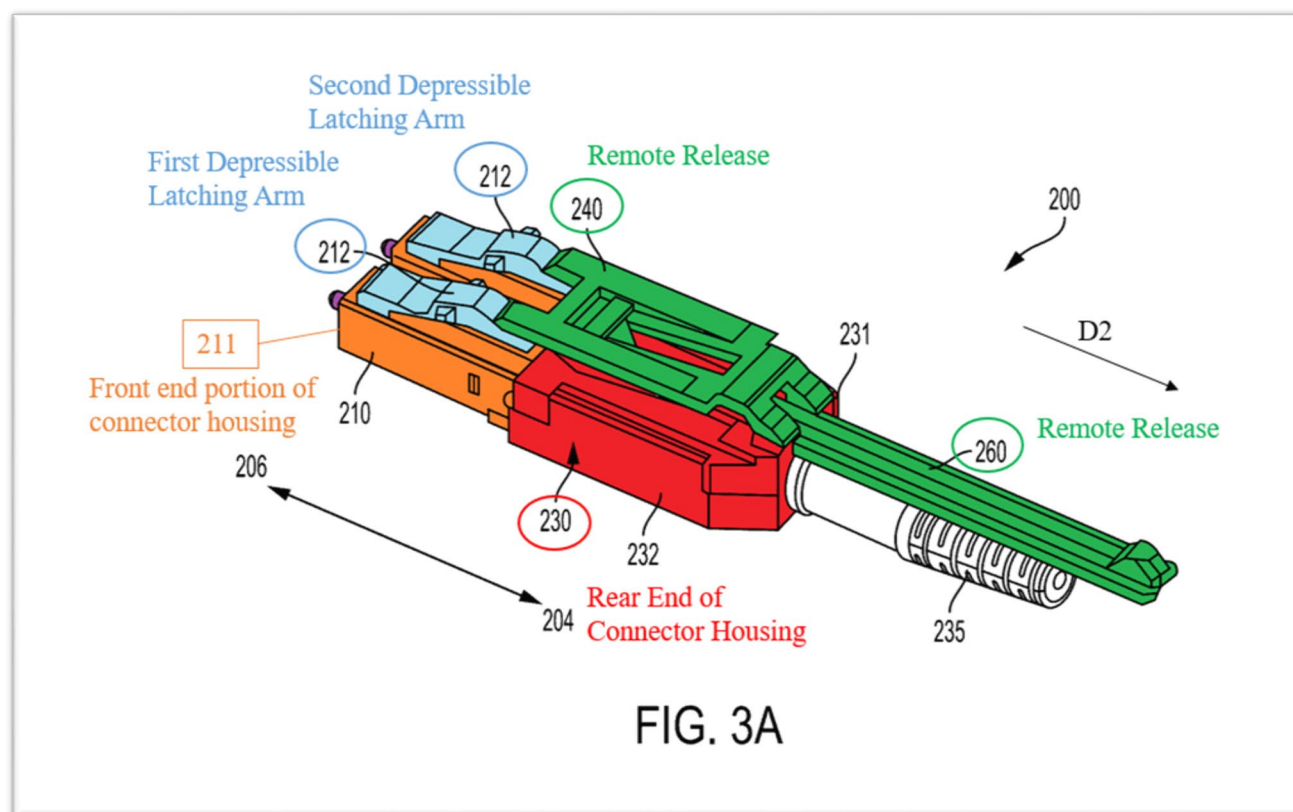
5. Claim 6

Wong discloses [6.1]. EX1007, ¶¶501-507.

Wong discloses a release member 240 and a plurality of cable assembly connectors 210 with which release member 240 engages. Wong's Figure 4 shows release member 240 is incorporated with switchable housing 230 and configured to engage with two cable assembly connectors 210. EX1005, 13:28-35.

When Wong's remote release (e.g., release member 240) is pulled rearward along the longitudinal axis, the remote release depresses the second depressible latching arm in the same way as it depresses the first depressible latching arm.

EX1007, ¶¶504-505; Section VIII.A.5.

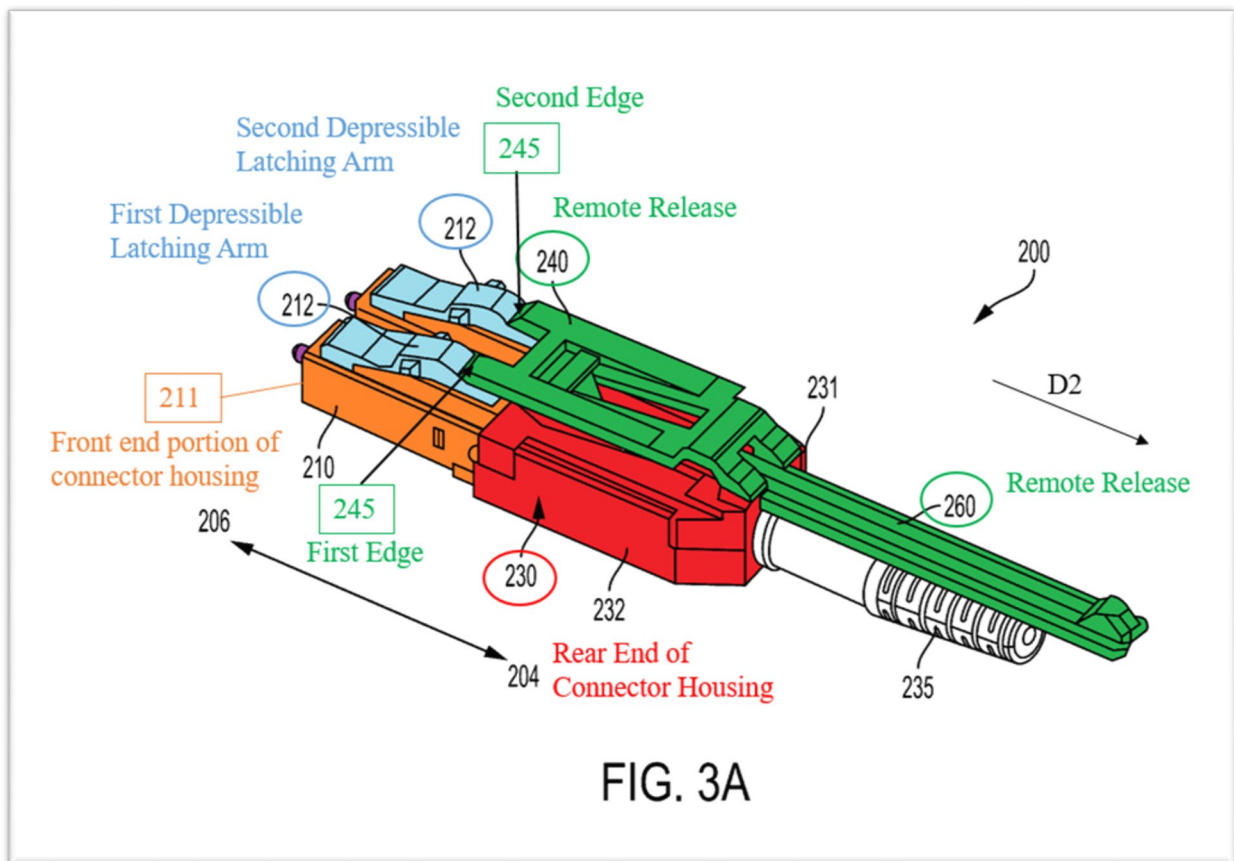


EX1005, FIG. 3A (annotated); EX1007, ¶505.

6. Claim 7

Wong discloses [7.1]. EX1007, ¶¶508-514.

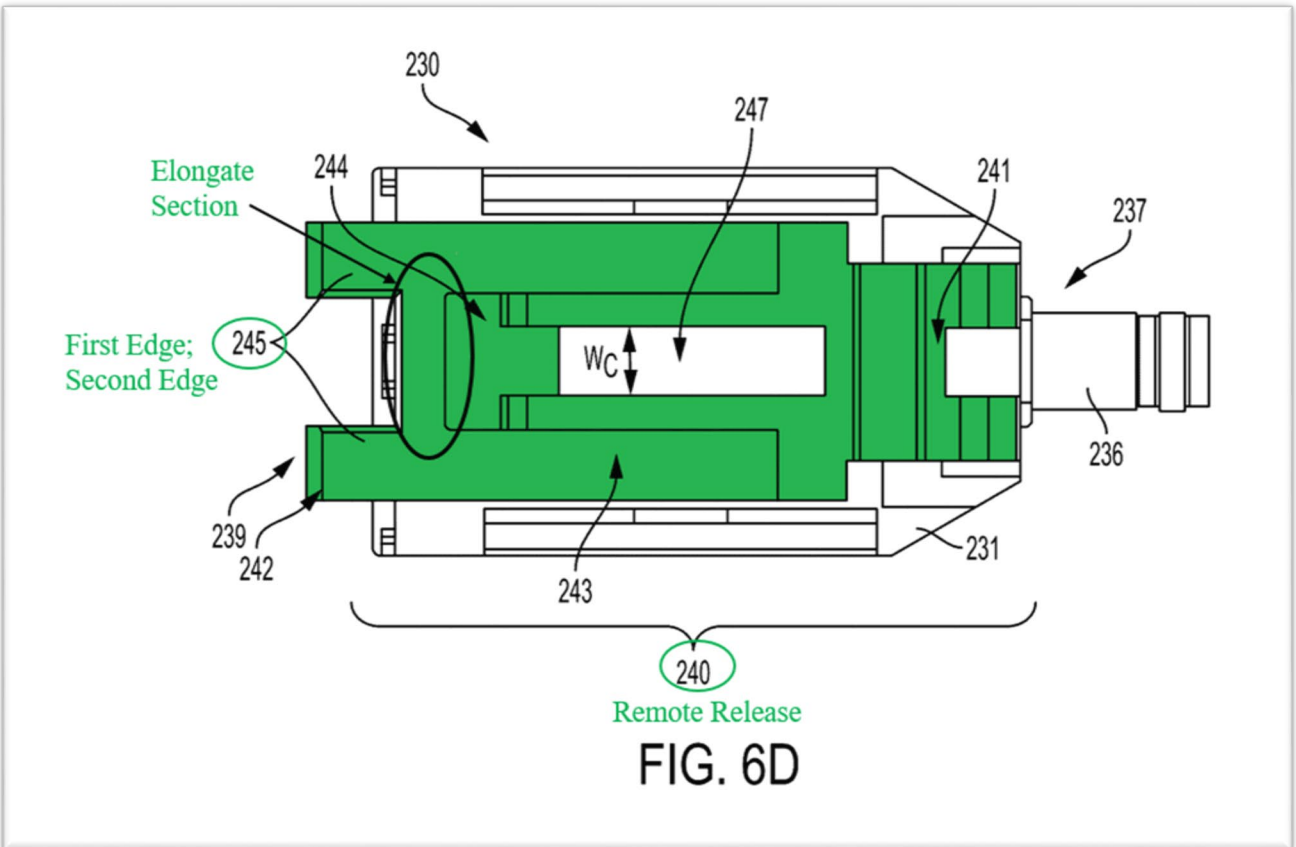
Wong's prongs, tabs, or the like 245 of release member 240 disclose a first edge for engaging the first depressible latching arm and a second edge for engaging the second depressible latching arm, and that the first and second edges are spaced apart from one another. EX1005, 15:8-16.



EX1005, FIG. 3A (annotated); EX1007, ¶512.

7. Claim 8

Wong discloses [8.1] as shown in Figure 6D. EX1007, ¶¶515-520.



EX1005, FIG. 6D (annotated); EX1007, ¶518.

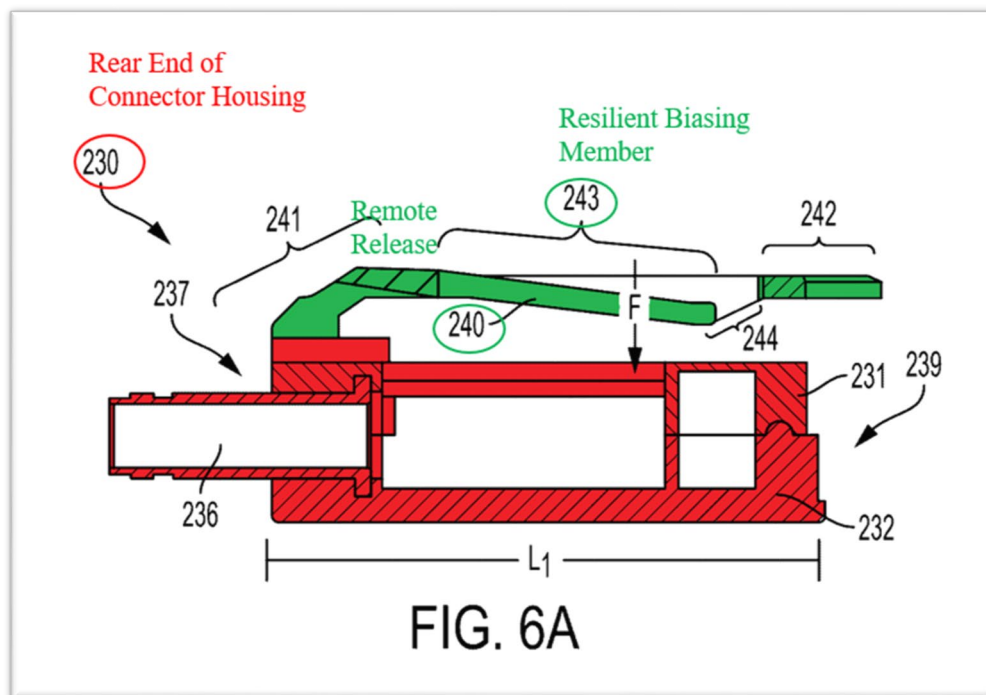
8. Claim 9

Wong discloses [9.1]. EX1007, ¶¶521-532.

Wong's depressible latching arm (e.g., latching portion 212) resiliently returns toward the un-depressed position. Section VIII.B.3. And in the resting state, biasing force F_1 acts on release member 240 such that second segment 242 (or a similar portion) of release member 240 is lifted off of latching portion 212 of cable assembly connector 210. EX1005, 18:19-24. Wong's 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—it is biased along the longitudinal axis toward the front-end portion of the connector housing. EX1007, ¶524.

Wong also explains that release member 240 includes third segment 243, extending 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, 14:24-34.



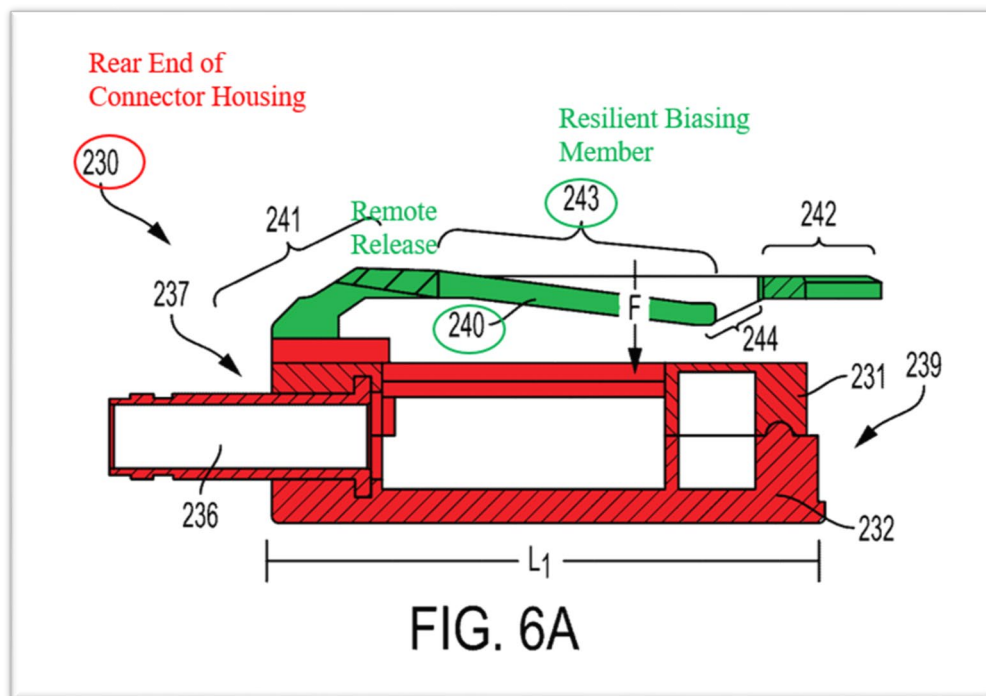
EX1005, FIG. 6A (annotated); EX1007, ¶525.

Third segment 243 slopes along a longitudinal axis of the connector, with a higher end connected to first segment 241 and a lower end approaching the front-end portion of the connector housing (e.g., switchable housing 230). When released from the actuated state shown in Figure 10, crossbar 266 of pull tab assembly 260 is yieldably biased towards the lower end of third segment 243. EX1007, ¶526.

9. Claim 10

Wong discloses [10.1]. EX1007, ¶¶533-540.

Wong's third segment 243 of release member 240 is sloped, such that crossbar 266 of pull tab assembly 260 are yieldably biased towards the lower end of third segment 243. Section VIII.B.8. 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:

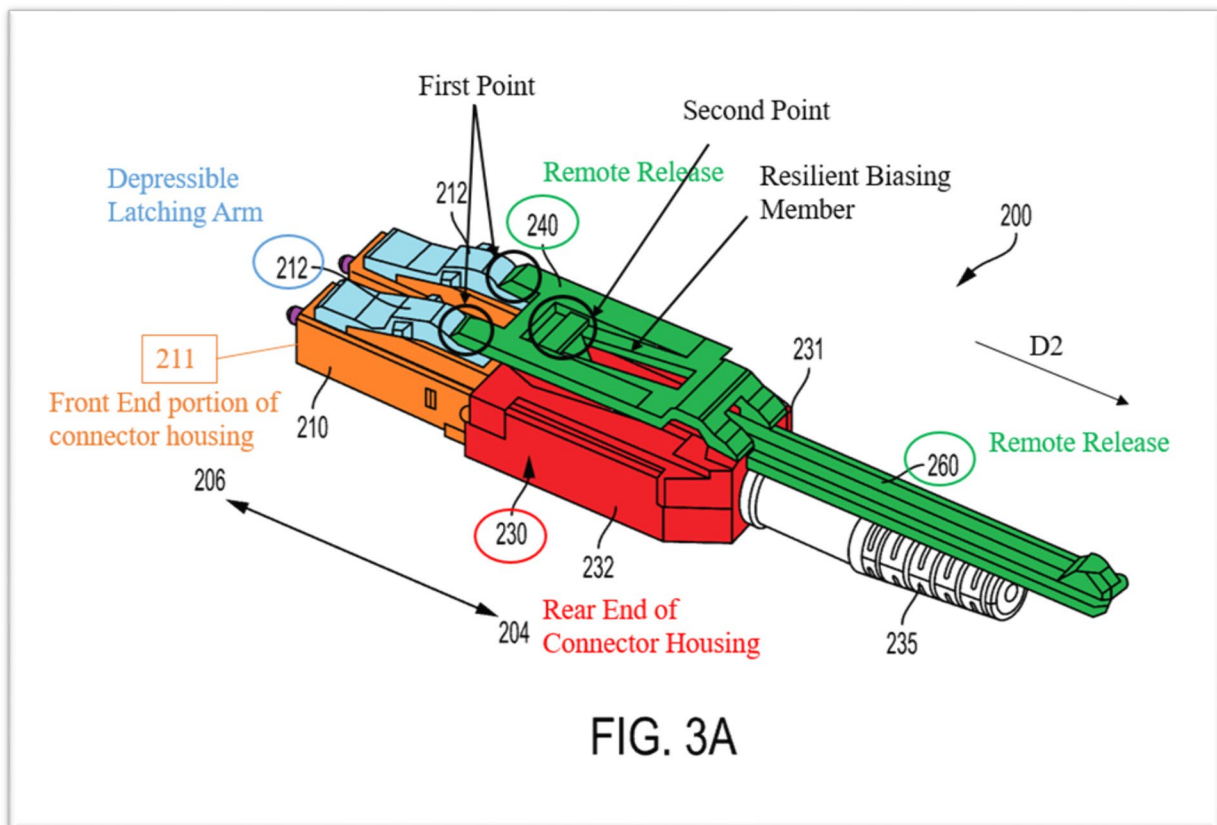


EX1005, FIG. 6A (annotated); EX1007, ¶¶536-537.

10. Claim 11

Wong discloses [11.1]. EX1007, ¶¶541-549.

Wong's 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) and its resilient biasing member (e.g., third segment 243 of release member 240) and 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); EX1007, ¶544.

The first point of contact and the second point of contact are both at the front section of the remote release. Prongs, tabs, or the like 245 are the front of release member 240 and crossbar 266 is the front of pull tab assembly 260. Wong's Figure 3A shows the second point of contact is spaced apart from the first point of contact

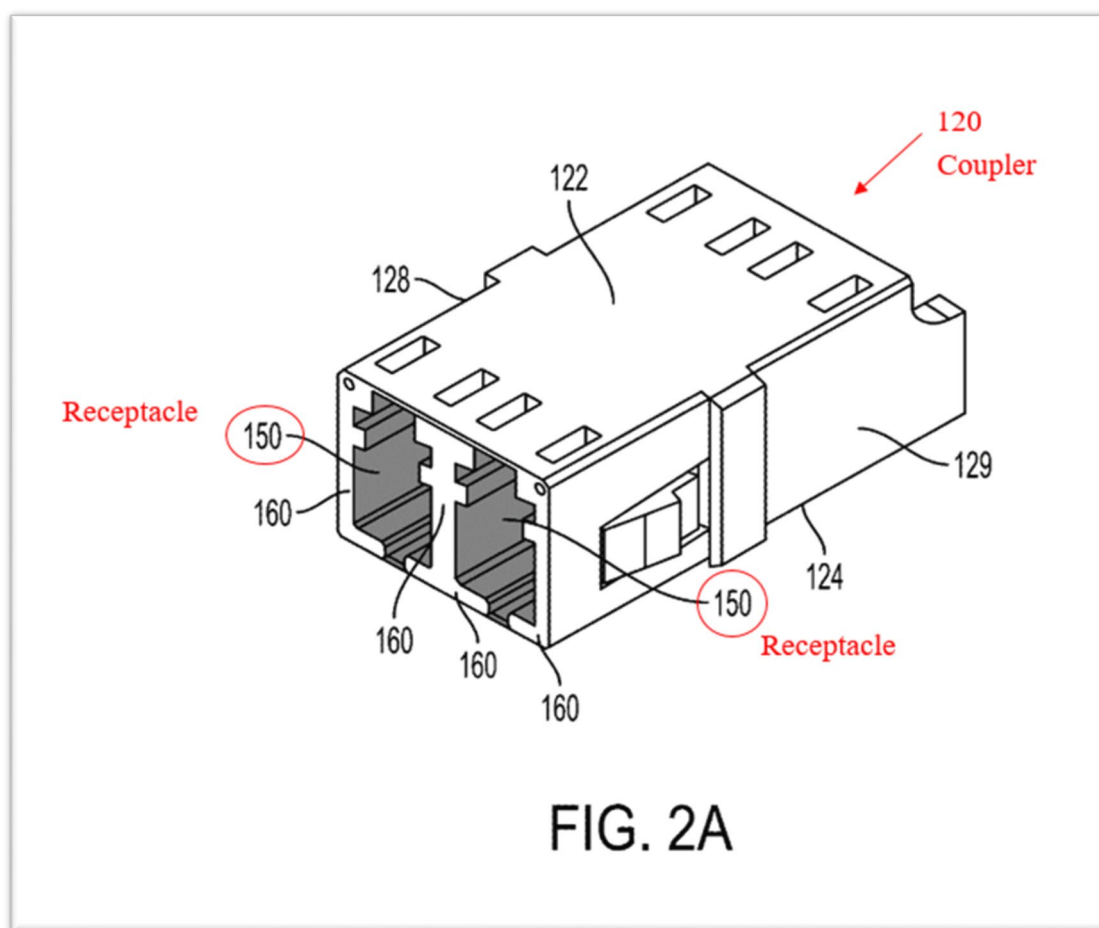
along the longitudinal axis toward the rear-end portion of the connector housing.

EX1007, ¶546.

11. Claim 15

Wong discloses [15.2]. EX1007, ¶¶550-557.

Wong's mating connector 150 is a receptacle for mating with the optical fiber connector (e.g., release connector assembly 200). EX1005, 7:12-17.

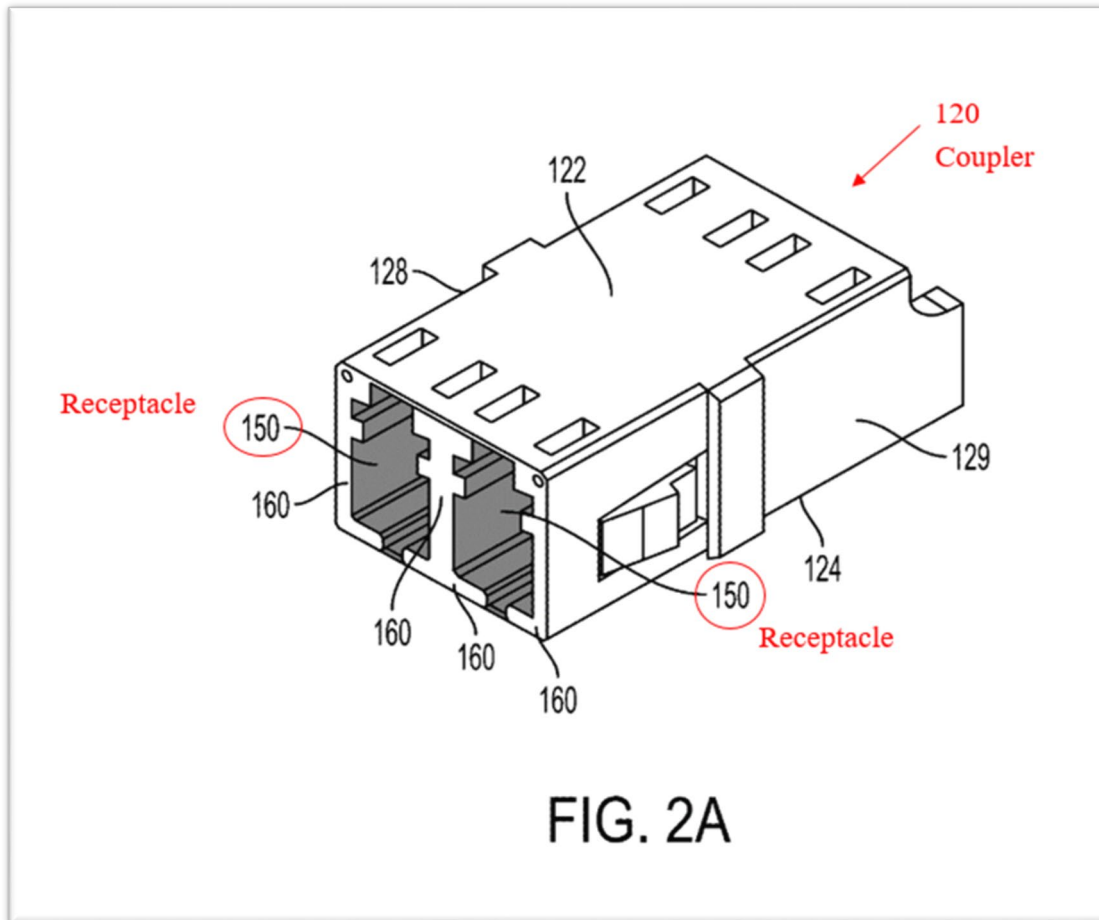


EX1005, FIG. 2A (annotated); EX1007, ¶554.

12. Claim 16

Wong discloses [16.1]. EX1007, ¶¶558-564.

Wong's "mating connector 150 may include . . . square-like . . . or rectangular components or shapes." EX1005, 5:16-19. And Wong's Figure 2A shows exactly that: a rectangular perimeter wall.



EX1005, FIG. 2A (annotated); EX1007, ¶561.

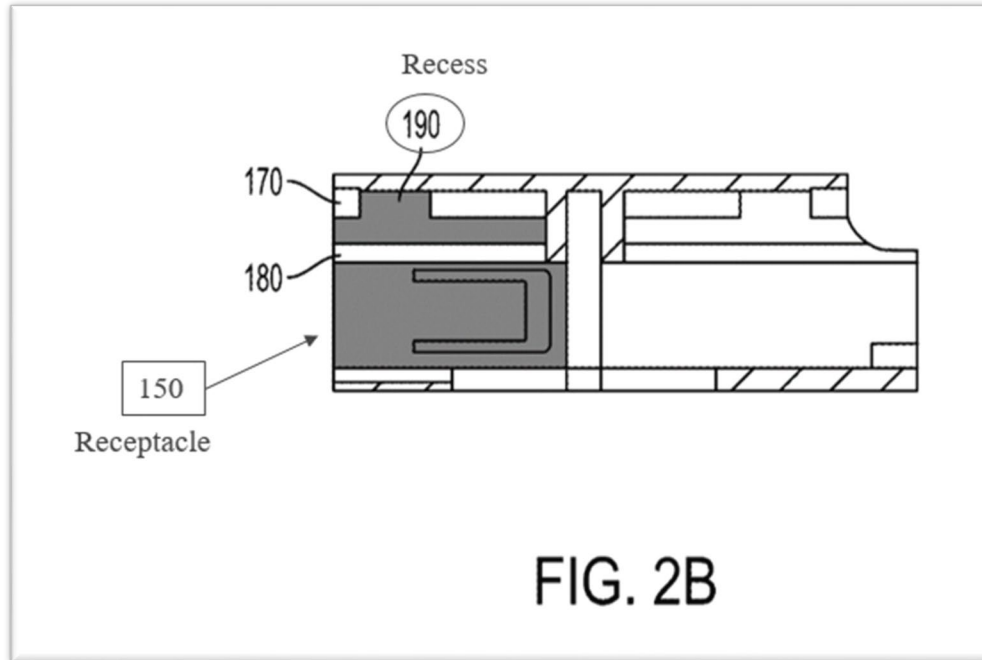
Wong's connector housing has "a generally rectangular perimeter." Section VIII.A.6. A POSITA would have readily understood that a receptacle for receiving the generally rectangular connector housing of Wong would have similarly comprised a generally rectangular perimeter wall to, e.g., provide for a secure

connection between the connector housing of the connector of Wong and the receiving port. EX1007, ¶562.

13. Claim 17

Wong discloses [17.1]. EX1007, ¶¶565-570.

Wong's connector engages with the mating connector 150, and depressible latching arm (e.g., latching portion 212) is trapped in trap 190 (recess). EX1005, 8:37-42, 5:1-7.



EX1005, FIG. 2B (annotated); EX1007, ¶¶568-569.

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

A. Claim 12

Wong 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.” And Kuffel further discloses this. EX1007, ¶¶572-590.

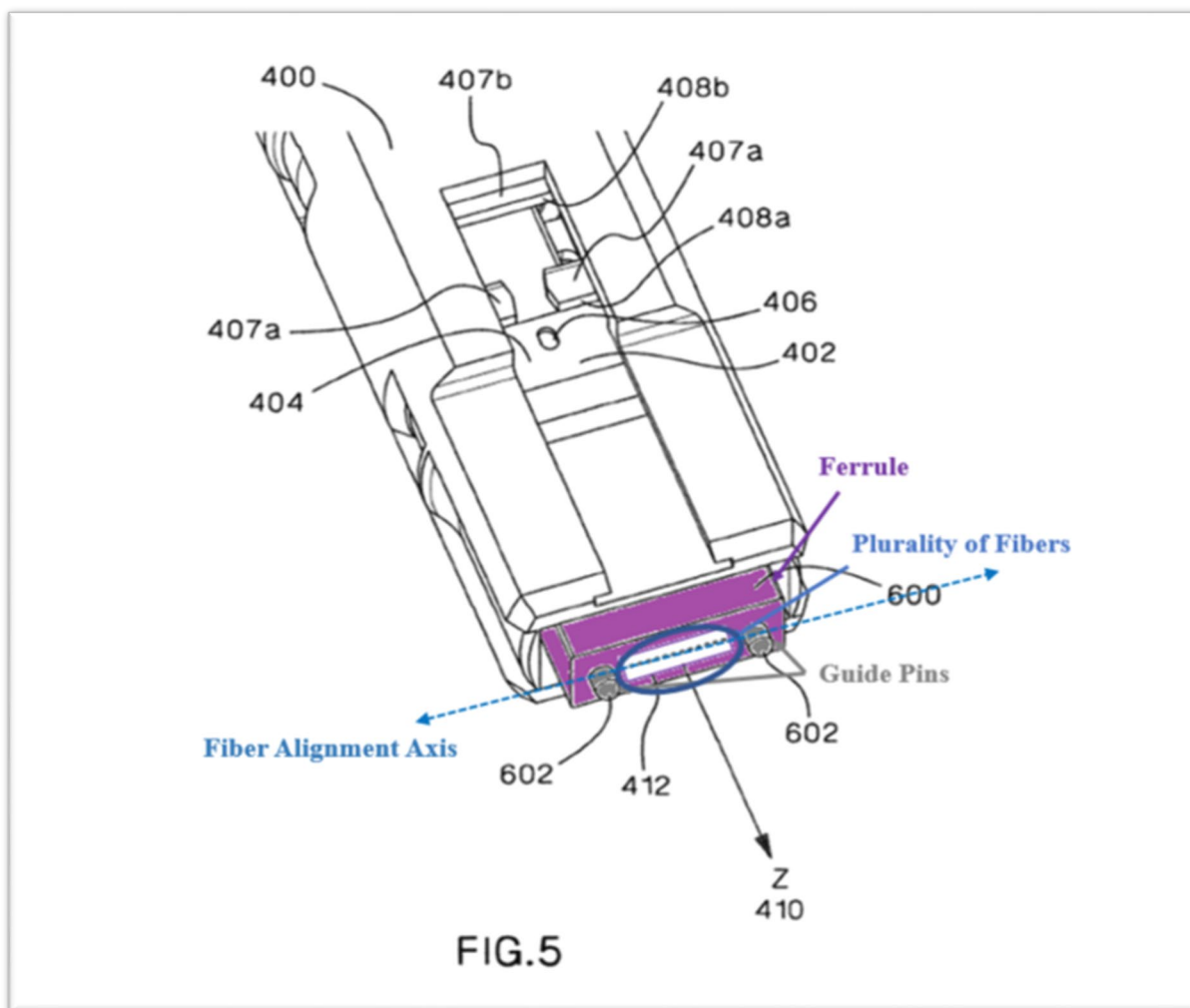
1. Wong

Wong’s connector (e.g., cable assembly connector 210) “may be any suitable type now known or later developed,” including an MT connector.” EX1005, 4:3-8, 7:57-8:2. Ferrule 219 can be an MT ferrule configured to receive a plurality of fibers.

Wong, however, may be (wrongly) alleged to not 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 comprises first and second guide pin openings spaced apart along the fiber alignment axis. While these are known features of MT ferrules, art such as Kuffel confirms the state of the art included these features of MT ferrules. EX1007, ¶¶573-574.

2. Kuffel

Kuffel’s ferrule 600 is an MT ferrule. Section V.A.3; EX1007, ¶575. Kuffel’s MT ferrule (like all MT ferrules, including Wong’s) 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 Figure 5 of Kuffel. Guide pins 602 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:



EX1004, FIG. 5 (annotated); EX1007, ¶576.

3. Motivation to Combine

A POSITA would have found it obvious to specify that Wong's MT ferrules have fibers spaced apart in a row that extend parallel to a fiber alignment axis and first and second guide pin openings are spaced apart along the fiber alignment axis, as disclosed in Kuffel. EX1007, ¶¶577-581.

Such a modification would only involve specifying that Wong's ferrules (e.g., the MT multi-fiber ferrule disclosed in Wong) are configured like Kuffel's MT

multi-fiber ferrule. Wong's connector housings 211 would also be able to be formed 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), with a reasonable expectation of success. EX1007, ¶¶577-578. Such a modification would 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. EX1007, ¶579.

A POSITA would have found this combination obvious because *Wong already discloses that its cable assembly connector 210 may include an MT ferrule.* EX1005, 4:3-8, 7:56-8:2. A POSITA would have been motivated to incorporate such a known configuration of an MT ferrule (e.g., Kuffel's MT ferrule showing the multiple fibers along a fiber alignment axis) based on the desired data transmission capacity and overall data transmission system design. EX1007, ¶580. A POSITA would have readily understood that Kuffel's MT multi-fiber ferrule is one of the MT multi-fiber ferrules contemplated by Wong, and a simple substitution provides different connectivity options to any MT multi-fiber ferrule contemplated by Wong. EX1007, ¶580.

A POSITA would have had reasonable expectation of success in such a substitution, which at most involves the direct replacement of one known type of MT multi-fiber ferrule for another, and which would have been readily implementable for a POSITA. EX1007, ¶581. Further, the combination retains Wong's remote release mechanism and merely specifies an interior component, which is a standard upgrade according to Kuffel, EX1004, 3:44-4:7, 4:8-19, that does not change the principle operation of Wong's remote release mechanism, as accounted for in Wong's description. EX1007, ¶581.

B. Claim 13

Wong discloses “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 Kuffel further discloses this. EX1007, ¶¶591-601.

Wong modified with Kuffel discloses a connector having an MT ferrule. Section IX.1. A standard MPO connector has a width along the fiber alignment axis of approximately 12.6 mm. EX1019, 5-7. EX1007, ¶¶593-594.

Wong's connector housing 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.” EX1005, 11:9-17. Therefore, Wong’s connector as disclosed can have a width less than approximately 12.6 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. EX1007, ¶595. Therefore, the cross-sectional dimension of Wong’s connector is also less than the cross-sectional dimension of a standard MPO connector. EX1007, ¶595.

To the extent that PO argues that the disclosed width of Wong’s connector housing does not apply to a MPO connector, Wong further recognizes 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. 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. EX1007, ¶596.

Wong—like the ’760 patent—explains deployment of high-density panels and their compacted form factor. EX1005, 1:6-17; EX1001, 1:34-40; EX1007, ¶597.

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, 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. EX1007, ¶598.

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 and shrink the outer cross-sectional dimension of Wong’s remote release connector to fit it to an even higher density panel. EX1007, ¶599. 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. EX1007, ¶599.

X. GROUND 6: WONG IN VIEW OF RAVEN RENDERS OBVIOUS CLAIM 14.

A. Claim 14

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. EX1007, ¶¶602-616.

1. Wong

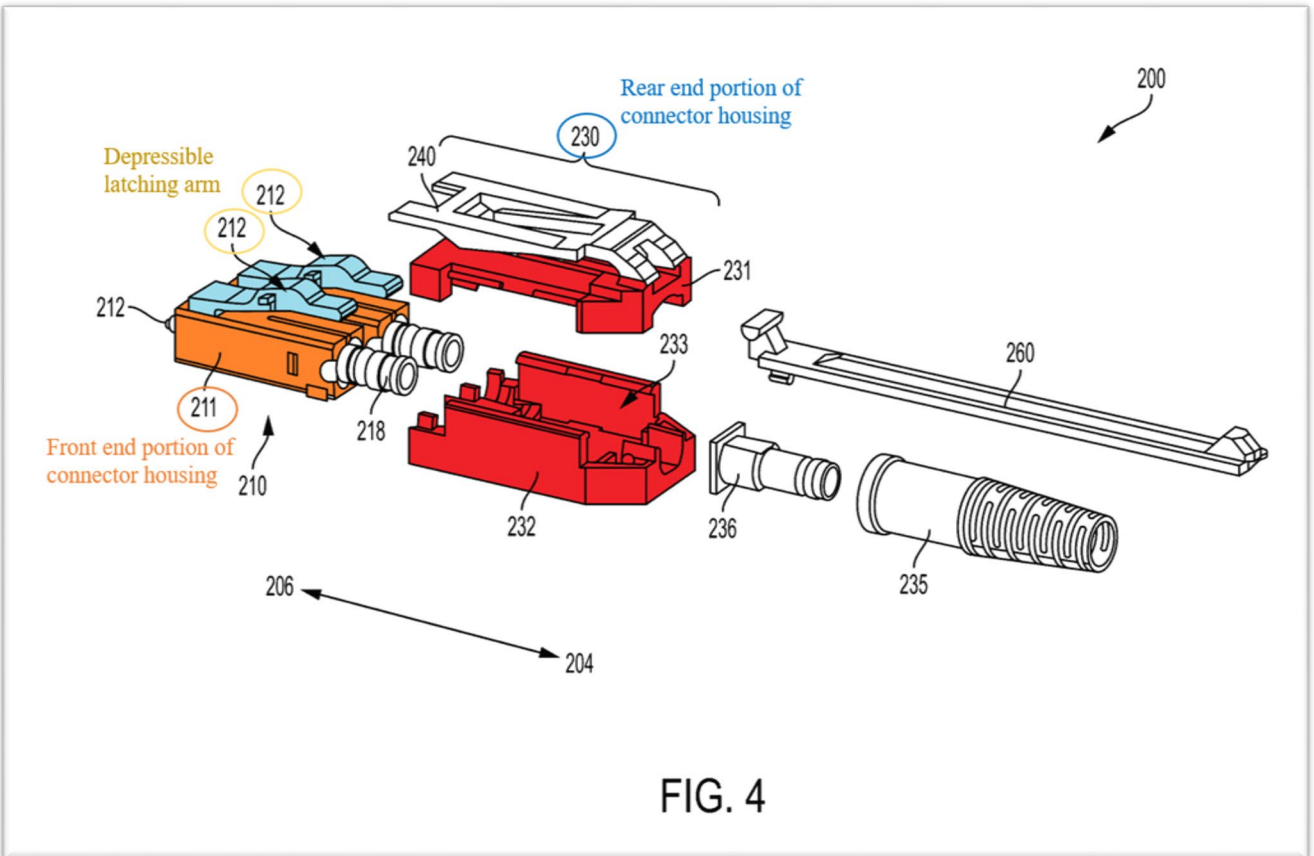
PO may allege that Wong does not expressly disclose that its connector housing can enable a polarity of the optical fiber connector to be selectively reversed. But a POSITA would have understood that Wong provides for exactly that. EX1007, ¶¶603-604.

2. Raven

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, 18:20-19:8, FIG. 1. In this second orientation, the polarity is reversed. EX1003, 18:30-19:4; EX1007, ¶¶605-606.

3. Motivation to Combine

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. Based on Figure 4 of Wong, when switchable housing top 231 and switchable housing bottom 232 are separated, its front-end portion of connector housing (e.g., connector housing 212) can be rotated 180° about a longitudinal axis 204-206, such that the polarity of ferrules 212 in each of connector housing 212 is reversed. EX1007, ¶¶607. And to preserve the 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. EX1007, ¶¶608.



EX1005, FIG. 4 (annotated); EX1007, ¶607.

A POSITA would have been motivated to make the modification of Wong in view of Raven at least because Raven supports 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; EX1007, ¶609.

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 Raven's connector housing, which is a function already disclosed by Wong, and rotating the front-end portion of Raven's connector housing. Additionally, the modification does not alter the structure of Raven's

connector housing, latching mechanism, and remote release mechanism. EX1007, ¶610.

XI. GROUND 7: RAVEN IN VIEW OF KUFFEL RENDERS OBVIOUS CLAIM 10.

A. Claim 10

Raven discloses this feature. Section V.B.9. To the extent PO argues—incorrectly—that Claim 10 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. EX1007, ¶¶617-624. 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, FIGs. 17; EX1007, ¶620.

Dr. Brennan points to corroborating evidence, not needed for any teaching of obviousness in this Ground. One example is U.S. Patent No. 9,411,111 to Banal, Jr. et al. (“Banal”) showing an optical connector uses 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; EX1007, ¶621.

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, such as Kuffel’s, in the optical fiber connector of Raven to even further bias the remote

release (e.g., manually operable control 69) forward to ensure engagement with the corresponding recess. A POSITA would have had a reasonable expectation of success in doing so, since such a structural arrangement was well known and is a minor modification. EX1007, ¶622.

XII. GROUND 8: WONG IN VIEW OF KUFFEL RENDERS OBVIOUS CLAIMS 10–11.

A. Claim 10

Wong discloses this feature. Section VIII.B.9. To the extent PO argues incorrectly that claim 10 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. EX1007, ¶¶625-632. 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; EX1007, ¶629.

Dr. Brennan points to corroborating evidence, not needed for any teaching for obviousness in this Ground. One example is U.S. Patent No. 9,411,111 to Banal, Jr. et al. (“Banal”) showing an optical connector uses 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 engagement of the optical connector with its recess. EX1016, 4:37-41, 4:61-65, FIG. 3; EX1007, ¶630.

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, such as Kuffel's, in the optical fiber connector of Wong to bias the remote release (e.g., pull tab assembly 260) forward to ensure engagement with the corresponding recess. A POSITA would have had a reasonable expectation of success in doing so since such a structural arrangement was well known and is a minor modification. EX1007, ¶631.

B. Claim 11

Wong discloses this feature. Section VIII.B.10. To the extent PO argues, incorrectly, that Claim 11 requires a spring, it would have been obvious to a POSITA to include the spring discussed in Section XII.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). Section VIII.B.10; EX1007, ¶¶633-637.

XIII. THE BOARD SHOULD NOT EXERCISE ITS DISCRETION TO DENY THE PETITION.

A. The Board should not deny the Petition under *Fintiv*.

The '760 patent is currently involved in a parallel district-court case that was filed on January 24, 2023. *Senko Advanced Components, Inc. v. US Conec Ltd.*, No. 1:23-cv-00083 (D. Del. Jan. 24, 2023), which was stayed at least through December 20, 2023. The Board should not deny this Petition under *Fintiv* because the Petition

sets forth a compelling unpatentability challenge to at least one claim. Further, if instituted, Petitioner stipulates not to pursue in the district court the grounds in the Petition or any ground that reasonably could have been raised in the Petition.

Accordingly, *Fintiv* does not favor denial of institution. *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 (P.T.A.B. Mar. 20, 2020) (precedential).

XIV. MANDATORY NOTICES (37 C.F.R. § 42.8(a)(1))

REAL PARTY IN INTEREST: The real party-in-interest is Petitioner US Conec Ltd. Petitioner US Conec Ltd. states that the following entities each own 10% or more of its stock: Corning Optical Communications, LLC; Fujikura Ltd.; and NTT Advanced Technology Corporation. This statement should not be interpreted as an admission or concession that the above-listed parties are real parties-in-interest or in privity with US Conec Ltd.

RELATED MATTERS: The '760 patent is asserted against US Conec Ltd. in *Senko Advanced Components, Inc. v. US Conec Ltd.*, 1:23-cv-00083 (D. Del.), filed January 24, 2023, which was stayed at least through December 20, 2023.

LEAD AND BACKUP COUNSEL: Pursuant to 37 C.F.R. §§ 42.8(b)(3) and 42.10(a), Petitioner appoints **Jason D. Eisenberg** (Reg. No. 43,447) as its lead counsel, and **Ian Soule** (Reg. No. 74,290) and **Yangbeini Wang** (Reg. No. 80,005) as its back-up counsel, all at the address: STERNE, KESSLER, GOLDSTEIN & FOX

P.L.L.C., 1101 K St., N.W., Washington, D.C. 20005; phone number: (202) 371-2600.

SERVICE INFORMATION: 37 C.F.R. § 42.8(b)(4)): Please direct all correspondence regarding this Petition to counsel at the email addresses: jasone-PTAB@sternekessler.com, isoule-PTAB@sternekessler.com, bwang-PTAB@sternekessler.com, and PTAB@sternekessler.com.

GROUND FOR STANDING (37 C.F.R. § 42.104(a)): Petitioner certifies that the '760 patent is available for IPR and Petitioner is not barred or estopped from requesting IPR of any '760 patent claim.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.

/Jason D. Eisenberg/

Jason D. Eisenberg, Reg. No. 43,447
Ian Soule, Reg. No. 74,290
Yangbeini Wang, Reg. No. 80,005
Counsel for Petitioner US Conec Ltd.

Date: January 3, 2024

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XV. APPENDIX A: CHALLENGED CLAIMS

1. **[1.P]** 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;

[1.2.1] and [1.2.2] 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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

16. The optical connection system as set forth in claim 15, wherein the receptacle comprises a rectangular perimeter wall.

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.

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

1. This Petition for *Inter Partes* Review complies with the type-volume limitation of 14,000 words, comprising 12,712 words, excluding the parts exempted by 37 C.F.R. § 42.24(a)(1).

2. This Petition for *Inter Partes* Review complies with the general format requirements of 37 C.F.R. § 42.6(a) and has been prepared using Microsoft® Word 2016 in 14-point Times New Roman font.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.

/Jason D. Eisenberg/

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Registration No. 43,447
Lead Counsel for Petitioner US Conec Ltd.

Date: January 3, 2024

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CERTIFICATE OF SERVICE (37 C.F.R. §§ 42.6(e), 42.105(a))

I certify that the above-captioned **PETITION FOR *INTER PARTES***
REVIEW FOR U.S. PATENT NO. 11,415,760 and associated Exhibits 1001-1027
were served in their entireties upon the Patent Owner on January 3, 2024, via
FedEx® Express at the following addresses:

SENKO ADVANCED COMPONENTS, INC.
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Hudson, MA 01749
Patent Owner's Correspondence Address of Record for U.S. Patent No. 11,415,760

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Minneapolis, MN 55402
Additional Address Known to Petitioner as Likely to Effect Service

STINSON LLP
7700 Forsyth Blvd., Suite 1100
St. Louis, MO 63105
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Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.

/Jason D. Eisenberg/

Jason D. Eisenberg
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Date: January 3, 2024

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