Paper No. 1

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

COMMSCOPE TECHNOLOGIES LLC
Petitioner

v.

BELDEN CANADA ULC
Patent Owner

Case IPR2024-_____
U.S. Patent No. 11,740,423

PETITION FOR *INTER PARTES* REVIEW OF U.S. PAT. NO. 11,740,423 UNDER 35 U.S.C. §§ 311-319 AND 37 C.F.R. § 41.100 ET SEQ.

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Mandatory Notices

A. Real Parties-in-Interest

CommScope Technologies LLC, CommScope, Inc. of North Carolina, CommScope, Inc., are the real parties-in-interest.

B. Related Matters

The challenged patent was asserted against petitioner CommScope Technologies LLC in an amended complaint in *Belden Canada ULC v. CommScope, Inc. et al.,* Case No. 1:23-cv-00810-RGA (D. Del.) (served August 30, 2023).

C. Lead and Back-Up Counsel

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D. Service Information

Please address all correspondence and service to both counsel listed above. Petitioners consent to service at the email addresses listed.

Preliminary Matters

A. Standing

Petitioner certifies IPR is available for the '423 Patent; Petitioner is not barred or estopped.

B. Identification of Challenge

Petitioner requests invalidation of claims 1-30.

	Claims	Basis for Unpatentability
Ground 1	1-30	Anticipated or obvious based on Fukui alone
Ground 2	1-30	Obvious: Fukui combined with Sauter
Ground 3	1-30	Obvious: Sauter combined with Dagley
Ground 4	1-30	Obvious: Sauter with Dagley in further light of Fukui
Ground 5	7, 15, 25	Obvious: Either of Grounds 4 or 5 in further combination with Laarveld

C. Supporting Declaration

Petitioner submits a declaration from Dr. Stephen Ralph (EX1003).

D. Fees

Petitioner authorizes the Patent Office to charge Deposit Account No. 502880 for the fee in 37 C.F.R. § 42.15(a) and any other fees.

Introduction

The ‘423 patent claims a tray for a modular fiber optic cassette system. The claims refer to the conventional elements of a “tray”, “cassettes”, and “receptacle modules.” The claims also recite limitations about the width of the cassettes and the tray being able to fit different configurations of cassettes. The examiner allowed the claims in a first action allowance.

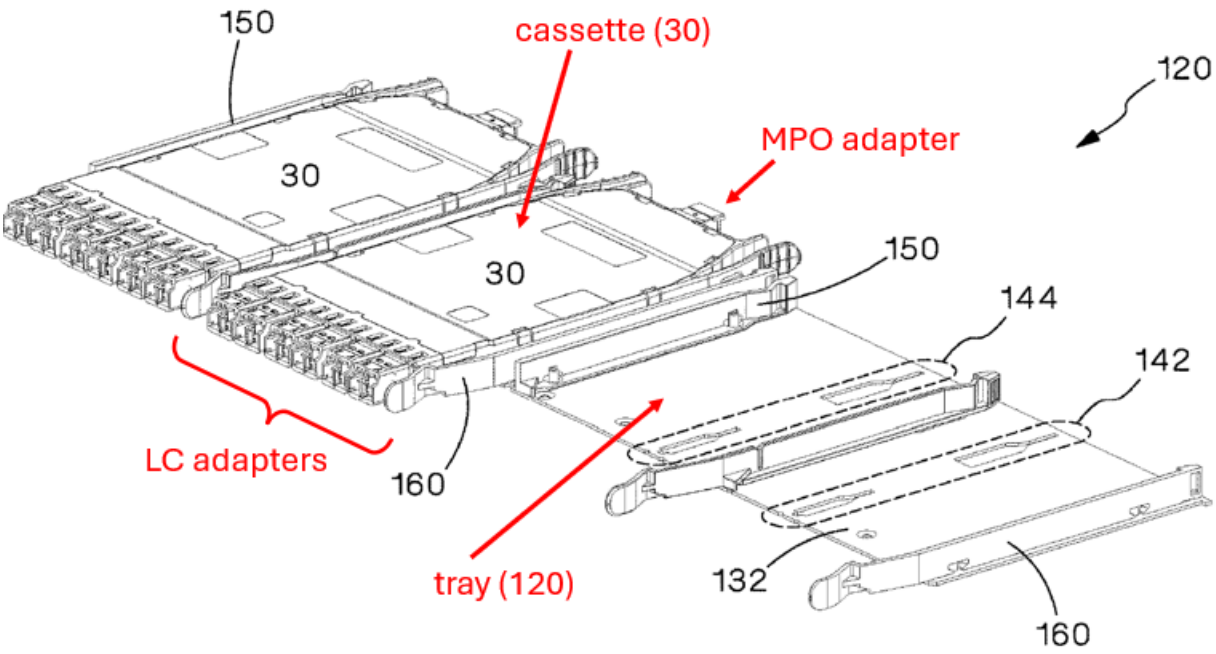
“Fukui” is a new reference. It discloses making cassette modules with different widths based on multiples of a unit width and configuring the tray to fit different combinations of the cassette modules.

The petition also identifies an alternative ground based on “Sauter.” In the co-pending litigation, Patent Owner now reads the claims for infringement on rail-based systems. Patent Owner’s claim constructions read right on Sauter.

Technology Background

The technology here is fiber optic cassette systems. These systems are deployed in data rooms where fiber optic cables are distributed to many subscriber connections.

The conventional elements include a tray and cassettes (also called modules). The “Sedor” prior art reference, disclosed during prosecution, shows these elements:



EX1005, Fig. 8. A cassette has a multifiber "MPO" adapter port on the rear and individual fiber "LC" adapter ports on the front for connecting fiber optic cables. The operator typically mounts the tray in a case in a rack.

Summary of the Challenged Patent

A. The '423 patent

The '423 patent discloses a modular fiber optic cassette system. EX1001, 1:22-24, 7:48-63. Figure 1 is illustrative:

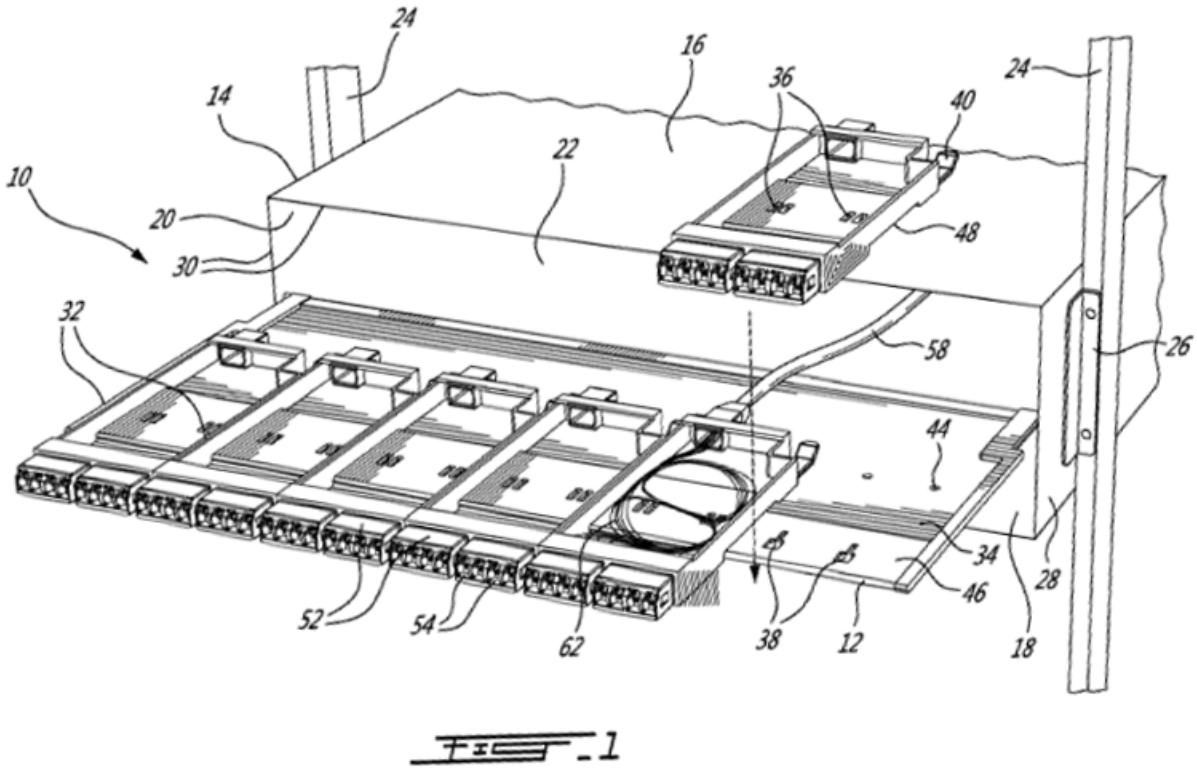


Fig. 1

EX1001, Fig. 1. The cassettes snap into apertures (44) on the tray. EX1001, 7:67-8:12.

The system accommodates cassettes with different widths. Each width is an "integer multiple" of a standardized width unit "W." EX1001, 8:39-42. The different multiples are W, 2W, 3W, 4W, and 6W. EX1001, 8:39-56.

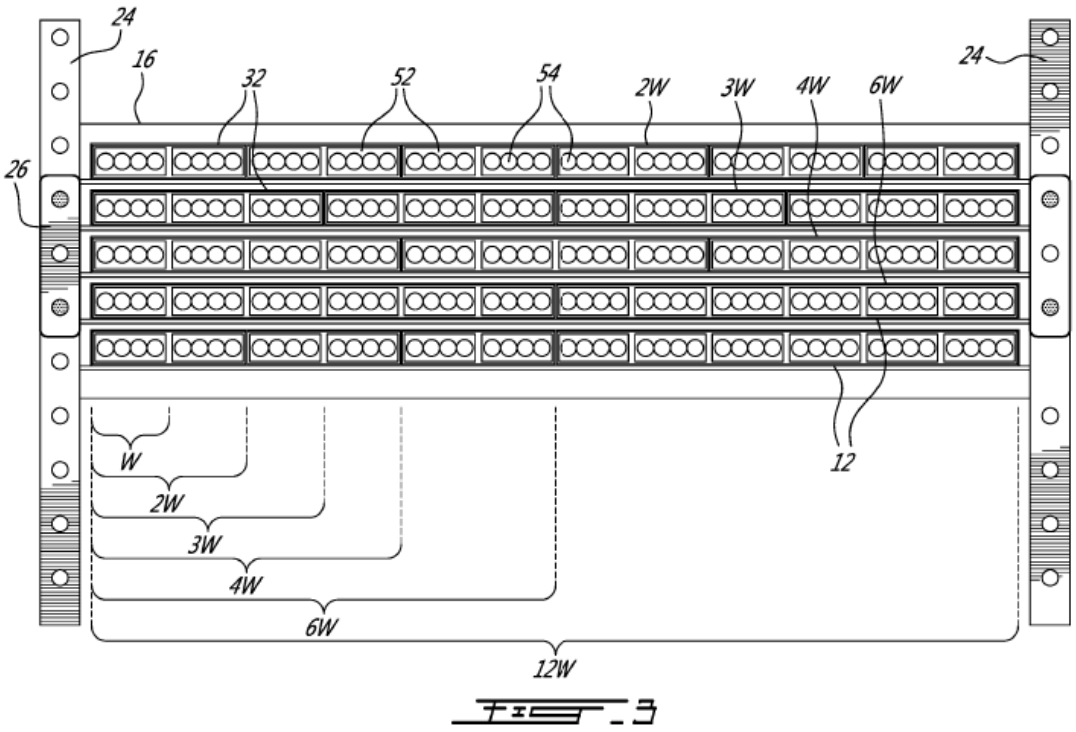


Fig. 3

EX1001, Fig. 3. In the preferred embodiment, the width W is based on an "LC Quad" technology footprint. EX1001, 8:57-60, Figs. 2A-2B. Numeral 52, below, is an LC quad receptable module with four individual LC ports 54:

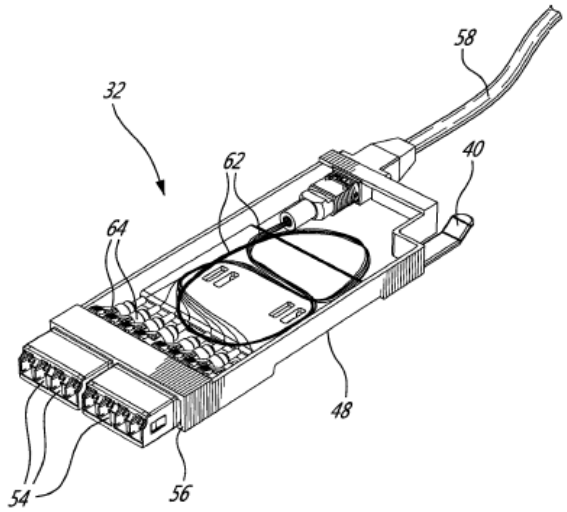


Fig. 2A

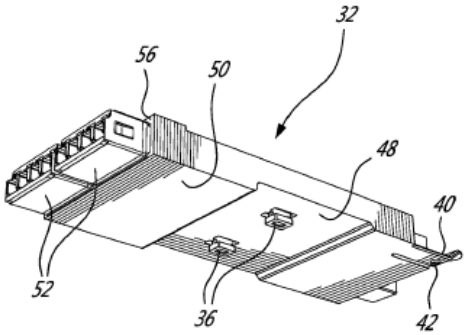
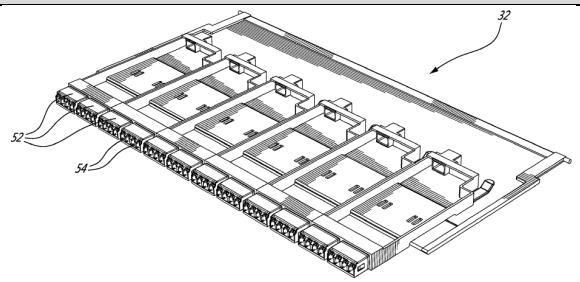
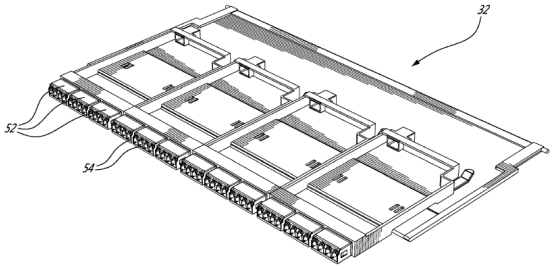
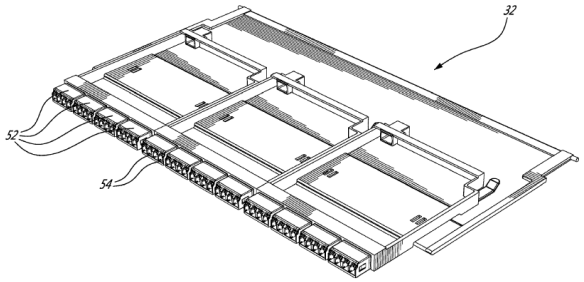
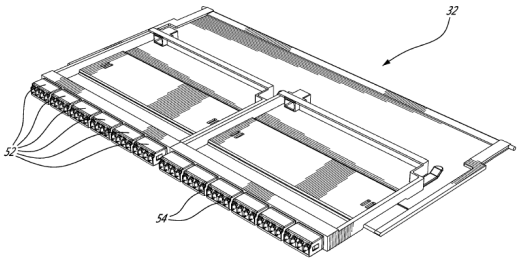


Fig. 2B

EX1001, 8:13-17.

Figures 4A-4D shows the 2W, 3W, 4W, 6W sizes:

2W Cassettes	3W Cassettes
	
4W Cassettes	**6W Cassettes**
	

EX1001. The purpose of the different sizes is to support "different numbers of optic fibers" (i.e., input cables plugged in the rear can have larger/smaller numbers of fibers). EX1001, 8:36-38; 8:67-9:4.

B. Claims

There are three independent claims (1, 9, 17). Each claims a tray that fits multiple configurations of cassettes having different cassette widths. Claim 17 is the broadest.

C. Prosecution History

This is the fourth patent in a line of continuations. The '423 patent issued after a first action allowance due to a substantial prior discussion in an earlier

continuation. During the prosecution of the first continuation (EX1002), PO and the examiner extensively discussed two limitations at issue here:

(a) *"standard width unit"* and the meaning of the cassettes having widths that are multiples of the standard width unit (relevant to all independent claims here)

(b) *"directly adjacent"* (relevant to dependent claims 5, 13, 27).

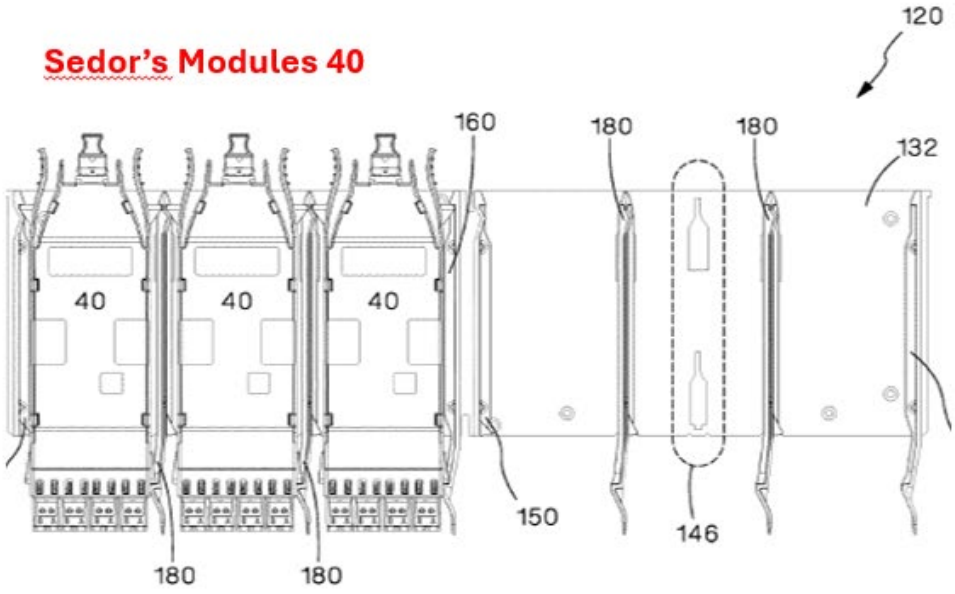
Below is a summary of the relevant prosecution history in the first continuation (U.S. Patent No. 11,435,542).

1. Prosecution history from the first continuation

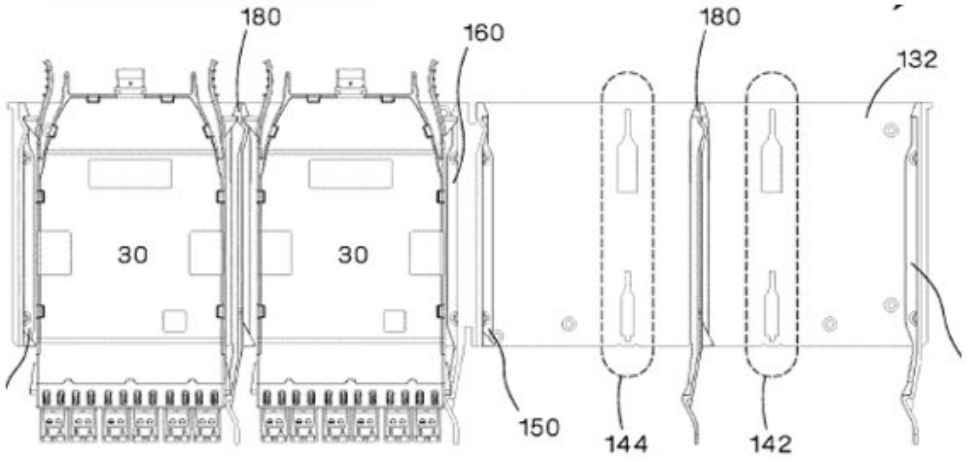
The applicant presented claims in the first continuation that, like the claims here, required a tray with different size cassettes where the width of the cassettes was two, three, four, or six standard width units. EX1002, 17. The claims also required the cassettes be "directly adjacent" to each other on the tray. *Id.*

First office action. The examiner rejected the claims as anticipated by Sedor. EX1002, 81-83. Sedor disclosed three sizes of cassettes:

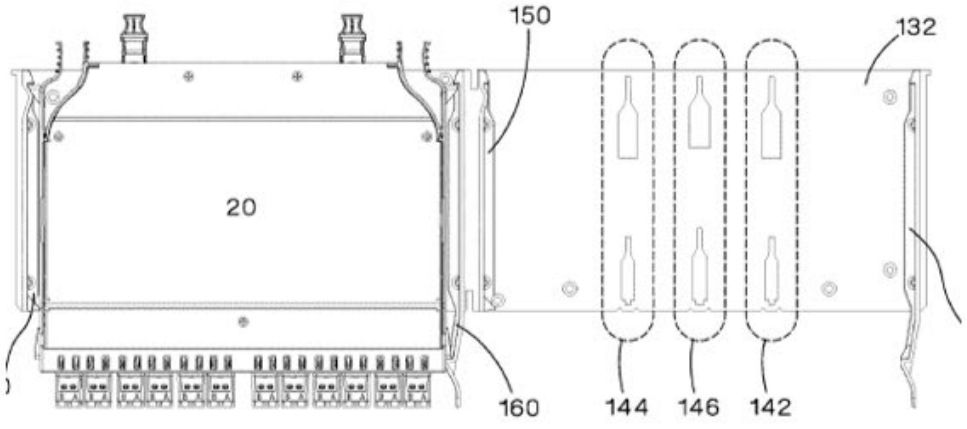
Sedor's Modules 40



Sedor's Modules 30



Sedor's Module 20



EX1005, Figs. 7, 9, 11 (cropped). The examiner identified modules 30 (top) as having a width of two standard width units and modules 40 (middle) as having a width of three standard width units. EX1002, 1002.

The examiner explained his understanding of the *"standard width unit"*:

> It is of note, for purposes of Sedor et al, one standardized width unit accommodates four receptacles, as in the current invention.

EX1002, 83. He also explained his understanding of "*directly adjacent"* as not precluding intervening structures between objects. EX1002, 83.

In response, PO argued the width of Sedor's cassettes did not meet the claim language about two, three, four, or six standard width units because they included the additional amount of width due to the presence of a rail. EX1002, 134. PO presented a math equation:

> 3*2U + 2*(width of rail) = 2*width of 12-optical fiber modules (40) + width of rail, or width of 12-optical fiber modules (40) = 3U + ½ the width of a rail (180).
>
> Clearly, therefore, Sedor et al. fails to disclose a system where the cassettes have the dimensions of the those as claimed at Claim 1.

EX1002, 134. These equations showed that the width of the second module (40) did not equal three units (3U) exactly but rather included the additional amount of "+ ½ the width of a rail." *Id.* PO also emphasized that the modifier "directly"

before “adjacent” was “clearly” intended to “exclude any intervening structure” such as a “rail.”

> Additionally, the optical fiber modules cannot be said to be directly adjacent to at least one other selected cassette. In this regard, Applicant notes that all of the modules of Sedor et al. are separated by a rail. Applicant also notes that according to the Examiner, on a broadest reasonable interpretation, “directly adjacent” would not preclude an intervening structure between the objects. Applicant respectfully disagrees. Indeed, such an interpretation effectively assigns no weight to the adjective “directly”. Applicant also submits that a person of ordinary skill in the art would clearly understand that the modification of adjacent by “directly” was clearly intended to exclude any intervening structure, and such that, although the cassettes may be separated by a relatively small gap, cassettes which are “directly adjacent” are almost touching or touching without any intervening structure.

EX1002, 135 (emphasis in original).

Second office action. The examiner issued a final rejection. The examiner reasoned that the unit width of the modules merely referred to the number of receptable modules on the modules and again that “directly” adjacent did not preclude intervening structure. EX1002, 142-143, 145.

In response, PO clarified that the standard width limitation did not refer to the number receptacles:

> Applicant respectfully disagrees with the Examiner's characterization of width and her finding that paragraph [0015] defines the width in terms of the number of receptacles. Indeed, nowhere does the speciation define width in such a fashion. In particular, such a definition of width makes no sense when viewed in respect to Claim 8, and where the standard width is defined in terms of a width of a front edge of a tray on which the cassettes are secured.
>
> Clearly, therefore, a person of ordinary skill in the art would understand that the width of a cassette is simply the width of the cassette from side to side and not some other "dimension" such as the number of receptacles or the like.

EX1002, 187. PO then repeated the same math equation to show Sedor's cassettes did not equal three units (3U) exactly but rather included the additional amount of "+ ½ the width of a rail." EX1002, 188. PO also reemphasized that "directly" adjacent "clearly" does "exclude any intervening structure" such as a "rail." EX1002, 188.

Advisory action. The examiner issued an advisory action maintaining his rejections. EX1002, 195.

In response, the claims were amended to require the cassette widths be "measured between the outer sides edges thereof" to emphasize the clarification from the last response that the cassette width is the width from side to side and not the number of receptacles. PO repeated its math calculation arguments:

> rail (180). As such, its clear that each of the two 12-optical fiber modules would not have a width 3U, as required in order to fall within the scope of Claim1 as amended, but rather a width of 3U plus the width of ½ the rail.

EX1002, 208-209. The examiner allowed the claims. EX1002, 221-222.

2. Present application prosecution (EX1039)

The notice of allowance repeated the examiner's understanding that Sedor was the most applicable prior art. EX1039, 96

D. Related IPR proceedings

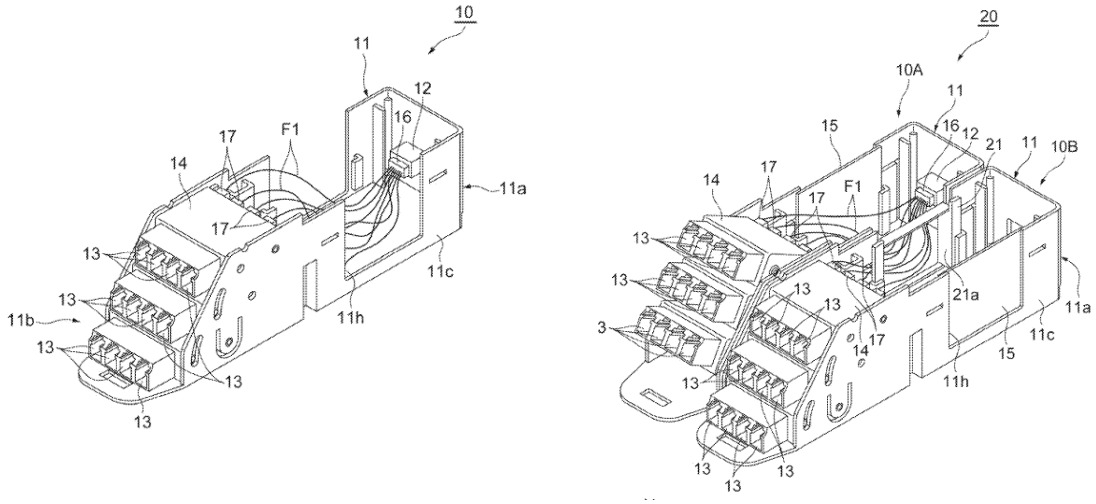
Petitioner filed IPR Petitions against PO's earlier patents in the family. IPR2024-01218, IPR2024-01227, IPR2024-01228.

Summary of the Asserted Prior Art

A. Fukui (EX1004)

Fukui is a new reference. It is U.S. Patent No. 10,101,551, which is 102(a)(2) prior art.

Fukui discloses a modular fiber optic system based on module 10. EX1004, Figs. 1-5, 4:60-7:22. Module 10 can be used individually or coupled to form larger modules. EX1004, 7:25-29, 8:1-6. Figure 1 shows one module 10, and Figure 5 shows two modules 10A and 10B coupled to form a larger module 20:



EX1004, Figs. 4-5. Fukui's text broadly discloses a "plurality of coupled unit modules," i.e., two or more coupled modules, including expanding to any "required number" of coupled unit modules. EX1004, 8:2-6. The coupled units function as "one body." *Id.* Fukui had the further insight to increase the height to support three rows in the height dimension, but that is irrelevant because the challenged claims recite limitations on the width.

Like PO's preferred embodiment, Fukui explains that the purpose of coupling module 10 is to support cables with "various" numbers of "cores" (i.e., fibers), including 12, 24, 36, 48, etc. EX1004, 3:27-28, 4:2-3, 4:42-43, 9:58-59, 10:4-6, 10:34-35; EX1003 ¶39, ¶47. One module 10 can support a cable with 12 fibers. EX1004, Fig. 1 (showing 12 adapter ports). Two coupled modules 10A and 10B can support a cable with "24" fibers. EX1004, Fig. 5 (showing 24 adapter ports), 7:60-67 ("24"). Fukui further explains the modules can support larger sizes

"such as" 36 and 48 cores according to "the number of coupled unit modules," i.e., three of four coupled unit modules. EX1004, 7:67-8:6.

Fukui's modules 10 can be coupled together because every module has detachable shutters 15 to form an opening in the walls on each side. EX1004, 6:33-35, 7:35-51, 9:44-50. Figure 1 shows the right shutter (yellow), and Figure 4 shows both shutters removed:

Fig.1

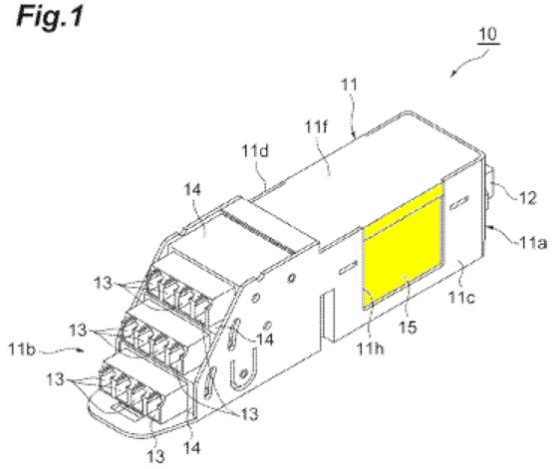
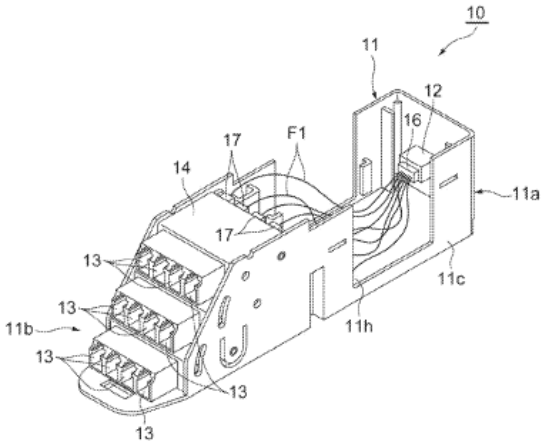
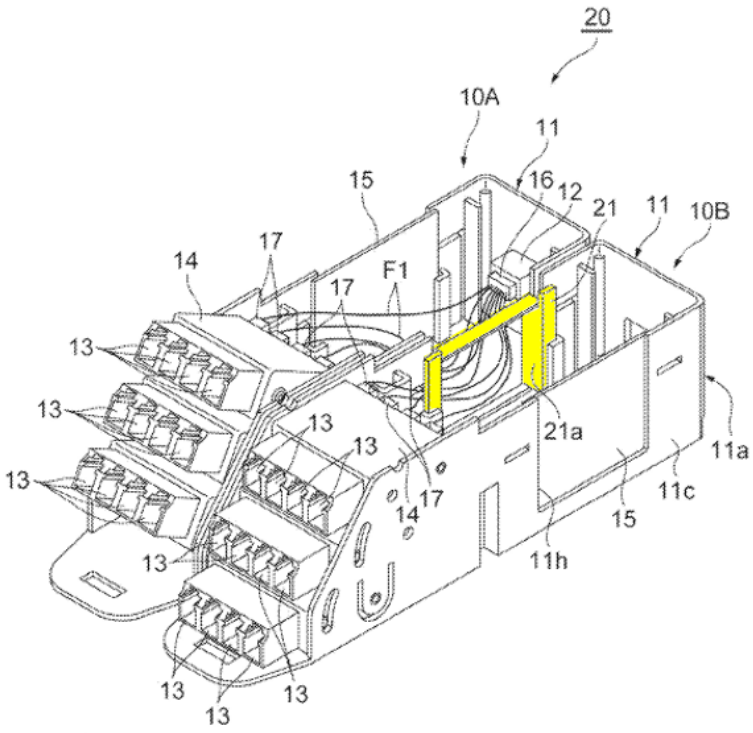


Fig.4



A coupling member (21) is inserted in place of the shutter. EX1004, 7:34-51.

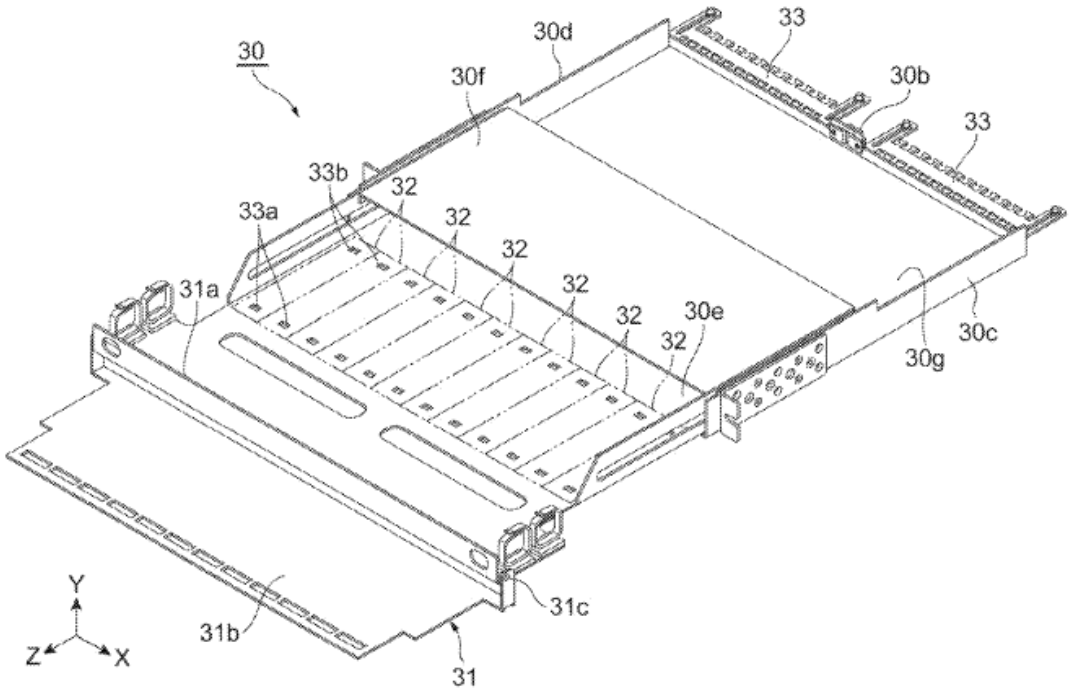
Fig.5



The two coupled units function as "one body." EX1004, 8:2-3. Fibers "pass through" the opening in the middles to second module. EX1007, 7:52-67. The other shutters can be removed to couple additional unit modules.

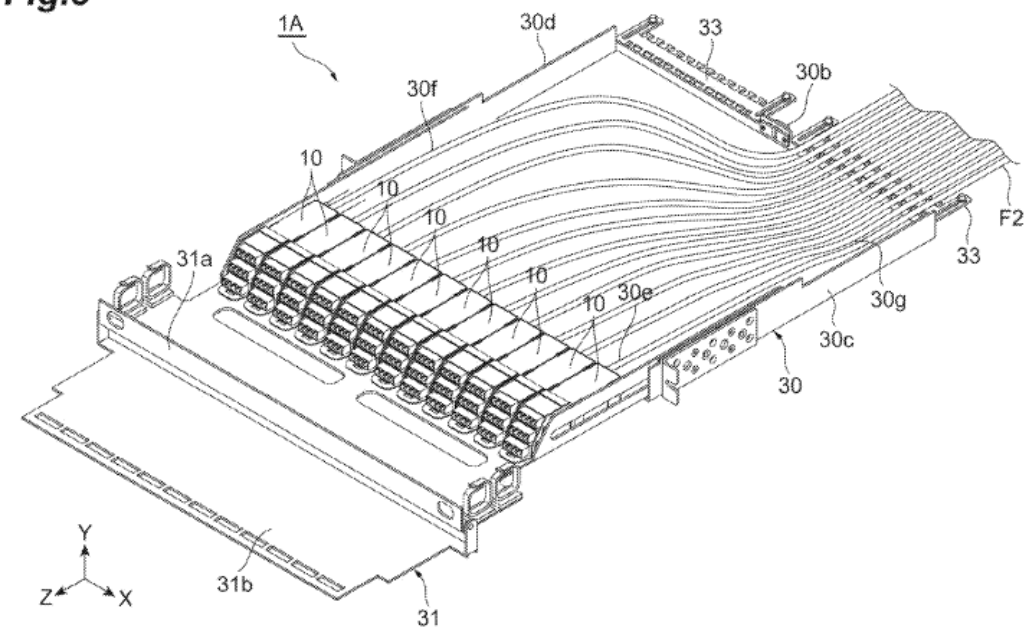
Fukui does not use rails. Fuki's modules have "hooks" on the bottom that attached to "holes" (33a, 33b) on the bottom panel (30e) of the tray that has twelve areas for attaching the modules:

Fig.9



EX1004, Fig. 9, 8:49-56. Figure 8 shows the modules attached:

Fig.8



B. Sauter (EX1006)

Sauter is U.S. Patent No. 9,690,064, which is 102(a)(2) prior art. It is art of record but was never discussed.

Sauter explains his system allows "multiple different sizes of cassettes." EX1006, 1:28-29, 51-58; 4:7-14; 9:60-63. Sauter uses "single-gang" for the smaller cassette size and "multi-gang" for the larger cassette sizes. The larger "multi-gang" sizes are wider than the single gang by a "factor." EX1006 4:54-61. For example, Sauter's "double-gang" cassette "is approximately twice as wide as a single-gang cassette" and a "triple-gang" cassette which is approximately "three times as wide as a single-gang cassette." EX1006, 4:54-61; 6:47-56; 7:3-19; 7:38-47, 63-66.

Figures 5, 6 and 7 shows examples of single-gang cassettes and double-gang cassettes:

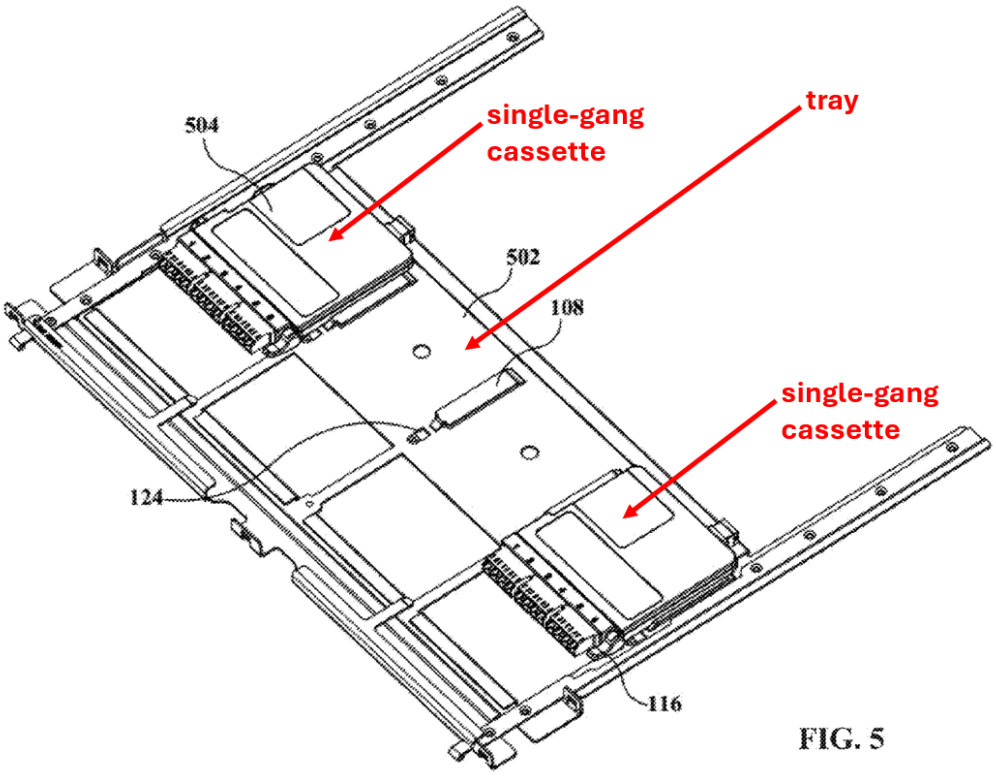


FIG. 5

EX1006, Fig. 5.

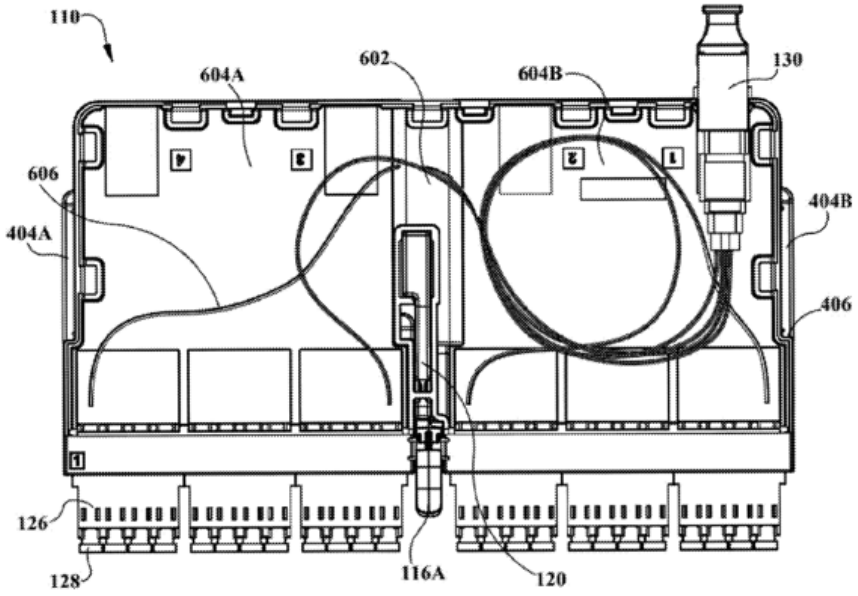


FIG. 6

double-gang cassette

EX1006, Fig. 6.

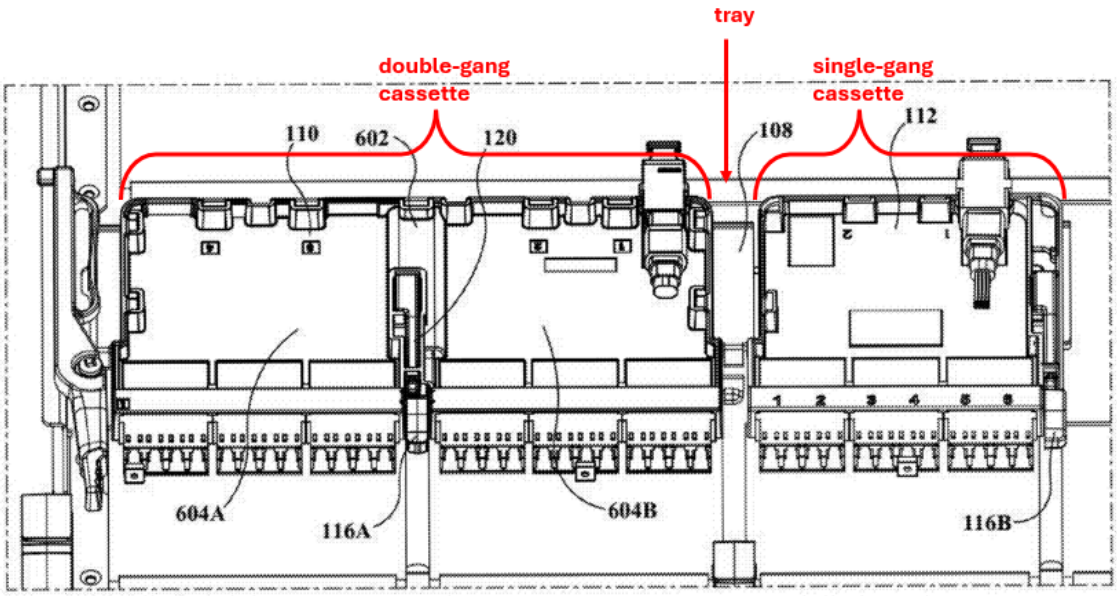


FIG. 7

EX1006, Fig. 7.

C. Dagley (EX1030)

Dagley is U.S. Patent App. Publication No. 2017/0192191, which is 102(a)(1)-(2) prior art. It was never discussed during prosecution.

Dagley discloses fiber optic tray solutions that allow migrating between cassette sizes for BASE-8 and BASE-12 systems. EX1030, Title, ¶0005, ¶¶0047-0048, ¶0094. Dagley shows a BASE-8 cassette having eight LC ports:

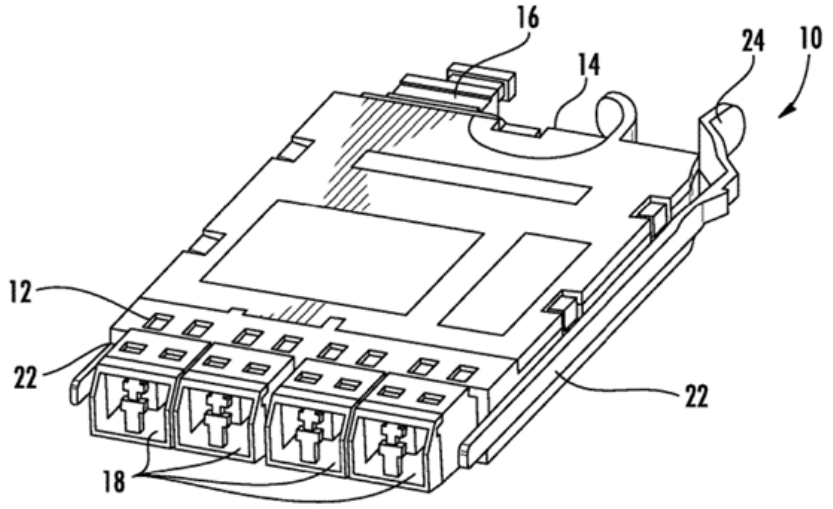


FIG. 1A

Dagley also discloses that it is desirable to support both BASE-8 and BASE-12 cassettes in the same row in a tray system. EX1030 ¶0094.

Claim Construction

Petitioner believes the plain meaning is enough to resolve at least the lead Fukui grounds

Petitioner notes the following disputes in the district court action. Fukui discloses the disputed language under either construction. The parties' initial claim construction briefs are Exhibits EX1041 and EX1042.

A. "two," "three," "four," and "six" standard width units

The independent claims require cassette widths that comprise a "standard two width (2W) unit," "standard three width (3W) unit," "standard four width (4W) unit," and "standard six width (6W) unit." EX1001, claims 1, 9, 17. The claims also recite a "standard one width (1W) unit." *Id.*

There are essentially two disputes between the parties: (1) does this claim language merely require counting receptacle modules and (2) does the claim language allow fractional amounts (e.g., 3.2 standard width unit)?

PO proposes the claim merely refers to counting receptacle modules. PO proposes "standard one width unit" refers to a "unit of width that accommodates a single receptacle module…" EX1011, 8. Likewise, PO proposes the other sizes refer to "a unit that accommodates two receptacle modules," "a unit that accommodates three receptacle modules", "a unit that accommodates four receptacle modules, and "a unit that accommodates six receptacle modules." EX1011, 13-14.

The claim language cannot merely require counting receptacle modules because PO expressly rejected that during prosecution:

> Applicant respectfully disagrees with the Examiner's characterization of width and her finding that paragraph [0015] defines the width in terms of the number of receptacles. Indeed, nowhere does the speciation define width in such a fashion. In particular, such a definition of width makes no sense when viewed in respect to Claim 8, and where the standard width is defined in terms of a width of a front edge of a tray on which the cassettes are secured.
>
> Clearly, therefore, a person of ordinary skill in the art would understand that the width of a cassette is simply the width of the cassette from side to side and not some other "dimension" such as the number of receptacles or the like.

EX1002, 187. PO unequivocally stated in the last sentence that "clearly" that width is "not some other 'dimension' such as the number of receptacles." *Id.*

Rather, the plain language requires the actual width of the cassette, measured from side to side, equal an integer multiple of the "standard" width unit where "standard" refers to an actual width standardized in the industry. EX1042, 5-22. The plain language does not cover cassette widths of fractional amounts (e.g., 3.2 standard width units). The independent claims recite specifically "one," "two," "three," "four," and "six" standard with units. PO also distinguished Sedor during prosecution as discussed above because it did not mathematically equal 3U but rather included an additional amount (3U + ½ the width of a rail).

Therefore, Petitioner's proposed constructions in district court are: (1) "Each of the modular fiber optic cassettes has a cassette width that equals two, three, four, or six times the standard one width unit, without an additional amount. This means the cassette widths must be evenly divisible by the standard width unit" and (2) "A standard width unit means an actual width that is standardized in the industry. For example, the width of an SC Duplex footprint."

B. "directly adjacent"

The dispute in district court is whether PO disclaimed arrangements with intervening rails. Both parties have proposed that "directly" adjacent means "almost touching or touching" and excludes "any intervening structure," but PO opposes any suggestion this excludes rails. EX1011, 21; EX1042, 29-31. But excluding "any" intervening structure (as even PO proposes) certainty excludes

rails—"any" is comprehensive. Furthermore, PO made a clear disclaimer during the prosecution of the first continuation. PO, as quoted above, used underlining to specifically contrast the term "directly" with use of a "rail." EX1002, 134-35, 187.

C. "each of the plurality"

Claim 9 recites: "wherein each of the plurality of different modular fiber optic cassette configurations includes a plurality of different sizes of modular fiber optic cassettes." Claim 9 then defines "the plurality" to include first, second, third, fourth, and fifth configurations. Due to the plain language "each," Petitioner's construction in district court states: "This requires each of the first, second, third, fourth, and fifth modular fiber optic cassette configurations includes a plurality of different sizes of modular fiber optic cassettes." EX1042, 31-33. PO suggests the claim only requires the "fifth" configuration to include different sizes of cassettes. EX1011, 28.

Level of Ordinary Skill

A person of ordinary skill in the art (POSITA) would have a B.S. degree or equivalent in mechanical or electrical engineering or similar fields, in addition to a minimum of two years of professional experience with or graduate studies involving design, development, and/or utilization of optical communication systems. EX1003 ¶¶19-21.

Discretionary Issues

Petitioners' grounds are not the same or substantially the same as any combination previously presented to the Patent Office. Fukui is a new reference.

Trial in the co-pending litigation between the parties is not expected within the next 18 months. This IPR also challenges a broader set of claims than are at issue in the co-pending litigation.

Argument

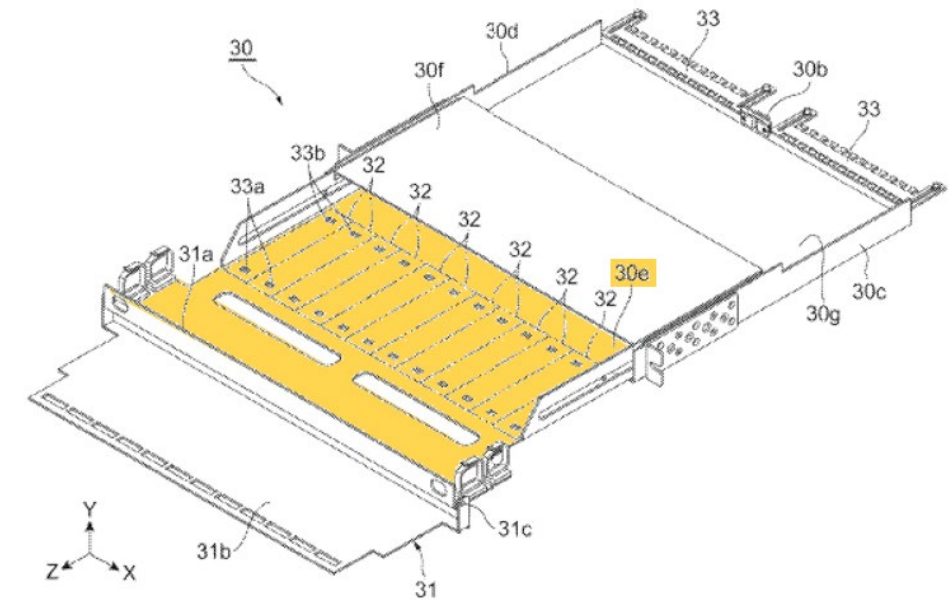
Ground 1: Fukui anticipates and renders obvious claims 1-30

A. Independent Claim 1

1. Preamble

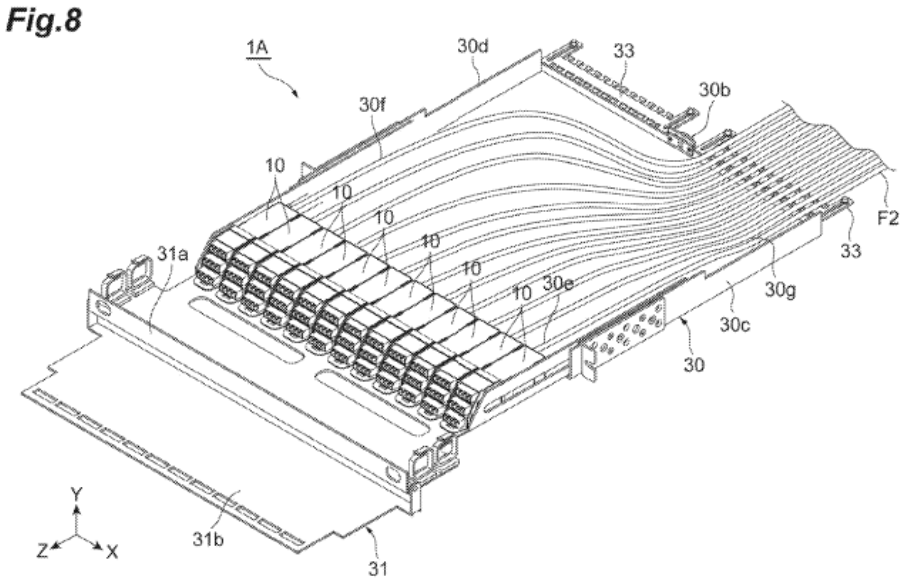
Fukui discloses each part of the preamble. First, Fukui's bottom panel 30e (orange) is a *"tray"*:

Fig.9



EX1004, Fig. 9, 8:45-48; EX1003 ¶45. Like PO's preferred embodiment, Fukui's tray is a flat panel upon which the Fukui's modules are arranged. EX1004, 8:30-32, 8:45-47; EX1003 ¶45.

Second, Fukui's tray provides for *"a plurality of different modular fiber optic cassette configurations."*. Fukui's tray has twelve areas (32) for placing modules and thus fits any configuration of modules where the total number of modules is less than or equal to twelve. EX1003 ¶50. For example, Figure 8 shows a configuration of twelve one-unit modules 10



EX-1004, Fig. 8. Fukui explains that any of these modules can be coupled together to form a different configuration such as six two-unit (double) modules 20. EX1004, 8:19-24, 9:38-43. Fukui also discloses more than two modules can be

coupled together to form other different configurations comprising larger sizes modules, which is disclosed below in Elements 1F and 1H. EX1004, 7:67-8-6.

Third, Fukui's modules are examples of *fiber optic cassettes*. EX1003 ¶¶46-49. Figures 4-5 shows Fukui's single and double module:

Fig.4

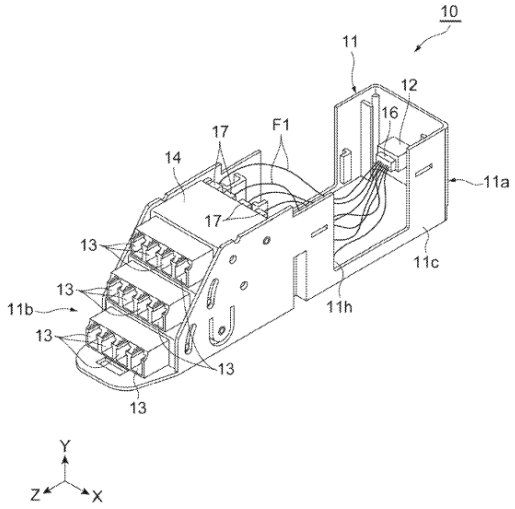
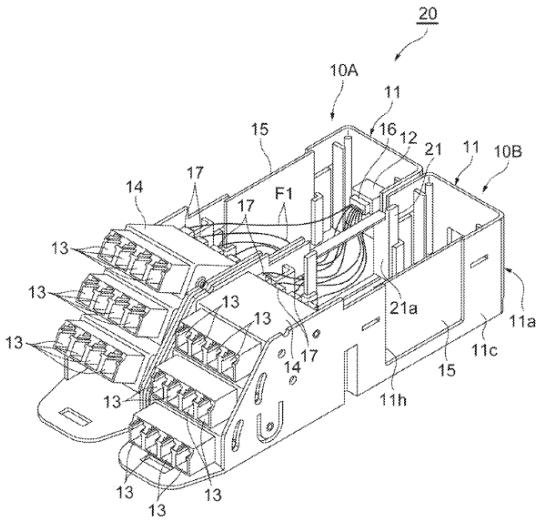


Fig.5



EX1004, Figs. 4-5, 5:12-42. Like PO's preferred embodiment, Fukui's modules have a multi-fiber MPO adapter (12) in the rear, LC adapters (13) in the front, and fibers (F1) interconnecting them. *Id.* Fukui's modules have a flat bottom with hooks such that the modules can be "easily fixed" to the tray. EX1004, Fig. 2, 8:52-56.

Fourth, Fukui tray is for *"a standard U-space fiber optic management system*." Fukui expressly teaches the system is for a "standardized…1U size." EX1004, 9:32-33, EX1003 ¶¶52-53. Figure 6-7 show Fukui's system:

Fig.6

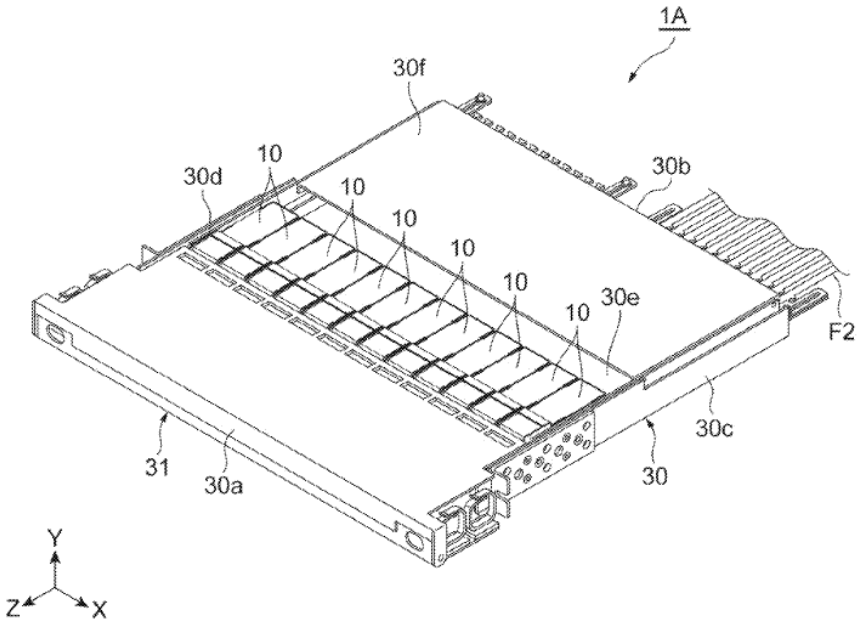
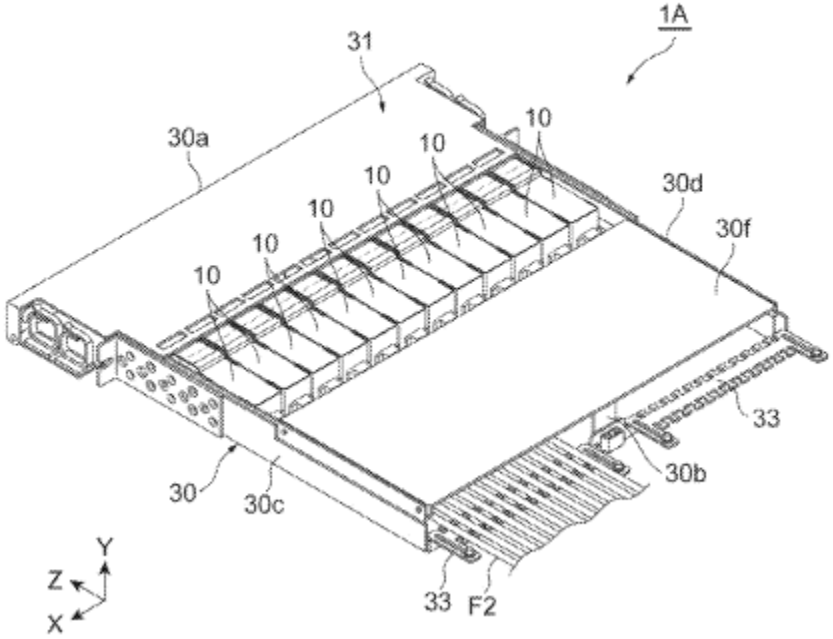


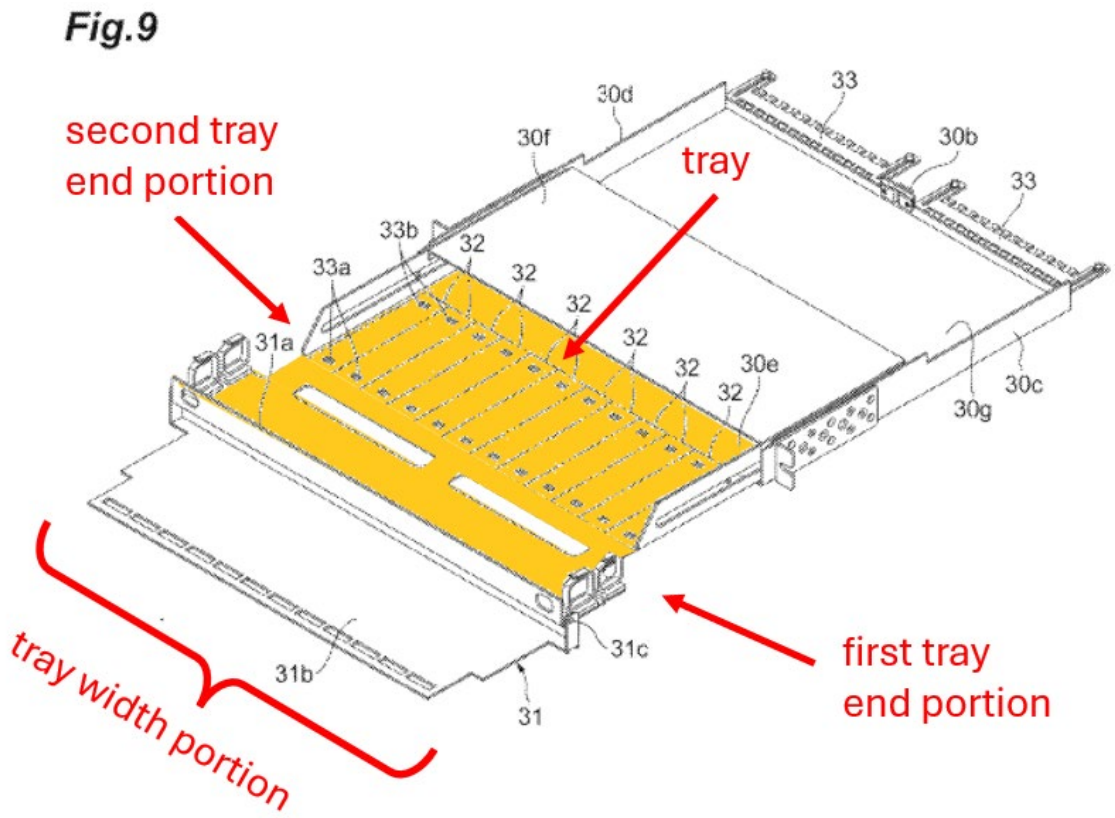
Fig.7



Fukui's system manages the cables (F2) with "various" numbers of cores. EX1004, 3:27-28, 4:2-3, 4:42-43, 9:58-59, 10:4-6, 10:34-35; EX1003 ¶54.

2. Element 1A

Fukui's tray (bottom panel 30e) has the features recited in this element:



EX-1004, Fig. 8-9, 8:30-32, 8:45-51; EX1003 ¶56.

3. Element 1B

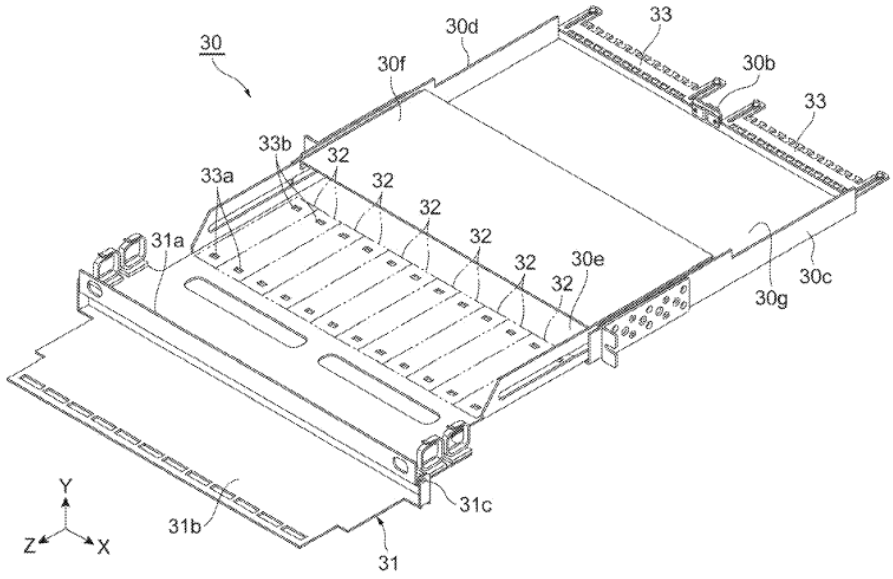
Fukui's tray's width fits within a "*standard U-space width dimension.*" Fukui explains that its tray and modules are "laterally aligned in a so-called 19-inch rack standardized by the Electronic Industries Alliance (EIA) in 1U size." EX1004, 9:32-38. This is a reference to the EIA/ECA-310-E standard that defines the 19-inch rack size and U space dimensions. EX1003 ¶¶60-62. Fukui's

disclosure is the same as PO's preferred embodiment. EX1001, 7:60-61 (a tray that fits a "19″ rack").

4. Element 1C

Element 1C repeats the language from the preamble. Fukui discloses this language for the same reasons discussed for the preamble. For example, Fukui's tray has twelve areas (32) for placing modules and thus fits any configuration of modules where the total number of modules is less than or equal to twelve (e.g., twelve one-unit modules, six two unit modules, etc.):

Fig.9

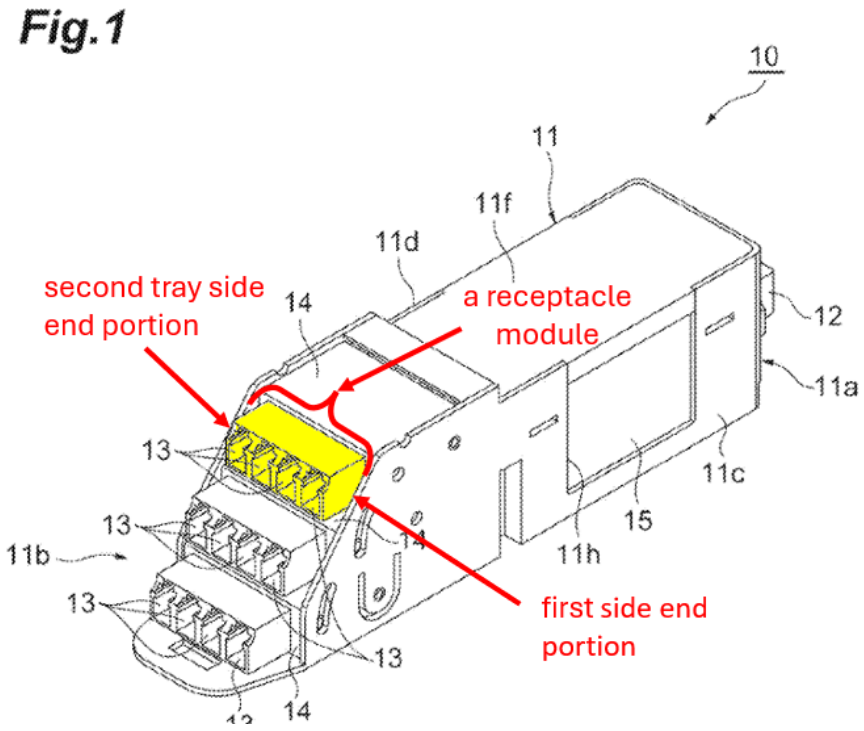


EX1004, Fig. 9, 8:19-24, 9:35-43 ("up to" 12 one unit modules, "up to" six two unit modules, a "combination"); EX1003 ¶65.

5. Element 1D

The analysis for the preamble explains that Fukui's modules are *"fiber optic cassettes"* as recited in this element. Fukui's modules, as the name suggest, are also *"modular"* because they can be coupled together to form larger cassettes and can be placed in any of the twelve areas (32) on Fukui's tray. EX1004, 7:25-29, 7:34-41, 7:65-8:6; EX1003 ¶67.

Fukui's modules are also configured to support a *"receptable module"* with the features recited in this element.[1] Figure 1 is exemplary:



[1] The parties agree "receptable" means "receptacle"." EX1011, 2.

EX1004, Fig. 1, 4, 5:24-42. Numerals 13 are "single-core optical connectors adapters" for an "LC connector." EX1004, 5:24-27. The four adapters 13 in each row are "made into one body," i.e., a quad LC adapter module. EX1004, 5:34-36; EX1003 ¶¶68-69. A quad LC module is the PO's preferred embodiment of the claimed receptacle module. EX1001, 8:57-60. Because each of Fukui's modules sizes comprises either a single module 10 or a number of the same modules 10 coupled together, each of Fukui's module sizes meet this element. EX1004, 7:27-28, 8:2-6. Element 1I shows this further.

6. Element 1E

Element 1E describes the relationship of the receptacle module in the prior element to a standard one width (1W) unit.

The relevant unit of width in Fukui's system is the width of module 10. EX1003 ¶73. Module 10 is the "unit" for all of Fukui's modules. For example, Fukui's expressly teaches the double module 20 comprises a first "unit" 10A and second "unit" 10B coupled together. EX1004, 7:26-27. Units 10A and 10B are the "same" as module 10. EX1004, 7:28-29, 8:3-6. Fukui explains that the modules can expand to larger sizes based on "the number" of coupled "unit modules." EX1004, 7:67-8:1. The width of module 10 is also the unit of width for tray, which has twelve evenly spaced areas for the modules 10:

Fig.9

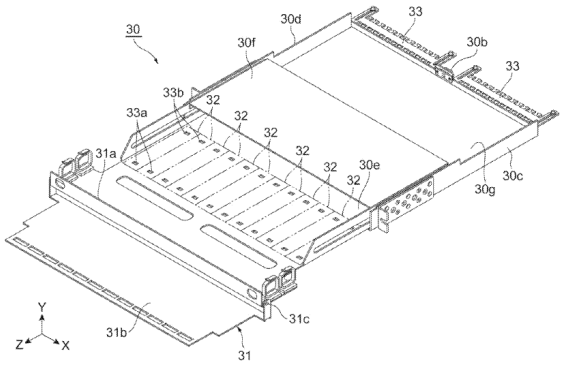
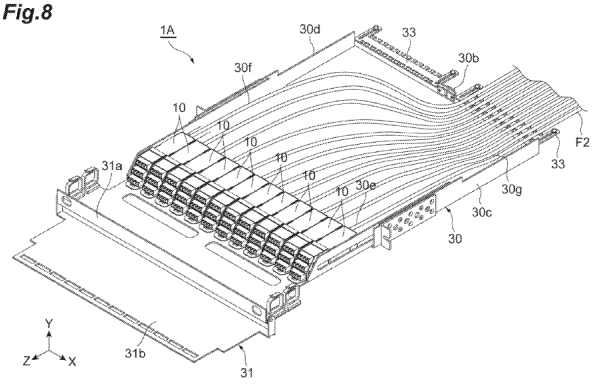


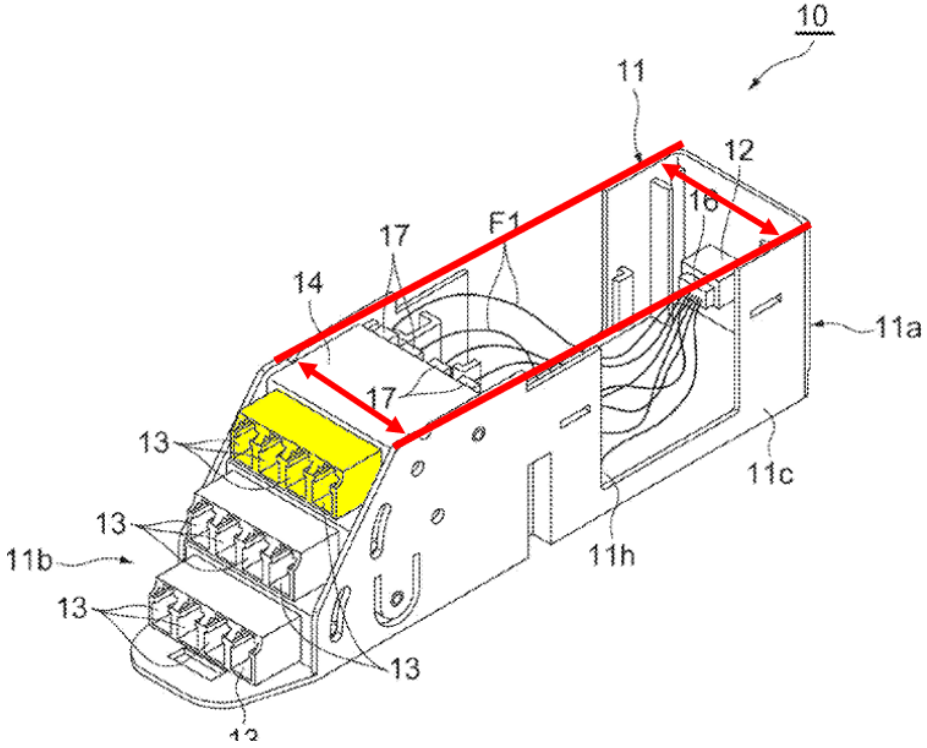
Fig.8



The width of Fukui's module 10 is a "standard" width unit because it is common for all of Fukui's modules and the tray and based on an actual width standardized in the industry. EX1003 ¶73; EX1009, 27. Element 1D, above, shows the width of Fukui's correspond to one LC quad adapter. The width of the LC quad adapter is standardized in the industry. *Id.* Thus, Fukui's *"one standard one width (1W) unit"* is the width of one module 10.

Fukui's receptacle module from the prior element is configured to fit within the width of one module 10:

Fig.4

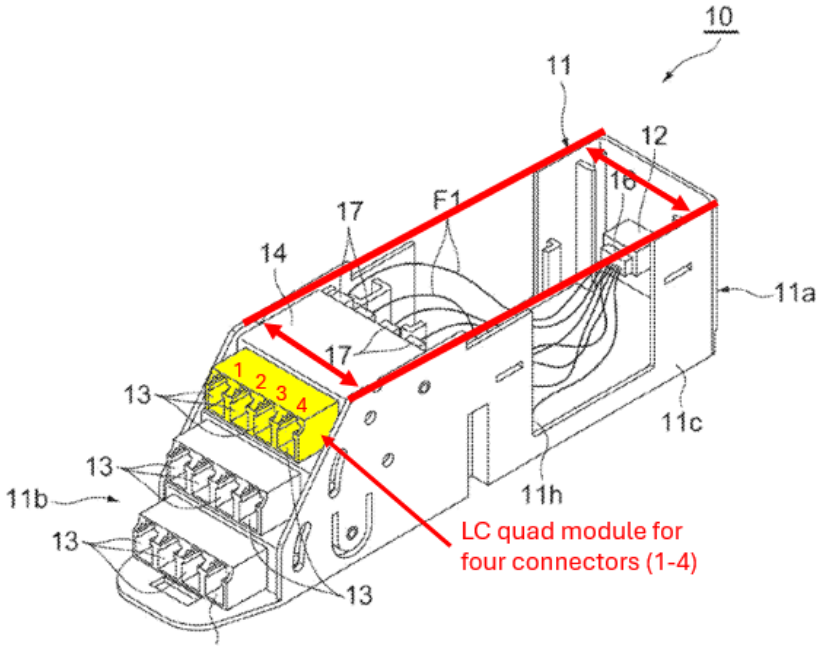


EX1004, Fig. 4.

Fukui's disclosure meets both proposed constructions in the litigation. EX1003 ¶¶74-76

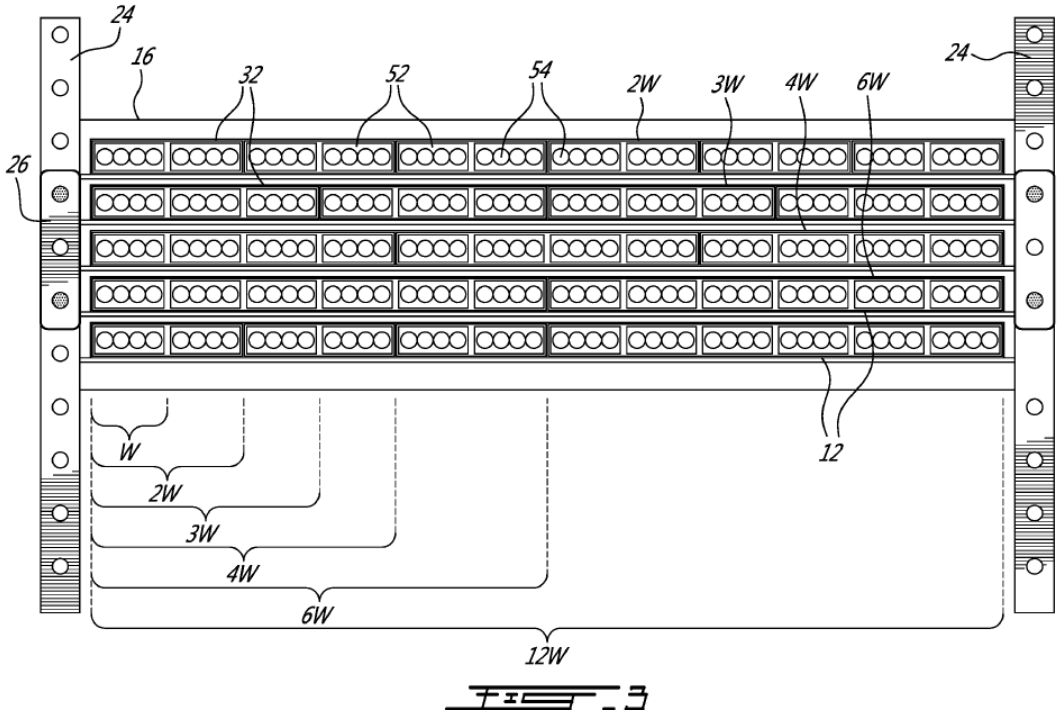
PO's construction. PO proposes that a standard one width (1 W) unit means "a unit of width that accommodates a single receptacle module, such as a LC Quad (SC Duplex) technology footprint comprising four connectors." EX1011, 8. The width of Fukui's module 10 "accommodates" a single LC quad module exactly as recited in PO's construction:

Fig.4



EX1004, 5:34-36.

If PO argues the height of Fukui's modules accommodates additional receptacles, that does not distinguish Fukui because the claim and PO's own construction state a limitation about the width, not the height. The specification also shows that the standard width unit is a *width* dimension, not a height dimension:



EX-1001, Fig. 3.

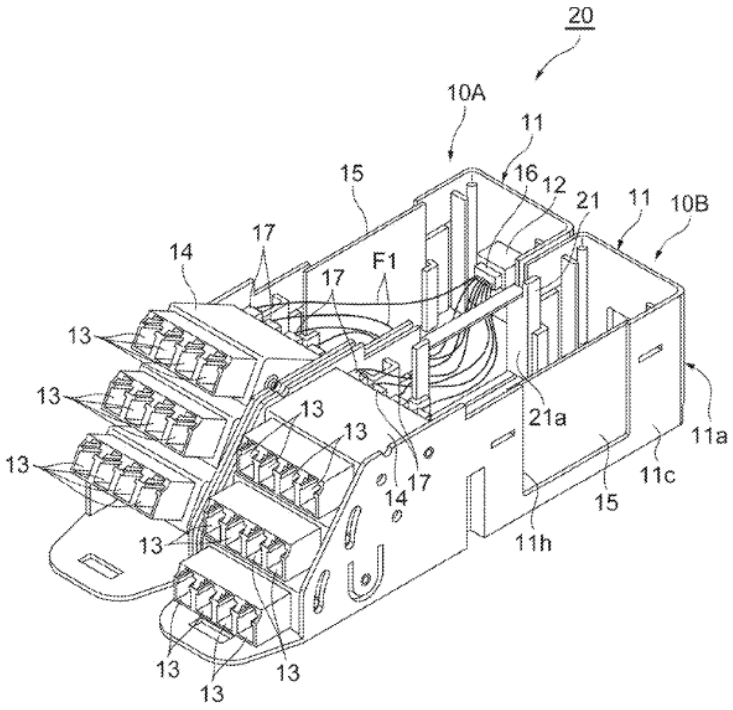
CommScope's construction. The width of module 10 also conforms to an actual width that is standardized in the industry (the LC quad footprint) as explained above.

7. Element 1F

This limitation requires that each of the cassettes comprise two, three, four, "or" six standard width units relative to the one width unit. Fukui discloses or renders obvious all these sizes. EX1003 ¶¶79-94.

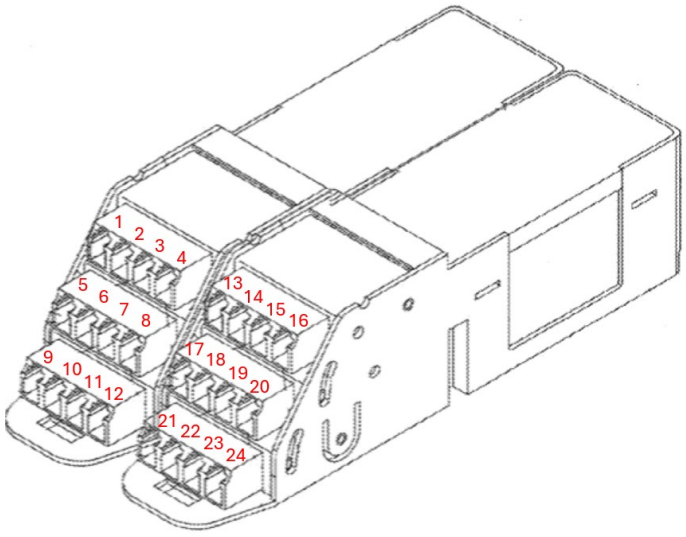
a standard two width (2W) unit

Fukui discloses to couple two unit modules together, which is an example of a 2W cassette.



EX1004, Fig. 5, 7:25-29. The two coupled units function as "one body." EX1004, 8:2-3.

By coupling two modules, Fukui explains the module can be expanded to support "24" cores because each of the two module supports 12 cores (2 x 12 = 24). EX1004, 7:65-67.



a standard three width (3 W) unit and a standard four width (4 W) unit

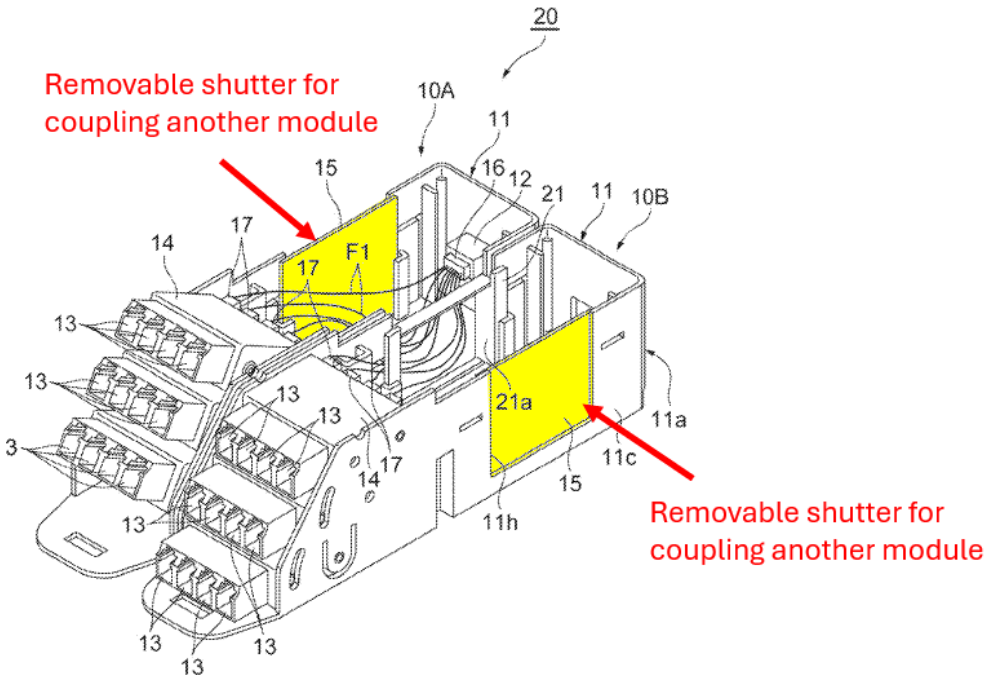
After teaching to expand to 24 cores, Fukui teaches to expand to larger sizes "such as" 36 cores and 48 cores according to "the number of coupled unit modules." EX1004, 7:67-8:2.

The "number" of coupled unit modules to support 36 cores is three. EX1003 ¶81. Because each unit module supports 12 cores, 36 cores requires 3 x 12 cores. *Id.* The "number" of coupled unit module to support 48 cores is four (4 x 12 = 48). *Id.* ¶82.

Fukui teaches to treat the plurality of coupled units as "one body," i.e., one cassette. EX1004, 8:2-3. Thus, the plurality of three coupled unit modules is one 3W cassette, and the plurality of four coupled unit modules is one 4W cassette. EX1003 ¶83.

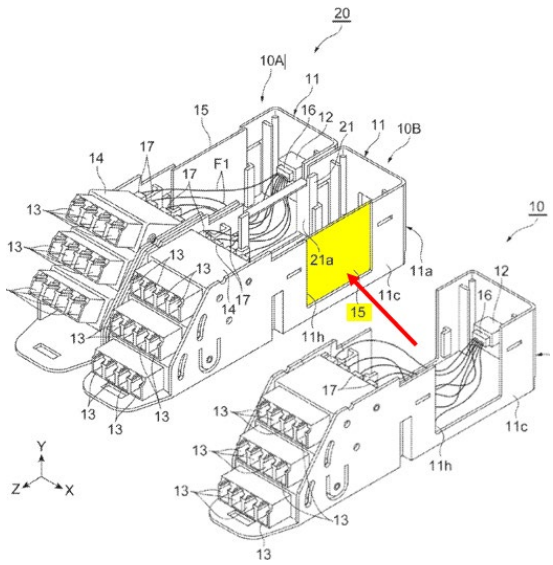
Figure 5 shows the removable shutters (15) used to expand two coupled units to three or four coupled units:

Fig.5

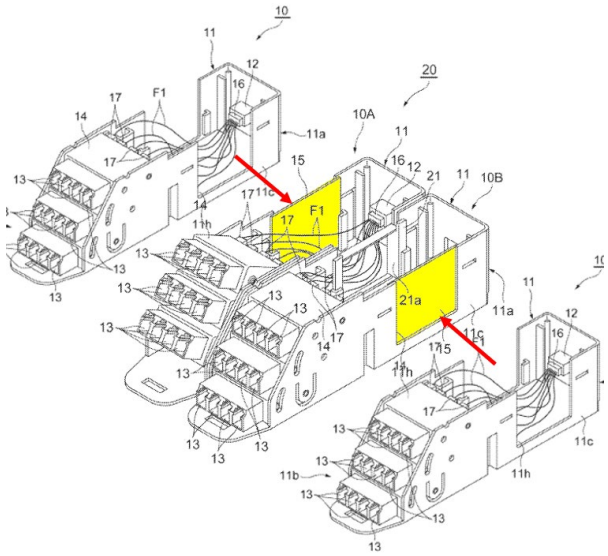


EX1003 ¶84. To couple a third or fourth module, the shutter(s) would be removed and the coupling member inserted:

3W cassettes



4W cassette



EX1003 ¶¶85-86.

"standard six width (6 W) unit"

First, Fukui lists expanding to 36 and 48 cores as "such as" examples, which indicates Fukui covers other examples. EX1004, 8:1-6; EX1003 ¶182. Fukui broadly teaches that any "plurality of coupled unit modules" can be coupled and treated together so long as "the required number of the same shape unit modules are prepared," which includes preparing six coupled unit modules. EX1004, 8:1-6; EX1003 ¶87.

Second, Fukui teaches the height of the unit module can be decreased from three tiers of quad LC adapters (12 cores) to two tiers (8 cores). EX1004, 10:39-44. The "number" of unit modules to support 48 cores in this alternative disclosed example is six because 48 = 6 x 8 core unit modules. In this example, Fukui's two, three, and four coupled unit modules would support 16, 24, and 32 cores, respectively.

If these disclosures are not sufficiently express, a POSITA would have found it obvious based on Fukui itself.[2] EX1003 ¶¶88-94. The next examples after supporting 36 and 48 cores are supporting 60 and 72 cores (five and six unit modules). EX1003 ¶92. Thus, six unit modules is one of only two choices.

A POSITA would be motivated to couple six unit modules to support 72 cores, which requires 6 x 12 core unit modules. Fukui itself broadly teaches to support the "various" number of cores, which includes 72 cores. EX1004, 3:27-28, 4:2-3, 4:42-43, 9:58-59, 10:4-6, 10:34-35. It was known in the art for cables to have 72 cores. EX1032, 4:35-38; EX1003 ¶89. Fukui's modules have an MPO adapter to connect to cables, and the MPO industry standard specifically provides a 72 fibers (cores) option. EX1003 ¶89.

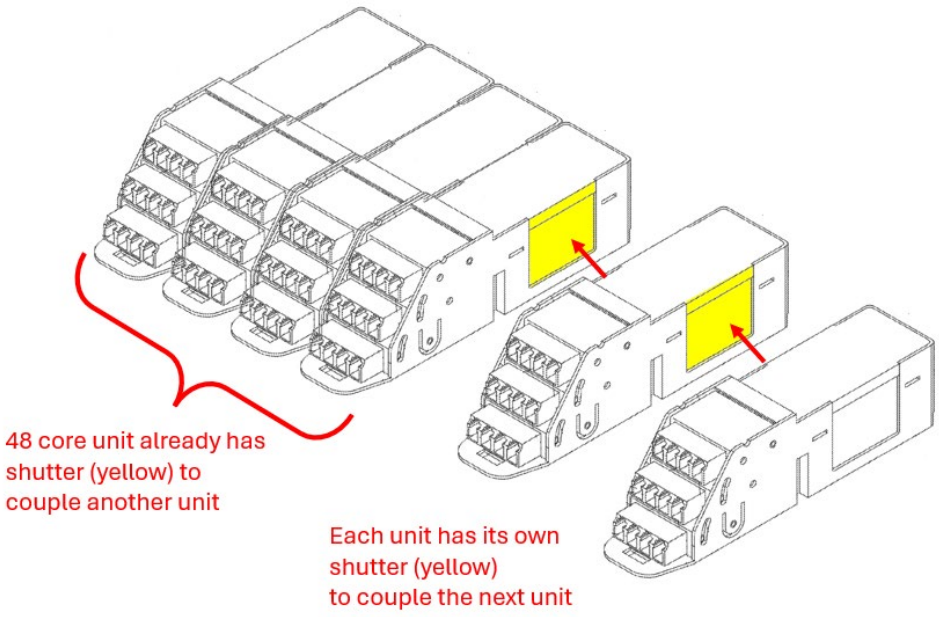
A POSITA would also be motivated to couple six unit modules to reduce the installation work. EX1003 ¶90. Consider the example where the worker needs to connect three cables each with 24 cores to customers. The worker could install a separate module for each cable, i.e., three 24-core modules. Alternatively, the user could install one six unit module. The six unit module could handle all three

---

[2] If PO disputes Fukui's disclosure to couple three and four modules, a POSITA would certainly find this obvious for the same reasons and because it is the logical implementation of Fukui's teaching to expand to 36 and 48 cores.

cables with 24 cores because the six unit module has 72 cores and 3 x 24 cores = 72 cores. *Id.* The worker could reduce from a three-step installation (install three 24 core unit modules for three 24 core cables) to a one-step installation (install one 72 core unit module for all the cables at once). *Id.* Because each coupled unit module 10 has a space for a rear connector, multiple cables can be plugged into the six coupled unit modules. EX1003 ¶90; EX1004, Fig. 4, 6:33-56. Fukui is specifically concerned with "reducing the work" by combining functionality. EX1004, 9:18-29.

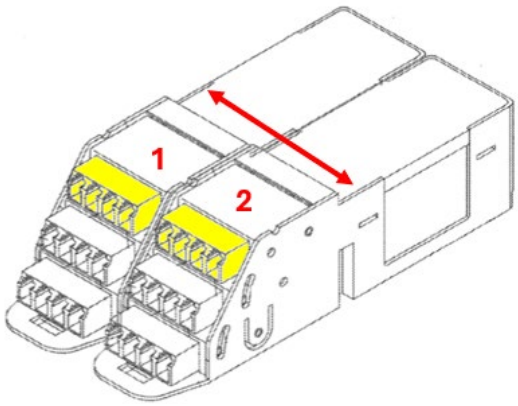
Fukui already discloses the functionality to couple six unit modules; thus, a POSITA would certainly have a reasonable expectation of success. A POSITA would simply remove the removable shutters on either side of the 48 core (four unit) module to couple two more modules. EX1003 ¶93.



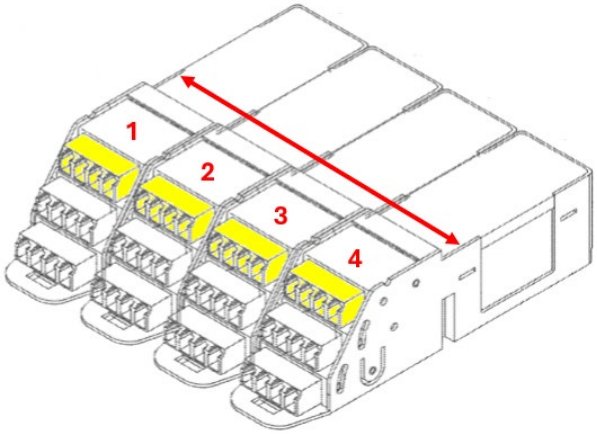
Fukui's teachings to couple different numbers of unit modules together to form larger modules meets both parties' proposed construction. EX1003 ¶¶96-98.

PO's construction. The width of each larger module that results from coupling two, three, four, and six unit modules accommodates the corresponding number of two, three, four, and six receptacle modules, respectively, as proposed by PO.

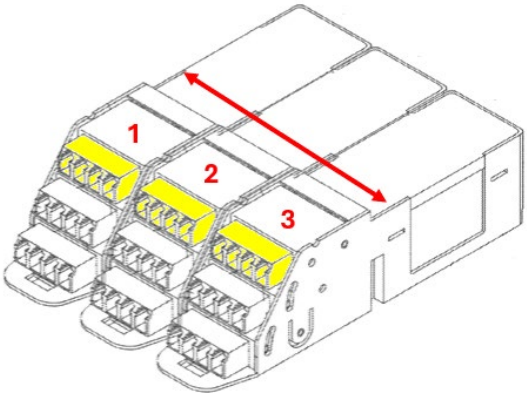
2W cassette



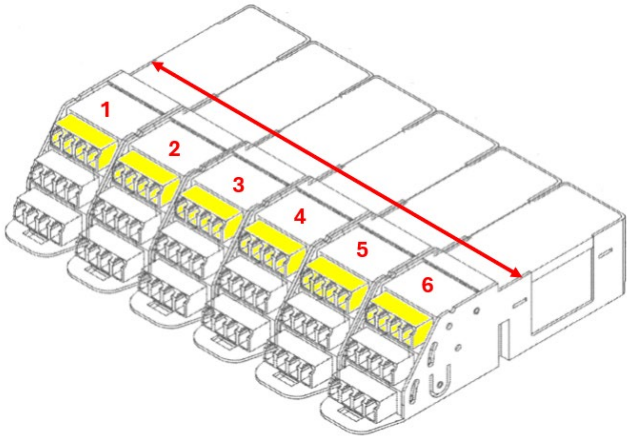
4W cassette



3W cassette



6W cassette

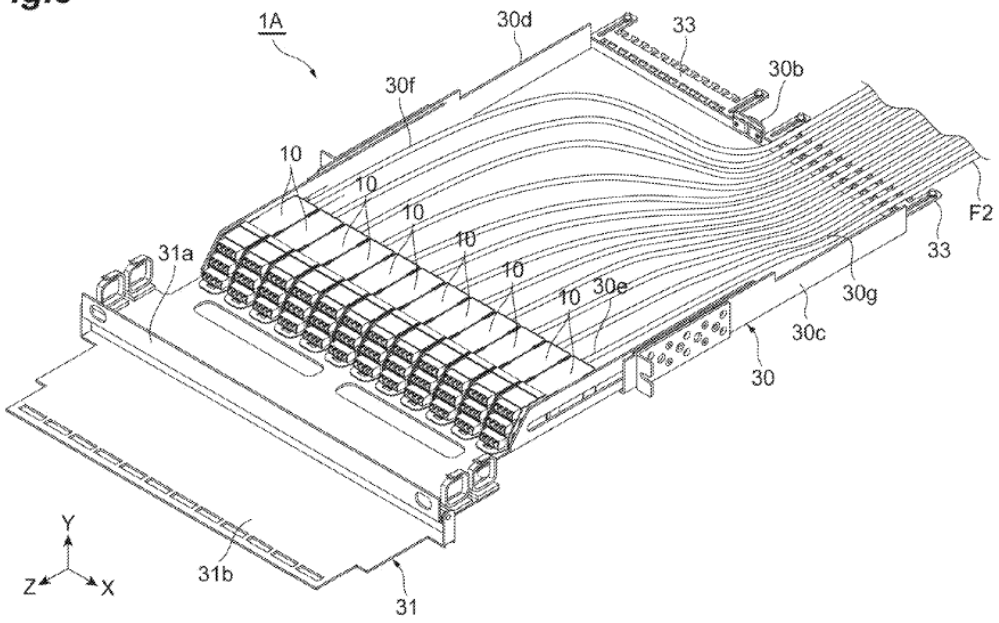


EX1003 ¶96. If PO argues the height of Fukui's modules accommodates additional receptacles, again, that does not distinguish Fukui because the claim and PO's own construction states a limitation about the width, not the height.

CommScope's construction. The width of each larger module that results from coupling two, three, four, and six unit modules together equals two, three, four, and six times the standard width units because, as shown above, each larger module comprises exactly that number of coupled unit modules. Fukui's modules do not include any additional amount such as a rail. EX1004, Figs. 4-9. Fukui's modules are all "evenly divisible" by the width of module 10. EX1003 ¶98. The width of module 20 / width of module 10 = 2. *See* EX1004, Fig. 5. The same logic applies to the other larger sizes. EX1003 ¶98.

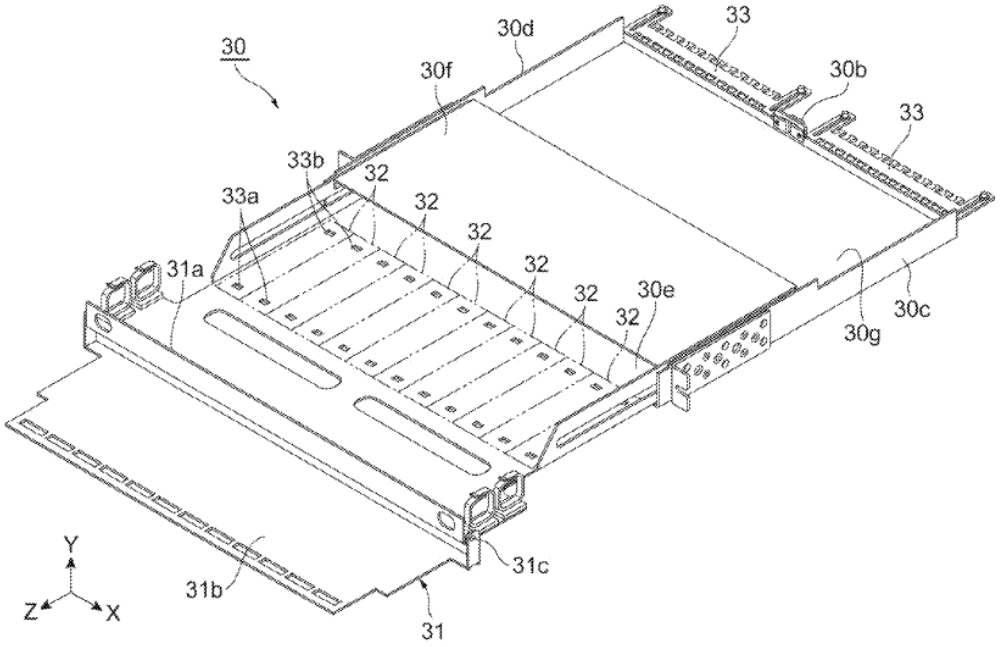
If PO argues Fukui's coupled modules include a space between them, that does not distinguish Fukui. First, PO's construction only requires the relevant number of receptacle modules. Second, Fukui describes the coupled modules as "fixed to each other," not spaced apart. EX1004, 10:13-14. Fukui's figures also show there is no room to space apart the coupled modules when installed in the tray. EX1003 ¶¶131-33. Figure 8 shows no space between adjacent modules (the lines merge together):

Fig.8



EX1004, Fig. 8. Figure 9 also shows no room to space apart adjacent modules that are coupled together. There is no extra space between adjacent areas:

Fig.9

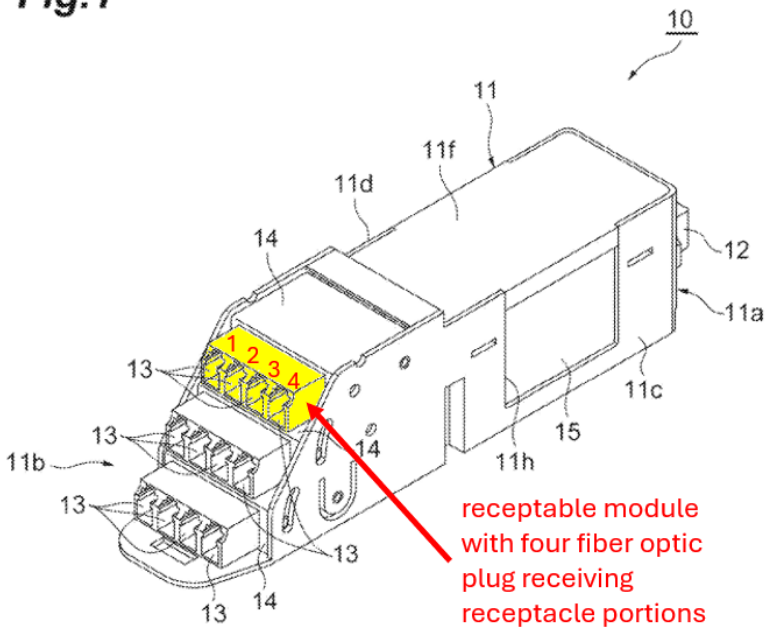


EX1004, Fig. 9; EX1003 ¶¶101-103. Third, even if the width of module 20 includes a space between the coupled modules, it would be obvious to remove such a space. EX1003 ¶¶104-114. Fukui never describes any need to space apart the coupled modules and any space is already so insignificant that it is not even visible in Figures 6-9. A POSITA could easily make this modification (to the extent any modification is even needed) by making the modules slightly larger to eliminate any extra space. EX1003 ¶¶112-113. A POSITA would also have been motivated to remove unnecessary spaces to (1) make it easier to align the modules during installation, (2) make the coupled modules more rigid, and (3) protect the fiber inside the modules from damages if anything enters a gap between the modules. EX1003 ¶¶107-111.

8. Element 1G

Fukui's receptable module (yellow) is configured to fit four fiber optic plug receiving receptacle in one module 10 as recited in this element:

Fig.1



EX1004, Fig. 1, 5:34-36, 5:24-27; EX1003 ¶116.

9. Element 1H

Element 1H relates back to Element 1C. Here are the two elements:

[1C] wherein *the tray is configured to fit* **a plurality of different modular fiber optic cassette configurations** in the tray width portion in a standard U-space fiber management system;

[1H] wherein **the plurality of different modular fiber optic cassette configurations** comprise:

a first modular fiber optic cassette configuration…

a second modular fiber optic cassette configuration…

a third modular fiber optic cassette configuration…

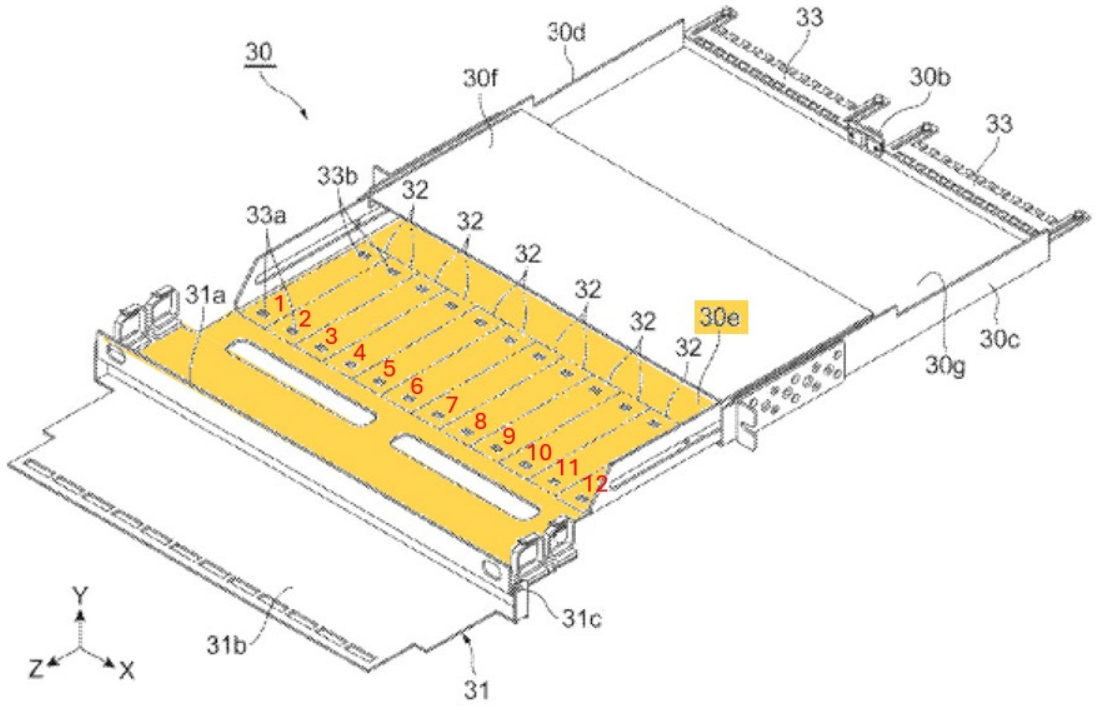
a fourth modular fiber optic cassette configuration…

a fifth modular fiber optic cassette configuration…

Element 1H defines the "a plurality of different modular fiber optic cassette configurations" that the tray must be "configured to fit" in Element 1C.

Fukui's tray is configured to fit the five recited configurations. Each of the five configurations requires twelve standard width units ("W") to fit. EX1003 ¶118. Fukui's tray is configured fit twelve standard width units ("W"):

Fig.9



EX1004, Fig. 9. There are twelve areas (32), and each area accommodates one module. Fukui's larger module size simply occupy the number of areas that equals the "number" of coupled modules, i.e., Fuki's double modules occupies two areas, Fukui's triple module occupies three areas, etc.:

Fig.8

First configuration:
six 2W cassettes

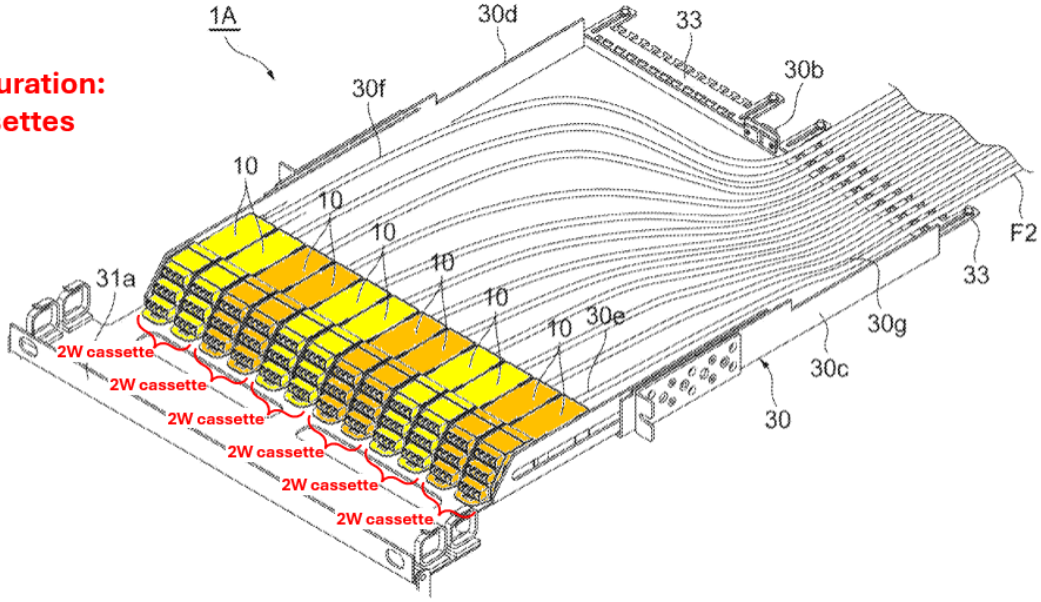


Fig.8

Second configuration:
four 3W cassettes

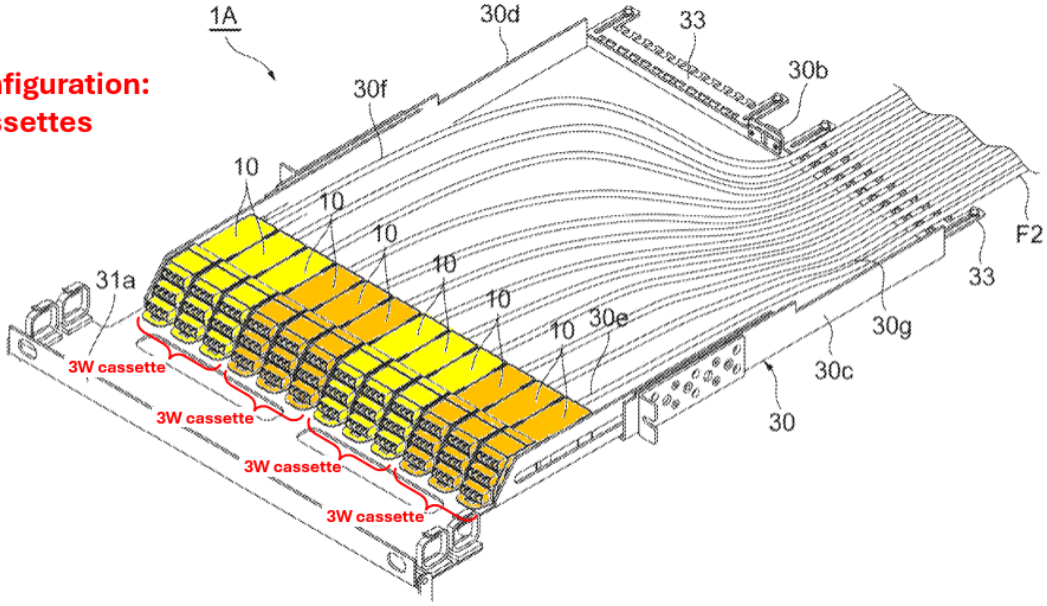


Fig.8

Third configuration: three 4W cassettes

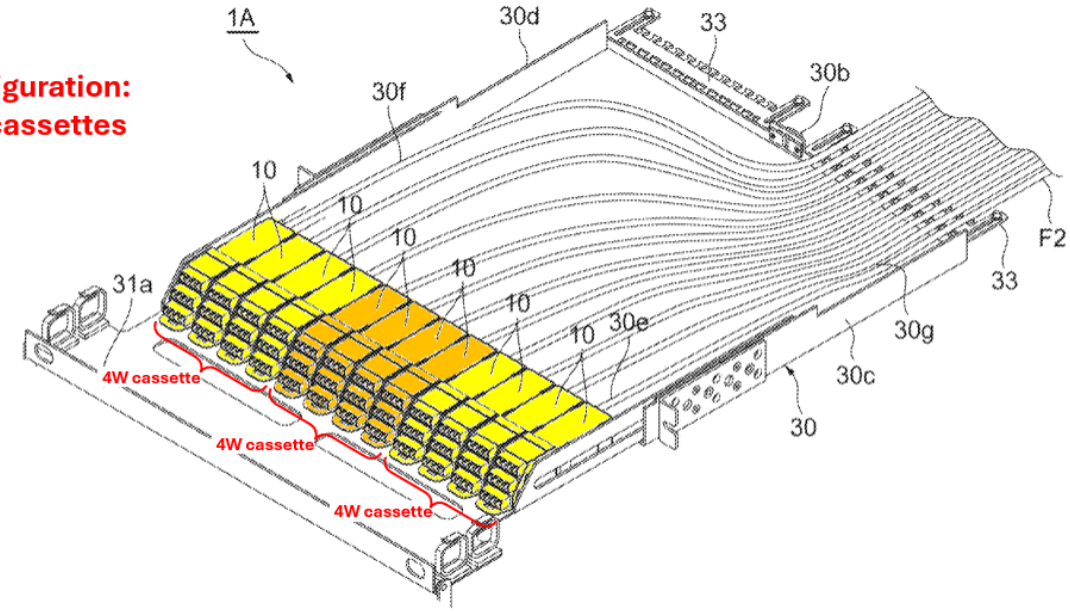
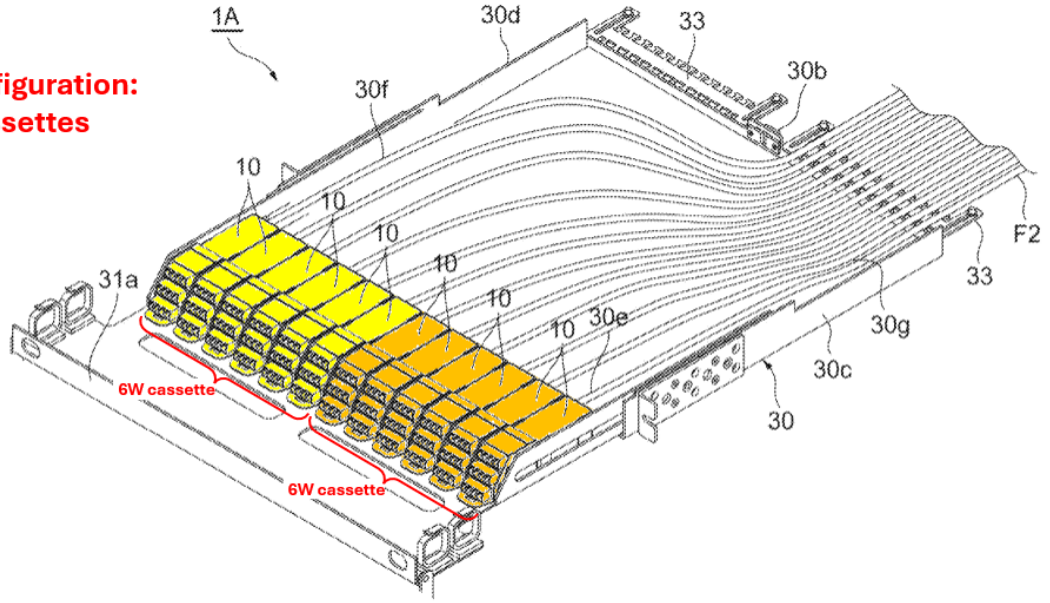
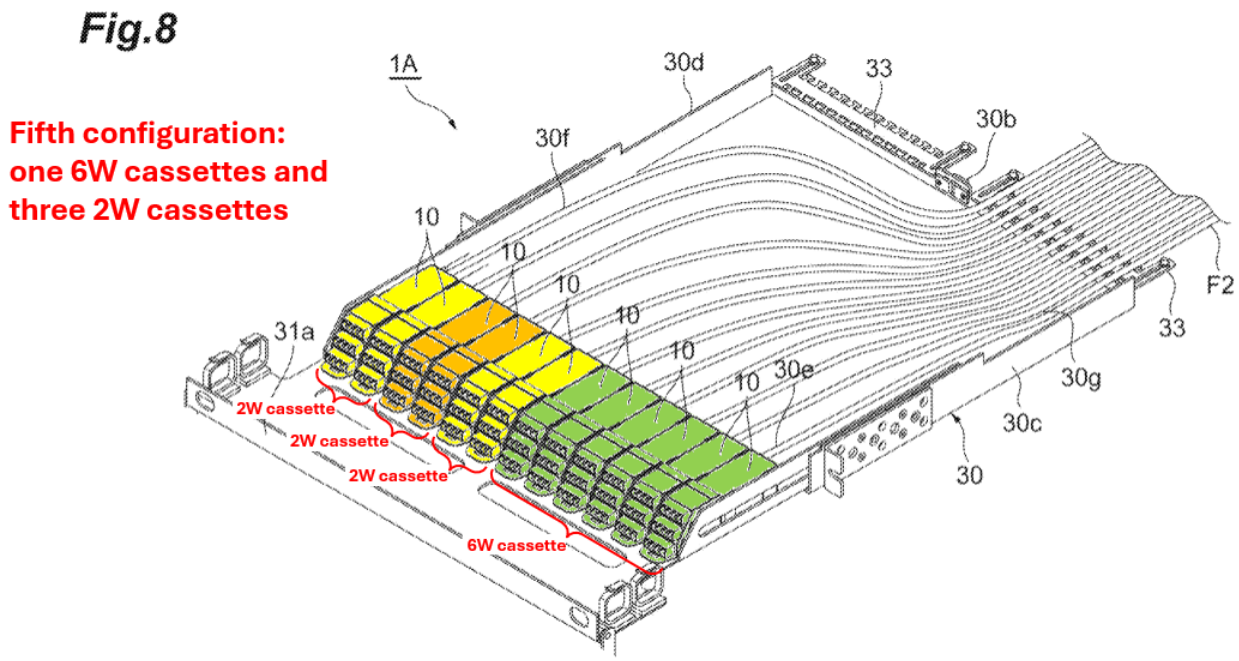


Fig.8

Fourth configuration: two 6W cassettes





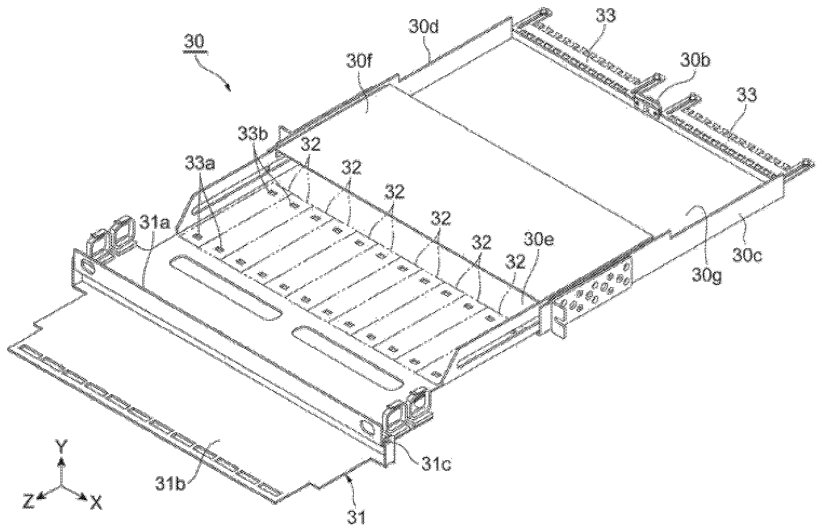
EX1004, Fig. 8; EX1003 ¶¶119-120.

Fukui's disclosure is similar to PO's preferred embodiment. The '423 Patent's tray is configured to fit the different sizes of cassettes because the apertures in the tray used to mount the cassettes conform to the standard width unit, i.e., the apertures are arranged every one standard width unit. EX1001, 9:5-9. Figure 1 shows the tray has twelve of these apertures each spaced every one standard width unit, which allows the tray to fit the different combinations of twelve standard width units. Fukui has the same features as just discussed.

"arranged side by side of each other in a row along the tray"

Figure 9 shows that Fukui's areas (32) for placing the modules are arranged side by side in a row along the tray:

Fig.9

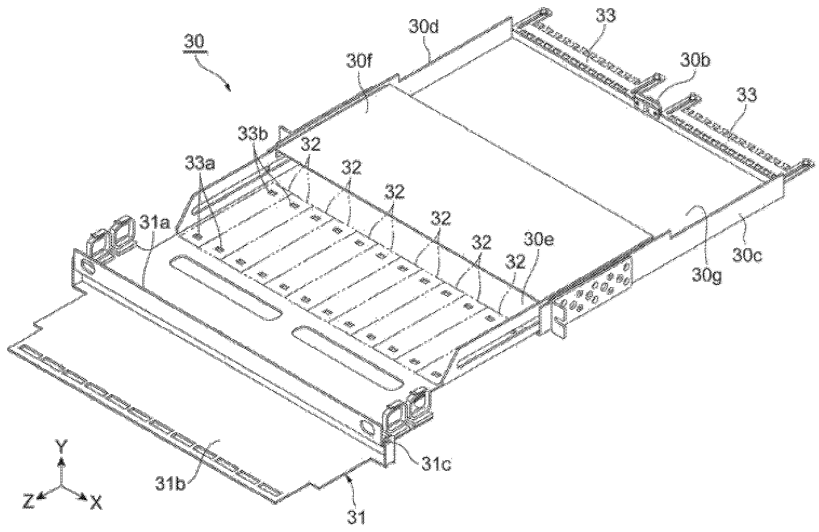


EX1004, Fig. 9, 8:47-48, 9:17 ("laterally aligned"), 9:35-40 ("rows"). Because of this, Fukui's tray is configured such that modules in all of the five configurations are arranged side by side in a row. EX1004, Fig. 8; EX1003 ¶123.

"adjacently faces"

Fukui's areas (32) for placing the modules are adjacent and the sides of adjacent modules face each other with no intervening structure such as a rail:

Fig.9



EX1004, Fig. 9, 4:34-38 ("…placed on the plurality of areas…in such a way that adjacent lateral walls…are faced with each other."); EX1003 ¶¶124-125.

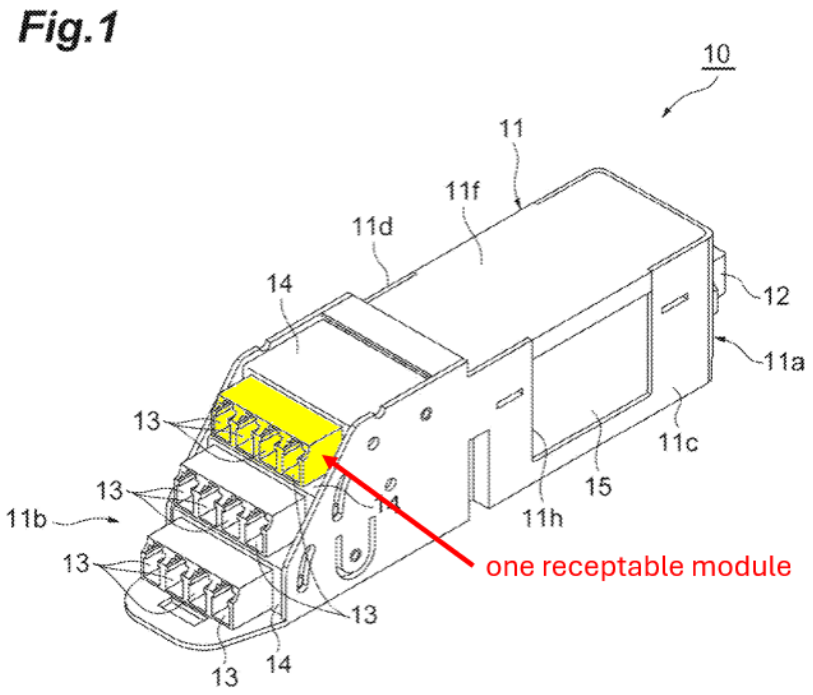
If Belden argues that Fukui does not expressly recite populating the tray with the five configurations, that does not distinguish Fukui. The claim only requires the tray be "configured to fit" the configurations. The claim does not require the additional step of populating the tray with each of the configurations. Claim 1 is not a method claim.

Even if the claim had required the marginal step of populating the tray with each of the configurations, that would not distinguish Fukui. A POSITA would have found it obvious to populate Fukui's tray with the five configurations. EX1003 ¶127. This marginal step does not require any modification to Fukui. Fukui already discloses to fully populate the tray. EX1004, Fig. 8, 9:36-37. The

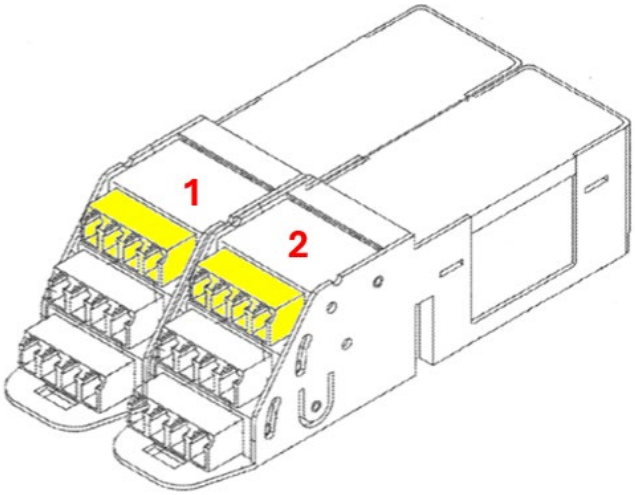
claimed first, second, third, and fourth recited configuration are simply predictable variations of Fukui's existing teaching to fully populate the tray as applied to Fukui's different sizes. EX1003 ¶127. For example, the first configuration of "six" 2W cassettes is simply populating Fukui's tray with Fukui's already disclosed two unit module (20) for 24 cores. The same reasoning applies to Fukui's second, third, and fourth configurations. EX1003 ¶127. The fifth configuration simply recites a combination of two modules sizes. Fukui already teaches that its module sizes may be present in "combination." EX1004, 9:43-45, 8:19-23; EX1003 ¶127. A POSITA would have been motivated to perform the marginal step of populating Fukui's tray with each of the five configurations to fully and efficiently use Fukui's system for the different combinations of input cables. EX1003 ¶127. Fukui already teaches to support input cables with "various" numbers of cores. EX-1004, 3:27-28, 4:2-3, 4:42-43, 8:1-2, 9:58-59, 10:4-6, 10:34-35.

10. Element 1I

Each unit module 10 has three tiers that are each configured to fit one receptacle module:

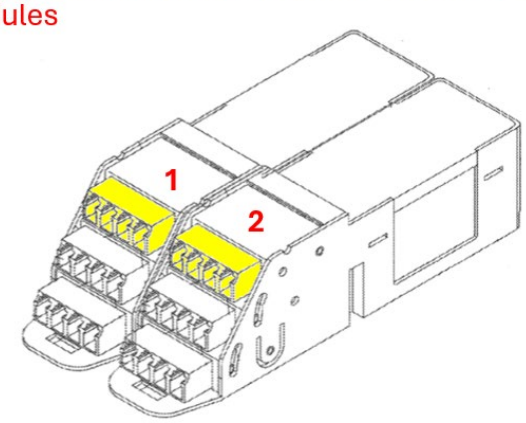


When modules are coupled together, the result has the same three tiers that are each now configured to fit two receptacle modules:

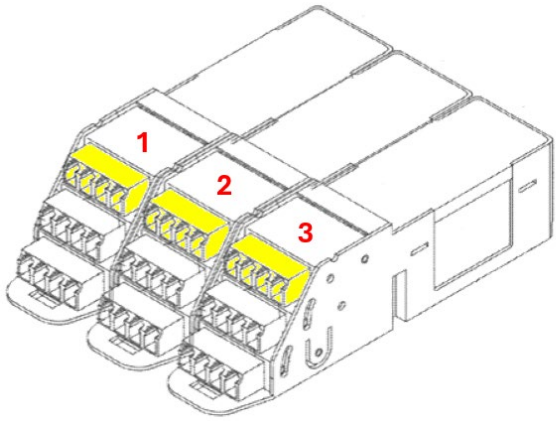


EX1003 ¶129; EX1004, Fig. 5. Each additional coupled module increases each of the tiers by one more receptacle.

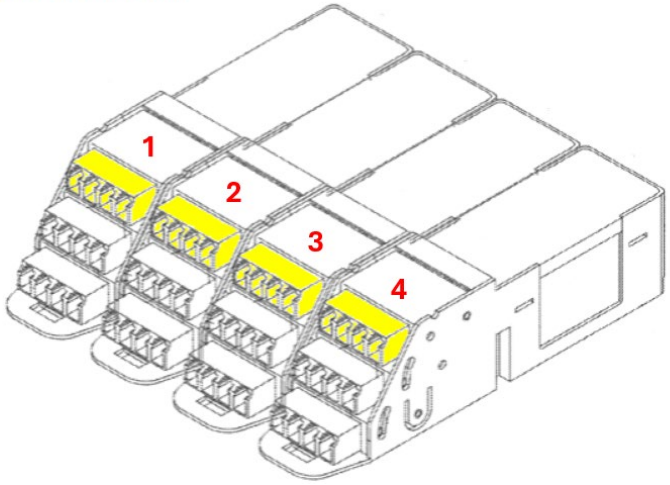
A modular two standard width (2W) cassette configured to fit two receptacle modules



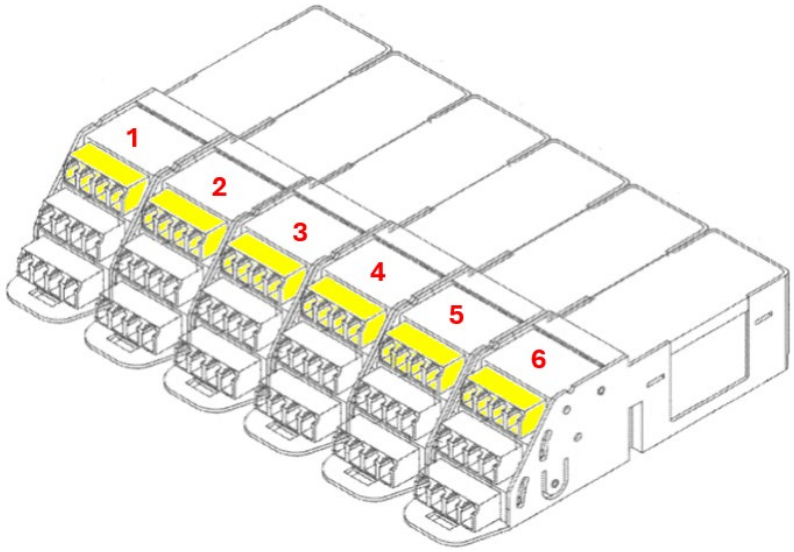
A modular three standard width (3W) cassette configured to fit three receptacle modules



A modular four standard width (4W) cassette configured to fit four receptacle modules



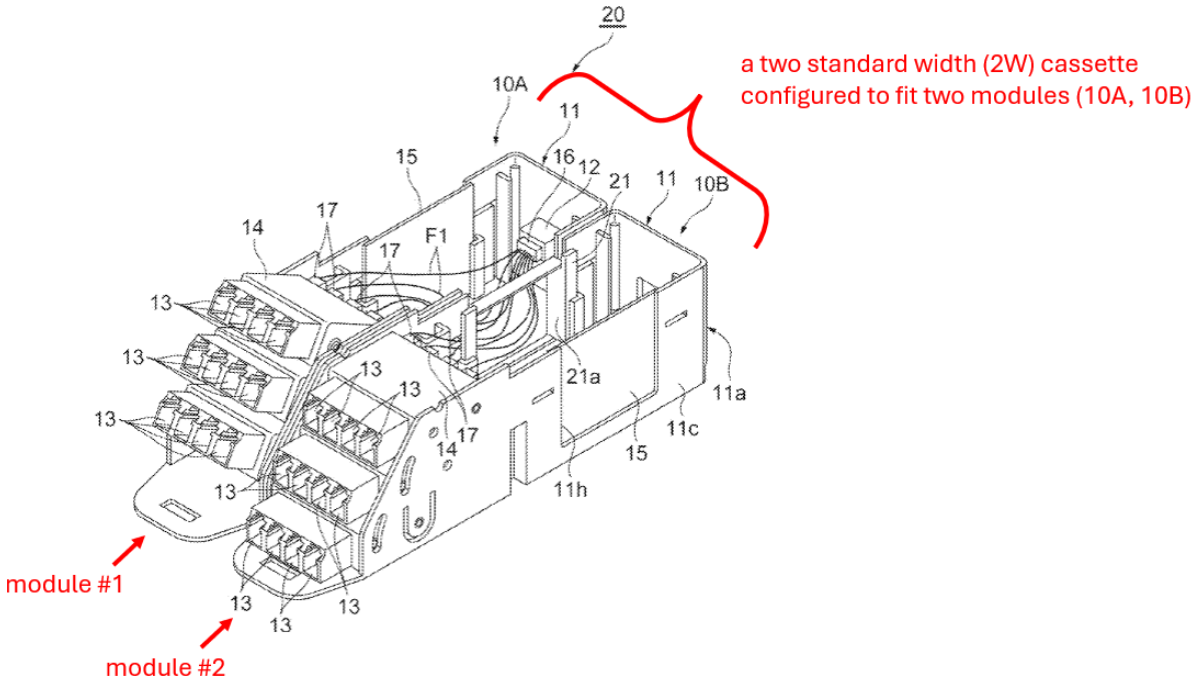
A modular six standard width (6W) cassette configured to fit six receptacle modules



EX1003 ¶130.

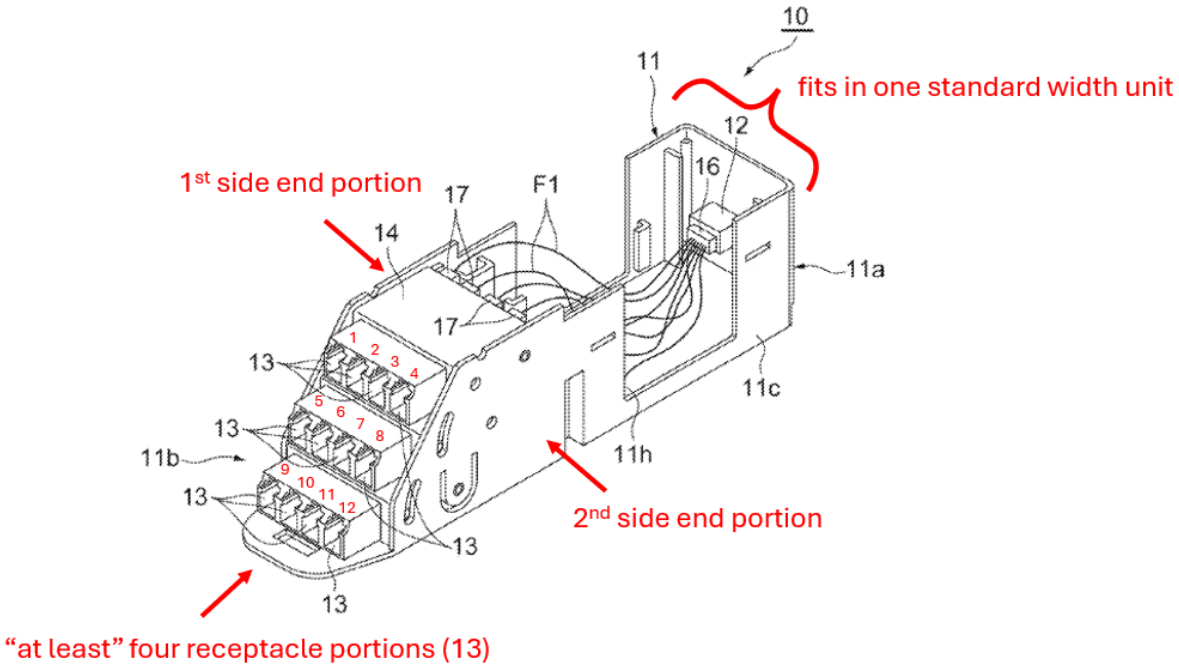
If PO argues Fukui's modules have additional tiers that support additional receptacle modules, that does not distinguish Fukui. The claim does not say the recited cassettes is configured to fit "only" the recited number of modules. Claim 1 is also a "comprising" claim. Thus, the prior art can add additional structure, i.e., additional tiers in Fukui. Furthermore, the additional tiers in Fukui are arranged in the *height* dimension. There is no limitation on the height dimension of the cassette other than that the tray when configured with cassettes fits in a U space, which is true in Fukui. EX1004, 9:33 ("1U size"). The claim does restrict the width dimension of the cassette, and Fukui's modules do fit the recited two, three, four, and six receptacle modules in the width dimension.

Even if claim 1 were interpreted to have an "only" limitation for the modules, that would not distinguish Fukui. Fukui has two different examples of the receptacle modules. The "one body" of four receptacles 13 is one example of a module. The one body is inserted into the larger "module" 10. EX1004, 4:60-67 ("module 10"). By Fukui's express terms, the larger module 10 is also a "module." The larger module 10 also houses the receptacles 13. Thus, the larger module 10 qualifies as a second example of a receptacle module. EX1003 ¶132. Each of Fukui's larger cassette sizes do fit "only" two, three, four, and six of the larger unit modules. Consider Fukui's example of a two standard width cassette (numeral 20):



EX1004, Fig. 5. This cassette (20) fits "only" two modules 10 (10A and 10B).

To be clear, Petitioner is not taking inconsistent positions on the meaning of "receptacle modules." Petitioner's point is that Fukui has two examples of "receptacle modules." Fukui's second example of a receptacle module also meets the earlier limitations for the receptacle module recited in Elements 1D, 1E, 1G:

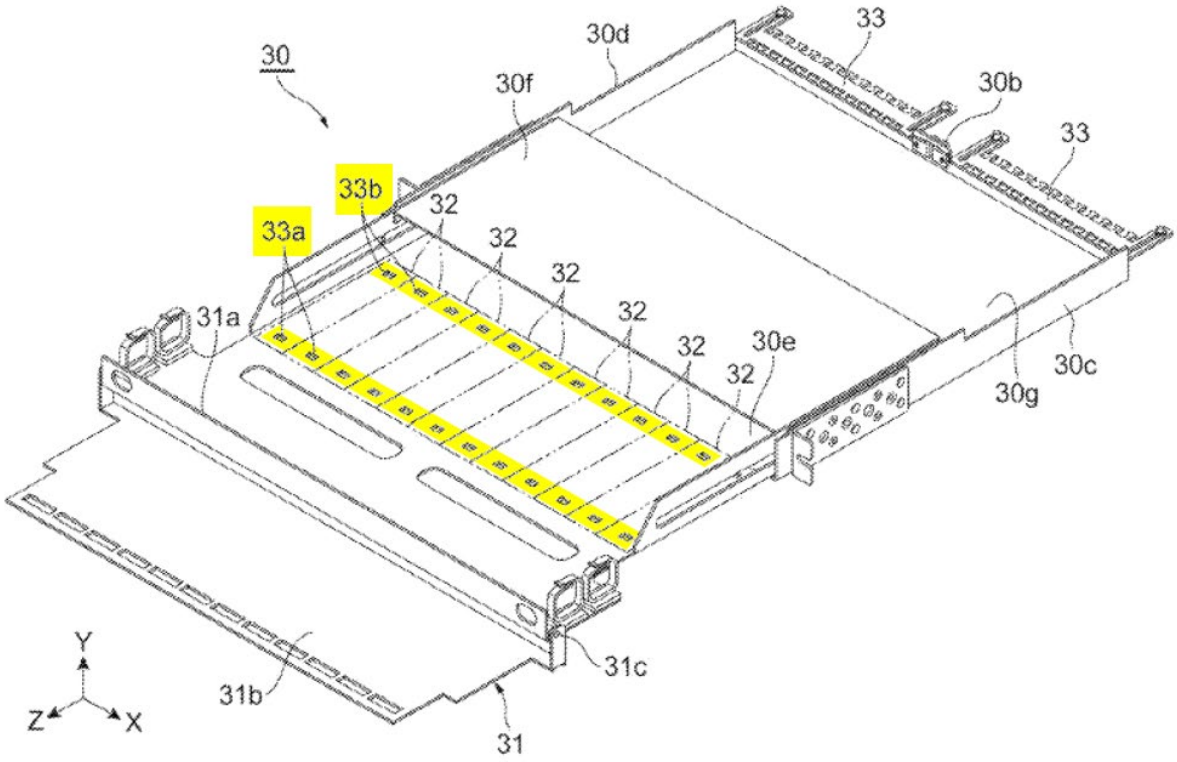


EX1003 ¶134. Lastly, this limitation is not even in the other independent claims (9 and 17); thus, Fukui further cannot be distinguished from those claims.

11. Element 1J

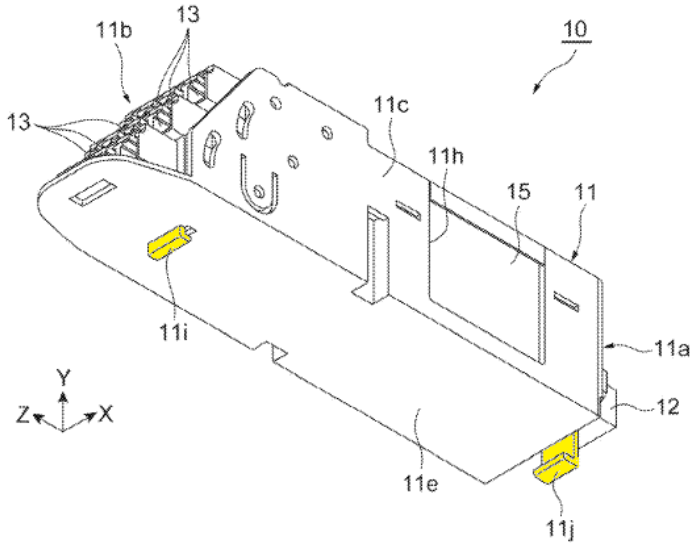
Fukui's tray is configured via holes (33a, 33b) to be *"removably secured"* to Fukui's modules:

Fig.9



EX1004, Fig. 9; EX1003 ¶137. Each module 10 has hooks (11i, 11j) on the bottom to "engage" the holes:

Fig.2



EX1004, Fig. 2, 8:52-56. Fukui expressly teaches the modules can be "easily removed" and "exchanged" (i.e., one removed and another secured). EX1004, 9:18-29, 9:66-10:1, 10:33-35, 3:8-11; EX1003 ¶138.

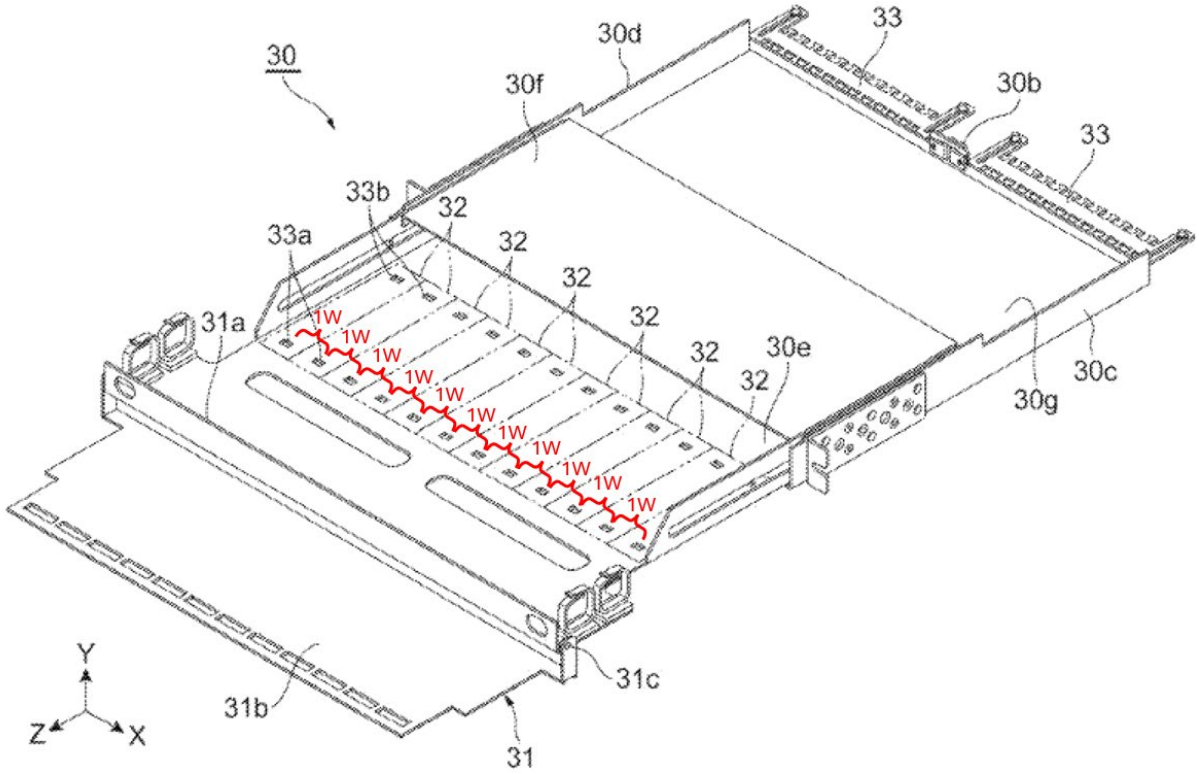
12. Element 1K

The holes in Fukui's tray constitute a *"plurality of cassette engaging portions."* As explained in the prior element, the holes engage with the hooks on the modules. EX1004, 8:52-55 ("…hooks 11i and 11j…*engage* with these holes 33a and 33b), Fig. 2.

Fukui's holes are *"configured to conform to the standard one width (1W)."* Each area (32) area has one pair of holes (top and bottom), and each pair of holes supports one module 10, i.e., one standard width unit. EX1004, 8:52-55, Figs. 8-9.

Figure 8 shows that the twelve holes for each of these one width units are evenly spaced apart, i.e., each hole is spaced apart at a pitch of one standard width:

Fig.9



EX1004, Fig. 9; EX1003 ¶141. PO's preferred embodiment likewise uses twelve evenly spaced holes:

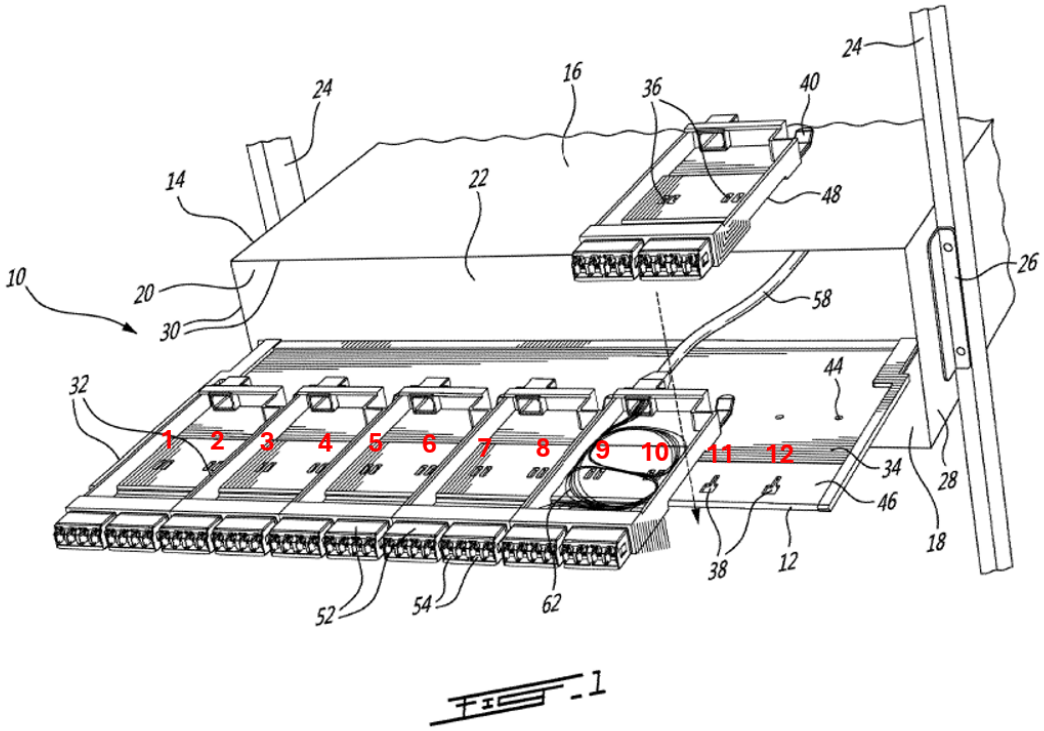


Fig. 1

EX1001, Fig. 1.

Fukui's cassette engaging portions (the holes) can also *"support"* two, three, four, and six standard width unit cassettes. The different size cassettes are simply a number of the same modules 10 coupled together that engage with the holes. EX1004, 8:3-6 ("the required number of the same shape unit modules are prepared"), 7:27-28 ("unit modules…are the same as that of the conversion module 10"). The different sized cassettes engage with the corresponding number of holes like this:

Fig.9

two sets of holes engage with two coupled unit modules

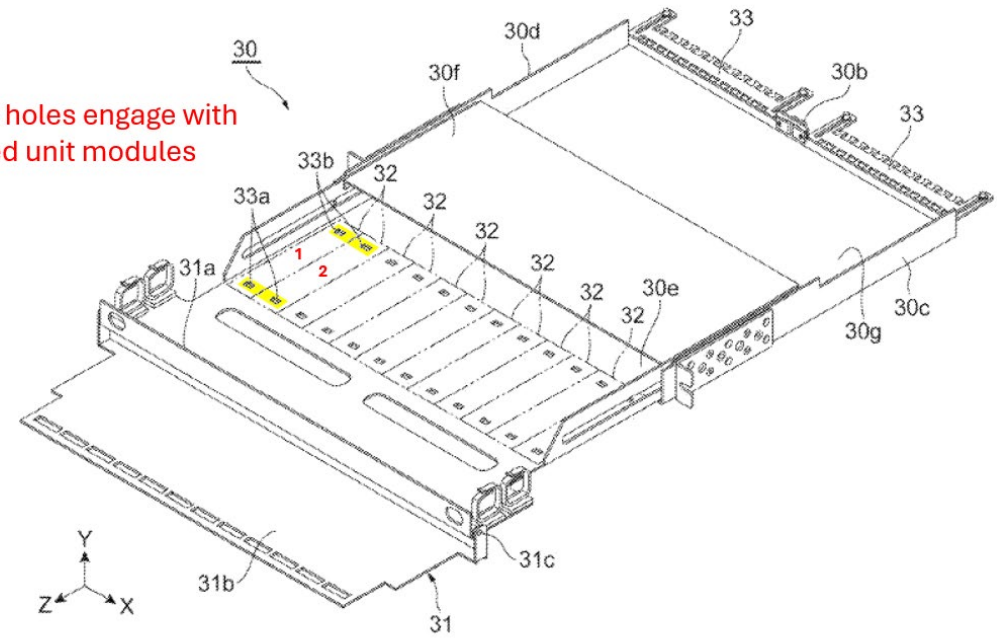


Fig.9

three sets of holes engage with three coupled unit modules

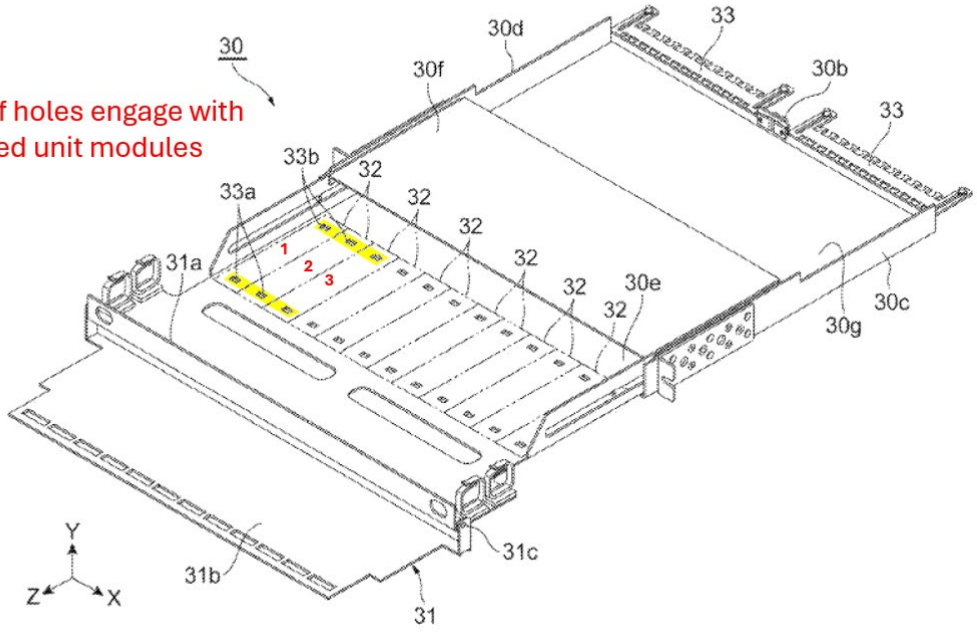


Fig.9

four sets of holes engage with four coupled unit modules

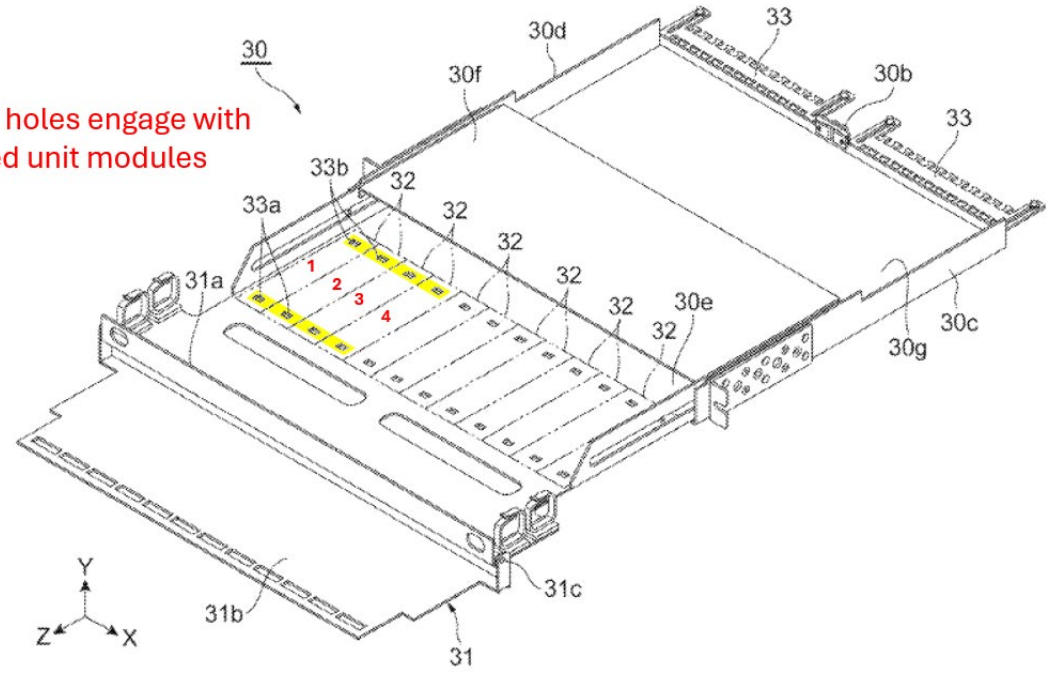
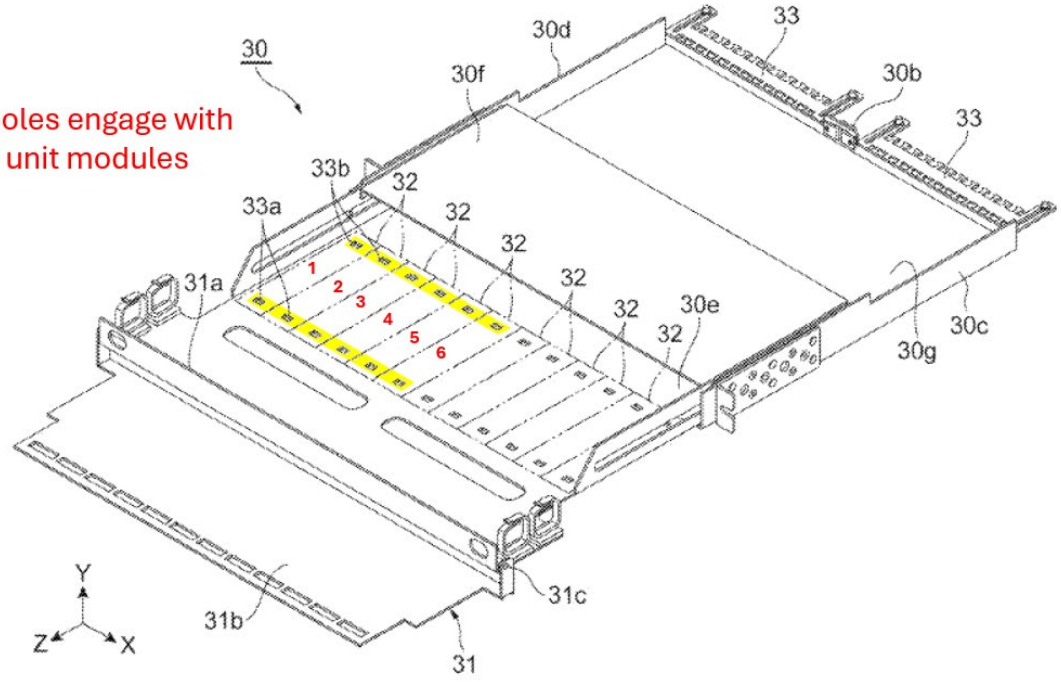


Fig.9

six sets of holes engage with six coupled unit modules



EX1003 ¶143.

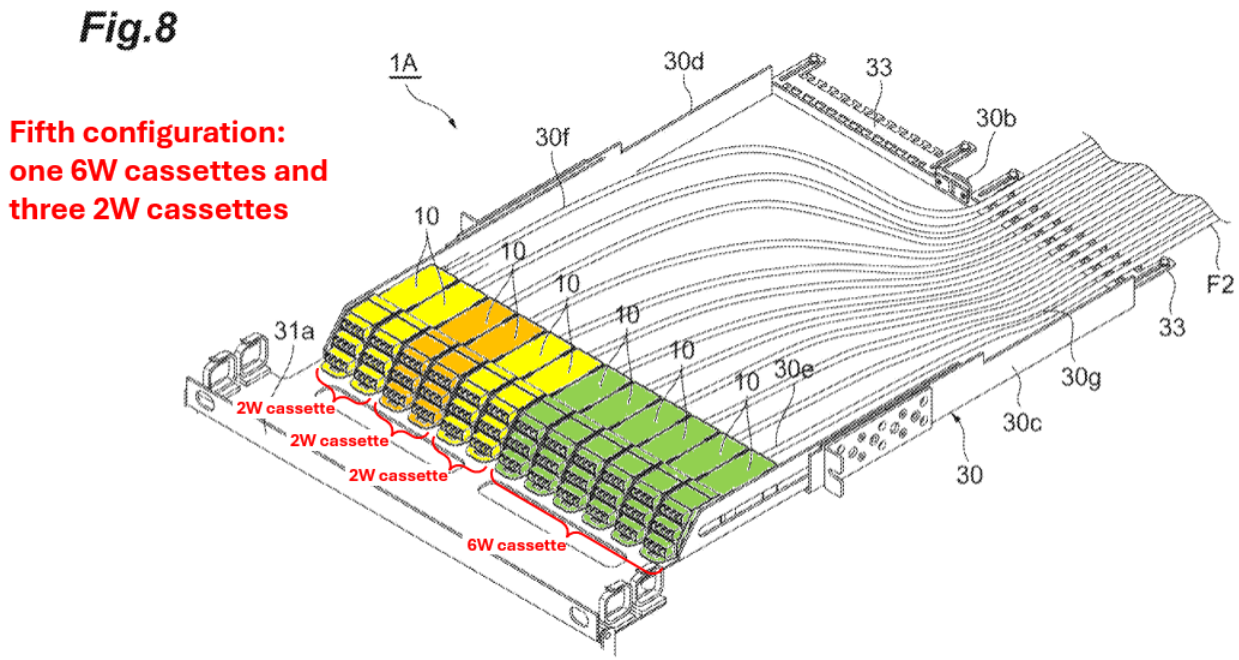
B. Independent Claim 9

Claim 9 substantially overlaps with Claim 1 with two exceptions. It (1) drops Elements 1A and 1I and (2) adds Element 9B. EX1003 ¶144, ¶¶154-56.

1. Element 9B

Like claim 1, claim 9 recites that the tray is "configured to support" different configurations, including a first, second, third, fourth, and fifth configuration. Elements 9B adds: "wherein each of the plurality of different modular fiber optic cassette configurations includes a plurality of different sizes of modular fiber optic cassettes." Fukui invalidates the claim under either interpretation of this element.

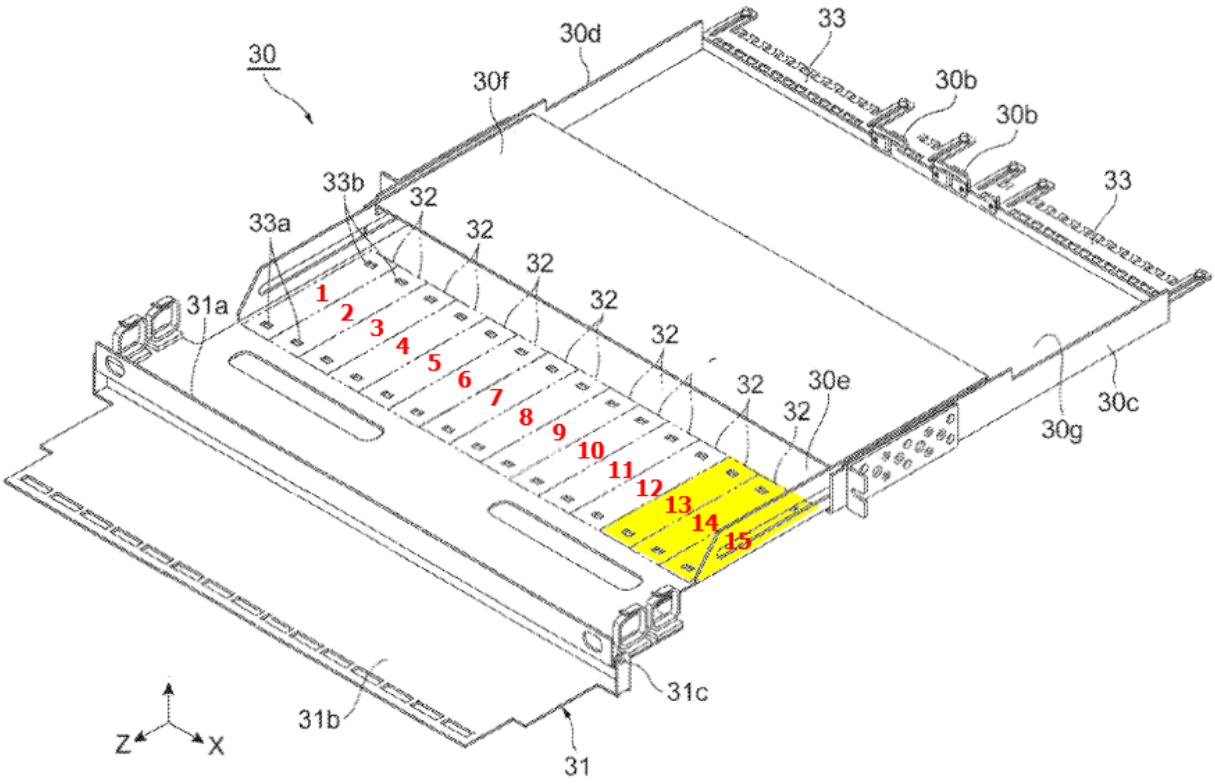
PO's construction. PO suggests Element 9B refers to the "fifth" configuration that already recites two different sizes. Fuki's tray does fit the fifth configuration:



EX1004, Fig. 8.

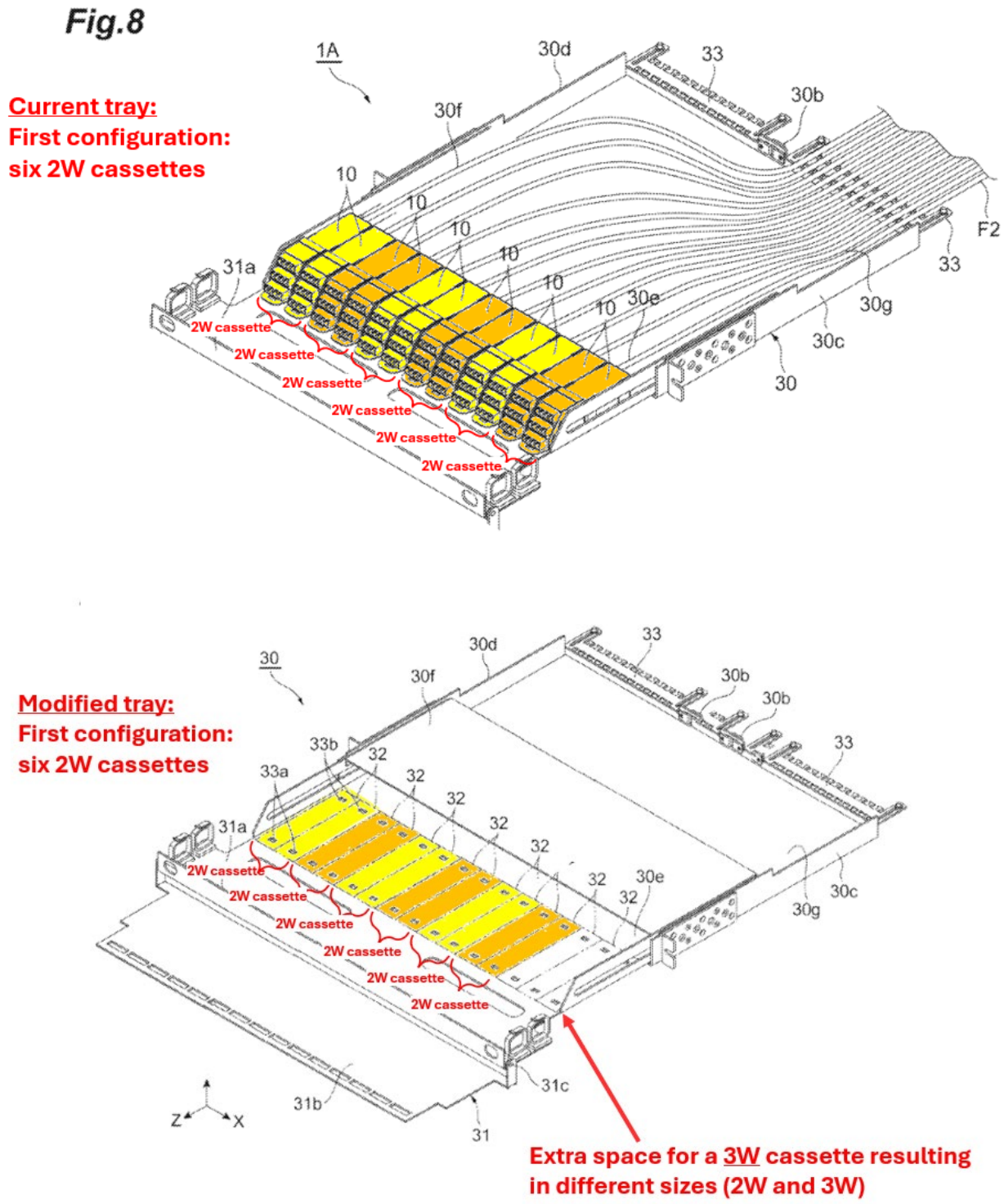
CommScope's construction. "Each" requires every one of configurations satisfy Element 9B, including the first, second, third, fourth, and fifth configurations. Fukui's current tray is not configured to include different size cassettes in the first, second, third, and fourth configurations because the tray is not wide enough.

A POSITA, however, would find it obvious to make Fukui's tray wider. EX1003 ¶¶148-153. Per industry standards, there are three standard rack widths: 19 inches (482.6 mm), 24 inches (609.6 mm), and 30 inches (762.0 mm). EX1008, 10; EX1003 ¶149. Fukui's current tray is sized for the narrowest rack (19 inches). EX1004, 9:32. A POSITA would be motivated to make Fukui's tray wider for customers with the wider rack sizes (24 and 30 inches). EX1003 ¶153. A POSITA would recognize this is a simple exercise of extending the width of the tray. EX1003 ¶¶150. The increase from 19 inches to 24 inches corresponds to increasing Fukui's tray from 12 slots to at least 15 slots (and from 12 slots to 18 slots for 30-inch racks):



EX1003 ¶¶150-151.

With these extra slots (yellow), Fukui's tray would be configured to support two sizes of cassettes in *each* configuration: (1) the size already recited in the first, second, third, and fourth configurations and (2) at least one additional, different size cassette in the extra space. Here is an example for the first configuration:



The same logic applies to the other configurations. EX1003 ¶148.

2. Other Elements of Claim 9

Each of the other elements in Claim 9 are disclosed or rendered obvious by Fukui as discussed for the corresponding element in Claim 1:

Preamble of Claim 9:	See Preamble of Claim 1.
Element 9A:	See Preamble of Claim 1 and Elements 1A and 1B that repeat the preamble.
Element 9B:	Already discussed
Element 9C:	See Element 1E, 1D.
Element 9D:	See Element 1F.
Element 9E:	See Element 1H.
Element 9F:	See Element 1J.
Element 9G:	See Element 1K.

C. Independent Claim 17

Claim 17 also substantially repeats Claim 1 with the following exceptions. Claim 17: (1) drops Elements 1A, 1I and the "fifth configuration" in Element 1H, and (2) adds elements 17B.

3. Element 17B

Element 17B removes the "each" limitation of Element 9B and only generally recites: "wherein the plurality of different modular fiber optic cassette configurations include different sizes of modular fiber optic cassettes." The analysis for Element 1H already shows that overall plurality of configuration that

Fukui's tray can support includes different sizes such as the 2W size in the first configuration and 3W size in the second configuration:

Fig.8

First configuration: six 2W cassettes

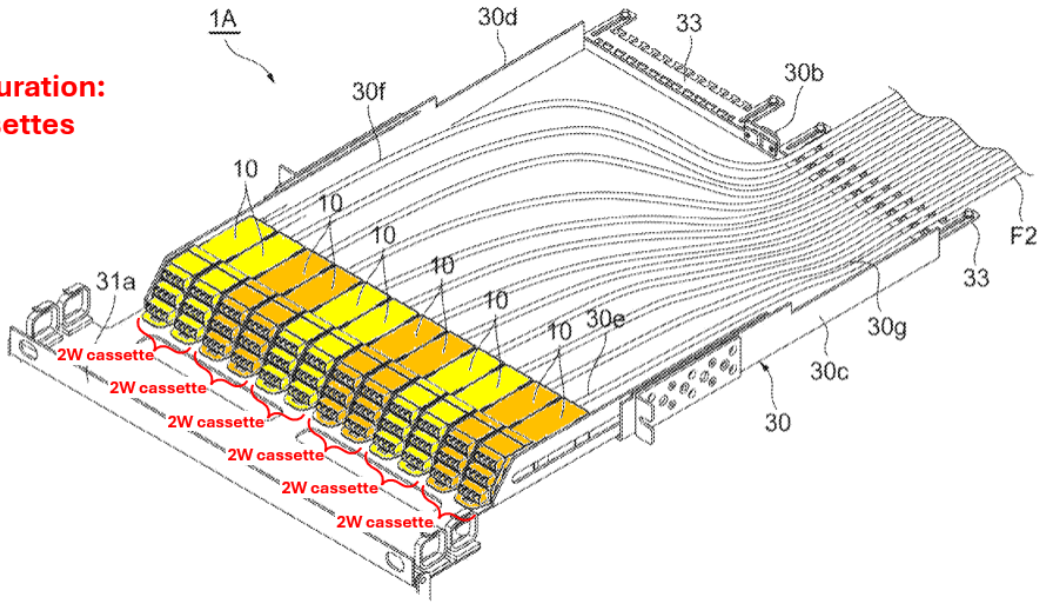
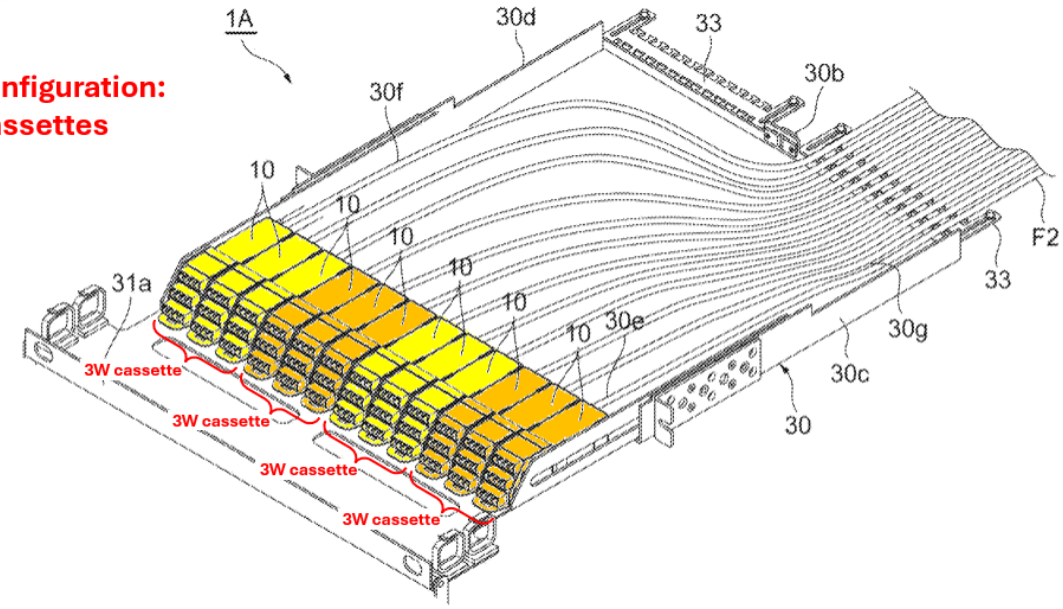


Fig.8

Second configuration: four 3W cassettes



Thus, Fukui discloses Element 17B for the same reasons as Element 1H.

4. Other Elements of Claim 17

Each of the other elements in Claim 17 are disclosed or rendered obvious by Fukui as discussed for the corresponding element in Claim 1:

Preamble of 17:	See Preamble of Claim 1.
Element 17A:	See Preamble of Claim 1 and Elements 1A and 1B that repeat the preamble.
Element 17B:	Already discussed
Element 17C:	See Elements 1E, 1D.
Element 17D:	See Elements 1F.
Element 17E:	See Element 1H.
Element 17F:	See Element 1K.

EX1003 ¶¶157-58.

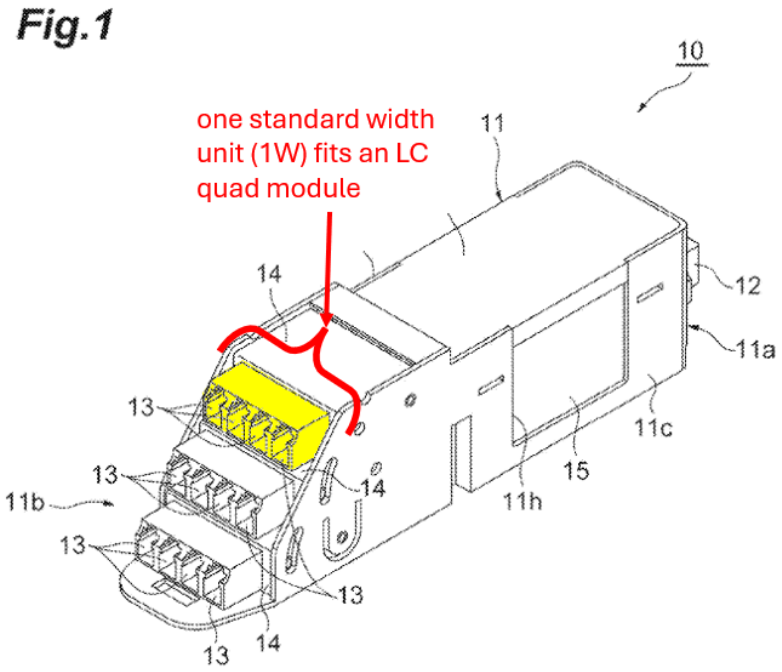
Claim 17 also recites a "tray member" instead of "a tray." The '423 patent does not teach there is any difference between a tray and tray member. Fukui's tray is a tray member. EX1003 ¶159.

D. Claims 2, 10, 18

These claims recite that the standard width unit is "based on" the SC duplex width unit. PO's specification explains for the preferred embodiment: "the pitch/width W is based on a LC Quad (SC Duplex) technology footprint"). EX1001, 8:58-59. The parenthetical recognizes that a width based on an LC quad technology footprint is based on the SC Duplex technology footprint. This is

because, by industry standards, the footprint of four (quad) LC connectors is designed to fit the footprint of dual SC connectors. EX1003 ¶163.

Like PO's preferred embodiment, Fukui's standard one width unit is based on the LC quad technology footprint and thus is also based on the SC duplex technology footprint:



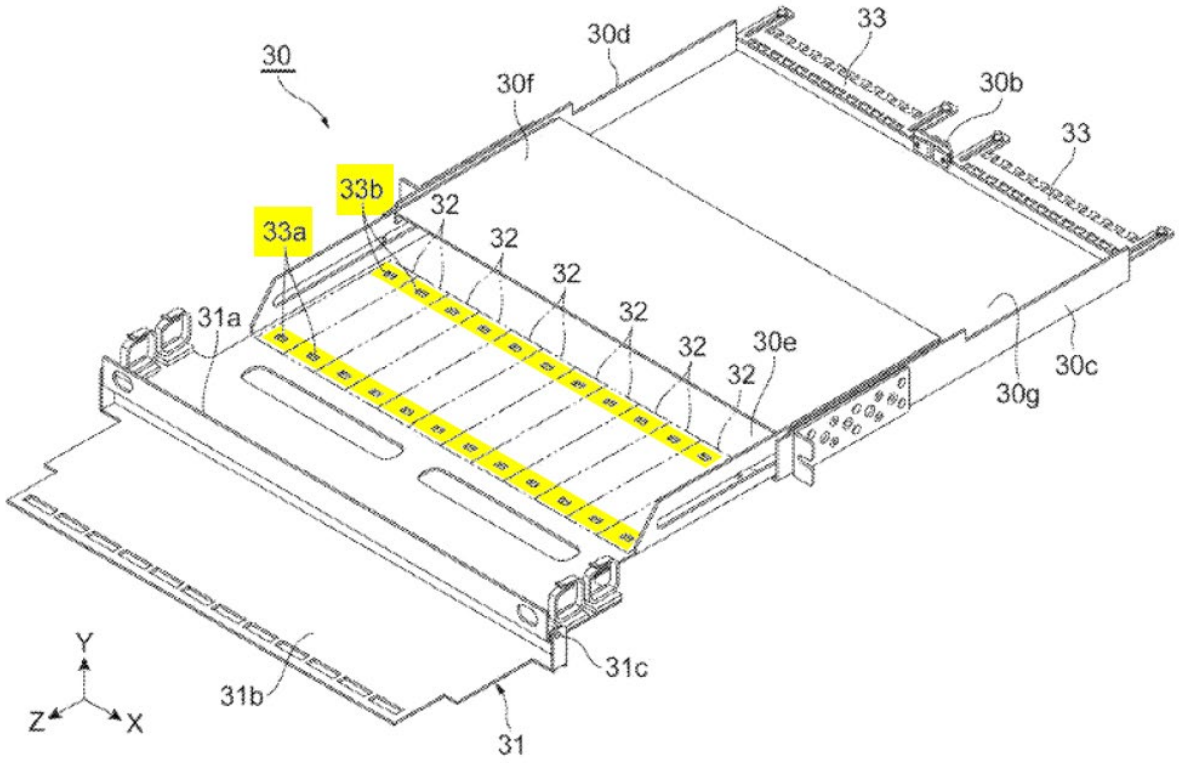
EX1004, Fig. 1, 5:24-36; EX1003 ¶¶164-65. Industry standards confirm that this same width fits two SC connectors, two MPO connectors, or four LC connectors. EX1003 ¶166.

E. Claims 3, 11, 19

These claims repeat the language of Element 1K with two changes. They add that the cassette engaging portions are "spaced apart" and form a "row" (claim

19). Fukui's cassette engaging portions (the holes) are spaced apart and arranged in two rows:

Fig.9



EX1004, Fig. 9. Fukui's holes meet the other language in these claims for the same reasons explained in Element 1K.

F. Claims 4, 12, 22

These claims add the limitations that the tray / tray member is configured to be "slidingly received" in a portion of a tray receiving space of a "case" of a fiber optic management system.

Fukui teaches that its tray (bottom panel 30e) is "slidable." EX-1004, 8:57-62. Comparing Figures 6 and 9 shows that Fukui's tray (orange) slides in and out

of Fukui's case (yellow) with the dashed lines representing the tray receiving space:

Fig.9

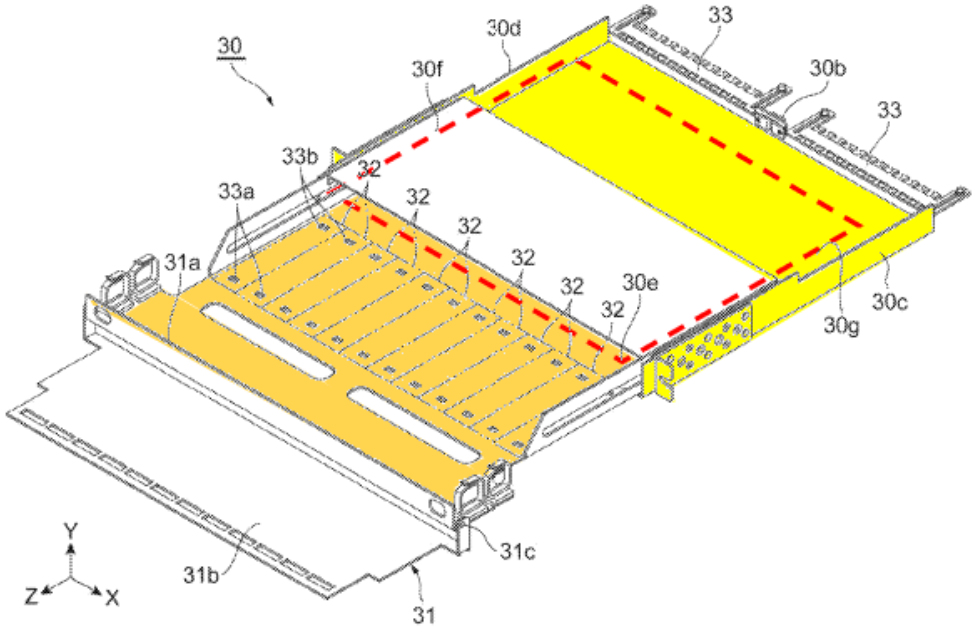
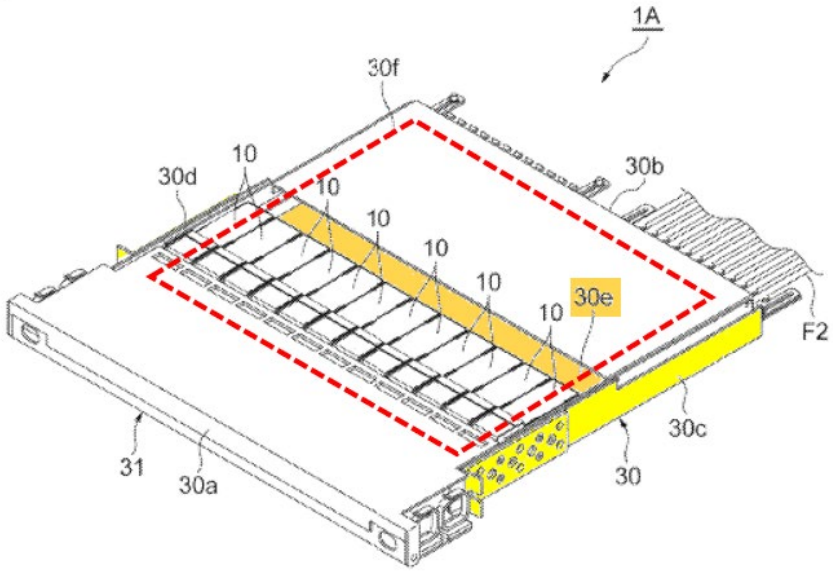


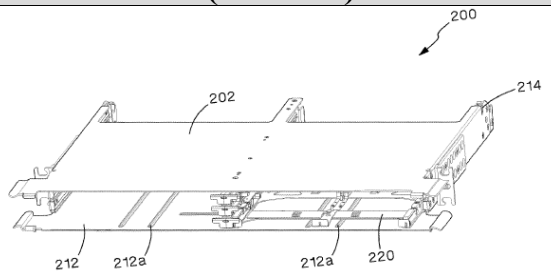
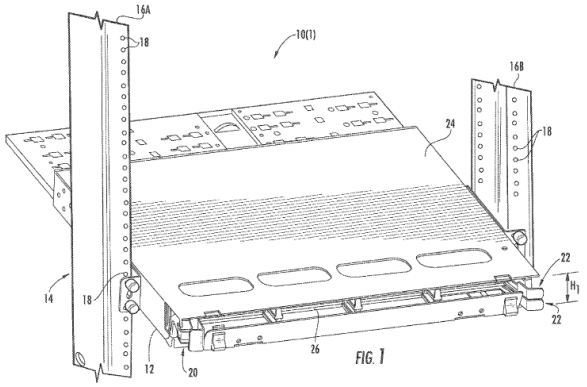
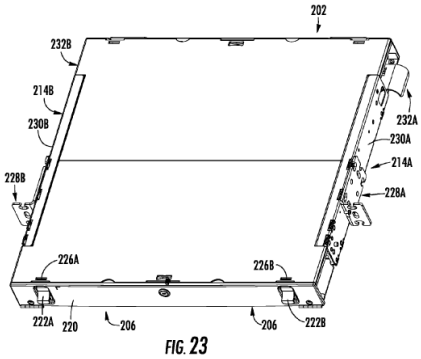
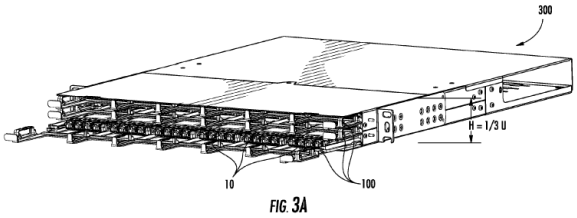
Fig.6

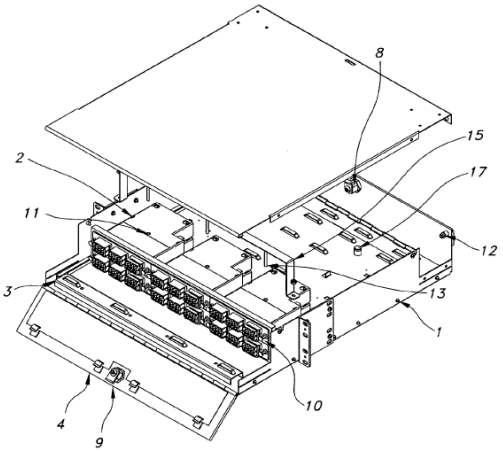


EX1003 ¶¶170-73. The yellow structure—bottom panel 30g and lateral faces 30c and 30d—are formed into "one body." EX-1004, 8:58-60. This "one body" defines Fukui's case. EX1003 ¶170. Fukui's case is part of a "*fiber optic management system*" as explained in the preamble for claim 1.

If PO argues Fukui's case does not have a top, that does not distinguish Fukui. PO's earlier claims in the patent family recite that the case includes a top. EX1034, claim 1 ("a case comprising a top"). PO, however, omitted the "a top" element in these claims. Even if a top were required, a POSITA would find it obvious to add a top based on Fukui itself because it was common knowledge that a case could have a top wall. *B/E Aero., Inc. v. C&D Zodiac, Inc.*, 962 F.3d 1373, 1380 (Fed. Cir. 2020) ("Here, the Board's invocation of common sense was properly accompanied by reasoned analysis and evidentiary support."). It is especially appropriate to consider the common knowledge because the feature at issue (a top wall) is indisputably simple. *B/E Aero*, 962 F.3d at 1380 (discussing common knowledge for "simple" technology). A top wall is merely an ordinary, flat piece of metal. EX1003 ¶179.

The prior art cited on the face of PO's patent shows it was common for the housing with a top wall and includes five examples:

U.S. Patent No. 10,215,944 (EX1005)	U.S. Patent No. 9,008,485 (EX1018)
 FIG.44 EX1005, Fig. 44, 7:32-35.	 EX1018, Fig. 1, 3:67.
U.S. Patent No. 9,075,216 (EX1019)	**U.S. Patent Pub. No. 2016/0062050 (EX1020)**
 FIG. 23 EX1019, Fig. 23, 16:15-29, Figs. 24-27, 17:13-15.	 FIG. 3A EX1020, Fig. 3A-3C, 10D-10E, ¶0052, ¶0061.

U.S. Patent No. 7,509,015 (EX1017)
 EX1017, Fig. 1-4, 4:12-15

EX1003 ¶¶176-78.

Fukui itself discloses a partial top panel (30f) attached to the side walls of the tray and a lid (32) attached to the front of the tray that flips up to partially cover the top:

Fig.9

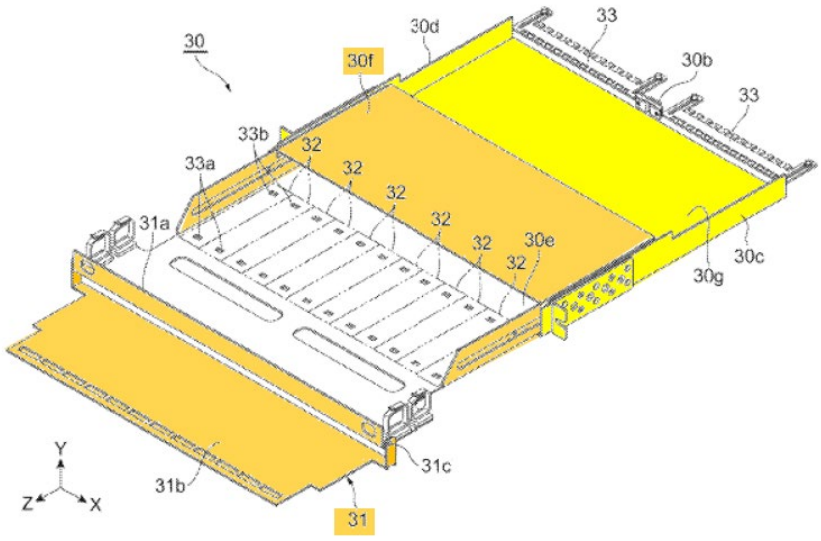
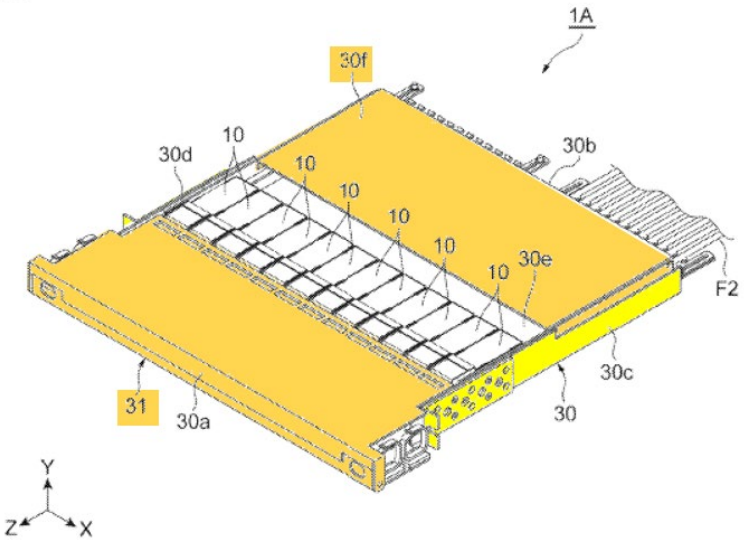


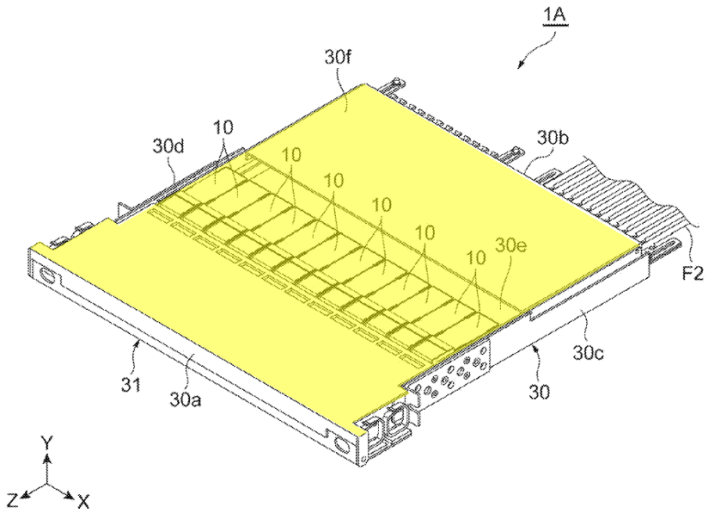
Fig.6



EX1004, Figs. 6, 9, 8:34-42, 8:29-30; EX1003 ¶180. Fukui's modules, however, are not fully protected from the top because there is a gap (white) where there is no top. EX1003 ¶180.

A POSITA would have been motivated to add a top wall to Fukui's case to better protect Fukui's system. EX1003 ¶81. Fukui's current design leaves a gap in the top. *Id.* Environmental elements (e.g., dust) can enter this gap, and components, tools, and other materials could also be accidentally dropped into this gap. *Id.* A top wall is an ordinary piece of metal that can be added with screws. EX1003 ¶182. For example, a POSITA could simply extend Fukui's existing partial top and screw it into the case:

Fig.6

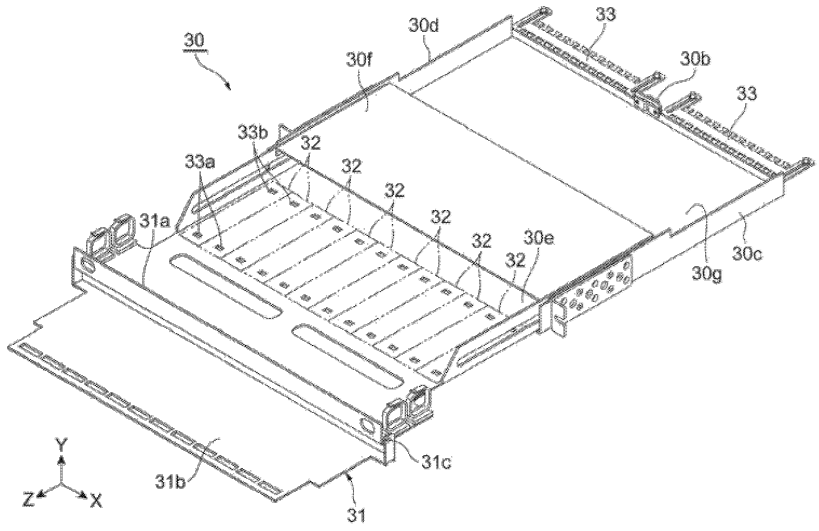


EX1003 ¶183, ¶¶182-187.

G. Claims 5-6, 13-14, 23-24

These claims require a side end portion of each cassette be *"directly adjacent"* (claims 5, 13, 23) or *"adjacent"* (claims 6, 14, 24) the side end portion of another cassette. Figure 9 shows that Fukui's areas (32) for placing the modules are directly adjacent with no intervening structure:

Fig.9



EX1004, Fig. 9; EX1003 ¶189. Figures 6-8 show that the side edges of the modules are directly adjacent when they are placed in these areas:

Fig.8

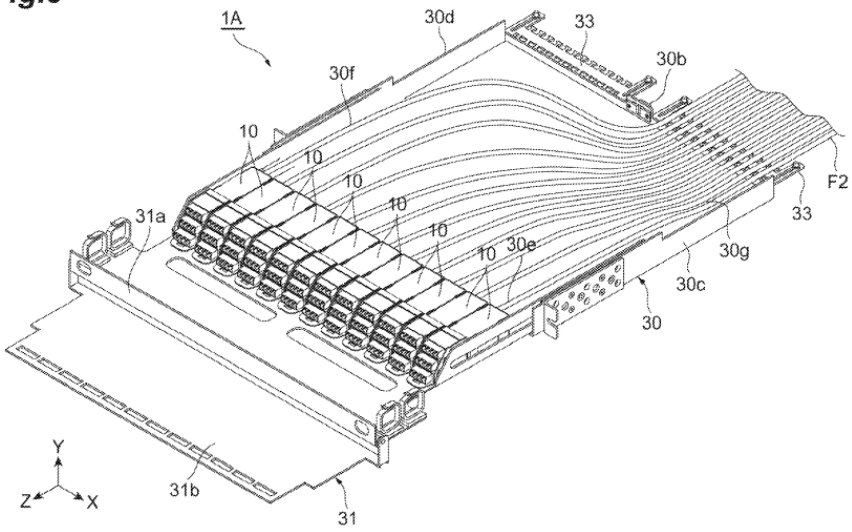

1A
30d
33
30b
30f
10
31a
30e
30g
30c
30
F2
Y
Z
X
31b
31

Fig.6

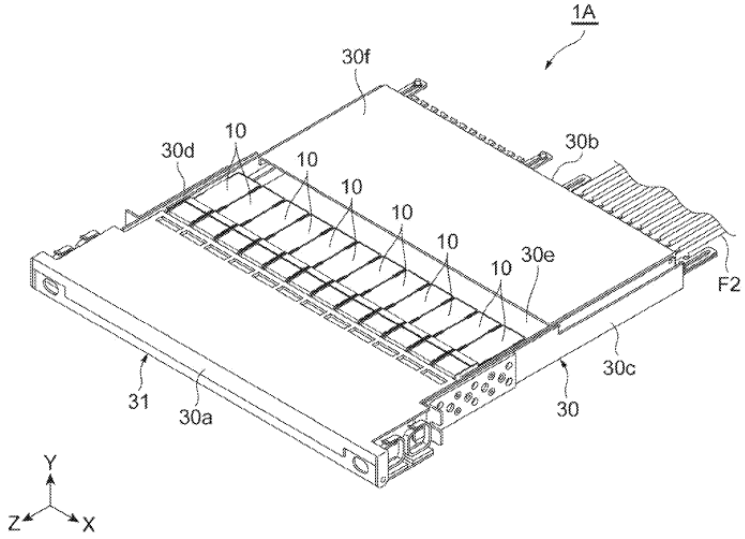
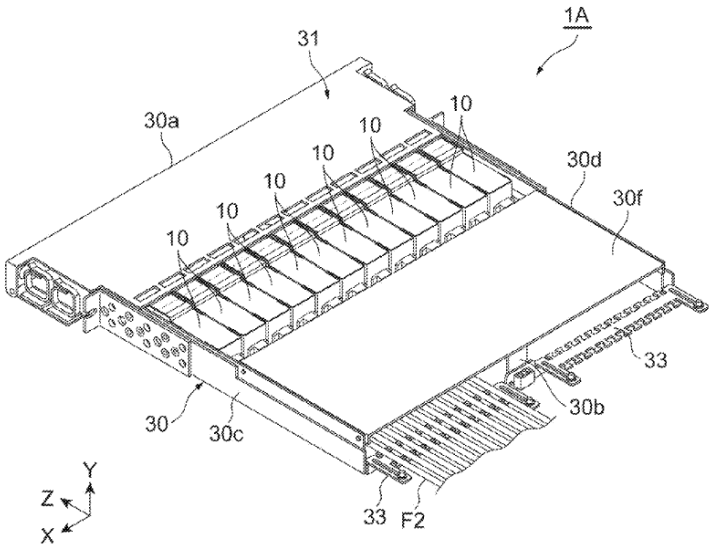

1A
30f
30d
10
30b
30e
F2
30c
31
30a
30
Y
Z
X

Fig.7

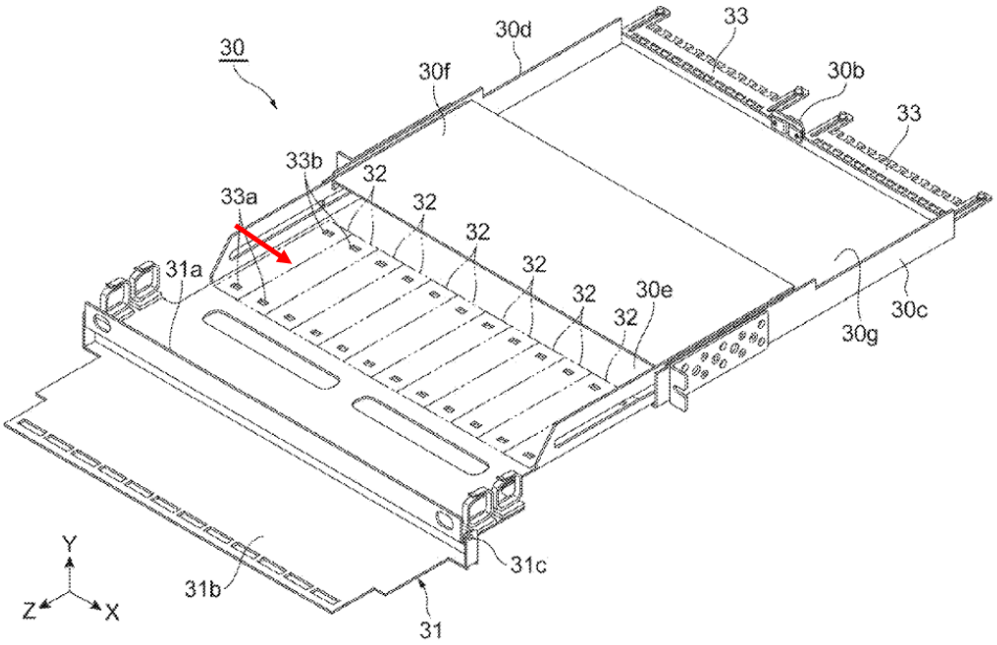


EX-1004, Figs. 6-8, 4:36-37 ("adjacent lateral walls"); EX1003 ¶¶190-192.

H. Claims 7, 15, 25

These claims require a side end portion of each cassette *"touches*" the side end portion of another cassette. Figure 9 shows the areas (32) for placing the modules touch each other. The sides of adjacent areas come together to a single black line:

Fig.9



EX1004, Fig. 9; EX1003 ¶197. Figures 6-8 show that the sides of adjacent modules come together to a single black line with no gaps when installed in those area:

Fig.8

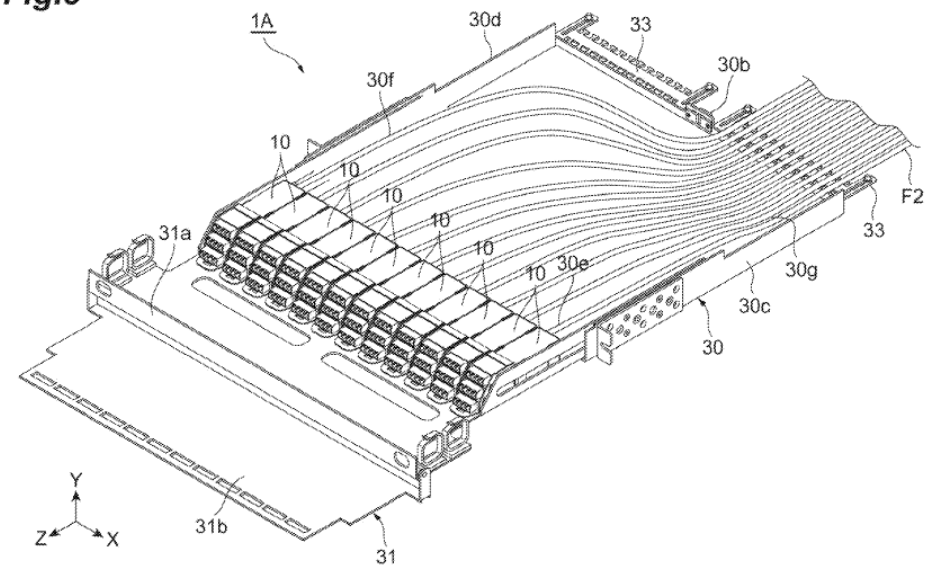


Fig.6

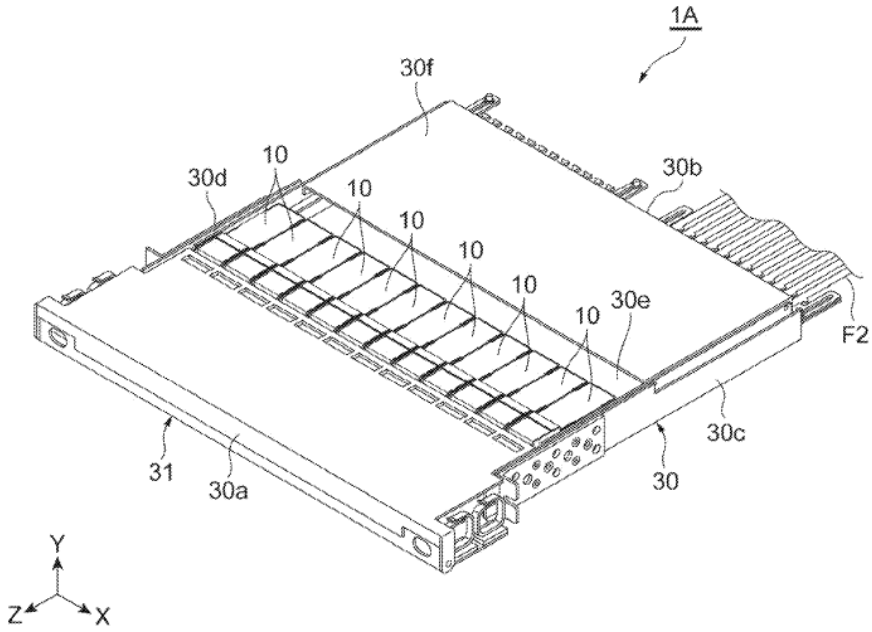
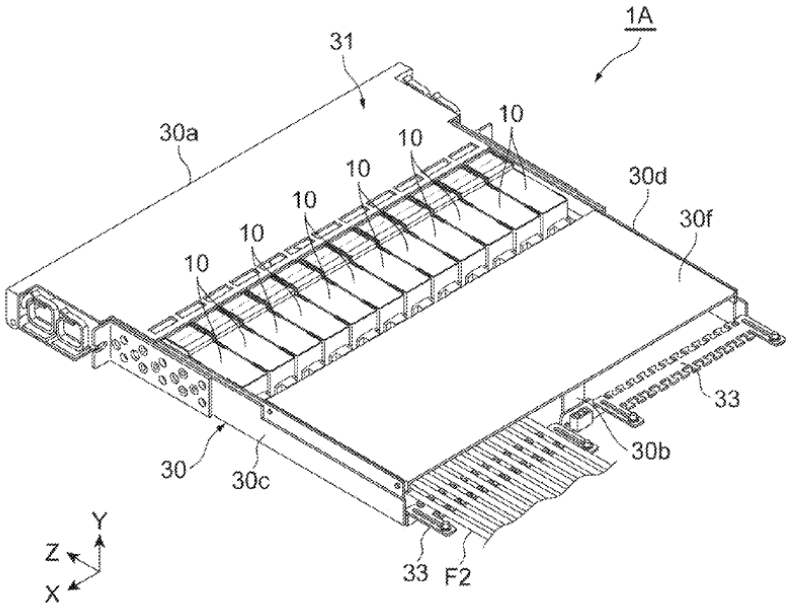


Fig.7



EX1004, Figs. 6-8; EX1003 ¶196.

To be clear, although the above figures show modules 10, the same proximity applies to other sizes of modules because they use the same areas (32). Here is an annotation showing the proximity of a two-unit module (orange) to three-unit module (green):

Fig.8

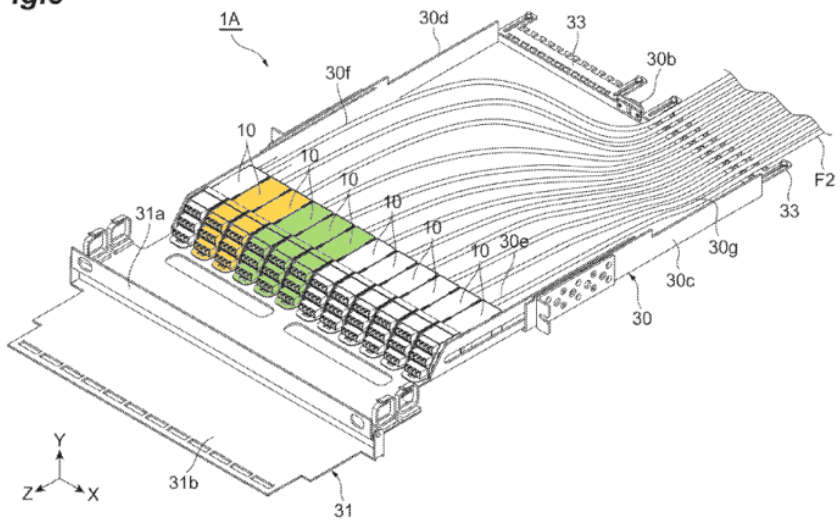
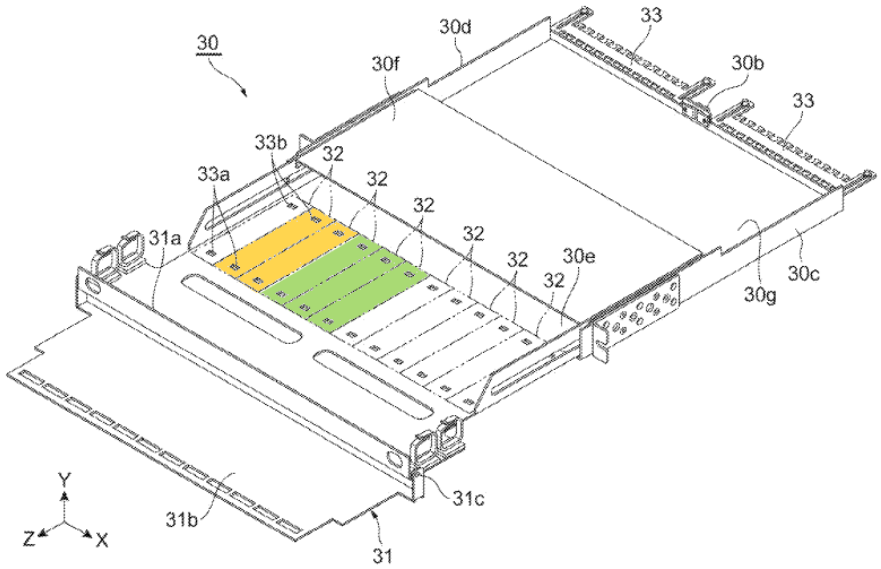


Fig.9



EX1003 ¶¶198-99.

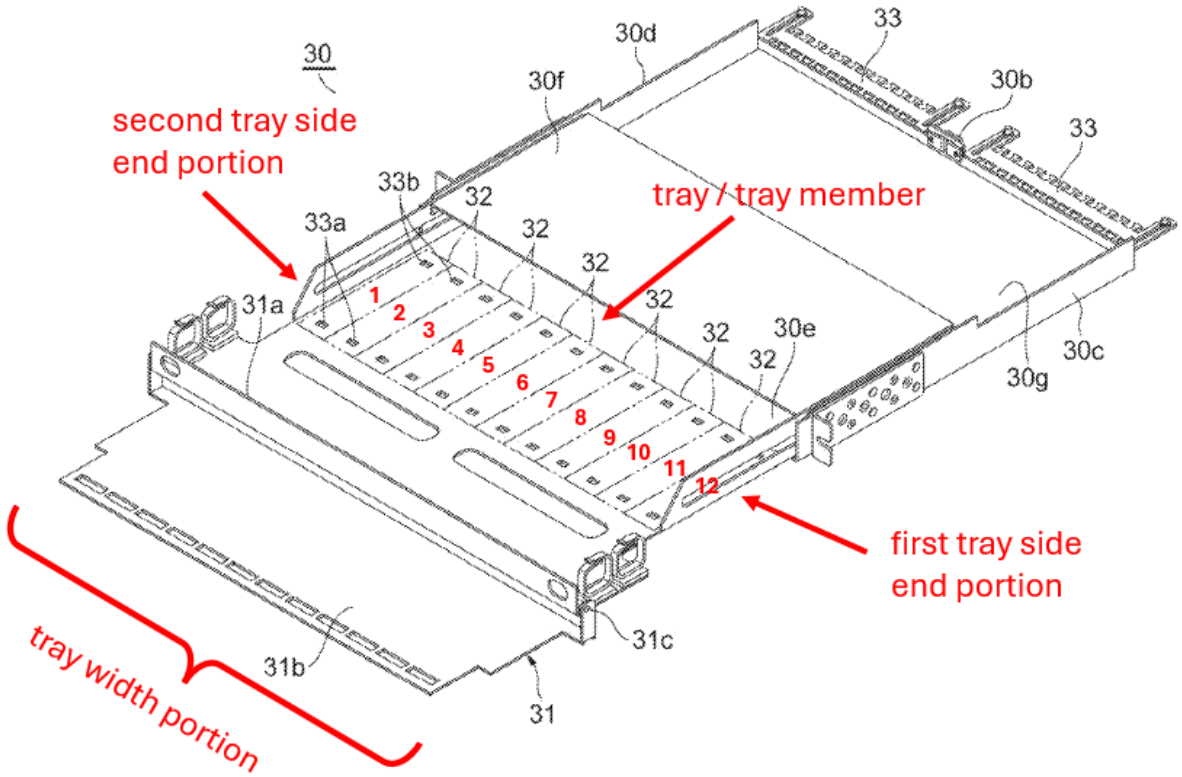
Fukui's disclosure is very similar to the disclosure in PO's specification. PO's specification does not expressly use the term "touches." Instead, like Fukui, PO's figures illustrate its cassettes side by side on the tray with no gaps in between. EX1001, Figs. 4A-4D.

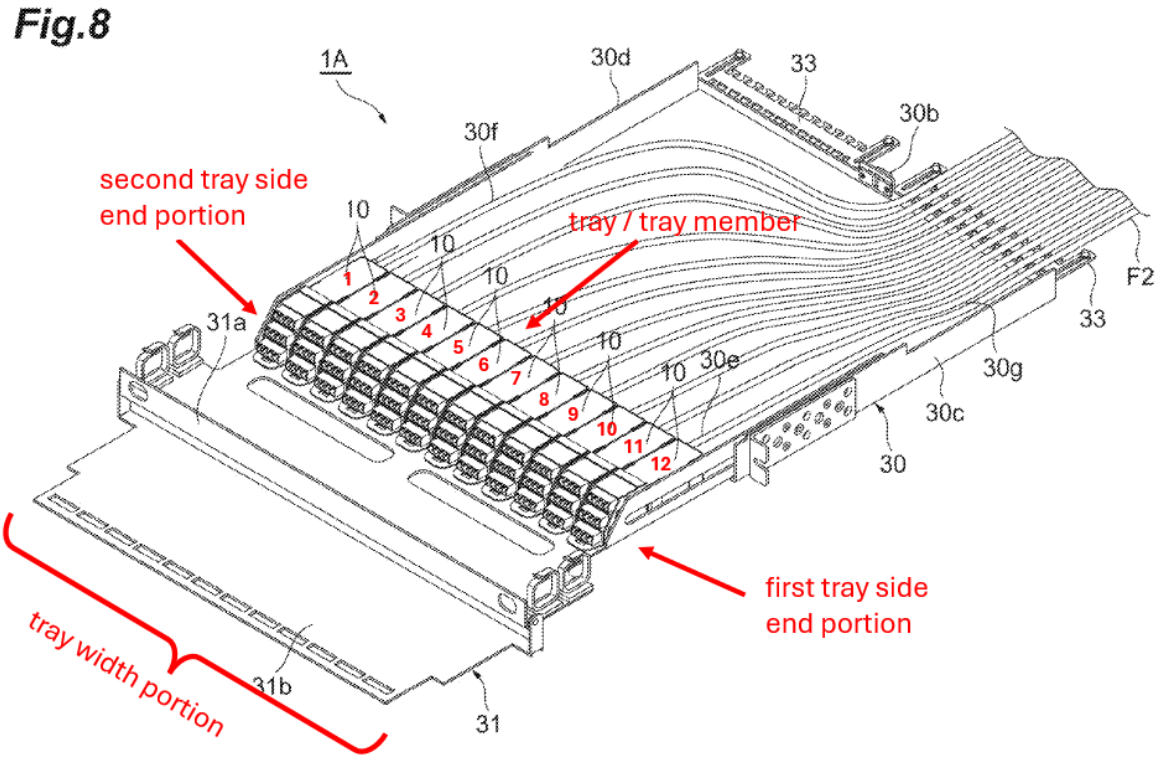
Even if there was a tiny space between the modules, a POSITA would find it obvious to omit such a tiny space and have the modules touch. EX1003 ¶¶201-212. Fukui itself teaches that it desirable to treat the larger coupled units as "one body," i.e., a rigid assembly. EX1004, 8:2-3. The prior art recognizes that having "no clearance" (i.e., no space) between coupled modules creates a more rigid assembly. EX1026, 3:4-9 ("Thus, a rigid assembly is achieved."). Thus, a POSITA would be motivated to have the modules touch. EX1003 ¶¶204-209. A POSITA would consider this obvious and predictable implementation of Fukui's teachings showing that the areas (32) for the modules touch. EX1003 ¶212. Having the modules touch would also provide advantages in alignment during installation and minimizing gaps through which dust and other materials can enter the modules. EX1003 ¶205, ¶¶207-209. At most, a POSITA would only need to slightly increase the size of modules 10 such that there is no space between adjacent modules 10. EX1003 ¶¶210-211. There are no rails or other intervening structures that would prevent having the modules touch.

I. Claims 8, 16, 26, 27

Fukui's bottom panel has the recited features and is configured to fit *"twelve"* standard width units side by side in a row along the tray:

Fig.9



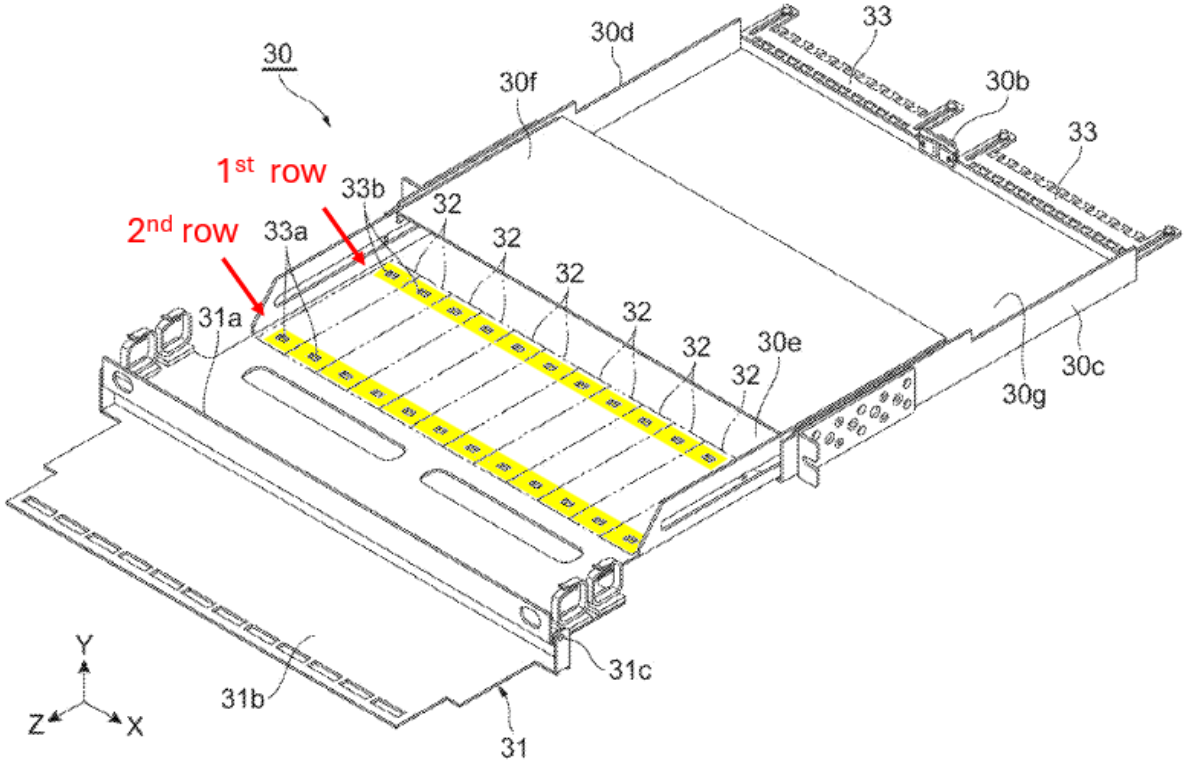


EX-1004, Fig. 8, 9:35-53; EX1003 ¶¶214-215.

J. Claim 20

Fukui tray has the two *"rows"* of cassette engaging features recited in this claim:

Fig.9



EX1004, Fig. 9, 8:52-55; EX1003 ¶217.

K. Claim 21

Claim 21 narrows Claim 20 to require the first row comprise "slot portions" to engage a "tab portion" of the cassettes. Fukui's rectangular holes each define a "slot." EX1003 ¶219. Comparing Figure 9 and 2 shows these slots each engage a tab on the cassettes:

Fig.9

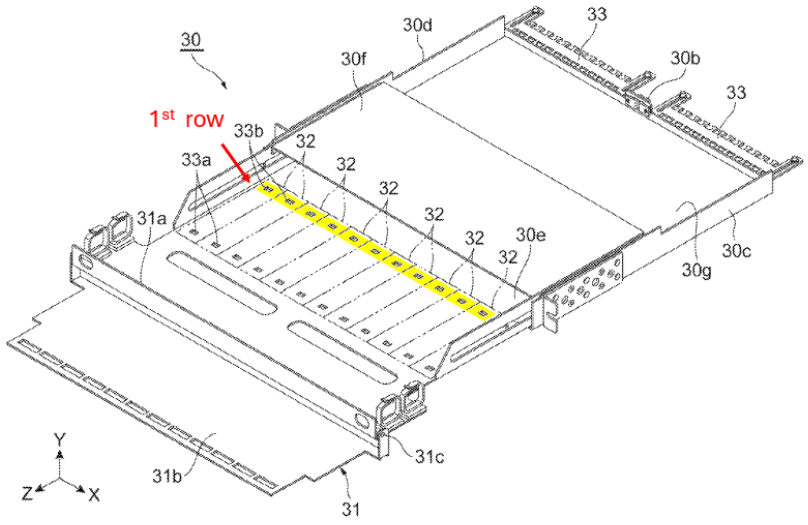
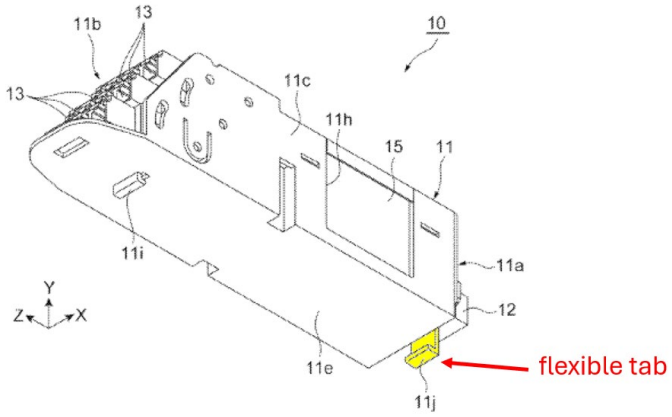


Fig.2

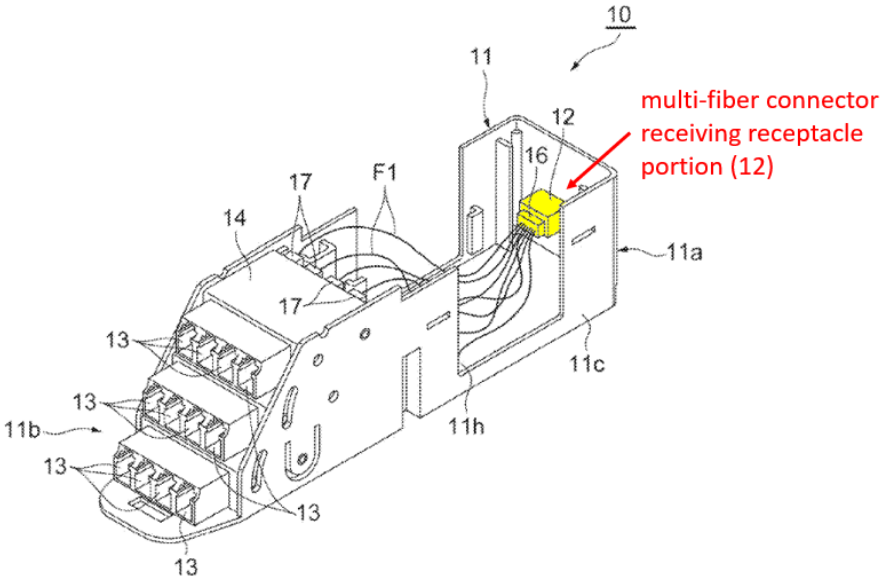


EX1004, Fig. 2, 8:52-56; EX1003 ¶219.

L. Claim 28

Fukui's modules comprise the claimed *"multi-fiber connector receiving receptacle portion"* (see element 12):

Fig.4

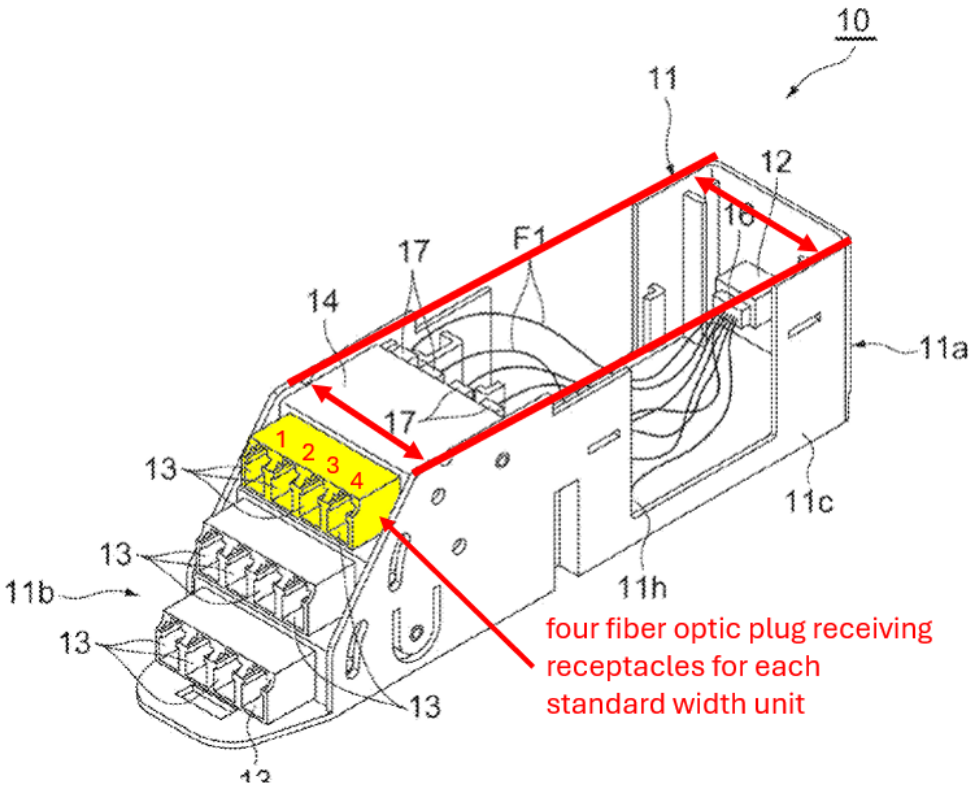


EX1004, Figs. 4-5, 5:13-14, 6:35-48, 6:64-7:13, 7:34-65; 7:27-29, 8:3-6, Figs. 4-5; EX1003 ¶221.

M. Claim 29

Fukui's one unit module comprises the claimed *"four fiber optic plug receiving receptacle portions"* (see elements 13) arranged side by side in a row along a front thereof as recited in the claim:

Fig.4

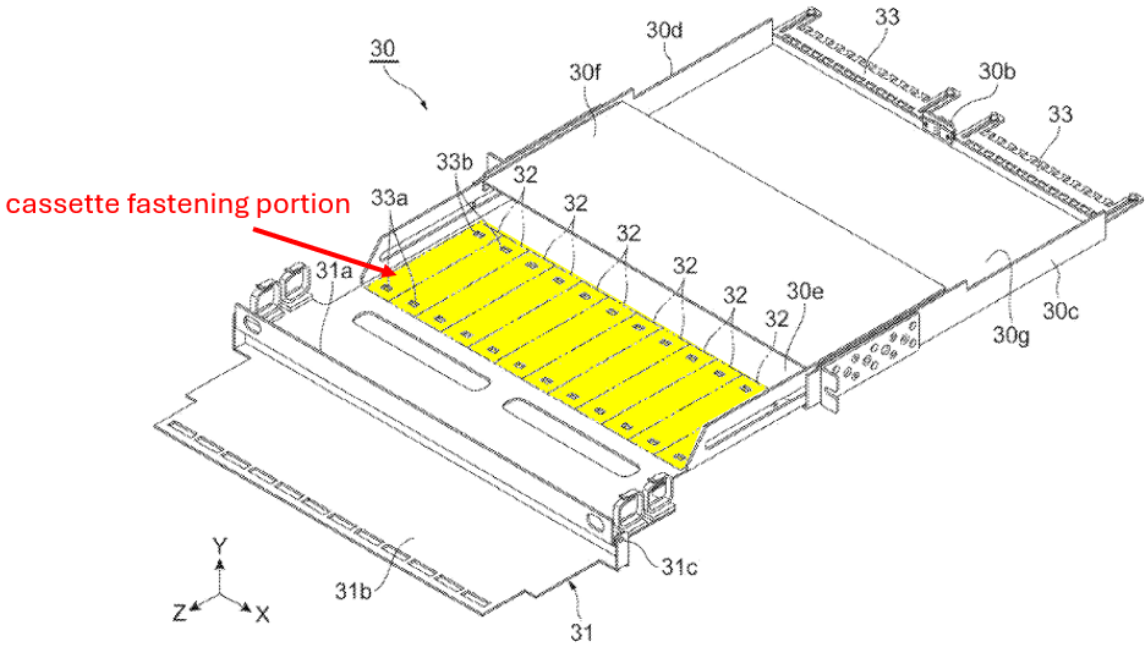


EX-1004, 5:31-33; EX1003 ¶¶223-224. Elements 13 are receptacles for LC connectors. EX1004, 5:24-27; 7:27-29, 8:3-6, Figs. 4-5.

N. Claim 30

Fukui's tray member comprises a *"cassette fastening portion"* (areas 32) that is configured to removably secure the tray member to each module via holes (33a, 33b) that engage with hooks (11i, 11j) on the modules:

Fig.9



EX-1004, Fig. 9, 8:45-56 ("hooks…engages with these holes"), 9:66-10:1 ("easily removed"), 9:18-29, 10:33-35, 3:8-11; EX1003 ¶226.

Ground 2: Fukui combined with Sauter renders claims 1-30 obvious

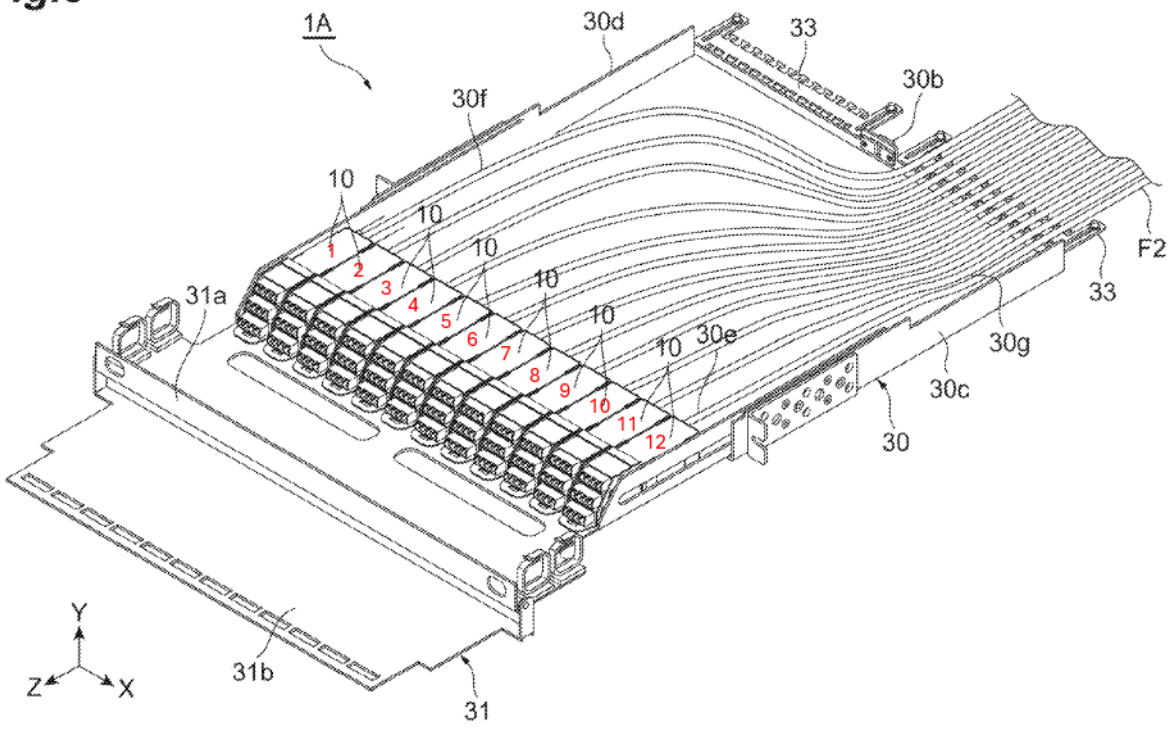
Ground 2 addresses three points.

First, if PO disputes Fukui's disclosure for the five configurations (Elements 1H, 9E, 17E), Sauter provides further disclosure.

Sauter broadly teaches that "any combination of single-gang and multi-gang cassettes can be installed on a given tray 1510, subject to space limitations of the tray." EX1006, 9:60-62. Fukui's one module unit 10 is a type of "single" gang cassette and multiple Fukui modules coupled together is a type of "multi" gang cassette. EX1003 ¶229; EX1004, 9:66-10:10. Applying Sauter's broad teaching to

install "any combination" of multi-gang cassettes "subject to space limitations of the tray," a POSITA would find the five recited configuration obvious. The space limitation of Fukui's tray is 12 unit modules, i.e., 12 standard width units:

Fig.8



EX1004, Fig. 8, 9:35-43. The recited five configurations all fit within this space because they all total 12 width units. EX1003 ¶¶229-230.

A POSITA would have been motivated to configure Fukui's tray with each of the five configurations to serve different combinations of input cables. EX1003 ¶¶231. Fukui already teaches to support input cables with "various" number of cores. EX-1004, 3:27-28, 4:2-3, 4:42-43, 8:1-2, 9:58-59, 10:4-6, 10:34-35. Consider the example where there are six input cables with 24 cores. An obvious

solution is to configure Fukui's tray with six two-unit modules that each support 24 cores to match the six cables with 24 cores, i.e., the claimed first configuration. EX1003 ¶231. The same reasoning applies to the other claimed configurations. *Id.* Element 1H shows Fukui's tray already fits the five configurations; thus, a POSITA would certainly have a reasonable expectation of success as no changes are needed. EX1003 ¶¶232.

Second, if PO argues Fukui is distinguishable because of the height of Fukui's moules, a POSITA would find it obvious that Fukui's modules could be scaled down in the height dimension. EX1003 ¶¶233-242. Fukui already teaches that the height of Fukui's can be scaled down in the height dimension from three tiers to two tiers. EX1004, 10:39-44. Sauter scales the height of the modules down further to one tier of LC modules:

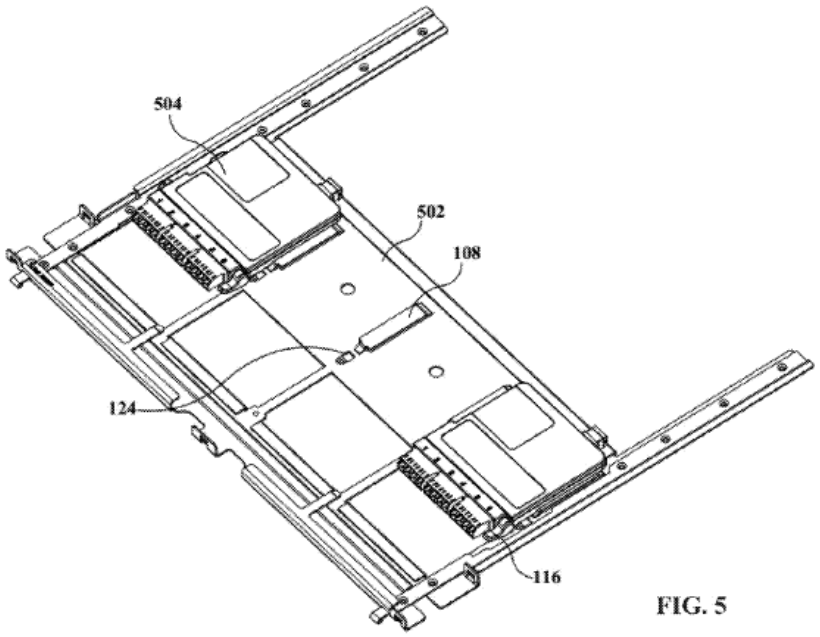


FIG. 5

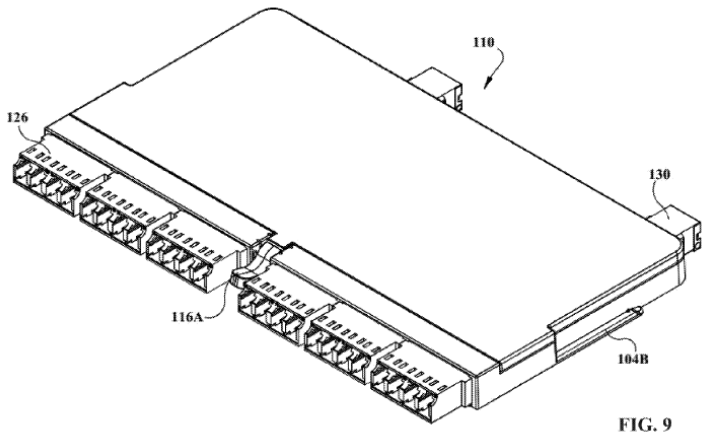


FIG. 9

EX1006, Figs. 5, 9.

A POSITA would have been motivated to scale the height of Fukui's modules down to one tier to support deployments where there is not sufficient space to accommodate more than one tier. EX1003 ¶¶236-238. Fukui three-tier design requires 1U space in a rack. EX1004, 9:30, 9:38. But there is not always 1U of space available. A rack may be already populated by other equipment that only leaves smaller amounts of space (½ U, ⅓ U). EX1003 ¶238, ¶236. A POSITA is motivated to use the available space in the rack, and a POSITA could advantageously deploy Fukui's system in both these smaller spaces simply by scaling Fukui's system down to one tier that proportionally only requires ⅓ U space. EX1003 ¶237. Background art confirms that one tier of modules occupies 1/3 U space:

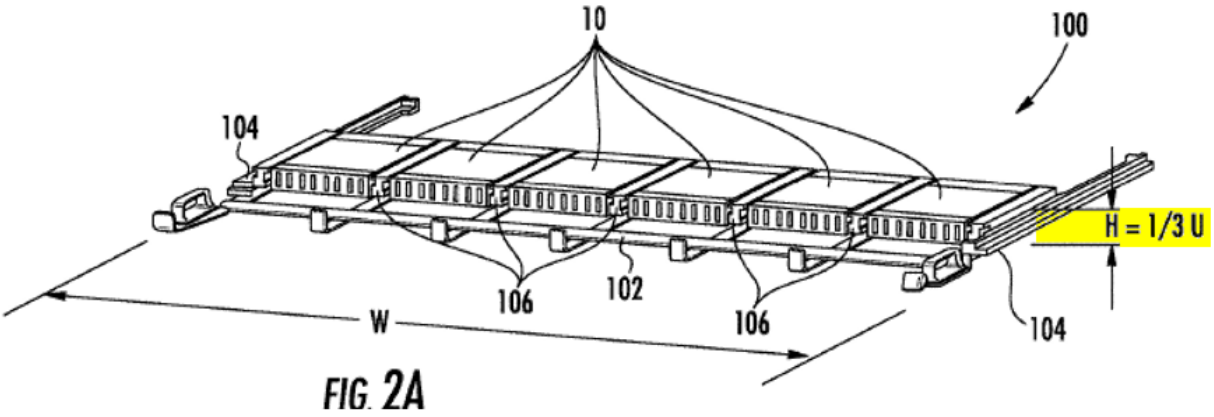


FIG. 2A

EX1030, Fig. 2A, ¶0060 ("⅓ U-Space"). This modification merely requires scaling Fukui's existing components, not adding any new functionality. EX1003 ¶240.

Fukui does not discourage reducing the height of Fukui's modules where less than 1U of space is available. Although Fukui does disclose benefits of having three tiers instead of one tier, that discussion relates to the instance where 1U of space is available. Fukui never discusses much less discourages reducing the height of Fukui's modules in the alternative instance where less than 1U of space is available. EX1003 ¶239.

Once scaled down, Fukui's two, three, four, and six unit modules would support only one, two, three, four, and six quad LC connectors, respectively, because there is only one tier. As a result, Fukui's two, three, four, and six unit modules would support 8, 12, 16, 24 cores, respectively. EX1003 ¶242, n.10. It was well known that that the "various" sizes of cables referenced in Fukui included

all these number of cores. *Id.* As mentioned above, Fukui's modules have MPO adapters to connect to the various sizes of cables, and the MPO industry standard specifically provides for all of these sizes (8, 12, 16, 24). EX1003 ¶242, n.10.

Third, if PO argues Fukui is distinguishable from dependent claims 2, 10, and 18, Sauter expressly discloses that cassettes can be configured to accept LC, SC and MPO connectors. EX1006, 8:20-28. A POSITA would have been motivated to have Fukui's width unit fit SC and MPO connectors for interoperability with deployments that require SC and MPO connectors. EX1003 ¶245. This merely requires a substitution of one known component (Fukui's LC adapter for LC connector) for another known component (Sauter's SC adapter for an SC connector). EX1003 ¶246. The adapters for LC, SC, and MPO connectors were all well-known, standardized, and commercially available. *Id.* This would not require any change to Fukui's width unit because the widths of the connectors are standardized to be compatible to fit within the same space of other connector types. *Id.*

Ground 3: Sauter combined with Dagley renders claims 1-30 obvious.

A. Independent Claim 1

1. Preamble

Sauter discloses fiber optic cassette trays (e.g., trays 102, 502, and 1510) that slide into an enclosure within a standard U-space. EX1006, Abstract; 1:54-58; 4:1-28; 2:44-45; Figs. 1-5, 7-8, 11, 15-16; 10:4-5.

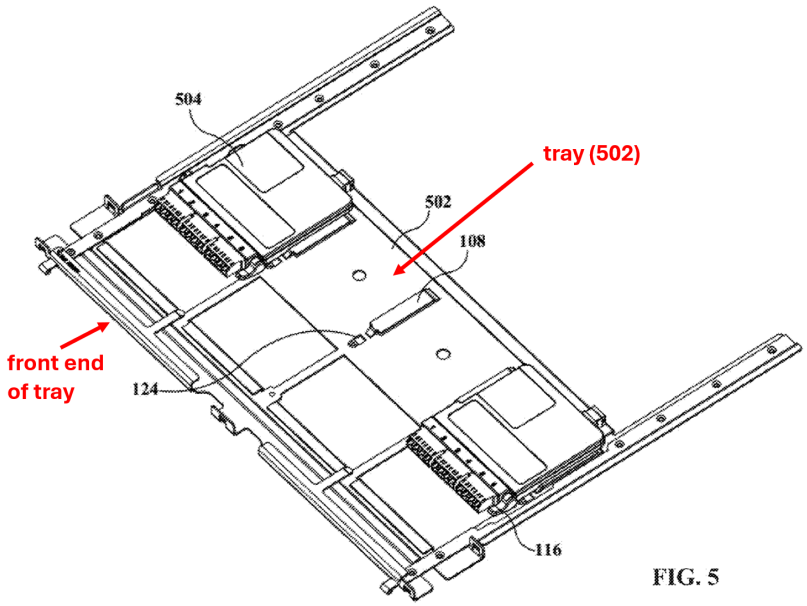


FIG. 5

The tray can be populated in multiple different configurations using modular cassettes of different sizes. EX1006, Figs. 1-16, 1:5-6; 4:1-14; 8:4-20; 5:4-17; 9:60-62; Fig. 17; EX1003 ¶¶247-256.

2. Element 1A

Sauter discloses trays (e.g., trays 102, 502, and 1510) that satisfy this element. EX1006, Abstract; 1:54-58; 4:1-28 2:44-45; Figs. 1-5, 7-8, 11, 15-16 (showing trays); 10:4-5; EX1003 ¶257.

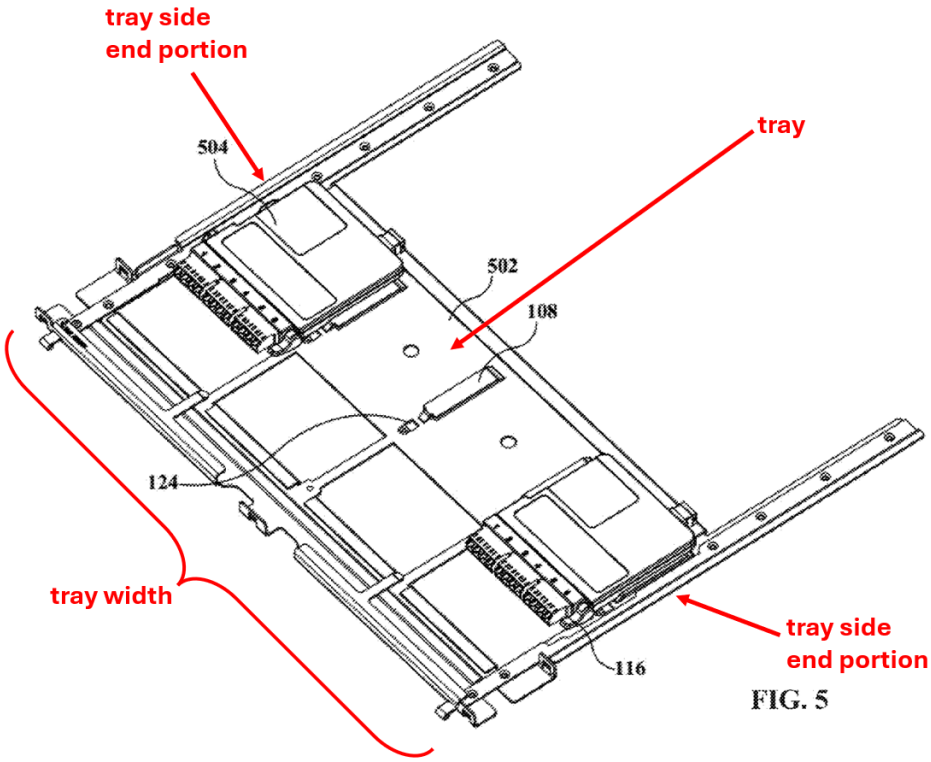


FIG. 5

3. Element 1B

Sauter's tray fits within a standard U-space width dimension. The parties agree that "a standard U-space width dimension" means "a width dimension defined in the EIA/ECA-310-E standard." EX1011, 2. This standard defines rack opening sizes for three different panel sizes.

4.1 Classification
EIA-310-C identified three cabinet or rack openings to accommodate each of three standard panel widths 482.6 mm, 609.6 mm and 762.0 mm. The preferred panel width is 482.6 mm.

EX1008, 2; EX1003 ¶¶258-262 (19 inch, 24 inch, and 30 inch sizes). The rack opening (width) for the smallest size is 450 mm. EX1008, p. 2, Figure 3.

From the well-known dimensions of the LC connector receptacles shown on Sauter's cassettes, a POSITA would recognize that Sauter's entire tray and enclosure system (including three trays) is sized to fit within a standard 19-inch rack's opening width (within 450 mm) and within the vertical space of 1U as defined by EX1008. EX1003 ¶¶263-265.

Conforming Sauter's tray to fit a U-space width dimension would have been obvious

If PO argues fitting a U-space width is not disclosed by Sauter, such a modification of Sauter would have been obvious. It would be highly unusual to offer a rack mounted panel that does not conform to the standard rack sizes already deployed in the industry. EX1003 ¶266. A POSITA would be motivated to make the system fit a standard 19 inch rack so that customers can deploy the system into already installed 19 inch racks. EX1003 ¶266. A POSITA would have a reasonable expectation of success because Sauter's cassettes leave sufficient space to fit the tray within any of the three standard U-space racks. EX1003 ¶266.

4. Element 1C

Sauter teaches that multiple cassettes can be chosen to form multiple cassette configurations on the tray. EX1006, 4:7-13; 5:4-17; EX1006 9:60-62 ("…any combination of single-gang and multi-gang cassettes can be installed on a given tray 1510."); Figs. 5, 17; 6:42-56. EX1003 ¶¶267-269.

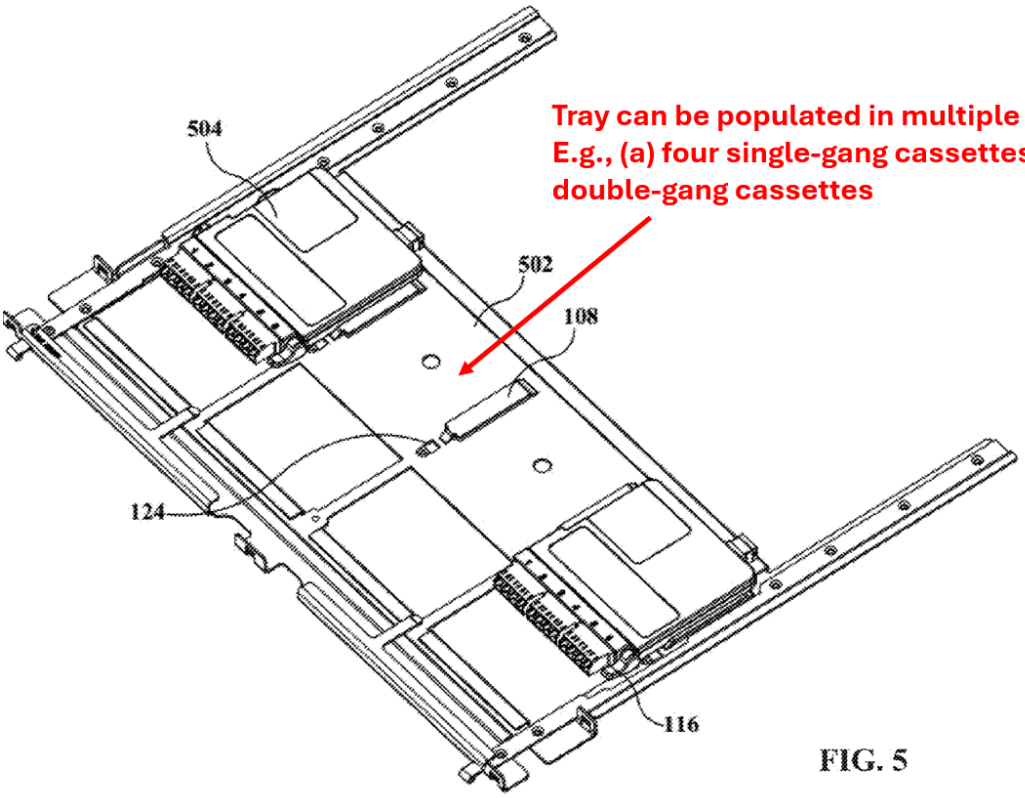


FIG. 5

EX1006 Fig. 5; 6:42-56.

5. Element 1D

Sauter shows LC adapters 126 in the cassettes which are examples of receptacle modules, each of which includes four LC connector receptacles. EX1006 8:4-28; Figs. 2-7, 9-11, 13, 15, 16; EX1003 ¶¶270-272.

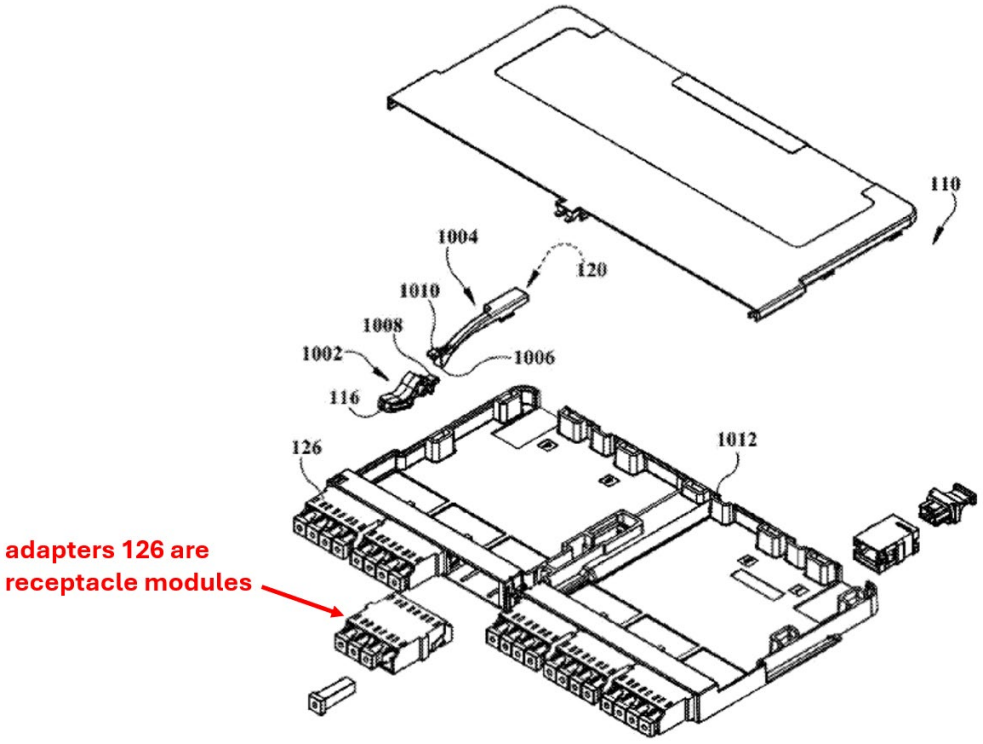

110
1004
120
1010
1008
1002
1006
116
126
1012
adapters 126 are
receptacle modules

FIG. 10

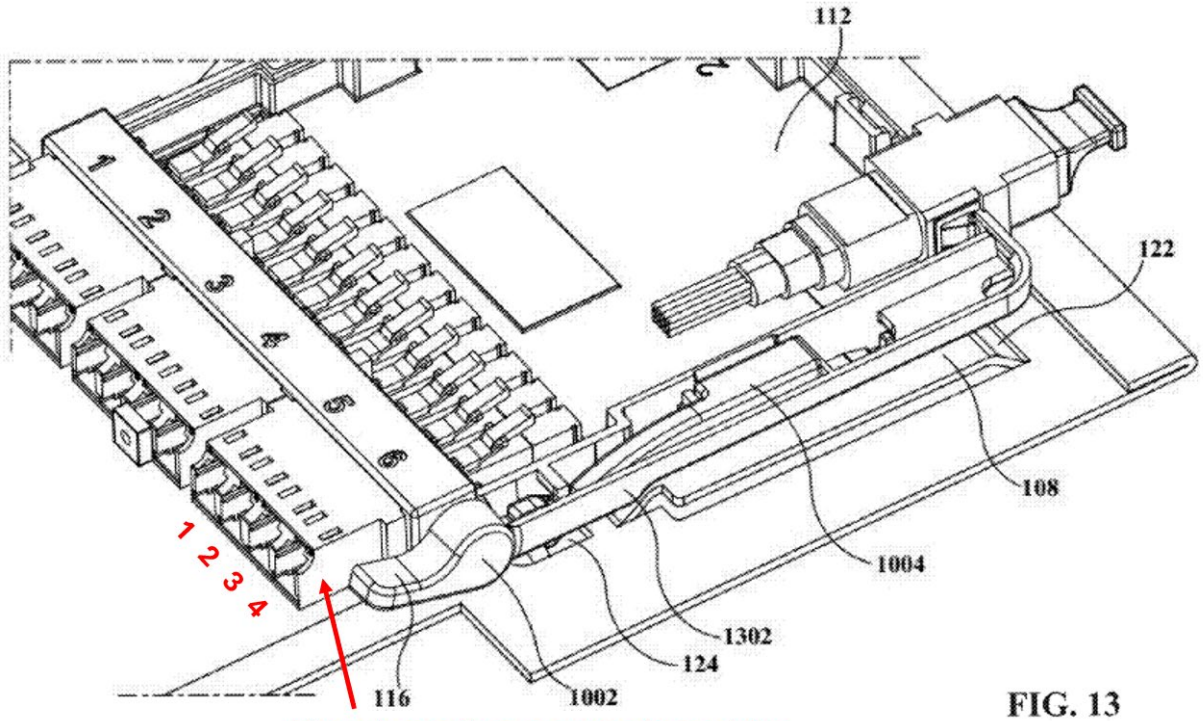

112
122
108
1004
1302
124
116
1002
1 2 3 4 5 6
1 2 3 4
The adapter is a receptacle module.
Each modules includes four plug
receiving receptacles side by side.

FIG. 13

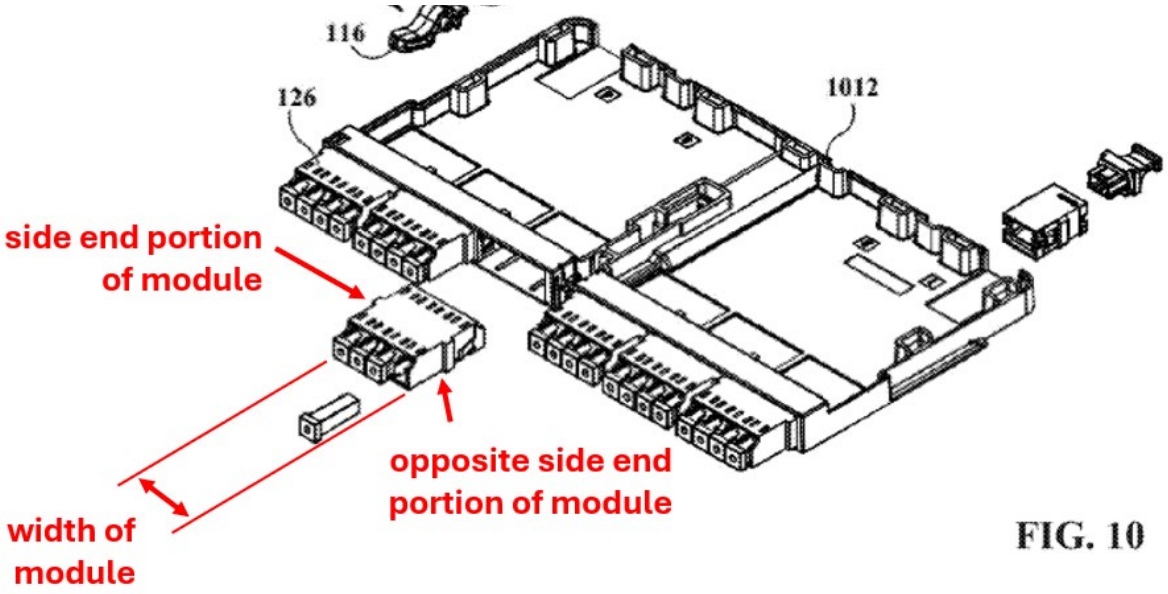


FIG. 10

EX1006, Fig. 10; *see also* EX1006 Figs. 3, 5, 10, 15.

6. Element 1E

Under PO's interpretation, Sauter's quad LC adapter modules satisfy this limitation. PO asserts a standard one width (1W) unit is "a unit of width that accommodates a single receptacle module, such as a LC Quad (SC Duplex) technology footprint comprising four connectors." EX1011, 8. Under PO's interpretation, one third of the width of Sauter's single-gang cassette (112, 504) is an example of a standard one width (1W) unit that accommodates a single receptacle module (126) having a LC Quad technology footprint comprising four connectors. EX1003 ¶273. Sauter's single-gang cassette 112, 504 has a width that accommodates three quad LC adapter modules along the front of the cassette, and each quad LC adapter module 126 in Sauter is small enough to fit within one third of the width of Sauter's single-gang cassette:

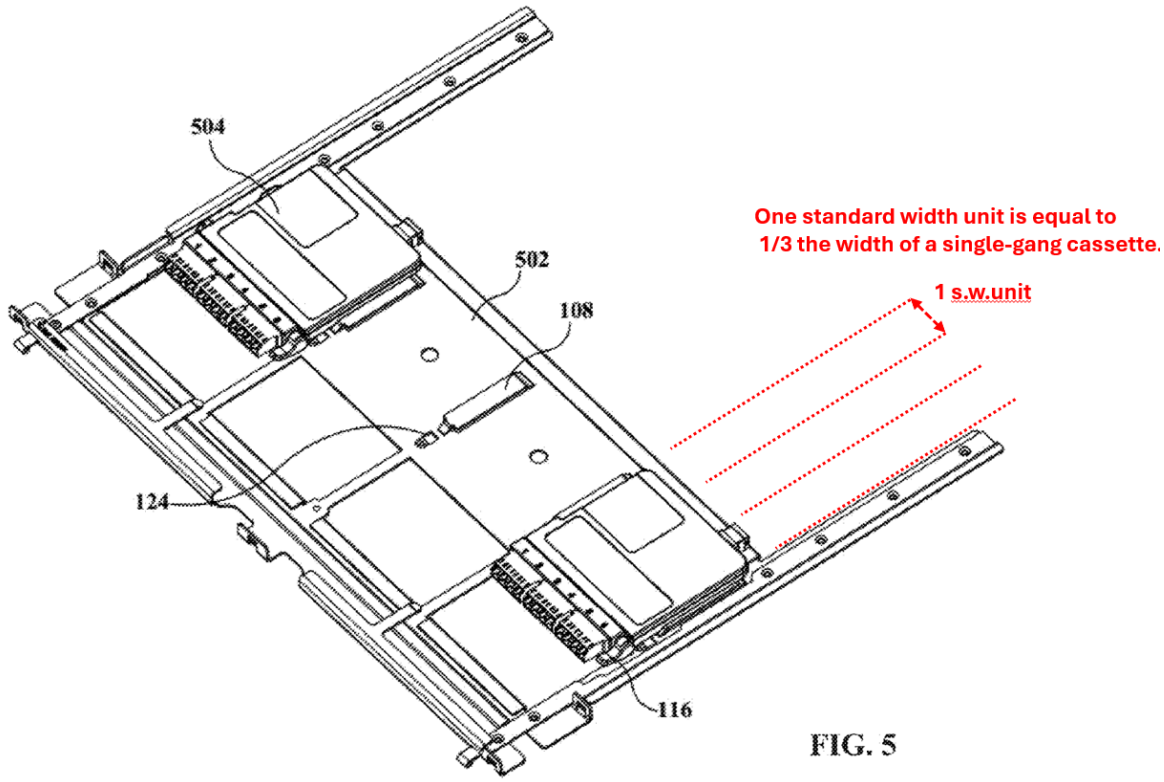


FIG. 5

EX1006, Fig. 5. The single-gang cassette 112, 504 is an example of a cassette having a width of three standard width units (3W). EX1003 ¶¶273-274.

Even if the term "standard (1W) width unit" is not merely defined by the number of modules a unit of width can accommodate, but is actually about the mathematical relative width dimensions of different cassettes as measured from side to side and being based on a width standardized in the industry, Sauter's cassettes disclose this. Sauter discloses cassettes that are a multiple in size relative to each other and are based on the standard quad LC footprint. EX1006, 4:50-61. EX1006, 4:50-61 ("approximately twice as wide…approximately three times as

wide"); 8:20-28, Fig. 10 (LC adapters). When the latching mechanism 120 is positioned along the right hand side of the double-gang cassette (as taught by Sauter at 7:48-60, 1:64-2:1), the width of the double-gang cassette mathematically equals twice the width of the single-gang cassette, without any additional amount, not merely "approximately" twice the width of cassette 112. EX1003 ¶¶275.

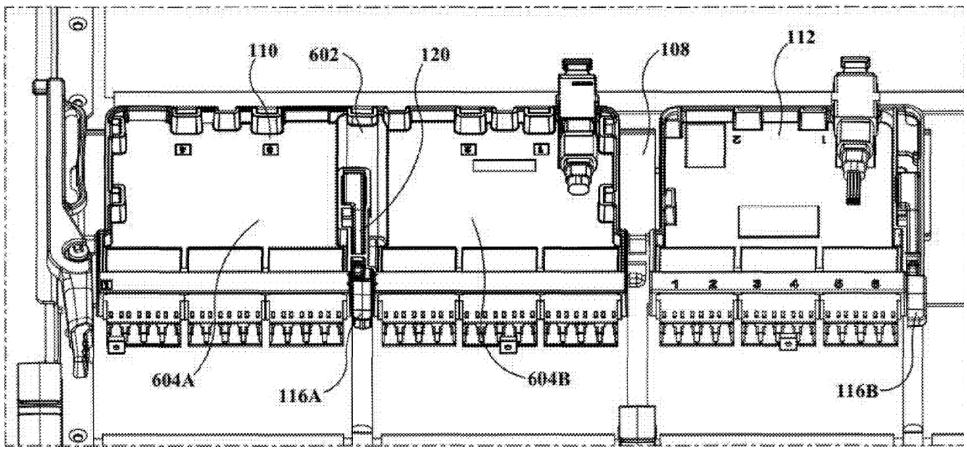
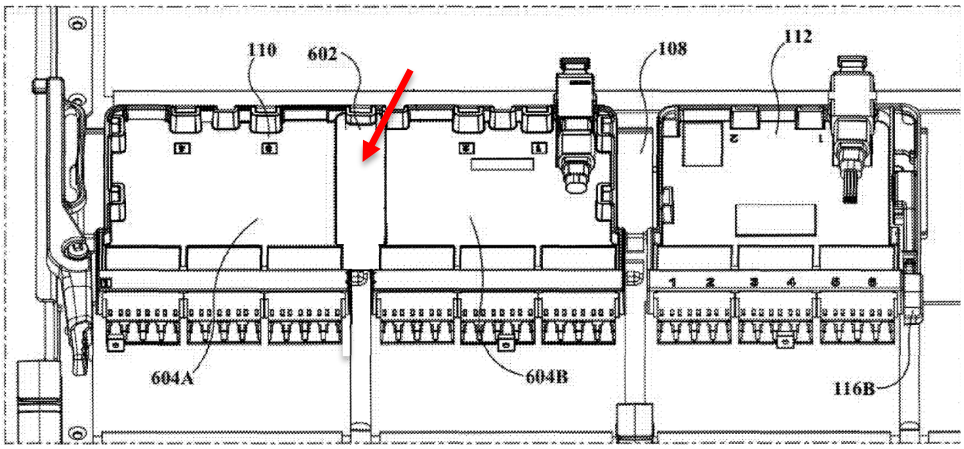
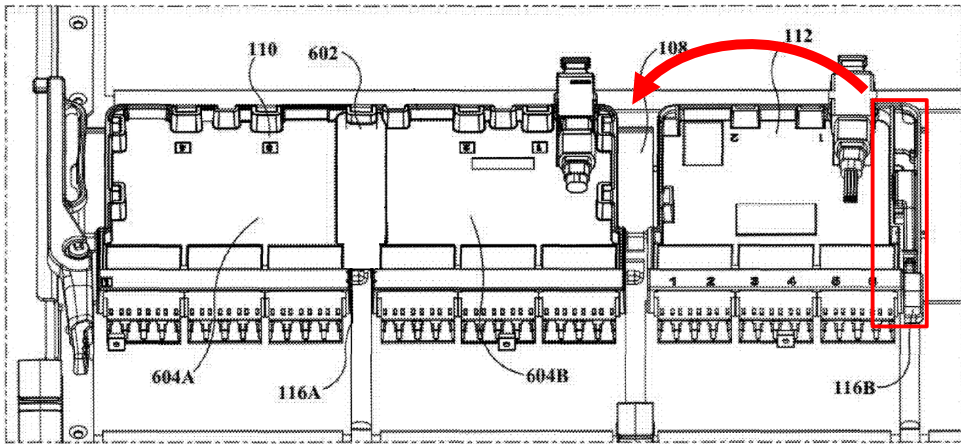
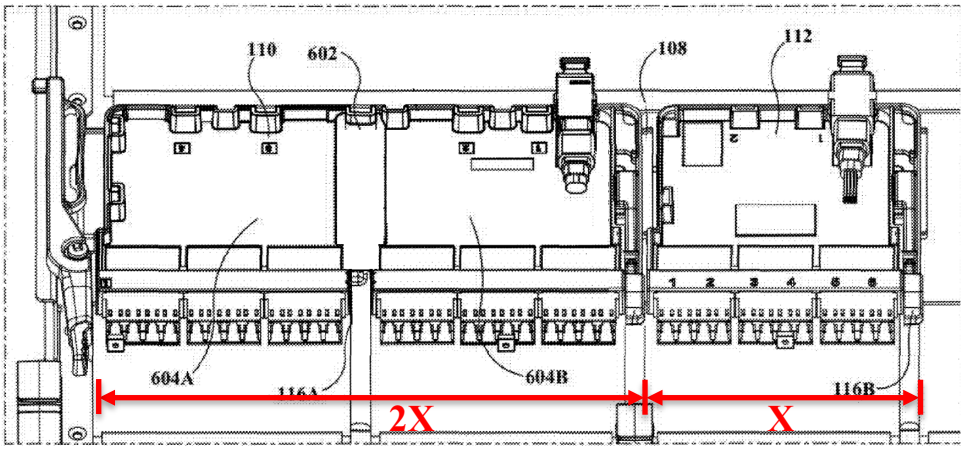
Fig. 7 as shown in Sauter (with latching mechanism 120 and 116A in the middle of cassette 110)	
Fig. 7 without middle latching mechanism 120 and 116A	

Fig. 7 indicating latch mechanism along right side of cassette 112 that Sauter teaches can be duplicated onto right side of cassette 110.	
Fig. 7 with latching mechanism located along right hand side of cassette 110 as taught by Sauter at 7:54-56.	

Such a double-gang cassette would also be an exact multiple of any width unit that divides evenly into the width of the single-gang cassette, such as 1/3 the width of the single-gang cassette. EX1003¶276.

The same relationship would be true for the single-gang and double-gang cassettes as modified as discussed below in Elements 1F and 1K to allow both BASE-12 and BASE-8 cassettes on the same tray (e.g., as modified with clearance

areas and module spacing to span additional, intermediate rail guides on the tray). EX1003 ¶277. The unit of width (1W) will still be defined to be one third of the modified 3W cassette (BASE-12). The double-gang cassette of both BASE-12 and BASE-8 will still be exactly twice the size of the single-gang cassettes, and will have as a common denominator the 1W width unit. EX1003 ¶277.

7. Element 1F

Sauter discloses a single-gang cassette (112, 504) that has a cassette width equal to three standard width (3W) units, as explained above for Element 1E. Sauter also discloses a double-gang cassette 110 that has a cassette width equal to six standard width (6W) units, when the latching mechanism is located along the right side as explained above for Element 1E. EX1003 ¶278.

Sauter does not expressly show a cassette having a width of 2W or 4W. It would have been obvious based on Sauter in combination with US 2017/0192191 ("Dagley") (EX1030) to include these two additional sizes of cassettes to support BASE-8 fiber systems that group fibers into groups of eight fibers or multiples of eight, rather than groups of twelve fibers. EX1003 ¶279.

Dagley discloses that newer "parallel" fiber cable systems were migrating to grouping fibers in connectors and cables into groups of **eight**, not twelve. See, EX1030 (US 2017/0192191 to Dagley), ¶¶0003-0005, 0047-0049, 0045 (cassettes

for BASE-8 systems); see EX1030, Fig. 1A (showing a cassette with eight LC receptacles):

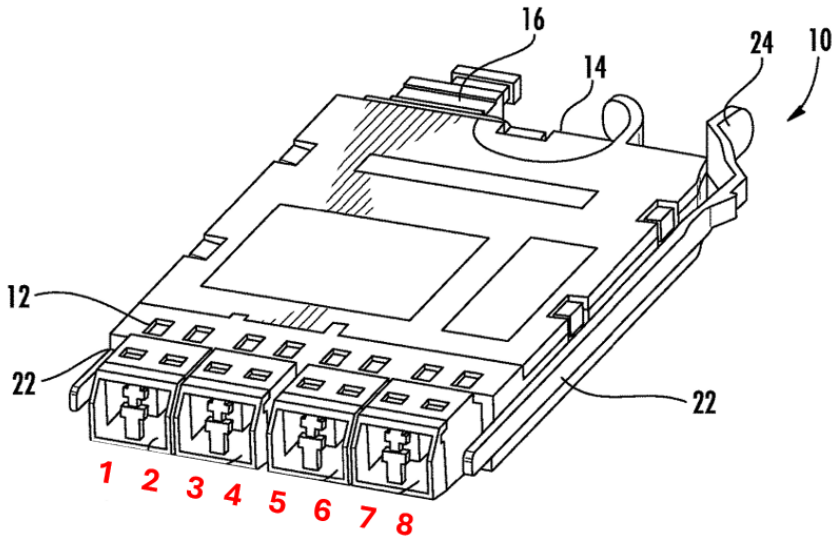


FIG. 1A

See also EX1030 ¶0052; see also EX1031 ¶¶0020-0027; EX1032, 4:20-43; EX1003 ¶¶280-281.

It would have been obvious to a POSITA to modify Sauter to include a BASE-8 "single-gang" cassette, as shown in Dagley, having a width that would accommodate only **two** quad LC adapter modules, instead of three. Thus, as modified, the BASE-8 single-gang cassette would include eight receptacle ports (not twelve) and would be an example of a cassette having a width of two standard width units. EX1003 ¶282. A BASE-8 "dual-gang" cassette would include sixteen receptacle ports (not twenty-four) and would be an example of a cassette having a width of four standard width units. EX1003 ¶282.

Sauter's use of the generic term "gang" which refers to a set of items grouped together, itself suggests that the base number in one gang or group does not always have to be the same as in the preferred embodiment. The term suggests to define a group, and then create multiples of it. EX1003 ¶283.

A POSITA would be motivated to include BASE-8 single and double-gang cassettes to match BASE-8 fiber systems, i.e., matching BASE-8 MPO connectors and cabling to cassettes with the same number of adapter ports to make more efficient use of available cassette space, rack space, and infrastructure. EX1003 ¶284.

Dagley also notes the desire to transition back and forth between 12-fiber systems and 8-fiber systems. EX1030 ¶¶0045-0046 ("…flexibility to convert back…"). Dagley also discloses the desirability to have **both** BASE-12 and BASE-8 cassettes in the same row within a tray system. EX1030 ¶0049. Therefore, a POSITA using Sauter's teaching would have been motivated to configure the tray to support both BASE-12 size cassettes (3W and 6W) and BASE-8 cassettes (2W and 4W) in the same tray. EX1003 ¶285. A POSITA would recognize that this would merely require adjusting the cassettes and number of rail guides (see the discussion of Element 1K below), and Sauter already teaches how to accommodate additional rail guides on the tray by spacing the quad LC modules apart slightly and defining clearance areas 602 in the bottom surface of

the larger cassette sizes to span intermediate rail guides. EX1003 286; EX1006, Fig. 8, 11, 9; 7:14-37.

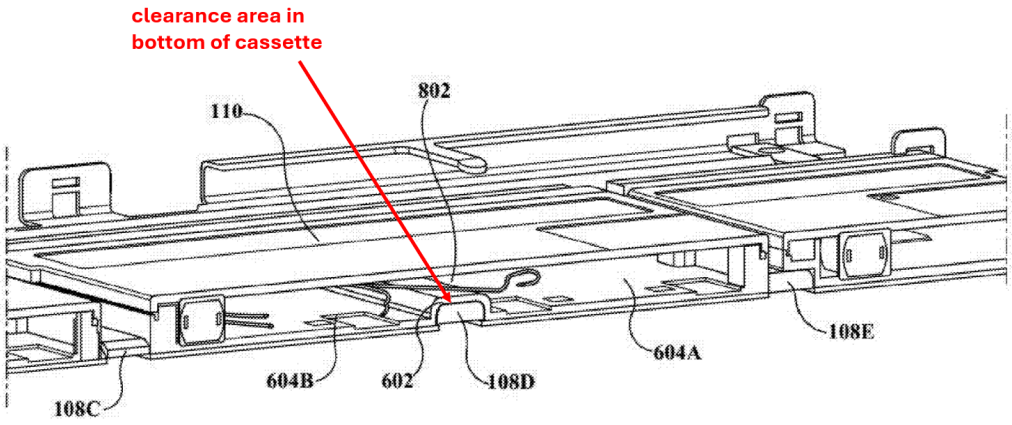


FIG. 8

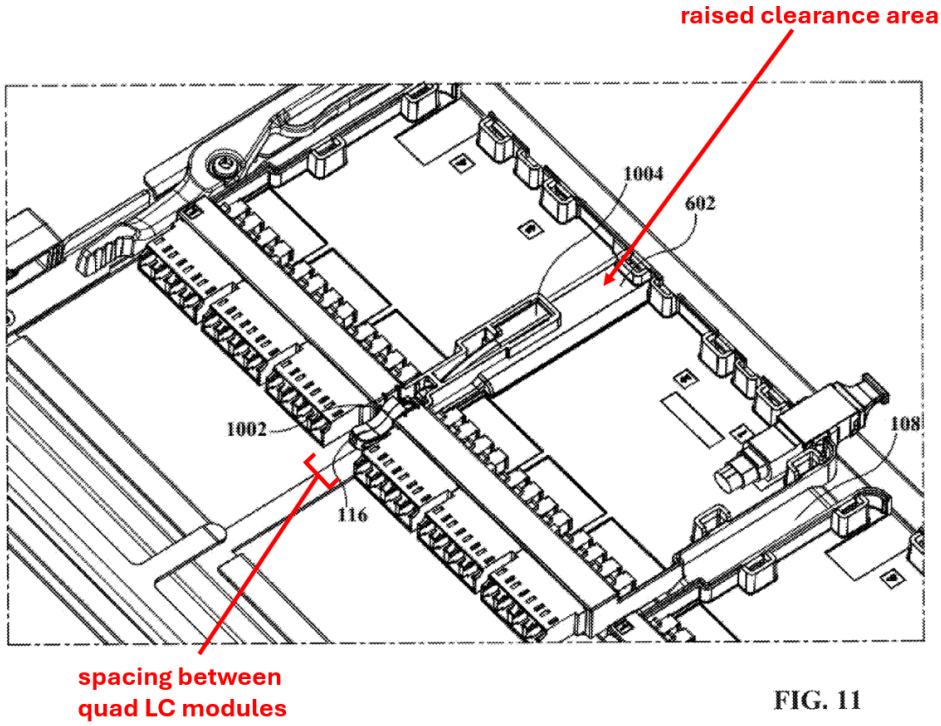
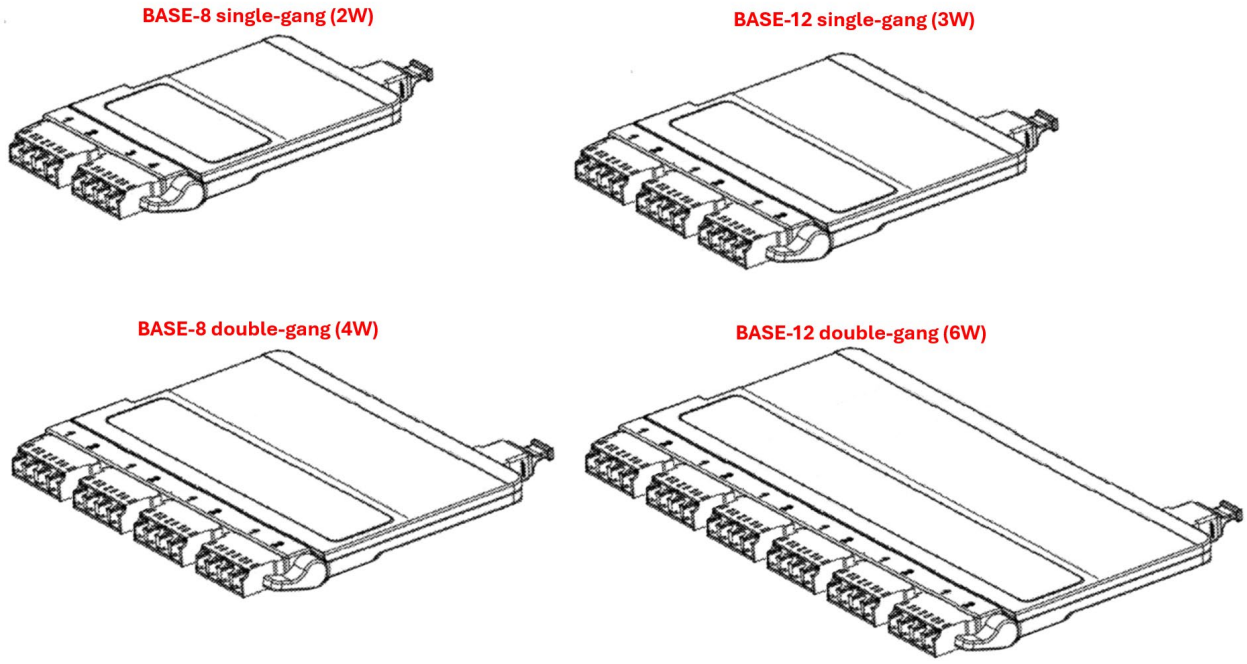


FIG. 11

The figures below show conceptually what a POSITA would immediately envisage when modifying Sauter's cassettes to support both BASE-12 and BASE-8 systems on the same tray. EX1003 ¶287.



No new functionality would be needed. The same components would function the same way. EX1003 ¶¶288-290. Finally, the intrinsic record acknowledges others in the art had already taught to make cassettes based on groups of eight. The Sedor reference—cited on the face of the '423 patent and discussed in the prosecution of the '423 parent patents—discloses such cassettes:

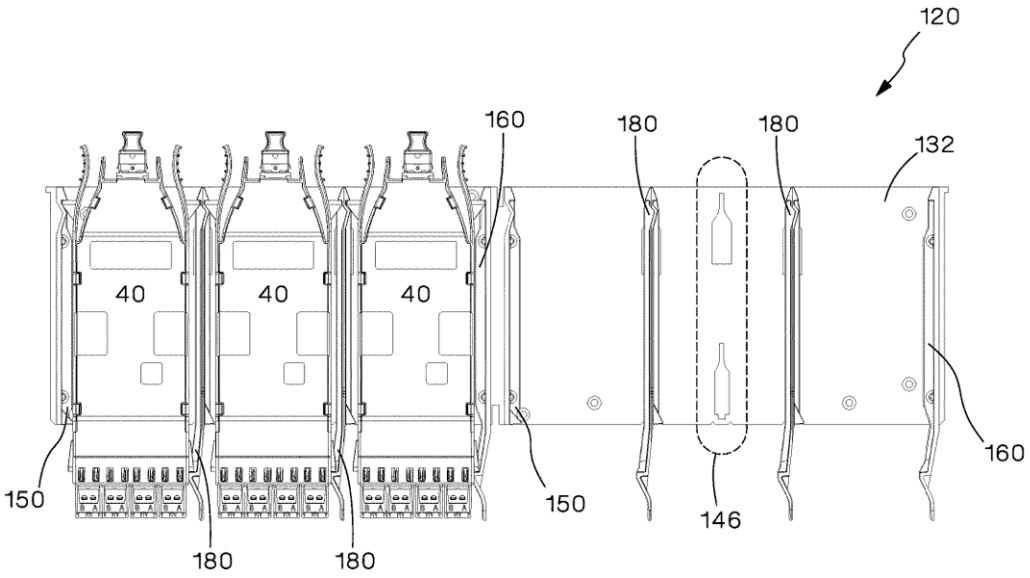


FIG.9

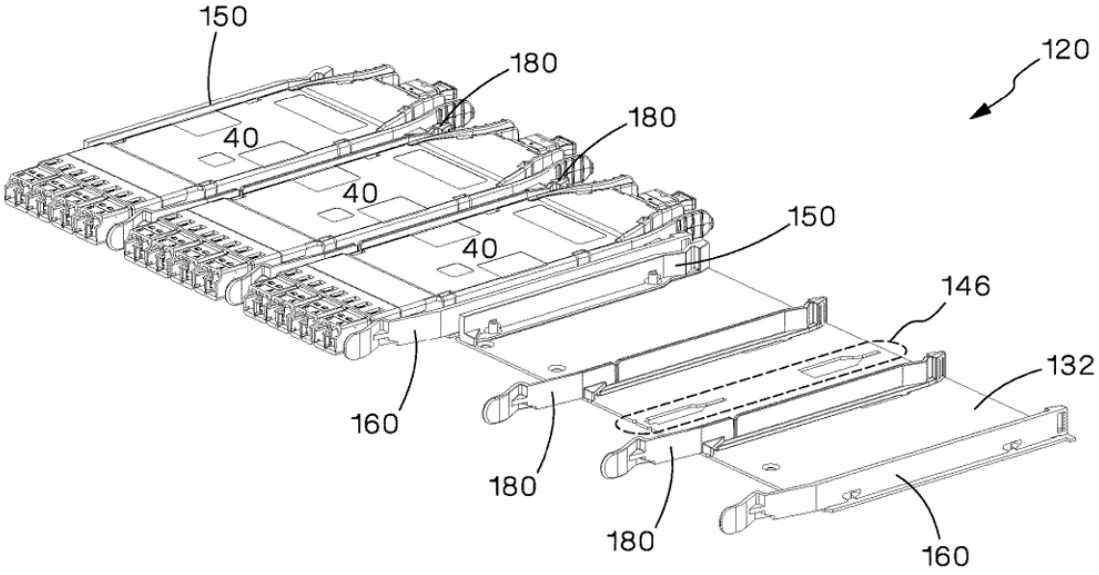


FIG.10

EX1005, Figs. 9-10, 4:23-35.

8. Element 1G

Sauter's adapter modules 126 satisfy this element. The adapter modules include four fiber optic plug receiving receptacles side by side in a row, and each quad adapter fits within one third of the width of the single-gang (3W) cassette, which is a standard width (1W) unit. EX1006, Figs. 7, 10, 13, 8:4-36; EX1003 ¶291.

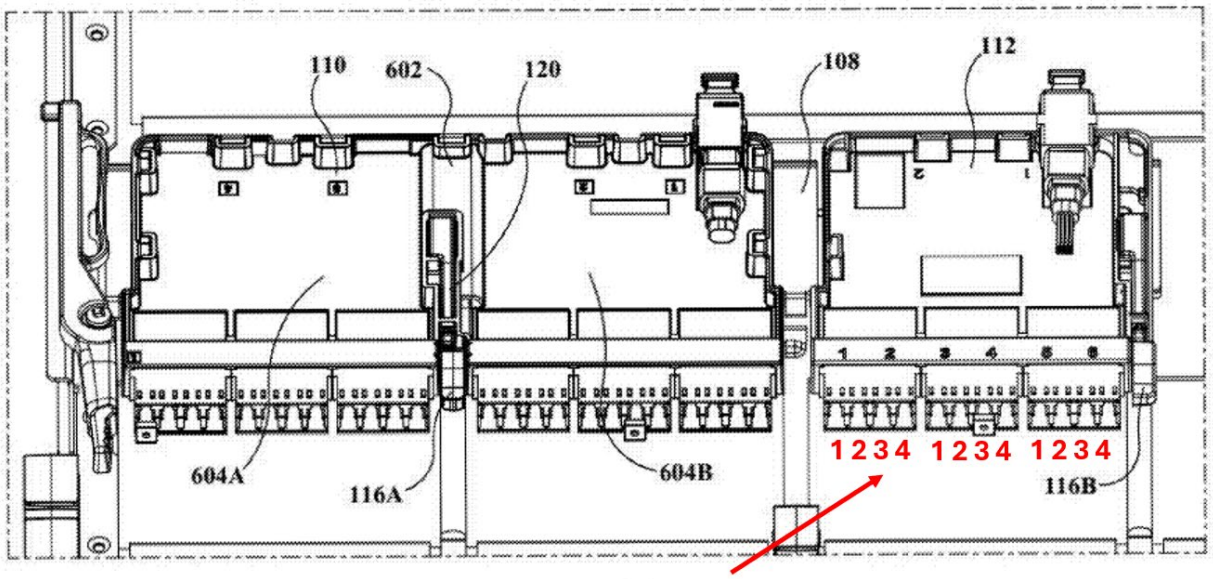


FIG. 7

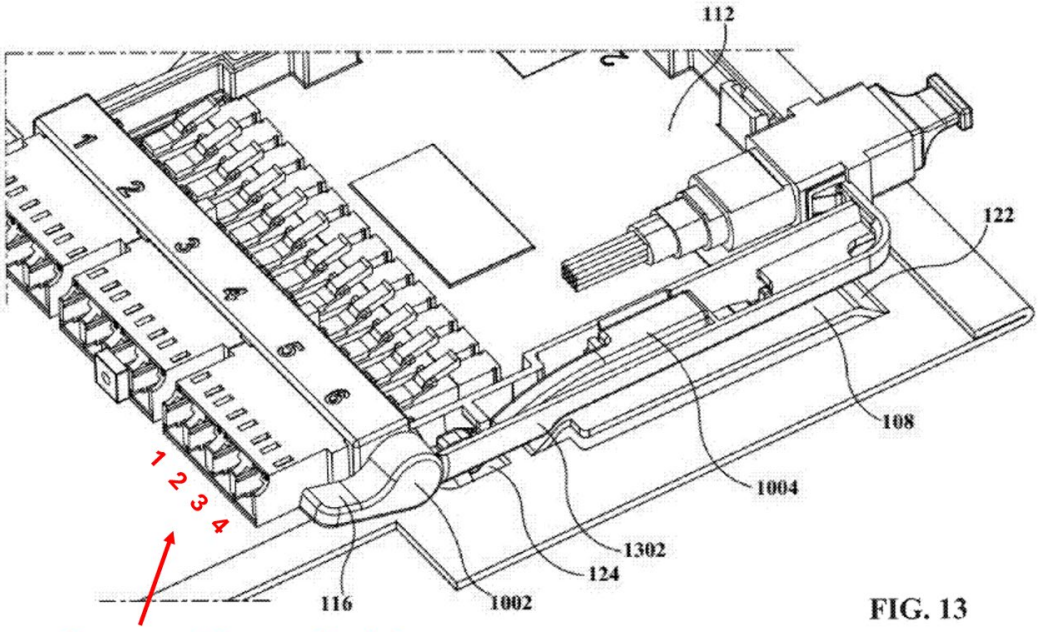


FIG. 13

Adapter modules each include four plug receiving receptacles side by side.

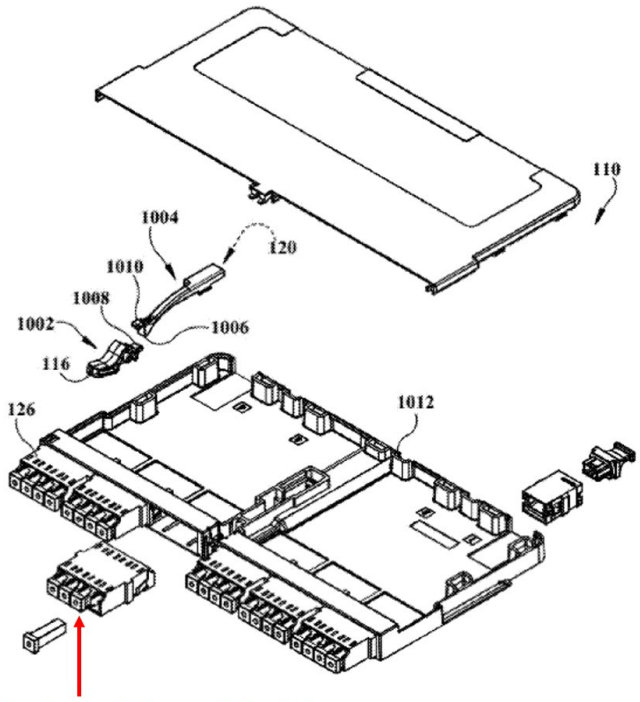


FIG. 10

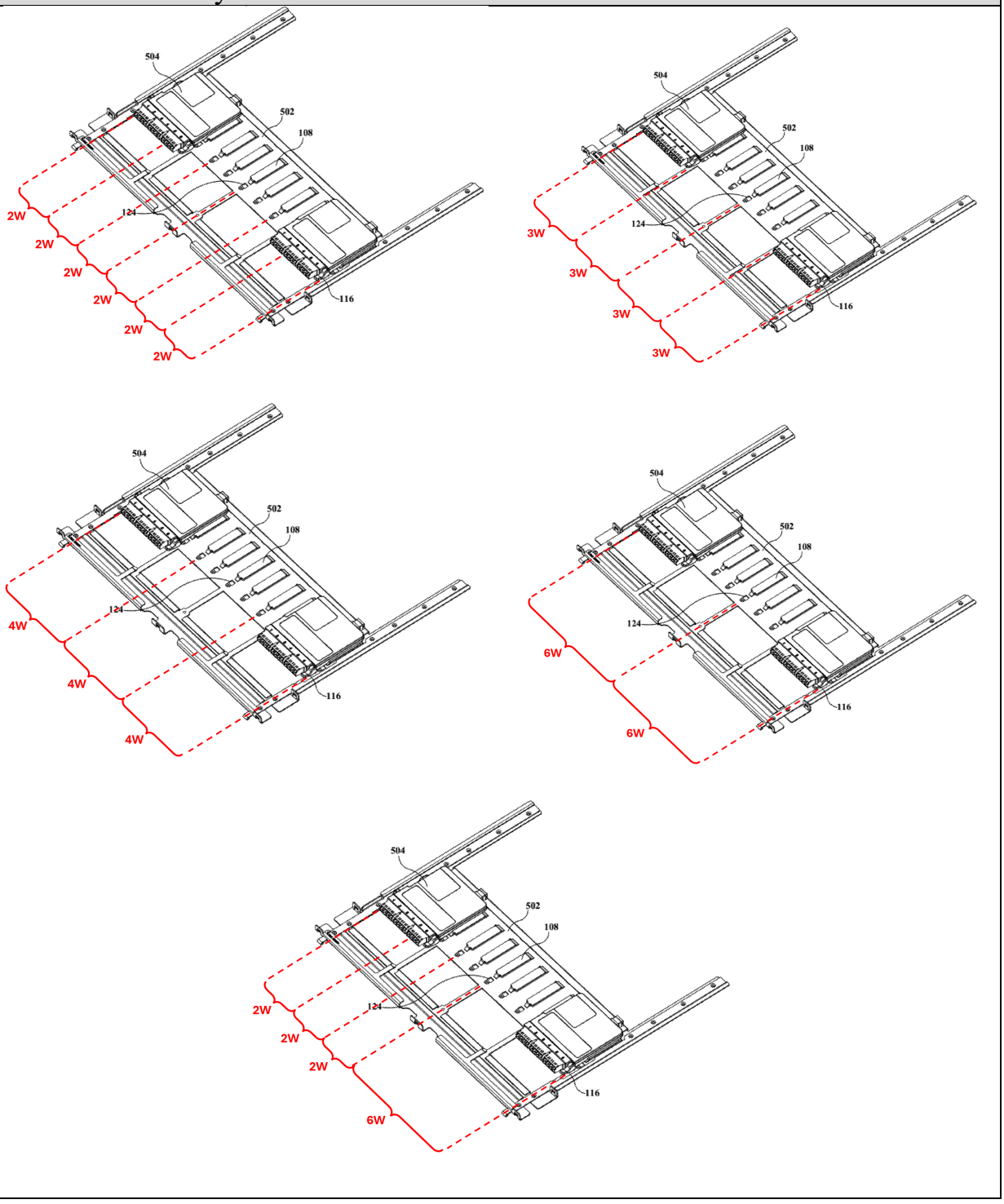
Adapter modules each include four plug receiving receptacles side by side.

9. Element 1H

As shown below, Sauter's tray is configured to fit twelve standard width units of cassettes. This means that it has the space required to fit all five cassette configurations listed in Element 1H. EX1003 ¶292.

The figures below conceptually illustrate how a modified Sauter's tray would also accommodate each of the recited cassette configurations. EX1003 ¶293.

Sauter's tray as modified to fit both BASE-12 and BASE-8 cassettes



The cassettes are arranged side by side such that a cassette side end portion of each adjacently faces a side end portion of another cassette. See, e.g., Fig. 15 of Sauter:

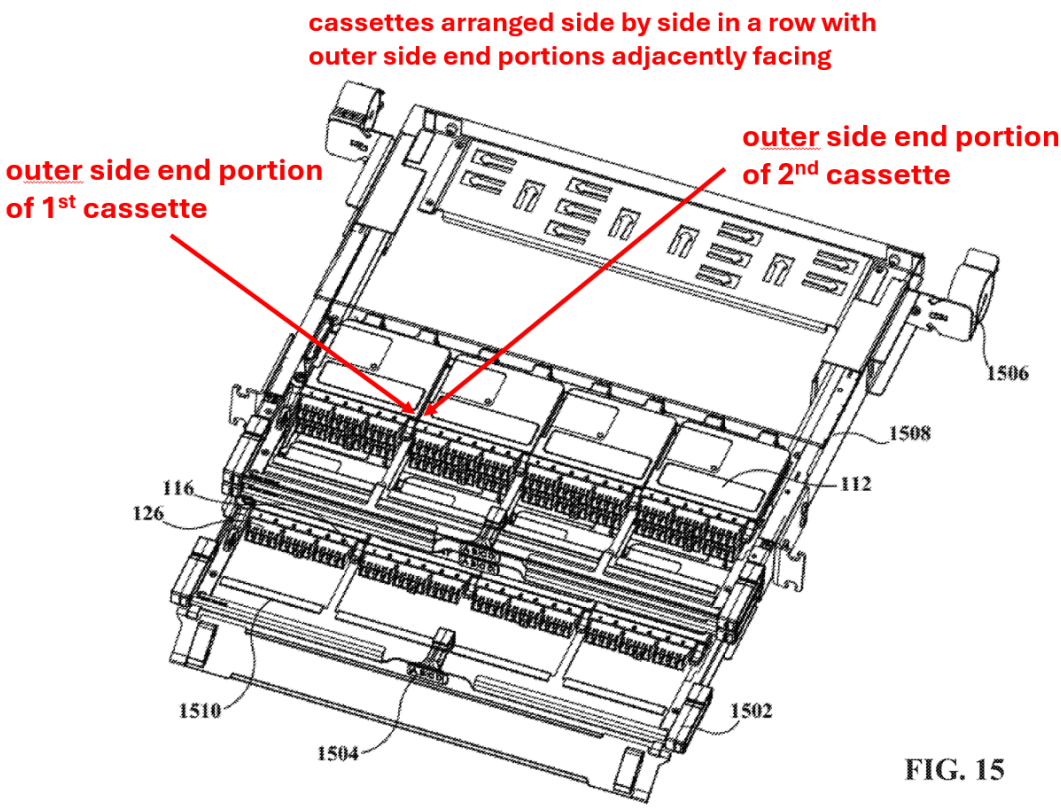
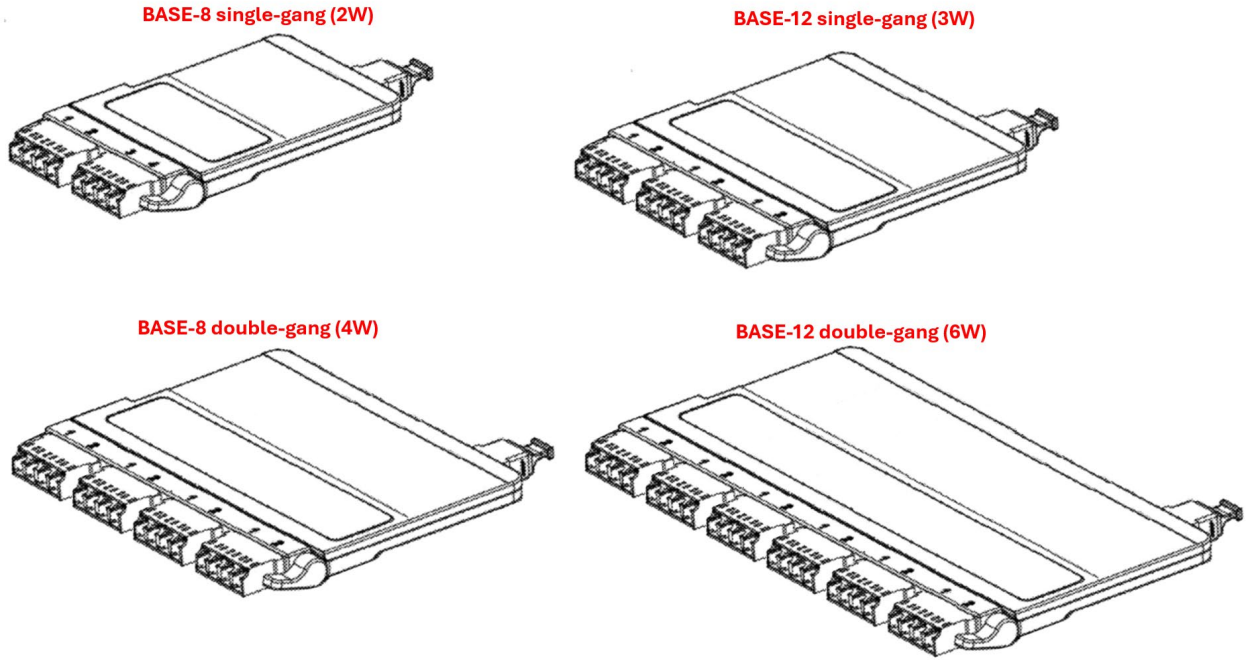


FIG. 15

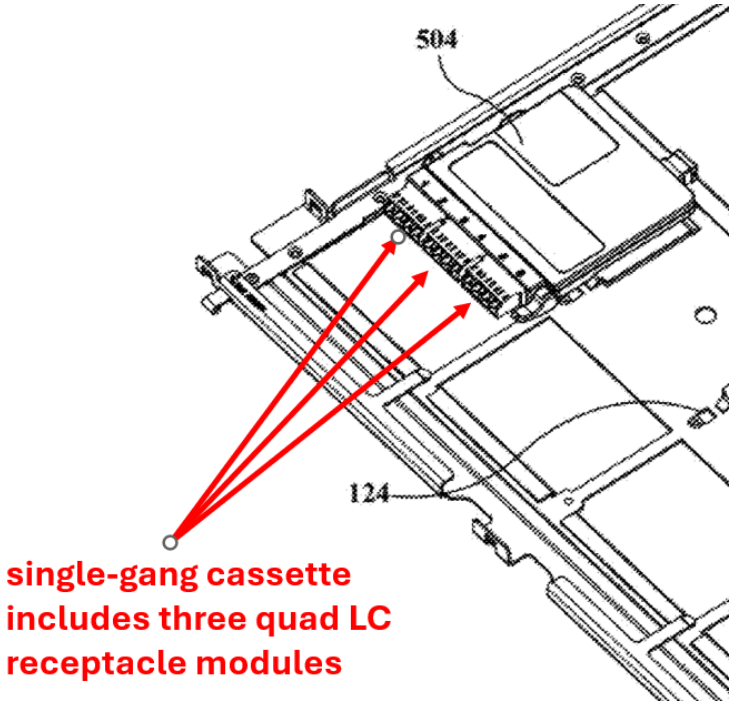
EX1006, Fig. 15; EX1003 ¶294.

10. Element 1I

The figures below show modified versions of Sauter's cassettes to support BASE-12 and BASE-8 systems as discussed above. The BASE-8 single-gang cassette size (2W) and the BASE-8 double-gang cassette size (4W) would fit two quad receptacle modules and four quad receptacle modules respectively. The conventional BASE-12 single-gang cassette size (3W) and BASE-12 double-gang cassette size (6W) would fit three and six quad receptacle modules respectively.



See also EX1006 Figs. 2-4, 5, 6, 7, 9, 10, 11, 13, 15, 16; EX1003 ¶295.



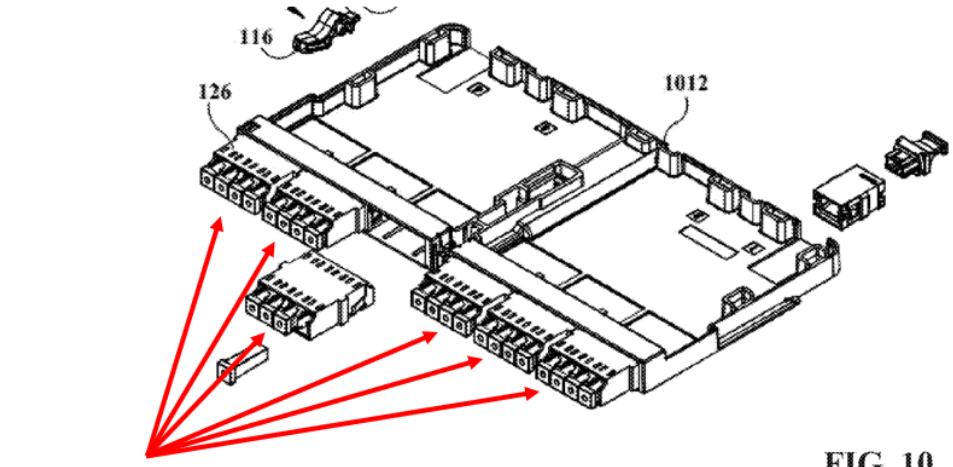


FIG. 10

11. Element 1J

Sauter's trays have apertures 124 and rail guides 108 that cooperate with the latching mechanism 120 and rails 404 on the cassettes to removably secure Sauter's trays to the cassettes. These structures removably lock the cassettes in place when the cassettes are installed on the tray. EX1006 5:60-6:29; 4:4-25; 4:46-50; 8:37-66; 4:61-67; 9:3-27; 7:47-60; 9:63-10:3; Figs. 1-2, 4-8, 10-14, 16; EX1003 ¶¶296-301.

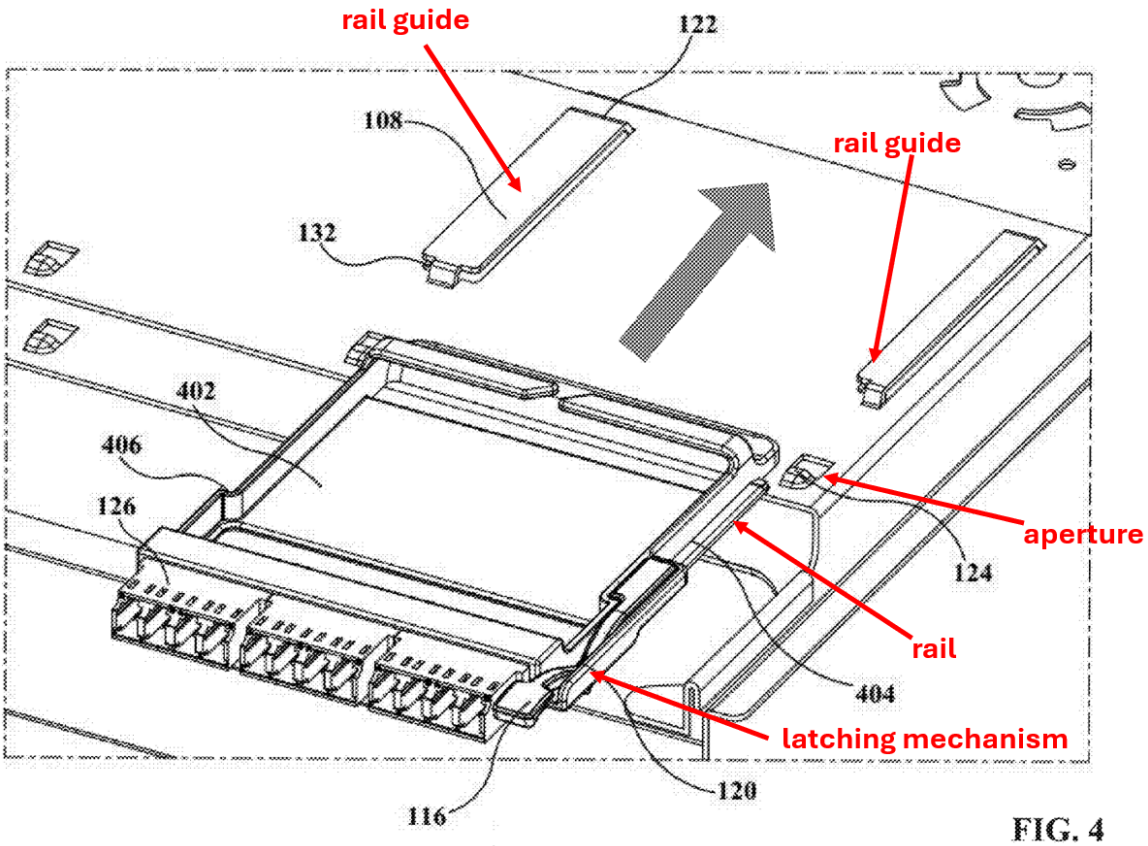


FIG. 4

12. Element 1K

The rail guides and apertures on Sauter's tray are cassette engaging portions. Adding the necessary rail guides to the tray surface to support any combination of the BASE-12 cassettes (3W and 6W) with BASE-8 cassettes (2W and 4W) as described above in Element 1F would result in multiple cassette engaging portions (rail guides) that conform to the standard one width (1 W) to support cassette size. EX1003 ¶¶302-314.

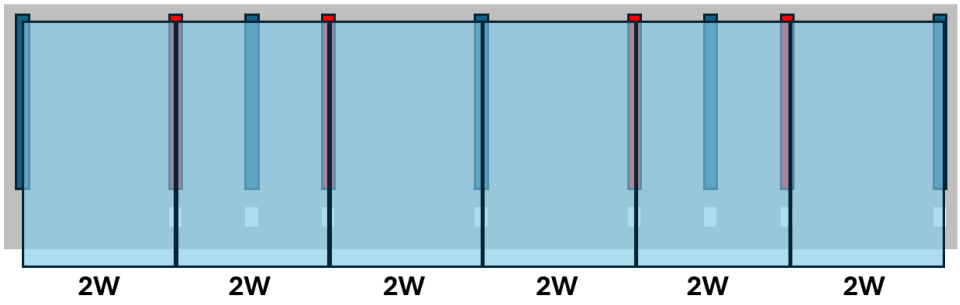
At least two different tray configurations would have been obvious based on Sauter in light of Dagley both of which satisfy Element K. First, to populate the same tray with either all 2W cassettes (BASE-8 single-gang cassettes) or all 4W

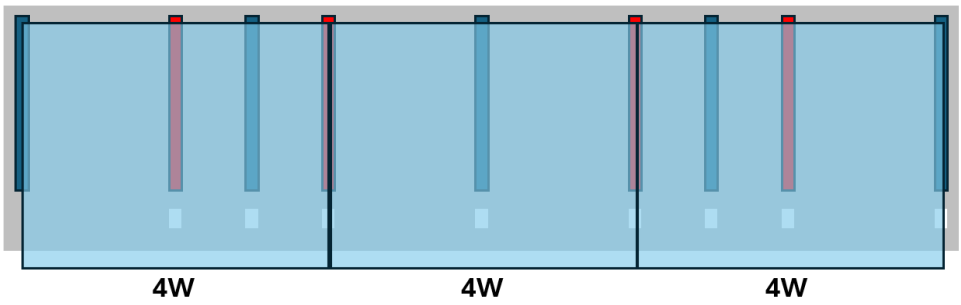
cassettes (BASE-8 double-gang cassettes), a POSITA would simply add four rail guides as shown on Tray A below. The blue rail guides show where Sauter already teaches to place rail guides (for 3W and 6W cassettes), and the red rail guides show where new rail guides are needed (for 2W or 4W cassettes).

Adding rail guides to Sauter to support BASE-8 cassettes

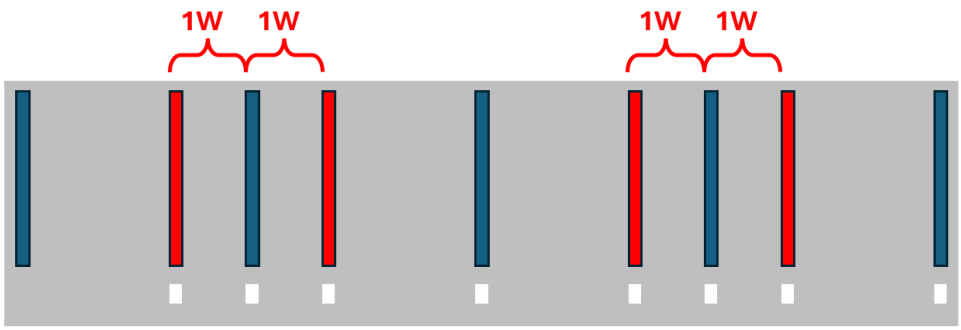


Tray A





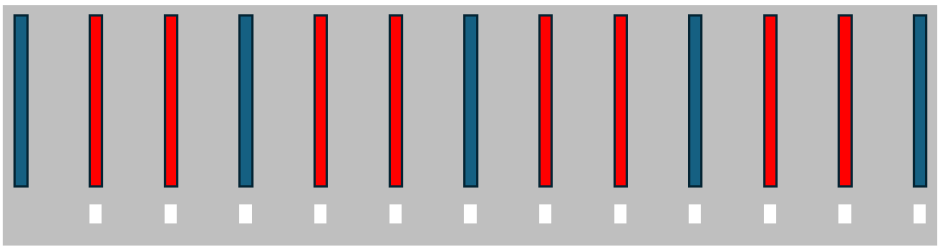
At least six rail guides on Tray A conform to the standard one width 1W:



Tray A

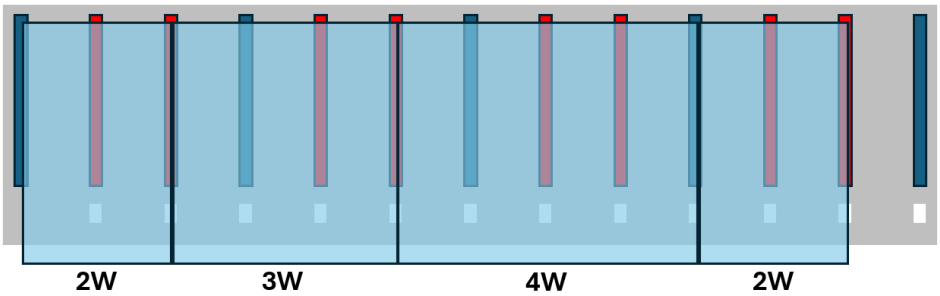
EX1003 ¶¶305-307.

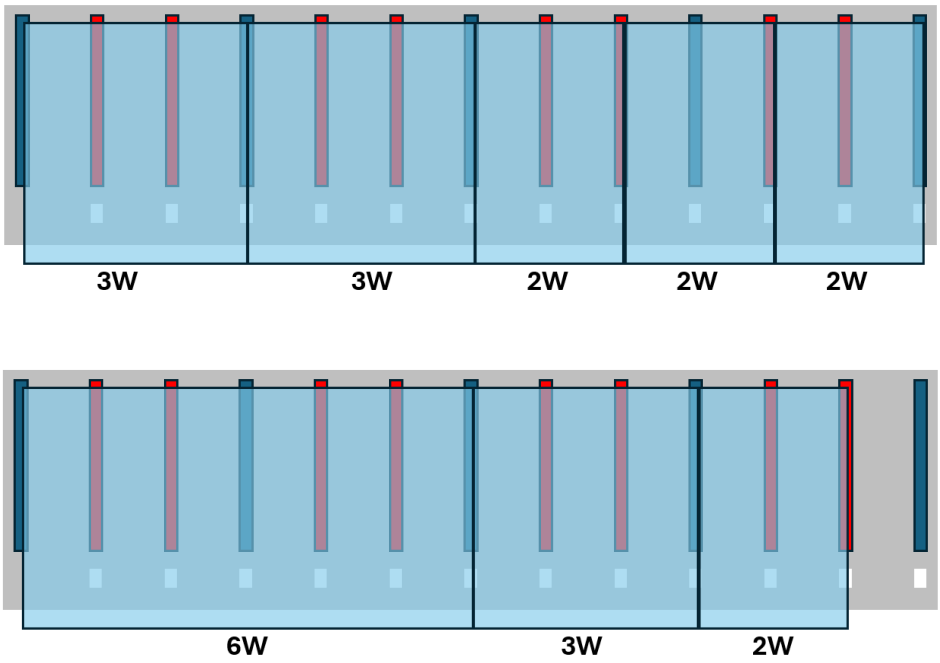
Second, in addition, following Sauter's teaching for "any combination" of cassettes as well as Dagley's teaching to combine both BASE-8 and BASE-12 cassettes *in the same row*, a POSITA immediately recognize that additional rail guides should be added as shown below in Tray B. EX1003 ¶¶308-311.



Tray B

These additional rail guides enable BASE-8 and BASE-12 cassette sizes to be combined in "any combination" in the same row. For example:





Like Tray A, Tray B also satisfies the limitations of Element 1K. Each rail guide conforms to the standard width unit 1W spacing. EX1003 ¶310.

A POSITA would have been motivated to add the additional rail guides for all the reasons given for Element 1E, e.g., to support flexible transition back and forth between BASE-8 systems and BASE-12 systems and even simultaneous BASE-8 and BASE-12 systems. EX1003 ¶312. No new functionality is required. Sauter already teaches how to accommodate the extra rails guides by teaching that the larger cassettes will include "clearance areas" to slide over unused intermediate rail guides. EX1006, 7:19-37, 9:49-56, Fig. 8 (clearance areas 602).

B. Independent Claim 9

Claim 9 substantially repeats Claim 1, except Claim 9 drops claim Elements 1A and 1I, and portions of Element 1D. With one exception (Element 9B

addressed below), Claim 9 does not add any limitation that is not already disclosed or rendered obvious by Sauter in combination with Dagley for the reasons already given under Claim 1.

1. Element 9B

The parties dispute the meaning of Element 9B's "each of the plurality." Resolving the dispute is not necessary because Sauter invalidates under either party's construction.

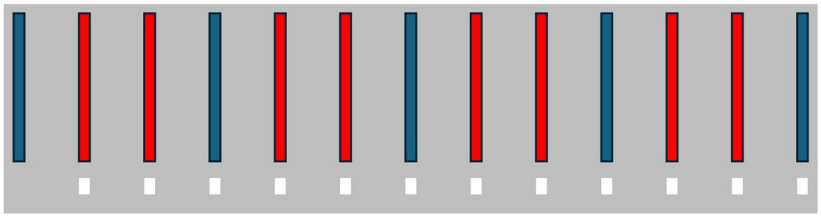
According to PO if the tray supports the fifth configuration of Element 9E that is sufficient to satisfy claim element 9B, and no other configurations need to have multiple sizes of cassettes. EX1011, Ex. A, p. 24.

If true, then 9B is invalidated for the same reasons given in the analysis of Elements 1H and 1F which already address why the fifth configuration would be obvious in light of Sauter and Dagley. EX1003 ¶¶316-317.

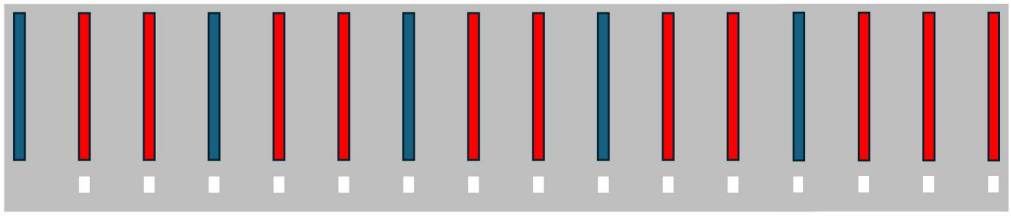
The correct interpretation of the plain language of Element 9B, however, requires that "**each** of the plurality" of cassette configurations includes different sizes of cassettes, even the first through fourth configurations. It is not satisfied by a single configuration, but must be met by "each" of the multiple configurations. As a result, to satisfy both 9B and 9E, the tray must be sized to support more than a total of 12W in cassette widths. EX1003 ¶¶318-319. The claims to not exclude

this, and dependent claim 16 even suggests a larger tray by reciting "at least twelve" standard width units. EX1001, Claim 16.

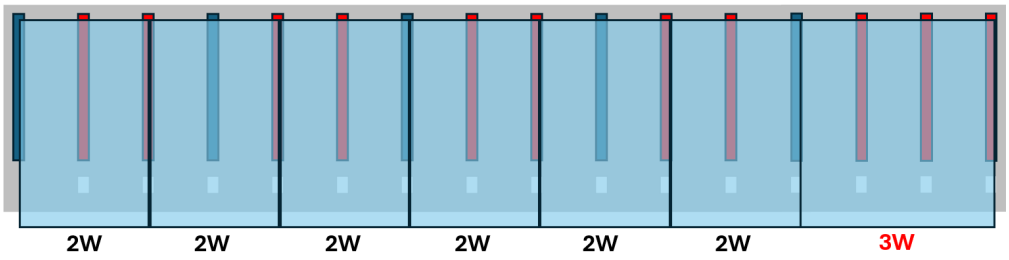
If Sauter's system were sized to fit a standard 24 inch or 30 inch 1U rack space, there would be sufficient space for at least an additional 3W of cassettes on the tray (which would accommodate, e.g., either another 2W or 3W cassette so that the first, second, third and fourth recited configurations could also include another differently sized cassette). EX1003 ¶¶320-321. It would have been obvious to a POSITA that the same tray shown in Sauter could be lengthened for use in either of the two wider standard rack sizes (24 inch or 30 inch) which would then accommodate more cassettes on one tray to satisfy both 9B and 9E, as shown below:



Tray for standard 19 inch U-space



Tray for standard 24 inch U-space



EX1003 ¶322.

A POSITA would be motivated to use a larger tray width for customers who already have existing racks in these standard larger sizes and to make most efficient use of valuable and limited available rack space. EX1003 ¶324. No new functionality would be required.

2. Other Limitations of Claim 9

Each of the other limitations in Claim 9 are disclosed or rendered obvious for the reasons already given for corresponding language in the discussion of Claim 1 as set forth below. EX1003 ¶325-327.

Preamble of Claim 9:	See Preamble of Claim 1.
Element 9A:	See Preamble of Claim 1, Element 1B, and Element 1C.
Element 9C:	See Element 1E, 1D.
Element 9D:	See Element 1F.
Element 9E:	See Element 1H.
Element 9F:	See Element 1J.
Element 9G:	See Element 1K.

C. Independent Claim 17

Claim 17 substantially repeats Claim 9 (and Claim 1) with a few exceptions. Claim 17 drops the requirement for the "fifth" cassette configuration in 9E and 1H and drops Element 9F (1I) altogether. Claim 17 also does not include the "each of" language that appears in Element 9B discussed above. Claim 17, therefore, is the broadest claim of the '423 patent. Claim 17 recites a "tray member" instead of "a tray." Sauter's tray is a tray member. EX1003 ¶330. Claim 17 is, therefore, rendered obvious for the same reasons given above for the corresponding claim elements in Claims 1 and 9. EX1003 ¶¶329-332.

Preamble of 17:	See Preamble of Claim 1.
Element 17A:	See Preamble of Claim 1, Element 1A-C.
Element 17B:	See Element 1H.
Element 17C:	See Elements 1E, 1D.
Element 17D:	See Element 1F.
Element 17E:	See Element 1H.
Element 17F:	See Element 1K.

D. Claims 2, 10, and 18

As seen in Sauter's figures (Figs. 2-7, 9-11, 13, 15, 16) and noted at EX1006 8:20-28, each of Sauter's single-gang cassettes incorporates three Quad LC adapter modules side by side.

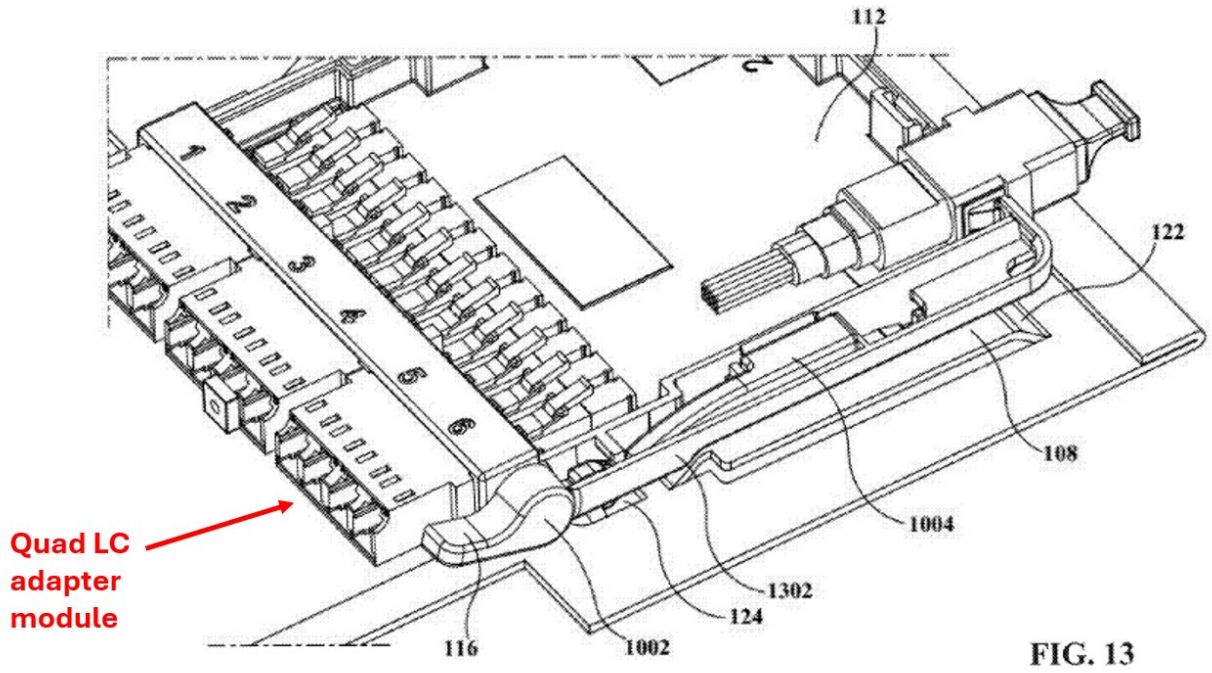


FIG. 13

The standard one width 1W unit in Sauter (one third the width of Sauter's single-gang cassette) is based on the same standardized LC Quad technology as is shown in the '423 patent. EX1003 ¶333. As the '423 patent acknowledges, the standard Quad LC adapter fits within the same footprint as an SC Duplex adapter. EX1001, 8:58-60 ("…width W is based on a LC Quad (SC Duplex) technology footprint…"). The Quad LC adapter module has a standardized footprint that inherently fits the standard SC Duplex footprint and will also inherently fit multiple MPO connectors. EX1003 ¶¶166, 333.

E. Claims 3, 11, and 19

The rail guides on Sauter's modified tray would be spaced to conform to 1W for the reasons given in Element 1K. EX1003 ¶334.

F. Claims 4, 12, and 22

Sauter's trays (102, 502, 1510) are configured with flat narrow, straight side edges to be slidingly received in at least a portion of a tray receiving space of a case of a fiber optic management system. Enclosure 1508 is a case. EX1006, 10:18-34, Figs. 15, 16; 4:1-28; 4:32-34 ("tray 102 is designed… to be installed in a fiber optic enclosure."); 6:39-40; 9:40-44; 10:4-5; EX1003 ¶335.

If PO argues these claims require a case having a top and bottom wall, Fig.15 of Sauter shows that its enclosure includes top and bottom walls. EX1003 ¶¶336-339. Also including top and bottom walls on a tray enclosure would have been obvious based on Sauter alone or in combination with Dagley (which shows in Fig. 3A a chassis for receiving cassette trays that includes top and bottom walls) in order to protect the fragile fiber components. EX1003 ¶¶340-342. Fig. 15 of Sauter even suggests fastener locations on the enclosure to attach flat top / bottom walls. EX1003 ¶342.

G. Claims 5, 13, 23

As seen in Fig. 15, each cassette includes a side end portion that is touching or almost touching an adjacent cassette side end portion.

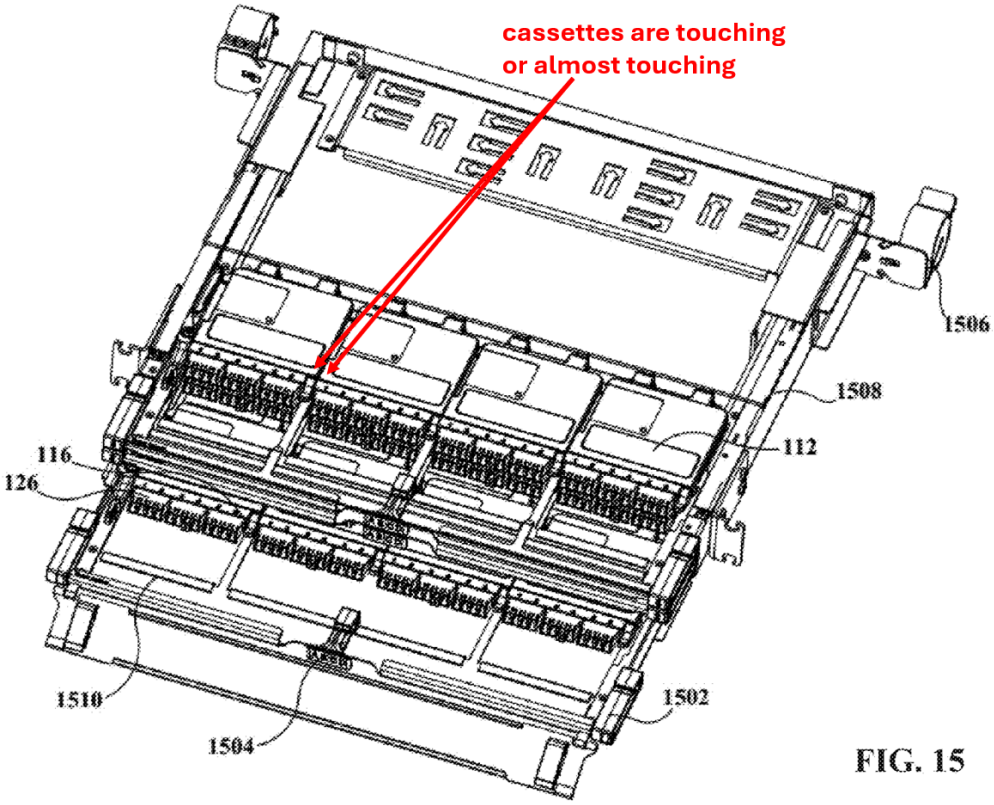
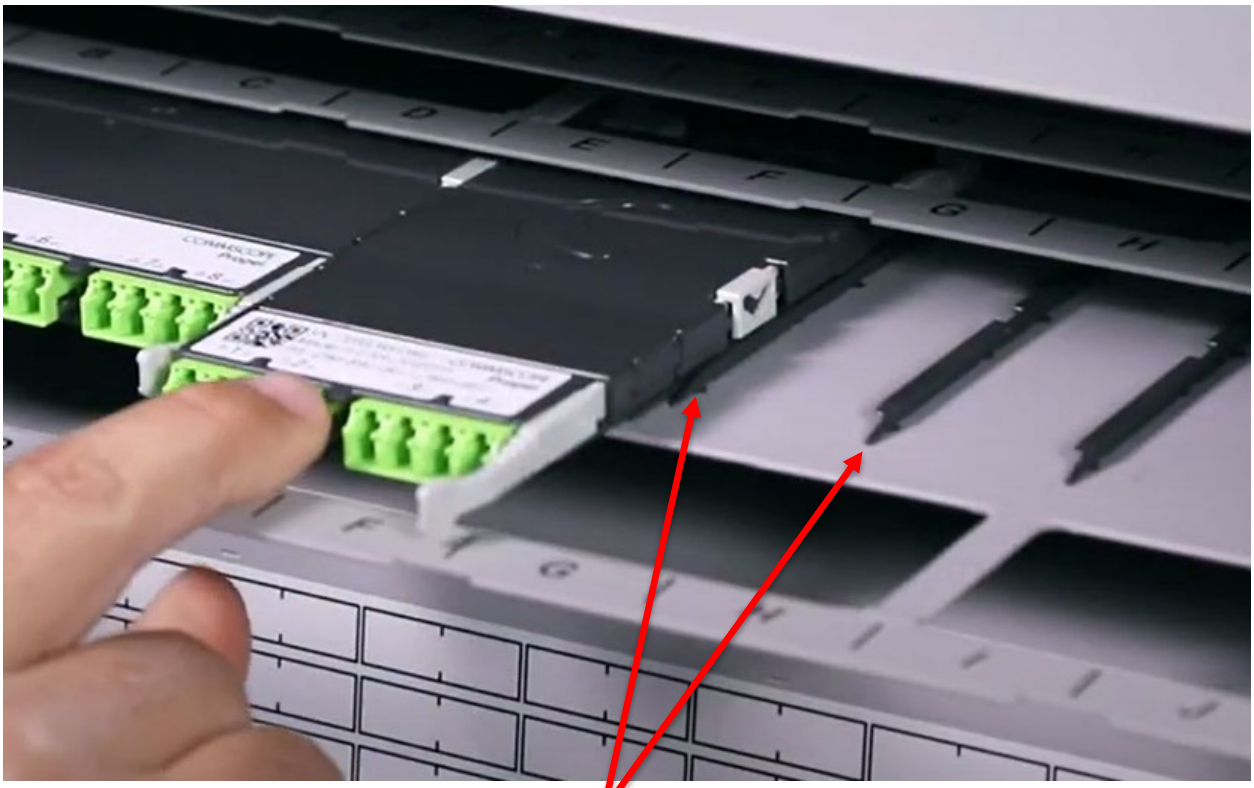


FIG. 15

In light of the prosecution history, PO has taken the position that "directly adjacent" means "an outer side edge of each of said selected cassettes is almost touching or touching, without any intervening structure, an outer side edge of at least one other selected cassette." EX1011, 19.

PO has applied this term to accuse a cassette and tray system that has rails on the tray that only partially separate the cassettes. In other words: (a) the accused system has rails on the tray that are not as tall as the accused cassettes, (b) the rails are not as long (deep) as the cassettes and (c) the accused cassettes at least partially overlap the rails. EX1012 17-19 (showing accused system), 19 (showing accused tray includes rails and citing User Manual); EX1016 (CommScope Propel

Panel User Manual), 27, 20, Figs. 26-28, 17, 18 (illustrating rails on tray compared to cassettes); EX1017 (screen capture of Propel instructional video at https://www.youtube.com/watch?v=_agZJP5tZWc at 1:55) (showing cassette being mounted on rails):



The accused tray includes rails that:
(a) are shorter than the cassettes,
(b) are not as long as the cassettes, and
(c) are at least partially overlapped by the cassettes.

At least under PO's proposed construction and application of this term, Sauter discloses the limitations of claims 5, 13, and 23. EX1003 ¶¶343-352. The rail guides in Sauter only partially separate adjacent cassettes when the cassettes are mounted to the tray, leaving some side portions of adjacent cassettes that are

touching or almost touching each other. The rail guides are not as tall or as long as the cassettes, and the cassettes overlap the rail guides on the tray. *See* EX1006, Figs. 5, 16, 13, 8:

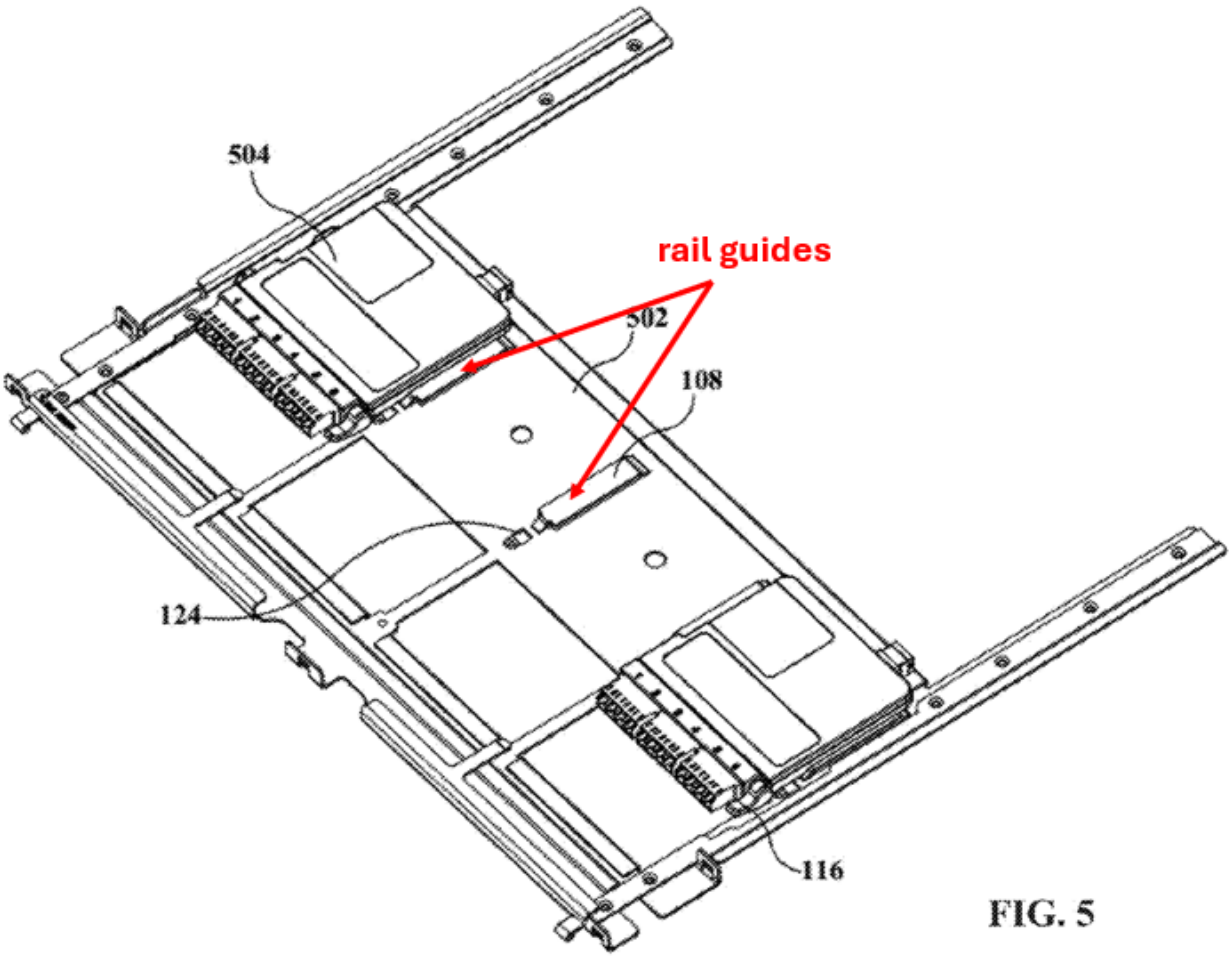


FIG. 5

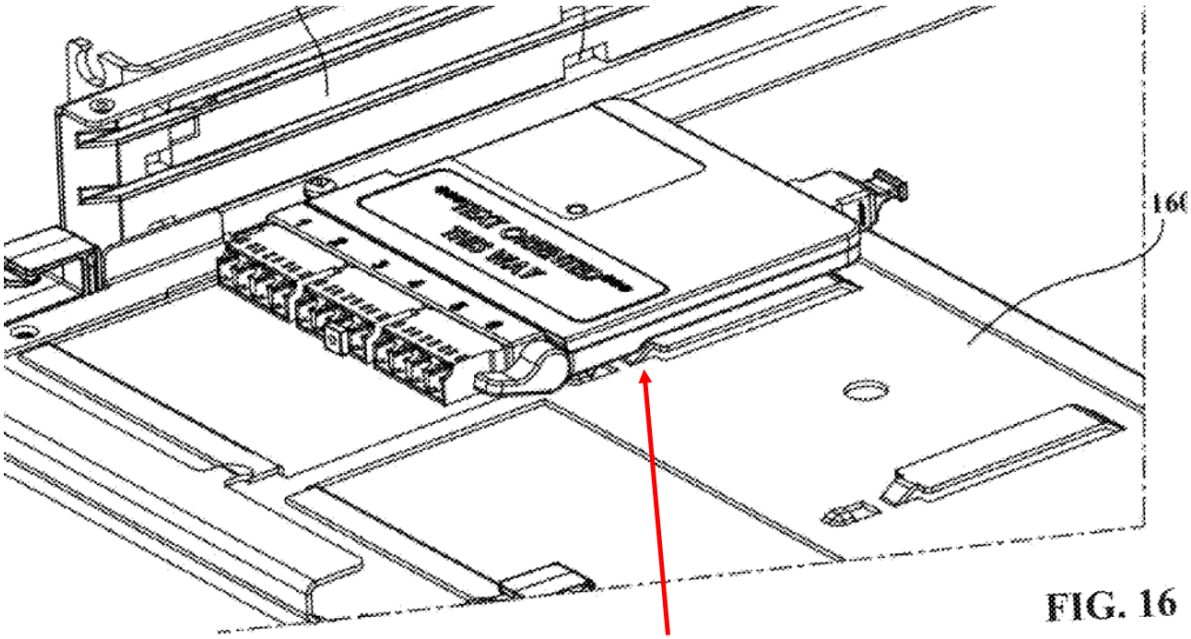


FIG. 16

The rail guides on tray are not as tall as the cassettes.
The cassettes at least partially overlap the rail guides.
The rail guides only partially separate adjacent cassettes.

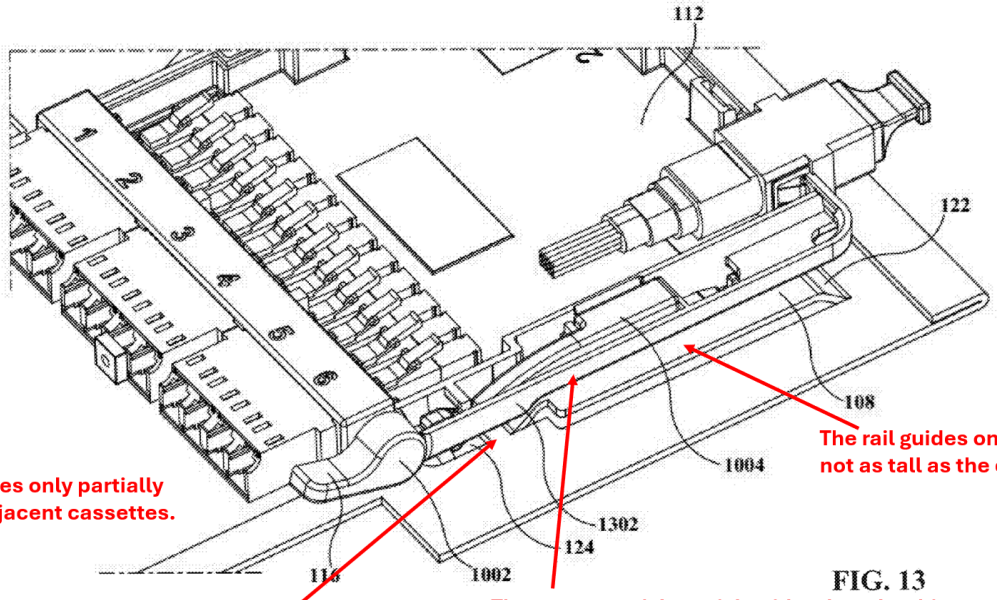


FIG. 13

The rail guides only partially separate adjacent cassettes.

The rail guides on tray are not as tall as the cassettes.

The rail guides are not as deep as the cassettes. (The rail guides do not extent to the front of the cassettes).

The cassettes (along right side where latching mechanism is located) at least partially overlap the rail guides.

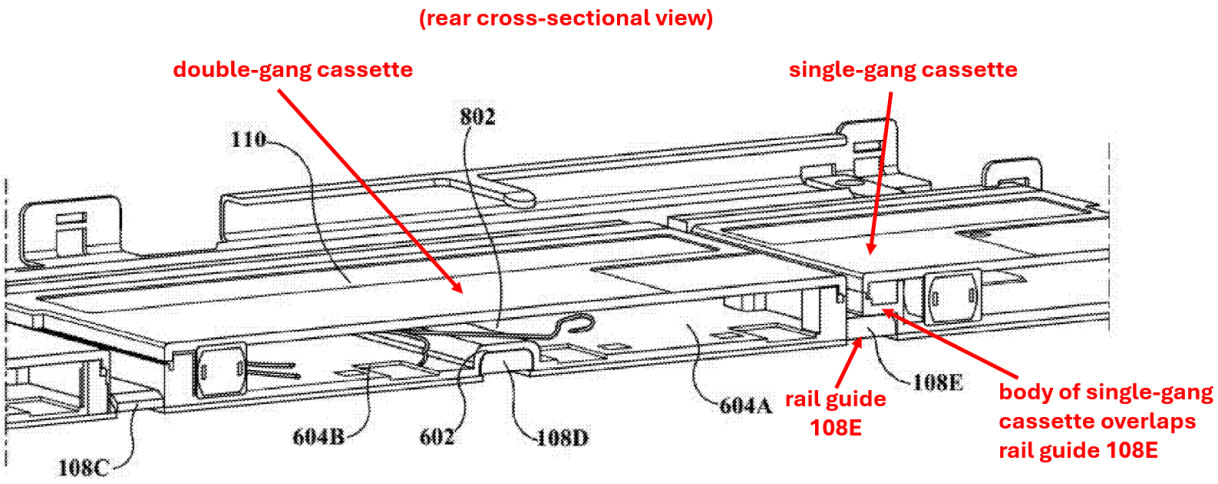


FIG. 8

H. Claims 6, 14, 24

These claims recite "adjacent" instead of "*directly* adjacent." When Sauter's tray is full of cassettes, each cassette will have a side end portion "adjacent" another cassette. EX1003 ¶353. See, e.g., Fig. 15:

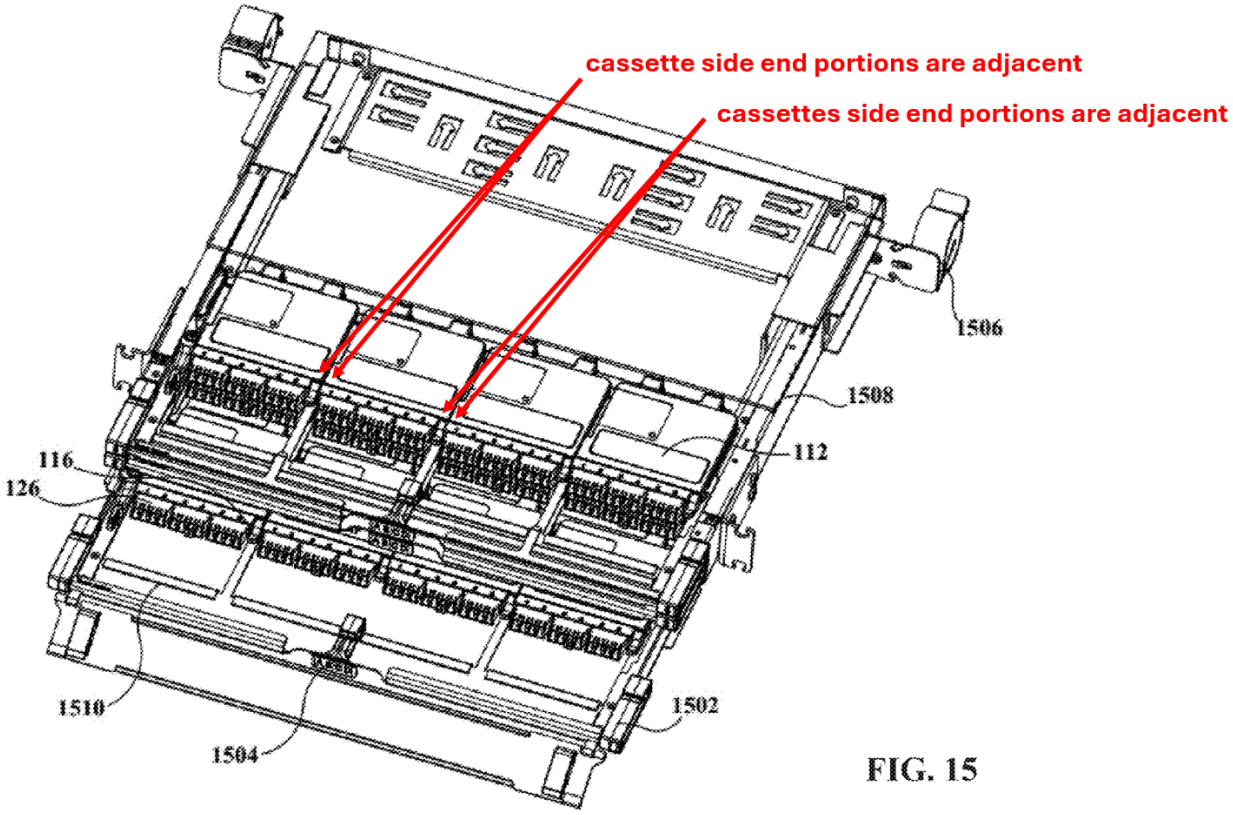


FIG. 15

I. Claims 7, 15, 25

Sauter's cassette side end portions are either touching or almost touching. EX1003 ¶354. There is no visible space between cassettes in Fig. 15:

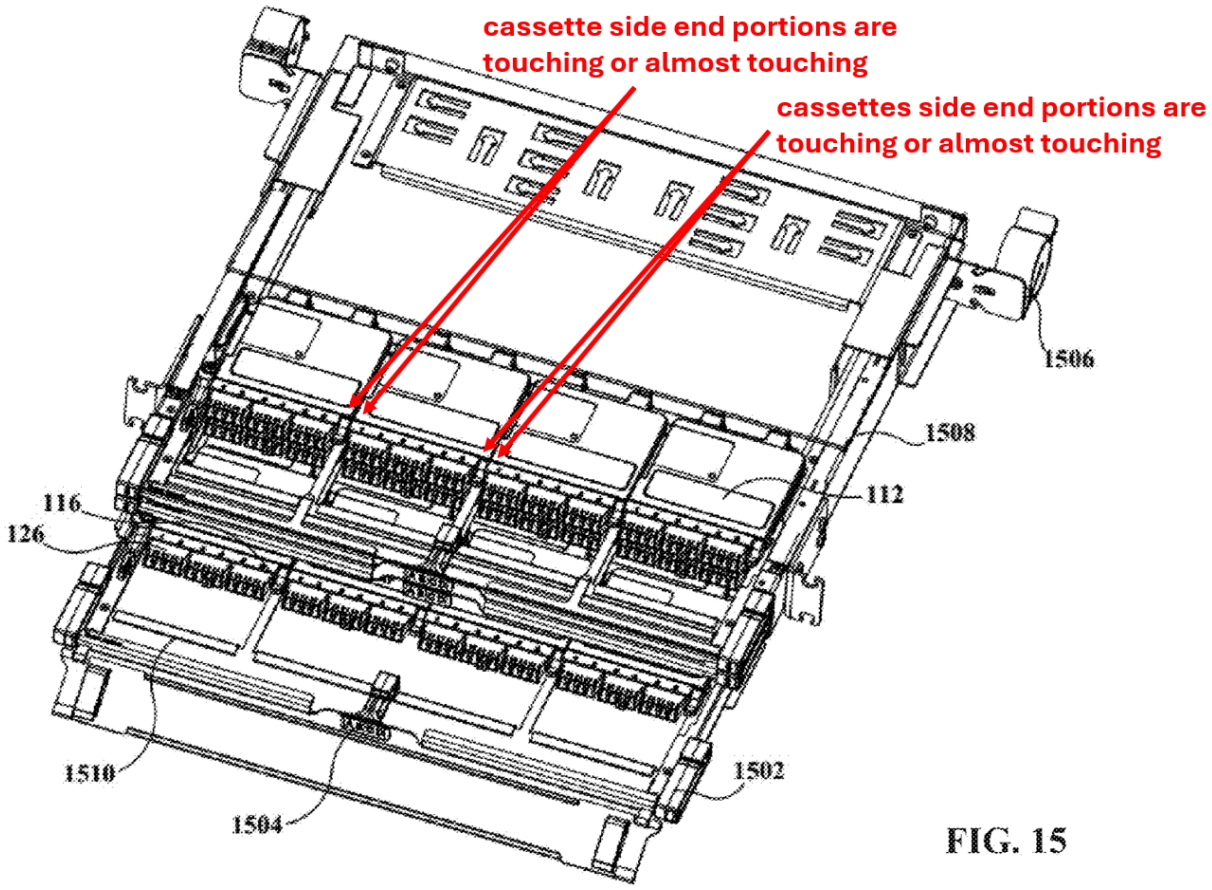
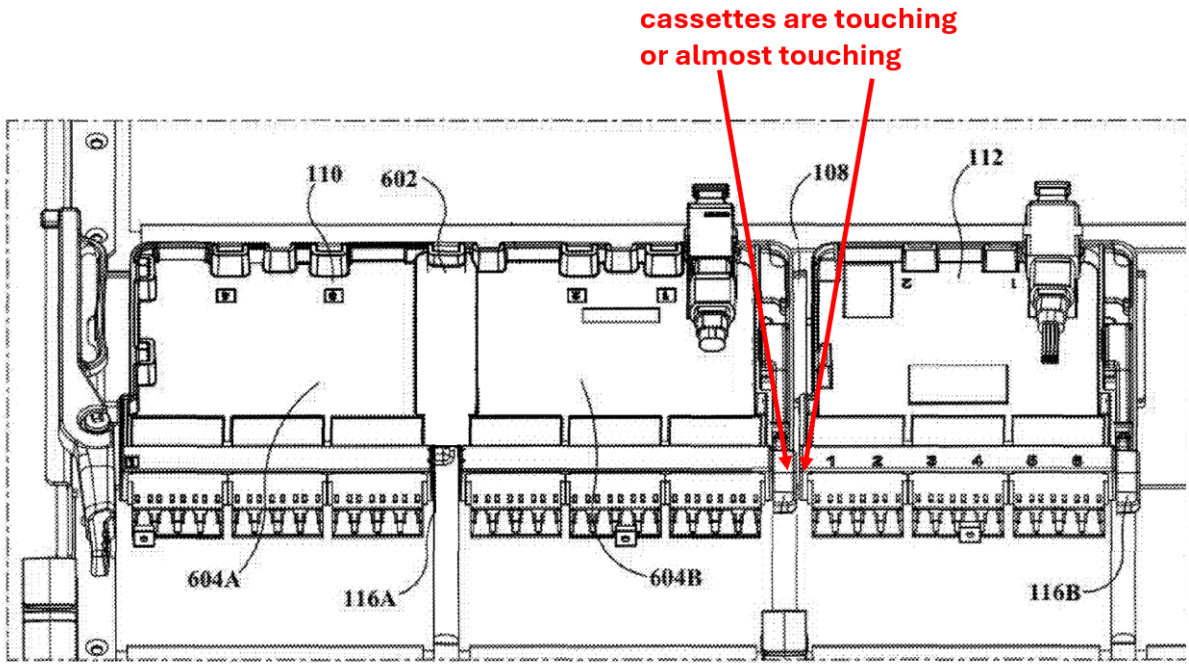


FIG. 15

The same applies to double-gang cassettes.



EX1003 ¶¶355-356.

Even if there is a tiny gap (that cannot be seen) between the cassettes, it would have been obvious based on Sauter alone to modify Sauter's cassettes so that they touch. EX1003 ¶357.

A POSITA would have been motivated to make the cassettes touch for multiple reasons: First, making this change would aid in aligning cassettes as they are being installed. Each new cassette could be positioned by bringing the cassette into contact with an already installed cassette and then sliding the cassette into place. It would provide a convenient, intuitive registration feature. EX1003 ¶¶358-359. Second, a POSITA would have been motivated to provide for additional or stronger cassette components. The additional width could be used by

incorporating thicker cassette walls making them more resistant to accidental damage. EX1003 ¶360.

A POSITA could easily achieve this modification by adjusting the thickness of the side walls of the cassette. EX1003 ¶361. It was already known to make adjacent cassettes touch. EX1026 3:4-9, Fig. 5; EX-1010, Figs. 3-4; EX1004, Fig. 8, 7:46-51.

J. Claims 8, 16, 26, 27

Sauter discloses configuring the tray to fit at least twelve standard width units side by side in a row along the width of the tray, where standard width unit is 1/3 of single-gang cassette. EX1003 ¶362. See Fig. 15:

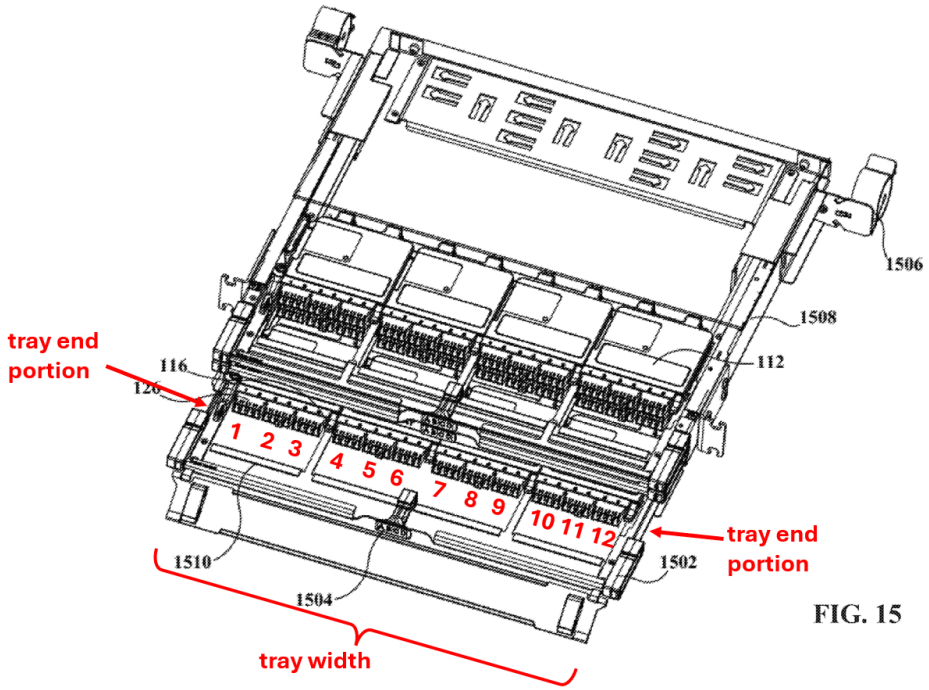


FIG. 15

K. Claim 20

The apertures 124 on Sauter's tray are a first row of cassette engaging portions that engage with locking protrusions 1006 on the cassettes. EX1003 ¶363. The rail guides on the tray are a second row of cassette engaging portions. These two rows are spaced away from each other. See EX1006, Figs. 5 and 1.

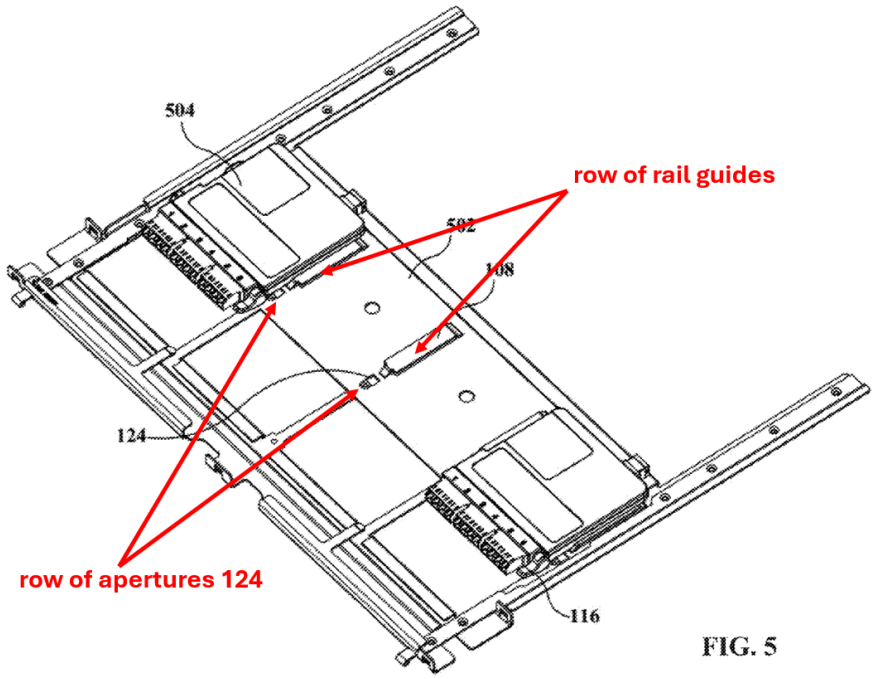


FIG. 5

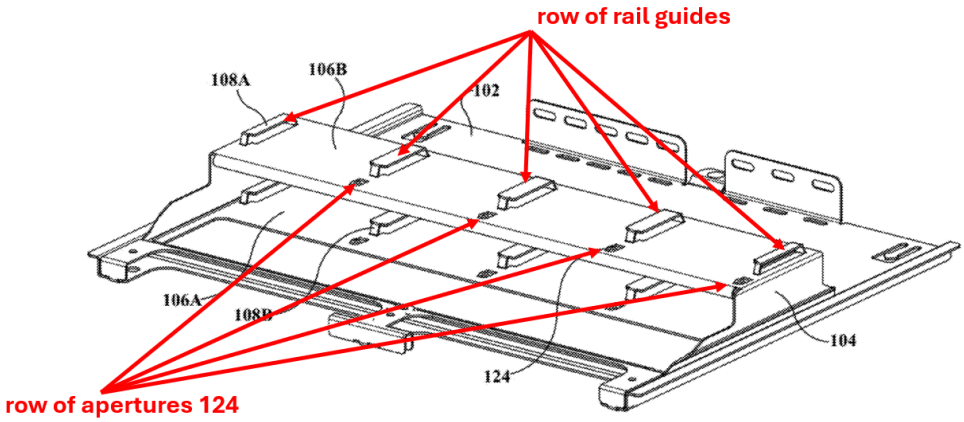


FIG. 1

L. Claim 21

The apertures 124 on Sauter's tray are a first row of cassette engaging portions that define slot portions that engage tabs on the cassettes (e.g., protrusions 1006). EX1003 ¶364; EX1006 Figs. 5, 1, 4, 12, 13, 14, and 16; 8:39-49.

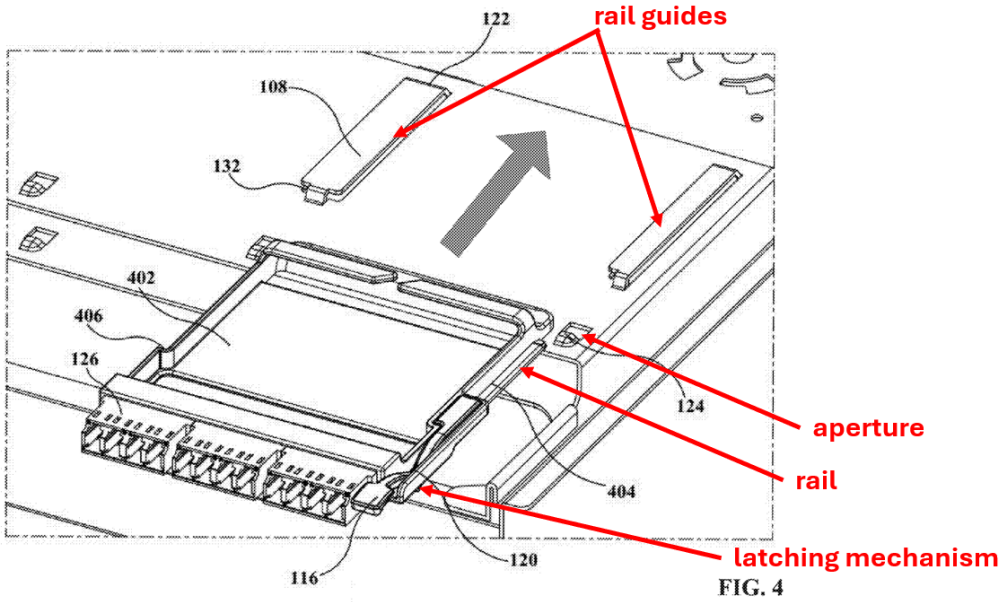


FIG. 4

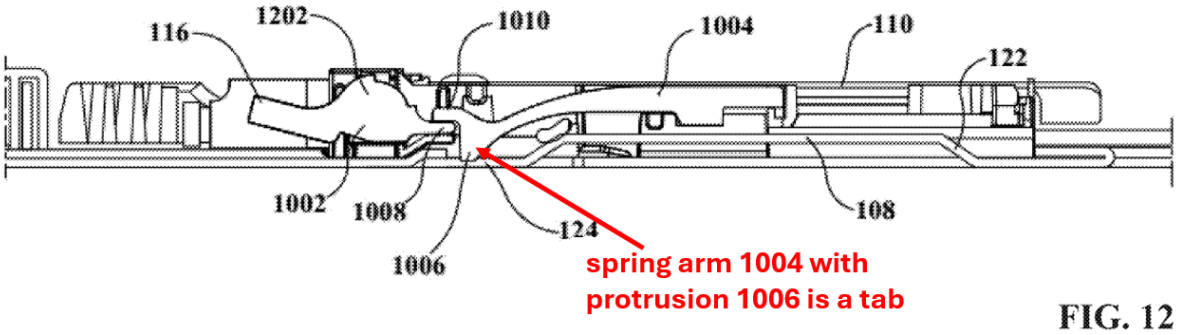


FIG. 12

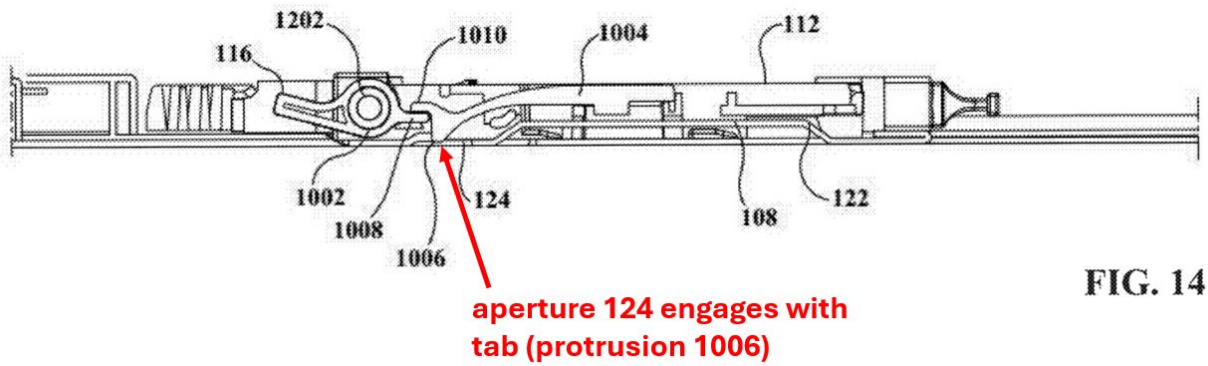


FIG. 14

M. Claim 28

Sauter's cassettes include a multifiber connector receptacle at the rear of the cassettes:

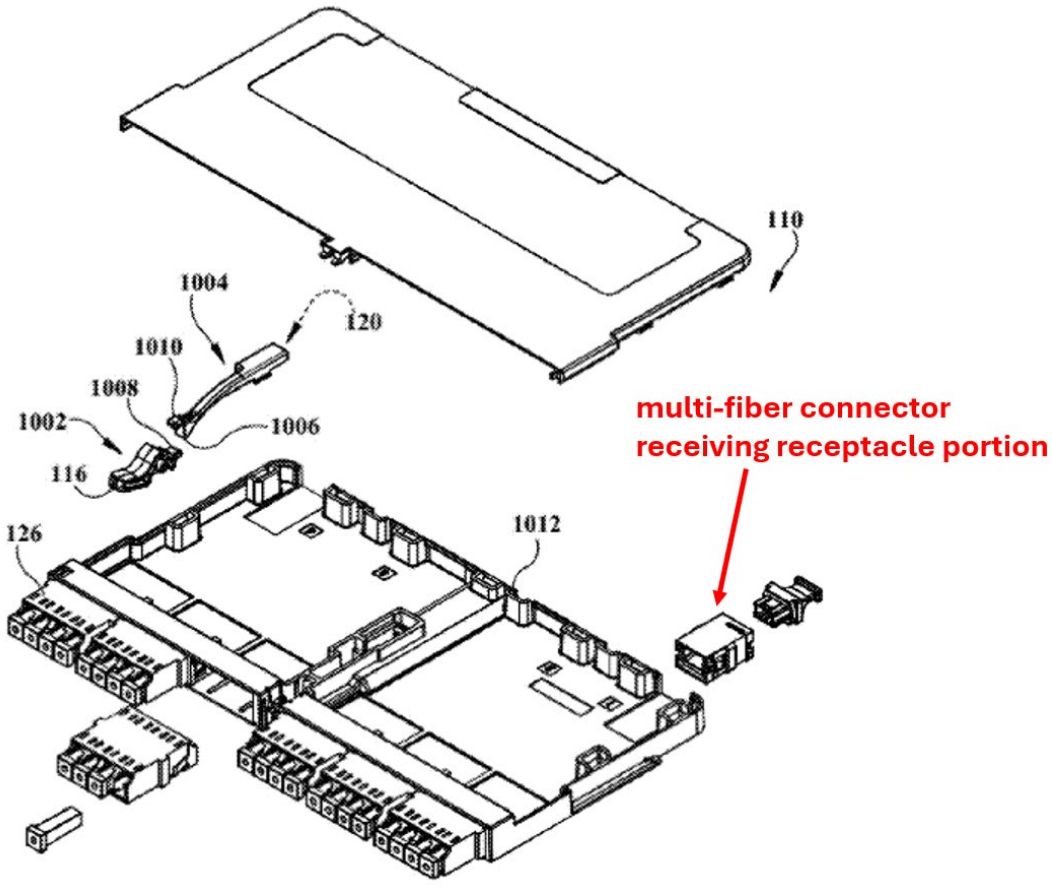


FIG. 10

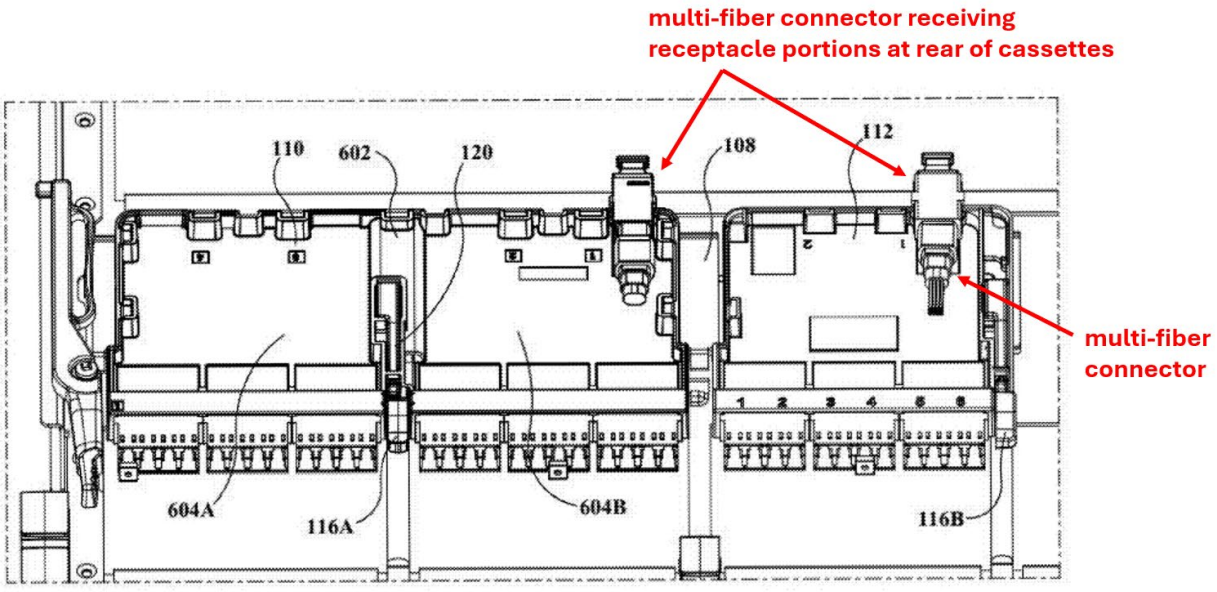


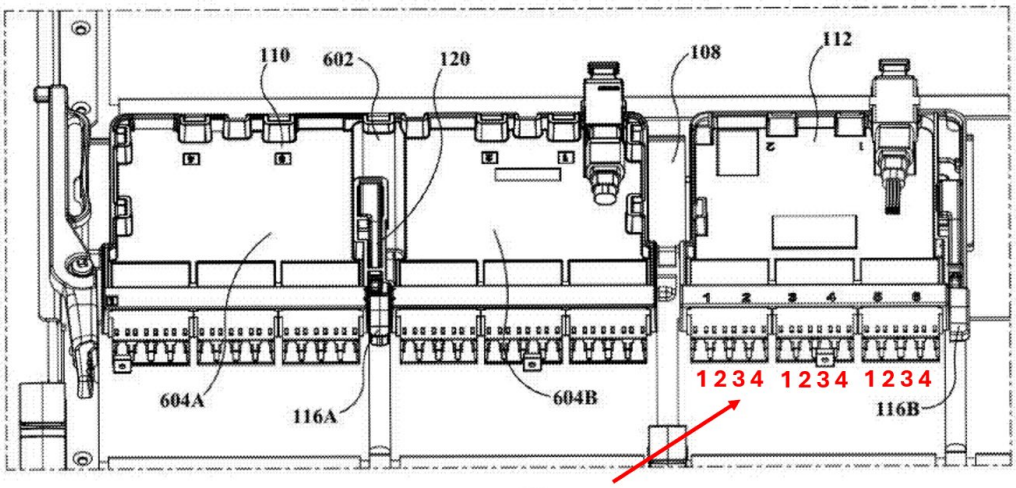
FIG. 7

EX1006, 8:4-28, Figs. 10, 7, 6, 13; EX1003 ¶365.

N. Claim 29

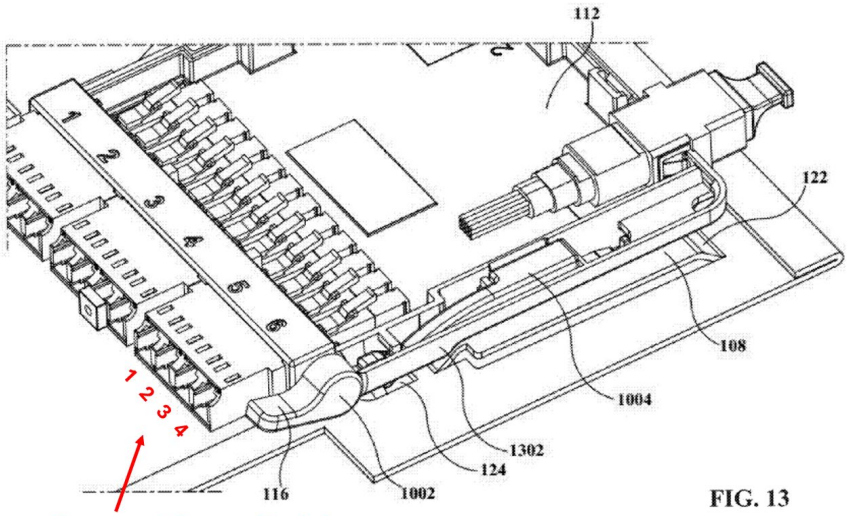
Sauter's cassettes include quad LC adapter modules along a front of each cassette. Each module includes four receptacles arranged side by side in a row, and there is one adapter module in a cassette for each standard width unit.

EX1006, Figs. 7, 10, 13, 8:4-36; EX1003 ¶366.



Single-gang cassette includes three adapter modules each of which includes four plug receiving receptacle portions side by side in a row.

FIG. 7



Adapter modules each include four plug receiving receptacles side by side.

FIG. 13

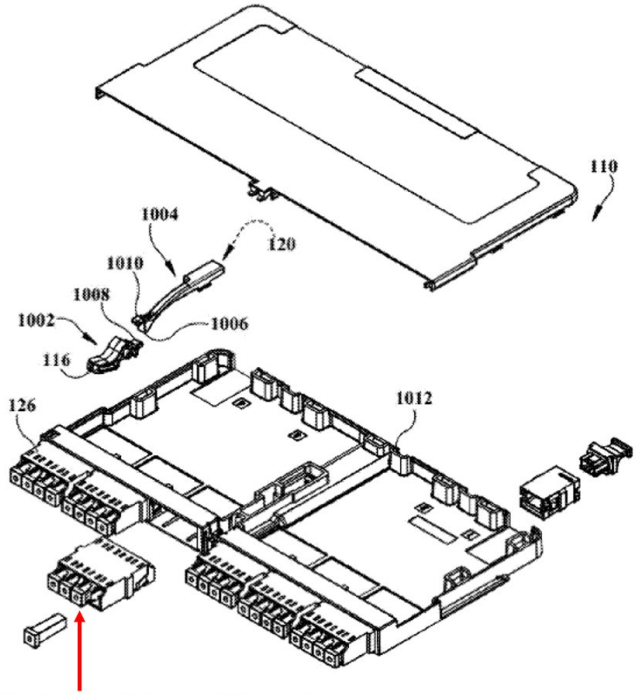
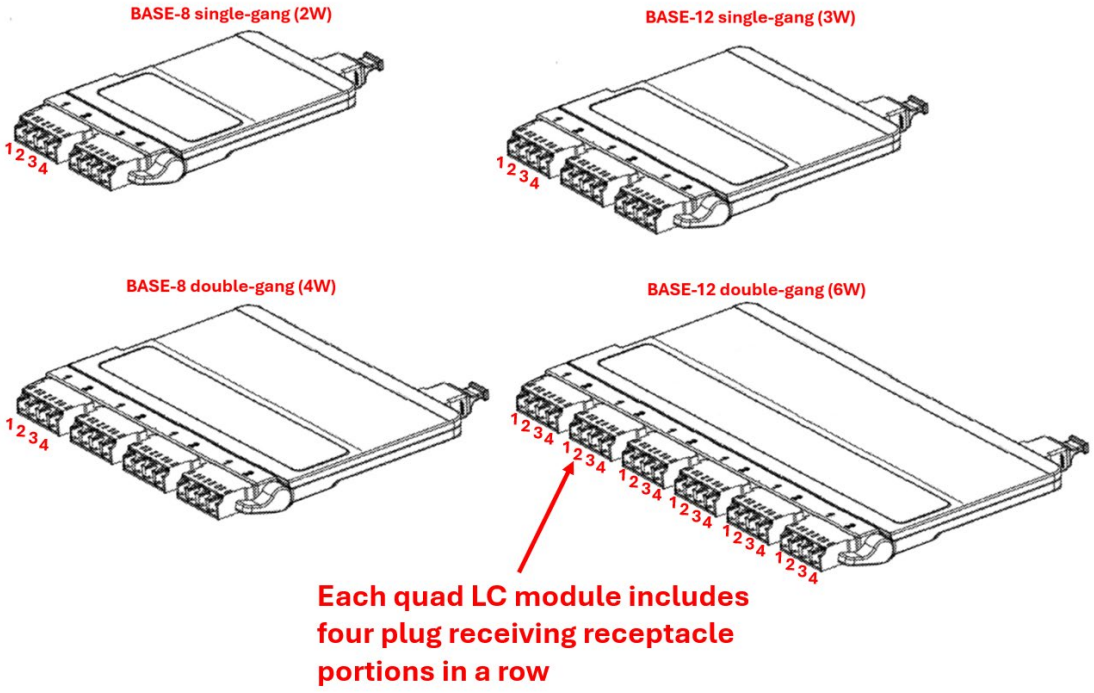


FIG. 10

The same is true for the cassettes when modified to support both BASE-8 and BASE-12 systems. EX1003 ¶367.



O. Claim 30

368. Sauter's trays are configured with apertures 124 and rail guides 108 ("cassette fastening portion") that removably secure the tray to each cassette. EX1006, 5:60-6:14; 6:15-29; 7:47-60; 8:37-49; 9:63-10:3; *see also* Figs. 1-2, 5-8, 10-11, 13-14, 16; EX1003 ¶¶368-371.

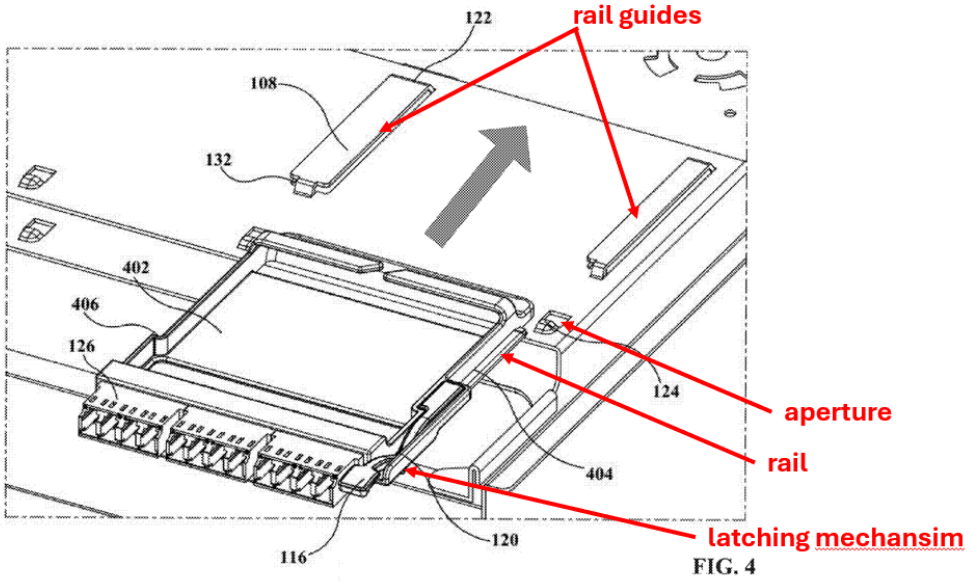


FIG. 4

Ground 4: Sauter combined with Dagley in further light of Fukui renders claims 1-30 obvious

A. Claims 5, 13, 23 "directly adjacent"

If PO argues the rail guides on Sauter's trays prevent cassettes from being "directly adjacent", Ground 3 further in light of Fukui (EX1004) renders these claims obvious.

Fukui shows that cassettes (called modules 10, 20 in Fukui) can be releasably secured to a tray using hooks that protrude from the bottom of the

cassette, without the need for rails or rail guides on the tray. EX1004, 8:52-56, Figs. 2, 9:

Fig.2

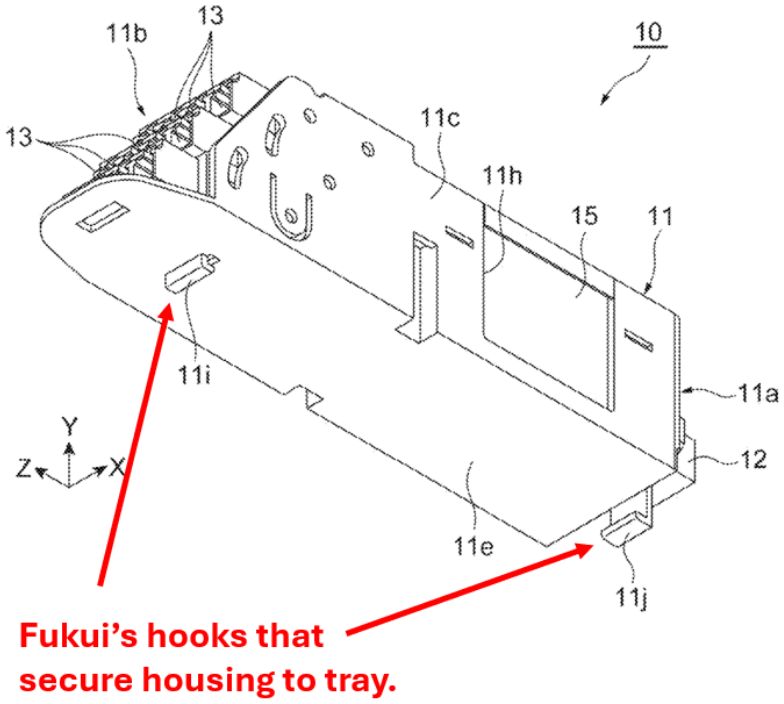
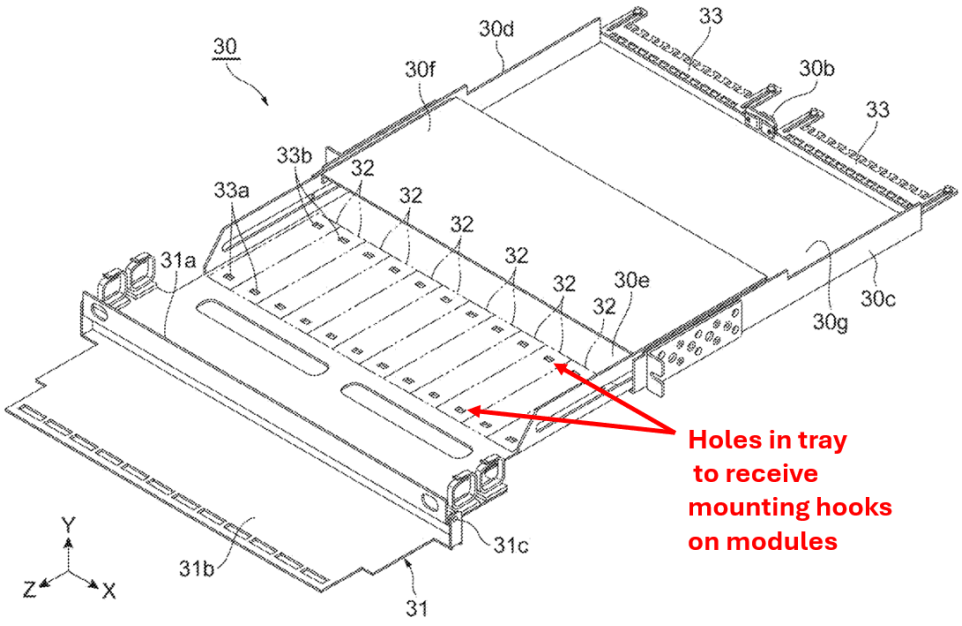


Fig.9



A POSITA would have been motivated to use the mounting technique taught by Fukui on Sauter's cassettes for multiple reasons. First, eliminating the space occupied by the rail and latching mechanism would allow the cassettes to occupy less space in the width dimension, making more space available on the tray. EX1003 ¶¶372-375.

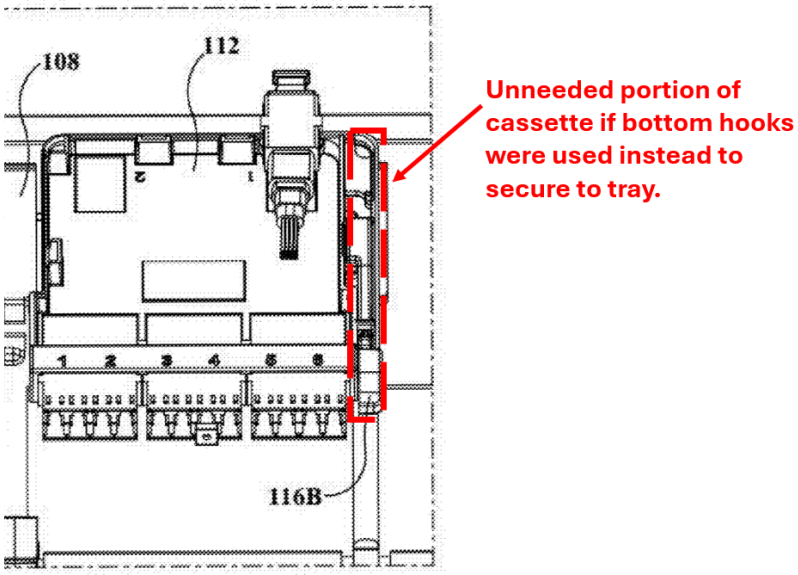


FIG. 7

It would also make more space available inside the cassettes by eliminating the "clearance areas" used by Sauter to span over rail guides, space that could be used for housing fiber optic components inside the cassettes such as splitters, connectors, splices, and fiber guides. EX1003 ¶¶375-376. Eliminating the need for clearance areas also makes it easier to combine different cassette sizes in one tray. EX1003 ¶¶376.

A POSITA would have a reasonable expectation of success because Sauter's technique already relies on holes/apertures (124) in the tray that receive tabs on the cassettes when mounting the cassettes to the tray. EX1006, Figs. 4, 12, 14, 1; EX1003 ¶¶377.

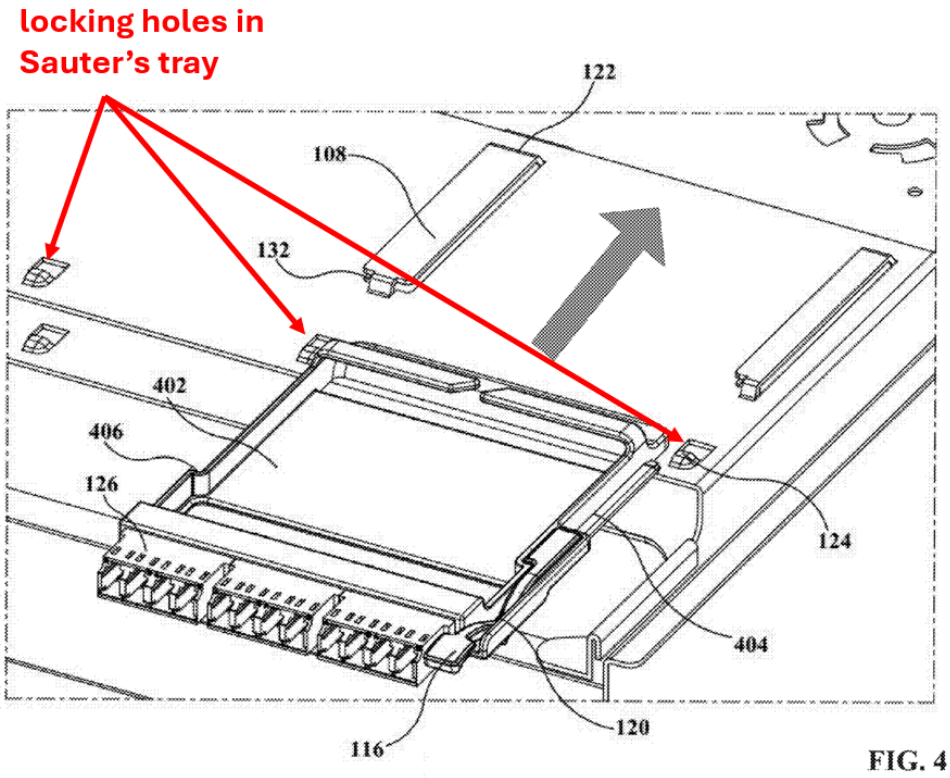


FIG. 4

When using Fukui's hook features to mount Sauter's cassettes to the tray, there would no longer be any intervening structure at all between cassettes. The outer side edges of adjacent cassettes would be "directly adjacent" because there would no longer be any rail guides on Sauter's tray. EX1003 ¶378.

With this modification, each claim limitation that was mapped to the rail guides and rails in Sauter would instead be found in the hooks and matching apertures that are taken from Fukui. EX1003 ¶379. Elements 1J, 9F, 1K, 9G, 17F, Claims 3, 11, 19, 20, 21, and 30 would still be satisfied for the reasons given above under Ground 1's discussion of Fukui's hooks and tray apertures. EX1003 ¶379.

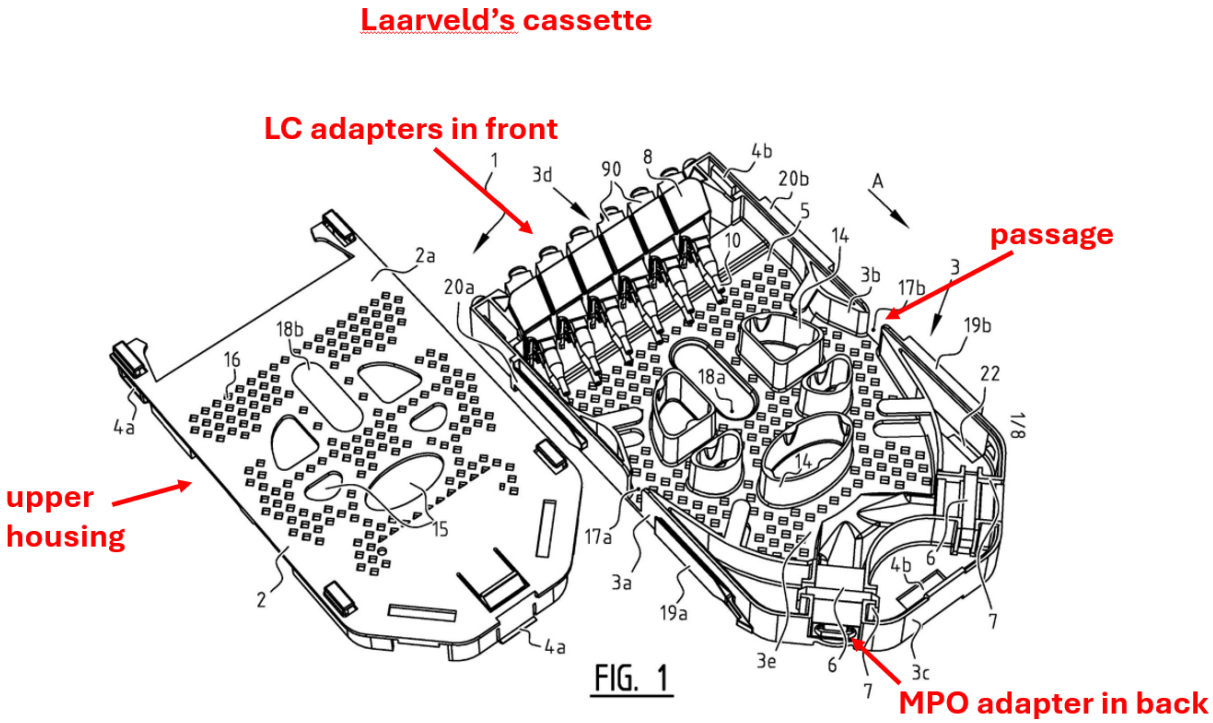
B. Cassette Size Limitations in Claims 1, 9, 17

If Ground 3 does not satisfy the cassette size limitations in Elements 1F, 9D, and 17D (2W 3W, 4W, 6W sizes), Ground 3 further in light of Fukui renders the claims obvious. Fukui uses different mounting features (i.e., cassette hooks and tray holes) without needing Sauter's side latching mechanism on the cassettes or the rail guides on the tray. It would have been obvious to incorporate the mounting features from Fukui into Sauter's cassettes and tray to eliminate Sauter's rail guides, rails, and latch. The resulting cassettes would be exact multiples of the smallest gang cassette. EX1003 ¶380.

Fukui teaches to form a pattern of holes in the tray that have a pitch equal to the width of the smallest module. EX1004, Fig. 9 (holes 32a and 32b). Using this mounting technique for Sauter instead of Sauter's rail guides and latching features, especially in light of Sauter's teaching to make the "multi-gang" cassettes multiples in width of the "single-gang" cassette, would result in Sauter's cassettes being like Fukui's in that they are exact multiples in width of the smallest "single-gang" cassette, with hooks positioned at locations underneath the cassettes at the same regular pitch as the holes in the tray for a single-gang cassette. EX1003 ¶381. A POSITA would be motivated to make this modification and have a reasonable expectation of success for the same reasons discussed under the "directly adjacent" limitation. EX1003 ¶381.

Ground 5: Either of Grounds 3 or 4 in further light of Laarveld renders claims 7, 15, and 25 obvious

If not already disclosed or obvious based on Sauter, it would have been obvious to modify Sauter so that the cassettes touch in light of Laarveld. EX1026. Laarveld discloses fiber optic cassettes much like Sauter's, with a row of LC connectors along the front connected to an MPO connector adapter at the back.



EX1026, Fig. 1, 10:19-20, 11:18-19; 11:11-12.

Laarveld discloses that two cassettes can be positioned to touch each other so that fiber can transition directly from one cassette to another adjacent cassette via passageways through their adjacent walls.

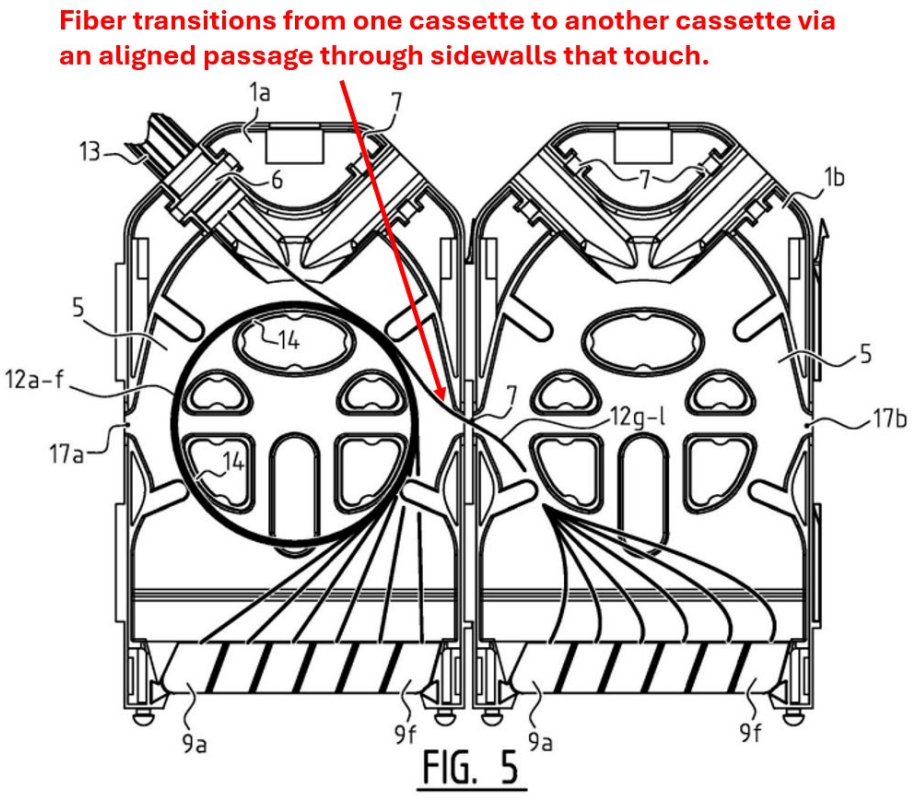


FIG. 5

EX1026, Fig. 5; 10:28-29; 14:23-15:14; 3:4-9.

It would have been obvious to modify Sauter's cassettes so that they touch as taught by Laarveld. EX1003 ¶¶382-384. A POSITA would be motivated by the reasons already articulated above regarding Claim 7, i.e., to aid in aligning cassettes during installation and provide space for additional or stronger cassette components. EX1003 ¶384. Laarveld provides an additional motivation: to permit fibers to transition horizontally from one cassette to another so that fibers entering a first cassette can be routed to adapter locations in an adjacent cassette. EX1003 ¶384. Bringing the cassettes into contact also ensures that a fiber is protected while transitioning, not exposed.

A POSITA would have a reasonable expectation of success. A POSITA could easily achieve this modification by adjusting the thickness of the cassette side walls. EX1003 ¶385. It was already known to make adjacent cassettes touch (e.g., EX1004, Fig. 8, 7:46-51; EX1010, Figs. 3-4) and to transition fibers horizontally from one cassette module to another (e.g., EX1004 Fig. 5, 7:34-8:6).

Conclusion

There is at least a reasonable likelihood all challenged claims are invalid.

Respectfully submitted,

Dated: August 30, 2024

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Claims Listing Appendix

U.S. Patent No. 11,740,423
Challenged Claims 1-30

Designation	Claim 1
Preamble	1. A tray for providing a plurality of different modular fiber optic cassette configurations in a standard U-space fiber optic management system comprising:
Element 1A	a tray having a first tray side end portion and a second tray side end portion defining a tray width portion that extends between the first tray side end portion and the second tray side end portion;
Element 1B	wherein the tray width portion fits within a standard U-space width dimension;
Element 1C	wherein the tray is configured to fit a plurality of different modular fiber optic cassette configurations in the tray width portion in a standard U-space fiber management system;
Element 1D	wherein each of the plurality of different modular fiber optic cassette configurations include a modular fiber optic cassette that is configured to support a receptable module having a first module side end portion and a second module side end portion defining a module width portion that extends between the first tray side end portion and second tray side end portion;
Element 1E	wherein the module width portion is configured to fit in a standard one width (1 W) unit;
Element 1F	wherein each of the modular fiber optic cassettes includes a first cassette side end portion and a second cassette side end portion defining a standard cassette width unit extending between the first cassette side end portion and the second cassette side end portion that comprises a standard two width (2 W) unit, a standard three width (3 W) unit, a standard four width (4 W) unit, or a standard a standard six width (6 W) unit relative to the standard one width (1 W) unit;

Element 1G	wherein the receptable module is configured to fit at least four fiber optic plug receiving receptacle portions in a standard one width (1 W) unit;
Element 1H	wherein the plurality of different modular fiber optic cassette configurations comprise: a first modular fiber optic cassette configuration that includes six modular two standard width unit (2 W) cassettes that are each arranged side by side of each other along the tray such that a cassette side end portion of each modular two standard width (2 W) cassette adjacently faces a cassette side end portion of at least one other modular two standard width (2 W) cassette; a second modular fiber optic cassette configuration that includes four modular three standard width unit (3 W) cassettes that are each arranged side by side of each other in a row along the tray such that a cassette side end portion of each modular three standard width (3 W) cassette adjacently faces a cassette side end portion of at least one other modular three standard width (3 W) cassette; a third modular fiber optic cassette configuration that includes three modular four standard width unit (4 W) cassettes that are each arranged side by side of each other in a row along the tray such that a cassette side end portion of each modular four standard width (4 W) cassette adjacently faces a cassette side end portion of at least one other modular four standard width (4 W) cassette; a fourth modular fiber optic cassette configuration that includes two modular six standard width unit (6 W) cassettes that are each arranged side by side of each other in a row along the tray such that a cassette side end portion of one of the two modular six standard width (6 W) cassettes adjacently faces a cassette side end portion of the other modular six standard width (6 W) cassette; and a fifth modular fiber optic cassette configuration that includes three modular two standard width unit (2 W) cassettes, which are each arranged side by side of each other in a row along the tray such that a cassette side end portion of one of the three modular two standard width (2 W) cassettes adjacently faces a cassette side end portion of one of the other modular two standard width (2 W) cassette, and one modular six standard width unit (6 W) cassette that is arranged side by side in a row along the tray with one of the three modular two

	standard width unit (2 W) cassettes, such that a cassette side end portion of the one modular six standard width unit (6 W) cassette adjacently faces a cassette side end portion of one of the other three modular two standard width unit (2 W) cassettes;
Element 1I	wherein each modular two standard width (2 W) cassette is configured to fit two receptacle modules; wherein each modular three standard width (3 W) cassette is configured to fit three receptacle modules; wherein each modular four standard width (4 W) cassette is configured to fit four receptacle modules; wherein each modular six standard width (6 W) cassette is configured to fit six receptacle modules;
Element 1J	wherein the tray is configured to be removably secured to each modular fiber optic cassette when the tray fits the plurality of different modular fiber optic cassette configurations within the tray width portion in the standard U-space fiber management system; and
Element 1K	wherein the tray includes a plurality of cassette engaging portions that are configured to conform to the standard one width (1 W) so as to support the modular two standard width (2 W) cassette, the modular three standard width (3 W) cassette, the modular four standard width (4 W) cassette, and the modular six standard width (6 W) cassette.
Claim 2	2. The tray of claim 1, wherein the standard one width (1 W) unit is based on a standard SC Duplex width unit that is configured to fit a plurality of different type of LC, SC, and MPO connectors.
Claim 3	3. The tray of claim 1, wherein the plurality of cassette engaging portions of the tray are spaced apart from one another so as to conform to the standard one width (1 W) and support the modular two standard width (2 W) cassette, the modular three standard width (3 W) cassette, the modular four standard width (4 W) cassette, and the modular six standard width (6 W) cassette.

Claim 4	4. The tray of claim 1, wherein the tray is configured to be slidingly received in at least a portion of a tray receiving space of a case of a fiber optic management system.
Claim 5	5. The tray of claim 1, wherein each of the modular fiber optic cassettes includes a cassette side end portion that is directly adjacent to a cassette side end portion of another module fiber optic cassette when each of the modular fiber optic cassettes are in the plurality of the plurality of different modular fiber optic cassette configurations.
Claim 6	6. The tray of claim 1, wherein each of the modular fiber optic cassettes includes a cassette side end portion that is adjacent to a cassette side end portion of another module fiber optic cassette when each of the modular fiber optic cassettes are in the plurality of the plurality of different modular fiber optic cassette configurations.
Claim 7	7. The tray of claim 1, wherein each of the modular fiber optic cassettes includes a cassette side end portion that touches a cassette side end portion of another module fiber optic cassette when each of the modular fiber optic cassettes are in the plurality of the plurality of different modular fiber optic cassette configurations.
Claim 8	8. The tray of claim 1, wherein the tray has a first tray end portion, a second tray end portion spaced away from the first tray end portion so as to define a tray width extending between the first tray end portion and the second tray end portion, and wherein the tray width is configured to fit at least twelve standard one width (1 W) units side by side along the tray width.
Designation	**Claim 9**
Preamble	9. A tray for providing a plurality of different modular fiber optic cassette configurations in a standard U-space fiber optic management system comprising:
Element 9A	a tray configured to fit in a standard U-space and support a plurality of different modular fiber optic cassette configurations in the standard U-space;

Element 9B	wherein each of the plurality of different modular fiber optic cassette configurations includes a plurality of different sizes of modular fiber optic cassettes;
Element 9C	wherein each of the plurality of different sizes of modular fiber optic cassettes is configured to support a fiber optic receptable module that is configured to fit in a standard one width (1 W) unit;
Element 9D	wherein the plurality of different sizes of modular fiber optic cassettes include a 2 cassette size that is configured to fit a standard two width (2 W) unit relative to the standard one width (1 W) unit, a 3 W cassette size that is configured to fit a standard three width (3 W) unit relative to the standard one width (1 W) unit, a 4 W cassette size that is configured to fit a standard four width (4 W) unit relative to the standard one width (1 W) unit, and a 6 W cassette size that is configured to fit a standard six width (6 W) unit relative to the standard one width (1 W) unit;
Element 9E	wherein the plurality of different modular fiber optic cassette configurations comprise: a first modular fiber optic cassette configuration that includes six modular 2 standard width unit size cassettes that are each arranged side by side of each other along the tray such that a cassette side end portion of each modular 2 standard width unit size cassette adjacently faces a cassette side end portion of at least one other modular 2 standard width size cassette; a second modular fiber optic cassette configuration that includes four modular 3 W standard width unit size cassettes that are each arranged side by side of each other in a row along the tray such that a cassette side end portion of each modular 3 W standard width size cassette adjacently faces a cassette side end portion of at least one other modular 3 W standard width size cassette; a third modular fiber optic cassette configuration that includes three modular 4 W standard width unit size cassettes that are each arranged side by side of each other in a row along the tray such that a cassette side end portion of each modular 4 W standard width size cassette adjacently faces a cassette side end portion of at least one other modular 4 W standard width size cassette;

	a fourth modular fiber optic cassette configuration that includes two modular 6 W standard width unit size cassettes that are each arranged side by side of each other in a row along the tray such that a cassette side end portion of one of the two modular 6 W standard width size cassettes adjacently faces a cassette side end portion of the other modular 6 W standard width size cassette; and a fifth modular fiber optic cassette configuration that includes three modular 2 standard width unit size cassettes, which are each arranged side by side of each other in a row along the tray such that a cassette side end portion of one of the three modular 2 standard width size cassettes adjacently faces a cassette side end portion of one of the other modular 2 standard width size cassette, and one modular 6 W standard width unit size cassette that is arranged side by side in a row along the tray with one of the three modular 2 standard width unit size cassettes, such that a cassette side end portion of the one modular 6 W standard width unit size cassette adjacently faces a cassette side end portion of one of the other three modular 2 standard width unit size cassettes;
Element 9F	wherein the tray is configured to be removably secured to each modular fiber optic cassette when the tray fits the plurality of different modular fiber optic cassette configurations within a tray width portion in the standard U-space fiber management system; and
Element 9G	wherein the tray includes a plurality of cassette engaging portions that are configured to conform to the standard one width (1 W) so as to support the modular 2 standard width unit size cassette, the modular 3 W standard width unit size cassette, the modular 4 W standard width unit size cassette, and the modular 6 W standard width unit size cassette.
Claim 10	10. The tray of claim 9, wherein the standard one width (1 W) unit is based on a standard SC Duplex width unit that is configured to fit a plurality of different type of LC, SC, and MPO connectors.
Claim 11	11. The tray of claim 9, wherein the plurality of cassette engaging portions of the tray are spaced apart from one another so as to conform to the standard one width (1 W) and support the modular 2

	standard width unit size cassette, the modular 3 W standard width unit size cassette, the modular 4 W standard width unit size cassette, and the modular 6 W standard width unit size cassette.
Claim 12	12. The tray of claim 9, wherein the tray is configured to be slidingly received in at least portion of a tray receiving space of a case of a fiber optic management system.
Claim 13	13. The tray of claim 9, wherein each of the modular fiber optic cassettes includes a cassette side end portion that is directly adjacent to a cassette side end portion of another module fiber optic cassette when each of the modular fiber optic cassettes are in the plurality of the plurality of different modular fiber optic cassette configurations.
Claim 14	14. The tray of claim 9, wherein each of the modular fiber optic cassettes includes a cassette side end portion that is adjacent to a cassette side end portion of another module fiber optic cassette when each of the modular fiber optic cassettes are in the plurality of the plurality of different modular fiber optic cassette configurations.
Claim 15	15. The tray of claim 9, wherein each of the modular fiber optic cassettes includes a cassette side end portion that touches a cassette side end portion of another module fiber optic cassette when each of the modular fiber optic cassettes are in the plurality of the plurality of different modular fiber optic cassette configurations.
Claim 16	16. The tray of claim 9, wherein the tray has first tray end portion, a second tray end portion spaced away from the first tray end portion so as to define a tray width extending between the first tray end portion and the second tray end portion, and wherein the tray width is configured to support at least twelve standard one width (1 W) units side by side along the tray.
Designation	**Claim 17**
Preamble	17. A tray for providing a plurality of different modular fiber optic cassette configurations in a fiber optic management system comprising:
Element 17A	a tray member configured to support a plurality of different modular fiber optic cassette configurations in a standard U-space width;

Element 17B	wherein the plurality of different modular fiber optic cassette configurations include different sizes of modular fiber optic cassettes;
Element 17C	wherein each of the different sizes of modular fiber optic cassettes is configured to support a fiber optic receptable module that is configured to fit in a standard one width (1 W) unit;
Element 17D	wherein the plurality of different sizes of modular fiber optic cassettes include a 2 cassette size that is configured to fit a standard two width (2 W) unit relative to the standard one width (1 W) unit, a 3 W cassette size that is configured to fit a standard three width (3 W) unit relative to the standard one width (1 W) unit, a 4 W cassette size that is configured to fit a standard four width (4 W) unit relative to the standard one width (1 W) unit, and a 6 W cassette size that is configured to fit a standard six width (6 W) unit relative to the standard one width (1 W) unit;
Element 17E	wherein the plurality of different modular fiber optic cassette configurations comprise: a first modular fiber optic cassette configuration that includes six modular 2 standard width unit size cassettes that are each arranged side by side of each other along the tray member such that a cassette side end portion of each modular 2 standard width unit size cassette adjacently faces a cassette side end portion of at least one other modular 2 standard width size cassette; a second modular fiber optic cassette configuration that includes four modular 3 W standard width unit size cassettes that are each arranged side by side of each other in a row along the tray member such that a cassette side end portion of each modular 3 W standard width size cassette adjacently faces a cassette side end portion of at least one other modular 3 W standard width size cassette; a third modular fiber optic cassette configuration that includes three modular 4 W standard width unit size cassettes that are each arranged side by side of each other in a row along the tray member such that a cassette side end portion of each modular 4 W standard width size cassette adjacently faces a cassette side end portion of at least one other modular 4 W standard width size cassette; and

	a fourth modular fiber optic cassette configuration that includes two modular 6 W standard width unit size cassettes that are each arranged side by side of each other in a row along the tray member such that a cassette side end portion of one of the two modular 6 W standard width size cassettes adjacently faces a cassette side end portion of the other modular 6 W standard width size cassette; and
Element 17F	wherein the tray member is configured to conform to the standard one width (1 W) so as to support the modular 2 standard width unit size cassette, the modular 3 W standard width unit size cassette, the modular 4 W standard width unit size cassette, and the modular 6 W standard width unit size cassette.
Claim 18	18. The tray member of claim 17, wherein the standard one width (1 W) unit is based on a standard SC Duplex width unit that is configured to fit a plurality of different type of LC, SC, and MPO connectors.
Claim 19	19. The tray member of claim 17, wherein the tray member includes a row of cassette engaging portions that are spaced apart from one another so as to conform to the standard one width (1 W) and support the modular 2 standard width unit size cassette, the modular 3 W standard width unit size cassette, the modular 4 W standard width unit size cassette, and the modular 6 W standard width unit size cassette.
Claim 20	20. The tray member of claim 19, wherein the row of cassette engaging portions comprises a first row of cassette engaging portions, and the tray includes a second row of cassette engaging portions that is spaced away from the first row of cassette engaging portions.
Claim 21	21. The tray member of claim 20, wherein the first row of cassette engaging portion comprises a first row of slot portions that are each configured to engage a tab portion of each modular cassette.
Claim 22	22. The tray member of claim 17, wherein the tray member is configured to be slidingly received in at least portion of a tray

	member receiving space of a case of a fiber optic management system.
Claim 23	23. The tray member of claim 17, wherein each of the modular fiber optic cassettes includes a cassette side end portion that is directly adjacent to a cassette side end portion of another module fiber optic cassette when each of the modular fiber optic cassettes are in the plurality of the plurality of different modular fiber optic cassette configurations.
Claim 24	24. The tray member of claim 17, wherein each of the modular fiber optic cassettes includes a cassette side end portion that is adjacent to a cassette side end portion of another module fiber optic cassette when each of the modular fiber optic cassettes are in the plurality of the plurality of different modular fiber optic cassette configurations.
Claim 25	25. The tray member of claim 17, wherein each of the modular fiber optic cassettes includes a cassette side end portion that touches a cassette side end portion of another module fiber optic cassette when each of the modular fiber optic cassettes are in the plurality of the plurality of different modular fiber optic cassette configurations.
Claim 26	26. The tray member of claim 17, wherein the tray member has a tray member width that is configured to support at least twelve standard one width (1 W) units side by side along a row.
Claim 27	27. The tray member of claim 17, wherein the tray member has first tray member end portion, a second tray member end portion spaced away from the first tray member end portion so as to define a tray member width extending between the first tray member end portion and the second tray member end portion, and wherein the tray member width is configured to support at least twelve standard one width (1 W) units side by side along the tray member.
Claim 28	28. The tray member of claim 17, wherein each of the modular fiber optic cassettes comprises a multi-fiber connector receiving receptacle portion arranged on a rear portion thereof.
Claim 29	29. The tray member of claim 17, wherein each of the modules fiber optic cassettes comprises four fiber optic plug receiving receptacle

	portions configured to be arranged side by side in a row along a front portion thereof for each standard width (1 W) unit.
Claim 30	30. The tray member of claim 17, wherein the tray member comprises a cassette fastening portion that is configured to removably secure the tray member to each modular fiber optic cassette.

Petitioner's Exhibit List

Number	Description
EX1001	U.S. Patent No. 11,740,423 (the challenged patent)
EX1002	Prosecution history of U.S. Patent No. 11,435,542
EX1003	Declaration of Dr. Stephen Ralph
EX1004	U.S. Patent No. 10,101,551 ("Fukui")
EX1005	U.S. Patent No. 10,215,944 ("Sedor)"
EX1006	U.S. Patent 9,690,064 ("Sauter")
EX1007	Prosecution history of U.S. Patent No. 10,795,107
EX1008	EIA Standard, Cabinets, Racks, Panels, and Associated Equipment (EIA/ECA-310-E)
EX1009	International Standard, Part 20: Type LC connectors Family (IEC 61754-20)
EX1010	U.S. Patent Publication No. 2014/0099064 ("Fabrykowski")
EX1011	Joint Claim Construction Chart from co-pending litigation
EX1012	Exhibits D, E, and F filed by Plaintiff Belden with its Complaint for Patent Infringement in the matter of *Belden Canada ULC v. CommScope, Inc. et al.*, 1:23-cv-00810 (D. Del. Jul. 27, 2023)
EX1013	Prosecution history of U.S. Patent 9,690,064 ("Sauter")
EX1014	U.S. Patent No. 9,690,065 ("Wiltjer")
EX1015	U.S. Patent No. 9,250,409 ("Blackwell")
EX1016	CommScope's user manual
EX1017	U.S. Patent No. 7,509,015
EX1018	U.S. Patent No. 9,008,485
EX1019	U.S. Patent No. 9,075,216
EX1020	U.S. Patent Publication No. 2016/0062050
EX1021	U.S. Patent No. 8,712,206
EX1022	Product literature for Leviton: FIBER SYSTEMS, Enclosure and Panel Selection Guide
EX1023	Product literature from Corning: EDGE™ HD Solutions
EX1024	Product literature from Panduit: HD Flex Fiber Cabling System
EX1025	WO2010148325A1
EX1026	NL2008155C2 ("Laarveld") (English translation)
EX1027	Declaration certifying translation of NL2008155C2
EX1028	NL2008155C2 ("Laarveld") (original in Dutch)
EX1029	Screen capture of Propel instructional video at https://www.youtube.com/watch?v=_agZJP5tZWc at 1:55)(showing cassette being mounted on rails)

EX1030	U.S. Patent App. Publication No. 2017/0192191 ("Dagley")
EX1031	U.S. Patent App. Publication No. 2017/0153406
EX1032	U.S. Patent No. 8,873,922
EX1033	Prosecution history of U.S. Patent No. 11,656,422
EX1034	U.S. Patent No. 11,435,542
EX1035	U.S. Patent No. 10,795,107
EX1036	U.S. Patent No. 9,885,845
EX1037	U.S. Patent App. Publication No. 2008/0298014
EX1038	U.S. Patent App. Publication No. 2006/0261015
EX1039	Prosecution history of U.S. Patent No. 11,740,423
EX1040	U.S. Patent No. 11,656,422
EX1041	"Belden's Opening Claim Construction Brief" in the matter of *Belden Canada ULC v. CommScope, Inc. et al.*, No. 1:23-cv-00810 (D. Del. Jul. 19, 2024).
EX1042	"CommScope's Answering Claim Construction Brief" in the matter of *Belden Canada ULC v. CommScope, Inc. et al.*, No. 1:23-cv-00810 (D. Del. Aug. 23, 2024).
EX1043	Exhibit P to CommScope's Claim Construction Brief in the matter of *Belden Canada ULC v. CommScope, Inc. et al.*, No. 1:23-cv-00810 (D. Del. Aug. 23, 2024).
EX1044	U.S. Pat. App. Pub. No. 20070146997A1
EX1045	U.S. Patent No. 9,095,070

CERTIFICATION UNDER 37 CFR § 42.24(d)

Under the provisions of 37 CFR § 42.24(d), the undersigned hereby certifies that the word count for the foregoing Petition for *Inter Partes* Review totals 13,978 words per Microsoft Word word count tool, which complies with requirement of 14,000 words allowed under 37 CFR § 42.24(a)(i).

Respectfully submitted,

Dated: August 30, 2024

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CERTIFICATE OF SERVICE

Pursuant to 37 CFR §§ 42.6(e)(4)(i) *et seq.* and 42.105(b), the undersigned certifies that on August 30, 2024 a complete and entire copy of this PETITION FOR INTER PARTES REVIEW OF UNITED STATES PATENT NO. 11,740,423 PURSUANT TO 35 U.S.C. §§ 311–319, 37 C.F.R. § 42 and all supporting exhibits were provided by Federal Express, to the PO by serving the correspondence address of record as follows:

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Dated: August 30, 2024

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