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 IPR2024-01228
U.S. Patent No. 11,656,422

PETITION FOR *INTER PARTES* REVIEW OF U.S. PAT. NO. 11,656,422 UNDER 35 U.S.C. §§ 311-319 AND 37 C.F.R. § 41.100 ET SEQ.

Table of Contents

Mandatory Notices 1

A. Real Parties-in-Interest 1

B. Related Matters 1

C. Lead and Back-Up Counsel 1

D. Service Information 1

Preliminary Matters 2

A. Standing 2

B. Identification of Challenge 2

C. Supporting Declaration 2

D. Fees 2

Introduction 3

Technology Background 3

Summary of the Challenged Patent 5

A. Disclosure of the ‘422 patent 5

B. Claims 8

C. Prosecution History 8

D. Related IPR proceedings 16

Summary of the Asserted Prior Art 16

A. Fukui (EX1004) 16

B. Sedor (EX1005) 20

C. Sauter (EX1006) 20

Claim Construction 23

A. “two, three, four, and six” standard width units 23

B. “directly adjacent” 25

Level of Ordinary Skill 26

Discretionary Issues 27

Argument 27

Ground 1: The challenged claims are all anticipated by Fukui or obvious based on Fukui itself 27
A. Independent Claim 1 27
B. Independent Claim 18 65
C. Independent Claim 40 68
D. Claims 2, 24, 50, 51 69
E. Claims 3, 25, 52 70
F. Claims 4, 26, 53 70
G. Claims 5, 27, 54-55 71
H. Claims 6, 28, 56 73
I. Claims 10, 20-22, 32, 45-47 74
J. Claims 11, 33 76
K. Claims 12, 34, 60 80
L. Claims 13, 35, 61 80
M. Claims 14, 36, 62 82
N. Claims 16, 38, 64 82
O. Claims 23 and 49 83
P. Claim 41 84
Q. Claim 42 84
R. Claim 44 85
S. Claim 48 85
Ground 2: The challenged claims are also all obvious based on Fukui plus Sedor 91
Ground 3: Sauter anticipates or renders obvious all challenged claims 94
A. Independent Claim 1 94
B. Independent Claim 18 121
C. Independent Claim 40 126
D. Claims 2, 11, 24, 33, 50, 51 127
E. Claims 3, 25, 52 129
F. Claims 4, 26, 53 131

G. Claims 5, 27, 54 133
H. Claims 6, 28, 56 135
I. Claim 10 135
J. Claims 12, 34, 60 137
K. Claims 13, 35, 61 138
L. Claims 14, 36, 62 138
M. Claims 16, 38, 64 139
N. Claim 20 140
O. Claims 21, 46 140
P. Claim 22 142
Q. Claim 23 142
R. Claim 32 143
S. Claim 41 143
T. Claim 42 143
U. Claim 44 145
V. Claim 45 145
W. Claim 47 145
X. Claim 48 146
Y. Claim 49 147
Z. Claim 55 148
Ground 4: Sauter in light of Fukui renders all challenged claims obvious 148
A. "directly adjacent" (Claims 1-6, 10-14, 16, 20, 22, 23, 45, 47) 148
B. Cassette width limitations in each independent claim 153
C. A third cassette size (Claims 12, 34, 60) 154
Ground 5: Grounds 3 or 4 in further light of Sedor 155
A. A "housing" or "case" in claims 1, 18, and 40 155
B. Element 1C and Claims 23, 49 156
C. Claims 12, 34, 40 157
Conclusion 159

Claims Listing Appendix 160
Petitioner Exhibit List 169

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 a complaint in *Belden Canada ULC v. CommScope, Inc. et al.,* Case No. 1:23-cv-00810-RGA (D. Del.) (served July 28, 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 that IPR is available for the '422 Patent; Petitioner is not barred or estopped.

B. Identification of Challenge

Petitioner requests invalidation of 1-6, 10-14, 16, 18, 20-28, 32-36, 38, 40-42, 44-56, 60-62, 64 (the challenged claims).

	Claims	Basis for Unpatentability
Ground 1	All challenged claims	Anticipated or obvious based on Fukui alone
Ground 2	All challenged claims	Obvious: Fukui combined with Sedor
Ground 3	All challenged claims	Anticipated or obvious based on Sauter alone
Ground 4	All challenged claims	Obvious: Sauter in light of Fukui
Ground 5	All challenged claims	Obvious: Either of Grounds 4 or 5 in further combination with Sedor

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 ‘422 patent claims a modular fiber optic cassette system. The claims recite the conventional elements of a “housing”, “tray”, and “cassettes.” The claims then recite limitations about the width and proximity of the cassettes. The examiner allowed the claims in a first action allowance because the closest art the examiner was aware of used rails between the cassettes on the tray.

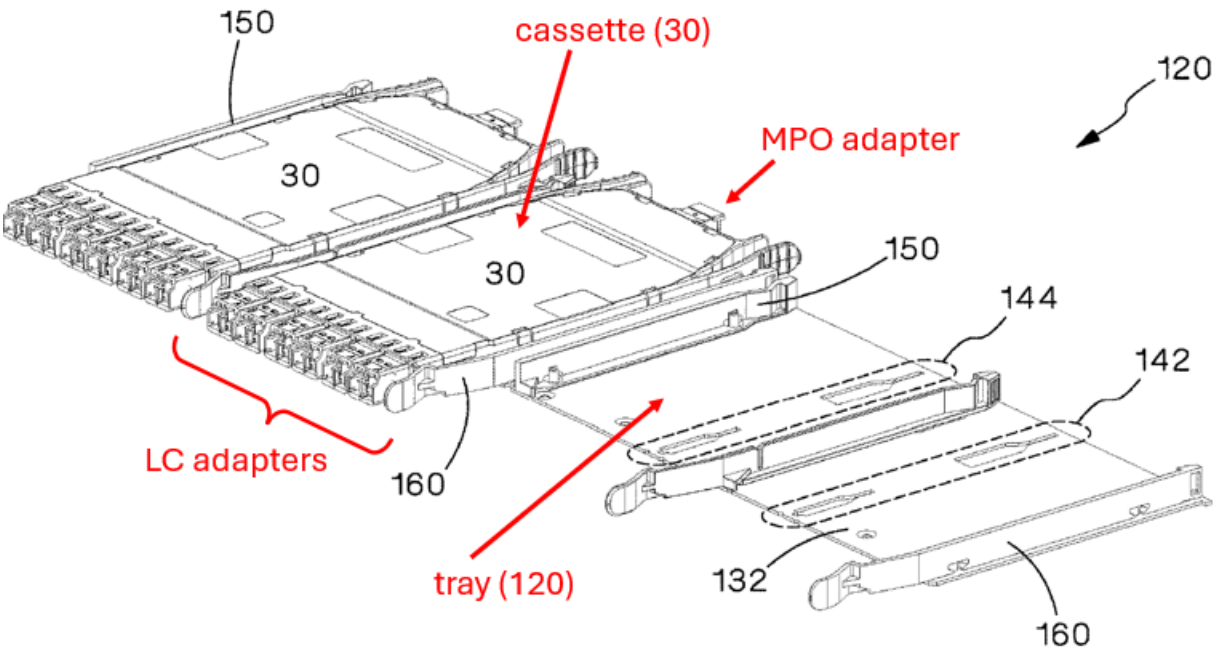
“Fukui” is a new reference. It does not have any rails between the cassettes and discloses the exact limitations the examiner believed were missing.

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 construction reads right on Sauter.

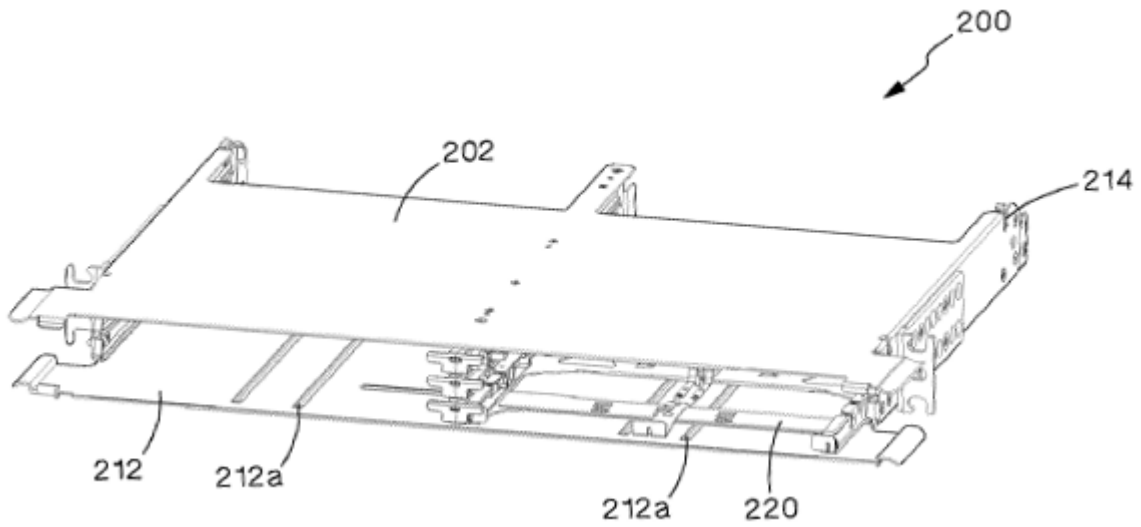
Technology Background

The technology at issue is fiber optic cassette systems. These systems are deployed in data rooms where high-capacity fiber optic cables are distributed to many subscriber connections.

The conventional elements are a case, tray, and cassettes (also called modules). The “Sedor” prior art reference, discussed during prosecution, shows a conventional cassette and tray:



EX1005, Fig. 8. A cassette has an "MPO" adapter port on the rear and "LC" adapter ports on the front for connecting fiber optic cables. MPO stands for "multiple-fiber push-on." "LC" stands for "Lucent Connector." The trays of cassettes are stored in a protective case. Sedor illustrates a conventional case:



EX1005, Fig. 44. The trays slide in and out of the case to allow the operator to insert cassettes and plug in cables. The operator typically mounts the case in a rack.

Summary of the Challenged Patent

A. Disclosure of the '422 patent

The '422 patent discloses a modular fiber optic cassette system. EX1001, 1:19-20, 2:26-27. Figure 1 is illustrative:

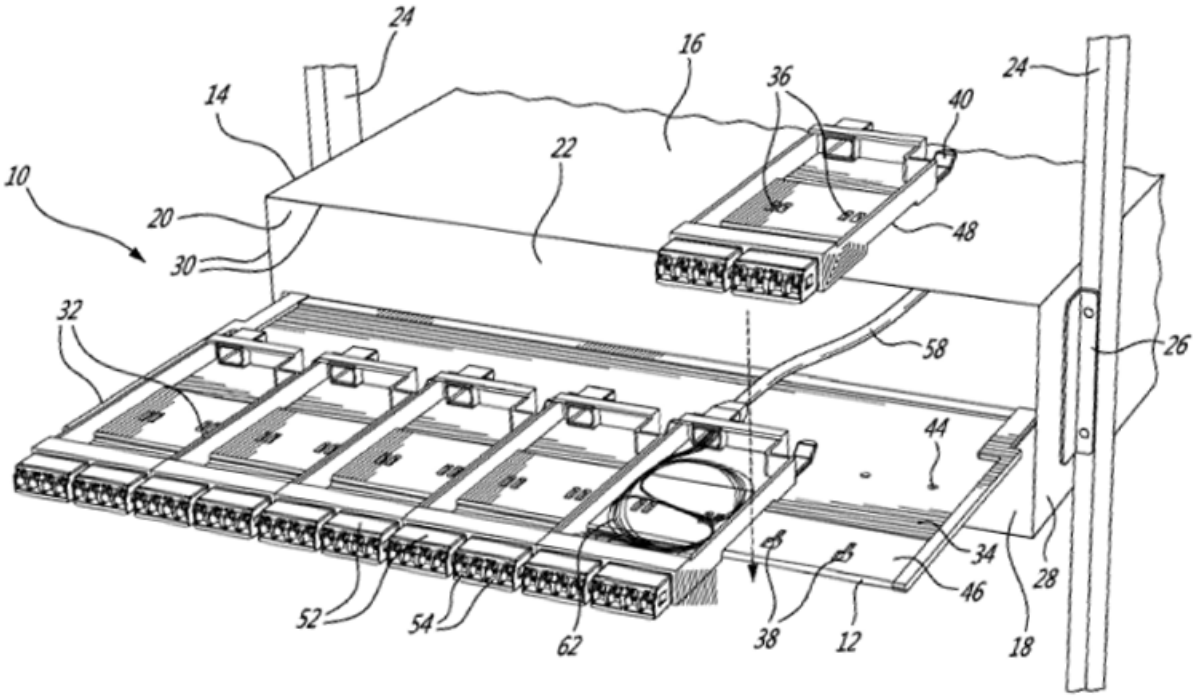


Fig. 1

EX1001, Fig. 1. The system comprises a case (14), sliding tray (12), and cassettes. EX1001, 2:28-29. The cassettes snap into apertures (44) on the tray. EX1001, 2:45-53.

The system accommodates cassettes with different widths. Each of the different widths is an "integer multiple" of a standardized width unit "W." EX1001, 3:18-21. The different multiples are W, 2W, 3W, 4W, and 6W. EX1001, 3:18-35, 3:55.

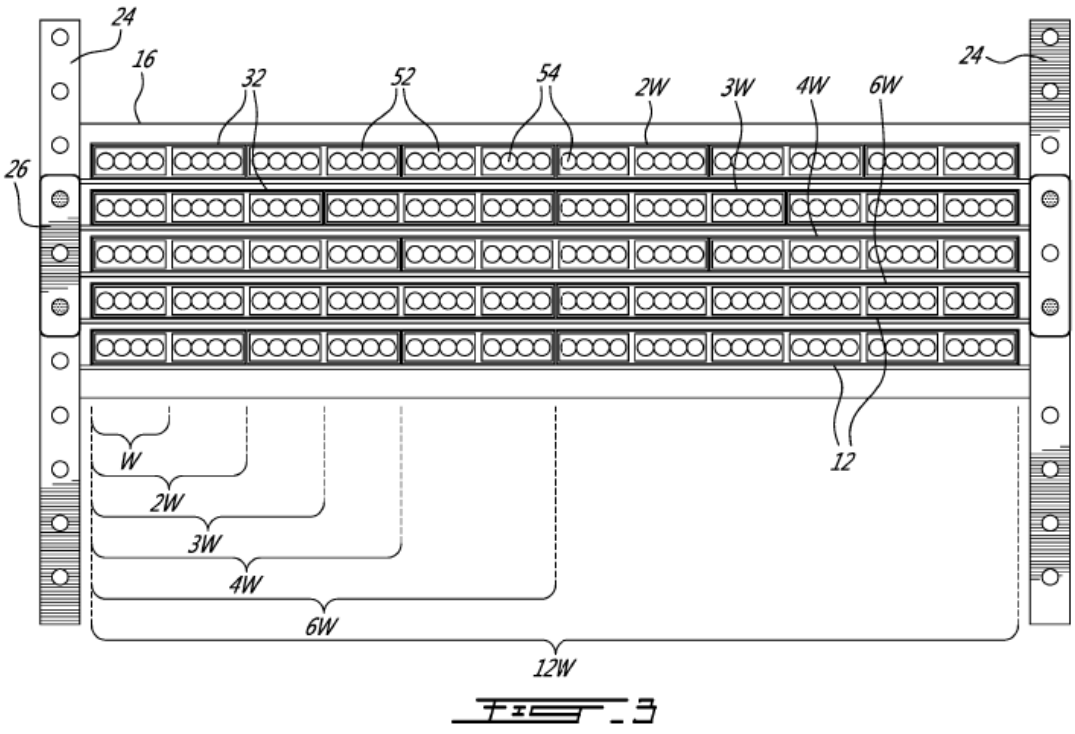


Fig. 3

EX1001, Fig. 3. In the preferred embodiment, the width W is based on an "LC Quad" technology footprint. EX1001, 3:37-40, Figs. 2A-2B:

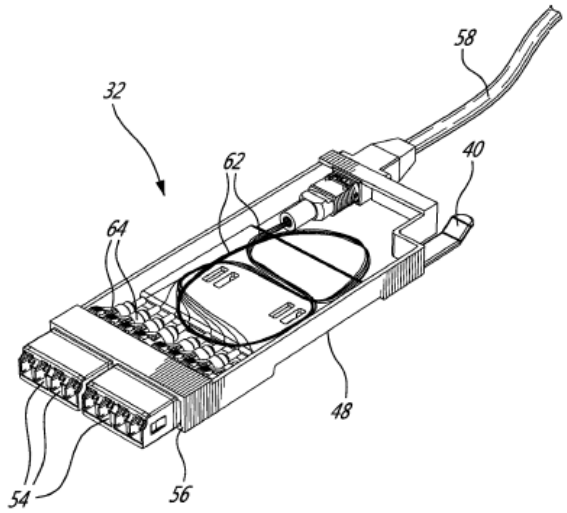


FIG. 2A

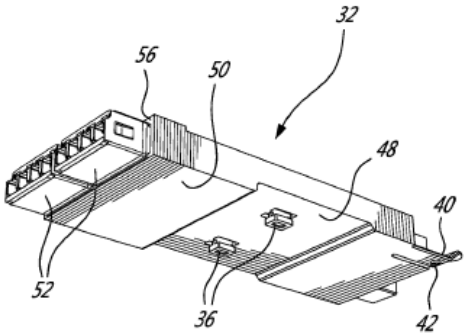
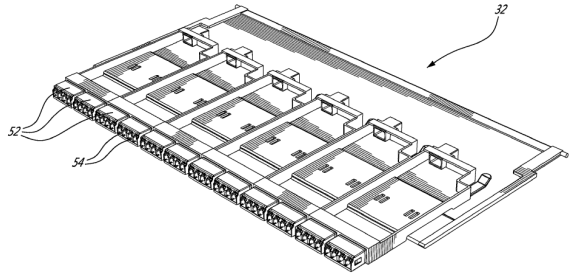
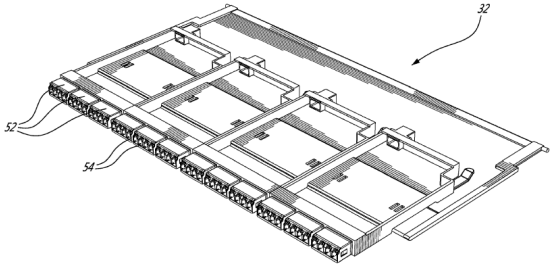
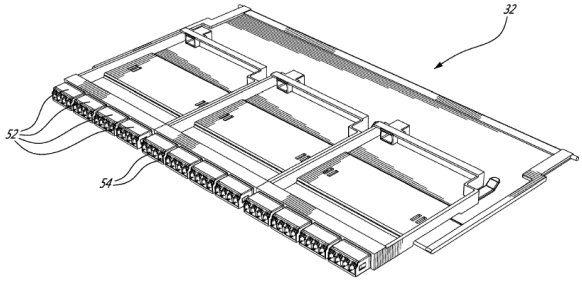
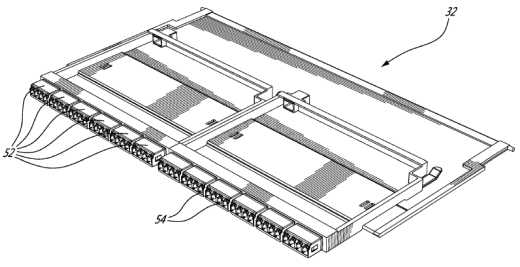


FIG. 2B

Numeral 52 is an LC quad receptable module with four individual LC ports 54. EX1001, 2:58-62. Figures 4A-4D shows the larger 2W, 3W, 4W, 6W sizes:

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

EX1001 (cropped). Because the '422 patent does not have rails between the cassettes, each of the cassettes "fit snuggly side by side." EX1001, 3:33. The

purpose of the different cassette 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, 3:14-17, 3:47-494-5.

B. Claims

There are three independent claims (1, 18, 40) that substantially overlap. The claims recite the conventional elements of a "housing" and "tray." The claims also require two cassettes with different widths. Claim 1, for example, requires a first and second cassette having a width of two three, four, or six standard width units. Claim 1 also requires the cassettes be "directly adjacent."

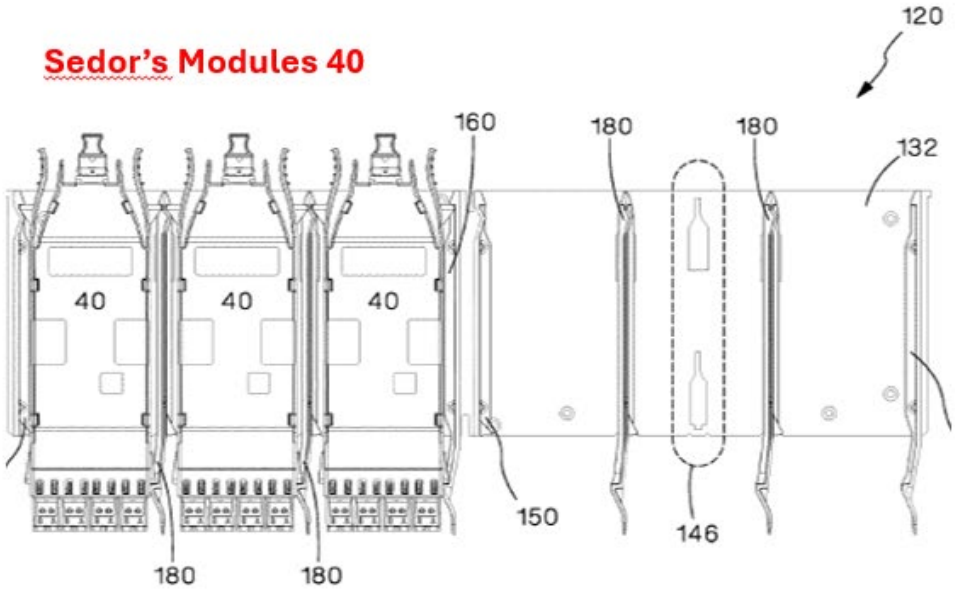
C. Prosecution History

The prosecution history, which starts in the grandparent case, focused on two limitations: the cassettes being multiples of the standard width unit and the phrase "directly adjacent."

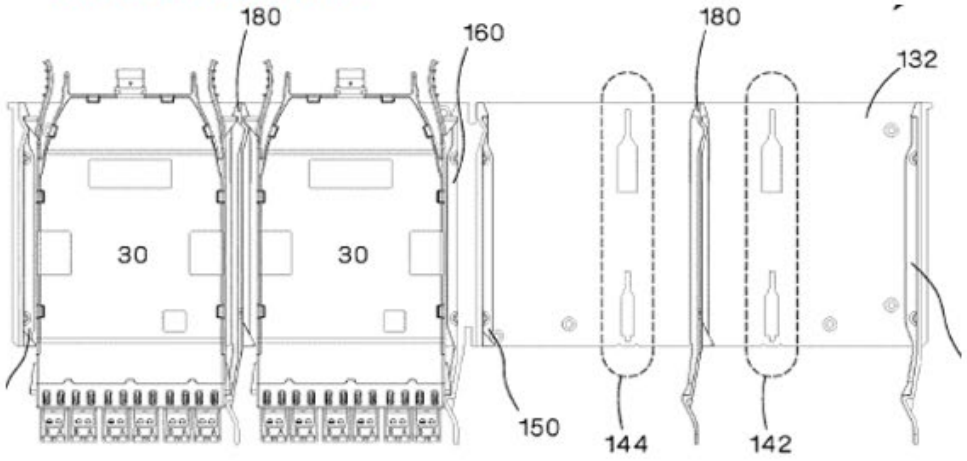
1. Grandparent application prosecution (EX1007)

First Office Action (April 2019). The examiner initially rejected the claims as anticipated by "Sedor" (U.S. Patent No. 10,215,944). EX1007, 64-67. Sedor's tray accommodates three cassette sizes (modules 30, 40, 20) by adjusting the location of removable rails on the tray:

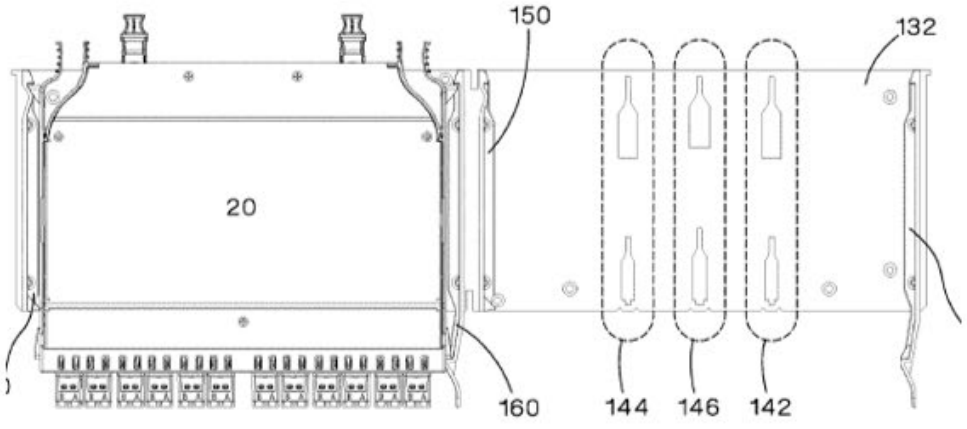
Sedor's Modules 40



Sedor's Modules 30



Sedor's Module 20



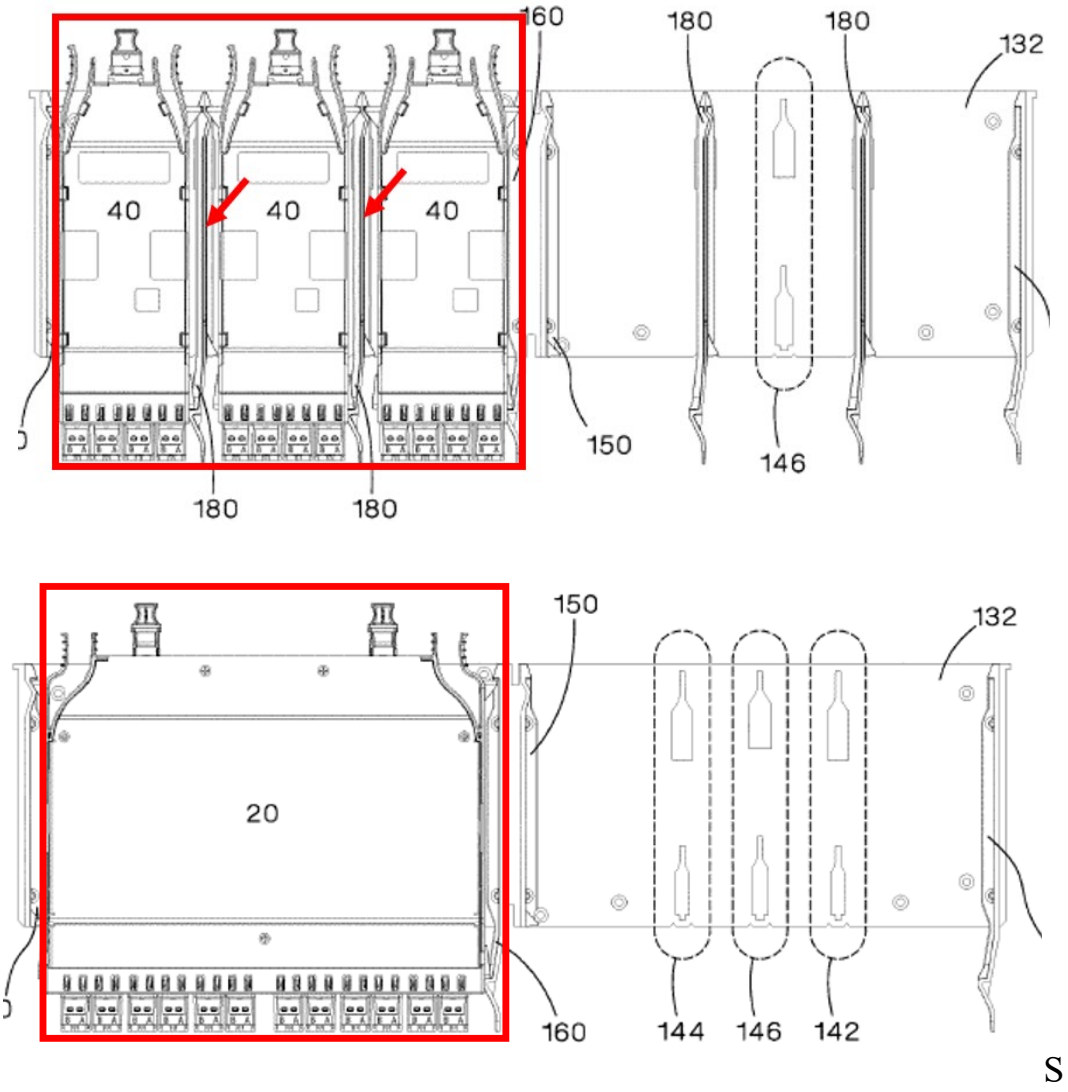
EX1005, Figs. 7, 9, 11 (cropped). The examiner identified modules 30 (top) as having a width of two standard width units and modules 40 (middle) as having a width of three standard width units. EX1007, 65.

The applicant argued Sedor's modules have "no common" standard module width because of the rails. Patent Owner ("PO") presented a mathematical equation:

> occupies the same overall width. As each rail is of a pre-determined width W_R, and given that the modules of the configuration of Figure 8 have a width W_2, the modules of Figure 9 has a width W_3 and the module of Figure 11 has a width W_1, it follows that for the configurations of Sedor et al.:
>
> $$2*W_2 + W_R = 3*W_3 + 2*W_R = W_1$$
>
> Clearly, therefore, due to the presence of a varying number of rails the module widths W_2, W_3 and W_1 have no common standard module width. In particular, neither W_2 or W_1 are divisible by W_3. The same applies if the standard width unit is taken

EX1007, 87. The applicant emphasized that "in particular" the width of the larger cassettes was not divisible by the width of the smaller cassette because of the rails (W_R). *Id.*

If you draw a box around the larger module, you can see that the width of the larger module includes the additional width of two rails:



S

Thus, the width of the larger module is not evenly divisible by the smaller module (it would have the remainder of two rails).

Second Office action (Aug. 2019). The examiner issued a final rejection. The examiner believed the specification "defines" the standardized width as accommodating a single receptable module comprising four receptacles (ports) per standard width unit; thus, applying that definition, Sedor's module 40 is two

standard width units because it supports eight receptacle and Sedor module 30 is three standard width units because it supports twelve receptacles. EX1007, 94-95.

In response, the applicant amended the claims to require the cassette be "immediately adjacent" and argued Sedor's modules were not immediately adjacent because they have "rails" between the modules. EX1007, 114-115.

Third Office action (Dec. 2019). The examiner again rejected all the claims. EX1007, 138-139.

In response, PO amended the claims to require that the cassettes touch each other. EX1007, 167, 170. The examiner allowed the claims. The examiner found a POSITA would not have removed the rails in Sedor to enable the modules to touch because the rails were "necessary to affix the modules to the tray." EX1007, 184.

2. Parent application prosecution (EX1002)

A continuation application followed in which the claims did not require touching but only required the cassettes be "directly adjacent." EX1002, 17.

First office action (Sept. 2021). The examiner rejected the challenged claims as anticipated by Sedor. The examiner reasoned that "directly" adjacent requires a smaller distance than adjacent "but does not preclude intervening structure". EX1002, 83.

In response, PO emphasized that the modifier "directly" was "clearly" intended to "exclude any intervening structure" such as a "rail." EX1002, 135. PO also returned to arguing Sedor did not disclose the width limitations. PO again presented math equations:

> 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.*

Second office action (Dec. 2021). 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 that "directly" adjacent did not preclude intervening structure. EX1002, 142-143, 145.

In response, the applicant reemphasized that "directly" adjacent "clearly" does "exclude any intervening structure" such as a "rail." EX1002, 188. The applicant also emphasized that the width of the module is not merely the number of receptacle modules and that such a definition "makes no sense":

> 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. The applicant then presented the same mathematical equations to argue that the prior art cassette widths did not satisfy the size limitations. 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 make clear its argument from the last response that the cassette width is the width from side to side and not the number of receptacles. The applicant 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.

Notice of allowance. The examiner allowed the claim and *italicized* both the amended language relating to the widths of the cassettes and the "directly adjacent" language in his reasons for allowance:

> ***Allowable Subject Matter***
>
> **Claims 1-13 allowed.**
>
> The following is an examiner's statement of reasons for allowance:
>
> Re. Claims 1-7, the prior art does not disclose or reasonably suggest a modular fiber optic cassette system, the system comprising a set of fiber optic cassettes, a selected plurality of the cassettes arrangeable side by side along said tray front end wherein each of said cassettes comprises a plurality of optic plug receiving receptacles arranged side by side in a row along a front thereof, a first of said set of cassettes comprising a first cassette width *as measured between outer side edges thereof* of one, two, three, four and six standard width units and a second of said cassettes comprising a second cassette width *as measured between outer side edges thereof* different from said first cassette width and one of one, two, three, four and six standard width units, wherein when arranged on the tray *an outer side edge of each of said selected cassettes is directly adjacent an outer side edge at least one other selected cassette*, in combination with the remaining limitations of the claims.

EX1002, 221-222.

3. Present application prosecution (EX1033)

The examiner allowed the claims in a first office action. The notice of allowance repeated the examiner's understanding that the Sedor reference with rails was the closest prior art.

D. Related IPR proceedings

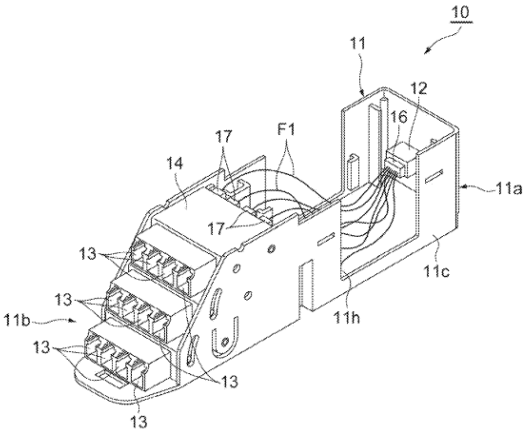
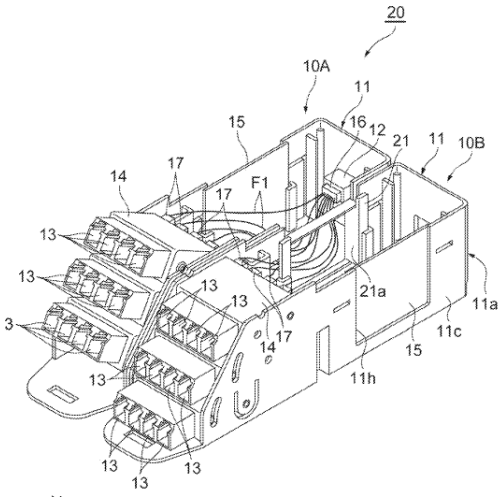
Petitioner is filing Petitions for IPR for the parent patent (11,435,542) and grandparent patent (10,795,107).

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. 1-4, 4:60-7:22. Module 10 can be used individually or coupled to form larger modules. Figure 1 shows one module 10, and Figure 5 shows two modules 10A and 10B coupled to form a larger module 20:

One module 10	Two coupled modules 10A and 10B
	

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." EX1004, 8:2-6. Fukui had the further discloses 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. 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), EX1004, 7:60-67 ("expanded to 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, 9:44. Figure 1 shows the right shutter (yellow), and Figure 4 shows both shutters removed:

Fig.1

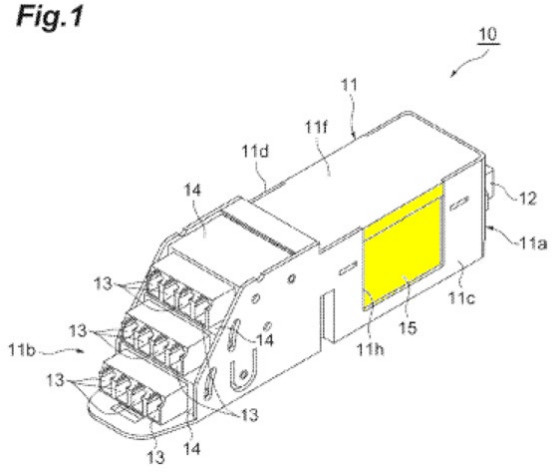
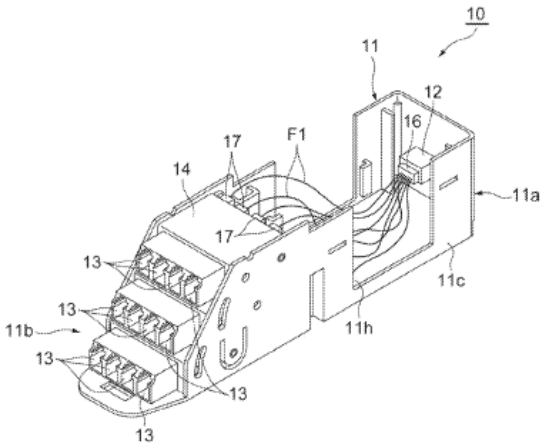
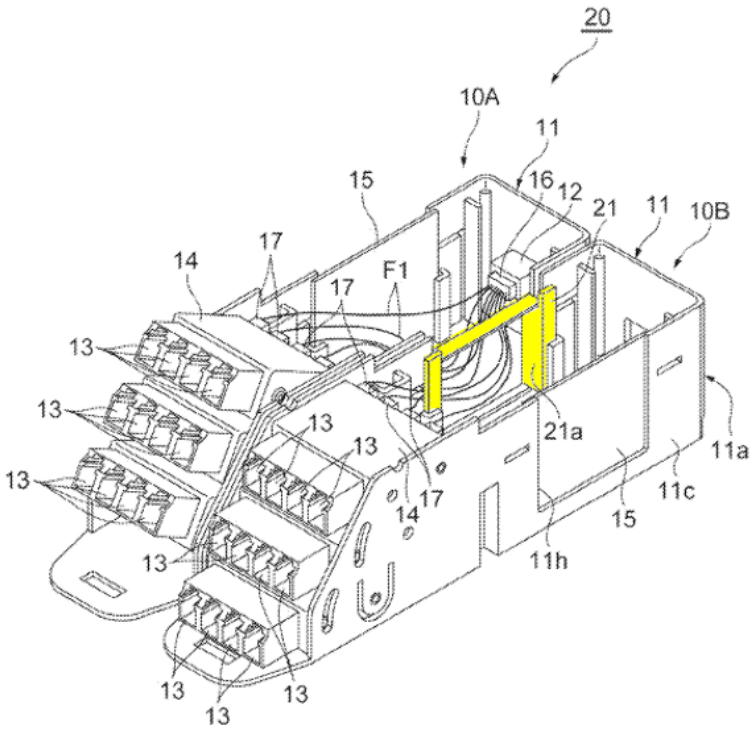


Fig.4



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

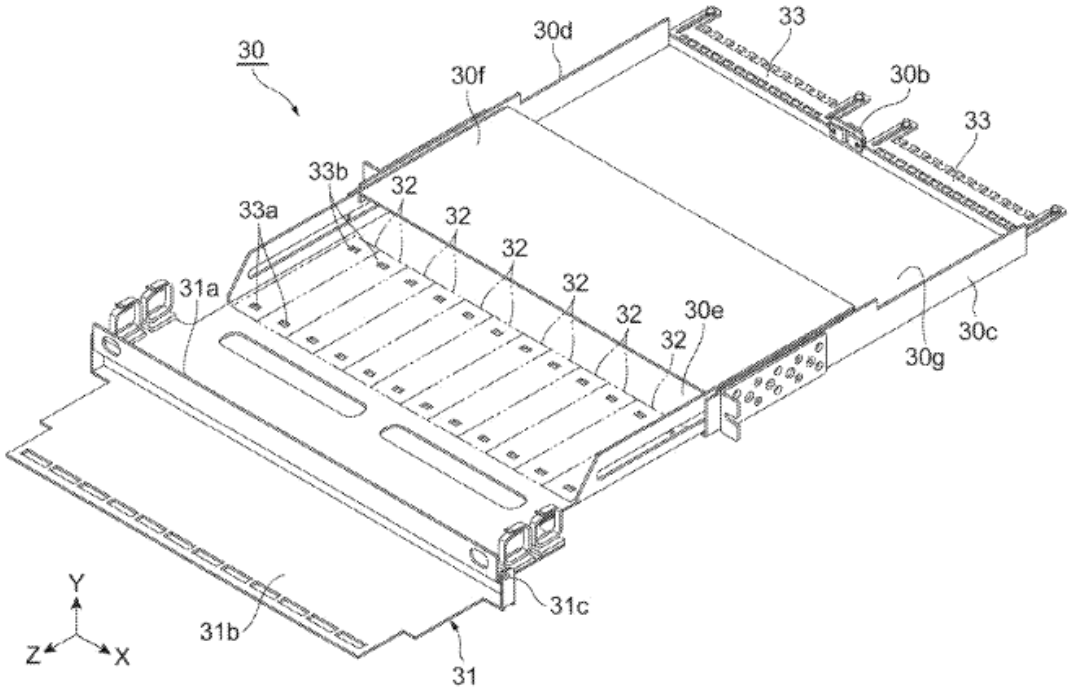
Fig.5



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.

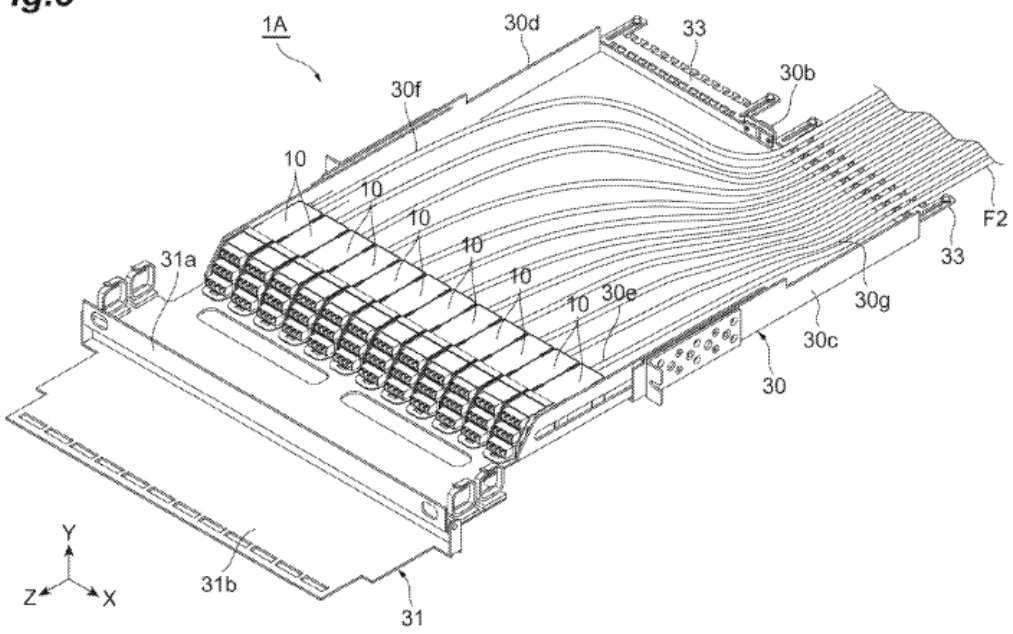
Fukui does not use rails. Fuki's modules have "hooks" on the bottom that attached to "holes" (33a, 33b) on the bottom panel (30e) of the tray that has twelve areas for attaching the modules:

Fig.9



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

Fig.8



B. Sedor (EX1005)

Sedor, as already discussed, discloses a modular fiber optic cassette system with three different sizes. *Supra* at Technology Background.

C. Sauter (EX1006)

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

Sauter explains his system allows "multiple different sizes of cassettes." EX1006 at 1:28-29, 51-58; 4:7-14; 9:60-63. Sauter uses "single-gang" for the smaller cassette size and "multi-gang" to 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 at 4:54-61; 6:47-56; 7:3-19; 7:38-47, 63-66.

Figure 5 shows an example of a tray with two single-gang cassettes, and :

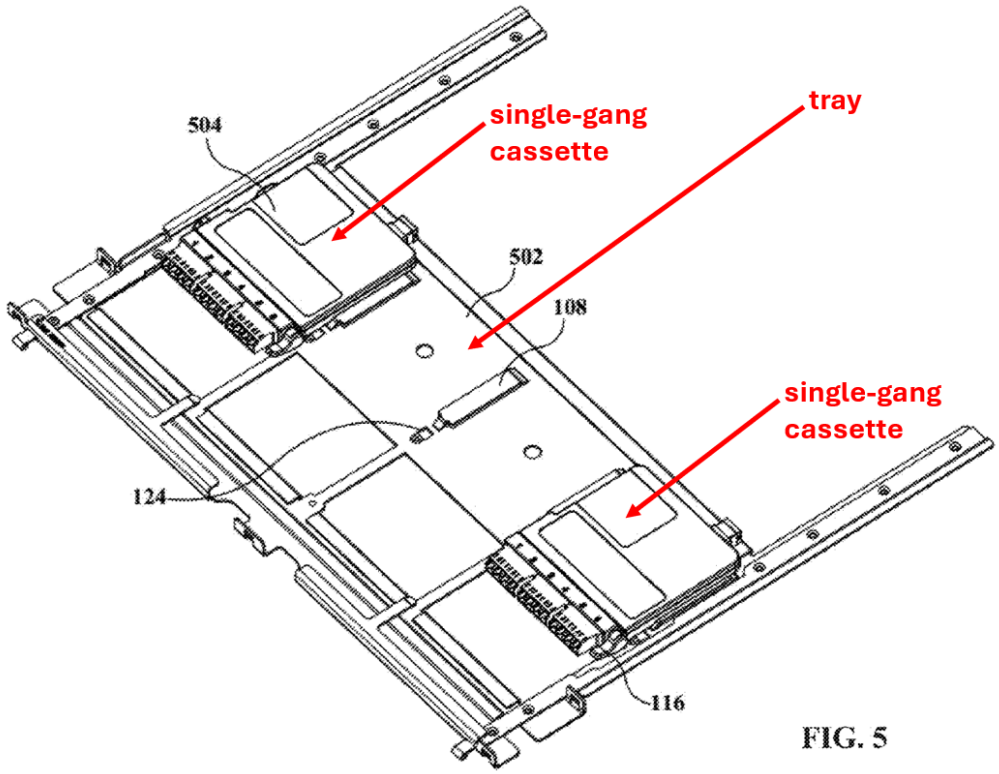


FIG. 5

EX1006, Fig. 5. Figure 6 shows a double-gang cassette.

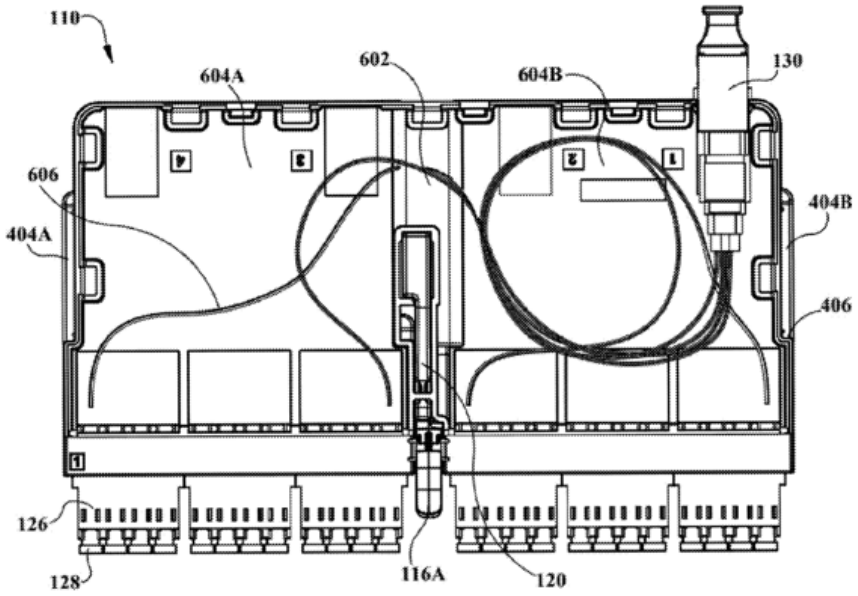


FIG. 6

EX1006, Fig. 6.

Figures 7 shows single and double gang cassettes mounted to the same tray.

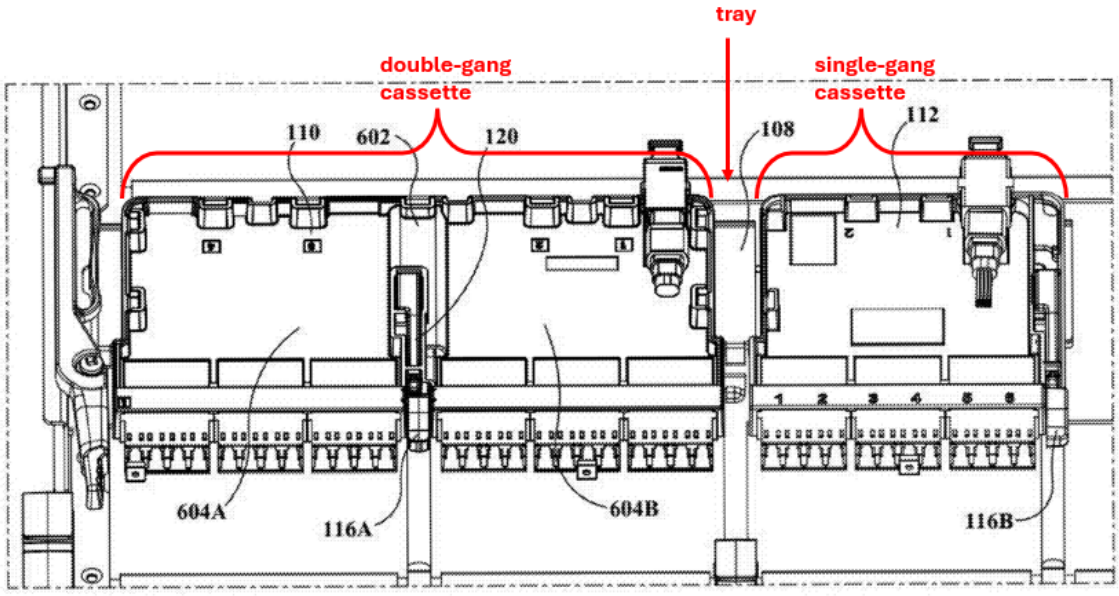


FIG. 7

EX1006, Fig. 7.

Claim Construction

Petitioner presently believes the plain meaning is enough to resolve the lead Fukui grounds. There are, however, two disputes relevant to the alternative Sauter grounds.

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

The parties proposed the below constructions in the co-pending litigation:

Term	PO's proposed construction	CommScope's proposed construction
"cassette width, as measured between outer side edges thereof, of two, three, four, or six standard width units"	"cassette width as measured between outer side edges thereof that accommodates one of one, two, three, four, or six receptacle modules"	"The cassette width, as measured between outer side edges thereof, equals two, three, four, or six times the standard width unit, without an additional amount. This means the cassette width must be evenly divisible by the standard width unit."

EX1011, 12.

The plain language of the claim says a cassette width is one "of" two, three, four, or six standard width units. To be one "of" these choices, the width must actually equal one of the choices; otherwise, the width is not one "of" these choices

but some other value.[1] Nothing in this phrase refers to fractional amounts, e.g., 3.2 standard width units.

PO's construction cannot be correct based on PO's express statements during the proseuction of the parent case. The examiner initially interpreted the claim language to refer to the number of receptacle modules. EX1007, 94. PO, however, emphatically rejected this and said it "such a definition of width makes no sense":

> 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." Thus, PO disclaimed the very meaning it now proposed.

[1] The phrase "one of…" certainty does not mean "accommodate" as Patent Owner proposes.

PO also explained that Sedor "clearly" failed to disclose the claim language because the width of Sedor's module was "not" "3U" but rather equaled "3U + ½ the width of a rail"

> Sedor et al. discloses a modular fiber optic tray comprising fiber optic modules which are configured to engage with rails. In particular with reference to Fig. 7, Fig. 9 and Fig. 11 Sedor et. al. discloses respectively two 12-optical fiber modules (30), three 8-optical fiber modules (40) and single 24-optical fiber module (20) all which fit in the same space of the tray. If, as characterized by the Examiner in his Official Action, each 8-optical fiber module (40) is of two unit widths 2U, the 12-optical fiber modules (30) would not have a width of 3U. Indeed, as clearly shown in the figures, the 3 8-optical fiber modules (40) and 2 rails (180) occupy the same space as 2 12-optical fiber modules (40) and a single rail (180), or 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, 188. The PO communicated here that the claim required the width equal three times the standard width unit (3U) without an additional amount (3U + ½ the width of a rail). By emphasizing that Sedor "clearly" did not disclose the limitation because of the difference between 3U and 3U + ½ the width of a rail, PO also disclaimed additional amounts.

B. "directly adjacent"

The parties recognize the applicant narrowed this term during prosecution. CommScope's construction clarifies that the applicant excluded rails (see underlining):

Term	PO's (Belden's) Proposed Constructions	CommScope's Proposed Construction
"an outer side edge of each of the selected plurality of fiber optic cassettes is directly adjacent to an outer edge of at least one other fiber optic cassette"	"an outer side edge of each of the selected plurality of fiber optic cassettes is almost touching or touching, without any intervening structure, an outer edge of at least one other fiber optic cassette"	"an outer side edge of each of the selected plurality of fiber optic cassettes is almost touching or touching an outer edge of at least one other fiber optic cassette. This excludes arrangements with any intervening structure such as a rail between an outer side edge of a cassette and an outer edge of at least one other selected cassette"

EX1011, 21. The applicant made a clear disclaimer. The applicant repeatedly said the modifier "directly" was "clearly" intended to exclude "any" intervening structure and specifically discussed "rails." EX1002, 134-35, 187. There is no ambiguity in the terms "clearly" and "any."

Level of Ordinary Skill

A person of ordinary skill in the art (POSITA) of the '422 patent 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 that discloses the elements the examiner believed all the other art failed to disclose, filling the precise gap at issue during prosecution.

There is little risk of duplication of effort. 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 suit. Finally, the litigation is pending before a Delaware District Court who has already recently stayed other actions between these parties after the PTAB instituted *Inter Partes* Reviews.

Argument

Ground 1: The challenged claims are all anticipated by Fukui or obvious based on Fukui itself

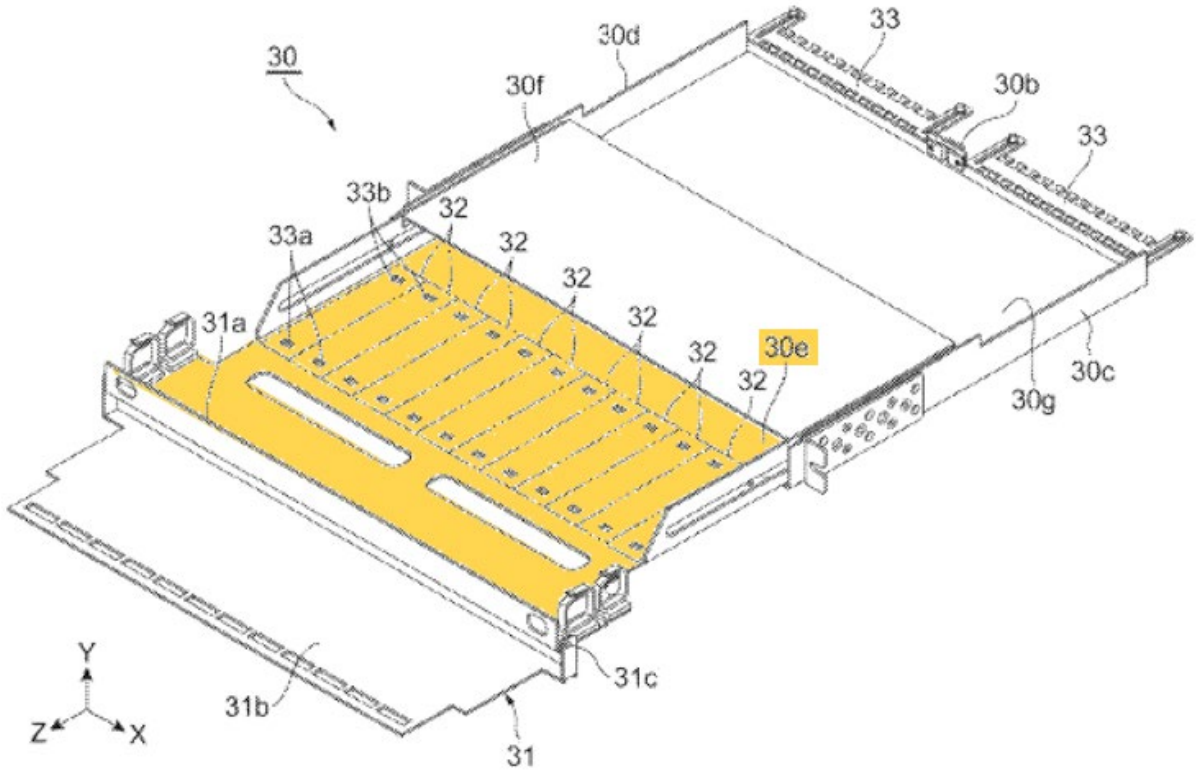
Fukui anticipates all the challenged claims. If PO tries to interpret the claims narrowly, alternatively, Fukui renders obvious the claims.

A. Independent Claim 1

1. Preamble

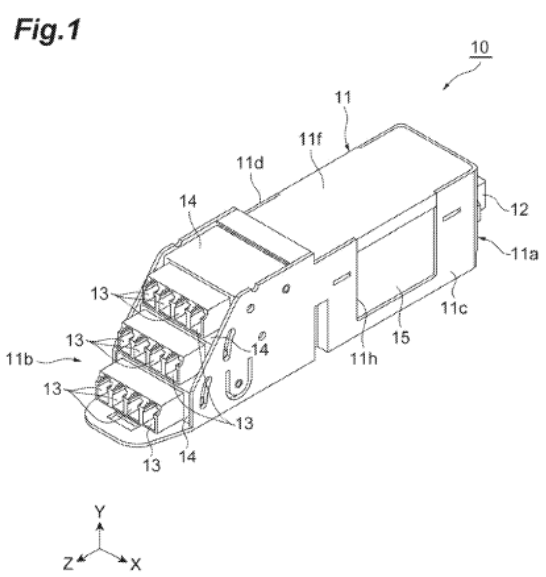
Fukui's panel 30e (orange) is a *"fiber optic cassette tray"* as recited in the premable.

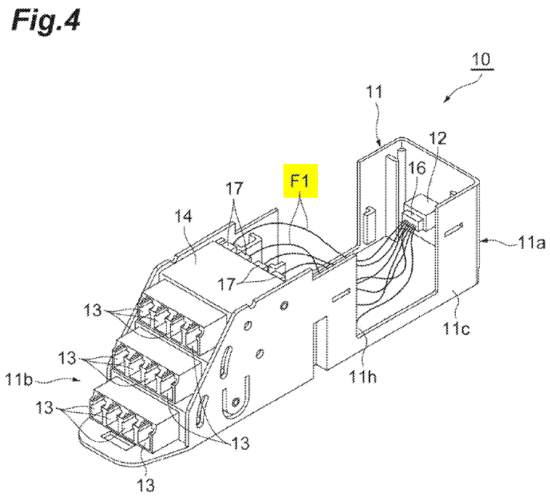
Fig.9



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. Fukui's tray has different areas (32) from arranging Fukui's modules. EX1004, Fig. 9, 8:45-51.

Fukui's modules are examples of fiber optic cassettes. EX1003 ¶¶46-49. Like PO's preferred embodiment, Fukui's module has a multi-fiber MPO adapter (12) in the rear, LC adapters (13) in the front, and fibers (F1) interconnecting them:





EX1004, Figs. 1, 4, 5:12-42; *see also* Fig. 5. 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. Figure 4-5 show the modules with three rows of adapters, but they may also have two rows of adapters. EX1004, 10:43-44.

Fukui's tray provides for a *"plurality of different modular fiber optic cassette configurations*" as recited in the premable. Fukui's tray supports different numbers and combinations of modules, including "up to" single modules 10 and a "combination" of the single modules 10 and coupled modules 10. EX1004, 9:35-53; EX1003 ¶¶48-50.

Figures 6-7 shows Fukui's tray is part of a *"fiber optic management system"* as recited in the premable.

Fig.6

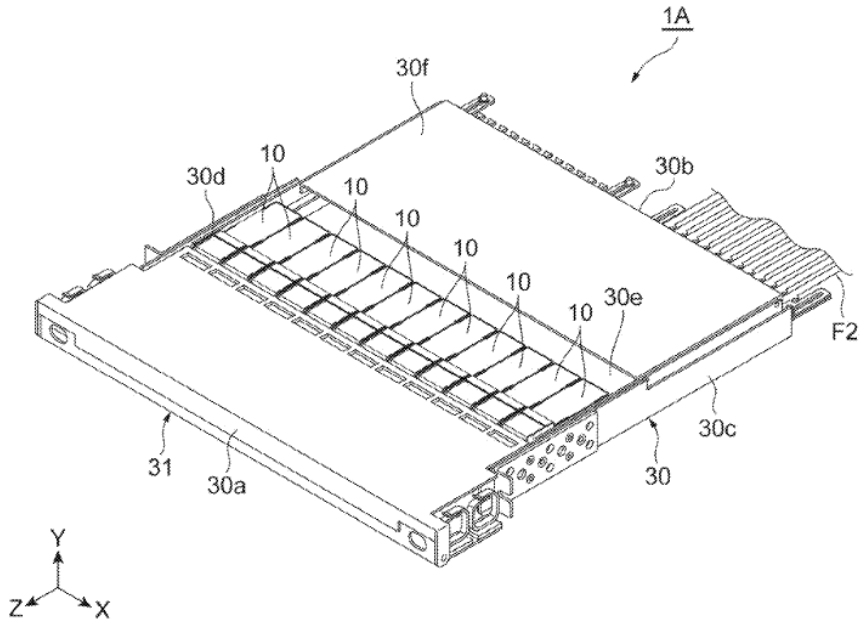
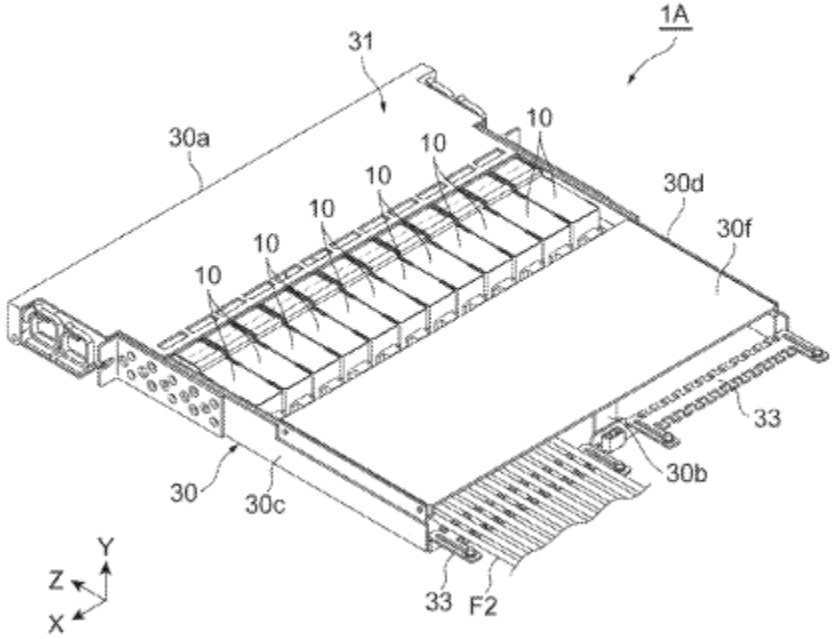

1A
30f
10
30d
10
10
10
10
10
30b
30e
F2
30c
31
30a
30
Y
Z
X

Fig.7

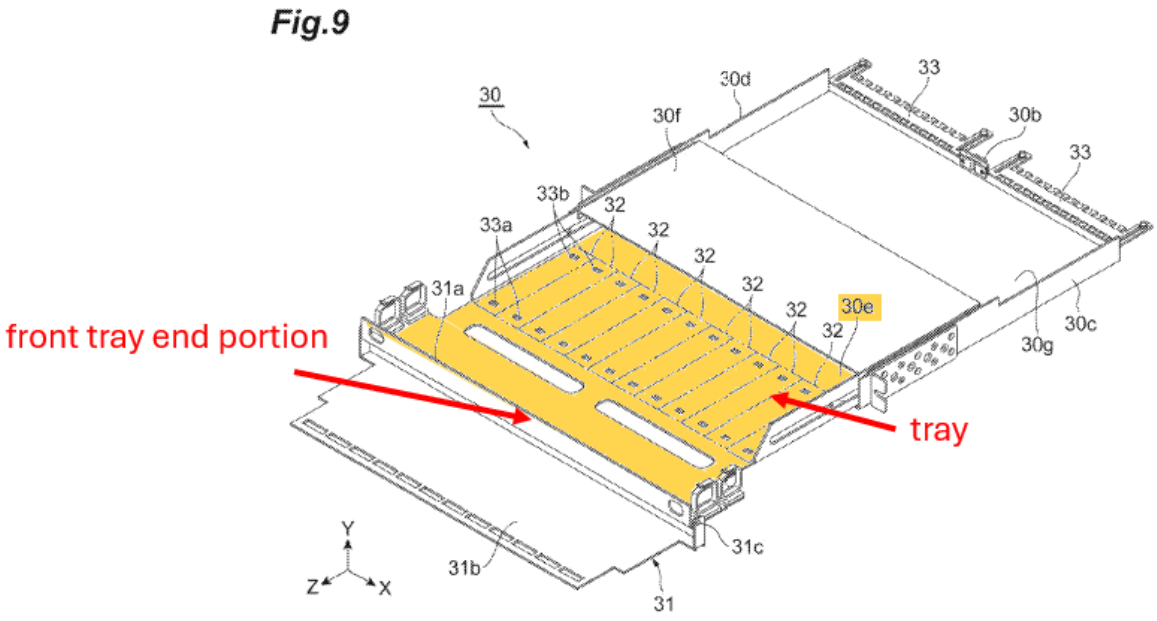

1A
31
30a
10
10
10
10
10
10
30d
30f
33
30b
30
30c
33
F2
Y
Z
X

Fukui system manages connecting cables (F2) with "various" numbers of cores (e.g., 12, 24, 36, and 48). EX1004, 3:27-28, 4:2-3, 4:42-43, 9:58-59, 10:4-6, 10:34-35.

2. Element 1A

"a tray having a front tray end portion…"

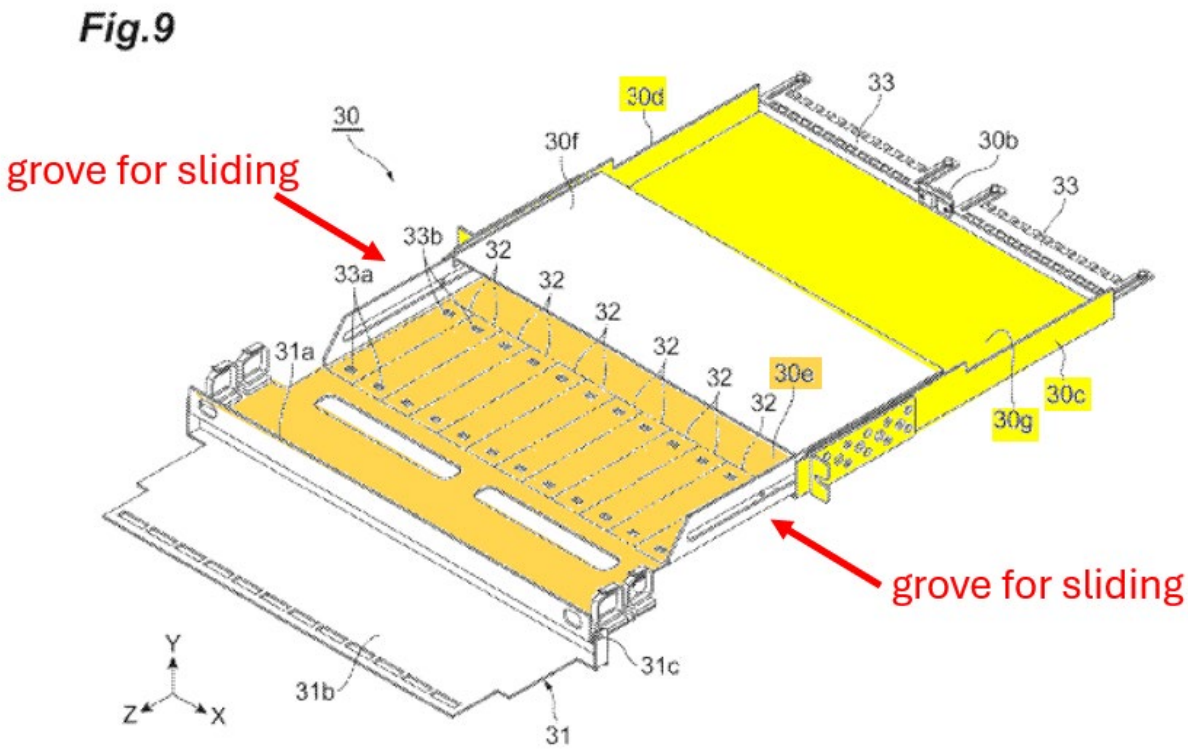
Fukui's tray (panel 30e) has a front tray end portion:



EX1004, Fig. 9; EX1003 ¶53.

"…configured to be slidingly received in at least a portion of the tray receiving space of a housing of a fiber optic management system"

Fukui expressly teaches his tray is "slidable." EX1004, 8:57-63. Figure 9 shows Fukui's tray (orange) slid out of Fukui's housing (yellow):



EX1004, Fig. 9; EX1003 ¶54, ¶57. Elements 30g, 30c, 30d (yellow) are formed into "one body" comprising a bottom panel and two side walls. EX1004, 8:58-60. This "one body" defines Fukui's housing. EX1003 ¶54. It houses the tray. *Id.* EX1004, Fig. 6. The bottom of Fukui's case is partially obscured because Fukui's tray (orange) overlaps and covers up the bottom. EX1004, Fig. 9, 8:57-58.

Fukui's case is hollow and defines a *"tray receiving space"* and an *"opening"* as recited in the claim. EX1004, 8:24-27. Comparing Figures 6 and 9, below, shows that Fukui's tray 30e (orange) slides in and out of the hollow space (red lines):

Fig.9

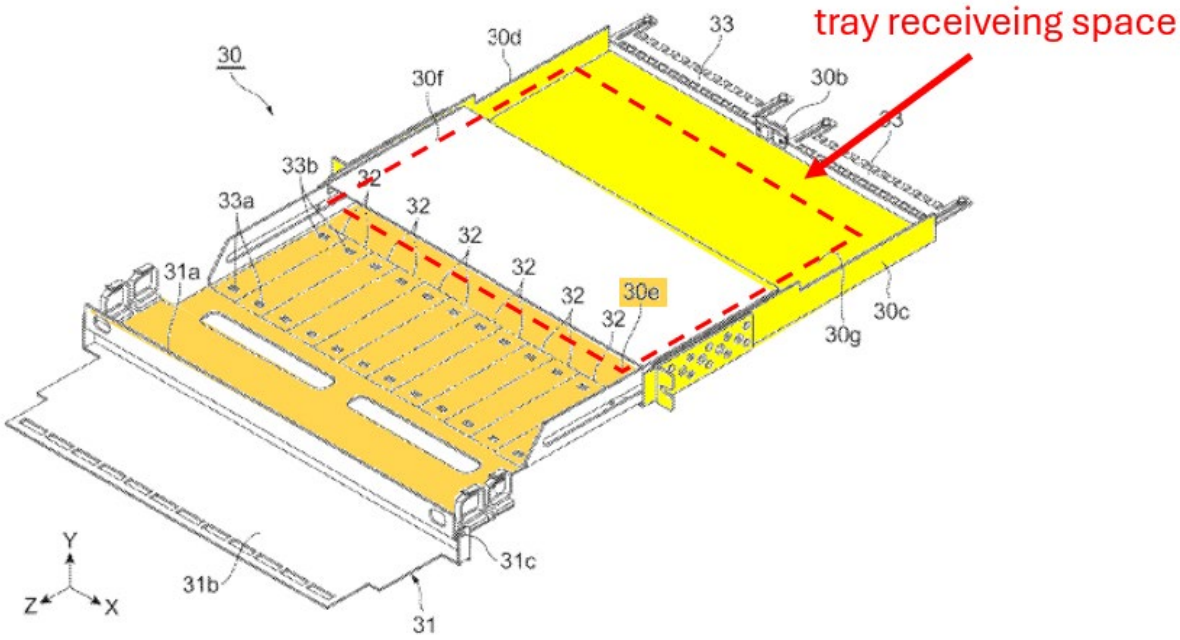
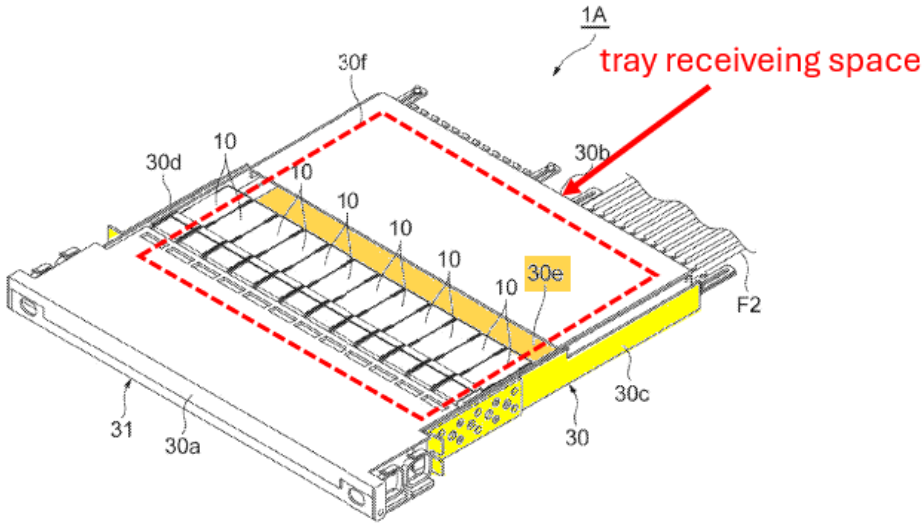


Fig.6



EX1004, Figs. 6, 9; EX1003 ¶55.

If PO argues Fukui's "one body" of elements 30g, 30c, 30d does not have a top, that does not distinguish Fukui. Claim 1 does not require the "housing" has a

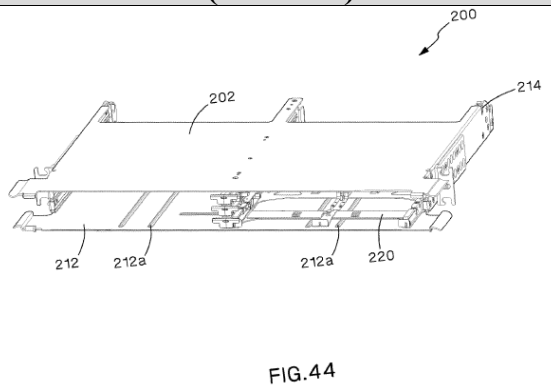
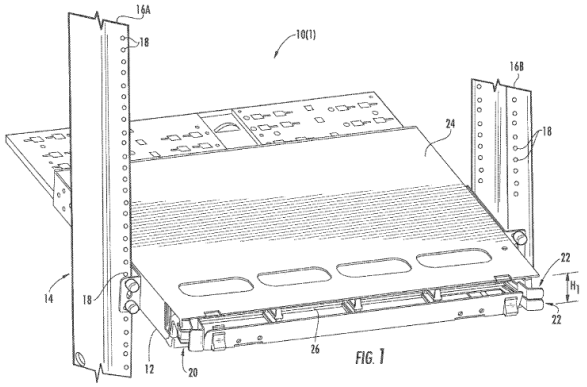
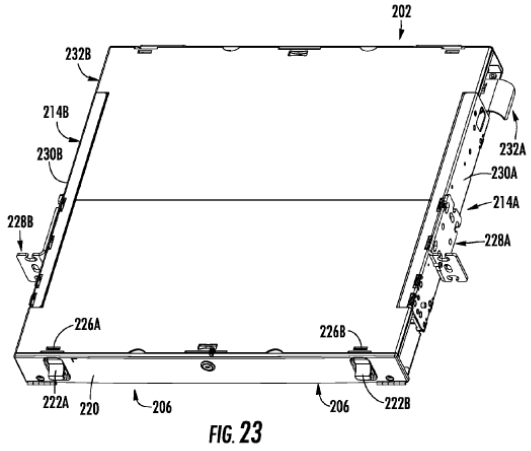
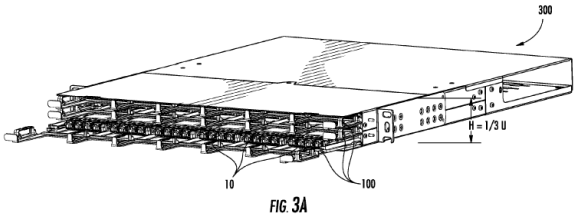
top wall. Although claim 1 of PO's *parent* patent recites a "top" wall, PO broadened this patent to omit the "top" wall. *See* EX1034 (parent patent), claim 1.

Even if a top wall were required, a POSITA would find it obvious to add a top wall based on Fukui itself because it was common knowledeg that a case could have a top wall. *Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355, 1361 (Fed. Cir. 2016) ("[A] patent can be obvious in light of a single prior art reference".) It is proper to consider common knowledge when properly supported. *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.").[2] Alternatively, Sedor expressly discloses a housing with a top wall, which Ground 2 addresses.

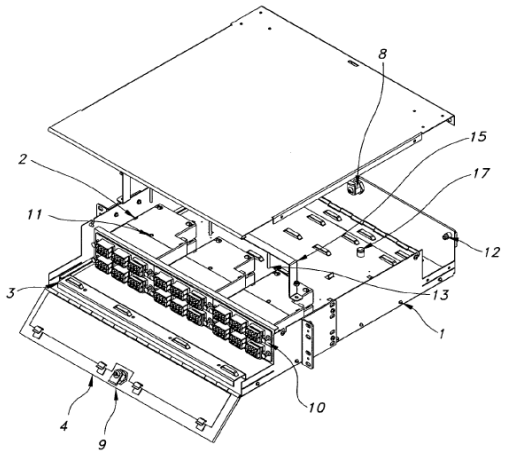
The prior art cited on the face of PO's patent shows it was common for the housing with a top wall and includes five examples:

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[2] *Koninklijke Philips N.V. v. Google LLC*, 948 F.3d 1330, 1338 (Fed. Cir. 2020) ("[T]he claims would have been obvious over SMIL 1.0 in light of the general knowledge "); *Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355, 1361 (Fed. Cir. 2016) ("[W]e do consider common sense, common wisdom, and common knowledge in analyzing obviousness."); *Perfect Web Techs., Inc. v. InfoUSA, Inc.*, 587 F.3d 1324, 1328 (Fed. Cir. 2009).

U.S. Patent No. 10,215,944 (EX1005)	U.S. Patent No. 9,008,485 (EX1018)
 FIG.44 EX1005, Fig. 44, 7:32-35.	 FIG. 1 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.

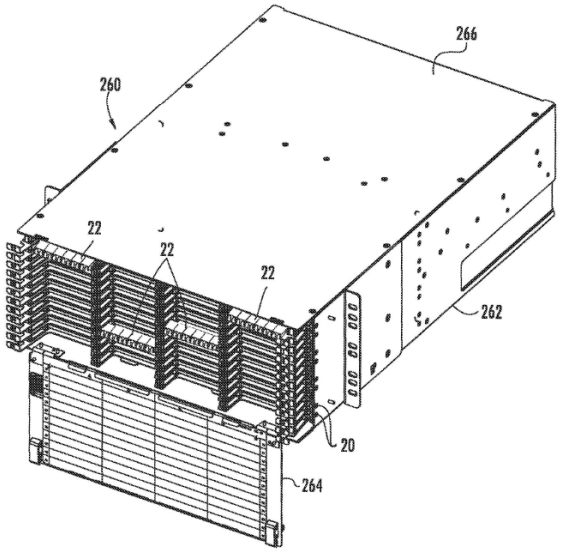
U.S. Patent No. 7,509,015 (EX1017)



EX1017, Fig. 1-4, 4:12-15

EX1003 ¶58, ¶¶60-68. The publicly available product literature in the industry also shows that the manufacturers of modular fiber optic cassettes systems at the time of PO's '107 (Leviton, Corning, Panduit) each advertised that the case had a top wall. EX1003 ¶69.

Fukui's itself in the "Background" cites W02010/148325 that illustrates a housing with a top wall:



EX1004, 1:21 (citing W02010/148325); EX1025 (W02010/148325), Fig. 25, ¶0087 ("A cover 266 is attached").

Under the case law, it is especially appropriate to consider the common knowledge 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 ¶83, ¶60.

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

Fig.9

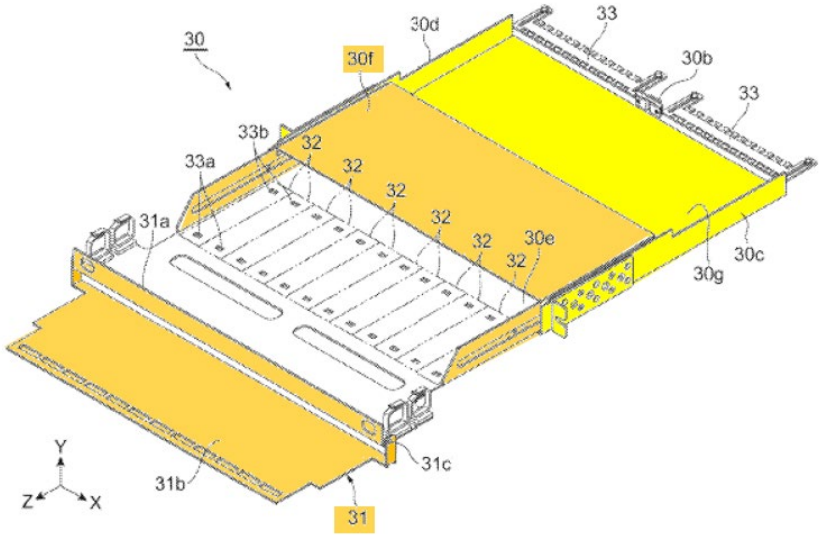
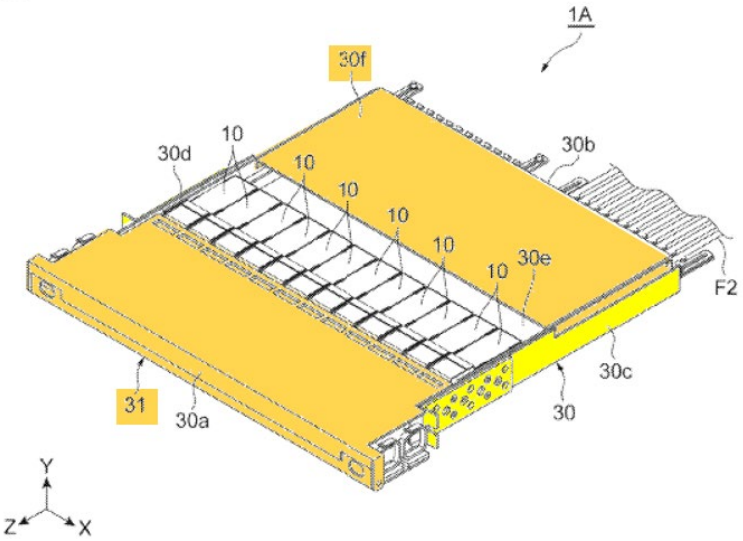


Fig.6



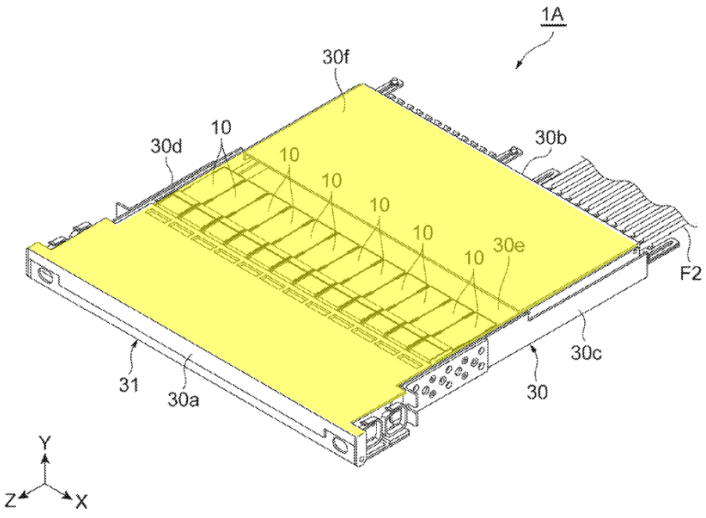
EX1004, Figs. 6, 9, 8:34-42, 8:29-30; EX1003 ¶59. Fukui's modules, however, are not full protected from the top because there is a gap (white) where there is no top.

A POSITA would have been motivated to add a top wall to Fukui's housing (yellow) to better protect Fukui's system. EX1003 ¶¶71-73. Fukui's current design leaves a gap in the top. EX1003 ¶72. Environmental elements (e.g., dust, water, etc.) can enter through this gap. *Id.* Components, tools, and other materials could also be accidentally dropped into this gap. *Id.* The modules and cables also could be accidentally bumped through this gap. *Id.* Fiber optic components are sensitive and even minor movement, damage, or obstruction (e.g., dust) can impeded the proper propagation of light. *Id.* Adding a top wall would predicably better protect the system because that is the very purpose of a top wall.

A POSITA would also recognize that modifying Fukui's case to have a top wall merely calls for a simple substitution of one known element for another, i.e., a case with a top for a case without a top. EX1003 ¶¶84-85. A top wall is an ordinary piece of metal that can be added with screws. EX1003 ¶83. Nothing in PO's disclosure describes a top wall as inventive. Likewise, Fukui does not teach there is anything critical about its existing case other than that it fits in a 19-inch rack. EX1004, 9:30-35.

A POSITA would also recognize that modifying Fukui's case to have a top wall is a predictable variation of Fukui's existing disclosure. Fukui's existing top panel (30f) could simply be attached to the Fukui's side walls (30c and 30d) instead of Fukui's tray and extended to the front:

Fig.6



EX1003 ¶60, ¶74.

A POSITA would also recognize that adding a top wall to the case simplifies Fukui's design. EX1003 ¶74, ¶¶80-82. Fukui's current design requires two partial

top panels (30f and 31) attached to the tray that only achieve partial protection. EX1004, Figs. 6, 9, 8:34-42, 8:29-30. Fukui's current design also requires two steps to access the modules (flip up Fukui's lid and slide the tray out):

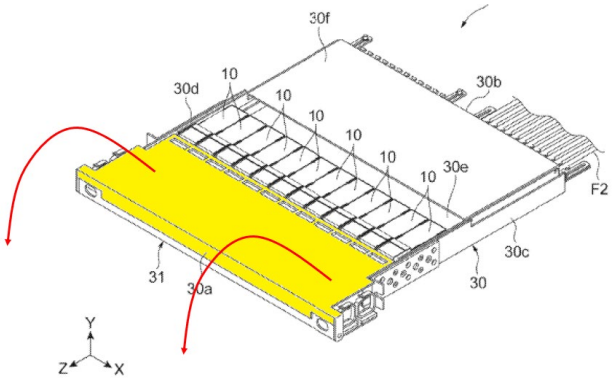
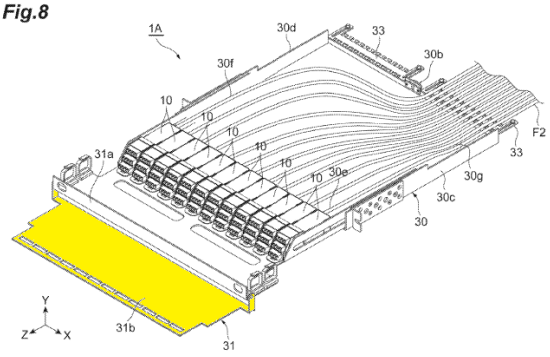


Fig.8

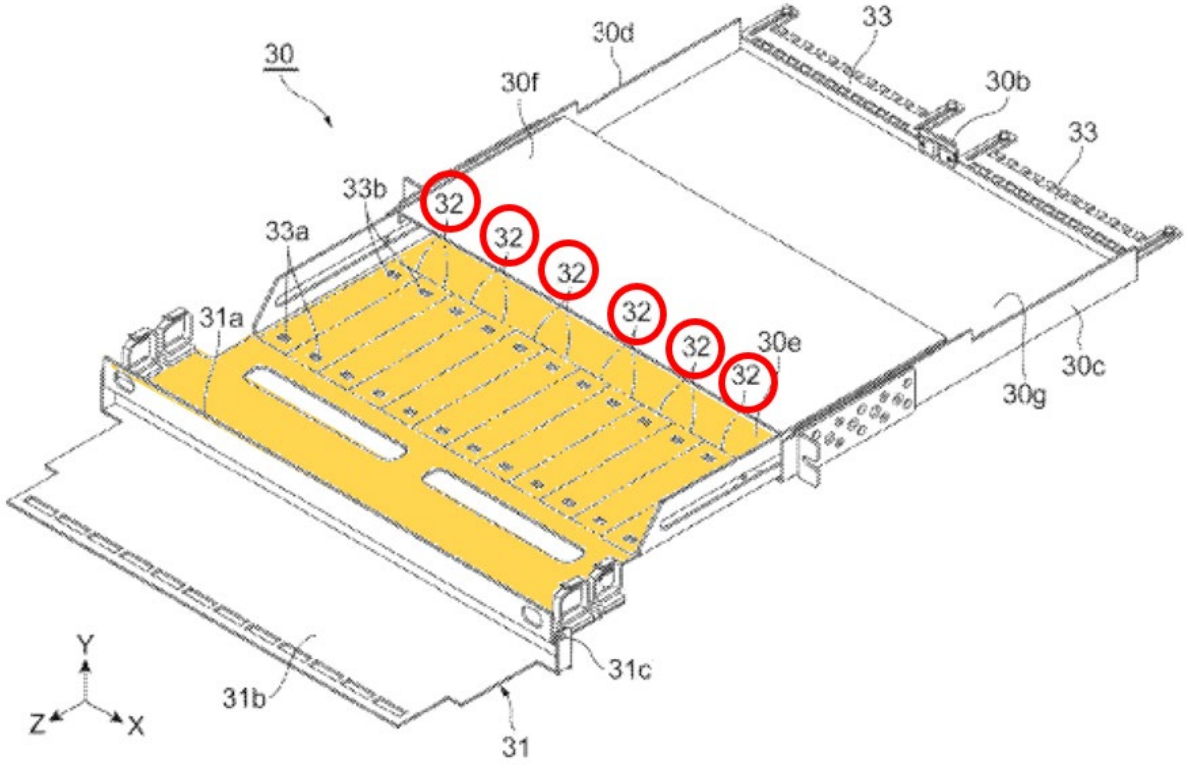


EX1003 ¶80. The pivoting lid also hangs down in front of the tray, which makes it more difficult for a technician who is standing in front. EX1003 ¶81. A POSITA could simply Fukui's design to one complete top panel attached to the case. EX1003 ¶74. This would simplify access to one step (slide the tray out) and eliminate the problem of the pivoting partial top handing down in front.

3. Element 1B

Fukui tray is configured to support to a *"plurality"* of different cassette configuration as recited in this element. Fukui expressly teaches that its tray has a "plurality" different areas (32) for placing modules:

Fig.9



EX1004, 8:45-47; EX1003 ¶87. These areas support "up to" twelve single modules 10 and a "combination" of single modules and coupled modules. EX1004, 9:35-53, EX1004, 8:17-24. Fukui's tray is configured to support any combination of modules sizes because all of Fukui's module sizes fit in the same areas (32). For example, Fukui explains that "a part or all" of the modules 10 in the areas can be the coupled modules 10A and 10B. EX-1004, 8:17-21. Comparing Figure 4 and 5 shows two coupled modules would simply occupy any two adjacent areas. EX1004, Figs. 4-5. Likewise, Fukui's larger modules would simply occupy multiple adjacent areas (e.g., three coupled modules would occupy three adjacent areas). EX1004, 7:26-27, EX1004, 7:67-8:6; EX1003 ¶87.

4. Element 1C

"wherein the plurality of different modular fiber optic cassette configurations include a selected plurality of fiber optic cassettes"

Fukui expressly discloses selecting a "plurality" of modules 10. EX1004, 8:18-32, 9:42-43. Figure 8, for example, shows selecting twelve modules 10. EX1004, Fig. 8, 9:35-53, EX1004, 8:17-24. Fukui's text gives other examples. EX1004, 8:19-24, 9:35-53. Because all of Fukui's module sizes comprise either an individual module 10 or a number of the same modules 10 coupled together, the plurality of modules 10 can be used to select any combination of modules sizes. EX1004, 7:26-27, EX1004, 7:67-8:6.

"…that are each configured to be arranged side by side along the front tray end portion of the tray…"

In all of Fukui's configurations, the modules are arranged side by side because the areas (32) for placing the modules are side by side.

Fig.9

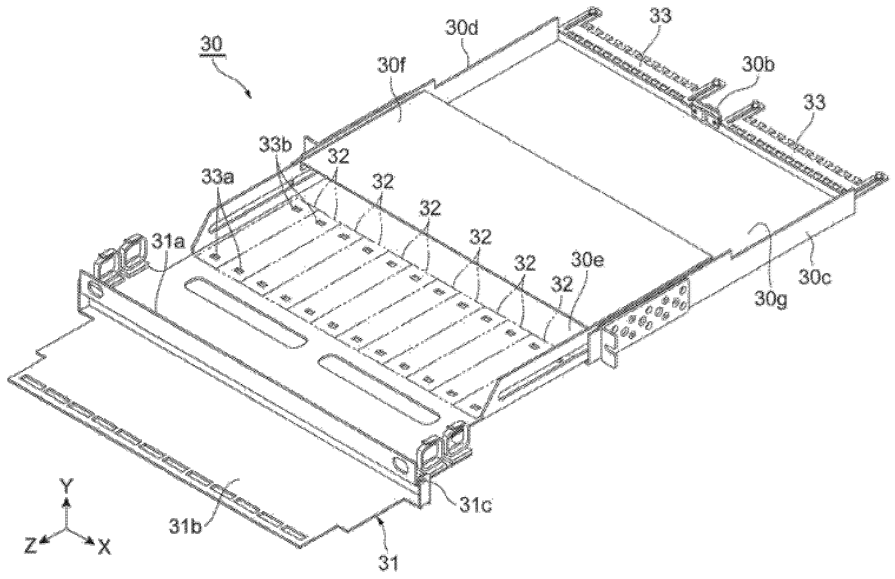
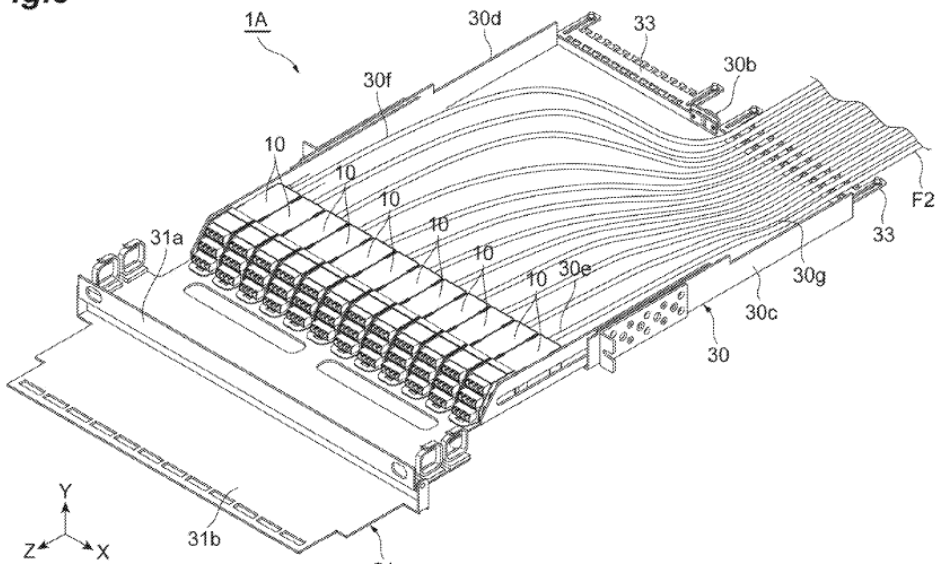


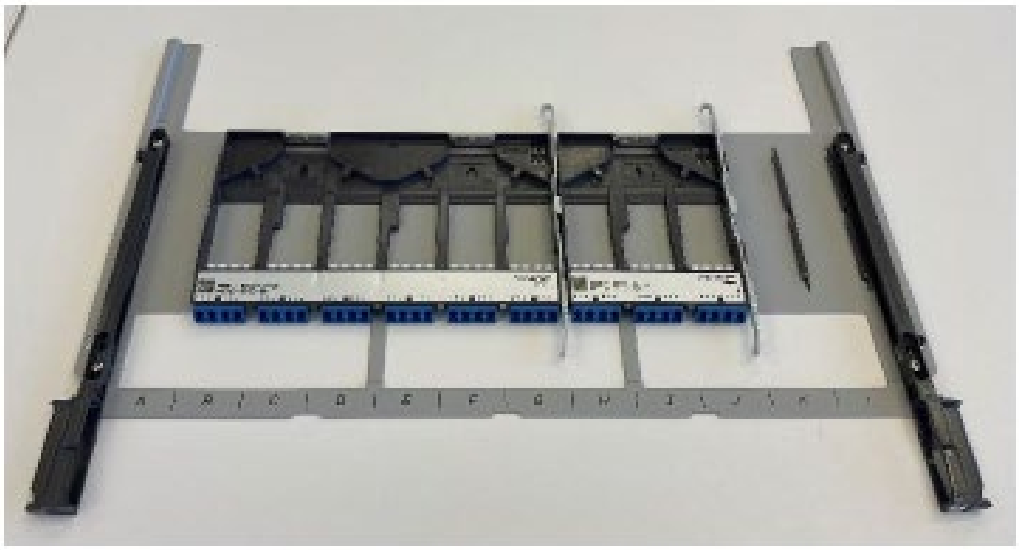
Fig.8



EX1004, Fig. 8-9, 8:51 ("lateral walls 11c and 11d are arranged with each other along the X direction"), 9:16-17 ("modules can be laterally aligned as shown in FIG. 8"). Although Figure 8 shows individual modules 10, Fukui's larger modules would be arranged the same way because, as explained below in Element 1F and

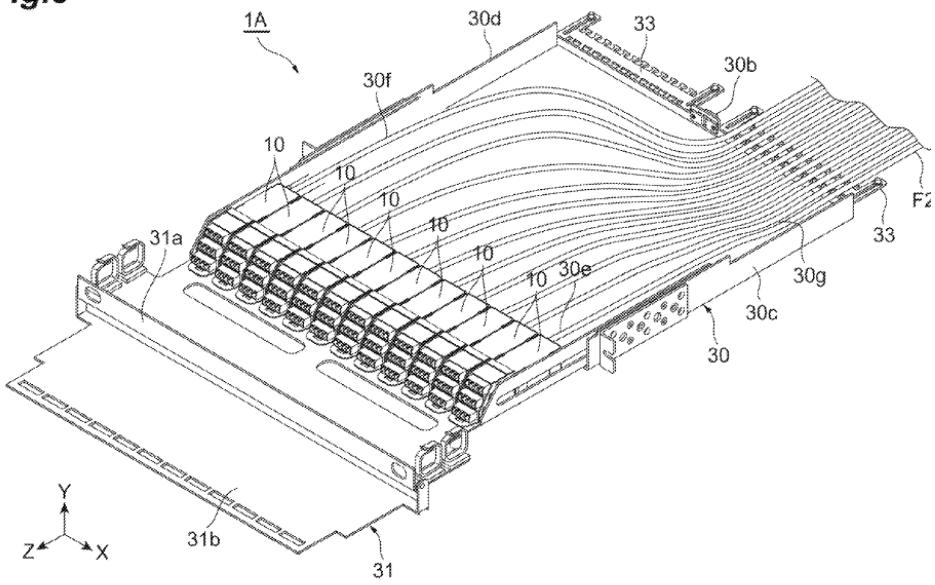
Element 1G, Fukui larger modules comprise those same modules 10 coupled together. EX1004, 7:26-27, EX1004, 7:67-8:6; EX1003 ¶89.

The parties have agreed in the co-pending litigation that "along" means "on or beside" the front tray end portion of the tray. EX1011 at 2. Fukui's cassettes are not "on" the front tray end portion of the tray but are "beside" the front tray end portion of the tray under PO's interpretation. EX1003 ¶90. For context, PO alleges the following arrangement meets the claim where the cassettes are set back from the tray front end:



EX1012, 17, 19. Fukui's cassettes are arranged in the same way:

Fig.8

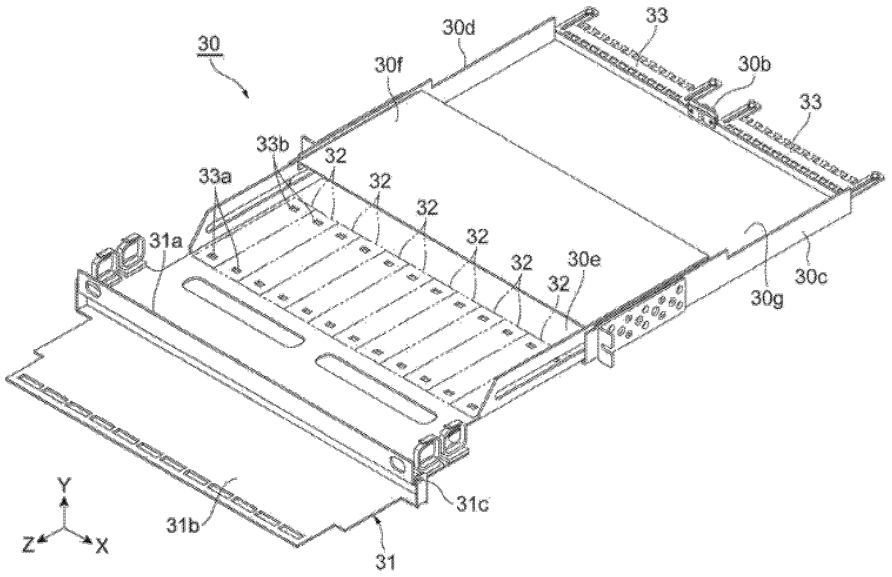


EX1004, Fig. 8; EX1003 ¶90.

> **"…such that an outer side edge of each of the selected plurality of fiber optic cassettes is directly adjacent to an outer edge of at least one other fiber optic cassette"**

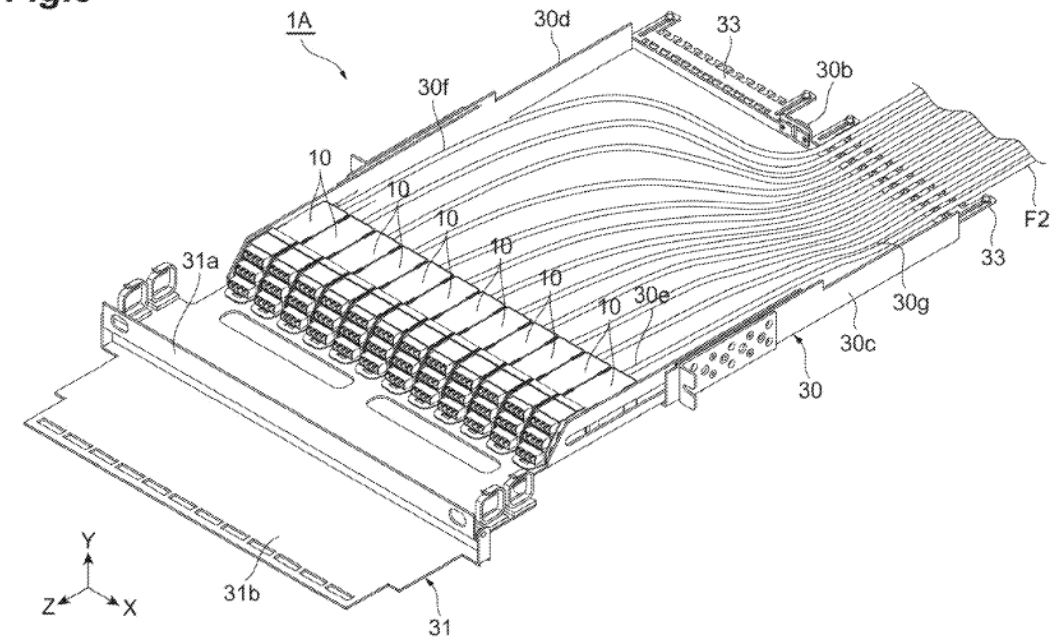
Figure 9 shows that Fukui's areas (32) for placing Fukui's modules are directly adjacent with no intervening structure:

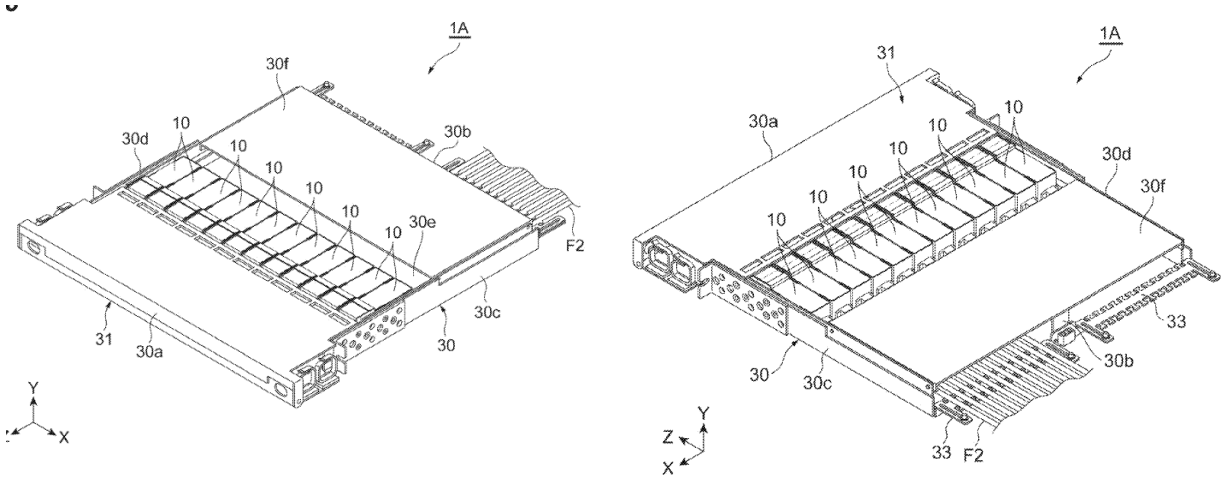
Fig.9



EX1004, Fig. 9; EX1003 ¶95. Figure 6-8 show that the outer side edges of the modules are directly adjacent when they are placed in these areas:

Fig.8

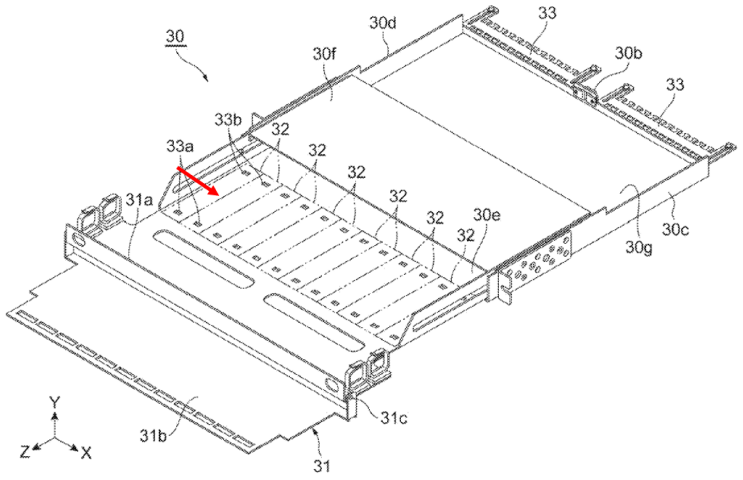




EX1004, Figs. 6-8, 4:36-37 ("adjacent lateral walls"); EX1003 ¶96. Because all the areas (32) are directly adjacent with no intervening strcuture and all the modules size comprises the same unit module 10 for placing in those areas, in all the configurations, the modules in adjacent areas will be directly adjacent to each other. EX1003 ¶96.

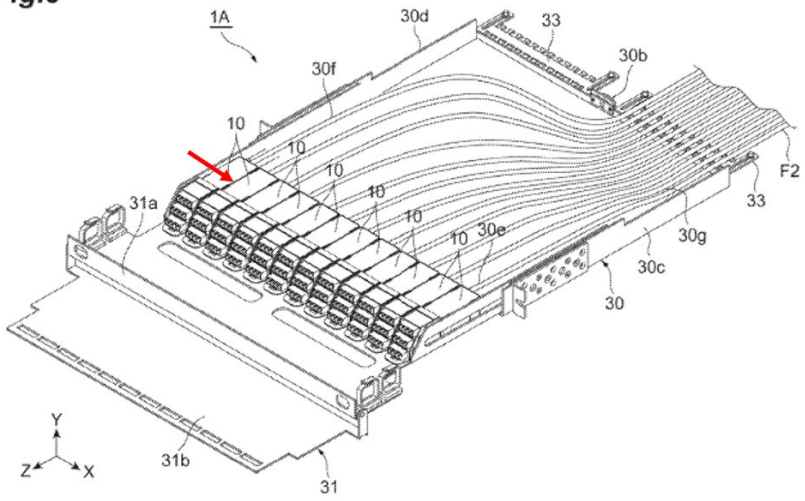
Fukui also meets the constructions proposed by both parties in the litigation. EX1003 ¶¶97-98. Fukui's modules meet the language *"almost touching or touching"* recited in both constructions. Figure 9 shows the areas (32) for placing the modules touch each other:

Fig.9



EX1004, Fig. 9; EX1003 ¶97. Figures 8 show the modules touch when installed those areas 32:

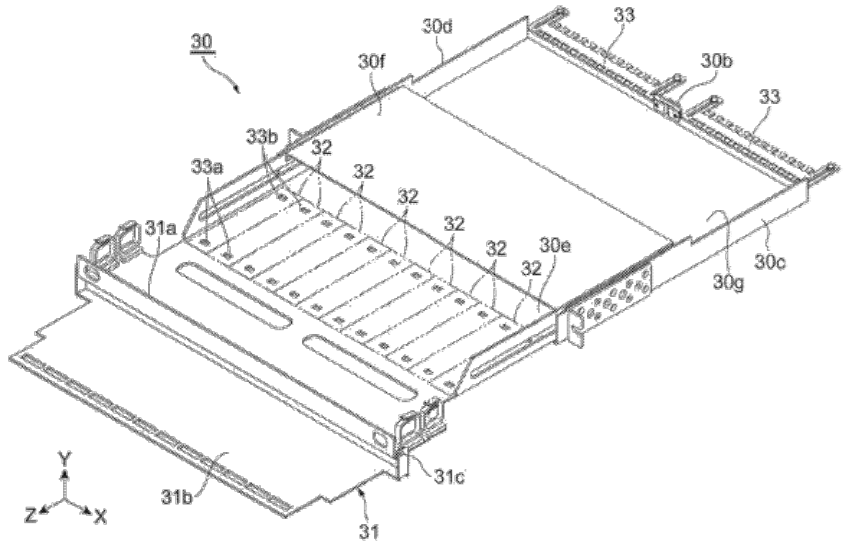
Fig.8



EX1004, Fig. 6; EX1003 ¶97. The sides of adjacent modules come together to a single black line with no gaps showing the modules touch. *Id.* Fukui's modules also have no "*intervening structure"* as recited in the constructions because, as shown in Figure 9 above, the modules attach directly to the tray bottom (via holes 33). EX1004, 8:45-56.

If PO were to change position and deny Fukui's modules are "along" (i.e., beside) the front tray end portion of the tray, that would still not distinguish Fukui. A POSITA would immediately recognize that Fukui's modules could be moved forward to be closer to the front end of the tray simply by moving the already disclosed areas (32) and holes (33a, 33b) forward. EX1003 ¶92.

Fig.9



EX1004, Fig. 9, 8:52-56; EX1003 ¶92. This requires no new structures—just an adjustment of the existing structure. EX1003 ¶92. Fukui does not teach there is anything special or critical about the location of his holes; thus, there is a reasonable expectation of success to adjust the position of the modules forward.[3] *Id.*

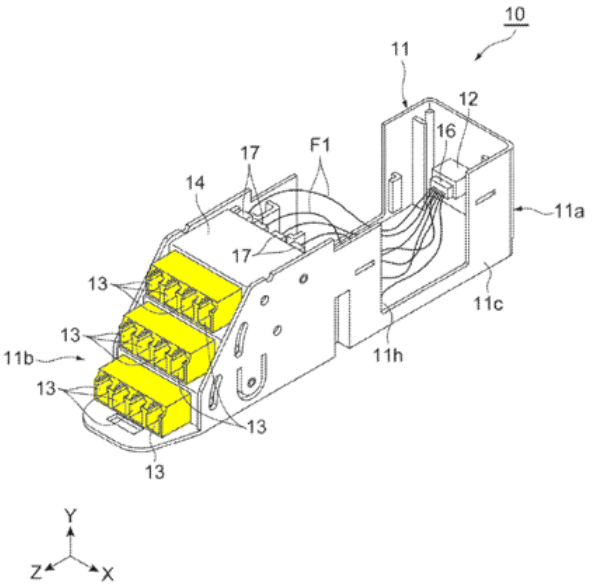
[3] A POSITA could equally move the two access cutouts forward as desired.

POSITA would have been motivated to move Fukui's modules forward on the tray to make it easier for field personnel to access Fukui's modules and minimize the need to slide Fukui's tray out. EX1003 ¶92. Fukui is specifically concerned with facilitating "access" to its modules and facilitating the work of inserting the connectors or drawing them out (unplugging them). EX1004, 8:57-64 ("facilitates an access to each single-core optical connector adapter 13"); 10:19-30 ("facilitate the inserting and drawing out work"), 9:20-29 ("reducing the work"). Field personnel must access the modules to plug/unplug LC connectors into the front. EX1003 ¶92. By moving the modules moved forward, field personnel do not need to reach as far into the tray and do not need to slide the tray as far out. *Id.* This is beneficial because space in telecommunication rooms can be cramped making it difficult to slide the tray out larger distances to access the module. *Id.* Alternatively, Sedor expressly discloses this element, which Ground 2 further addresses.

5. Element 1D

Each module 10 has the *"plurality of fiber optic plug receiving receptacle portions"* recited in this element.

Fig.4



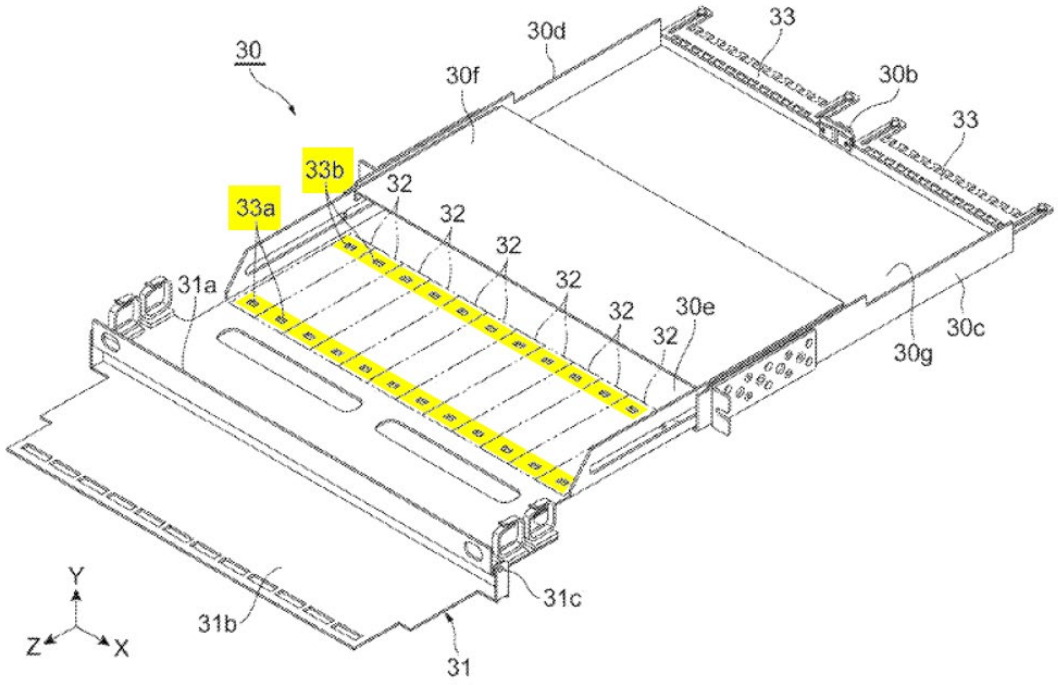
EX1004, Figs. 4-5, 5:24-42; EX1003 ¶100. Numerals 13 in the rows are "single-core optical connectors adapters" for an "LC connector." EX1004, 5:24-27, EX1004, 5:34-36. Because each of Fukui's modules comprises either an individual module 10 or multiple modules 10 coupled together, all of Fukui's modules have the claimed receptacles. EX1004, 7:26-27, EX1004, 7:67-8:6; EX1003 ¶100.

6. Element 1E

"wherein the tray is configured to be removably secured to each of the selected plurality of fiber optic cassettes…"

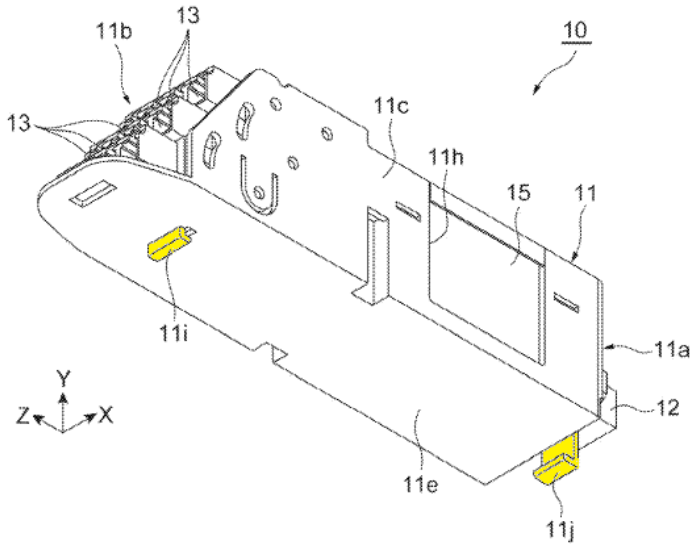
Fukui's tray has a plurality of areas (32) with holes (33a, 33b) for removably securing Fukui's modules:

Fig.9



EX1003 ¶102. Fukui's module 10 has hooks (11i, 11j) on the bottom to "engage" the holes:

Fig.2

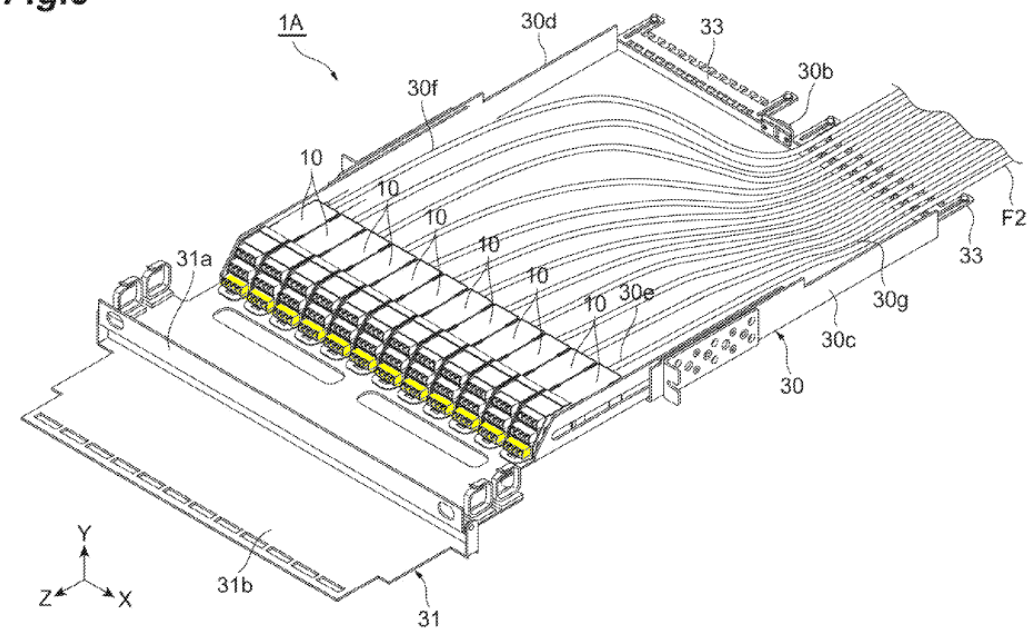


EX1004, Fig. 2, 8:52-56; EX1003 ¶102. Because all of Fukui's modules comprises either an individual module 10 or multiple modules 10 coupled together, all of Fukui modules have this same feature. EX1004, 7:27-29, 8:3-6, Figs. 4-5. Fukui expressly teaches the modules can be "easily removed" and "exchanged" (i.e., one removed and another secured) and EX1004, 9:18-29, 9:66-10:1, 10:33-35, 3:8-11; EX1003 ¶¶103-104.

"…when each of the plurality of fiber optic plug receiving receptacle portions are arranged side by side in a row along the front tray end portion"

Figure 8 shows, for example, the fiber optic receptable receptacles are arranged side by side in three rows with the bottom row highlighted:

Fig.8



EX1004, Fig. 8, *see also* EX1004, Figs. 4-5; EX1003 ¶105. Under the agreed construction that "along" means "on or beside," Fukui's fiber optic plug receiving receptacle portions (yellow) are "beside" the front tray end portion for the same reasons given above in Element 1C. If PO changes its position, the analysis in Element 1C also explains it would be obvious to move Fukui's modules forward to improve access, which equally applies to this element because the receptacle portions would equally move forward with the modules as they are on the front of the modules. *Id.*

7. Element 1F

The relevant unit of width in Fukui's system is the width of module 10. Module 10 is the "unit" for all of Fukui's modules. EX1003 ¶107. 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

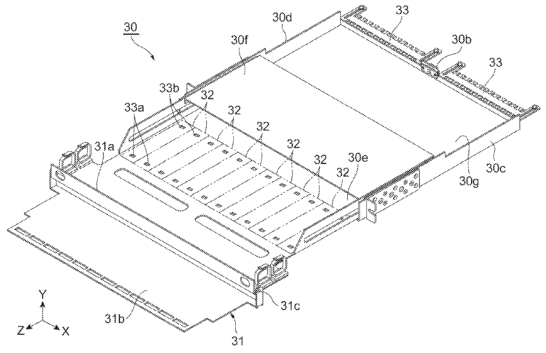
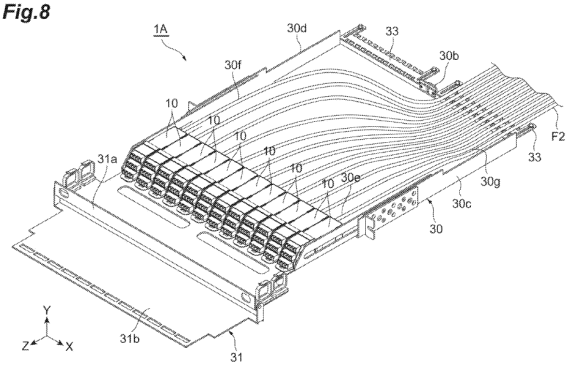
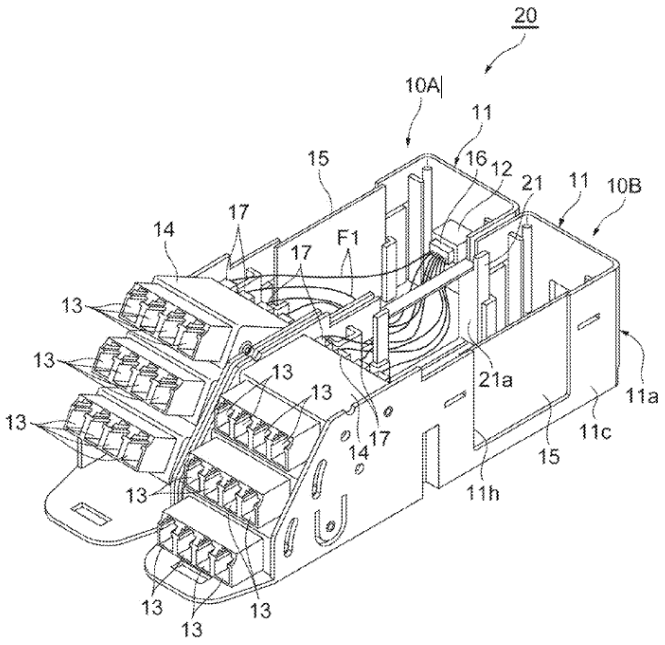


Fig.8



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 ¶107; EX1009, 27. Figure 1, 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.*

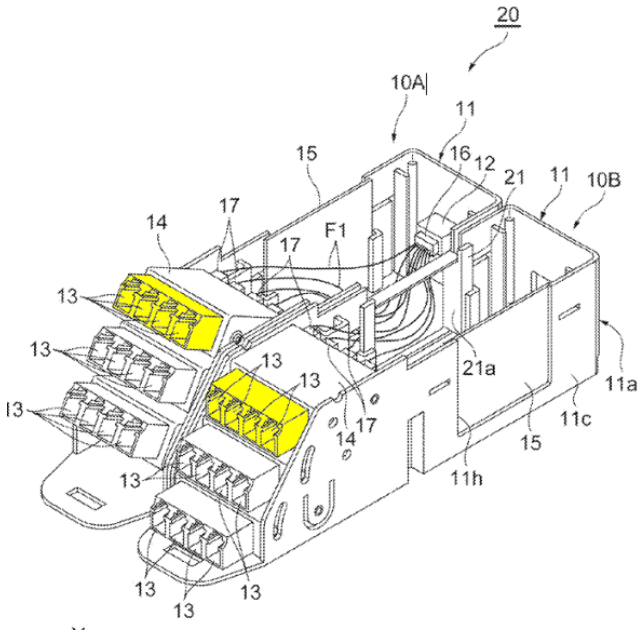
Thus, Fukui's module 20 is an example of the recited *"first"* cassettes comprising a first cassette width of *"two"* standard width units. EX1003 ¶108. Figure 5 shows the width of Fukui's module 20 is two modules 10:



EX1004, Fig. 5, 7:25-29. Fukui disclsoes to treat the coupled units as "one body," i.e., one cassette. EX1004, 8:2-3.

Fukui's disclosure meets both proposed constructions in the co-pending litigation. EX1003 ¶¶109-111.

PO's construction. The width Fukui's modules 20 accommodate two quad LC receptacles modules, as recited in PO's construction.

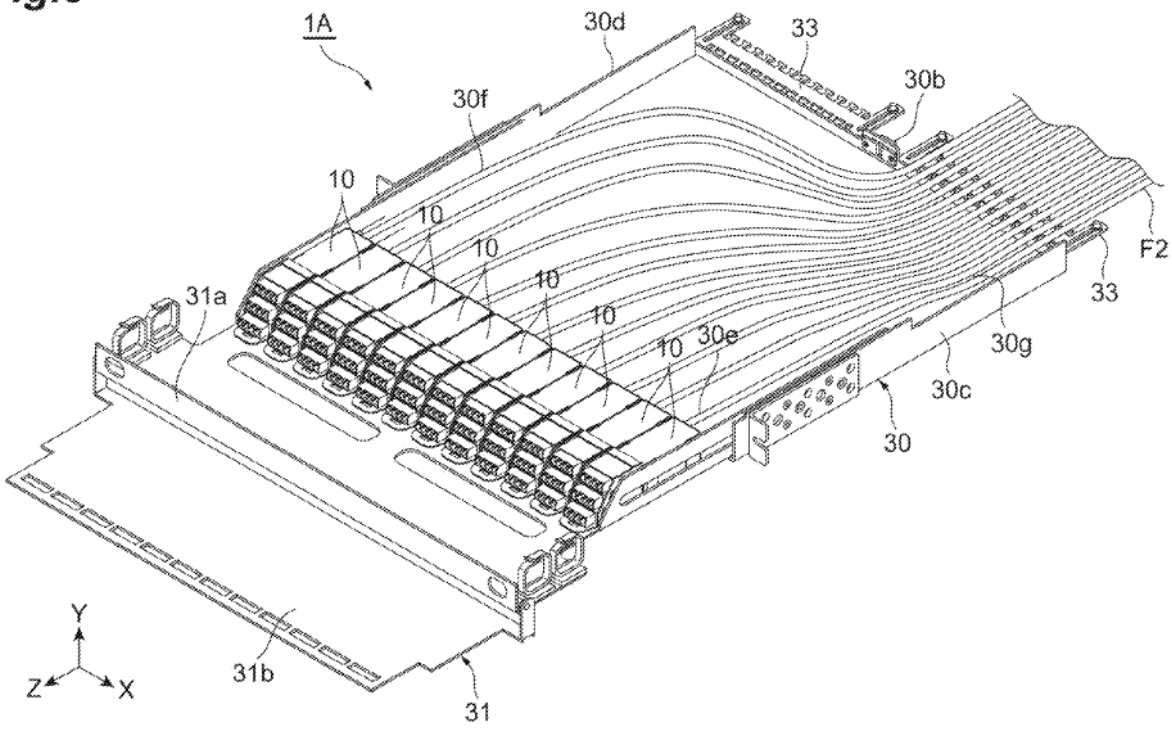


EX1004, 5:34-36 (explaining the four receptacles are "made into one body", i.e., one receptacle module."); EX1003 ¶110. If PO argues the height of Fukui's modules accommodates additional receptacles, that does not distinguish Fukui because the claim and PO's own construction states a limitation about the width, not the height. EX1003 ¶112.

CommScope's construction. Module 20 equals two times the width of module 10 because it comprises two modules 10A and 10B. EX1004, 7:25-29, 8:3-6; EX1003 ¶111. Module 20 does not include an additional amount such as a rail. Fukui's system has no rails. *See* EX1004, Figs. 4-9. Fukui's modules are all "evenly divisible" by the width of module 10. For example, the width of module 20 / the width of module 10 = 2, and there is no remainder for rails as there was in Sedor.

If PO argues the width of module 20 includes a space between the coupled modules 10A and 10B, that does not distinguish Fukui. EX1003 ¶¶113-28. First, PO's construction only requires the relevant number of receptacle modules. Second, Fukui's describes 10A and 10B are "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 10A and 10B when installed in the tray. EX1003 ¶¶115-16. Figure 8 shows no space between adjacent modules 10 (the lines merge together):

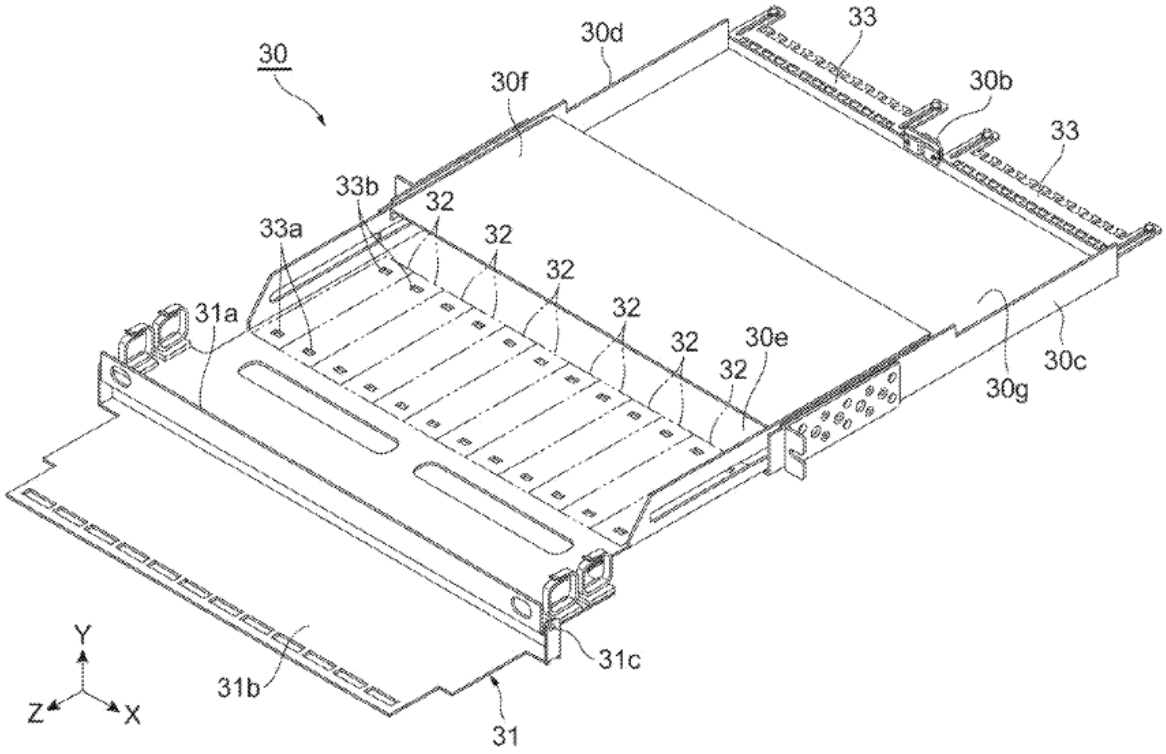
Fig.8



EX1004, Fig. 8. Modules 10A and 10B have the "same" shape as module 10. EX1004, 7:28-29, 8:3-6. Thus, when two coupled units 10A and 10B are installed in the tray, there is no room to space apart the modules. EX1003 ¶116. Figure 9

also shows no room to space apart adjacent modules that are coupled together. EX1003 ¶115. There is no extra space between adjacent areas:

Fig.9



EX1004, Fig. 9. Third, even if the width of module 20 includes a space between the coupled modules 10A and 10B, it would be obvious to remove such a space. EX1003 ¶¶118-128. Fukui never describes any need to space apart the coupled modules. 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 ¶126. 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 ¶¶121-25.

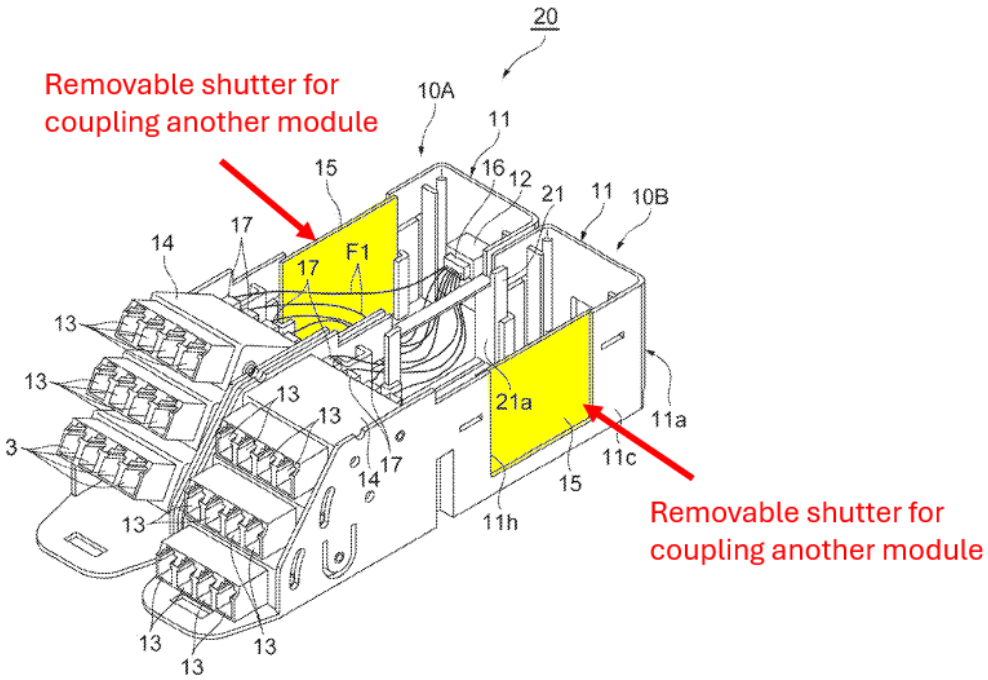
8. Element 1G

Fukui's 36 core module is an example the recited *"second"* cassettes comprising a second cassette width of *"three"* standard width units. EX1003 ¶130. After disclosing expanding one module 10 that support 12 cores to two coupled modules to support 24 cores, Fukui expressly teaches to further expand to support 36 cores and 48 cores based on "the number of coupled units modules." EX1004, 7:67:8-2. The "number" of coupled unit modules to support 36 cores is three, i.e., a triple modules that is three standard width units.[4] EX1003 ¶130. Each of the individual modules 10 would support 12 cores (3 x 12 = 36 cores). *See* EX1004, Fig. 1 (showing module 10 has 12 receptables); EX1003 ¶130. Fukui discloses to treat the plurality of coupled units as "one body," i.e., one cassette. EX1004, 8:2-3.

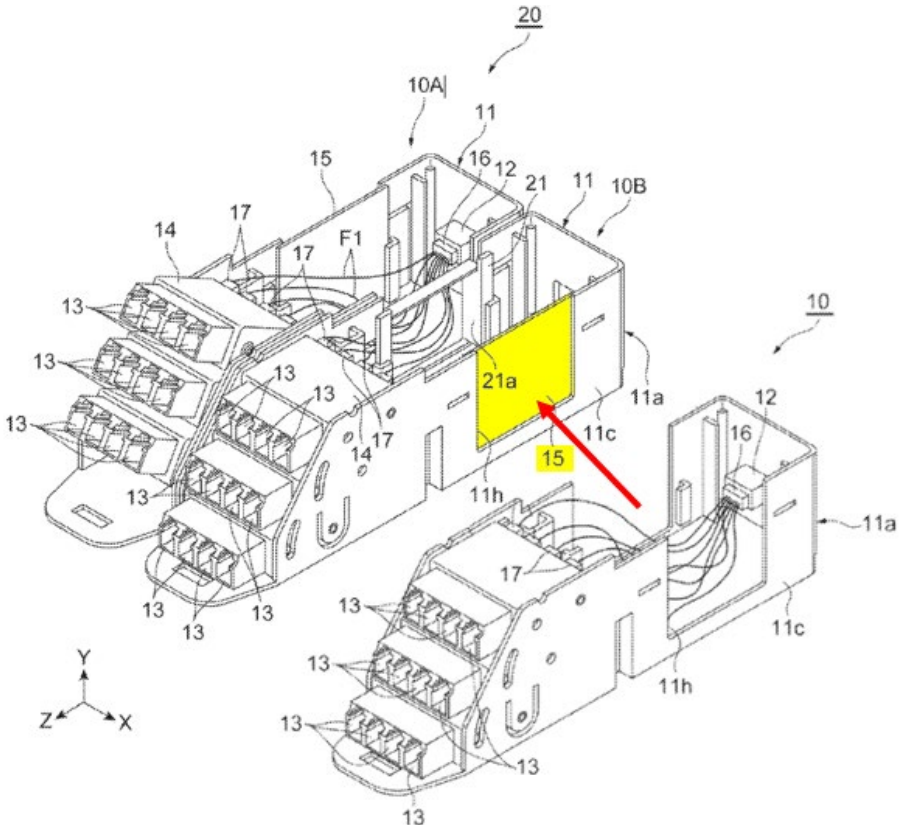
Fukui shows the structure to expand the two coupled unit modules (20) supporting 24 cores to the larger three coupled unit modules supporting 36 cores in Figure 5:

[4] Likewise, the "number" of coupled unit modules to support 48 cores is four, i.e., a quadruple module of four standard width units.

Fig.5



EX1003 ¶131. The two coupled modules include additional removeable shutters (15) on each side to couple either one more unit and form a triple module supporting 36 cores or coupled two more units to form a quadruple module supporting 48 cores.



EX1003 ¶131. A second coupling member (21) would be inserted in the opening created by removing the shutter (15) shown in yellow.

Fukui's 36 core module comprising three coupled unit modules meets the constructions from both parties for the same reasons discussed above. EX1003 ¶133. The width of the triple module would comprise three quad LC adapters per PO's construction. *Id.* The width of the triple module equals three times the width of module 10 (the standard width unit) per CommScope's construction. *Id.*

If PO argues Fukui's disclosure is not sufficiently express for the 36 core module, a POSITA would also find this element obvious based on Fukui itself. EX1003 ¶134. Fukui itself discloses a "plurality" of coupled unit modules, which

includes three coupled unit modules. EX1004, 8:2-3. Fukui itself teaches to support a "number" of coupled of unit modules, which also includes three coupled unit modules. EX1004, 7:67-8:6. A POSITA would find it obvious for the selected plurality of modules to include both the 24 core module and 36 core modules. EX1003 ¶134. Fukui itself already recognizes that "of course" the selected plurality of modules may include a a "combination" of modules. EX1004, 9:42-43. A POSITA would have been motivated to include the 24 and 36 core module unit module in the plurality of modules to support input cables F2 with 24 and 36 cores. EX1003 ¶135. Fukui itself discloses the need to support "various" number of cores, including 12, 24, and 36. EX1004, 3:27-28, 4:2-3, 4:42-43, 9:58-59, 10:4-6, 10:34-35. A POSITA would have a reasonable expectation of success because no new functionality is needed. EX1003 ¶136. Fukui modules already have the functionality to couple three, four, or more unit modules (i.e., the detachable shutter and coupling member). *Id.* Every unit module 10 has a removable shutter on "each" side for further expansion. *Id.* Fukui's existing tray already can include multiple sizes, e.g., a two unit module (orange) and a three unit module (green):

Fig.8

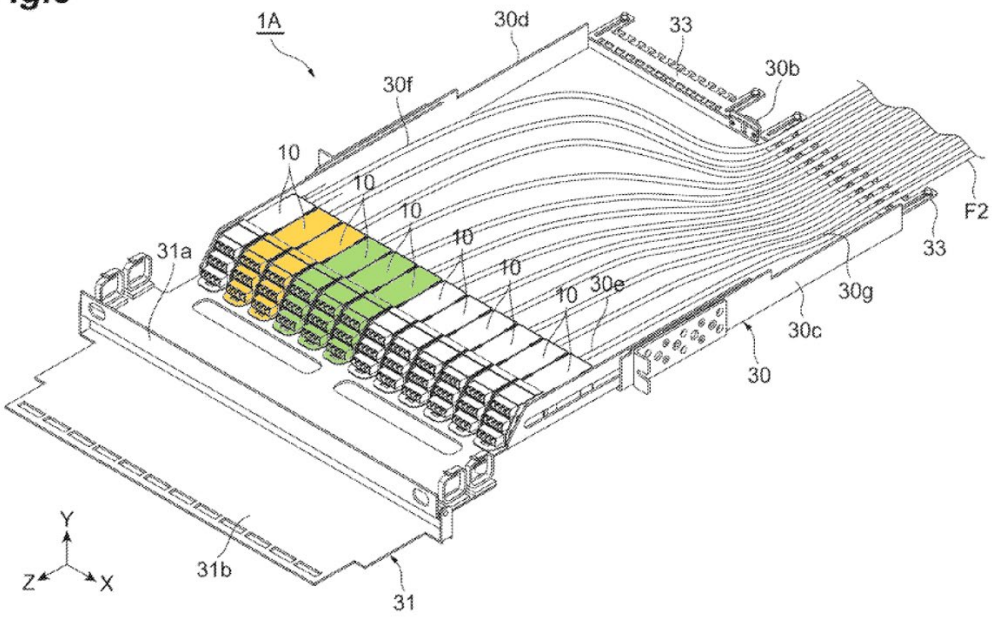
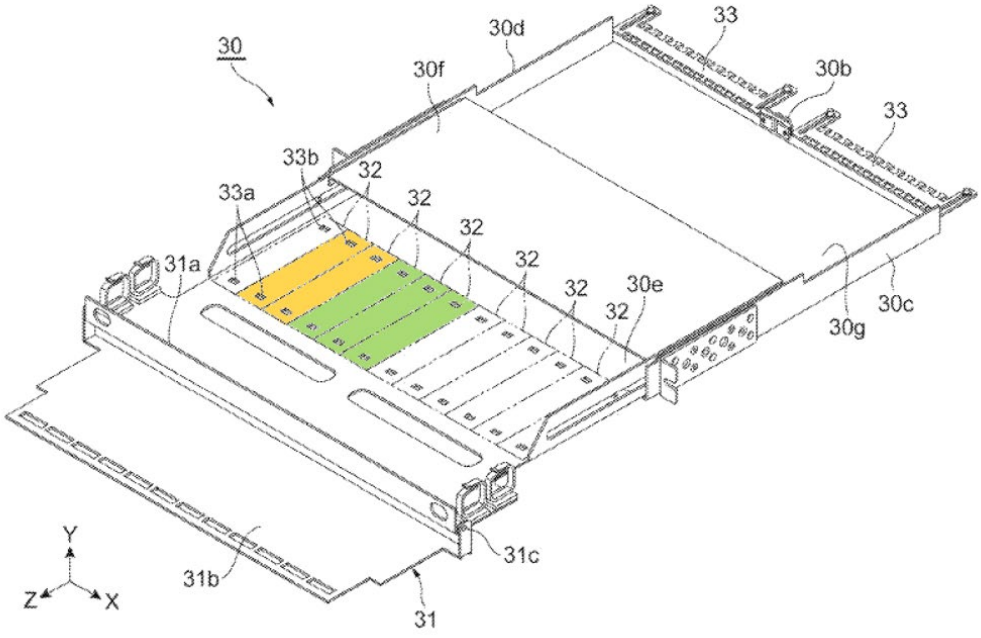


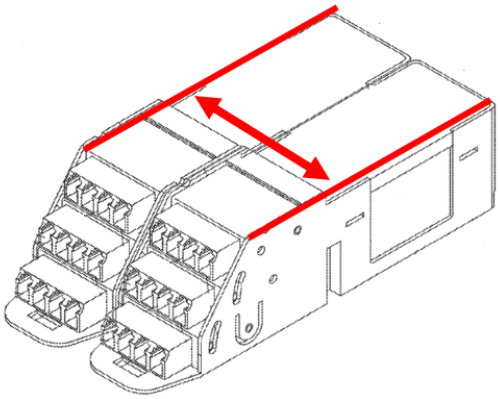
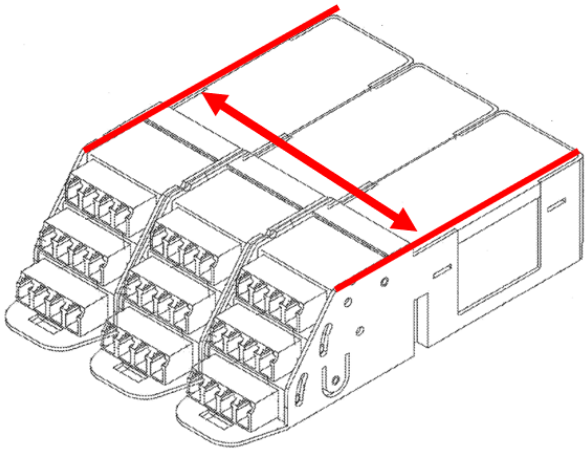
Fig.9



EX1003 ¶136. It was known to repeat the coupling technique to couple more than two modules. EX1026, 2:30-33 ("interconnect two or more patch cassettes, thus creating an assembly of patch cassettes"), Fig. 8.

9. Element 1H

As explained in Element 1F and 1G, the width of Fukui's 36 core modules (a *second cassette*) is three coupled unit modules, and the width of Fukui's 24 core module (a *first cassette*) is two coupled unit modules.

Fukui's 24 core (double) module	**Fukui's 36 core (triple) module**
	

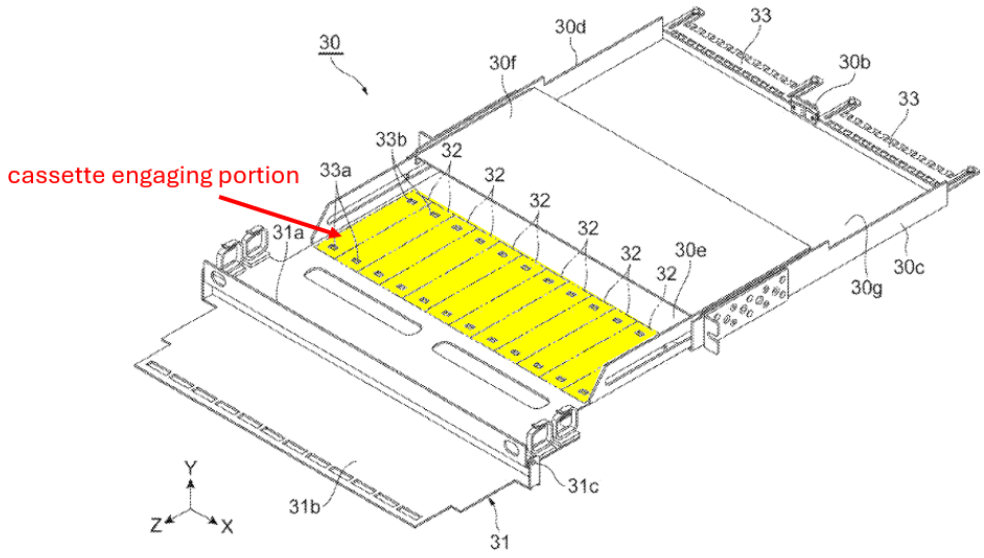
EX1003 ¶138.

B. Independent Claim 18

Claim 18 recites the same limitations as Claim 1 and is invalid for the same reasons with the following exceptions. EX1003 ¶¶168-184

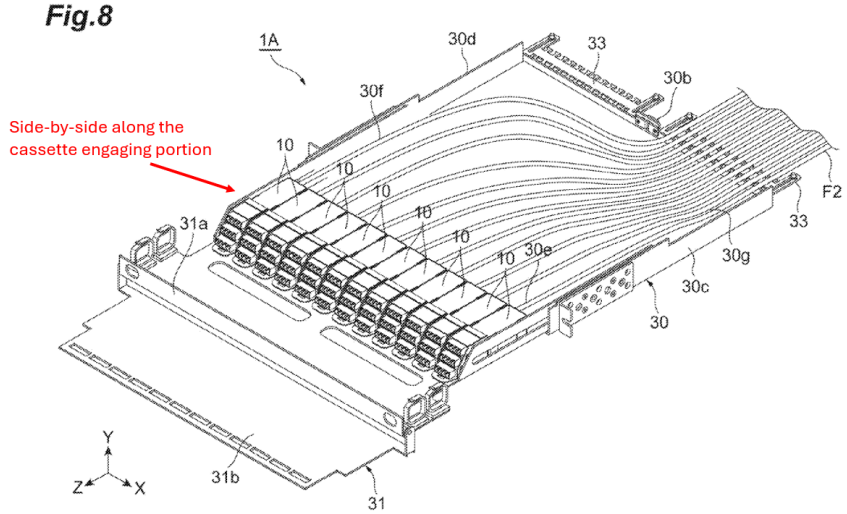
First, Element 18-A recites "a tray having a *cassette engaging portion*." Fukui's tray also has a "*cassette engaging portion"*:

Fig.9



EX1003 ¶170. The portion of Fukui's tray with areas 32 and holes 33a, 33b is expressly for engaging the hooks on the bottom of Fukui's modules. EX1004, 8:45-56. Fukui's modules also arranged "along" (on or beside) Fukui's cassette engaging portion because the modules are arranged *on* this portion:

Fig.8



EX1004, Fig. 8; EX1003 ¶176.

Second, Element 18-C recites that an outer side edge of each of the cassettes "adjacently faces" an outer side edge of another cassette. The outer side edges of Fukui's cassettes "face" each other. EX1004, 4:34-38 ("…adjacent lateral walls …are faced with each other."). Figures 8-9 show that Fukui's modules and their outer side edges adjacently face each other with no intervening structure:

Fig.9

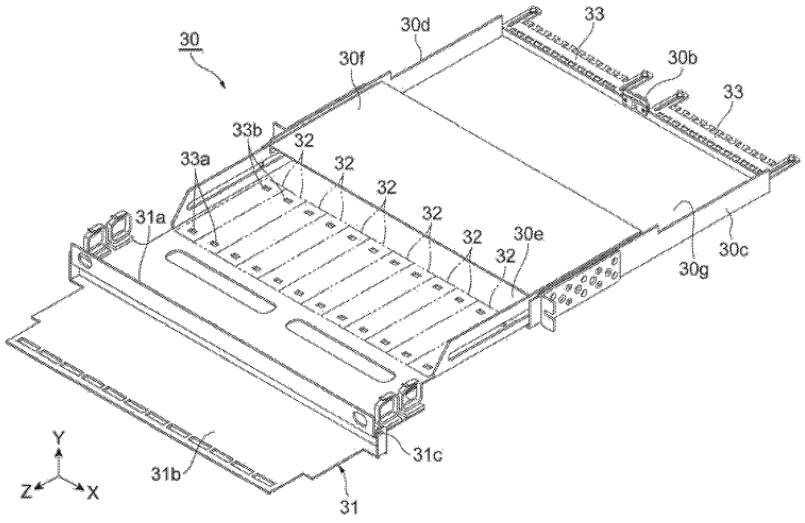
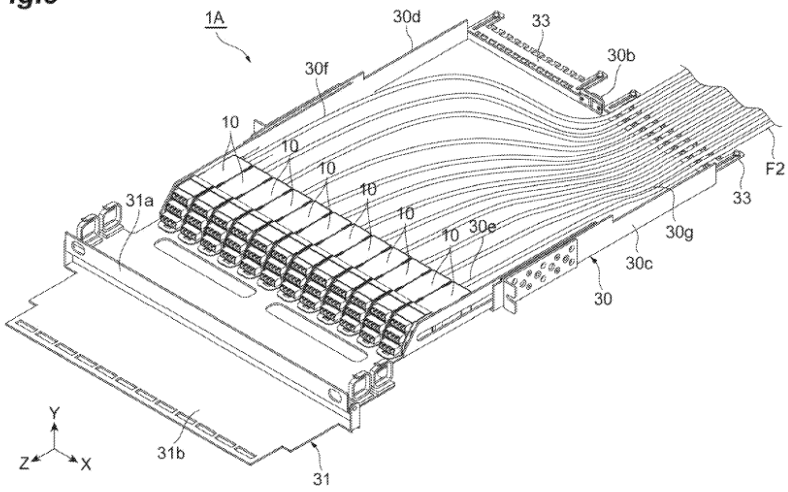


Fig.8



EX1004, Figs. 8-9, 8:47-48; EX1003 ¶174-75.

Third, PO replaced the term "or" with "and" so that the claim recites a "cassette width… of two, three, four, **and** six standard width units" in Elements 18-F and 18-G. By claim differentiation, this appears to be a deliberate choice. PO, however, asserts "and" means "or." See EX1011, 16. If this is correct, Fukui discloses Elements 18-F and 18-G, for the same reasons given above for Elements 1F and 1G. EX1003 ¶184.

C. Independent Claim 40

Claim 40 also recites substantially the same limiations as Claim 1 and invalid for the same reasons with the following exceptions. EX1003 ¶¶212-225.

Claim 40 changed terminology from "housing" (Element 1A) to "case" (Element 40-A). Fukui discloses a "case" for the same reasons it discloses a "housing" (and renders it obvious if PO says a case needs a "top" wall). EX1003 ¶215. Claim 40 does not require the tray slide or be received in a tray receiving space and does not require the cassettes be "along the front tray end portion" but simply "along the tray" (Element 40-C).

PO also made the same change from "or" to "and" and from "directly adjacent" to "adjacently faces" as discussed for Claim 18. No other changes in Claim 40 affect the invalidity analysis for Fukui.

D. Claims 2, 24, 50, 51

Figures 8-9 show the width of Fukui's tray is configured "to receive at least twelve standard cassette width units side by side":

Fig.9

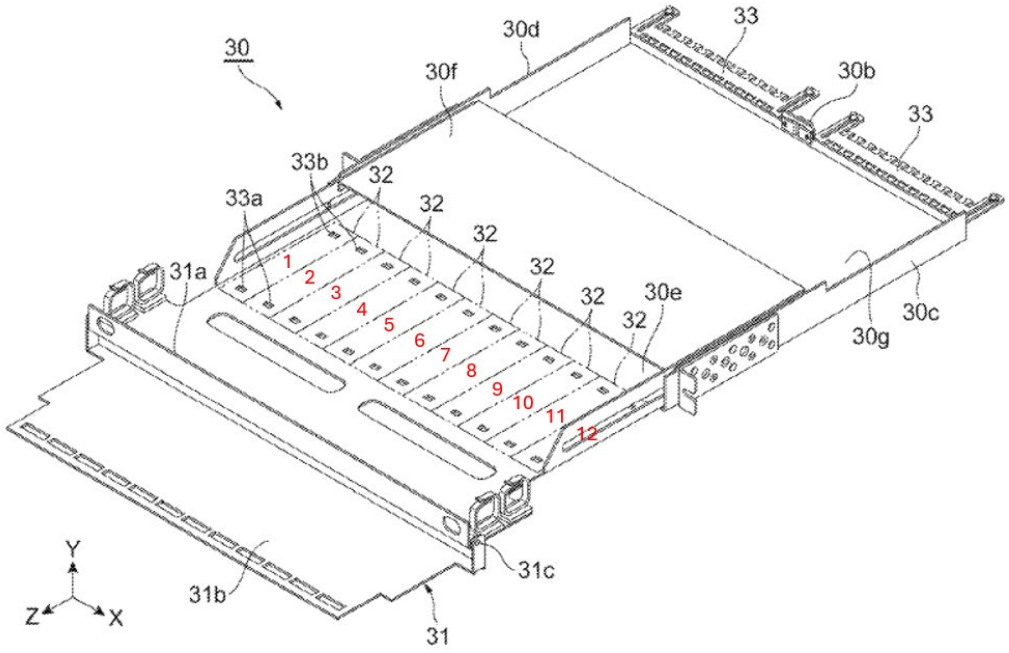
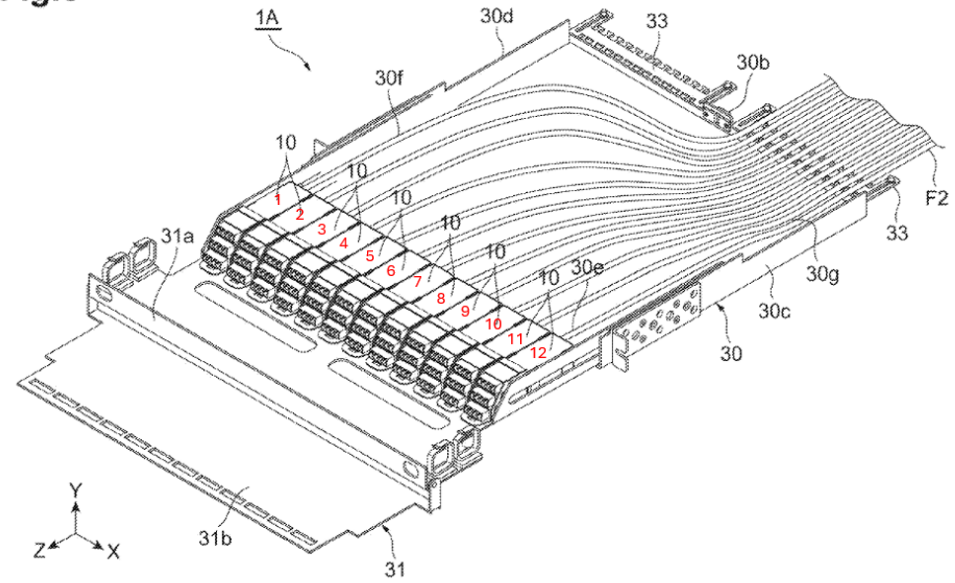


Fig.8

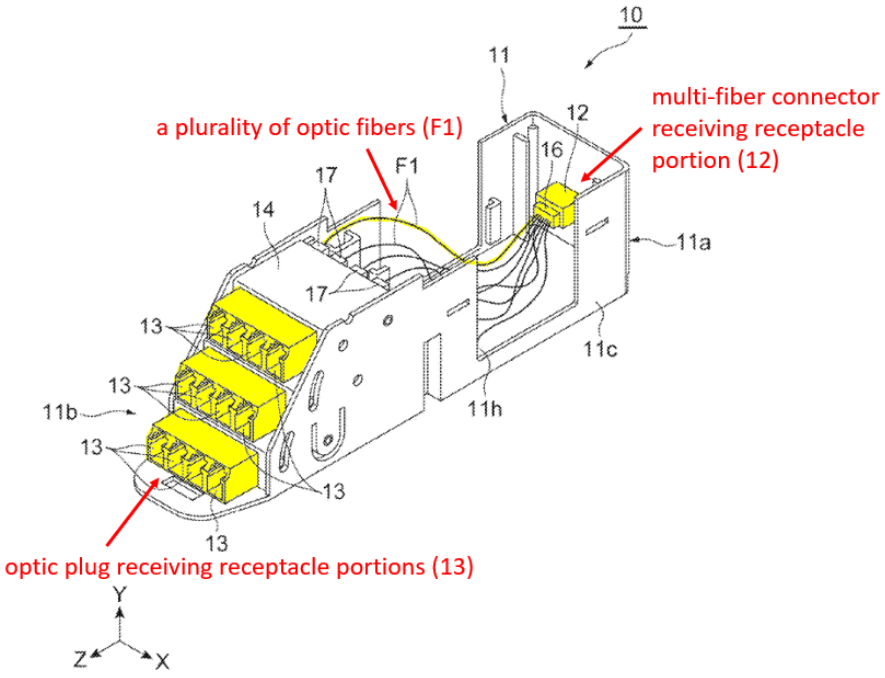


EX1004, Fig. 8; EX1004, 9:35-53; EX1003 ¶¶140-41, 259-62.

E. Claims 3, 25, 52

Fukui's module 10 (and Fukui's larger modules) has the claimed *"receptacles"* and *"plurality of optic fibers"*:

Fig.4

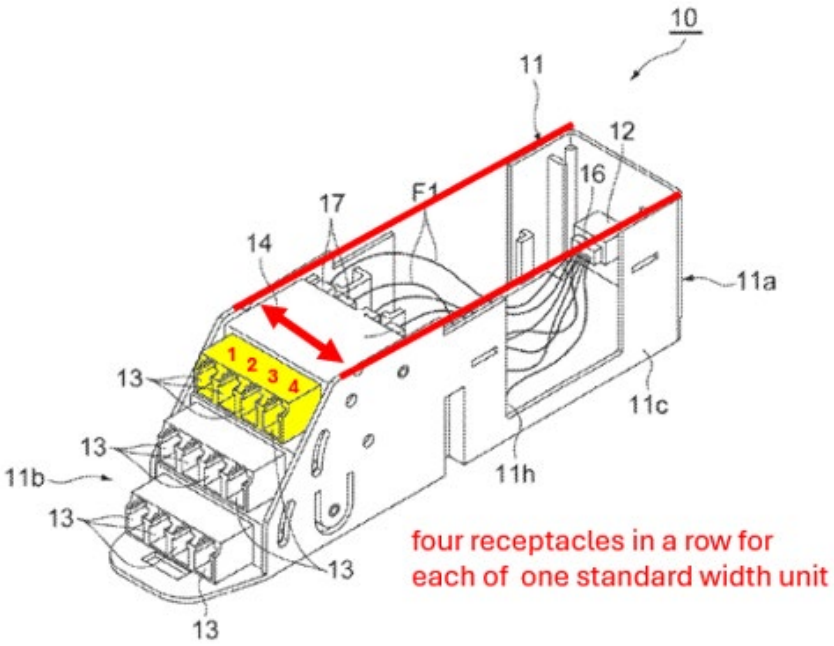


EX1004, Figs. 4-5; 4:66-5:4, 5:12-27, 6:33-48, 7:26-27, 7:67-8:6; EX1003 ¶¶143-44, 194-95.

F. Claims 4, 26, 53

Fukui's module 10 has the claimed *"four"* receptacles side by side in a row along a front portion for *"each standard width unit"*

Fig.4

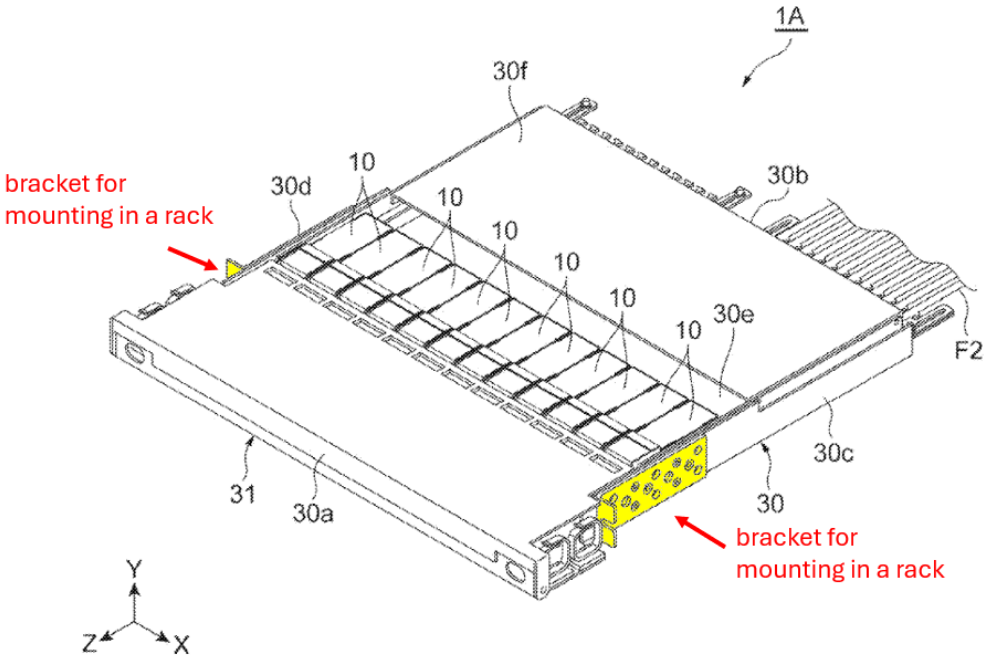


EX1004, Fig. 4-5, 5:24-36 ("four single-core optical connector adapters"), 7:27-29, EX1003 ¶146, 196-97, 265-66. Any of the three tiers meets the claim. Fukui's larger size modules have these same features because they comprise the same modules 10 coupled together. EX1004, 7:26-27, EX1004, 7:67-8:6.

G. Claims 5, 27, 54-55

Fukui's system is for a "19-inch standardized rack by the Electronic Industries Alliance (EIA) in 1U size," and, therefore, discloses these claims. EX1004, 9:30-32. Fukui's Figure 6 shows brackets for mounting in a rack:

Fig.6



EX1004, Fig. 6; EX1003 ¶148. Fukui's "1U" size is an example of the "U" space standardized by the EIA:

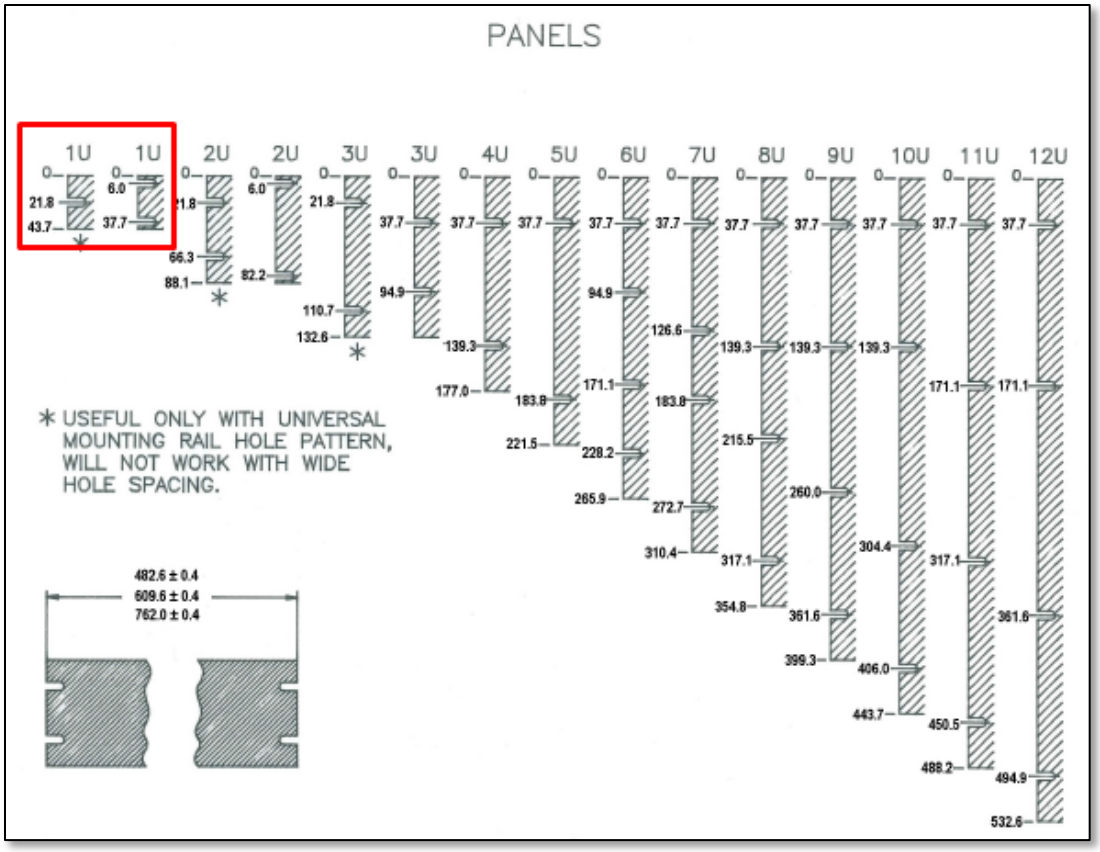
4.2 Terms for Cabinets and Racks
"n"—"n" is equal to the number of modular units to be used in determining various dimensions. It is generally used with the value "U."

"U"—The modular unit "U" on which panel heights are based is equal to 44.45 millimeters.

4.3 Cabinets and Racks

4.3.1 Cabinet
A cabinet shall be standard when it conforms to the dimensional requirements shown in Figure 1 and Figure 3.

4.3.2 Rack
A rack shall be standard when it conforms to the dimensional requirements shown in Figure 2 and Figure 3.

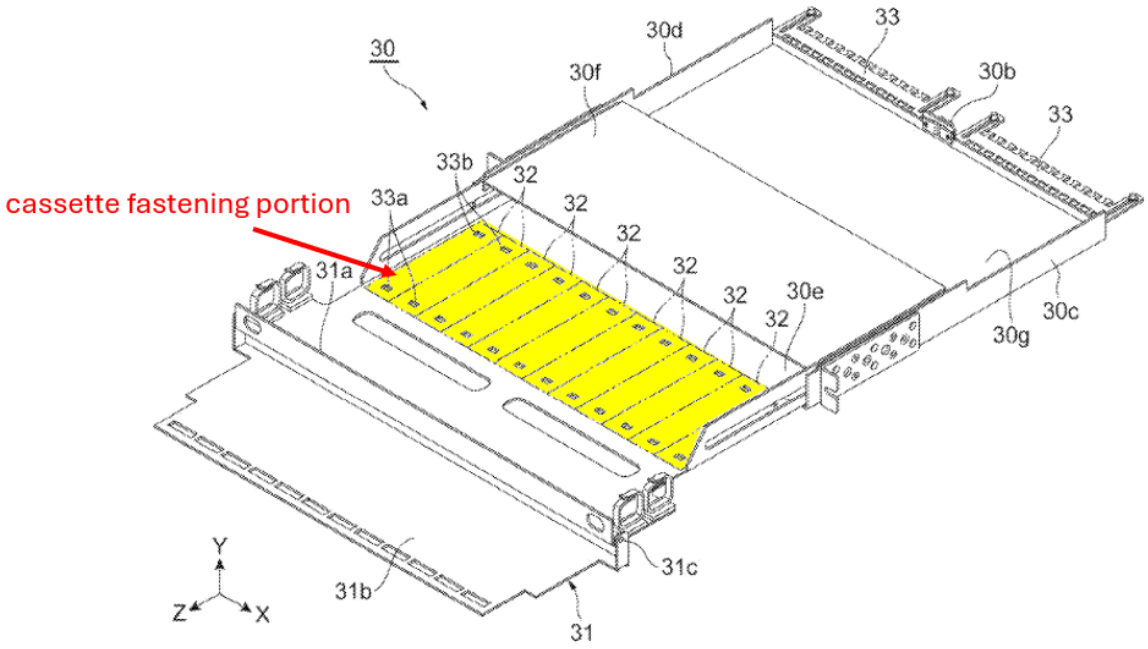


EX1008, 10, 13; EX1003 ¶148, ¶¶198-99, ¶¶269-70.

H. Claims 6, 28, 56

Fukui's tray is configured with the claimed *"cassette fastening portion"* to secure the cassettes:

Fig.9



EX1004, Fig. 9; EX1003 ¶150, ¶¶200-201, ¶¶271-72. Areas (32) are configured with holes (33a, 33b) to removably secure the tray to each module. EX1004, 8:45-56.

I. Claims 10, 20-22, 32, 45-47

These claims similarity recite that the outer side edge / portion of a cassette "*faces a directly adjacent"* outer side edge / portion of another cassette (claims 10, 32) or that the edges / portions are *"adjacent"* (claims 21, 46) or *"directly adjacent"* (claims 20, 22, 45, 47). The claims also variously recites that the cassettes are *"arranged side by side in the row."* Fukui meets all these claims. Figures 8-9, for example, show that the entire outer side of each of Fukui's modules is adjacent, directly adjacent, and facing the entire outer side of the

adjacent module because the modules are arranged in side by side areas (32) with no intervening structure:

Fig.9

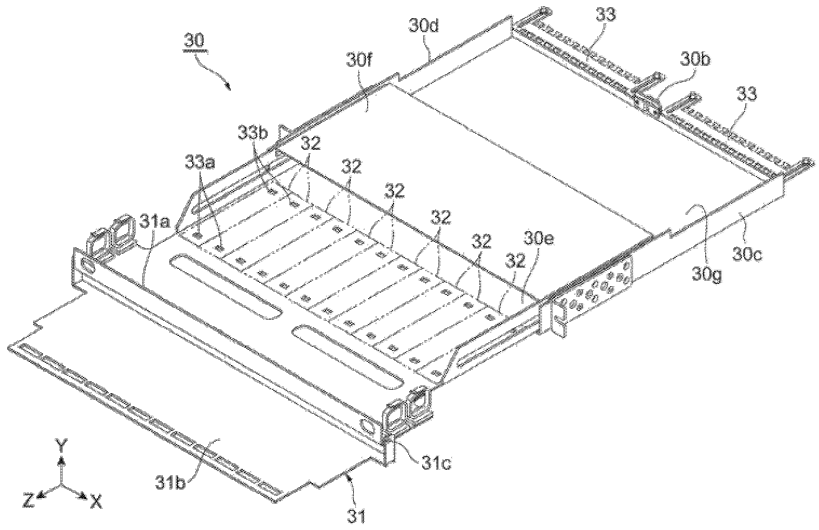
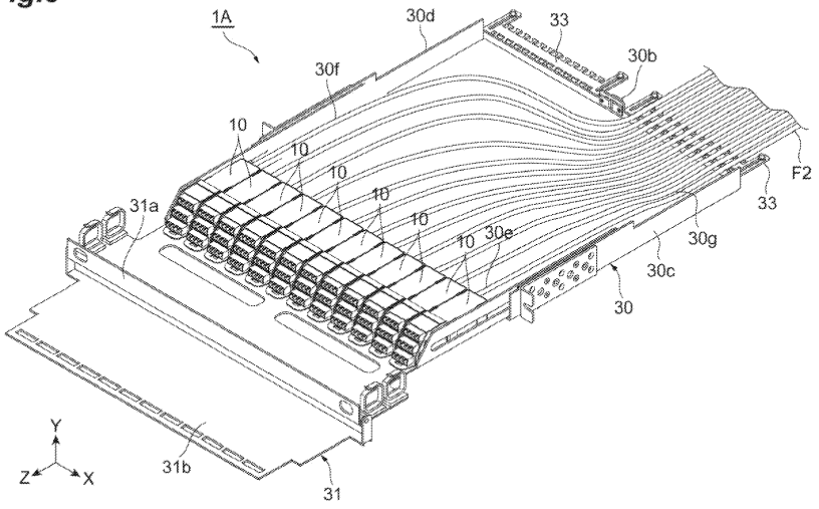


Fig.8

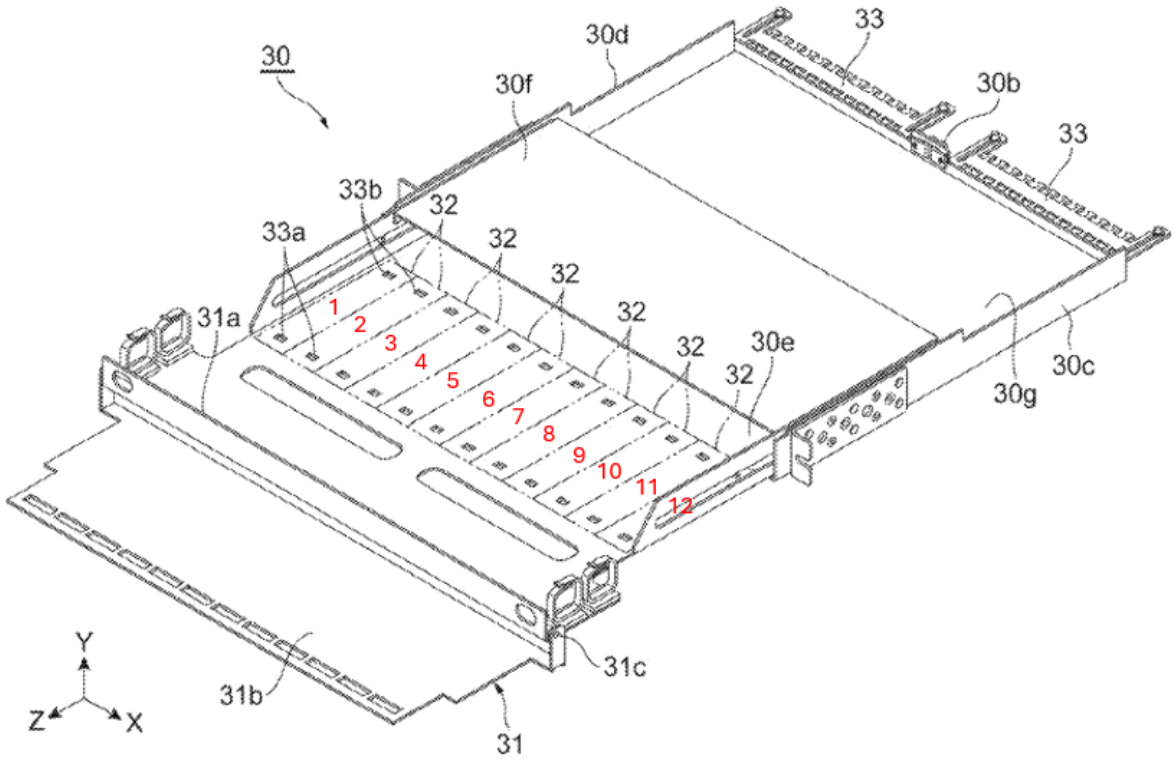


EX1004, Figs. 8-9, 8:47-48; EX1003 ¶¶152-53, ¶¶185-89, ¶¶202-203, ¶¶233-38.

J. Claims 11, 33

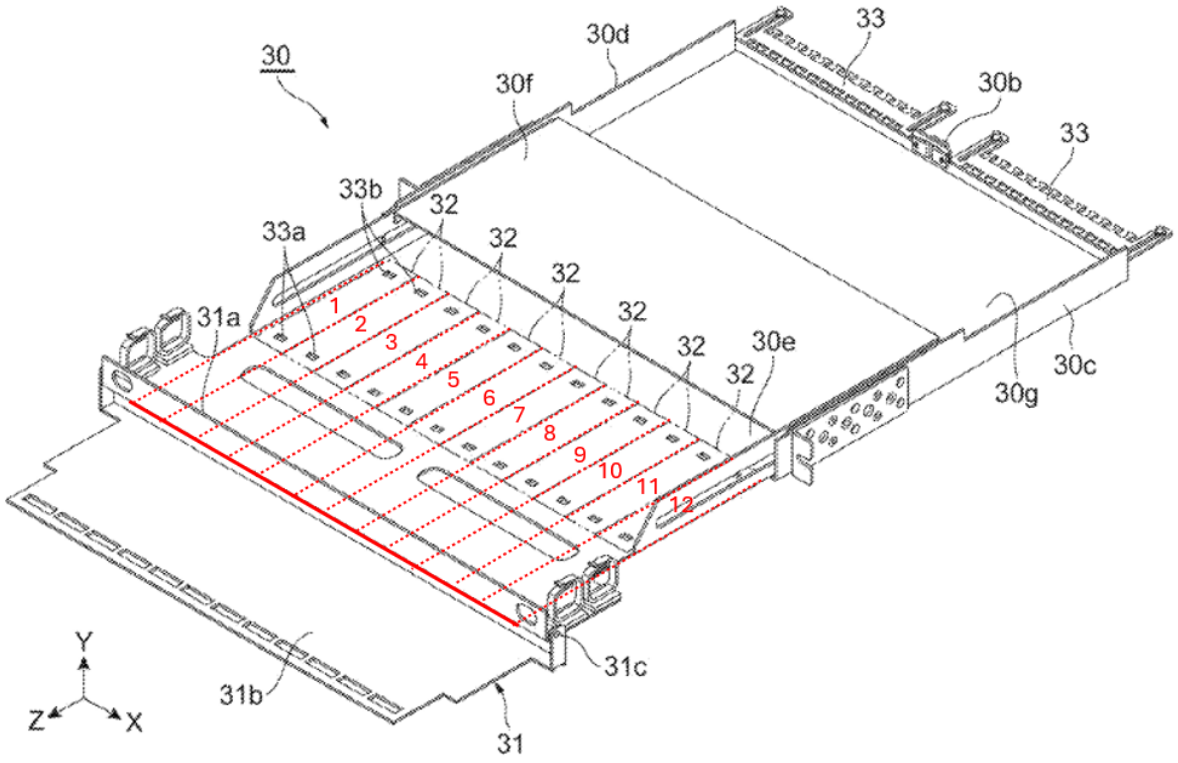
Fukui's tray has twelve evenly space areas (32) where each area accommodates one of Fukui's modules 10 (Fukui's standard width unit).

Fig.9



EX1003 ¶¶155, ¶¶192-93. Likewise, an edge (below red) of Fukui's first tray end portion (and cassette engaging portion) is evenly divisible by the Fukui's standard width unit:

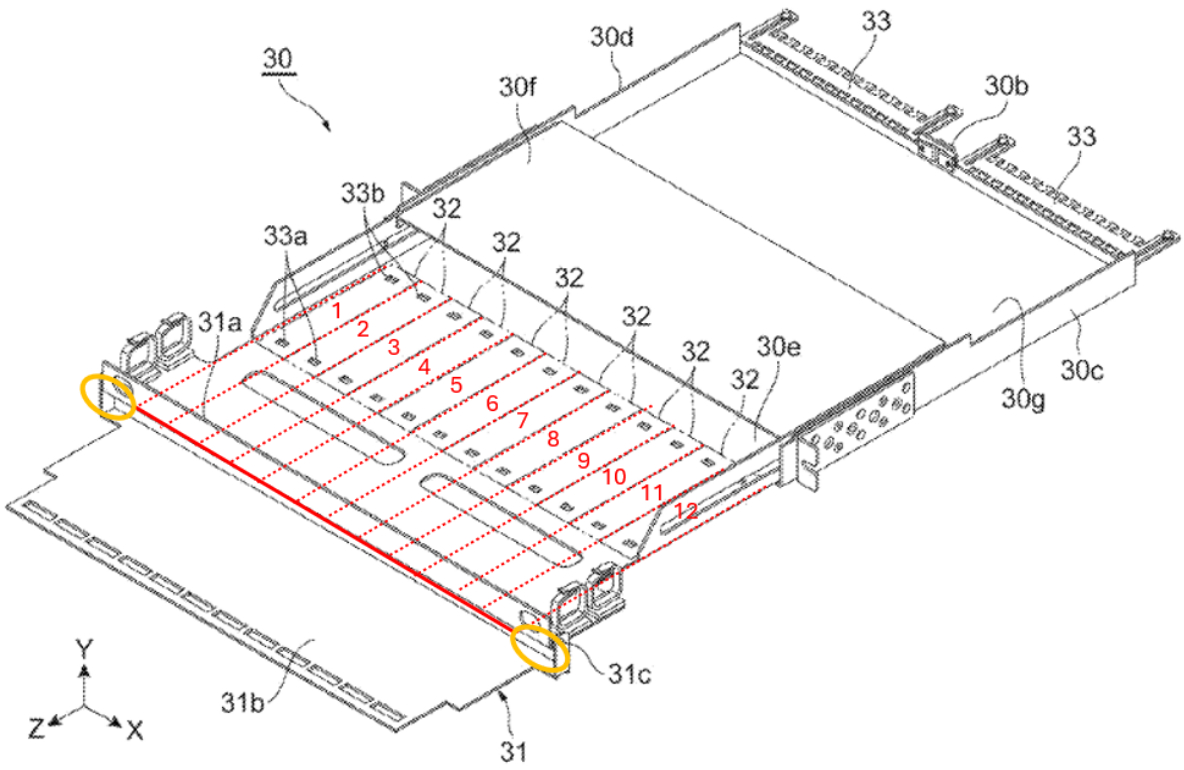
Fig.9



EX1003 ¶155. There are no gaps (remainders) between each of the twelve standard width units.

If PO argues there is some excess space on the right and left side of the edge (orange circled below), that does not distinguish Fukui.

Fig.9



EX1003 ¶156. PO's proposed construction in the litigation for "substantially" evenly divisible expressly allows that "there may be some excess space between a cassette and an end of the front edge of the tray." EX1011, 17.[5] PO's preferred embodiment has excess space on the side.

[5] Because the PTAB cannot resolve indefinite issuses as applied to infringement, CommScope adopted Patent Owner's construction of "substantially" evenly divisible for this IPR.

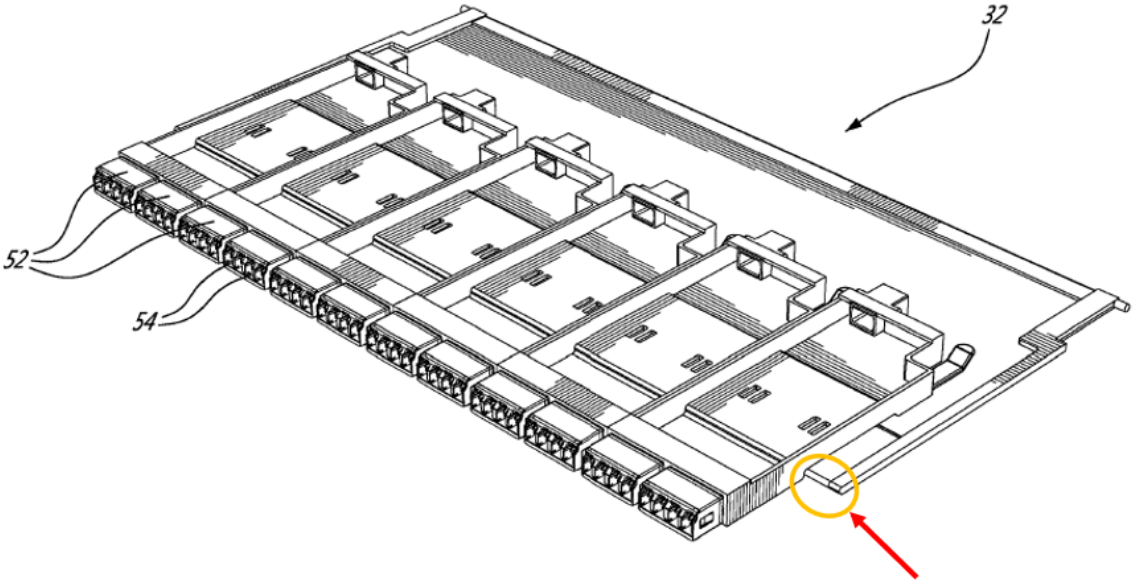


FIG. 4A

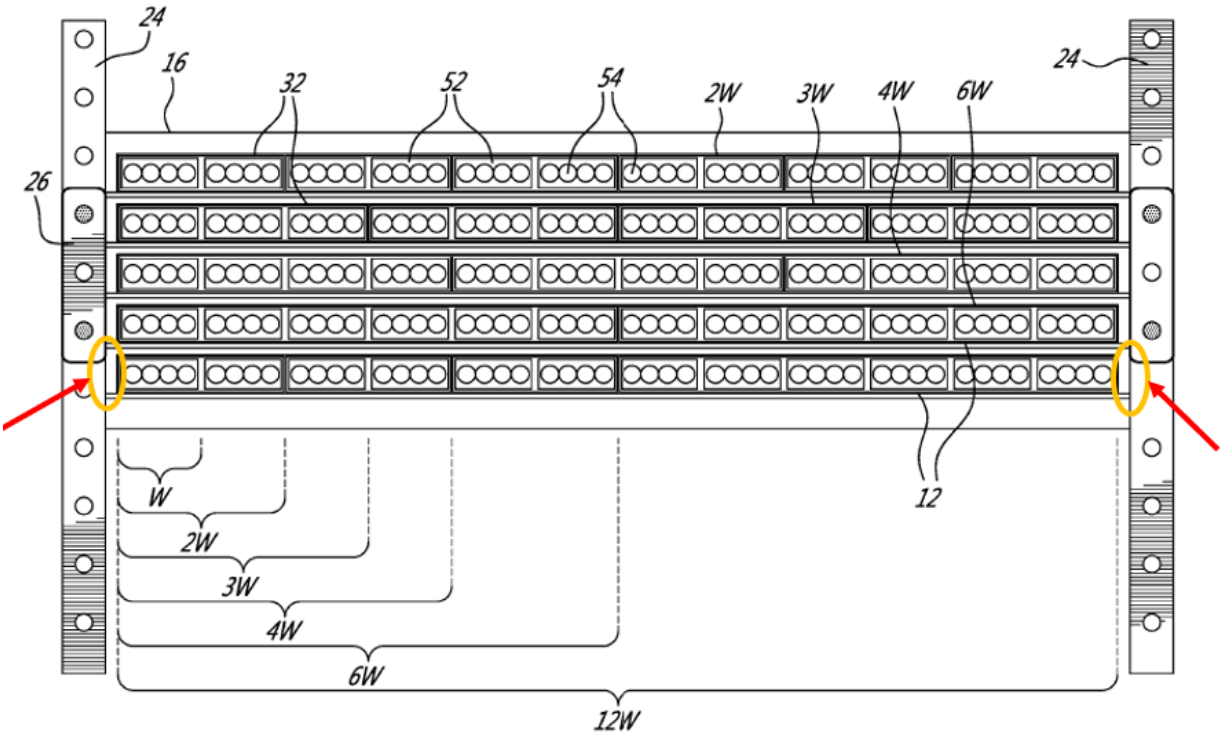
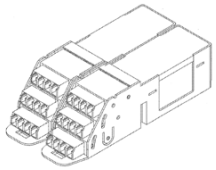
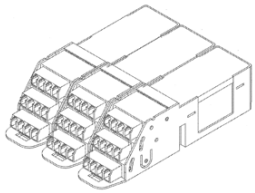
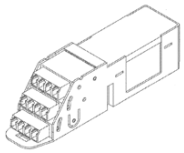


FIG. 3

EX1001, Figs. 3, 4A; EX1003 ¶156.

K. Claims 12, 34, 60

As explained in claim 1, coupling two of Fukui's modules creates a *"first"* cassette and coupling three modules as taught by Fukui creates a *"second"* cassette. Fukui's single module 10 is an example of recited *"third"* cassette.

A first cassette	A second cassette	A third cassette
		
<u>two</u> coupled modules for 24 cores	**<u>three</u> coupled modules for 36 cores**	**<u>one</u> module for 12 cores**

EX1003 ¶158, ¶¶204-205, ¶¶273-74. Fukui also discloses coupling unit modules to support 48 cores, which is another example of a cassette of different width.

L. Claims 13, 35, 61

Fukui's tray 30e comprises holes 33a, 33b (an *engagement feature*) in areas 32 configured to received hooks 11i, 11j (an *engagement structure*) on the bottom of Fukui's modules. EX1004, Fig. 9, 8:52-56.

Fig.9

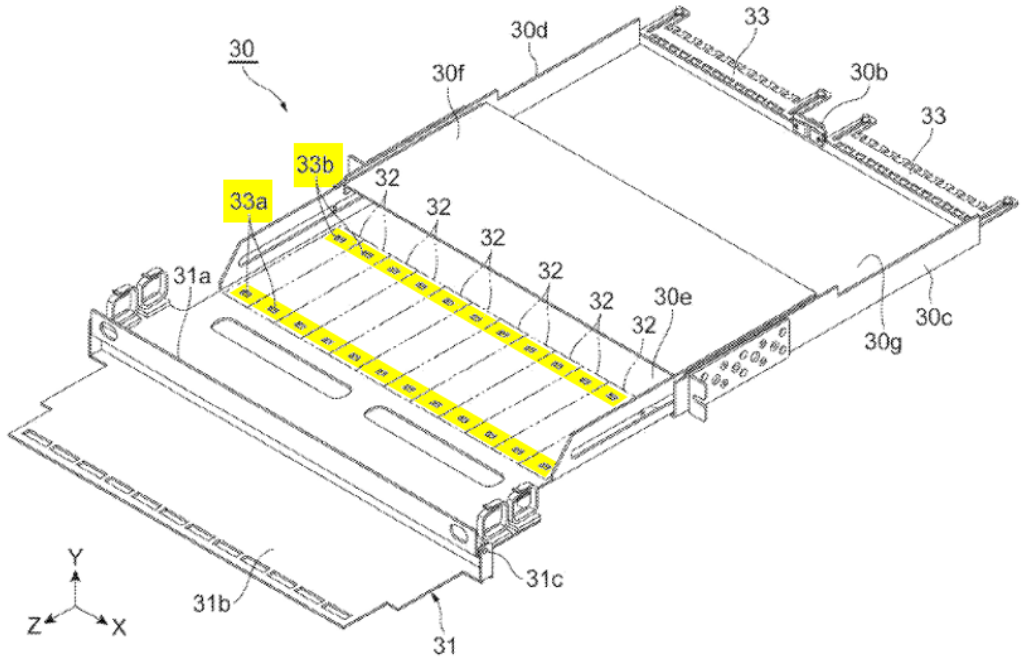
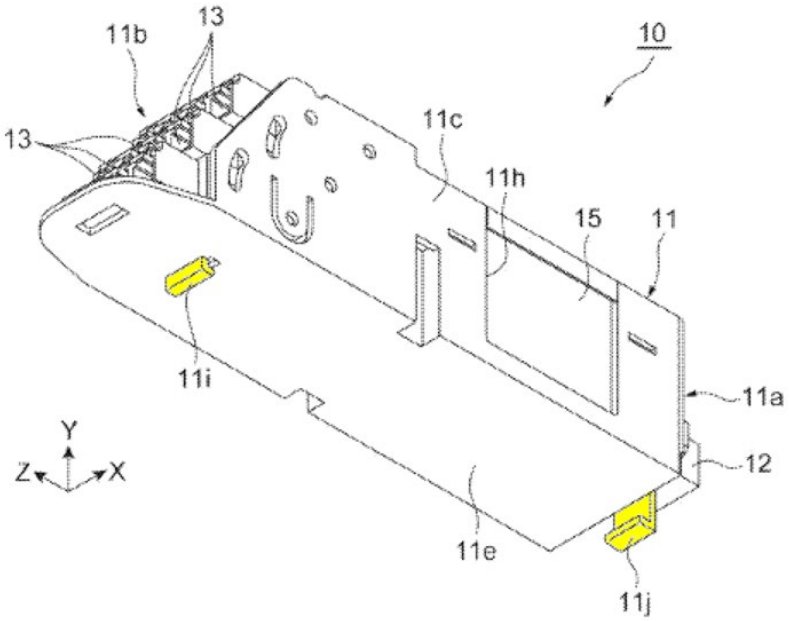

30
30d
33
30f
30b
33
33b
33a
32
32
32
32
32
32
31a
30e
30g
30c
31c
31b
31
Y
Z
X

Fig.2

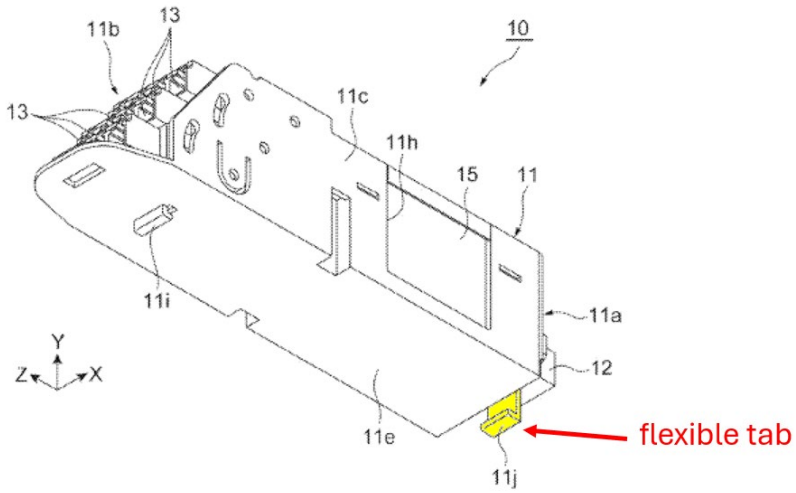

10
11b
13
13
11c
11h
15
11
11i
11a
12
11e
11j
Y
Z
X

EX1003 ¶160, ¶¶206-07, ¶¶275-76. Because each module comprises one or more unit modules 10, all of Fukui's module sizes include these hooks. EX1004, 7:26-27, EX1004, 7:67-8:6; EX1003 ¶160.

M. Claims 14, 36, 62

The rectangular holes in Fukui's tray define a *"slot"* for the hooks to enter. EX1004, Fig. 9, 8:52-56; EX1003 ¶162. The hooks on the bottom of Fukui's modules (the *engagement structure*) comprise a tab.

Fig.2

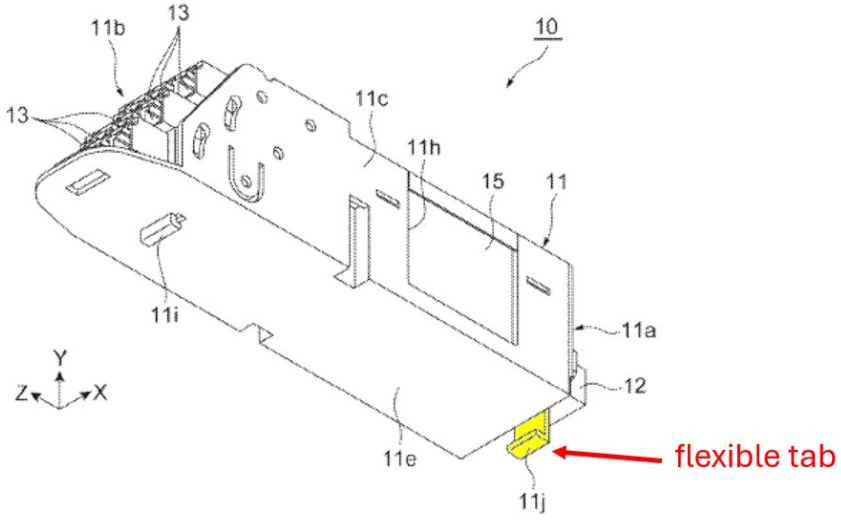


EX1003 ¶162, ¶¶208-09, ¶¶277-78. The tab goes through the holes on Fukui's tray and engages with the underside of the tray.

N. Claims 16, 38, 64

Fukui's "holes" on the tray are an *"aperture."* EX1004, Fig. 9, 8:52-56; EX1003 ¶164. Fukui's rear hook on the bottom of Fukui's modules include a "*flexible tab*":

Fig.2



EX1003 ¶164, ¶¶210-11, ¶¶279-80. The rear hook has a longer cantilevered body to easily flex forward or backward during installation and removal. CITE, EX1004, 8:56 ("easily fixed"), 9:66-10:1 ("easily removed."); EX1003 ¶¶164-66.

If not taught by Fukui, a POSITA would also find this claim obvious. EX1003 ¶167. A POSITA would have been motivated to make Fukui's hook flexible to ensure it is easy for Fukui's modules to be attached and removed. EX1004, 3:56, 3:67-4:1, 8:46; EX1003 ¶167. A POSITA knows how to make a structure flexible (select flexible material). EX1003 ¶167

O. Claims 23 and 49

Fukui discloses and renders obvious these claims for the same reasons provided for Element 1E and 1C. *See* EX1003 ¶¶190-91.

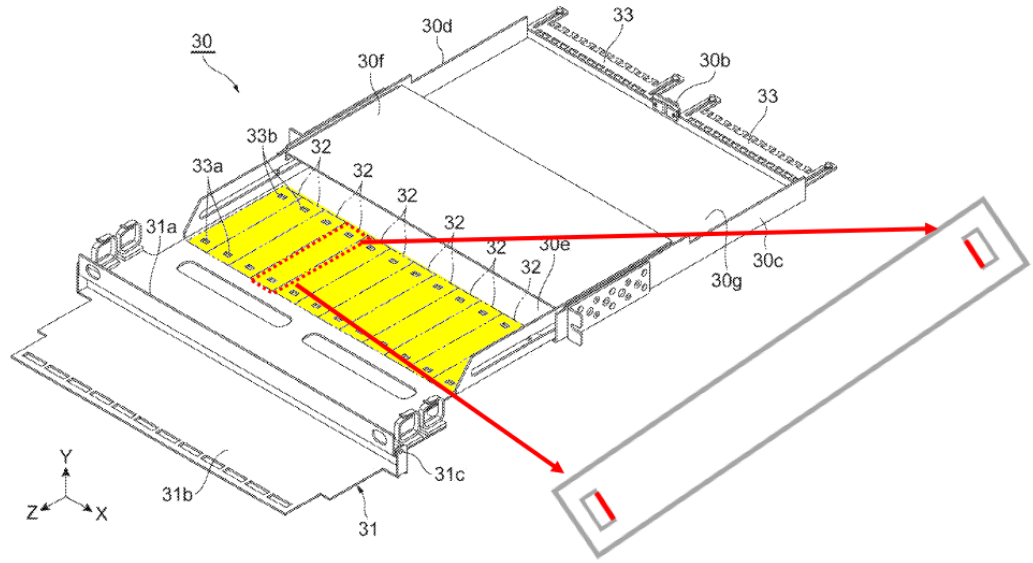
P. Claim 41

Fukui discloses this claim for the same reasons provided for the same language in claim 18. *See* EX1003 ¶¶226-27.

Q. Claim 42

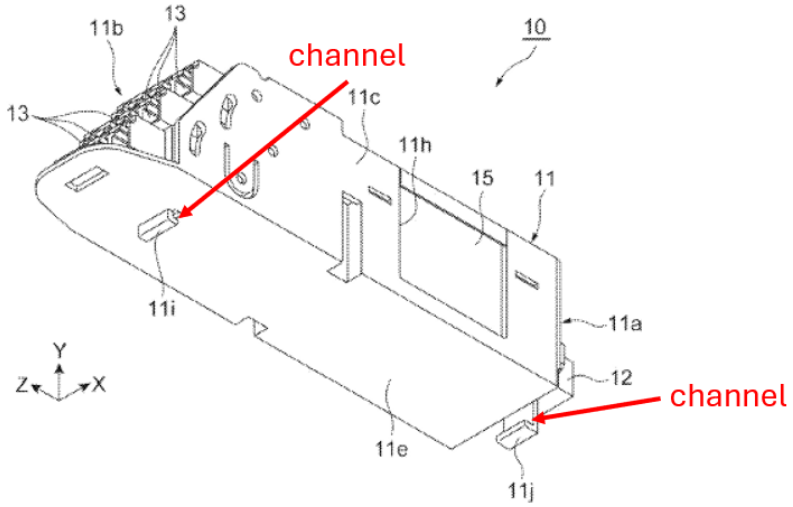
The edges of the holes in Fukui's cassette engaging portion form *"shoulders"* (red) that the two hooks attach to:

Fig.9

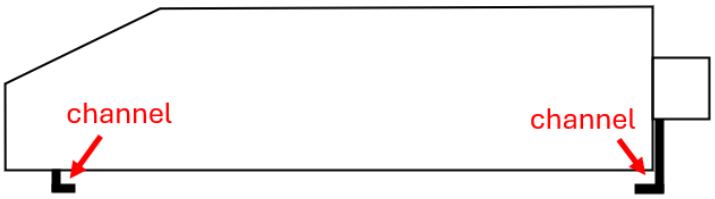


EX1004, Fig. 9, 8:45-56; *See* EX1003 ¶¶229-30. The hooks on Fukui's modules together with the bottom form *"channels"* to receive these shoulders:

Fig.2



EX1004, Fig. 2, 8:45-56; EX1003 ¶230.



EX1003 ¶230.

R. Claim 44

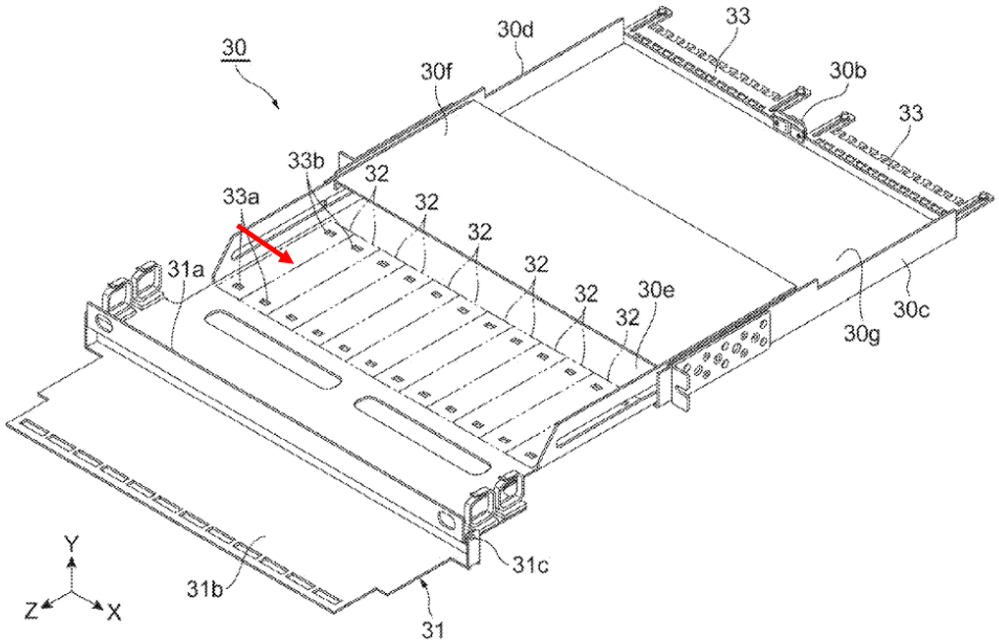
Fukui discloses or renders obvious Claim 44 for the same reasons provided for the same language in Element 1A. *See* EX1003 ¶¶231-32.

S. Claim 48

Claim 48 specifies the outer side edge of each cassette *"touches"* the outer edge of at least one other fiber optic 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 ¶241. There are no rails between the areas to prevent touching. 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, showing the modules touch:

Fig.8

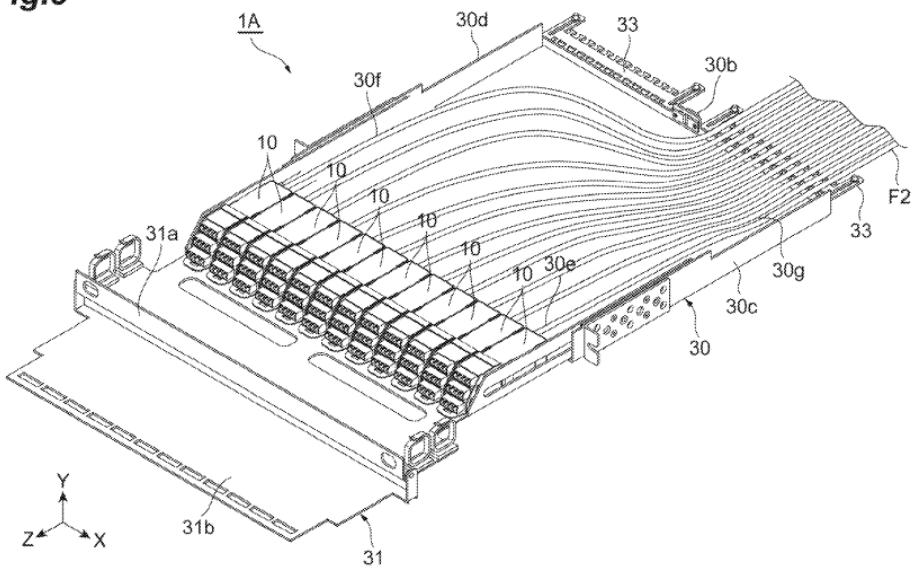

1A
30d
33
30f
30b
10
F2
31a
30e
30g
30c
30
31b
31
Y
Z
X

Fig.6

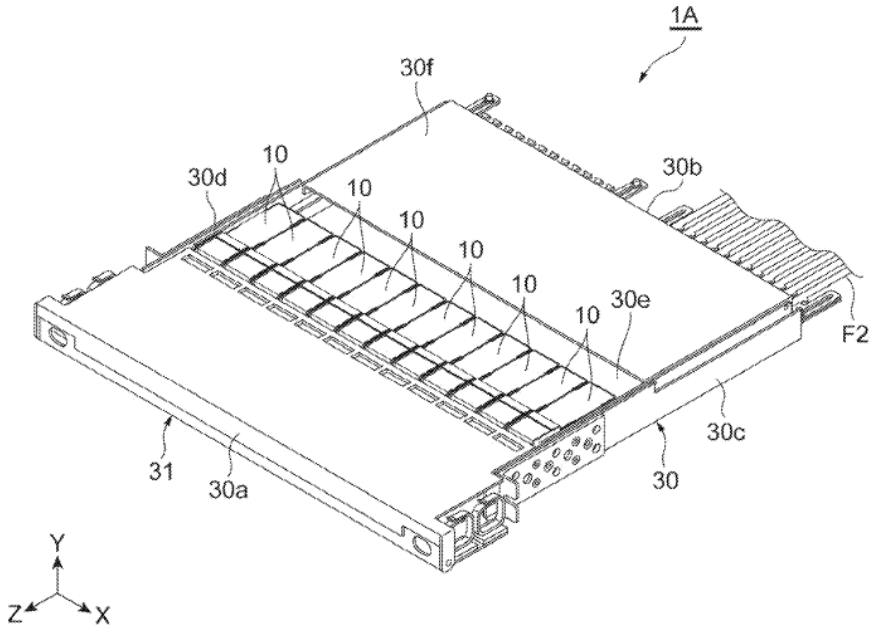
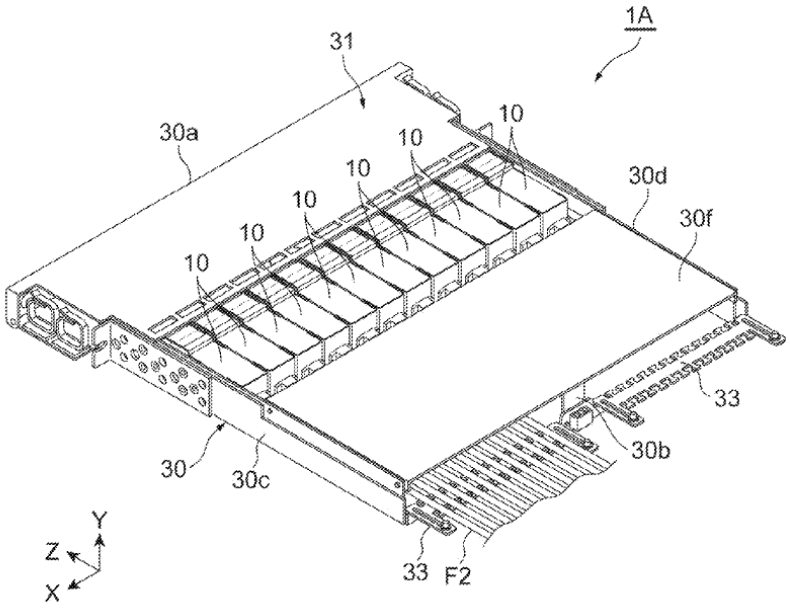

1A
30f
30d
10
30b
F2
30e
30c
31
30a
30
Y
Z
X

Fig.7



EX1004, Figs. 6-8; EX1003 ¶240.

Here is an annotation showing the proximity of two coupled modules 10 (orange) to three coupled unit modules (green):

Fig.8

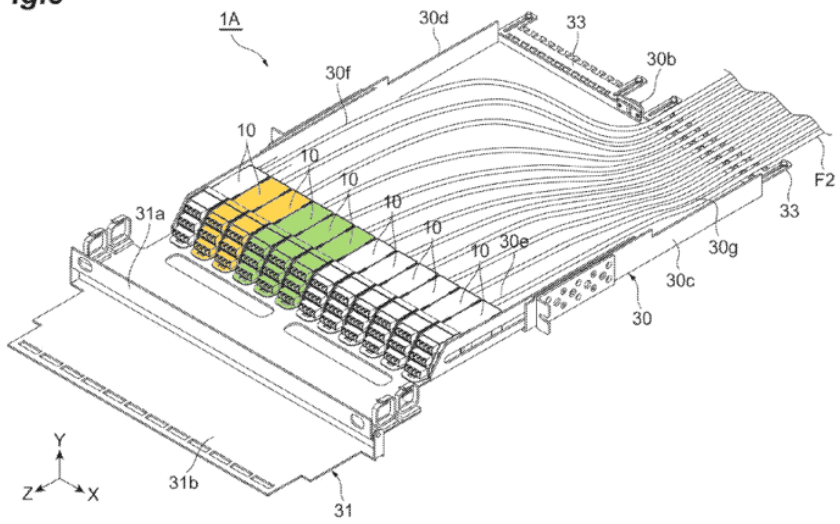
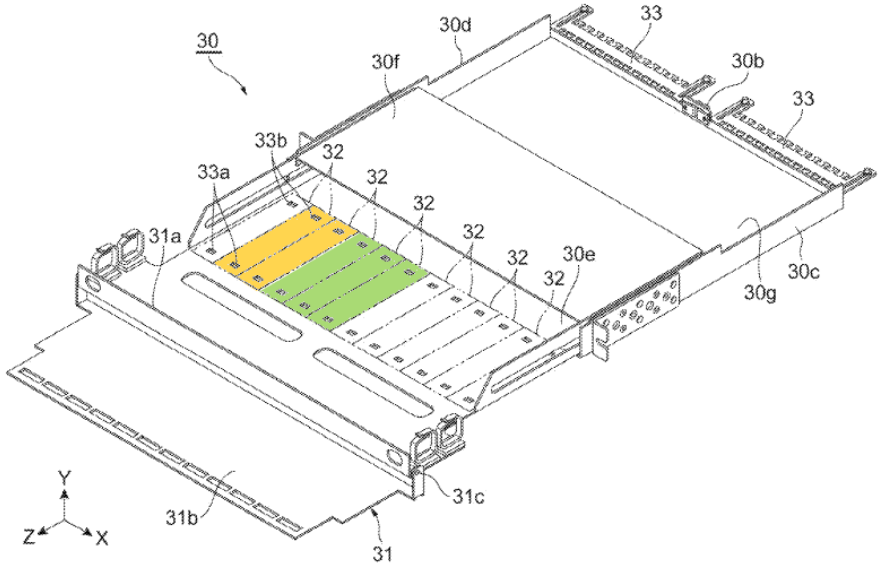


Fig.9



EX1003 ¶243. The double module touches the triple module.

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. *See, e.g.*, EX1001, Figs. 4A-4D. PO's specification also says its cassettes fit "snuggly side by side," which is exactly what is shown in Fukui's figures above. *Compare* ("snuggly side by side") *with* EX1004, Figs. 6-9.

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 ¶¶244-56. A POSITA would consider this obvious and predictable implementation of Fukui's teachings showing that the areas (32) for the modules touch.

A POSITA would have been motivated to have Fukui's modules touch for multiple reasons. First, it would make it easier to align the modules during installation. EX1003 ¶249. Making the modules touch would provide an intuitive, easy registration feature for aligning the hooks with holes. *Id.* Fukui is concerned with reducing the work for field personnel and facilitating easy insertion and removal). EX1004, 9:20-29 ("reducing the work"), 10:19-30 ("when inserting and drawing out the single-core optical connector…facilitate the inserting and drawing out work"), 4:38-43. Second, it would make the modules more rigid. EX1003 ¶250. Fukui 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."). Third, it would prevent material (e.g., dust) from getting into the gap or entering the modules

through the gap and interfering with coupling the modules or the fiber inside the modules. EX1003 ¶252.

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 ¶254. There are no rails or other intervening structures that would prevent having the modules touch.

Ground 2: The challenged claims are also all obvious based on Fukui plus Sedor

The challenged claims are also all obvious based on Fukui plus Sedor. Ground 2 addresses two points. EX1003 ¶¶281-92.

First, if PO disputes that Fukui itself discloses or renders obvious arranging the modules and their receptacles "along" (on or beside) the recited front tray end portion and front end portion of the tray, Sedor further discloses that element. Sedor, for example, discloses to place the modules and their receptacles on the front end of the tray. Figure 7, for example, shows the cassettes (30) arranged on the front of the tray (120):

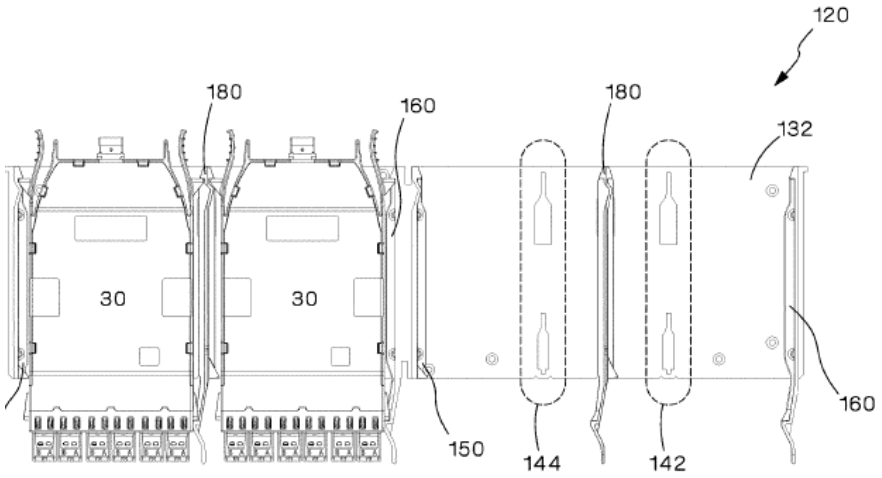


FIG.7

EX1005, Fig. 7; *see also* EX1005, Fig. 8-12; EX1003 ¶282. A POSITA would find it obvious to combine Fukui with Sedor's teaching and move Fukui's modules and their receptacles forward to be on or beside the recited portions of the tray. EX1003 ¶283.

Ground 1 explained that a POSITA would have been motivated to make it easier for field personnel to access the receptacles and minimize the need to slide the tray. Ground 1 explained that the proposed modification is trivial. The modification merely requires adjusting the position of Fukui's areas (32) (e.g., by moving the holes in the area forward). Ground 2 proposes the same modification (with the further evidence of Sedor); thus, the same motivations and reasonable expectation of success apply.

Second, if PO disputes that Fukui discloses or renders obvious the recited "housing" and "case," Sedor further discloses that element. Sedor discloses a conventional enclosure (200) with a top wall:

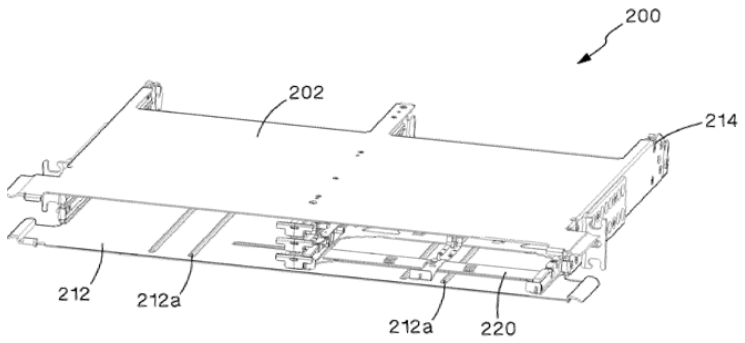


FIG.44

EX1005, Fig. 44, 7:32-35; EX1003 ¶284. A POSITA would recognize that Sedor's "enclosure" is an example of the claimed "case" and a "housing."

Ground 1 explained that a POSITA would have been motivated to place Fukui's tray and modules in full enclosure with a top wall to better protect Fukui modules and cover up Fukui's existing gap. Ground 1 also explained that the proposed modification is trivial. Adding a top wall merely requires screws and a piece of metal. Ground 2 proposes the same modification (with the further evidence of Sedor); thus, the same motivations, advantages, and reasonable expectation of success apply.

A POSITA reading Fukui would also naturally consider Sedor because they disclose the same type of system, i.e., modular fiber optic systems with multiple module sizes for mounting on trays.

Ground 3: Sauter anticipates or renders obvious all challenged claims

A. Independent Claim 1

1. Preamble

Sauter discloses fiber optic cassette trays (e.g., trays 102, 502, and 1510). EX1006 at Abstract; 1:54-58; 4:1-28; 2:44-45; Figs. 1-5, 7-8, 11, 15-16; 10:4-5.

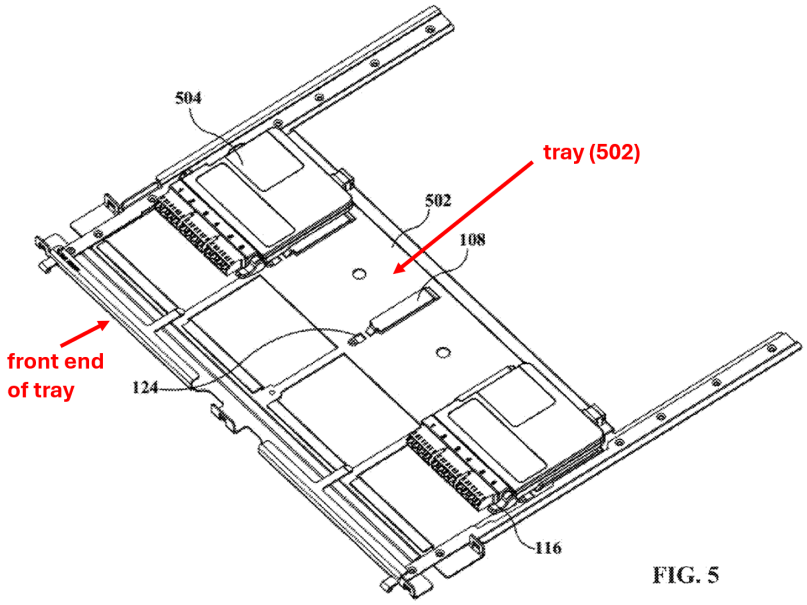


FIG. 5

The tray can be populated in multiple different configurations using modular cassettes of different sizes. EX1006 at Figs. 1-16, 1:5-6; 4:1-14; 8:4-20; 5:4-17; 9:60-62; Fig. 17; EX1003 ¶¶298-300.

2. Element 1A

Sauter discloses trays, see, e.g., trays 102, 502, and 1510, that satisfy this element. See, e.g., EX1006 at Abstract; 1:54-58; 4:1-28 2:44-45; Figs. 1-5, 7-8, 11, 15-16 (showing trays); 10:4-5; EX1003 ¶¶300-301.

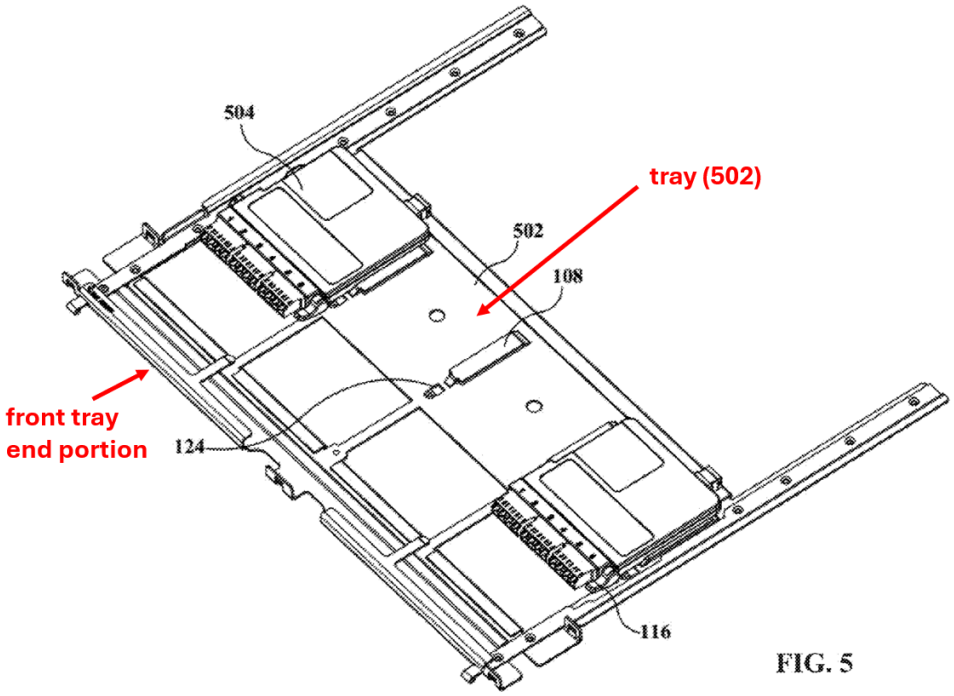
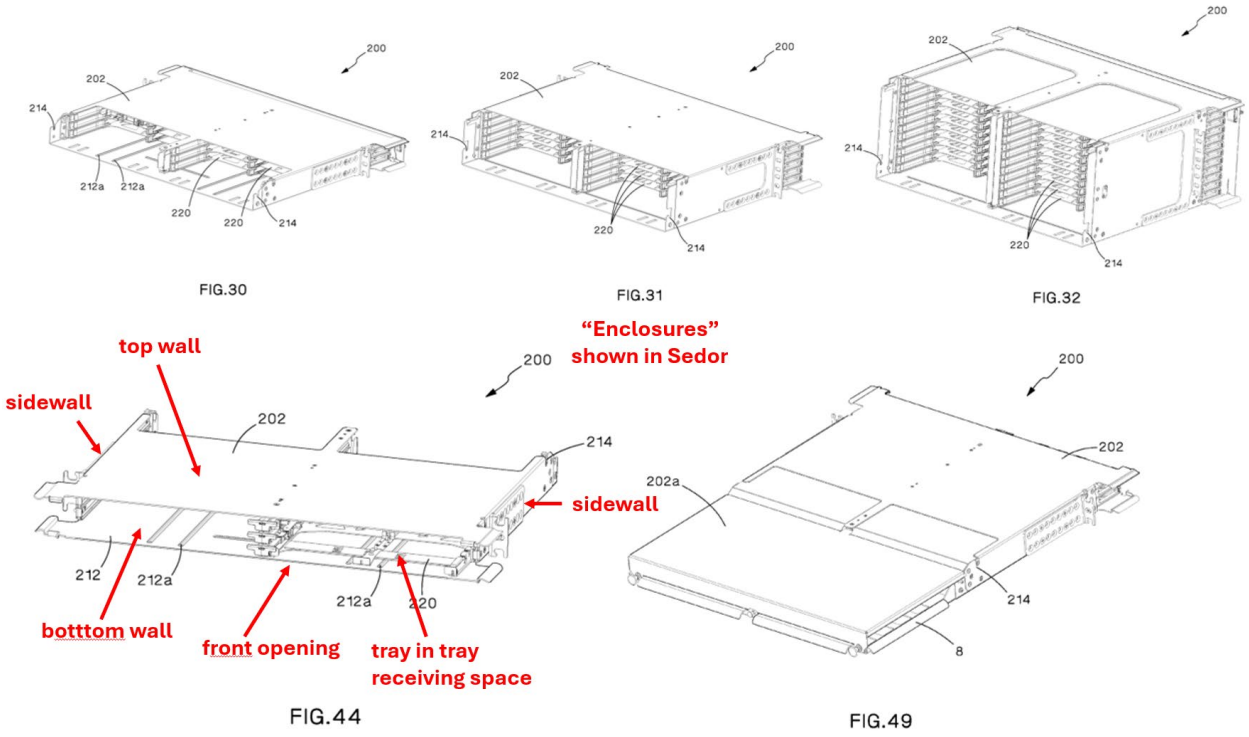


FIG. 5

Sauter's trays are configured to be slidingly received in a tray receiving space of a housing (enclosure 1508) of a fiber optic management system. EX1006 at 10:18-34, Figs. 15, 16; 4:1-28; 4:32-34 ("Example tray 102 is designed… to be installed in a fiber optic enclosure."); 6:39-40; 9:40-44; 10:4-5; EX1003 ¶302. As described above, Sauter's trays include side edges that are configured to be slidingly receiving into guide channels 1604 of enclosure 1508.

If PO argues a housing must have a top and bottom wall, a POSITA understands that "an enclosure" includes a top wall, bottom wall, and side walls to

enclose the trays. EX1003 ¶303; EX1005 at Figs. 30-32, 44-50; 1:13-15; 3:1-41; 13:5-7.



EX1005 Figs. 30-32, 44, 49.

Figures 15 and 16 of Sauter show an enclosure 1508 that is a housing. EX1006 3:1-3; Figs. 15, 16. The top wall in the figure has been made transparent to reveal internal components, but its outline is still there. Fig. 15 still shows the edges of a two-piece top wall and fastener holes to secure the top wall to the sidewall. EX1003 ¶304.

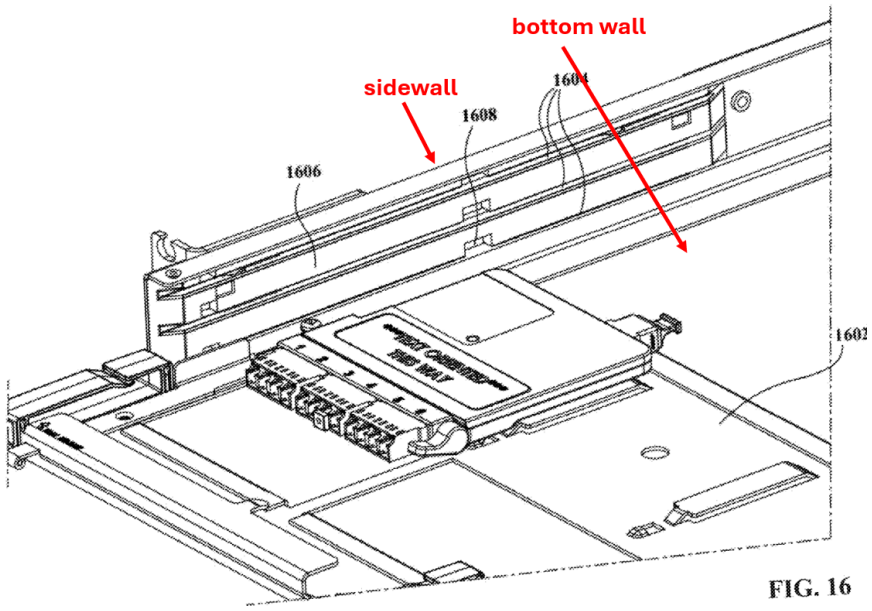


FIG. 16

EX1006, Fig. 16.

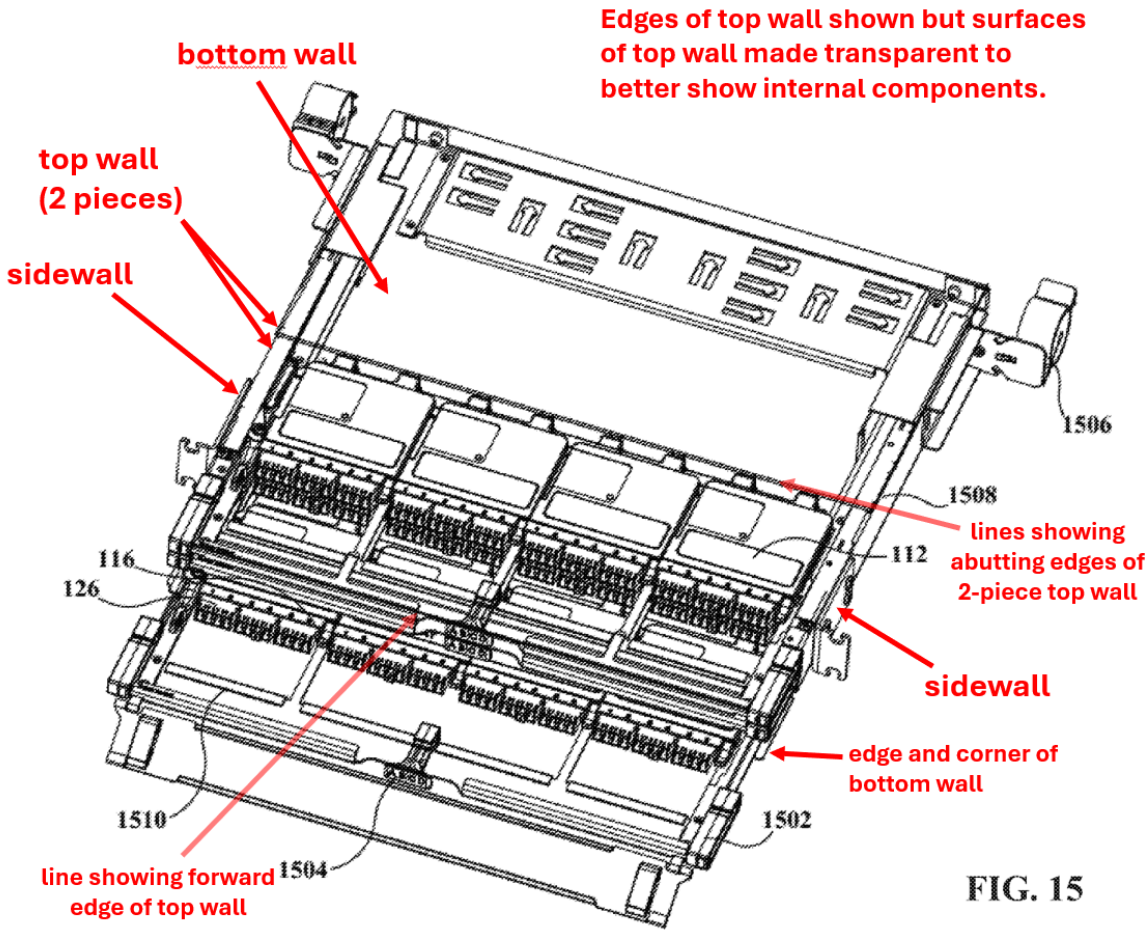
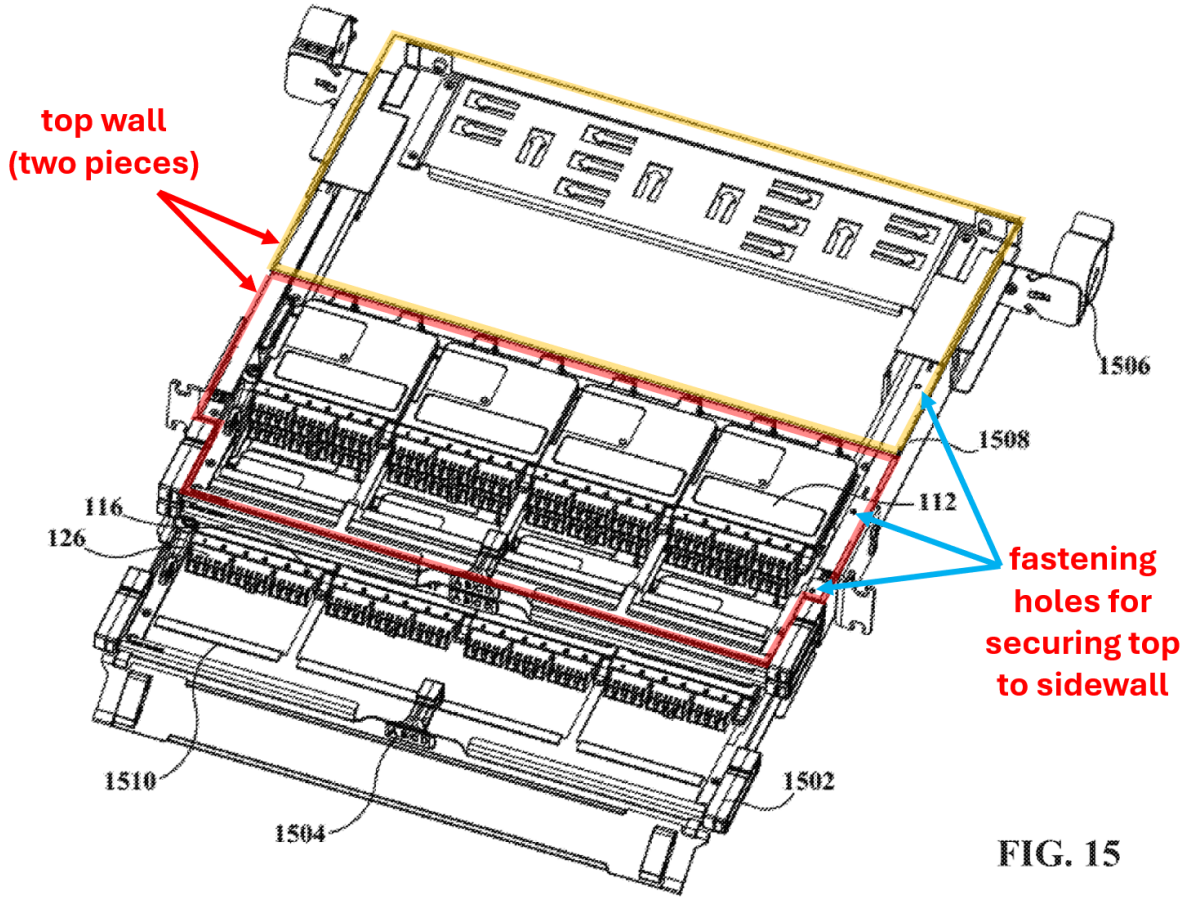


FIG. 15

EX1006, Fig. 15.



EX1006, Fig. 15; EX1003 ¶304. The drawings originally filed by Sauter with his application included greyscale shading that corroborate Sauter's "enclosure" would be understood to include top and bottom walls. EX1013 at 37, 38, Figs. 15, 16 (see below); EX1003 ¶305-306.

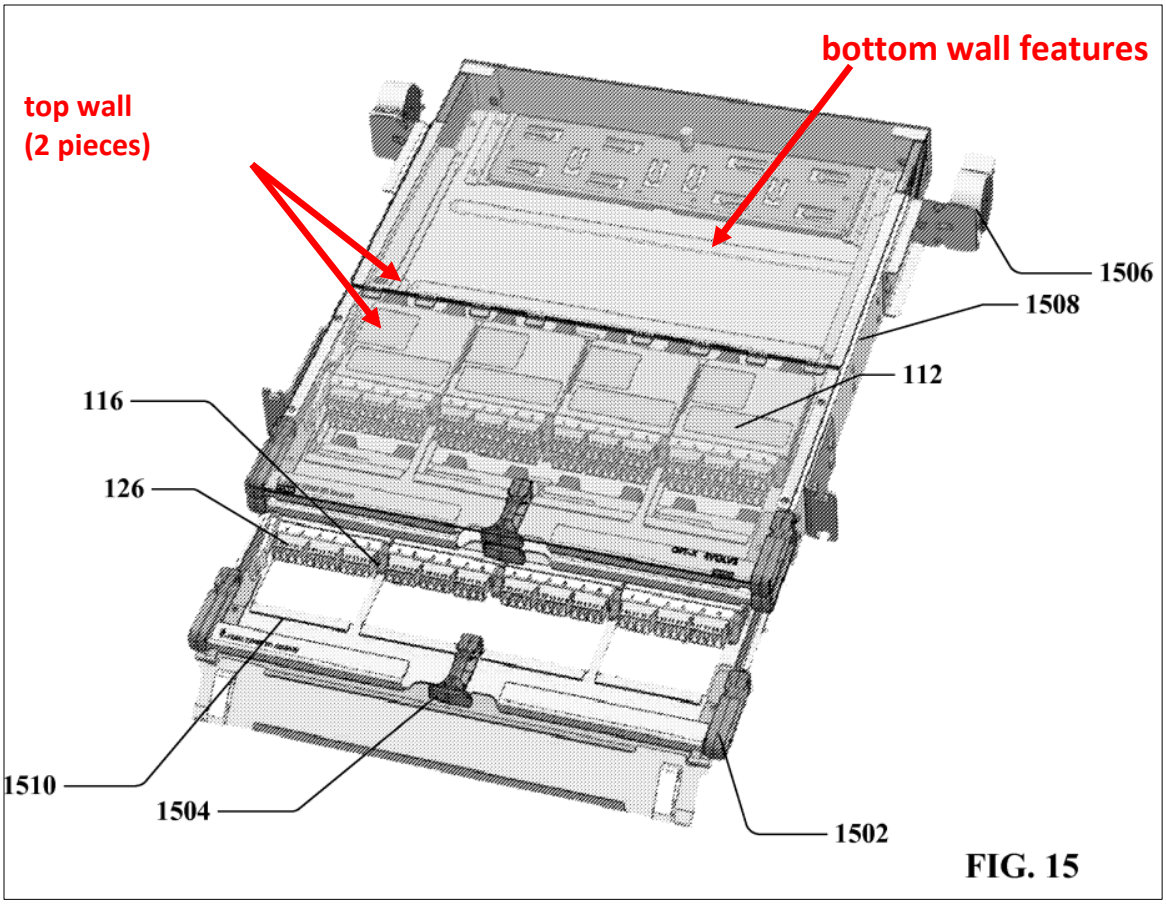


Figure 15 as originally filed by Sauter included greyscale shading.

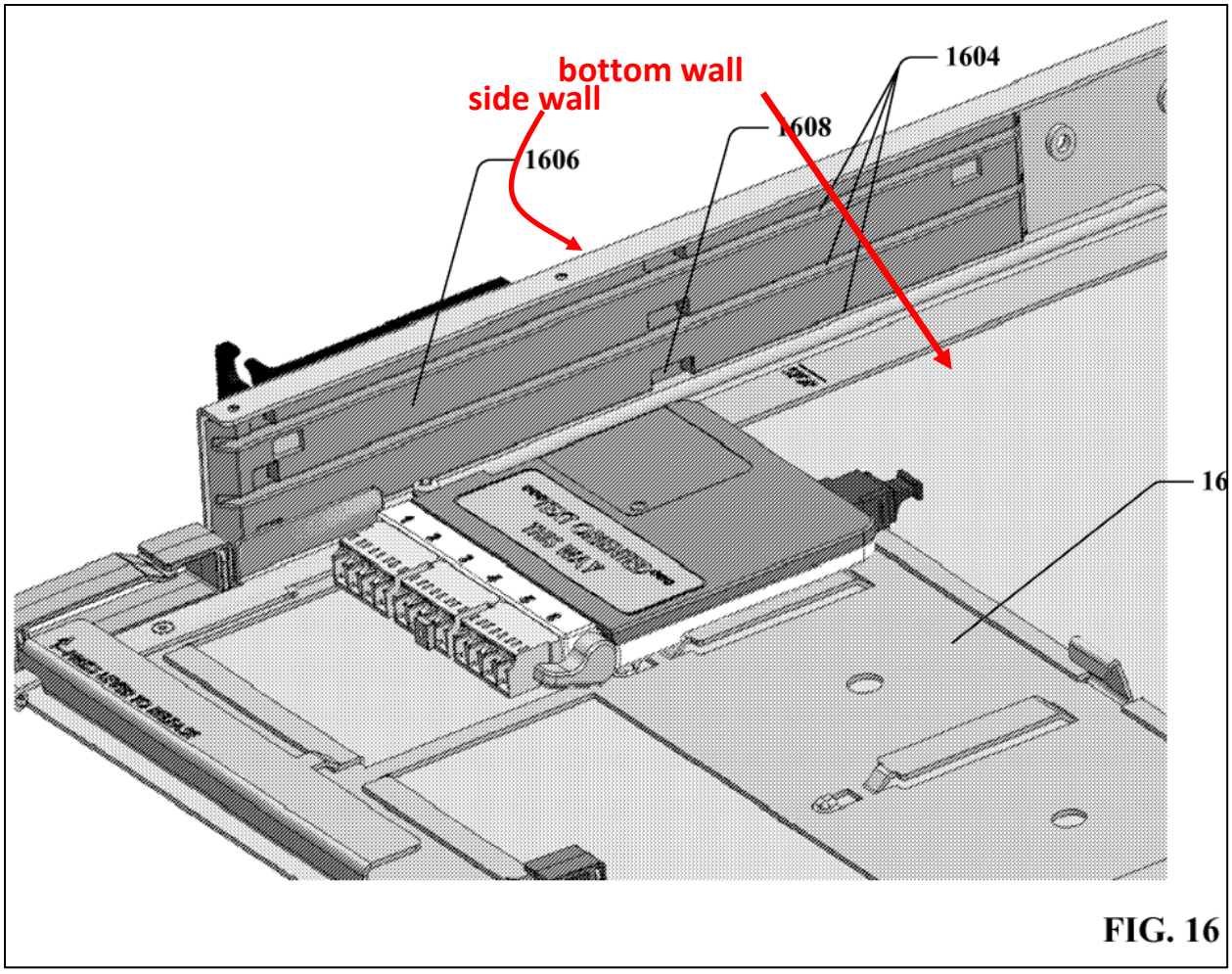


FIG. 16

Figure 16 as originally filed by Sauter included greyscale

Alternatively, including top/bottom walls on Sauter's enclosure if necessary to define a "housing" would have been obvious. It was obvious to protect the fiber optic components by including top and bottom walls to surround the components above and below. EX1003 ¶307. Adding flat pieces of sheet metal to the top and/or bottom of the enclosure would have been within the skill of a POSITA. It only requires a mechanical connection that could be secured with simple screws.

EX1003 ¶307. Sauter already suggested fastener hole locations for making the connection.

3. Element 1B

Sauter's tray is configured to receive a plurality of different modular fiber optic cassette configurations when the tray is slidingly received in the tray receiving space. EX1003 ¶308. Figs. 15-16 show examples.

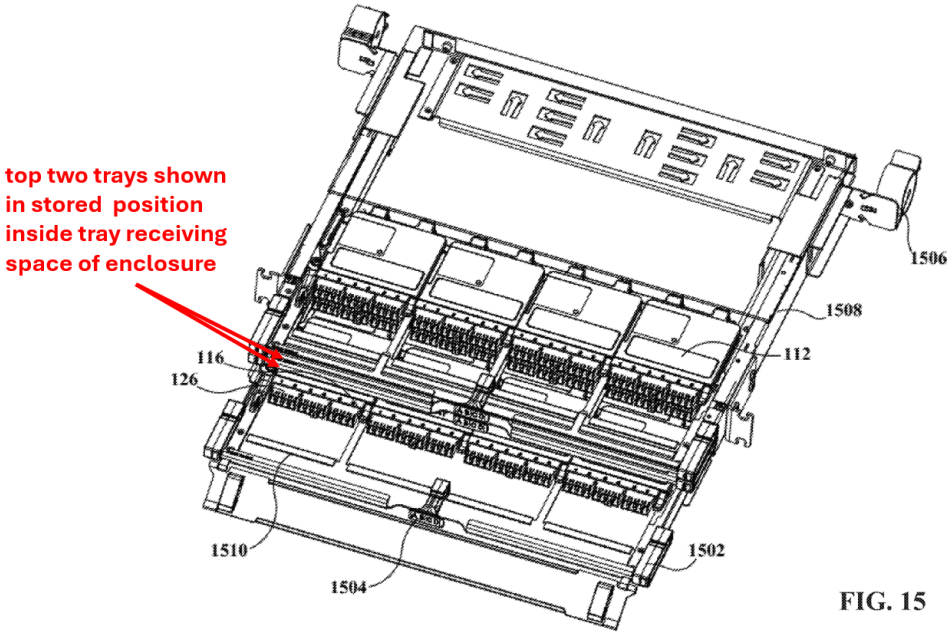
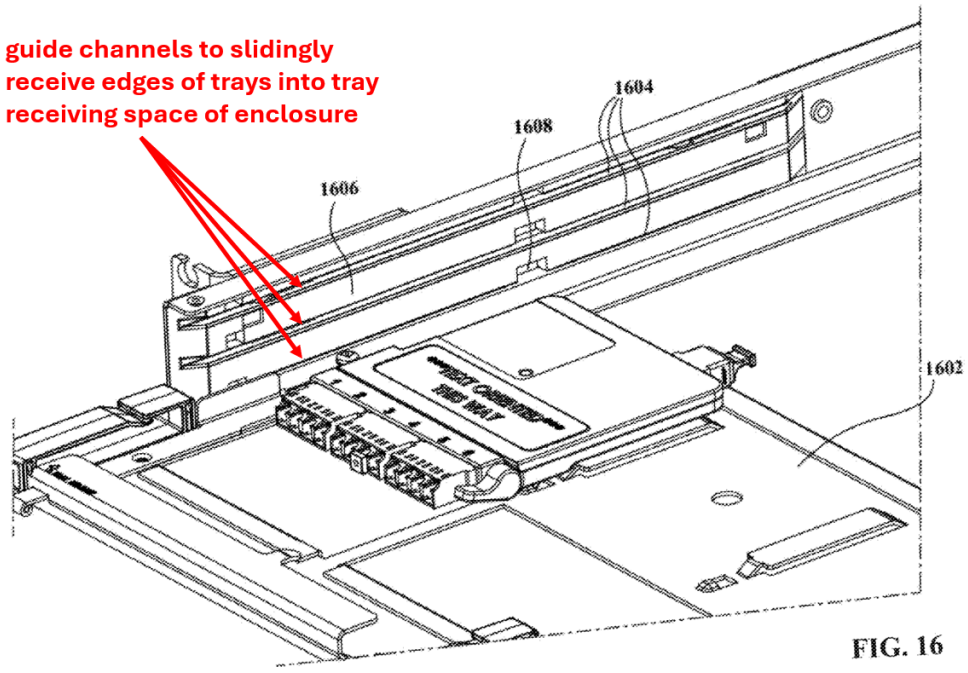


FIG. 15



EX1006 at Figs. 15, 16, 10:21-28.

Sauter's system includes modular cassettes. "Any combination" of different cassettes can be on the tray to form multiple cassette configurations. EX1006 at 4:7-13; 5:4-17; 9:60-62; Fig. 17; EX1003 ¶¶309-310. Two example configurations are described at Fig. 5 and 6:42-56.

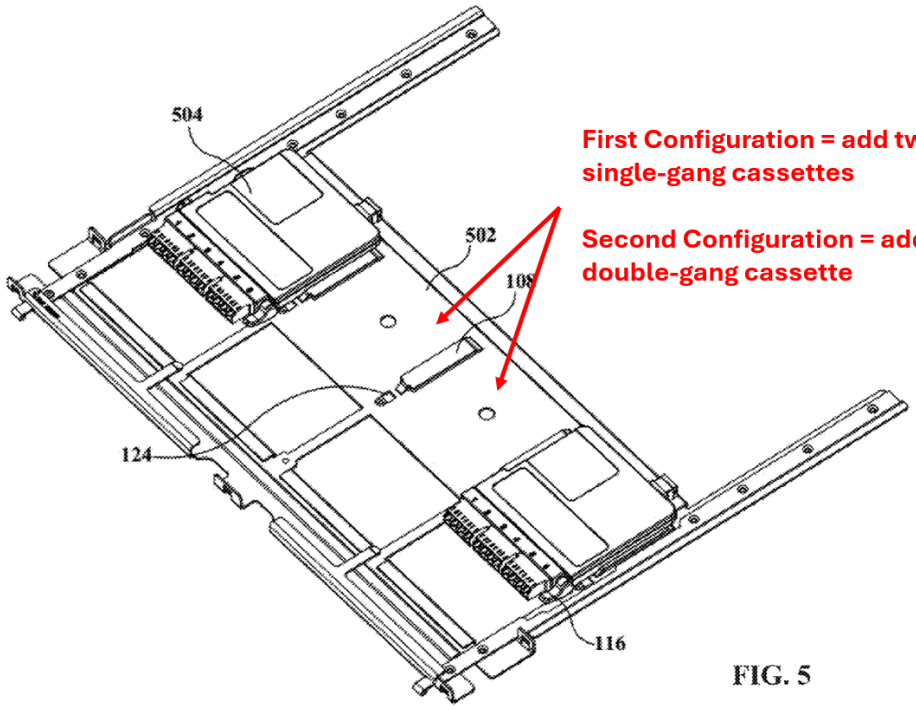


FIG. 5

4. Element 1C

"wherein the plurality of different modular fiber optic cassette configurations include a selected plurality of fiber optic cassettes that are each configured to be arranged side by side…"

In Sauter, multiple cassettes can be chosen to form the cassette configurations. As discussed above for Element 1B, the various possible configurations shown and enabled by Sauter's system can include, for example, two single-gang cassettes and a double-gang cassette (EX1006 at 6:42-56), and when arranged on Sauter's tray the cassettes are side-by-side along the tray. This can be seen in Sauter at Figs. 2-3, 5, 7-8, 11, and 15. EX1003 ¶311.

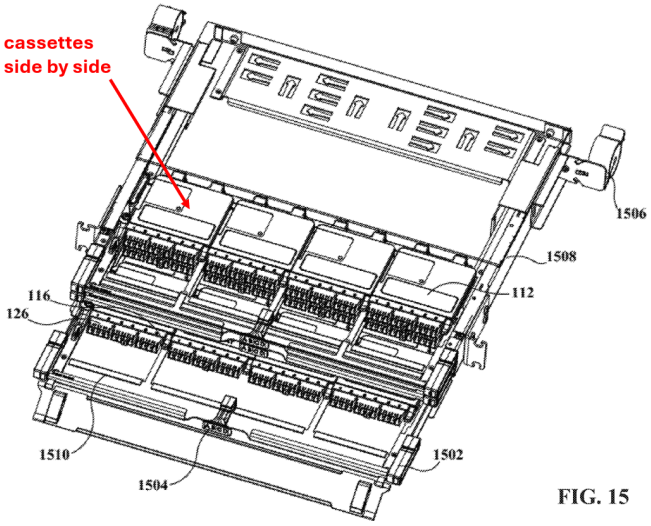


FIG. 15

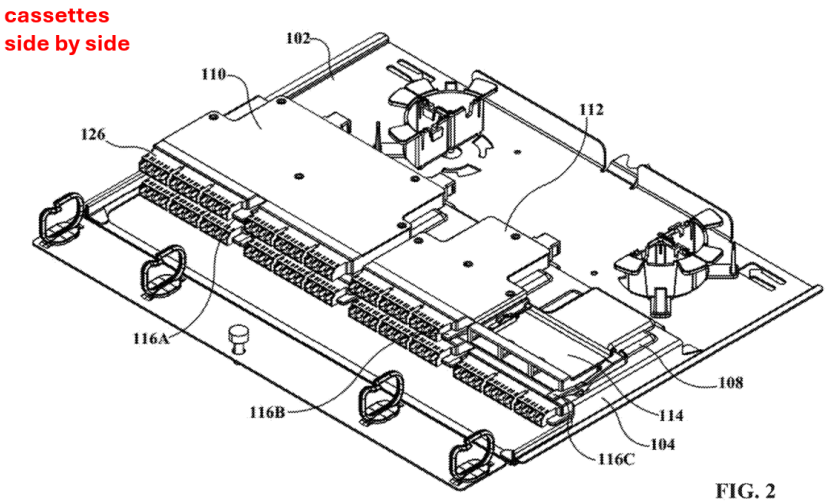


FIG. 2

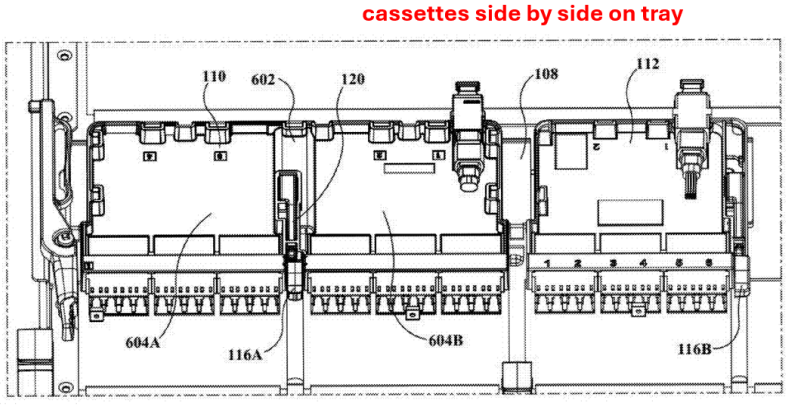
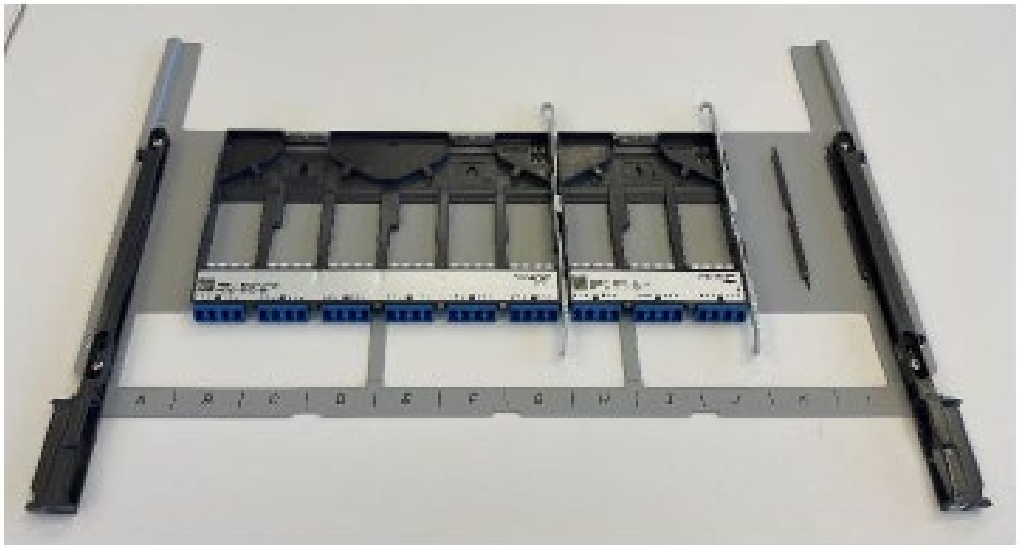


FIG. 7

The trays include rail guides 108 and apertures 124 (see Figs. 5 and 1) defining adjacent bays that enable multiple cassettes to be aligned side-by-side along the width of the tray. EX1006 at 6:42-56; 5:12-17; 5:60-6:29; 8:29-9:39; 5:36-59; 9:40-62; 7:3-36; EX1003 ¶311-313.

"…along the front tray end portion of the tray…"

Under PO's application of this limitation, Sauter's cassettes are arranged "along the front tray end portion of the tray." EX1003 ¶318. PO has accused a product just like Sauter that places the cassettes set back from the front edge or end of the tray by finger access windows.



EX1012, 17; EX1003 ¶318.

As shown in Figs. 5 and 15, Sauter's cassettes when mounted on a tray are arranged set back from the front tray end portion. Sauter's cassettes are arranged on rectangular openings formed in the tray. EX1003 ¶314-315.

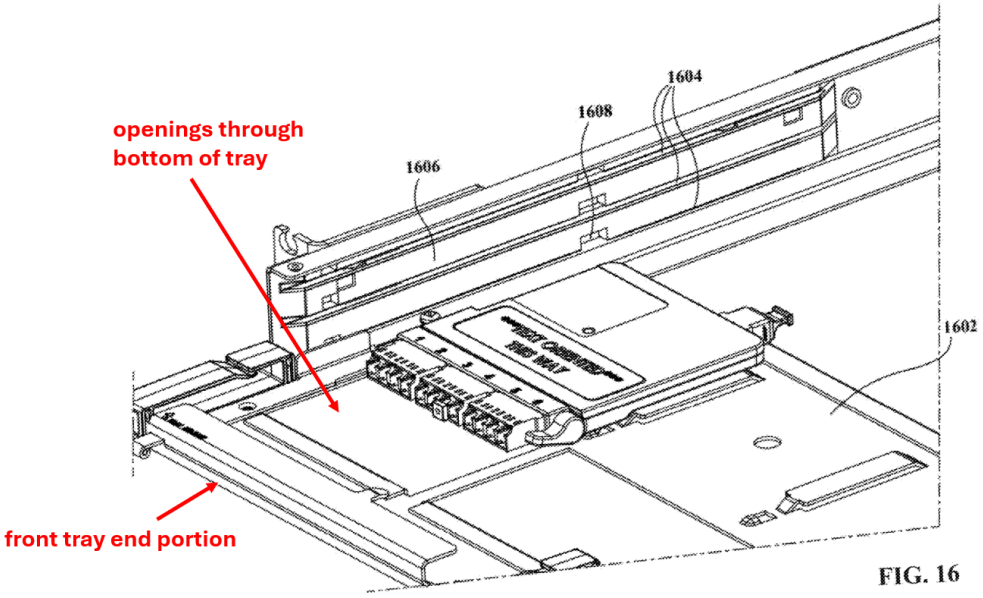


FIG. 16

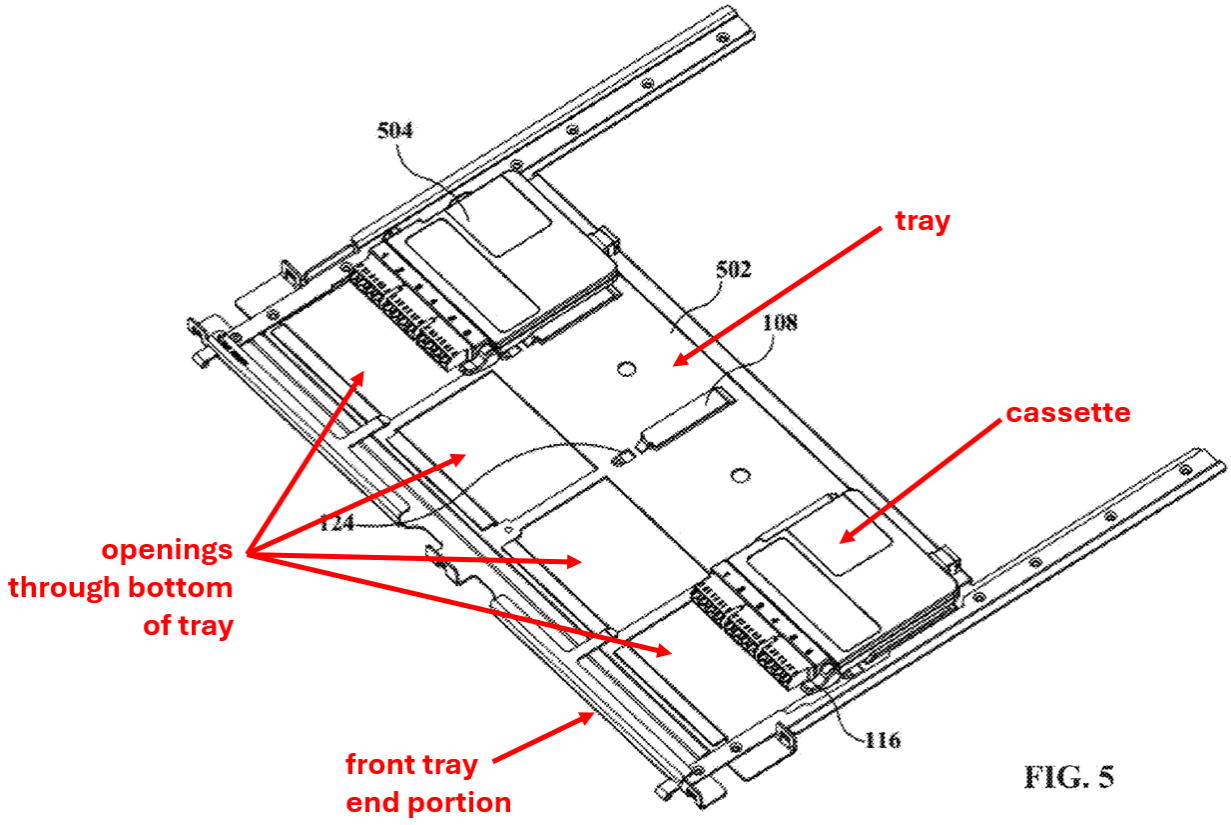


FIG. 5

Also, it would have been obvious to alter Sauter by mounting the cassettes on the front tray end portion. One would have been motivated to do so to improve the accessibility of the connection locations at the front of the cassettes and also to

minimize the risk of damaging optical fiber components when sliding trays in and out of the enclosure. EX1003 ¶316. It makes the connection locations quicker and easier to reach. EX1003 ¶316.

A POSITA would have a reasonable expectation of success. EX1003 ¶317. This only requires shifting the guide rails and aperture in the tray forward. Sauter already shows how this can be done. In Fig. 1, the upper row of cassette are positioned on the very front edge of the upper tray layer.

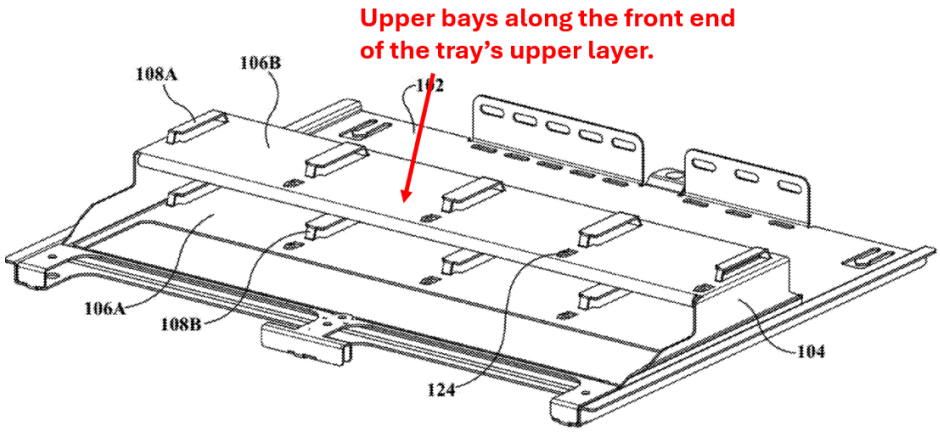


FIG. 1

EX1006 at Fig 1.

"…directly adjacent…"

During prior prosecution, the PO repeatedly stated that the term "directly" when modifying "adjacent" excluded arrangements that included "any intervening structures" such as an intervening "rail." EX1002 at 135, 189. However, PO is accusing of infringement a system that has rails on the tray that only partially separate the cassettes. EX1003 ¶322; EX1012 at pp. 17, 19; EX1016 at pp. 12, 27,

20, Figs. 26-28, 17, 18; EX1029 (screen capture of Propel instructional video at https://www.youtube.com/watch?v=_agZJP5tZWc at 1:55)(showing cassette being mounted on rails):



At least under PO's proposed construction and application of this term, Sauter discloses this limitation. EX1003 ¶323. 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 almost touching each other. The rail guides are not as tall as the cassettes. The rail guides on the tray

are not as long as the cassettes (i.e., the rail guides do not extent to the front of the cassettes). The cassettes at least partially overlap the rail guides on the tray. EX1003 ¶323. There are portions of the cassette sides between which the rails do not intervene. See, for example, Sauter at Figs. 5, 16, 13, and Fig. 8 annotated below:

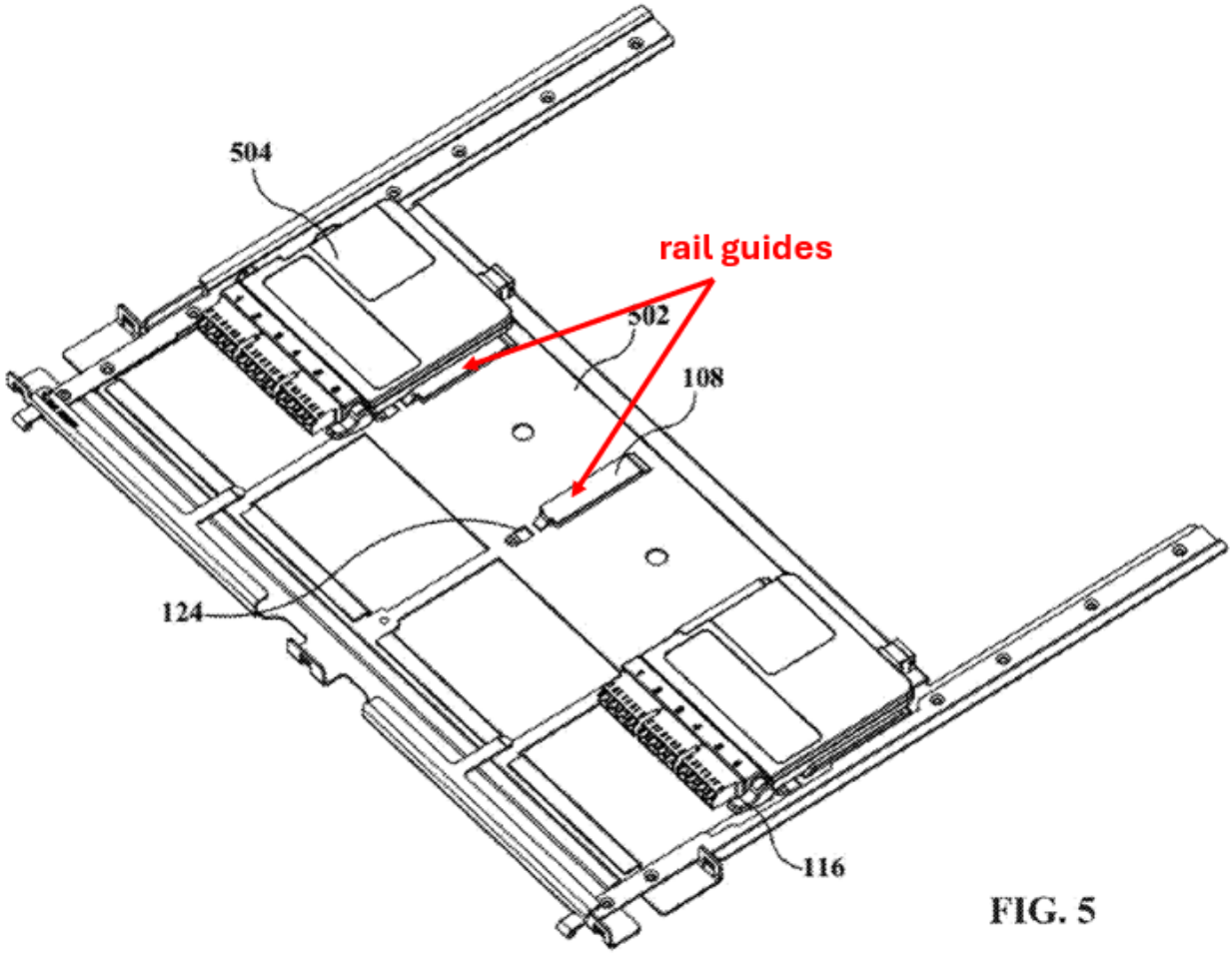


FIG. 5

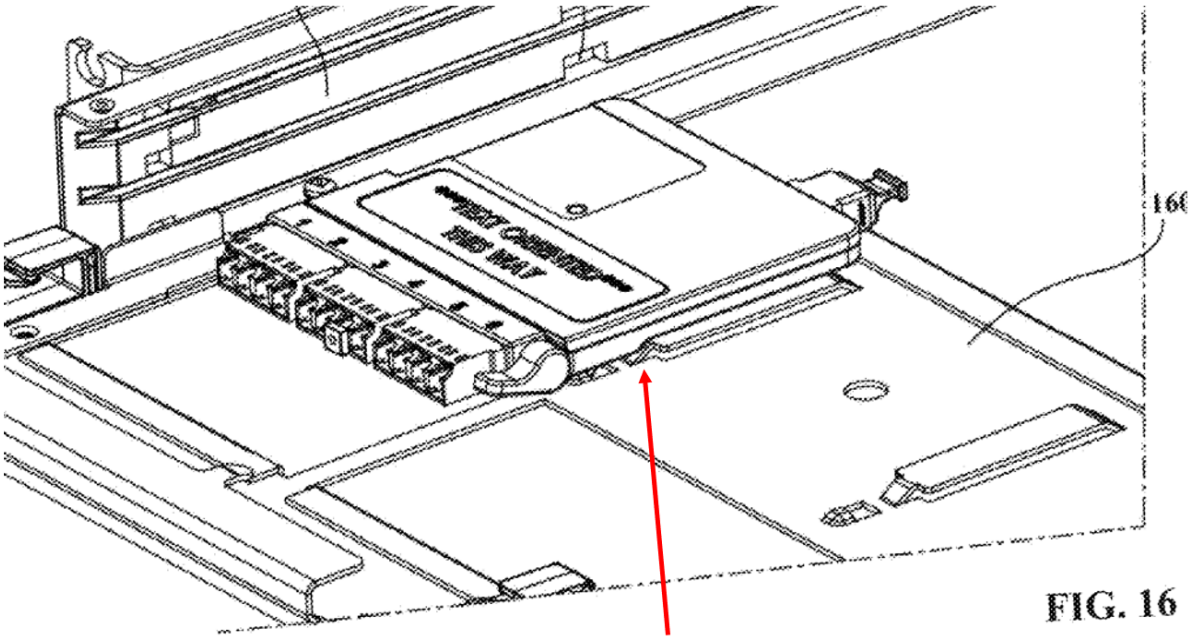


FIG. 16

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.

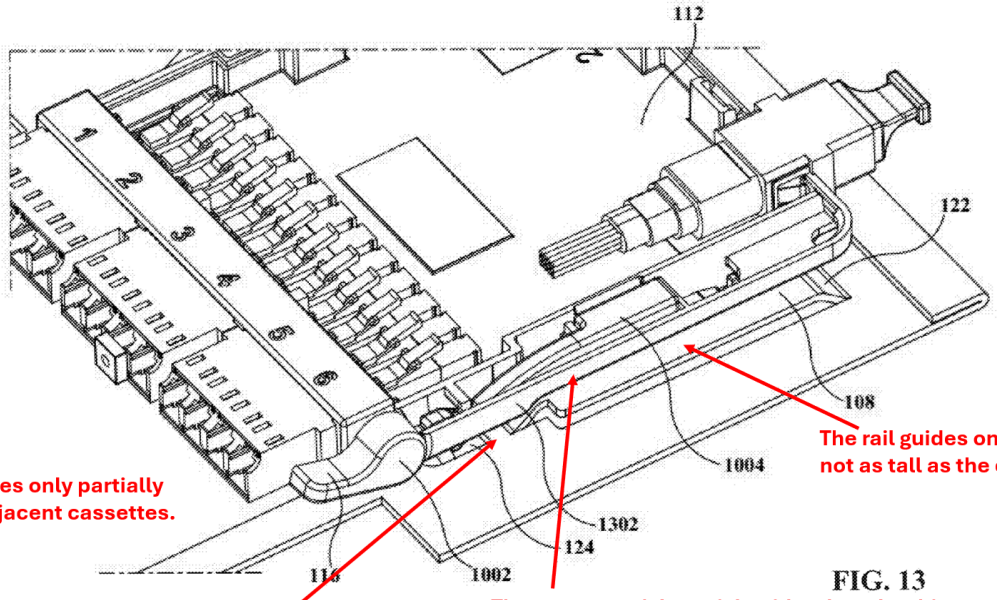


FIG. 13

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.

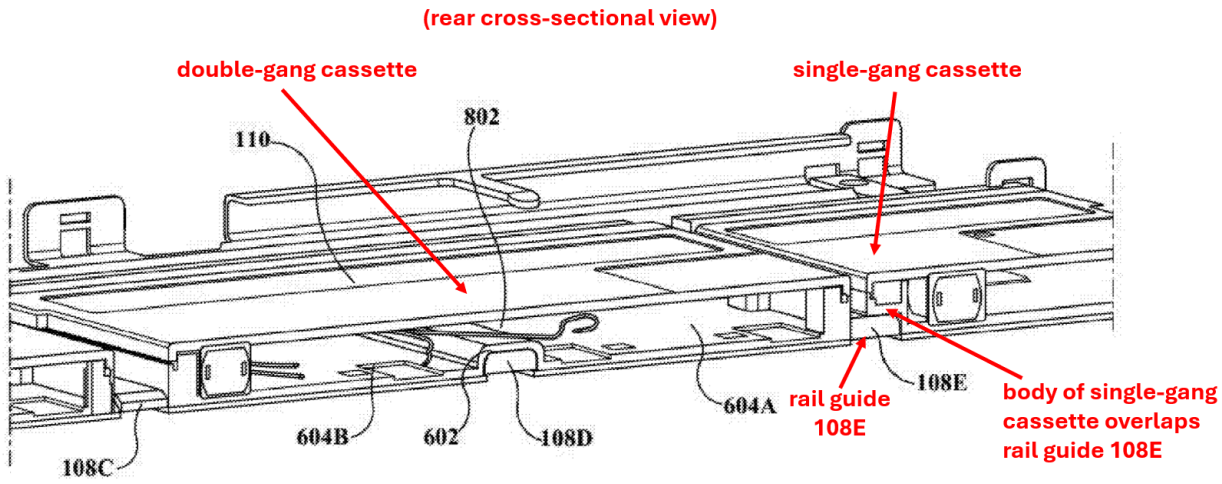


FIG. 8

EX1003 ¶323. The figures in Sauter show that portions of the sides of the cassettes are almost touching. See for example, Fig. 15 (annotated below):

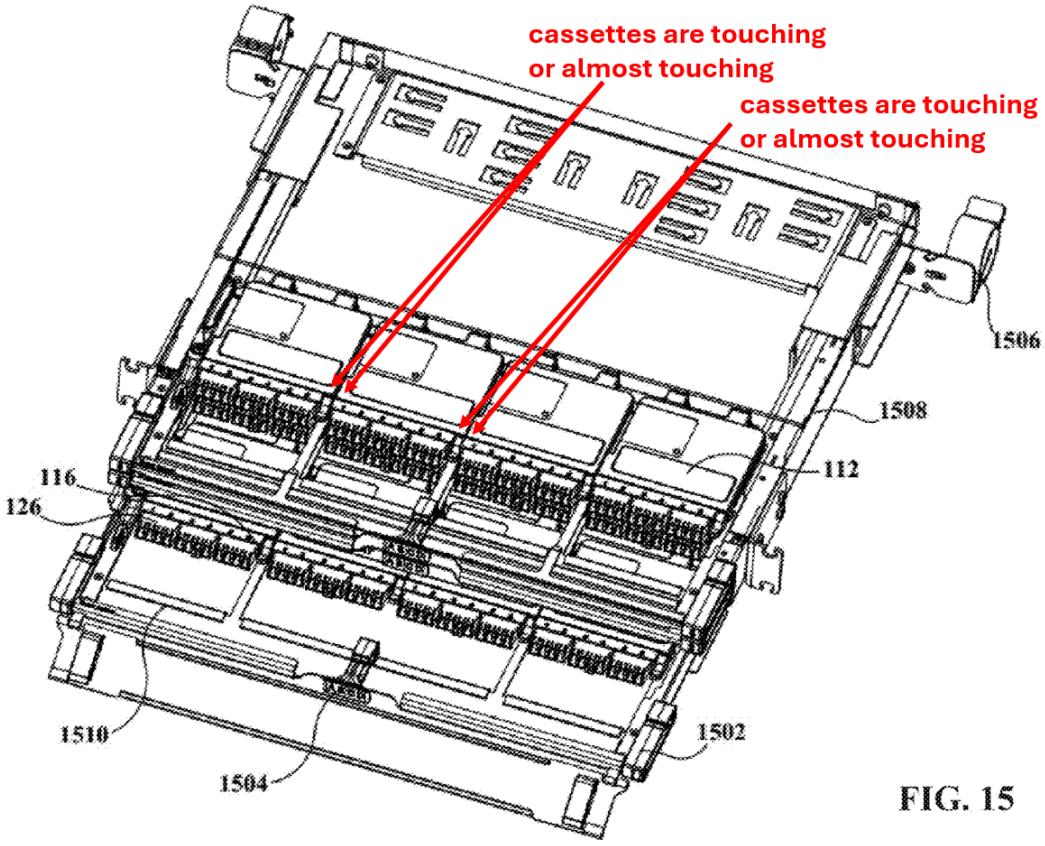


FIG. 15

In addition, Sauter teaches an alternative configuration (see EX1006 at 7:48-60) that places the latching mechanism of the double-gang cassette on the right side of the cassette, instead of in the middle of the cassette. EX1003 ¶324-325.

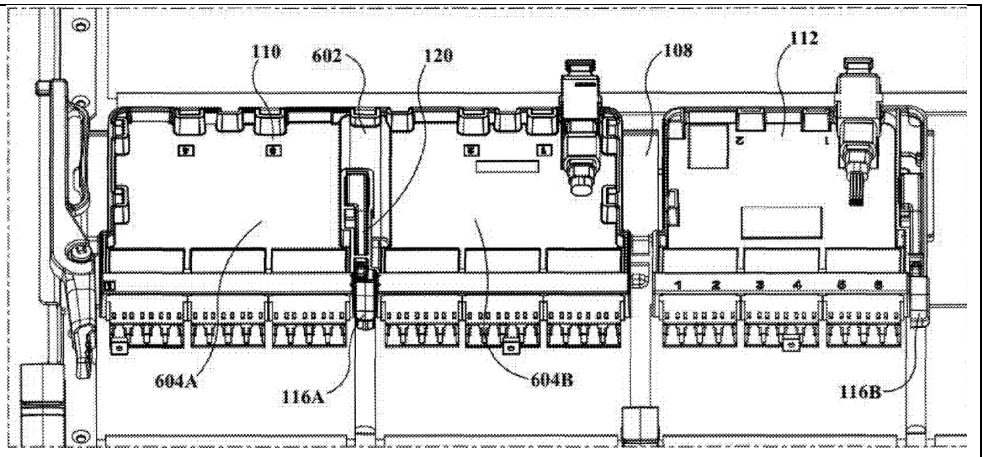
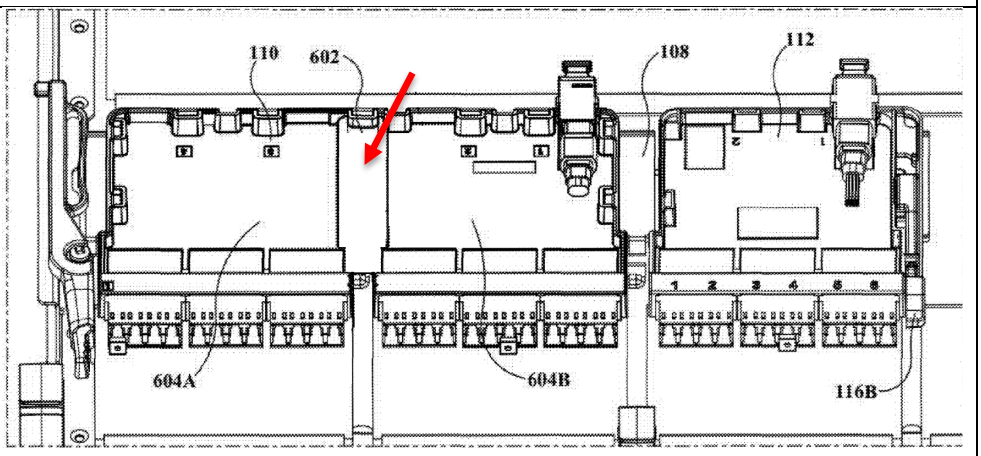
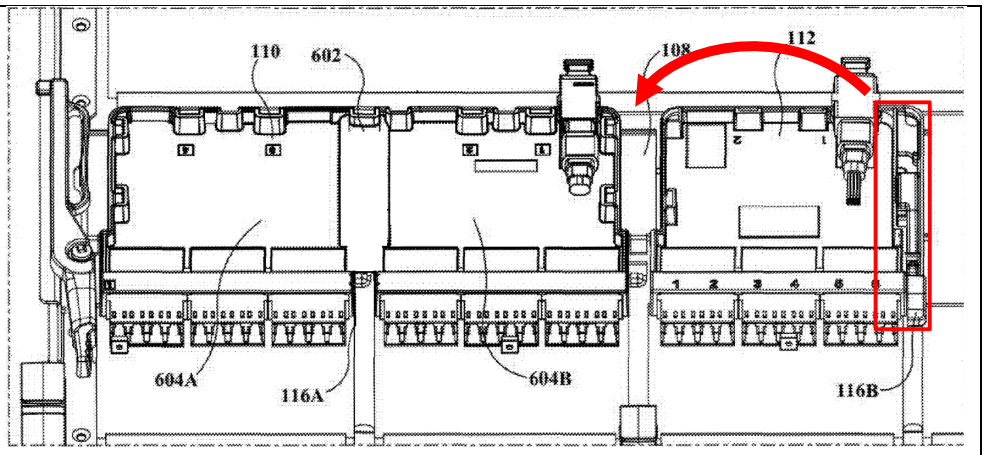
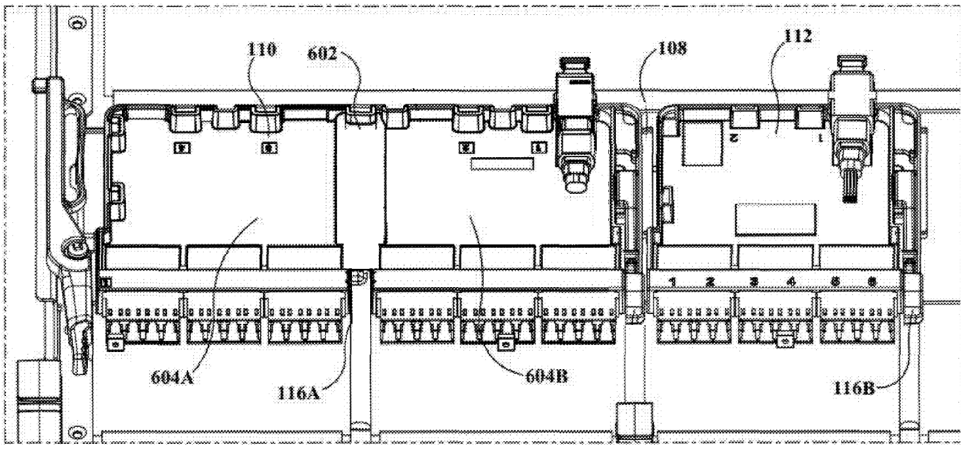
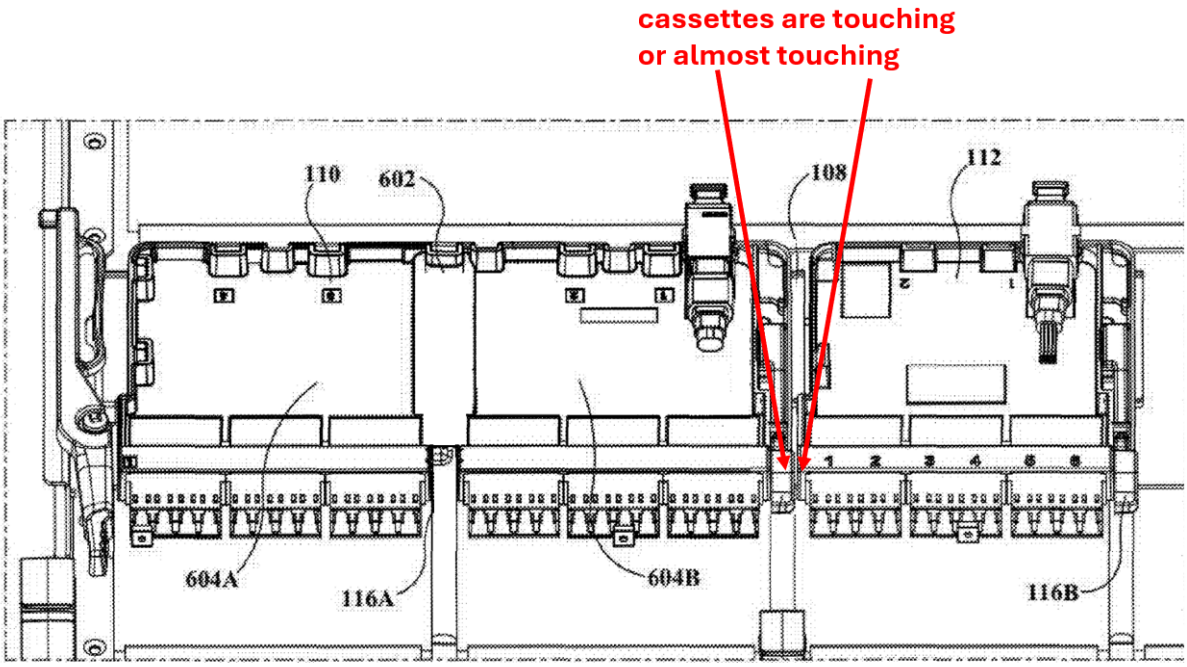
Fig. 7 as shown in Sauter (with latching mechanism 120, 116A in the middle of cassette 110)	
Fig. 7 without middle latching mechanism 120 (including without release latch 116A)	

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.	

EX1003 ¶325. The resulting modification of Fig. 7 figure would look like this in which the right side of the double-gang cassette is touching or almost touching the single-gang cassette:



EX1003 ¶325.

Therefore, at least under PO's application, Sauter discloses this limitation because even though Sauter includes rail guides on the tray that partially separate the cassettes, there remain other side portions of adjacent cassettes that are touching or almost touching. EX1003 ¶326.

5. Element 1D

The adapters at the front of Sauter's cassettes are fiber optic plug receiving receptacles. See, e.g., EX1006 at Figs. 2, 9, and 11 below:

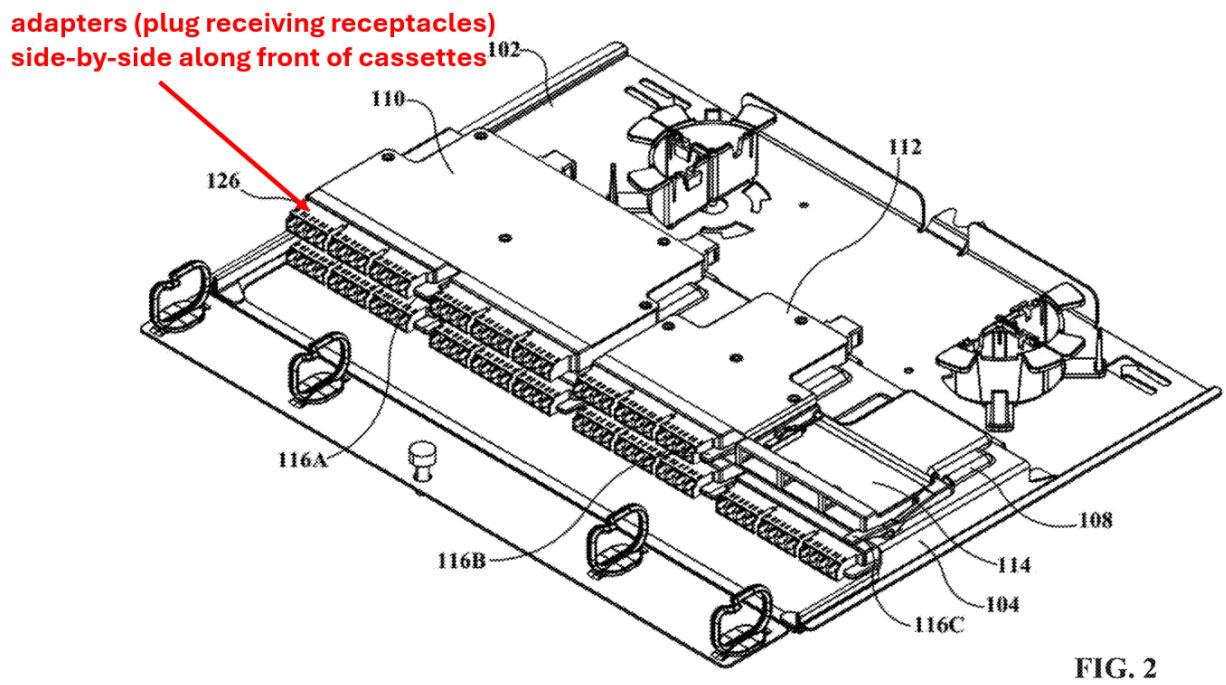

adapters (plug receiving receptacles)
side-by-side along front of cassettes
102
110
112
126
116A
116B
108
114
104
116C

FIG. 2

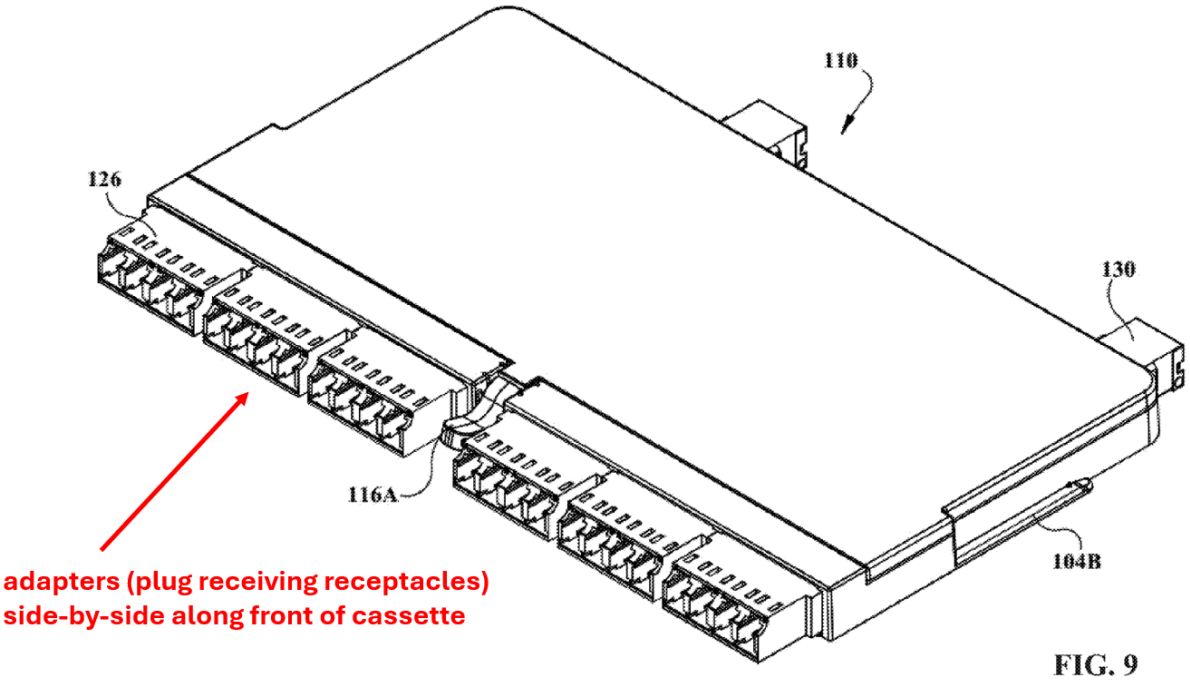

110
126
130
116A
104B
adapters (plug receiving receptacles)
side-by-side along front of cassette

FIG. 9

adapters (plug receiving receptacles) side-by-side along front of cassettes

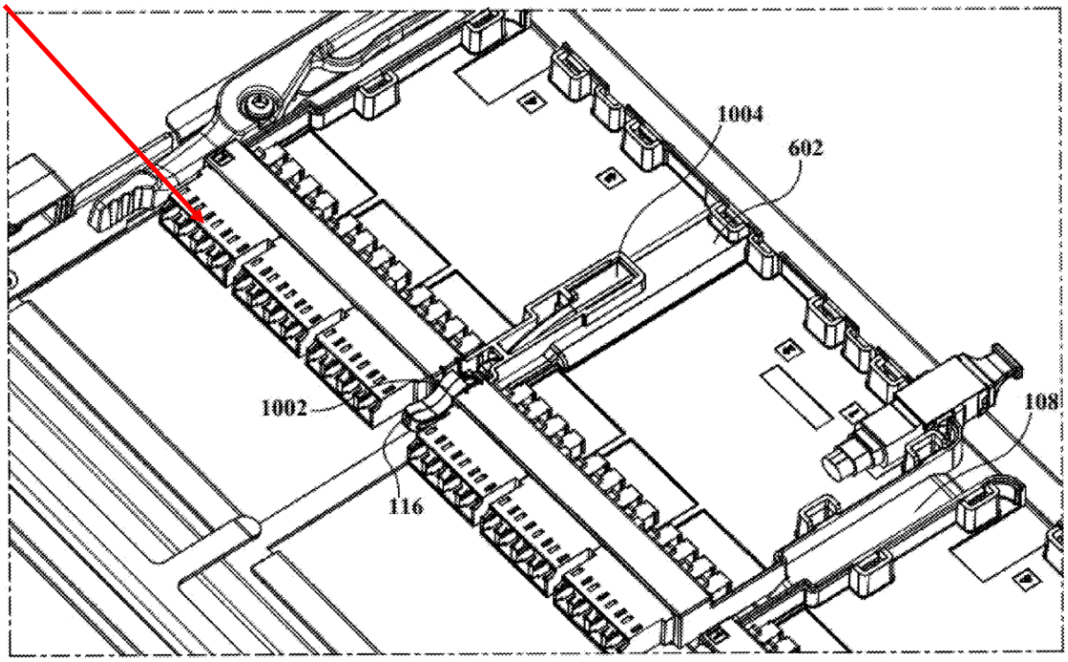


FIG. 11

See also EX1006 at Figs. 3, 5-7, 10, 13, 15-16; 8:4-6; 8:7-28; EX1003 ¶327.

6. Element 1E

Sauter's trays are configured with 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 when each of the plurality of fiber optic plug receiving receptacle portions (adapters) are arranged side by side in a row on the trays. EX1006 at 5:60-6:14; 6:15-29; see also Figs. 1-2, 4-8, 10-14, 16; EX1003¶328-333.

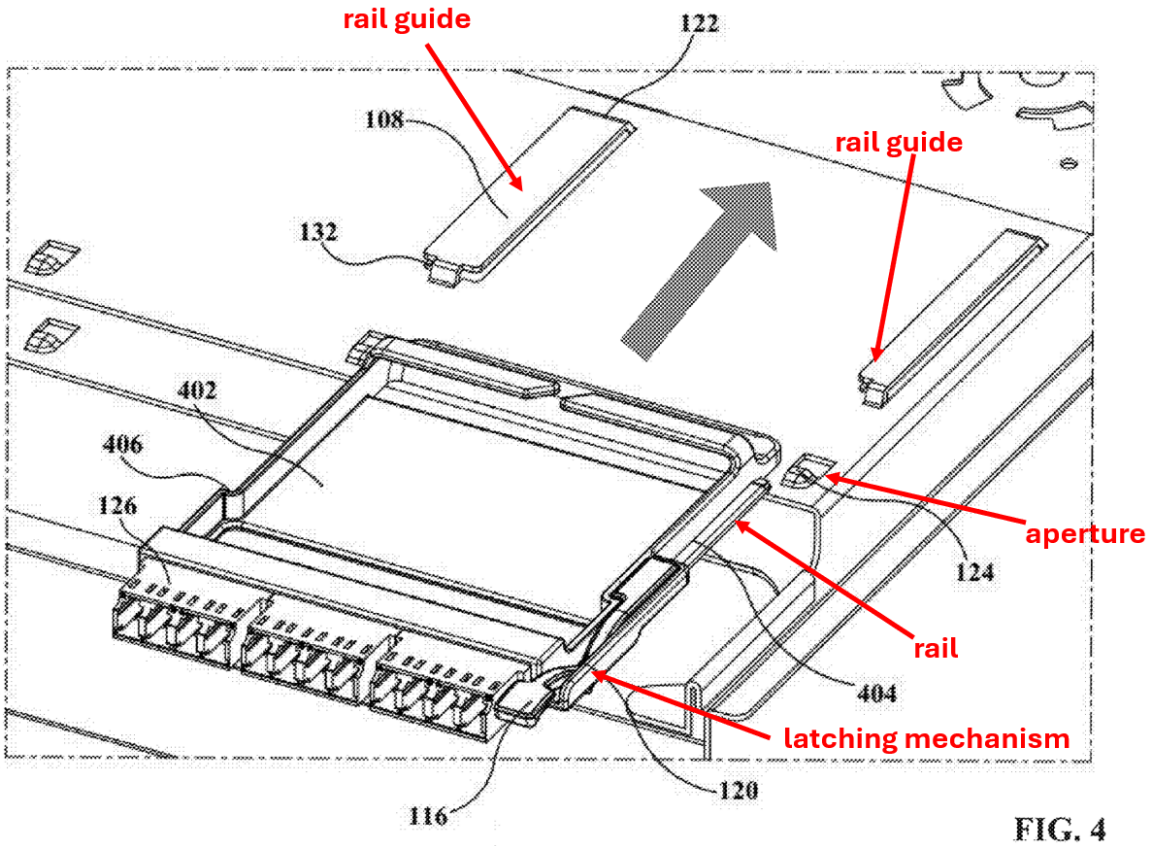

rail guide
122
108
rail guide
132
402
406
126
aperture
124
rail
404
latching mechanism
120
116

FIG. 4

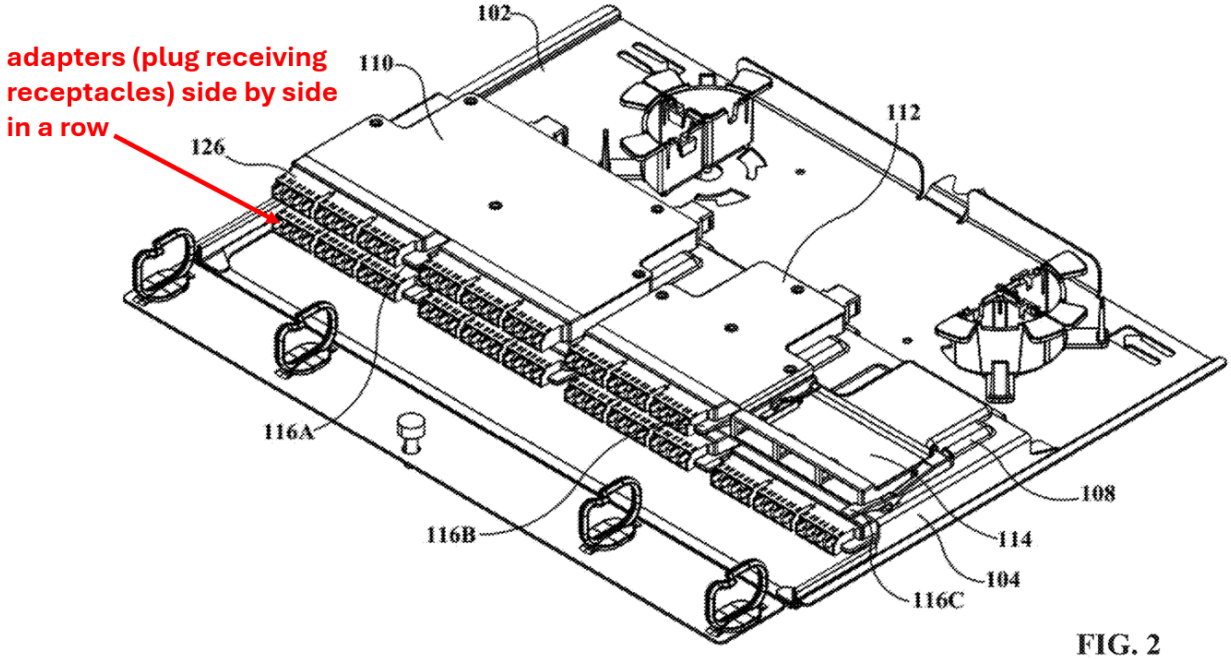

adapters (plug receiving receptacles) side by side in a row
102
110
112
126
116A
108
116B
114
104
116C

FIG. 2

adapters (plug receiving receptacles)
side-by-side in a row

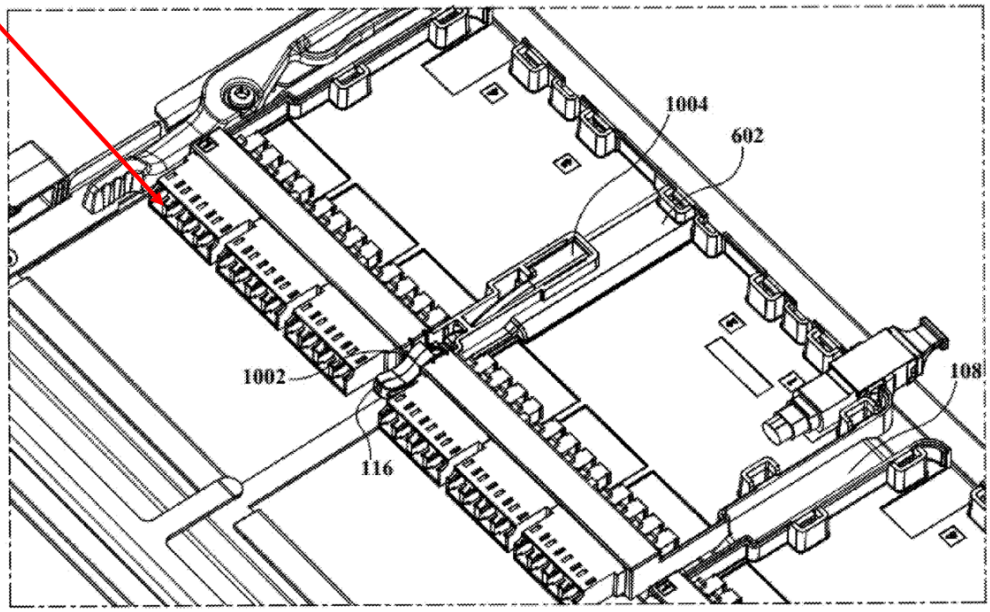


FIG. 11

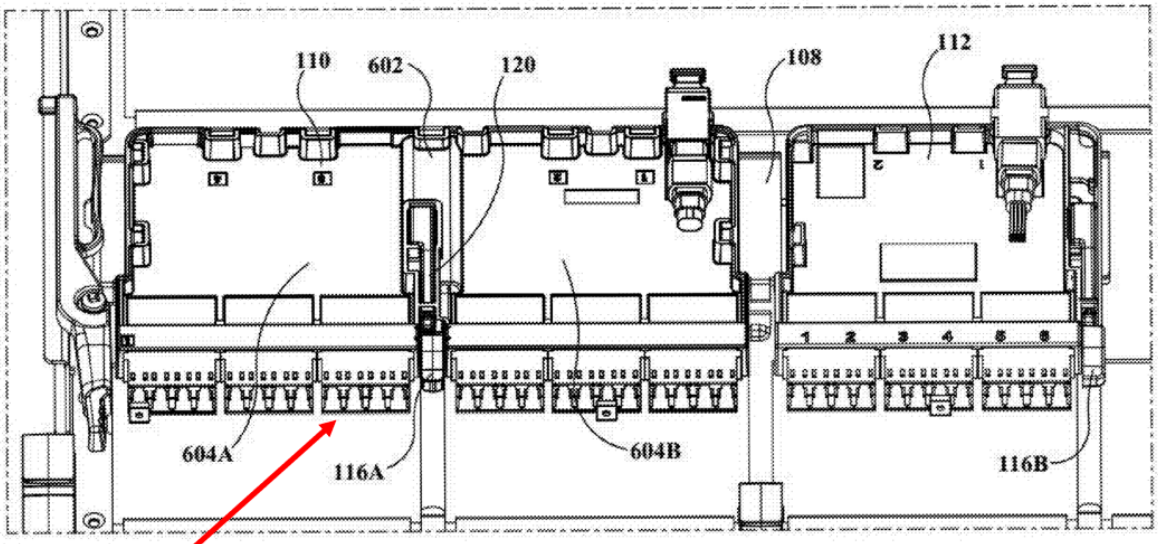


FIG. 7

When the cassettes are secured along the tray, the adapters are not arranged on "the front tray end portion." For the reasons given under Element 1C above, what

Sauter shows meets PO's interpretation of the term or it would have been obvious to modify Sauter to position the cassettes and their adapters (plug receiving receptacles) on the front tray end portion. EX1003 ¶334.

7. Elements 1F, 1G, 1H

At least under PO's interpretation, Sauter's sets of single-gang, double (or dual)-gang, triple-gang, and multi-gang cassettes satisfy these limitations. As shown in Sauter's Fig. 7, the single-gang cassette 112 has a width that accommodates **three** quad LC adapter modules. EX1006, Fig. 7. Therefore, according to PO this must be an example of a first cassette having a first cassette width of **three** standard width units. EX1003 ¶__. The double-gang cassette accommodates **six** quad LC connector module. Under PO's interpretation, therefore, the "double-gang" cassette 110 is an example of a cassette having a width of six standard width units. EX1003 ¶335.

Even if being multiples of a standard width unit is actually about the mathematical relationship of the measured width dimensions of the cassettes, not merely the number of modules they can accommodate, Sauter's cassettes disclose this relationship. Sauter discloses cassettes that are a multiple in size relative to each other. EX1006 at 4:50-61 ("approximately twice as wide…approximately three times as wide"). When the latching mechanism 120 of the double-gang cassette is positioned along the right-hand side of the cassette (as taught by Sauter

at 7:48-60; 1:64-2:1) cassette 110 mathematically equals twice the width of cassette 112, not merely "approximately" twice the width of cassette 112. EX1003 ¶¶336-338.

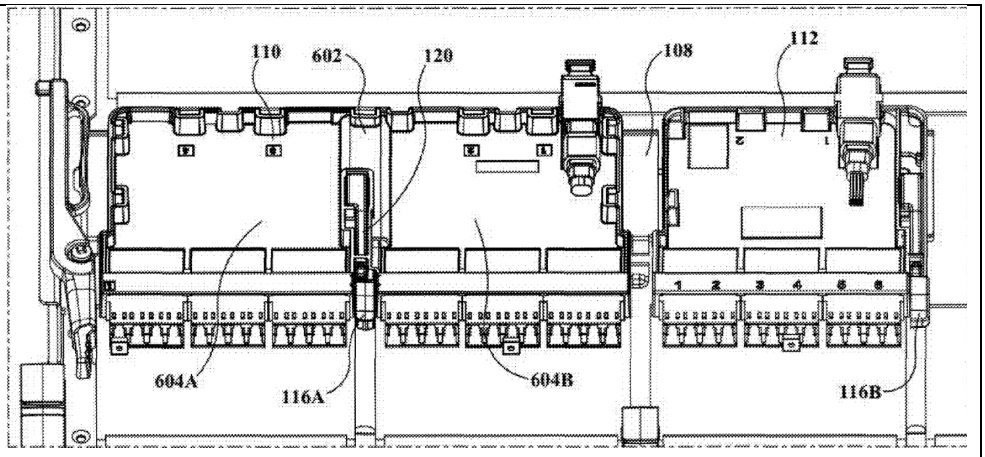
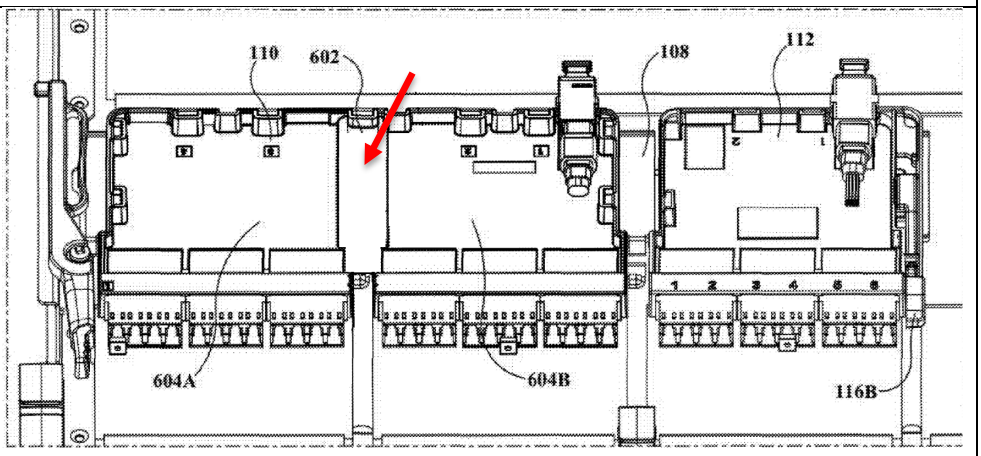
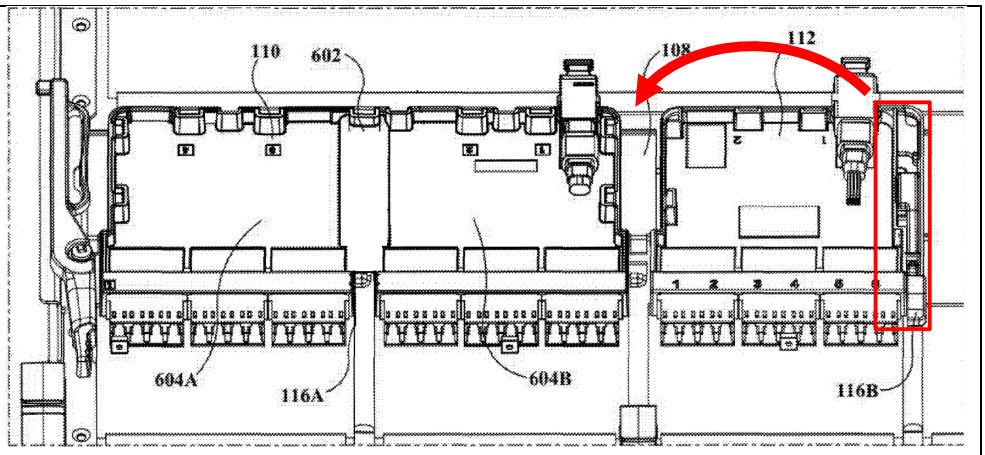
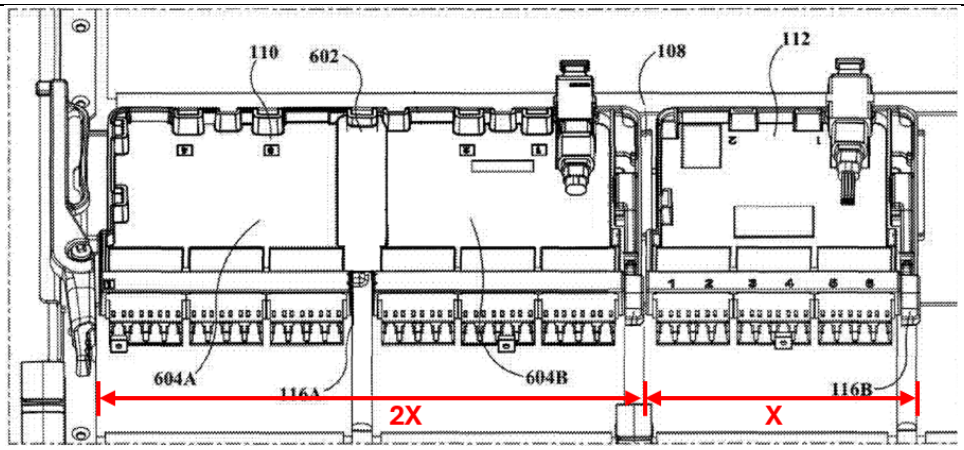
Fig. 7 as shown in Sauter (with latching mechanism 120, 116A in the middle of cassette 110)	
Fig. 7 without middle latching mechanism 120 (including without release latch 116A)	

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.	

The double-gang cassette would also be an exact multiple of any width unit that divides evenly into the width of the single-gang cassette. For example, if a standard width unit is chosen as 1/3 the width of the single-gang cassette 110, then the double-gang cassette will be equal to 6 times the standard width unit without any additional amount. The double-gang cassette will be evenly divisible by 1/3 the width of the single-gang cassette (the standard width unit). EX1003¶338.

B. Independent Claim 18

1. Preamble

If limiting, see the analysis of the Preamble of claim 1 above. EX1003 ¶357.

2. Element 18A

"a tray having a cassette engaging portion and configured to be slidingly received in at least a portion of the tray receiving space of a housing of a fiber optic management system"

See Element 1A. In addition, the bays of Sauter's trays define cassette engaging portions. EX1003 ¶358. The rail guides 108 and the apertures 124 define bays in Sauter's tray. EX1003 ¶358.

3. Element 18B

See Element 1B.

4. Element 18C

Element 18C is very similar to Element 1C. For the reasons given in Element 1C, Element 18C is disclosed by Sauter with the following additions. Element 18C uses the phrase "adjacently faces" instead of "is directly adjacent to." When arranged on the tray in Sauter, an outer side edge of Sauter's cassettes adjacently faces an outer side edge of an adjacent cassette. See, e.g., EX1006 at Figs. 13, 15, 8, 2, and 3; EX1003 ¶360.

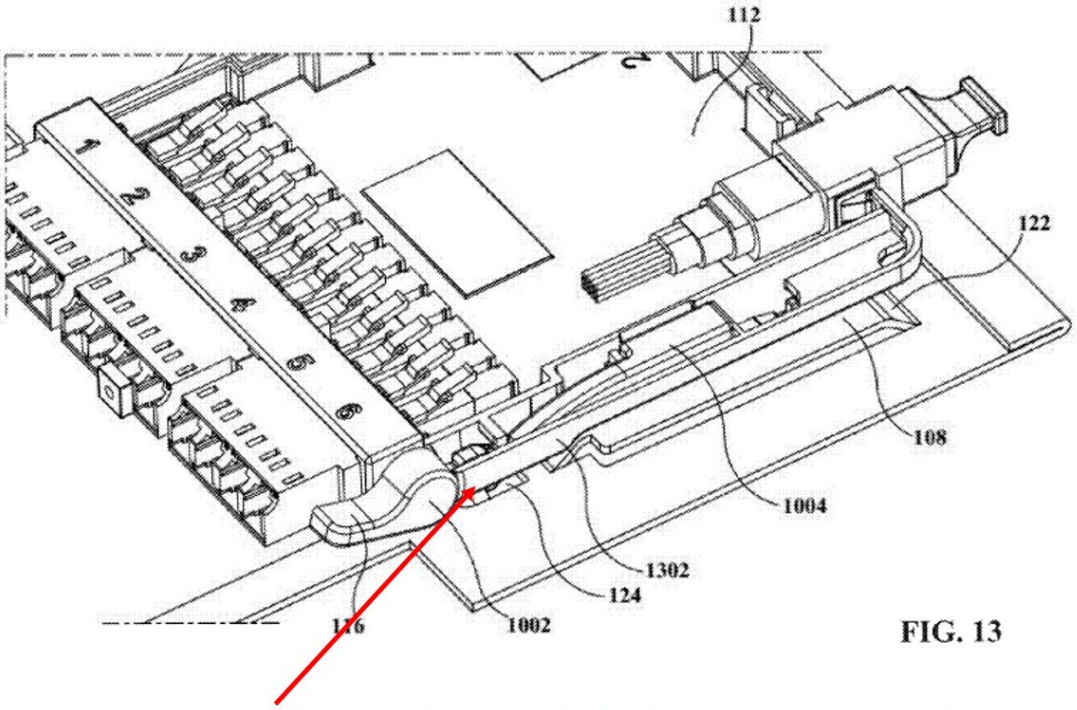


FIG. 13

outer side edge of cassette that will adjacently face another cassette outer side edge when both cassettes are arranged on the tray

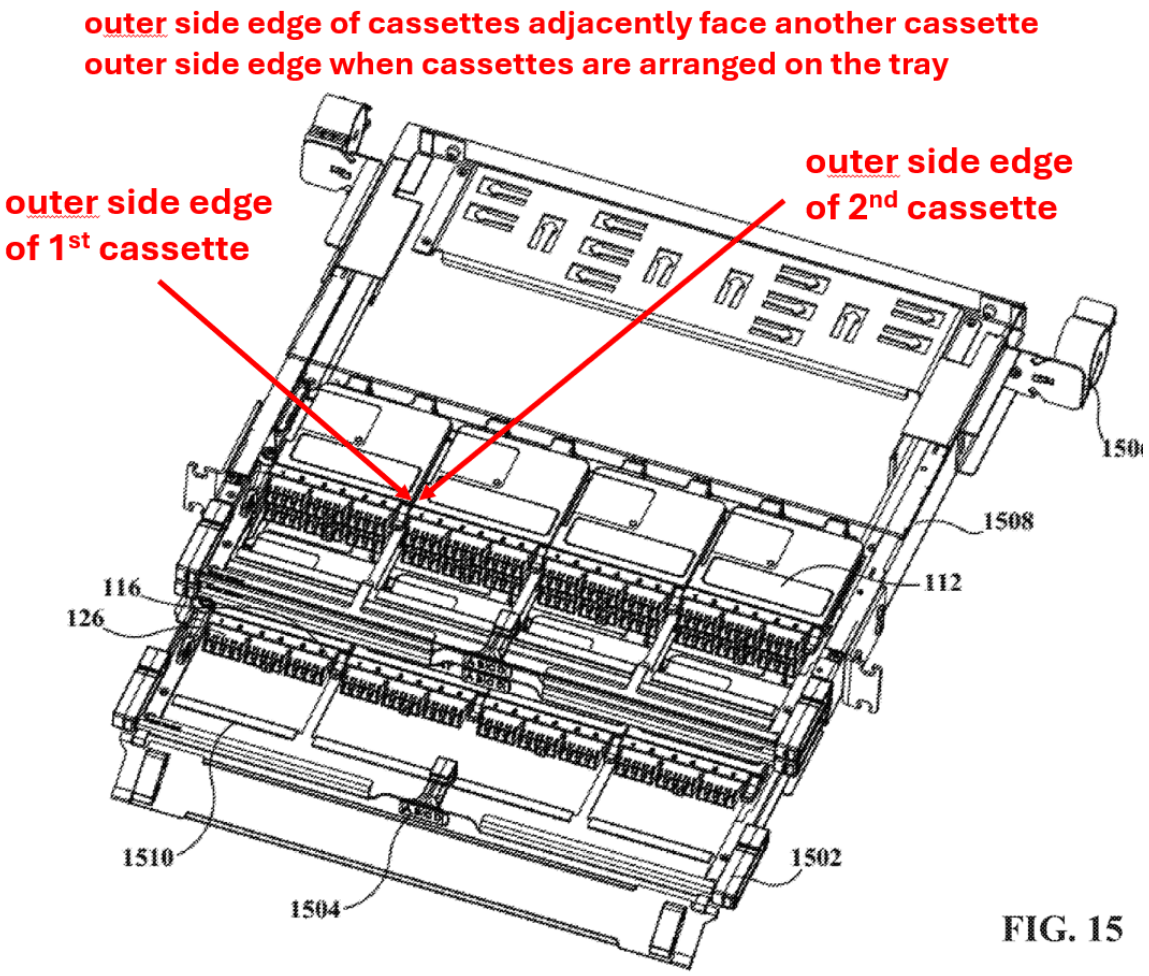


FIG. 15

Element 18C recites that the cassettes are configured to be arranged "along the cassette engaging portion" of the tray. The "cassette engaging portion" of Sauter's tray are the bays defined by the rail guides and apertures. The bays are side-by-side. Sauter's cassettes are configured to be secured on the tray, arranged side-by-side along the bays of the tray. See, e.g., EX1006 at Figs. 15, 1 and 2; 4:41-47; 6:42-51; EX1003 ¶361.

cassettes arranged side by side along the bays of the tray which make up the "cassette engaging portion" of the tray

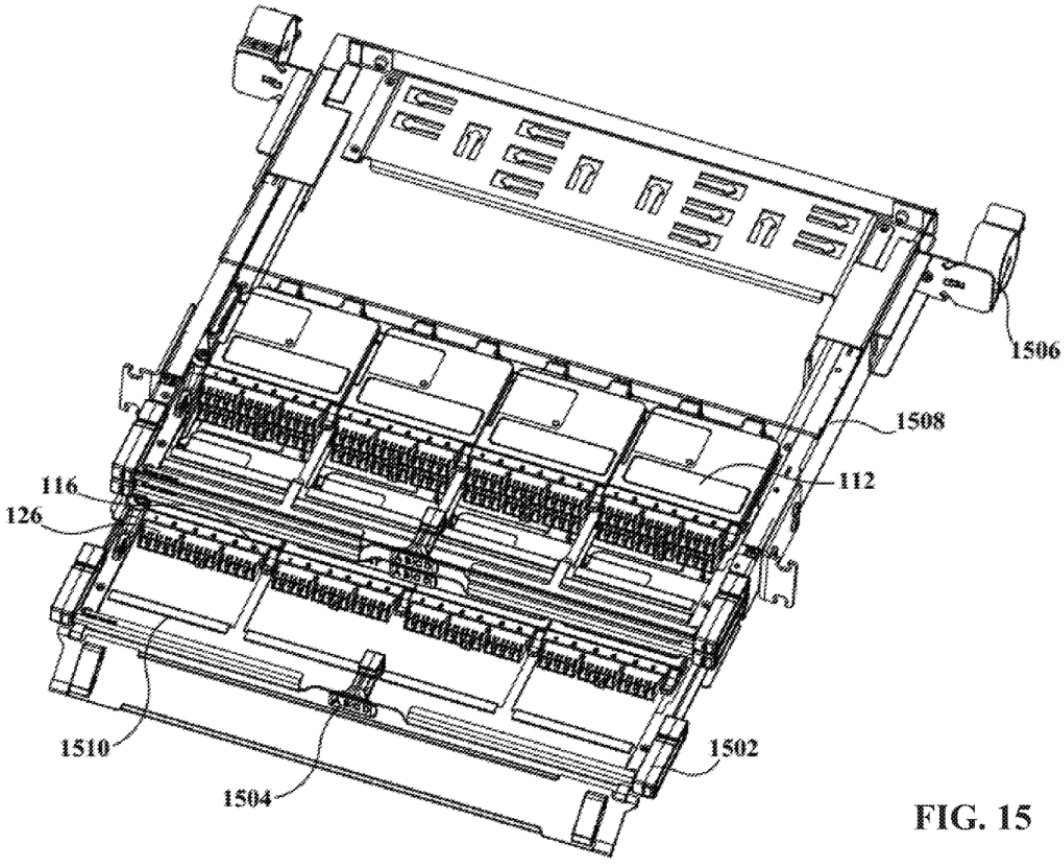


FIG. 15

5. Element 18D

See Element 1D.

6. Element 18E

See Element 1E.

7. Element 18F, 18G, 18H

PO asserts that the term "and" in the phrase "a first cassette width… of two, three, four, **and** six standard width units" should be interpreted to mean "or." See EX1011 at p. 12. If this is the correct interpretation, then Sauter discloses

Elements 18F, 18G, and 18H for the same reasons given above for Elements 1F, 1G, and 1H. EX1003 ¶364.

C. Independent Claim 40

1. Preamble

If limiting, see the discussion above of the Preamble of claim 1.

2. Element 40A

"a tray configured to fit a plurality of different modular fiber optic cassette configurations…"

Sauter discloses this limitation of Element 40A for the same reasons provided for claim Element 1B.

"…in a case of a fiber management system"

Sauter discloses this limitation for the same reasons provided for Element 1A. Element 40A uses the term "case" instead of "housing." For the same reasons that Sauter's "enclosure" that receives the trays discloses a housing, it also discloses a "case." EX1003¶382. Also, for the same reasons that Sauter's enclosure renders a "housing" obvious, it also renders a "case" obvious. EX1003¶382.

3. Element 40B

See Element 18C.

4. Element 40C

See Element 1D.

5. Element 40D

See Element 1E. Also, the cassettes in Sauter are configured to be arranged side by side along the tray as shown, for example, in Figs. 15, 2, 3, 7, 8, 11; EX1003¶385.

6. Element 40E, 40F, 40G.

See Elements 1F, 1G, and 1H.

D. Claims 2, 11, 24, 33, 50, 51

Sauter's tray and tray front edge have a width dimensioned to receive a maximum of twelve standard width units side by side. If the standard width unit is considered 1/3 the width of a single-gang cassette, and the trays accommodate four such cassettes, then the tray that is dimensioned to receive at least 12 standard width units side by side, and is evenly divisible by 12 standard width units. See EX1006 at Fig. 15, 3, 2; EX1003¶339, 350, 402.

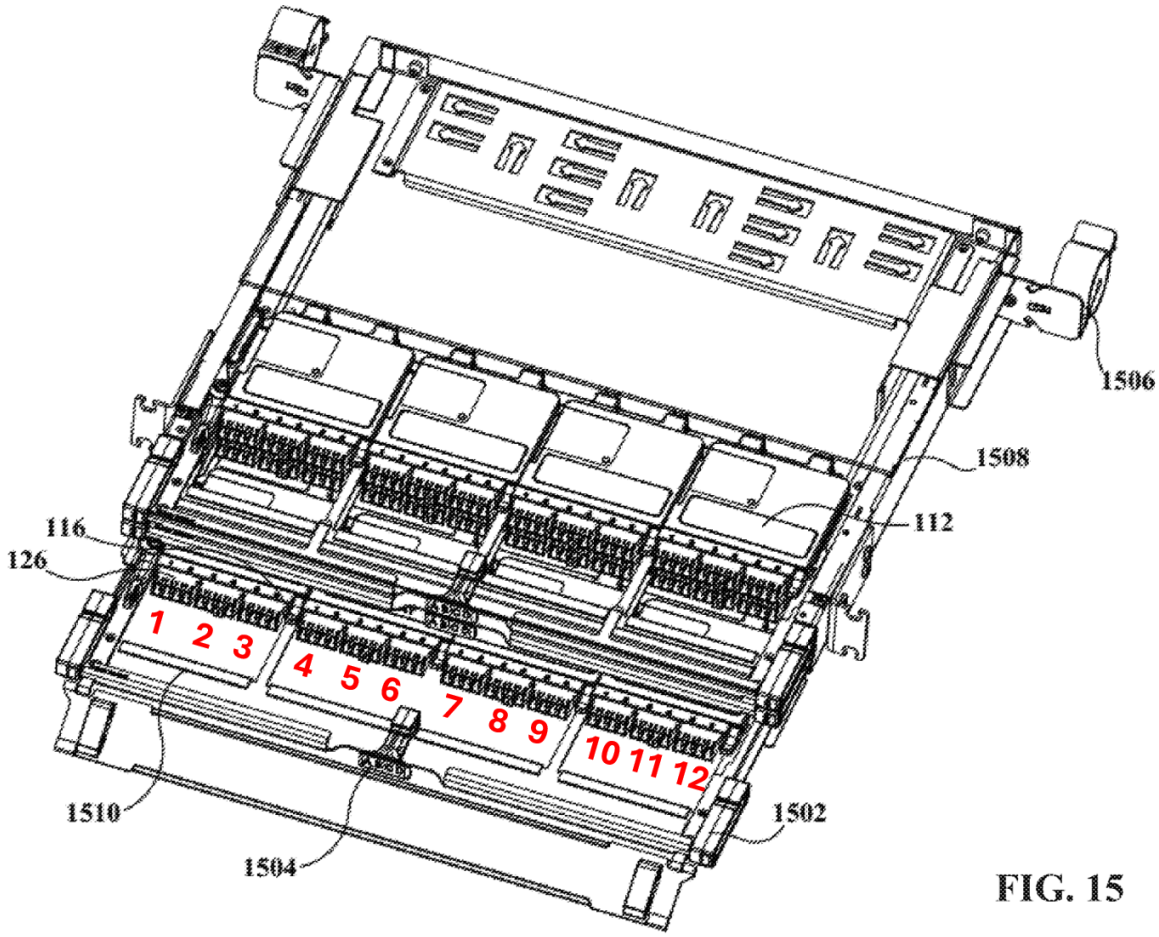


FIG. 15

See also Figs. 2 and 3, annotated below:

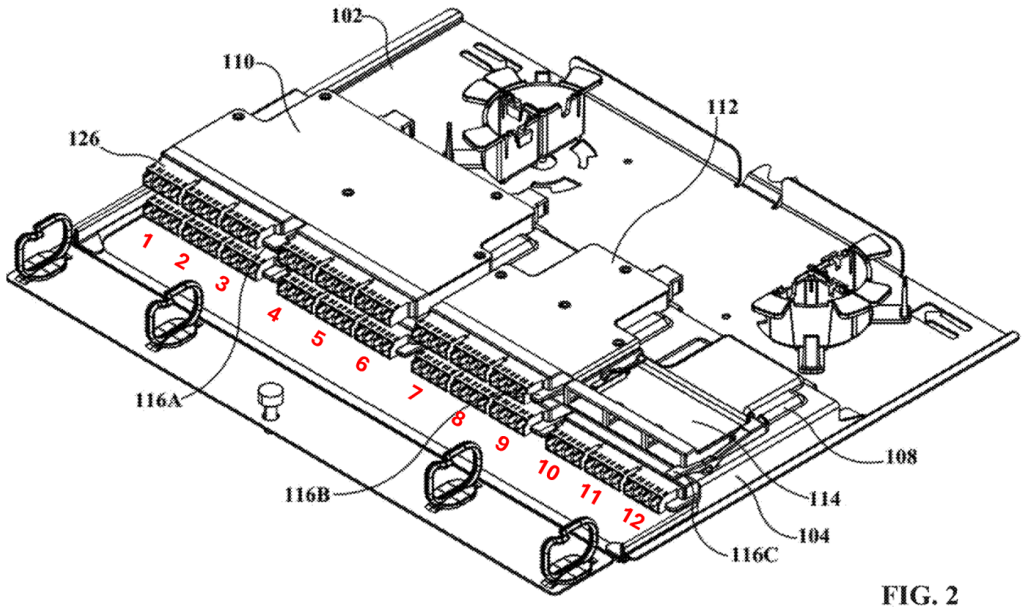


FIG. 2

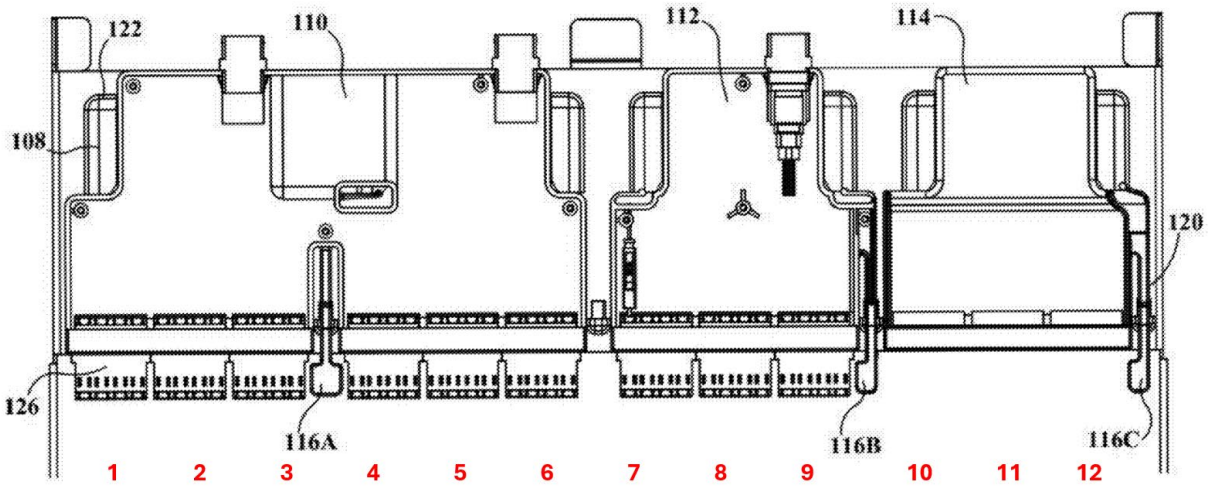


FIG. 3

E. Claims 3, 25, 52

Sauter discloses that his cassettes include an interfacing connector 130 at the rear of the cassettes in a connector receptacle which is a multifiber connector receptacle and that fibers from the multifiber connector and receptacle can be connected to the rear side of the adapter receptacles 126 at the front of the cassettes. See EX1006 at 8:4-28, Figs. 10, 7, 6, 13; EX1003 ¶340.

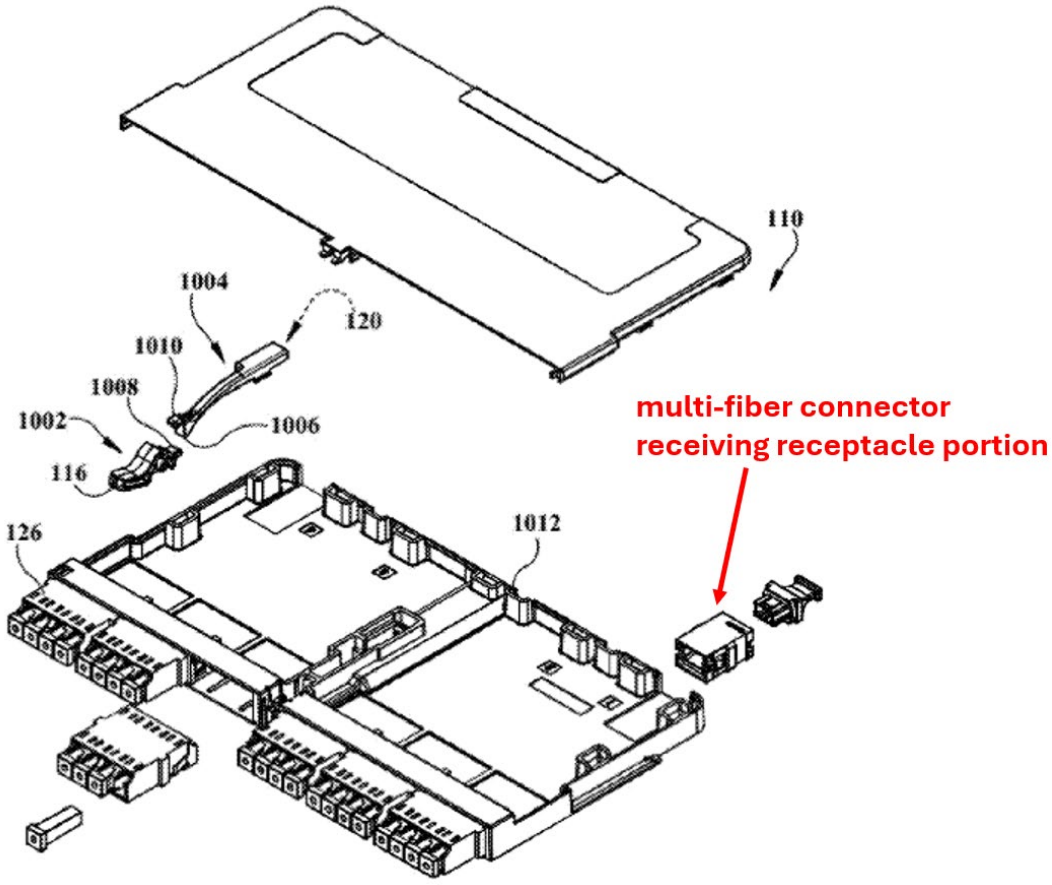

110
1004
120
1010
1008
1002
1006
116
126
1012
multi-fiber connector
receiving receptacle portion

FIG. 10

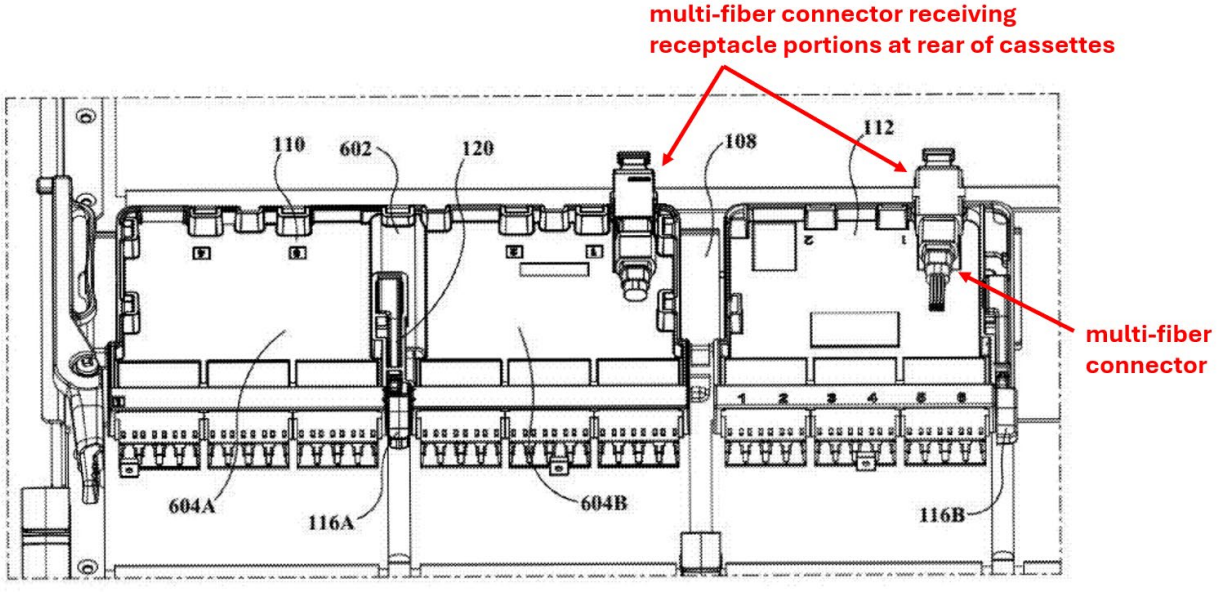

multi-fiber connector receiving
receptacle portions at rear of cassettes
110
602
120
108
112
multi-fiber
connector
604A
116A
604B
116B

FIG. 7

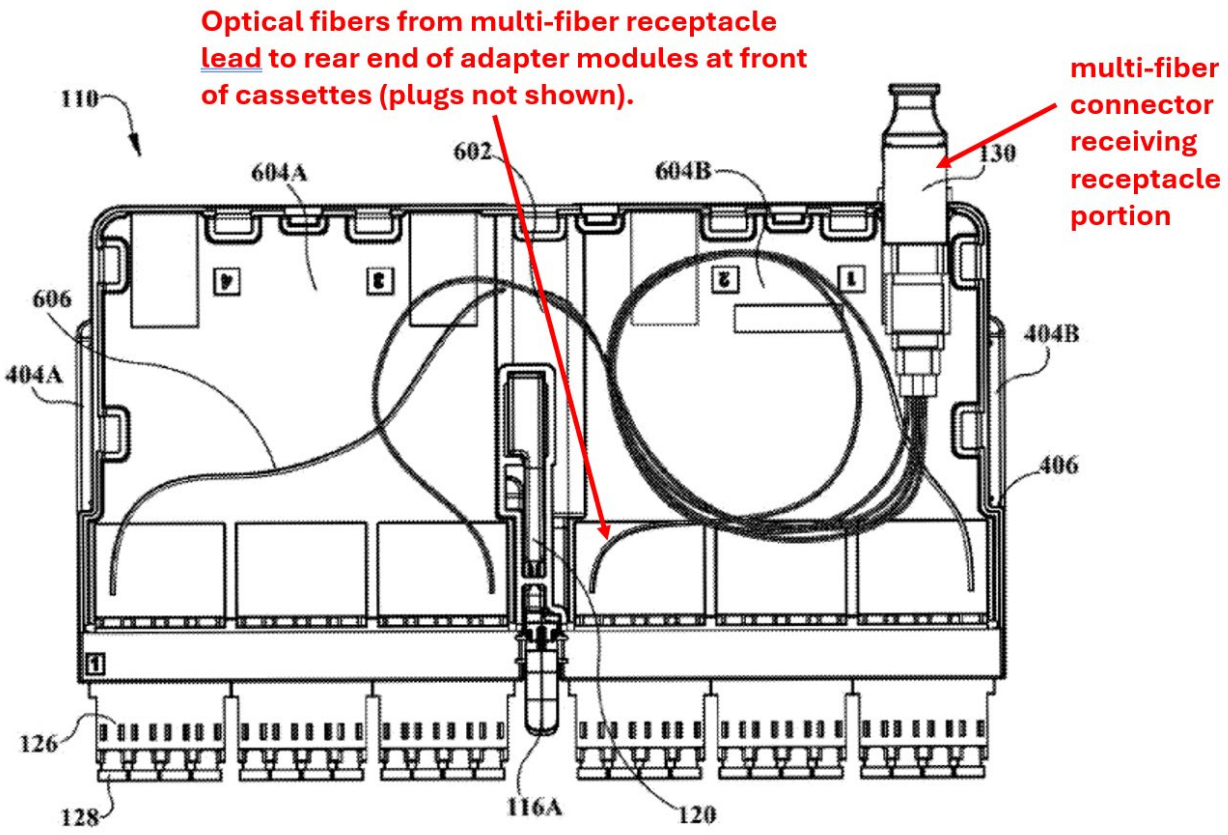
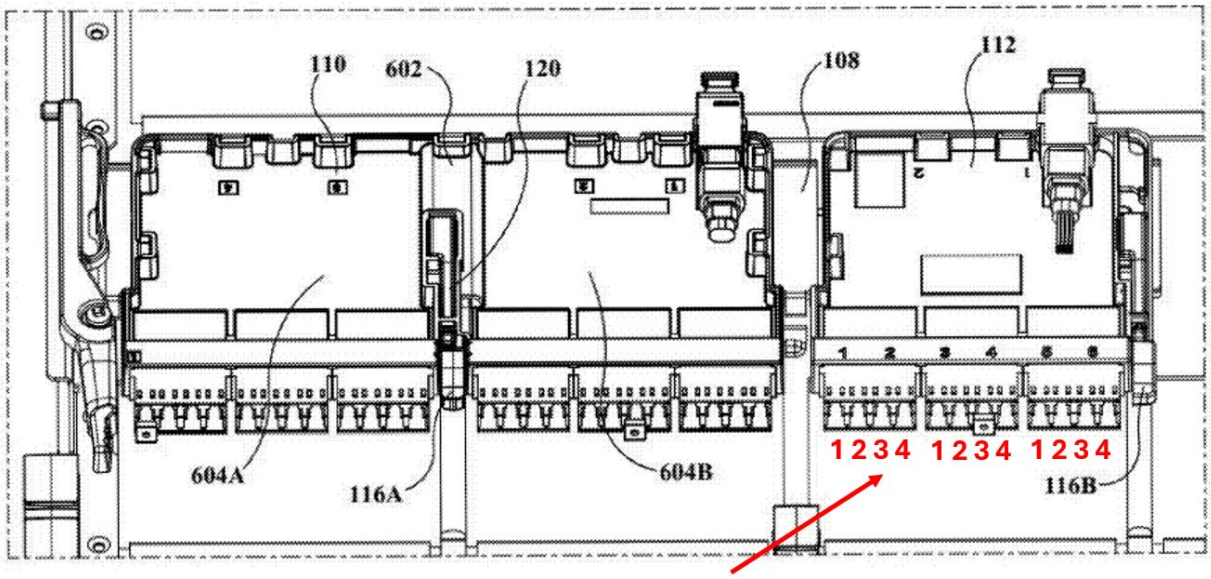


FIG. 6

F. Claims 4, 26, 53

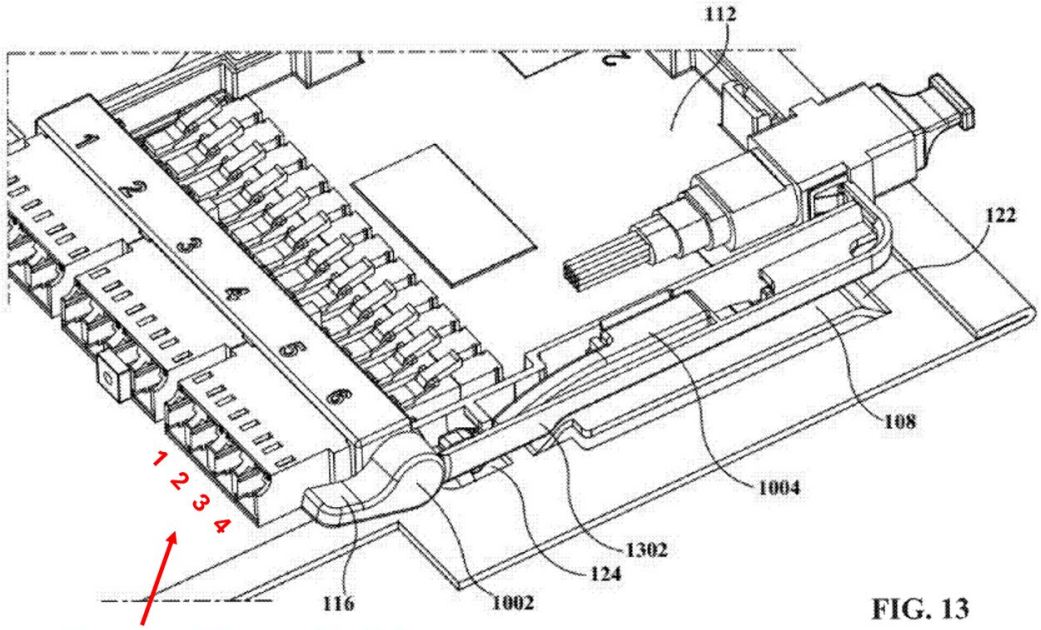
Sauter's cassettes include quad LC adapter modules along a front of each cassette. Each quad LC adapter module includes four fiber optic plug receiving receptacles arranged side by side in a row, and there is one quad adapter module in a cassette for each standard width unit of the cassette. EX1003 ¶341; EX1006 at

Figs. 7, 10, 13 and 8:4-36.



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

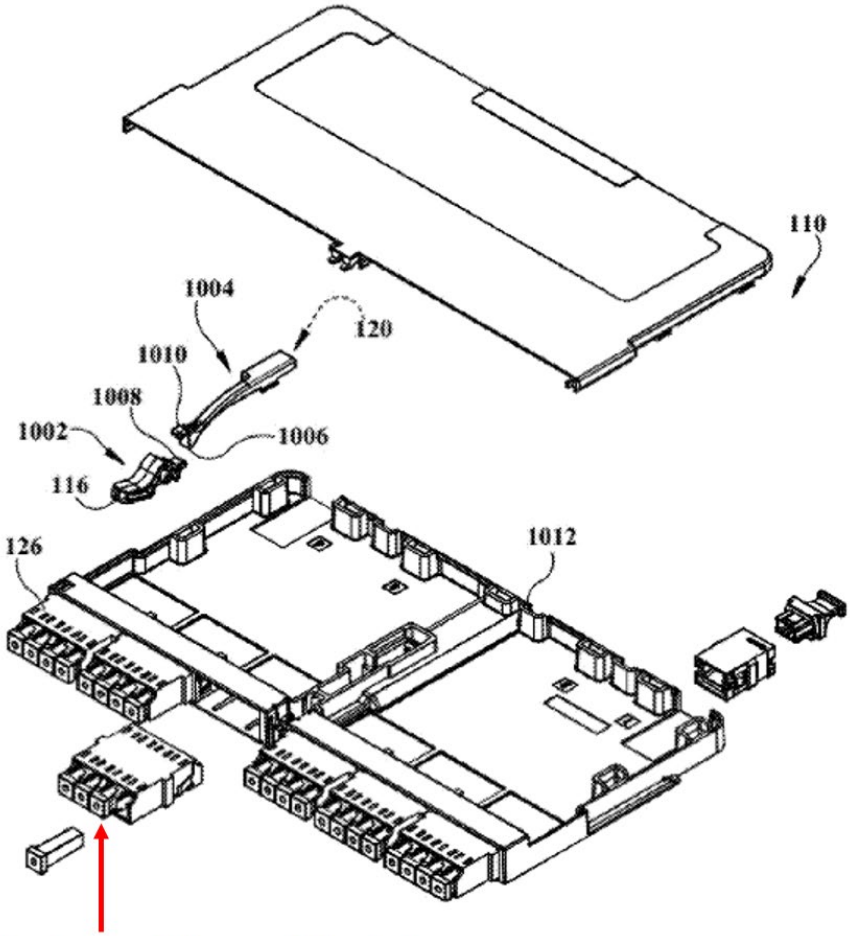


FIG. 10

G. Claims 5, 27, 54

Sauter discloses a pair of mounting brackets for securing the enclosure to a rack. See, e.g., Figs. 15, 16; EX1003 ¶¶342-343.

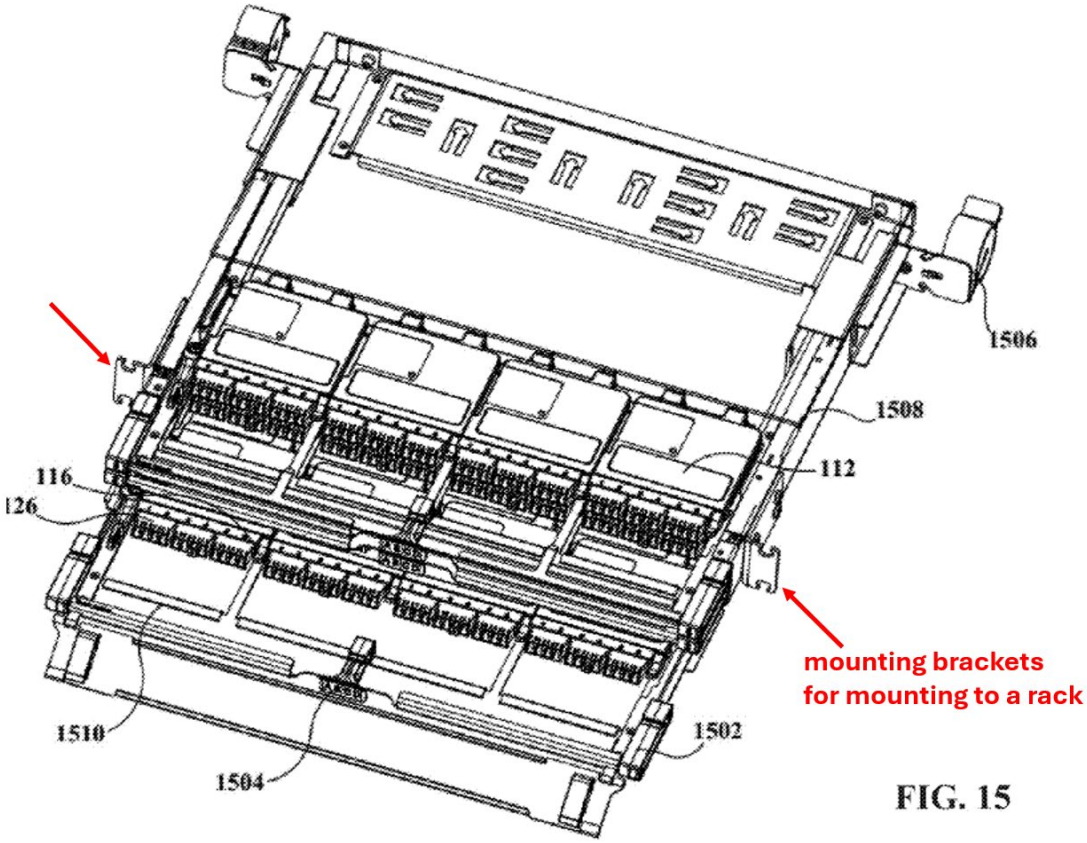

1506
1508
112
116
126
mounting brackets
for mounting to a rack
1510
1504
1502

FIG. 15

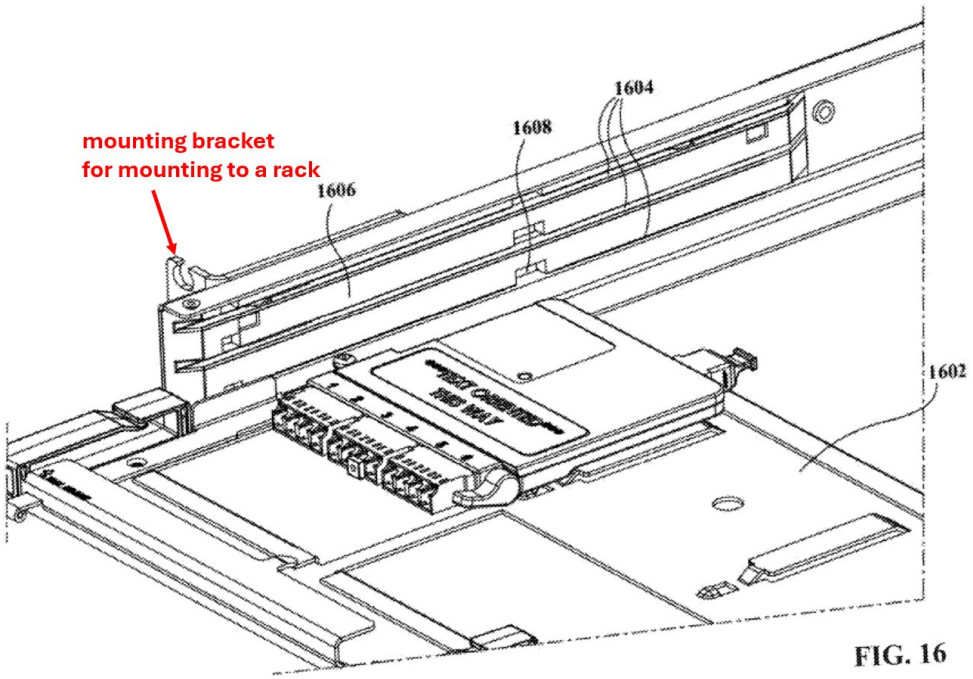

1604
1608
mounting bracket
for mounting to a rack
1606
1602

FIG. 16

H. Claims 6, 28, 56

Sauter's trays are configured with apertures 124 and rail guides 108 that form a cassette fastening portion that is configured to removably secure the tray to each cassette. EX1006 at 5:60-6:14; 6:15-29; see also Figs. 1-2, 4-8, 10-14, 16; EX1003 ¶¶344-347.

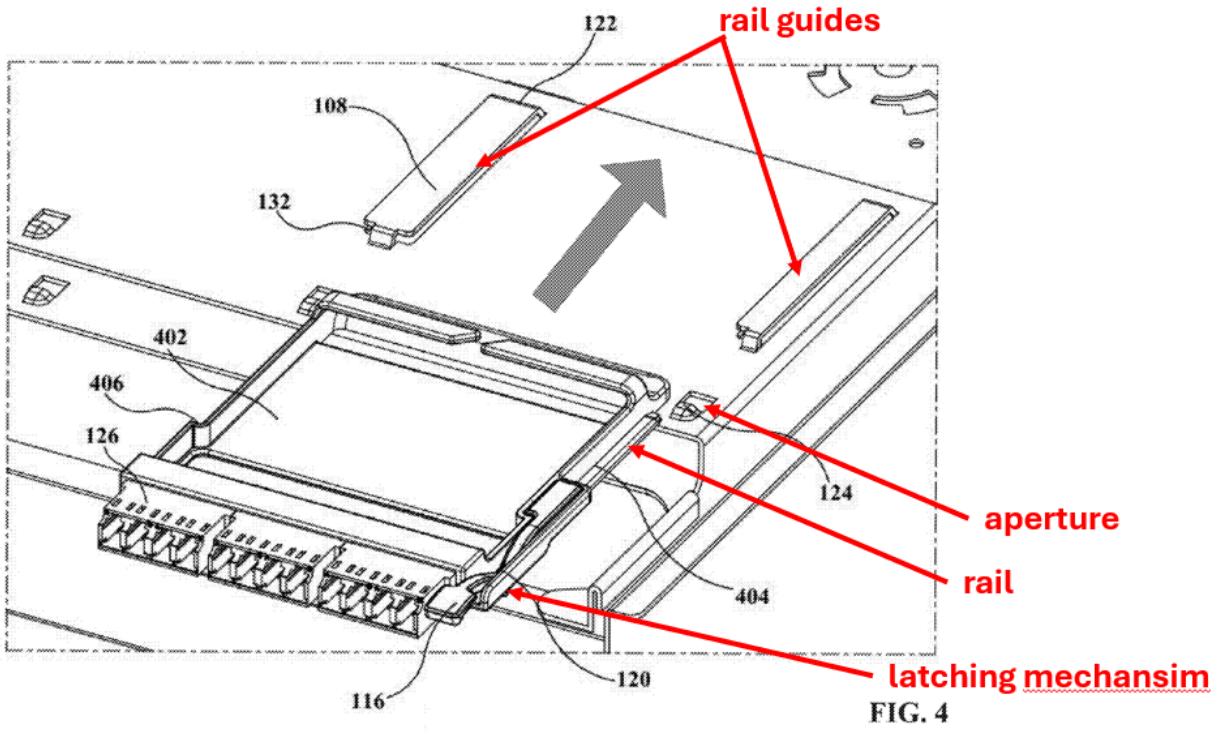


FIG. 4

I. Claim 10

See Element 1E. In addition, when the cassettes are secured to the tray, an outside edge portion of each selected cassette "faces" a directly adjacent outside edge portion of another cassette. This can be seen, for example, in Figs. 15 and 13. This can also be seen in Fig. 7 as amended according to Sauter's teaching to

position the latching mechanism of the double-gang cassette along the right side of the cassette like the single-gang cassette. EX1003 ¶¶348-349.

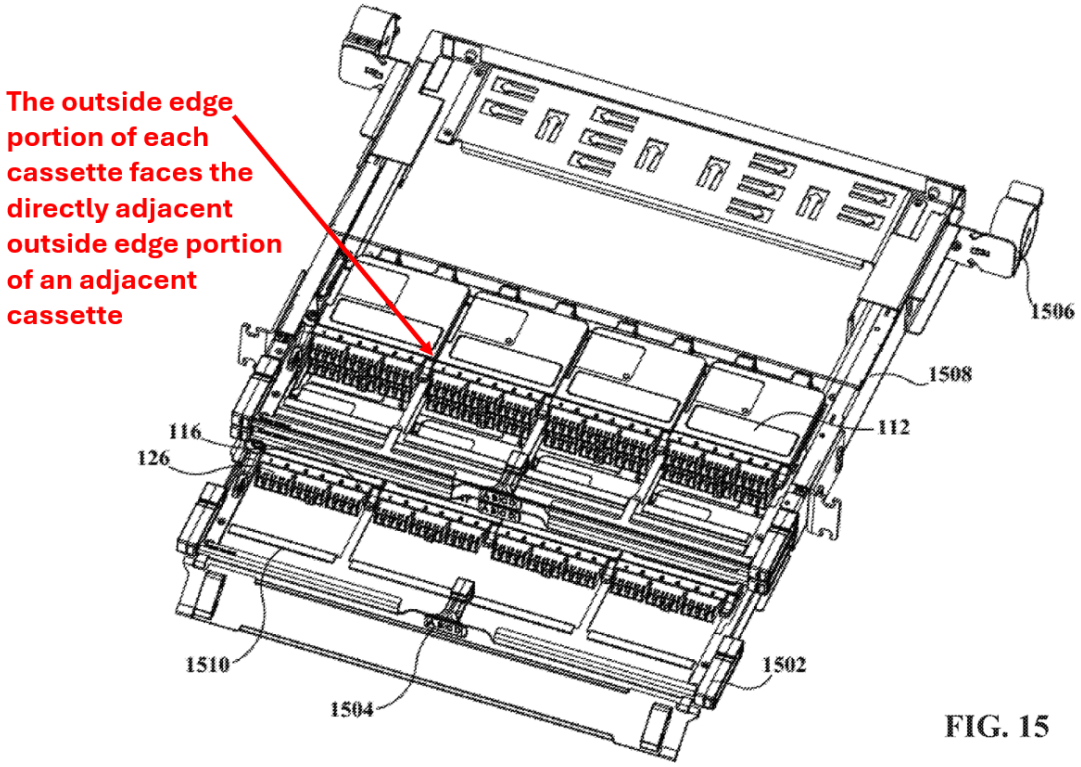


FIG. 15

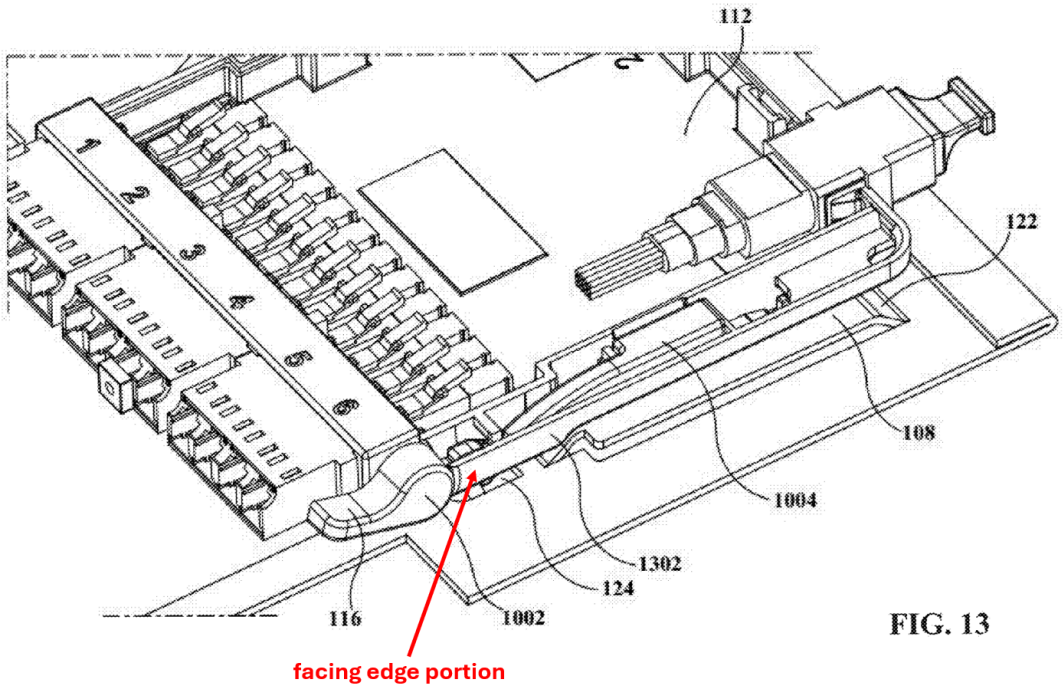
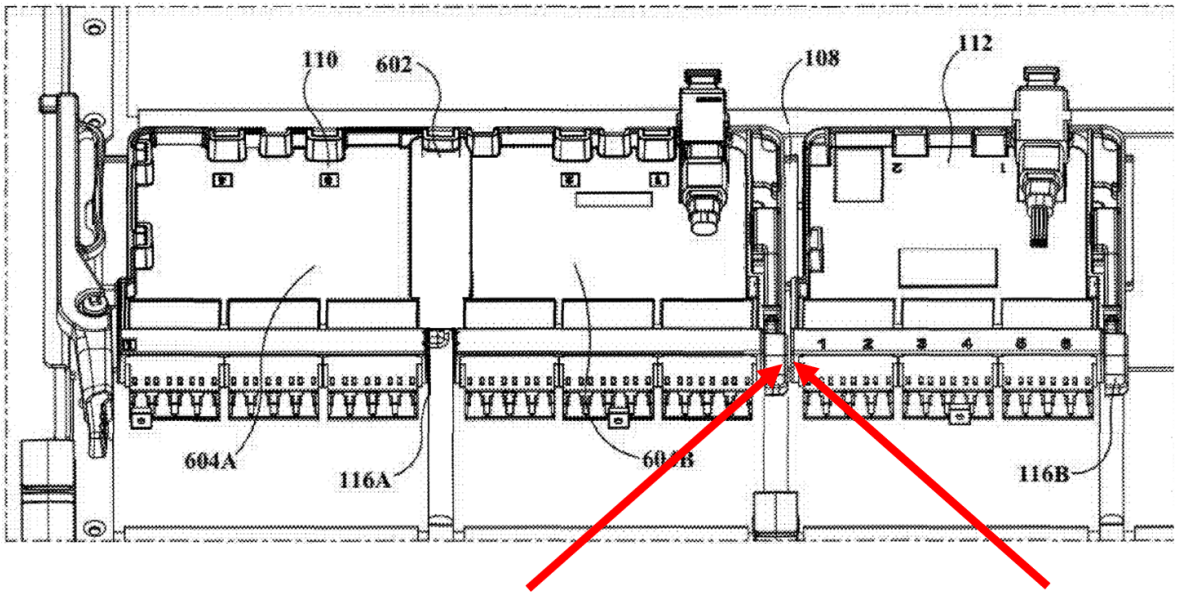


FIG. 13



EX1003¶348. These facing edge portions are "directly adjacent," for the reasons already provided above under Element 1C.

J. Claims 12, 34, 60

In addition to the single-gang and dual-gang cassette sizes, Sauter discloses a three-gang cassette and additional "multi-gang" cassettes. EX1006 at 4:50-61; 7:38-47; 5:12-17.

All three sizes of the exemplary cassettes that Sauter teaches could fit on the same tray if the tray were a two tier tray as shown, for example, in Fig. 1 of Sauter that defines multiple rows of cassette bays (lower row 106A and upper row 106B) on one tray for a total of eight bays capable of receiving eight single-gang cassettes or the equivalent number of multi-gang cassettes. EX1003 ¶¶351-352.

K. Claims 13, 35, 61

The rail guides (108) and apertures (124) on Sauter's tray are "engagement features" that receive the rails (404) and latching mechanisms (120, with protrusions 1006) "engagement structures" of Sauter's cassettes. EX1003 ¶354.

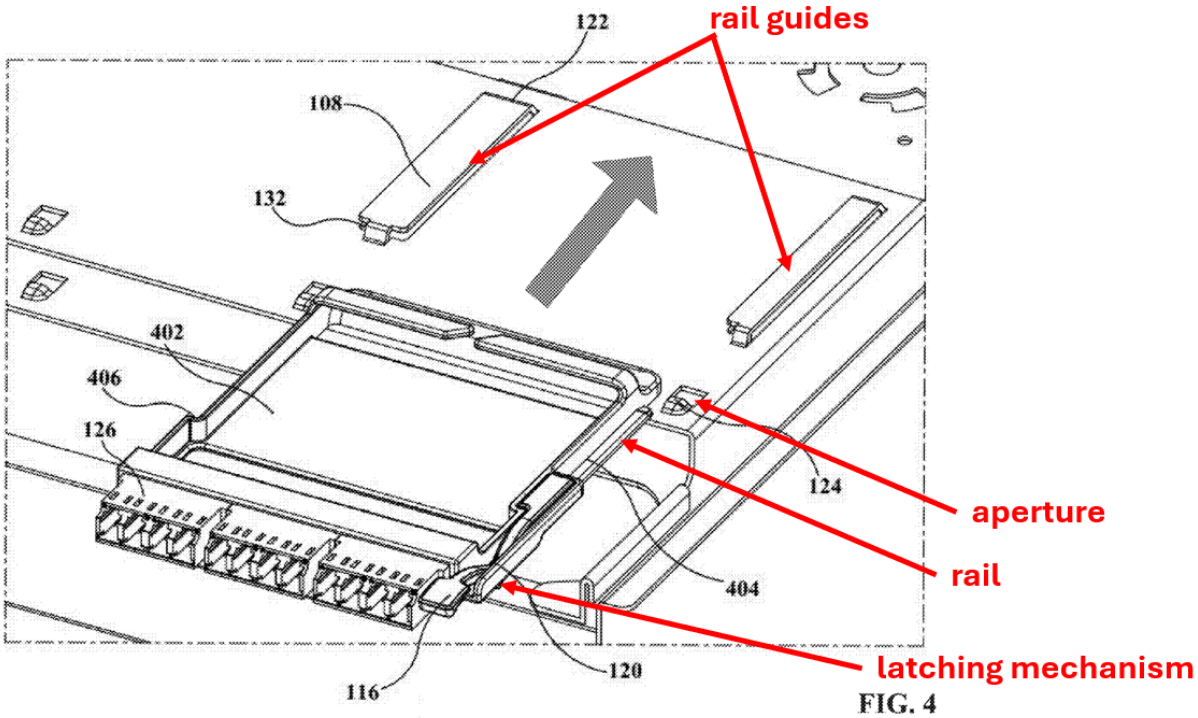


FIG. 4

L. Claims 14, 36, 62

The rail guides and apertures on Sauter's tray are "engagement features" that both comprise a slot. EX1003 ¶355. The rails and protrusion on the latching mechanisms of Sauter's cassettes are "engagement structures" that both comprise a tab. EX1003 ¶355. The rails on the cassettes are tabs. EX1003 ¶355. The spring arm 1004 with the protrusion 1006 in Sauter's latching mechanism is also a tab. EX1003 ¶355.

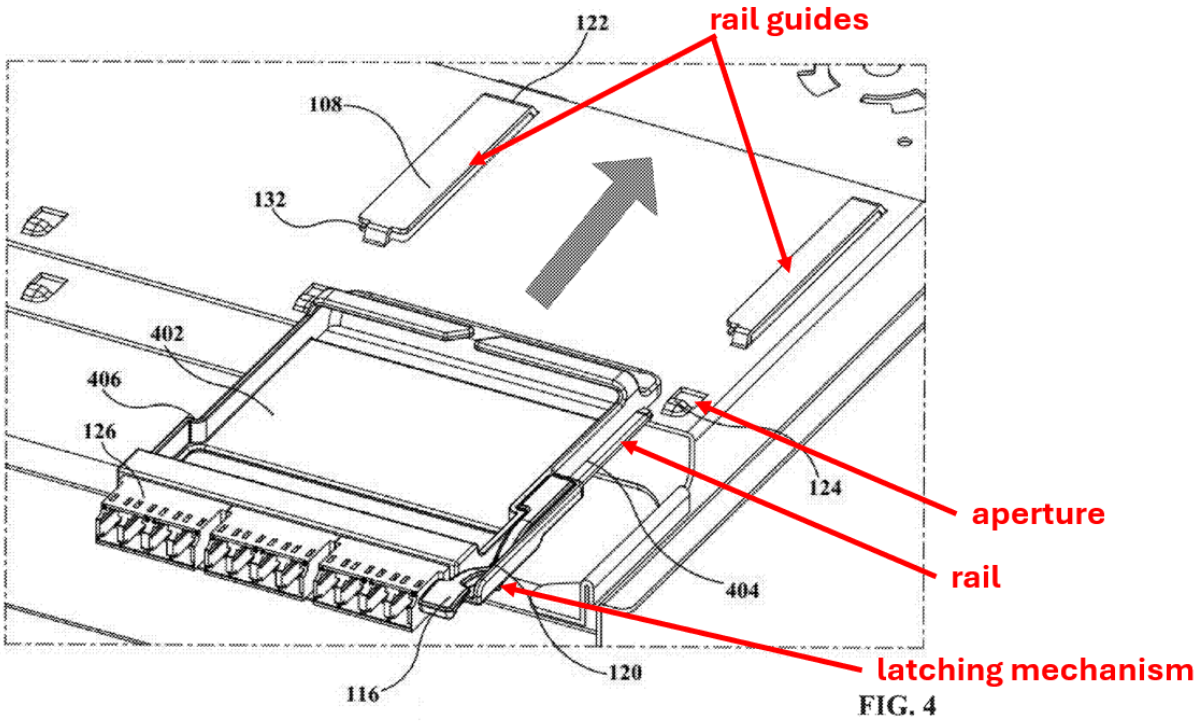


FIG. 4

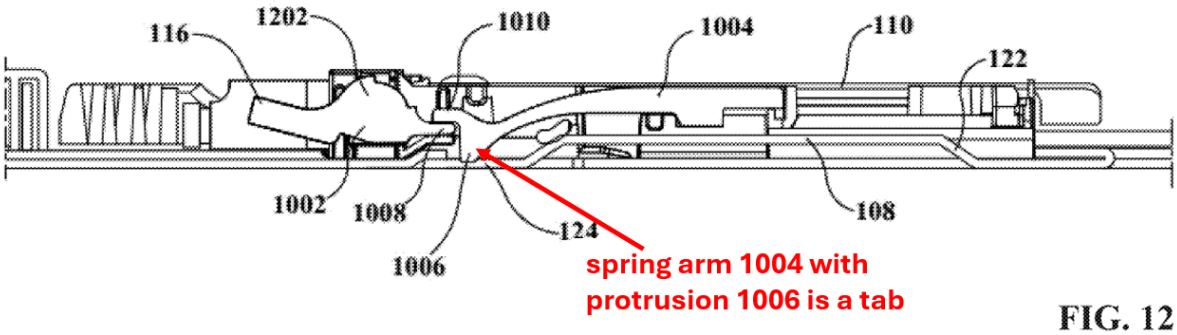


FIG. 12

M. Claims 16, 38, 64

The rail guides (108) and apertures (124) on Sauter's tray are "engagement features" that both comprise an aperture. The latching mechanism 120 with its spring arm ending in protrusions 1006 is an "engagement structure" comprising a flexible tab. The spring arm with its protrusion is a flexible tab because it is

designed to flex upward to allow the cassettes removed from the tray. EX1003 ¶356.

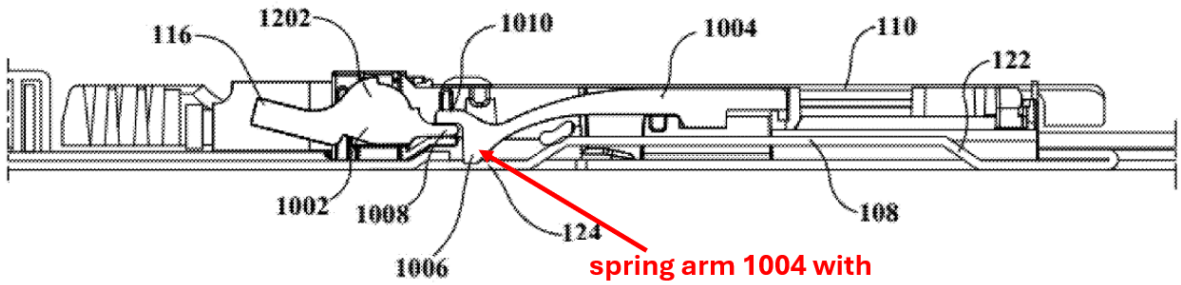


FIG. 12

See, EX1006 at Fig. 12 and 8:37-9:13.

N. Claim 20

See Element 1C.

O. Claims 21, 46

As seen, for example, in Figs. 15 and 13 of Sauter, when arranged side by side along the bays of Sauter's tray (the bays making up the "cassette engaging portion" of the tray), each cassette will be supported by the tray and will have an outer side edge that is adjacent to the outer side edge of another cassette. EX1003 ¶366. See also the analysis of Element 18C above.

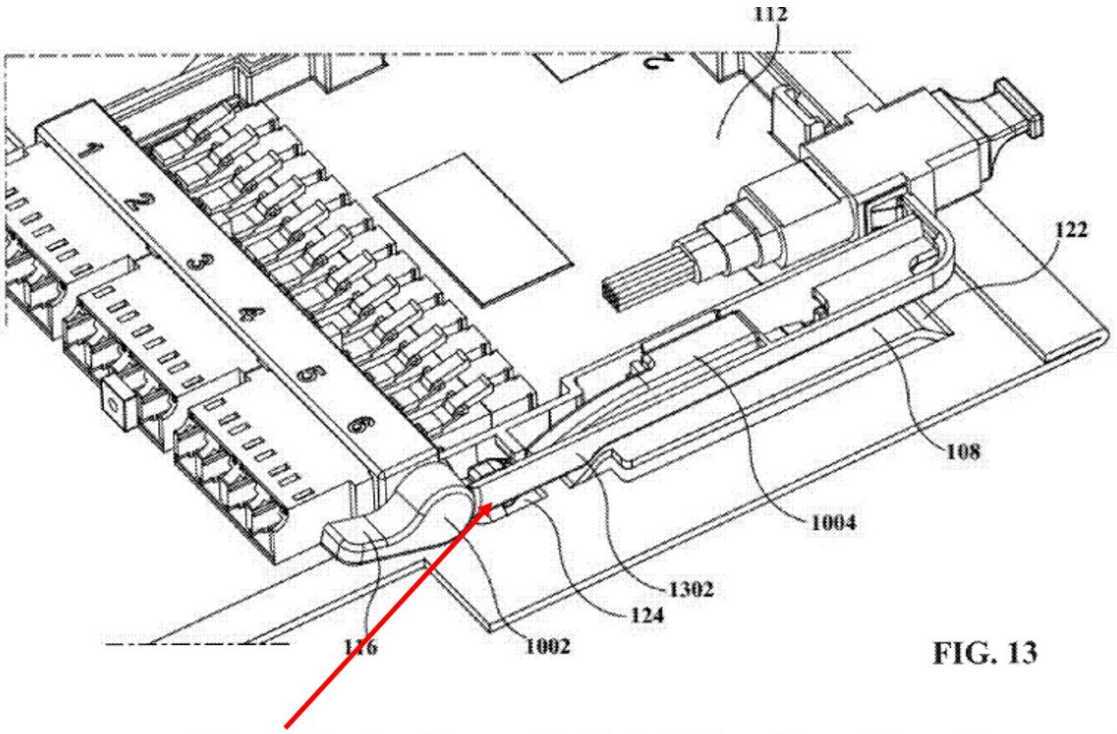


FIG. 13

Outer side edge of cassette that will be adjacent to another cassette outer side edge when both cassettes are arranged on Sauter's tray

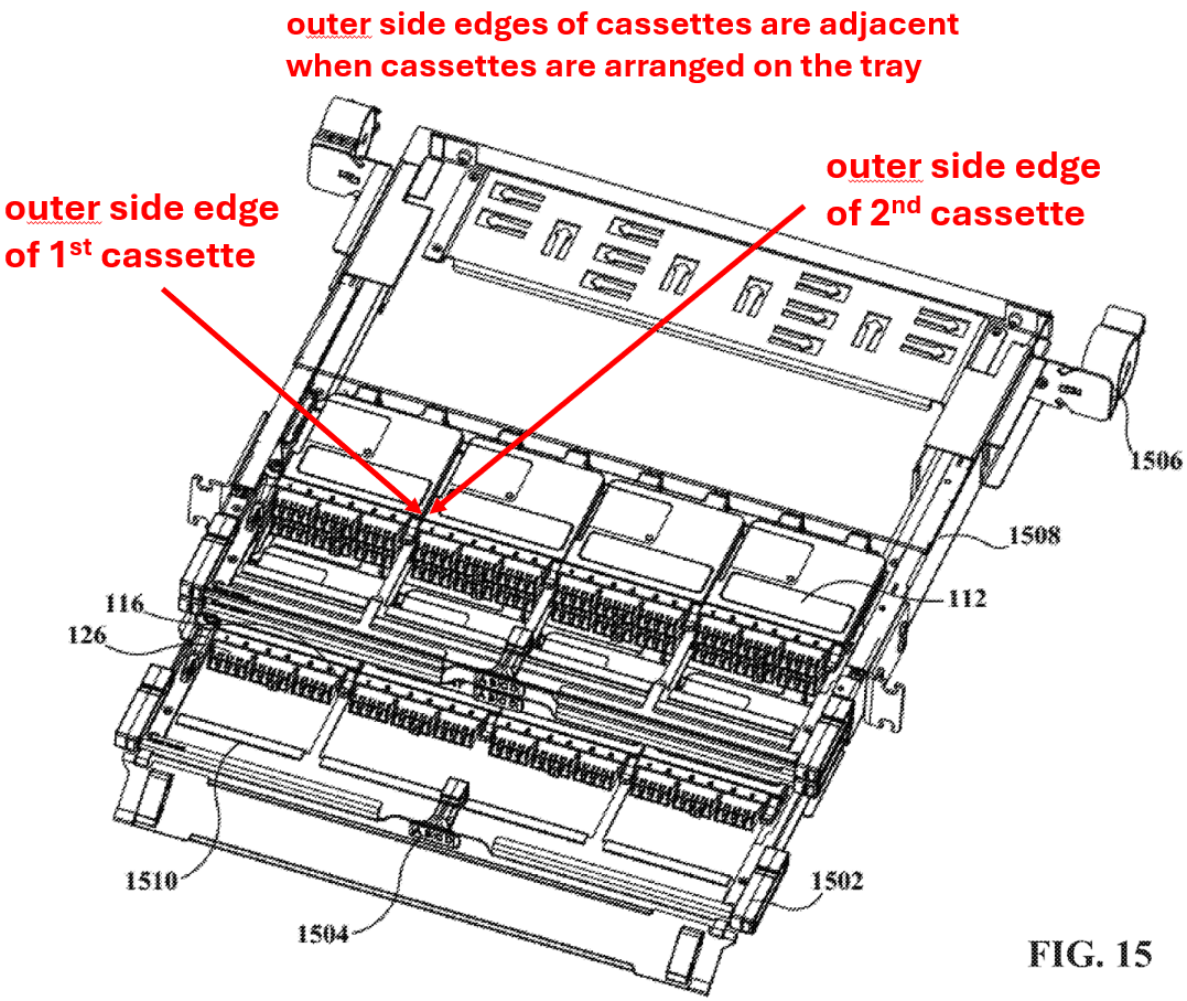


FIG. 15

P. Claim 22

See claim 20 and Element 1C.

Q. Claim 23

See Elements 1E and 1C. Modifying Sauter to position the cassettes (and their receptacles) on "a front end portion of the tray" would have been obvious for all the same reasons that positioning them on "the front tray end portion" was obvious. EX1003 ¶368.

R. Claim 32

See Elements 18C (e.g., re "faces"), Element 1C ("directly adjacent"), and Claim 10. EX1003 ¶374.

S. Claim 41

See Element 18C.

T. Claim 42

Sauter's "cassette engaging portion" includes rail guides 108 that define shoulders. EX1003 ¶388. The shoulders are defined by the horizontal top surface on the rail guides 108. EX1003 ¶388. See Sauter at Figs. 4, 1, 5 and partially in Figs. 13 and 16.

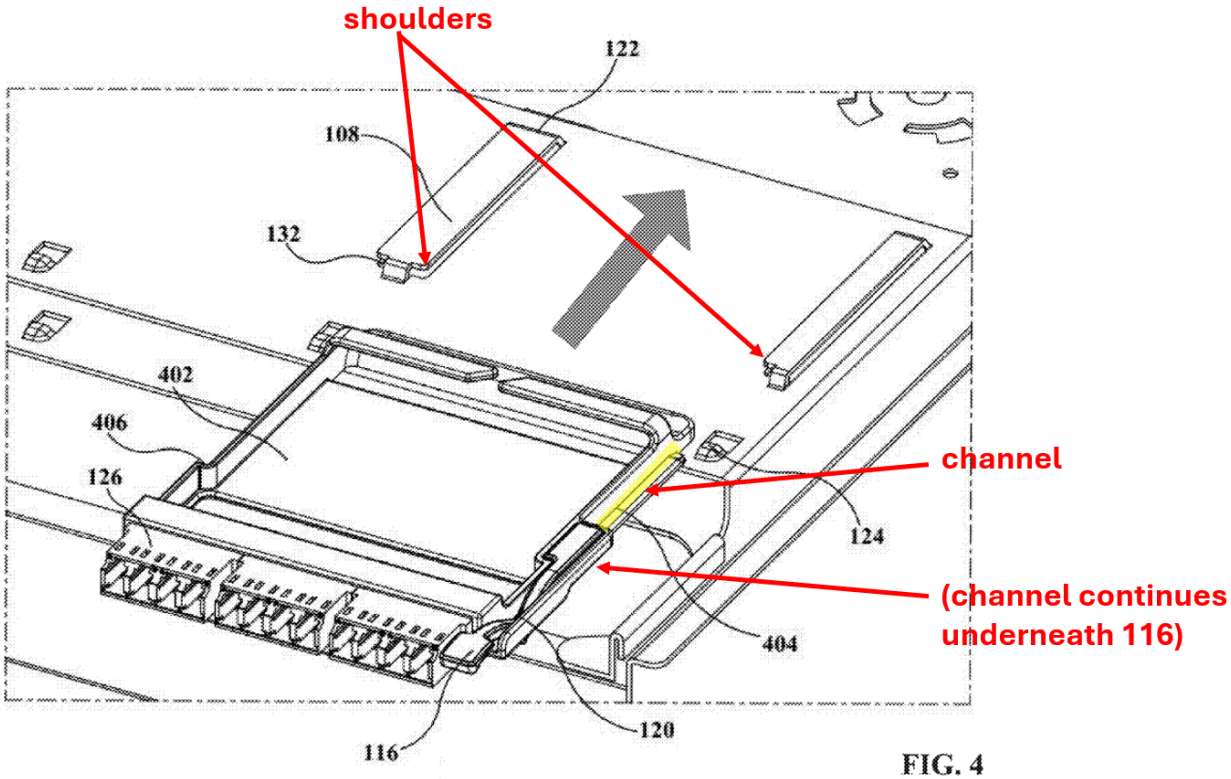


FIG. 4

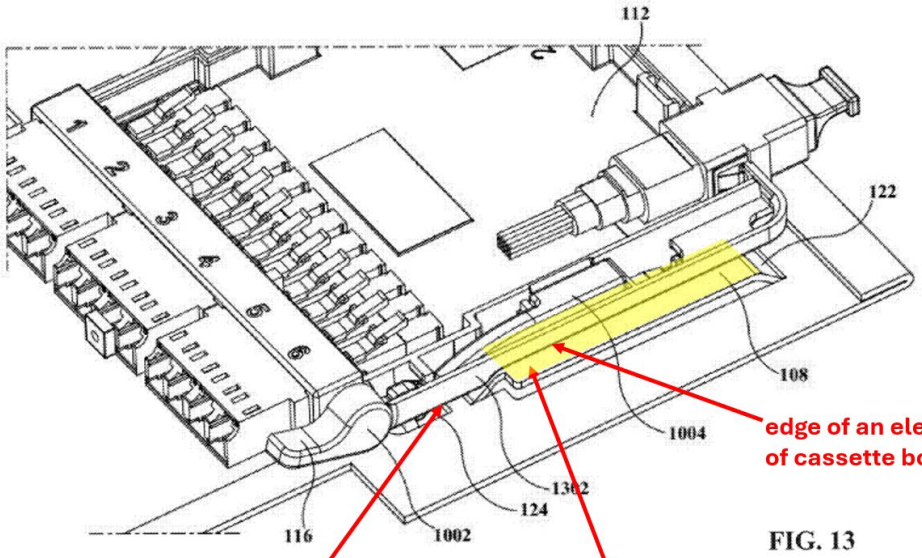


FIG. 13

edge of an elevated portion of cassette bottom

non-elevated portion of cassette side

The horizontal portion of the rail guides define shoulders. Left side shoulder of the rail guide 108 is obscured because it is received in a channel between the rail 404 on the cassette (that slides underneath the shoulder) and an elevated bottom portion of cassette housing. Yellow indicates extent of shoulders.

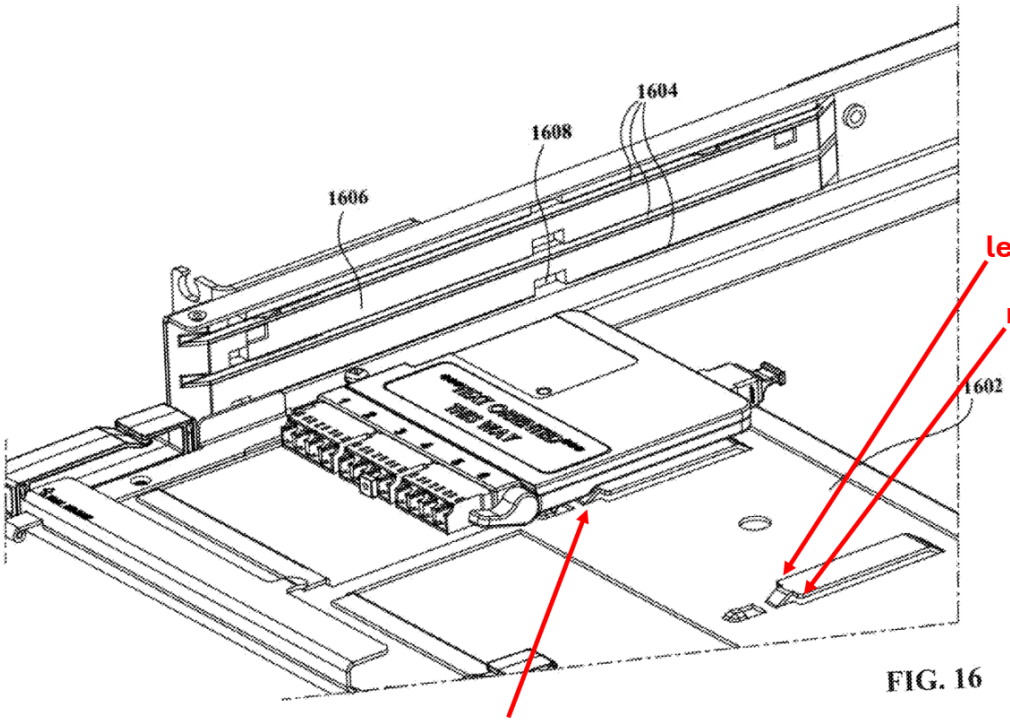


FIG. 16

left shoulder

right shoulder

left shoulder of rail guide obscured because it is received into channel between cassette rail and elevated bottom surface of cassette housing

EX1003 ¶388.

Each rail guide between bays includes both left and right shoulders. The rail guides at the ends of the tray only define one shoulder. The shoulders of the rail guides are received into a channel on the cassettes defined by the rail 404 and the cassette housing. EX1003 ¶388. As best seen in Figs. 13 and 16, there is channel between the rail and an elevated portion of the cassette bottom along the cassette side. The left shoulder of the rail guide cannot be fully seen in Figs. 13 and 16, because it has been received into this channel. EX1003 ¶388.

U. Claim 44

See Element 1A. Also, Claim 44 uses the term "case" instead of "housing." Sauter's enclosure is a case, for the same reasons that it is a housing. Further, to the extent that Sauter's enclosure is not sufficient disclosure of a "case" then it would have been obvious to modify Sauter's enclosure to add any missing top or bottom walls to make it a case for the same reasons given above in Element 1A regarding a "housing." EX1003 ¶389.

V. Claim 45

See Element 1C.

W. Claim 47

See Element 1C.

X. Claim 48

In Sauter, when the cassettes are arranged on the tray side-by-side, the cassettes are either touching or almost touching. EX1003 ¶393. For example, as shown in Fig. 15, there is no visible space between the cassettes.

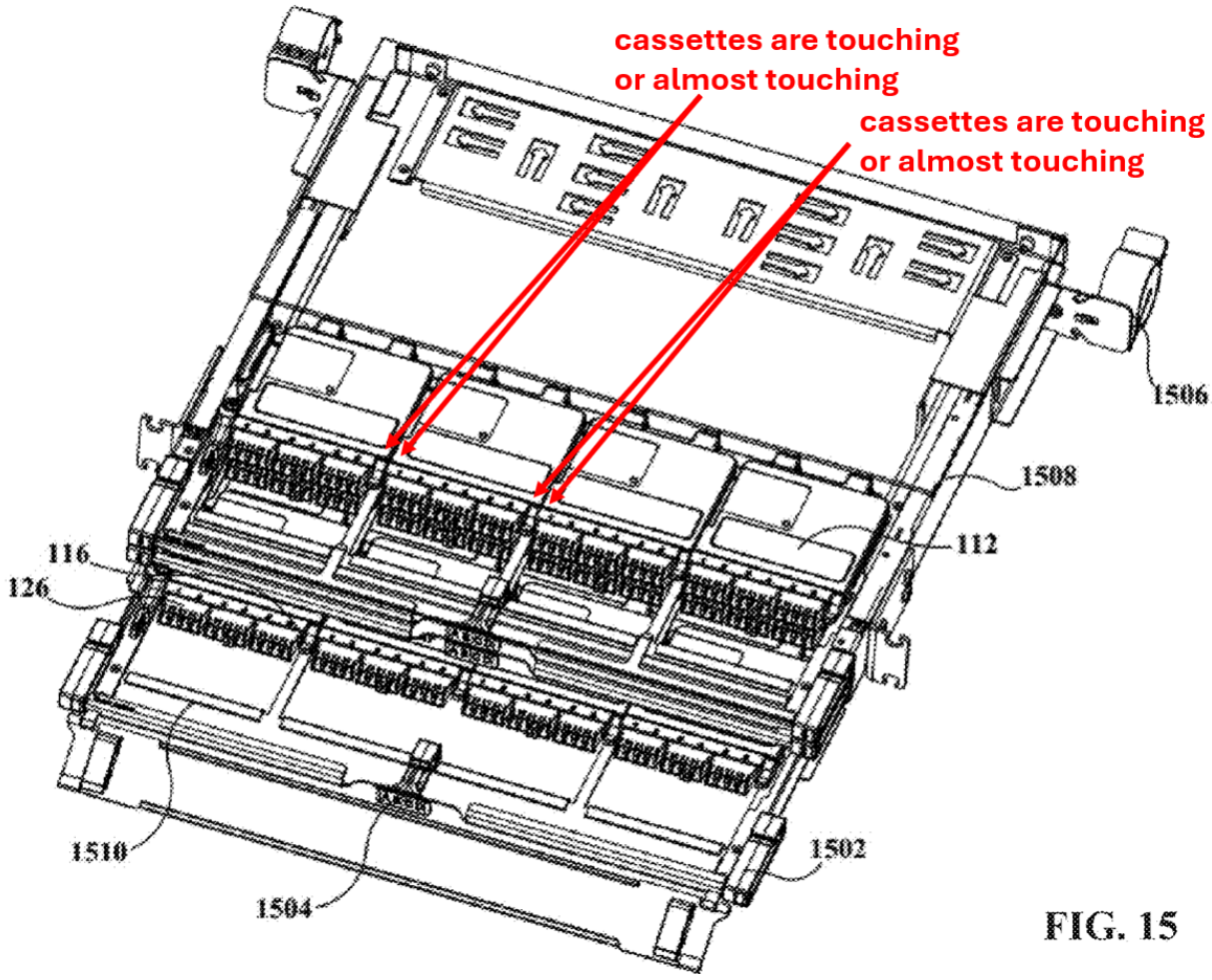
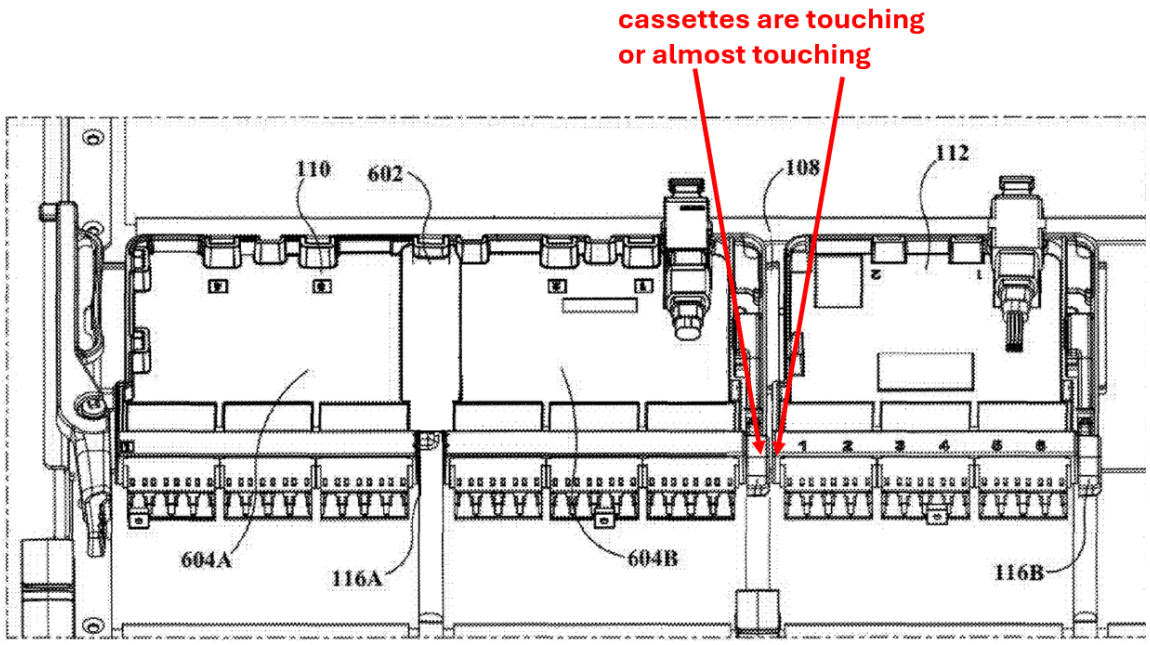


FIG. 15

Sauter, as explained above, teaches to place the latching mechanism of a double-gang cassette on the right side of the cassette. The result is that the right side of the double-gang cassette is touching or almost touching the single-gang cassette:



EX1003 ¶394.

Even if there is a tiny gap (that cannot be seen) between the cassettes when mounted on the tray, it would have been obvious based on Sauter alone to modify Sauter's cassettes so that they touch. EX1003 ¶395. This is, at most, an insignificant modification to Sauter. Any such gap is already so small it is not even visible in Fig. 15. A POSITA could easily make this modification by making the cassettes a tiny amount wider. EX1003 ¶395. The same motivations for the same claim discussed under Ground 1 equally apply here, including that ti was already known to make adjacent cassettes touch. See, e.g., EX1026 at 3:4-9, Figs. 5; EX-1010 at Figs. 3-4; EX1004 at Fig. 8, 7:46-51; EX1003 ¶396-399.

Y. Claim 49

See Elements 1E and 1C.

Z. Claim 55

A POSITA would recognize from Fig. 15 and 5 that Sauter's tray is configured with dimensions that will allow the tray to be mounted within the standard U-space rack. EX1003 ¶¶406-409. The dimensions of a "standard U-space" rack had already been defined in an industry standard. EX1008; EX1003 ¶406. The rack unit "U" or "RU" refers to an amount of vertical space and is defined as 44.45 millimeters (1.75 inches). EX1008 at 2; EX1003 ¶406.

The height of Sauter's tray with cassettes (see Fig. 5, 15) is much shorter than the 1.75 inches of a U-space. EX1003 ¶407. The dimensions of the tray can be recognized because they include standard LC adapter ports. EX1003 ¶407; EX1009, 25 (vertical dimension of a quad LC adapter is 9.45 mm). From these well-known LC port dimensions, a POSITA would recognize Sauter's tray will fit within a one U rack space (e.g., it is less than 1.75" tall and less than 450mm wide). EX1003 ¶¶407-408.

As seen in Fig. 5 and 16, Sauter's trays are also configured with straight edges or flanges along its sides to allow the trays to be mounted by sliding the tray edges within grooves of a support structure. EX1003 ¶409.

Ground 4: Sauter in light of Fukui renders all challenged claims obvious

A. "directly adjacent" (Claims 1-6, 10-14, 16, 20, 22, 23, 45, 47)

If Sauter's cassette side edges are not "directly adjacent," Sauter plus Fukui (EX1004) renders these claims obvious. It would have been obvious to use the

cassette fastening features from Fukui on Sauter's cassettes to eliminate the need for any rail guides on Sauter's tray. EX1003 ¶405.

Fukui shows cassettes can be releasably secured to a tray using hooks that protrude from the bottom of the cassette module instead of rails and rails guides. EX1004, 8:52-56, Fig. 2.

Fig.2

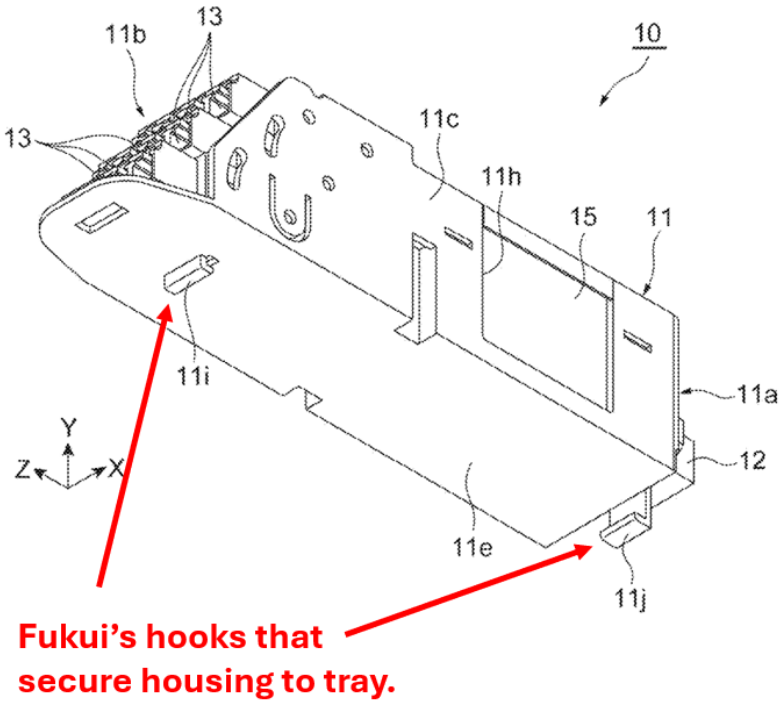
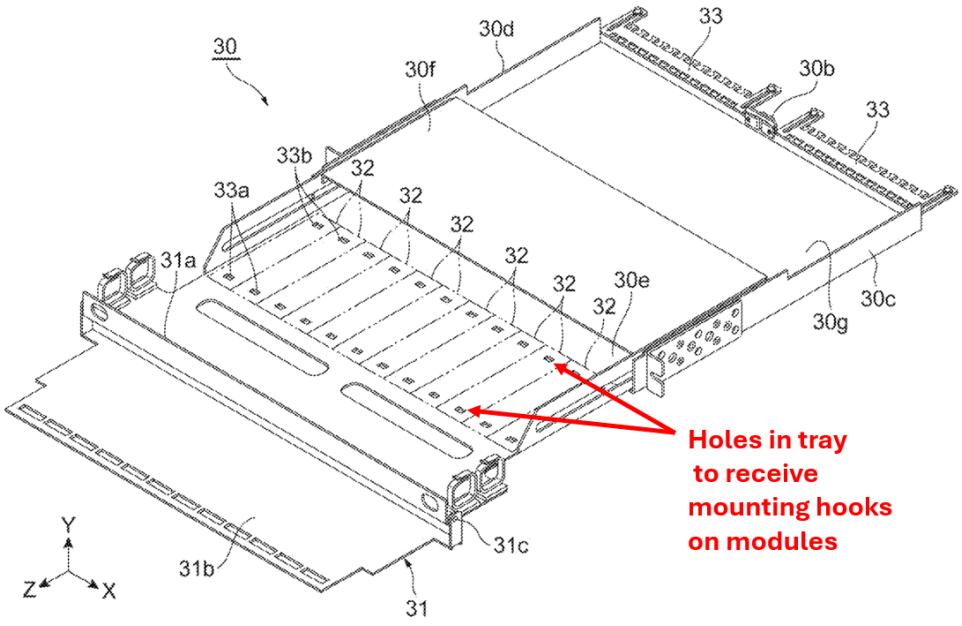


Fig. 9 of Fukui shows that the tray includes holes for the hooks:

Fig.9



The examiner did not consider Fukui and appears to have considered the rails on trays "necessary" in the prior art to affix modules to the tray. EX1007, 184. The examiner was not aware of Fukui's alternative using hooks.

A POSITA would be motivated to use the Fukui hooks on Sauter's cassettes. First, eliminating the space occupied by the rail and latching mechanism would allow the cassettes to occupy less space in the width dimension (eliminating rails/latch mechanism). EX1003 ¶418.

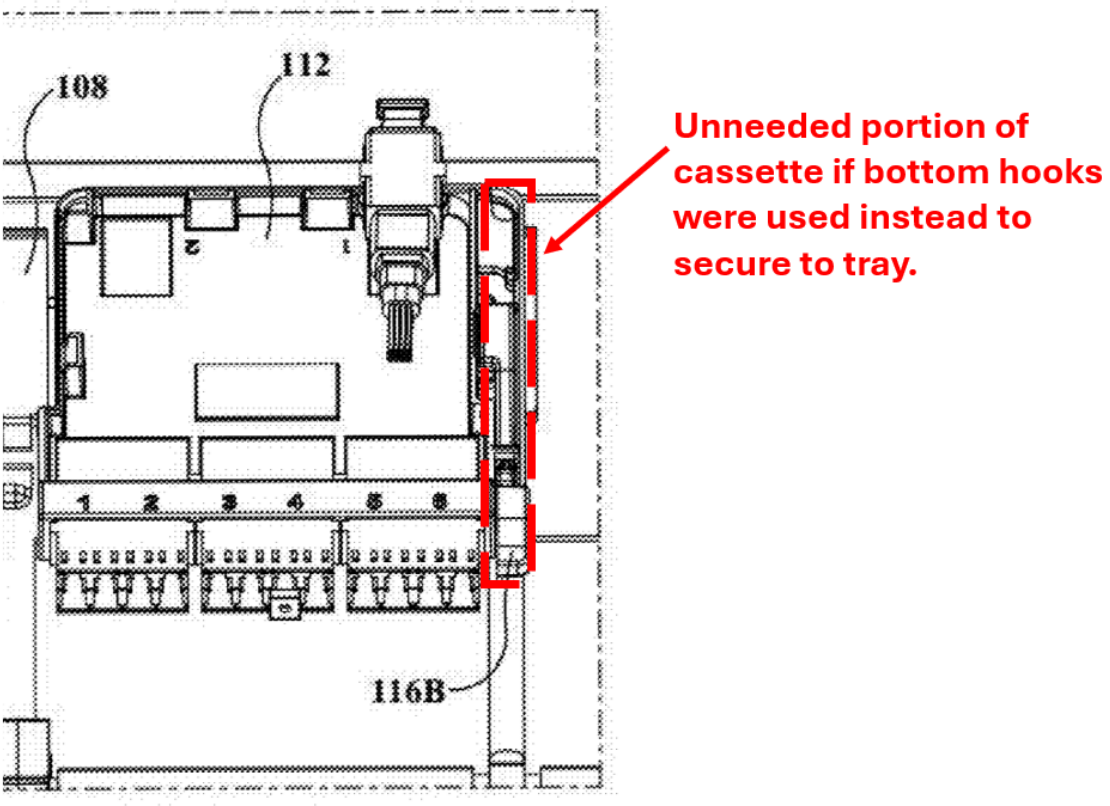


FIG. 7

More available space creates room to fit more components within the same panel.

Second, doing this would free up space within Sauter's cassettes. EX1003 ¶418. Sauter's use of rail guides on the tray requires sacrificing space within the cassettes to create a "clearance area 602" spanning intermediate rail guides on the tray. See EX1006 at Fig. 8, 7:19-28. Fukui's hook approach does not need to sacrifice any space inside the cassettes.

A POSITA would have considered combining Fukui and Sedor because they disclose the same type of system (modular fiber optic cassette systems with multiple sizes). EX 1003 ¶419.

A POSITA would have a reasonable expectation of success. Sauter's technique already relies on other holes ("apertures 124") in the tray when mounting the cassettes. See EX1006 at Figs. 4, 12, 14, 1; EX1003 ¶420.

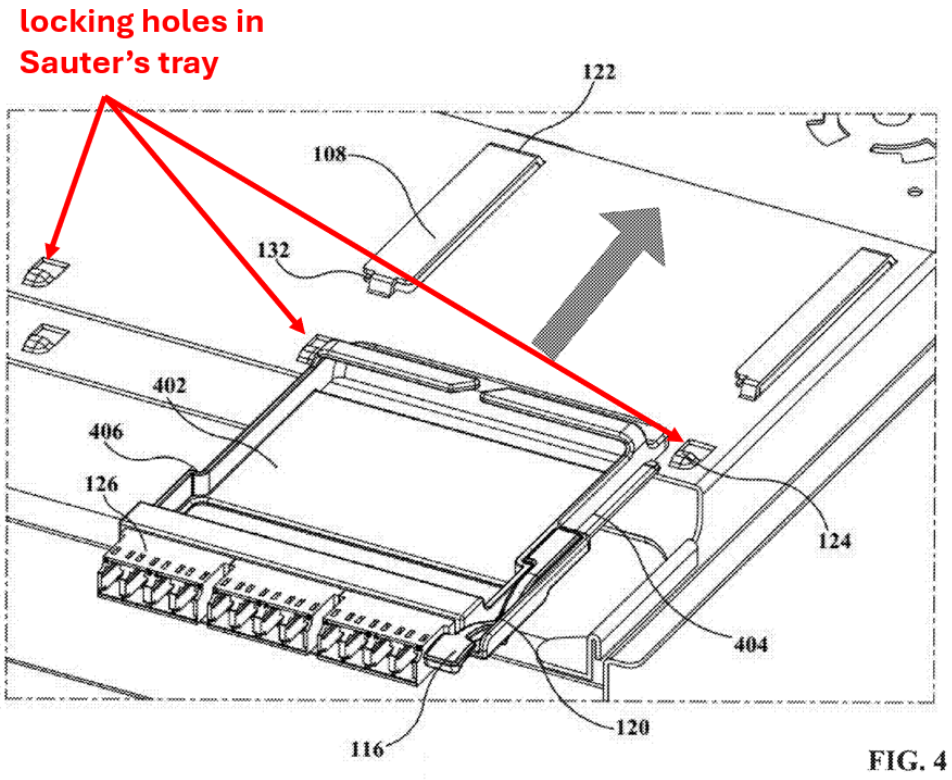


FIG. 4

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 ¶421.

Ground 1 above explains that Fukui's hooks and holes satisfy the "fastening portion," "engagement features," and "engagement structures," "slot," "tab," and "cassette engagement portion." Thus, the combination of Sauter with Fukui's holes and hook technique discloses those limitations too. EX1003 ¶422.

B. Cassette width limitations in each independent claim

The combination of Sauter and Fukui renders the width limitations obvious. When Fukui's mounting features are used instead of Sauter's rail guides/latch, the resulting cassettes would be exact multiples in width of the smallest gang cassette. EX1003 ¶423.

Fukui teaches to form holes in the tray with a pitch equal to the width of the smallest module. EX1004, Fig. 9 (holes 32a and 32b). Thus, multiple single modules can be coupled together to form one larger module and still mount to the same holes in the tray. Using this technique on Sauter's cassettes would result in Sauter's cassettes being like Fukui's in that they are exact multiples in width of the smallest "single-gang" cassette. EX1003 ¶424. A POSITA would be motivated to make this modification and have a reasonable expectation of success for the same reasons discussed above for this ground under the "directly adjacent" claim limitation.

C. A third cassette size (Claims 12, 34, 60)

Sauter plus Fukui renders claims 12, 34, 60 obvious. Sauter discloses more than two sizes (e.g., single, dual, and three-gang cassettes). EX1006 at 4:50-61, 7:38-47, 5:12-17. Selecting a three-gang cassette, however, leaves room in a single layer of cassettes for one additional single-gang cassette.

Fukui teaches additional narrower cassette sizes such as module 20 that accommodates the width of **two** quad LC adapter modules. A POSITA would have found it obvious to modify Sauter so that the base "single-gang" cassette accommodated only **two** quad LC adapter modules, instead of three. EX1003 ¶¶426-427. Sauter's use of the generic term "gang" itself suggests the gang or group may be any desirable number. If a single gang were a group of 8 ports (two adapter modules), then all three sizes of cassettes (single (8), double (16), triple-gang(24)) would fit in one row on Sauter's tray. EX1003 ¶427.

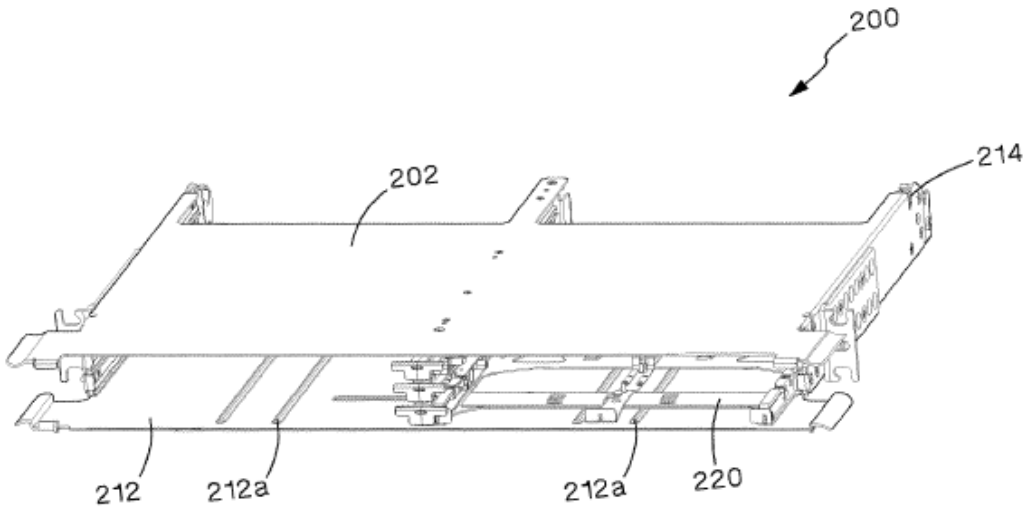
A POSITA would be motivated to make a single "gang" in Sauter equal to the eight receptacles in order to match BASE-8 fiber systems which group fibers and connector components into groups of eight instead of twelve and to avoid wasting cassette and tray capacity. EX1003 ¶¶428-429; EX1030 ¶0003-0005, 0045; EX1031 ¶¶0020-0027; EX1032 4:20-43. A POSITA would have a reasonable expectation of success because the components of the cassettes would function the same way. EX1003 ¶430.

Ground 5: Grounds 3 or 4 in further light of Sedor

A. A "housing" or "case" in claims 1, 18, and 40

Sedor provides further disclosure of a "housing" or "case" and the combination of Sauter and Sedor renders these limitations obvious. EX1003 ¶432.

Sedor discloses a "fiber enclosure" (200). Sedor at 7:33-34. Figure 44 shows Sedor's enclosure (200):



The enclosure, as shown above, includes a top (202) and bottom (212). EX1005 7:32-35; EX1005 Figs. 1A-3, 30, 31, and 32.

For the same reasons and motivations to modify Fukui under Ground 2 as well as the motivations given in Gound 3, it would also have been obvious to modify Sauter's "enclosure" to include top and bottom walls as taught by Sedor for improved protection. EX1003 ¶¶434-435.

B. Element 1C and Claims 23, 49

"…cassettes…arrangeable… along the front tray end portion"
"…arranged… along a front end portion of the tray"

Arranging the cassettes on "the front tray end portion" or on "a front end portion" of the tray would have been obvious based on Sauter in view of Sedor. See EX1005 Figs. 7-12; EX1003 ¶436. For the same reasons given above that it was obvious based on Sedor to modify Fukui to position the cassettes on the tray front end (e.g., to improve access to connector locations), it was also obvious based on Sedor to position Sauter's cassettes on the front end of Sauter's tray. EX1003 ¶436.

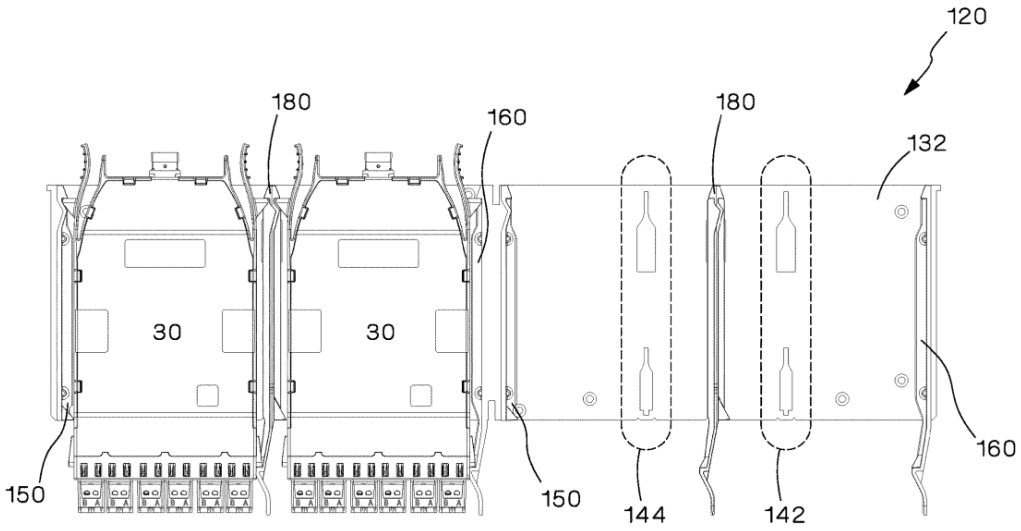


FIG.7

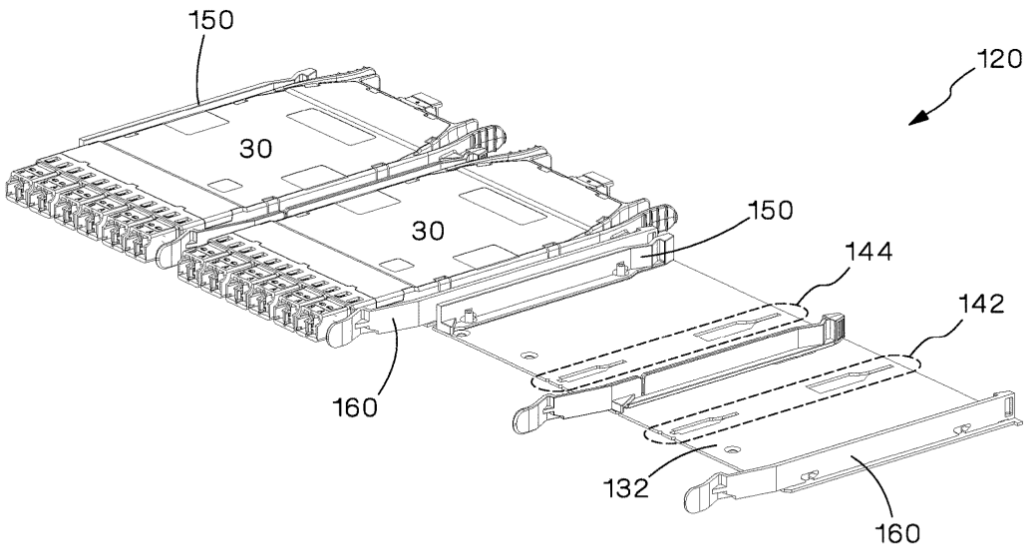


FIG.8

EX1005, Figs. 7-8 (cassettes 30 on front end of tray 120).

C. Claims 12, 34, 40

Sauter teaches a third cassette size, specifically a "three-gang cassette." However, Sauter's tray is not wide enough to receive all three cassette sizes simultaneously, unless the "gang" were reduced from twelve ports, to eight ports. Sedor teaches a narrower cassette with a width of eight LC connector ports. See, Sedor's cassette 40 in Figs. 9 and 10:

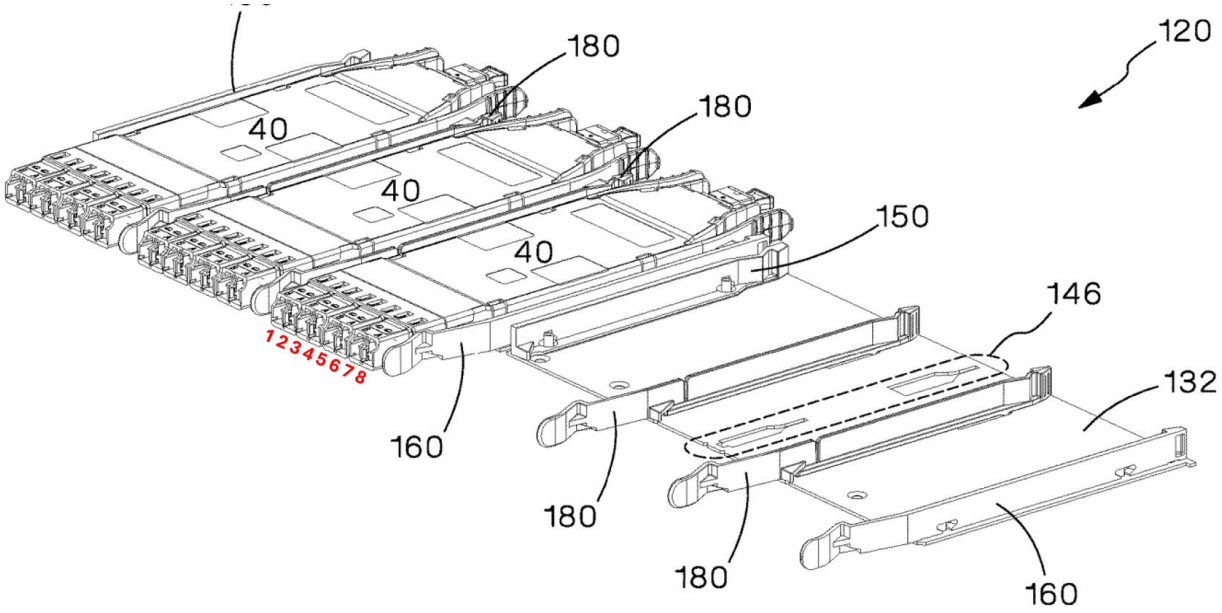

120
180
180
40
40
40
150
146
132
1 2 3 4 5 6 7 8
160
180
180
160

FIG.10

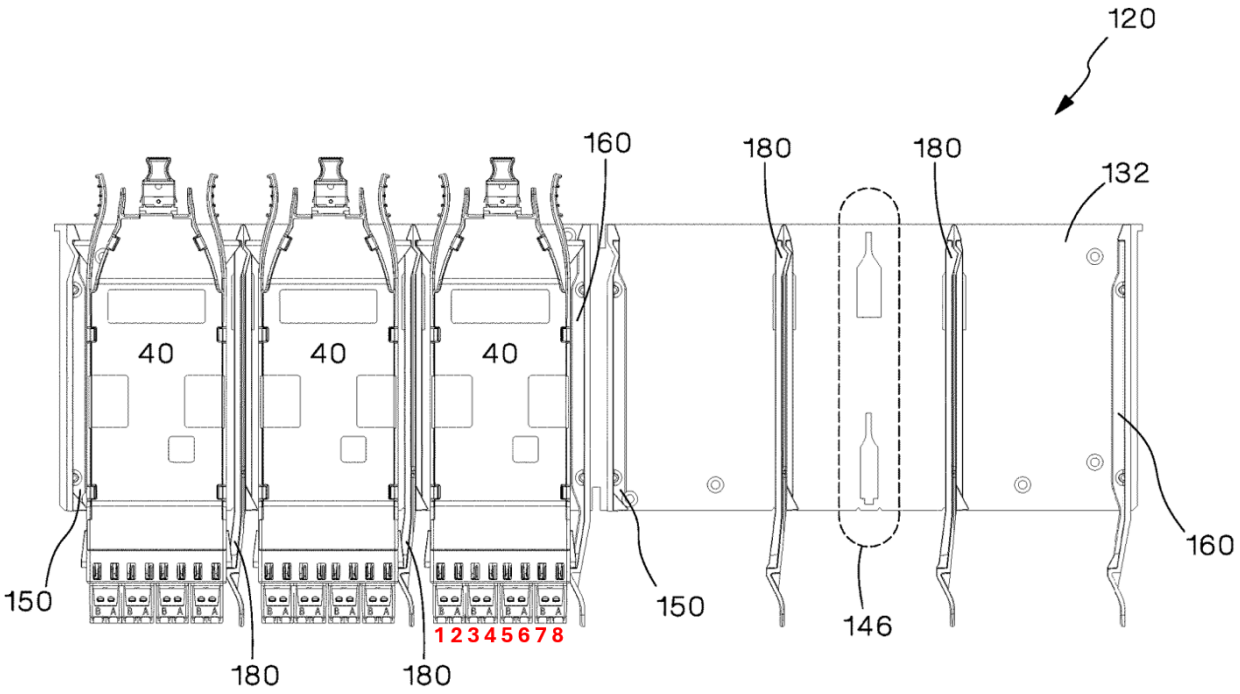

120
160
180
180
132
40
40
40
150
150
146
160
1 2 3 4 5 6 7 8
180
180

FIG.9

It would have been obvious based on Sedor to modify Sauter's "gang" to be eight LC ports instead of twelve LC ports. EX1003 ¶¶437-439. The same motivation and expectation of success from Claim 12 under Ground 4 apply (to match BASE-8 fiber systems). EX1003 ¶438.

Conclusion

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

Respectfully submitted,

Dated: July 26, 2024

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Claims Listing Appendix

U.S. Patent No. 11,656,422
Challenged Claims
1-6, 10-14, 16,
18, 20-28, 32-36, 38,
40-42, 44-56, 60-62, 64

Designation	Claim 1
Preamble	1. A fiber optic cassette tray for providing a plurality of different modular fiber optic cassette configurations in a fiber optic management system comprising:
Element 1A	a tray having a front tray end portion and configured to be slidingly received in at least a portion of the tray receiving space of a housing of a fiber optic management system;
Element 1B	wherein the tray is configured to support a plurality of different modular fiber optic cassette configurations when the tray is slidingly received in at least the portion of the tray receiving space;
Element 1C	wherein the plurality of different modular fiber optic cassette configurations include a selected plurality of fiber optic cassettes that are each configured to be arranged side by side along the front tray end portion of the tray such that an outer side edge of each of the selected plurality of fiber optic cassettes is directly adjacent to an outer edge of at least one other fiber optic cassette;
Element 1D	wherein each of the selected plurality of fiber optic cassettes include a plurality of fiber optic plug receiving receptacle portions;
Element 1E	wherein the tray is configured to be removably secured to each of the selected plurality of fiber optic cassettes when each of the plurality of fiber optic plug receiving receptacle portions are arranged side by side in a row along the front tray end portion;
Element 1F	wherein a first of the selected plurality of fiber optic cassettes comprises a first cassette width, as measured between outer side edges thereof, of two, three, four, or six standard width units;

Element 1G	wherein a second of the selected plurality of fiber optic cassettes comprises a second cassette width, as measured between outer side edges thereof, of two, three, four, or six standard width units; and
Element 1H	wherein the second cassette width is different from the first cassette width.
Claim 2	2. The fiber optic cassette tray of claim 1, wherein the tray has a tray width that is configured to receive at least twelve standard cassette width units side by side.
Claim 3	3. The fiber optic cassette tray of claim 1, wherein each of the fiber optic cassettes comprises a multi-fiber connector receiving receptacle portion arranged on a rear portion thereof and a plurality of optic fibers, one of the optic fibers being configured to interconnect a respective one of the optic plug receiving receptacle portions with the multi-fiber connector receiving receptacle portion.
Claim 4	4. The fiber optic cassette tray of claim 1, wherein each of the 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 unit.
Claim 5	5. The fiber optic cassette tray of claim 1, wherein the cassette tray is configured to be mounted in a rack.
Claim 6	6. The fiber optic cassette tray of claim 1, wherein the tray comprises a cassette fastening portion that is configured to removably secure the tray to each cassette.
Claim 10	10. The fiber optic cassette tray of claim 1, wherein the tray is configured to be removably secured to each of the plurality of the selected plurality of the set of fiber optic cassettes arranged side by side in the row such that an outer side edge portion of each of the selected plurality of the set of fiber optic cassettes faces a directly adjacent outside edge portion of at least one other selected fiber optic cassette.
Claim 11	11. The fiber optic cassette tray of claim 10, wherein an edge of the first tray end portion is substantially evenly divisible by a maximum of twelve (12) of the standard width units.
Claim 12	12. The fiber optic cassette tray of claim 11, wherein a third cassette of the selected plurality of fiber optic cassettes comprising a third

	width different from the first cassette width and the second cassette width.
Claim 13	13. The fiber optic cassette tray of claim 1, wherein the tray comprises an engagement feature configured to receive an engagement structure of the fiber optic cassettes.
Claim 14	14. The fiber optic cassette tray of claim 13, wherein the engagement feature comprises a slot and the engagement structure comprises a tab.
Claim 16	16. The fiber optic cassette tray of claim 13, wherein engagement feature comprises an aperture and the engagement structure comprises a flexible tab.
Designation	Claim 18
Preamble	18. A fiber optic cassette tray for providing a plurality of different modular fiber optic cassette configurations in a fiber optic management system comprising:
Element 18A	a tray having a cassette engaging portion and configured to be slidingly received in at least a portion of the tray receiving space of a housing of a fiber optic management system;
Element 18B	wherein the tray is configured to support a plurality of different modular fiber optic cassette configurations when the tray is slidingly received in at least the portion of the tray receiving space;
Element 18C	wherein the plurality of different modular fiber optic cassette configurations includes a selected plurality of fiber optic cassettes that are each configured to be arranged side by side along the cassette engaging portion of the tray such that an outer side edge of each of the selected plurality of fiber optic cassettes adjacently faces an outer edge of at least one other fiber optic cassette;
Element 18D	wherein each of the selected plurality of fiber optic cassettes include a plurality of fiber optic plug receiving receptacle portions;
Element 18E	wherein the tray is configured to be removably secured to each of the selected plurality of fiber optic cassettes when each of the plurality of fiber optic plug receiving receptacle portions are arranged side by side in a row;

Element 18F	wherein a first of the selected plurality of fiber optic cassettes comprises a first cassette width, as measured between outer side edges thereof, of two, three, four, and six standard width units;
Element 18G	wherein a second of the selected plurality of fiber optic cassettes comprises a second cassette width, as measured between outer side edges thereof, of two, three, four, and six standard width units; and
Element 18H	wherein the second cassette width is different from the first cassette width.
Claim 20	20. The fiber optic cassette tray of claim 18, wherein the plurality of different modular fiber optic cassette configurations includes the selected plurality of fiber optic cassettes that are each configured to be arranged side by side along the cassette engaging portion of the tray such that the outer side edge of each of the selected plurality of fiber optic cassettes is directly adjacent to the outer edge of at least one other fiber optic cassette.
Claim 21	21. The fiber optic cassette tray of claim 18, wherein the tray is configured to support the selected plurality of fiber optic cassettes that are each configured to be arranged side by side along the cassette engaging portion of the tray such that the outer side edge of each of the selected plurality of fiber optic cassettes is adjacent to the outer edge of at least one other fiber optic cassette.
Claim 22	22. The fiber optic cassette tray of claim 18, wherein the tray is configured to support the selected plurality of fiber optic cassettes that are each configured to be arranged side by side along the cassette engaging portion of the tray such that the outer side edge of each of the selected plurality of fiber optic cassettes is directly adjacent to the outer edge of at least one other fiber optic cassette.
Claim 23	23. The fiber optic cassette tray of claim 18, wherein the tray is configured to be removably secured to each of the selected plurality of fiber optic cassettes when each of the plurality of fiber optic plug receiving receptacle portions are arranged side by side in a row along a front end portion of the tray.

Claim 24	24. The fiber optic cassette tray of claim 18, wherein the tray has a tray width that is configured to receive at least twelve standard cassette width units side by side.
Claim 25	25. The fiber optic cassette tray of claim 18, wherein each of the fiber optic cassettes comprises a multi-fiber connector receiving receptacle portion arranged on a rear portion thereof and a plurality of optic fibers, one of the optic fibers being configured to interconnect a respective one of the optic plug receiving receptacle portions with the multi-fiber connector receiving receptacle portion.
Claim 26	26. The fiber optic cassette tray of claim 18, wherein each of the 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 unit.
Claim 27	27. The fiber optic cassette tray of claim 18, wherein the tray is configured to be mounted in a rack.
Claim 28	28. The fiber optic cassette tray of claim 18, wherein the tray comprises a cassette fastening portion that is configured to removably secure the tray to each cassette.
Claim 32	32. The fiber optic cassette tray of claim 18, wherein the tray is configured to be removably secured to each of the plurality of the selected plurality of the set of fiber optic cassettes arranged side by side in the row such that an outer side edge portion of each of the selected plurality of the set of fiber optic cassettes faces a directly adjacent outside edge portion of at least one other selected fiber optic cassette.
Claim 33	33. The fiber optic cassette tray of claim 18, wherein a width of a front edge of the cassette engaging portion is substantially evenly divisible by a maximum of twelve (12) of the standard width units.
Claim 34	34. The fiber optic cassette tray of claim 18, wherein a third cassette of the selected plurality of fiber optic cassettes comprising a third width different from the first cassette width and the second cassette width.
Claim 35	35. The fiber optic cassette tray of claim 18, wherein the tray comprises an engagement feature configured to receive an engagement structure of the fiber optic cassettes.

Claim 36	36. The fiber optic cassette tray of claim 35, wherein the engagement feature comprises a slot and the engagement structure comprises a tab.
Claim 38	38. The fiber optic cassette tray of claim 35, wherein the engagement feature comprises an aperture and the engagement structure comprises a flexible tab.
	Claim 40
Preamble	40. A tray for providing a plurality of different modular fiber optic cassette configurations in a fiber optic management system comprising:
Element 40A	a tray configured to fit a plurality of different modular fiber optic cassette configurations in a case of a fiber management system;
Element 40B	wherein the plurality of different modular fiber optic cassette configurations includes a selected plurality of fiber optic cassettes that are each configured to be arranged side by side along the tray such that an outer side edge of each of the selected plurality of fiber optic cassettes adjacently faces an outer edge of at least one other fiber optic cassette;
Element 40C	wherein each of the selected plurality of fiber optic cassettes includes a plurality of fiber optic plug receiving receptacle portions;
Element 40D	wherein the tray is configured to be removably secured to each of the selected plurality of fiber optic cassettes that are each configured to be arranged side by side along the tray;
Element 40E	wherein a first of the selected plurality of fiber optic cassettes comprises a first cassette width, as measured between outer side edges thereof, of two, three, four, and six standard width units;
Element 40F	wherein a second of the selected plurality of fiber optic cassettes comprises a second cassette width, as measured between outer side edges thereof, of two, three, four, and six standard width units; and
Element 40G	wherein the second cassette width is different from the first cassette width.

Claim 41	41. The tray of claim 40, wherein each of the selected plurality of fiber optic cassettes are configured to be arranged side by side along a cassette engaging portion of the tray.
Claim 42	42. The tray of claim 40, wherein the cassette engaging portion comprises a shoulder and each of the selected plurality of fiber optic cassettes comprises a channel that is configured to receive the shoulder.
Claim 44	44. The tray of claim 40, 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 45	45. The tray of claim 40, wherein the plurality of different modular fiber optic cassette configurations includes the selected plurality of fiber optic cassettes that are each configured to be arranged side by side along the tray such that the outer side edge of each of the selected plurality of fiber optic cassettes is directly adjacent to the outer edge of at least one other fiber optic cassette.
Claim 46	46. The tray of claim 40, wherein the tray is configured to support the selected plurality of fiber optic cassettes that are each configured to be arranged side by side along the tray such that the outer side edge of each of the selected plurality of fiber optic cassettes is adjacent to the outer edge of at least one other fiber optic cassette.
Claim 47	47. The tray of claim 40, wherein the tray is configured to support the selected plurality of fiber optic cassettes that are each configured to be arranged side by side along the tray such that the outer side edge of each of the selected plurality of fiber optic cassettes is directly adjacent to the outer edge of at least one other fiber optic cassette.
Claim 48	48. The tray of claim 40, wherein the tray is configured to support the selected plurality of fiber optic cassettes that are each configured to be arranged side by side along the tray such that the outer side edge of each of the selected plurality of fiber optic cassettes touches the outer edge of at least one other fiber optic cassette.
Claim 49	49. The tray of claim 40, wherein the tray is configured to be removably secured to each of the selected plurality of fiber optic cassettes when each of the plurality of fiber optic plug receiving receptacle portions are arranged side by side in a row along a front end portion of the tray.

Claim 50	50. The tray of claim 40, wherein the tray has a tray width that is configured to receive at least twelve standard width units side by side.
Claim 51	51. The tray of claim 40, 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 fit at least twelve standard width units side by side along the tray.
Claim 52	52. The tray of claim 40, wherein each of the fiber optic cassettes comprises a multi-fiber connector receiving receptacle portion arranged on a rear portion thereof and a plurality of optic fibers, one of the optic fibers being configured to interconnect a respective one of the optic plug receiving receptacle portions with the multi-fiber connector receiving receptacle portion.
Claim 53	53. The tray of claim 40, wherein each of the 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 unit.
Claim 54	54. The tray of claim 40, wherein the cassette tray is configured to be mounted in a rack.
Claim 55	55. The tray of claim 40, wherein the cassette tray is configured to be mounted in a standard U-space rack.
Claim 56	56. The tray of claim 40, wherein the tray comprises a cassette fastening portion that is configured to removably secure the tray to each cassette.
Claim 60	60. The tray of claim 40, wherein a third cassette of the selected plurality of fiber optic cassettes comprises a third width different from the first cassette width and the second cassette width.
Claim 61	61. The tray of claim 40, wherein the tray comprises an engagement feature configured to receive an engagement structure of the fiber optic cassettes.
Claim 62	62. The tray of claim 61, wherein the engagement feature comprises a slot and the engagement structure comprises a tab.

Claim 64	64. The tray of claim 61, wherein the engagement feature comprises an aperture and the engagement structure comprises a flexible tab.

Petitioner Exhibit List

Number	Description
EX1001	U.S. Patent No. 11,656,422 (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 Publication No. 2017/0192191
EX1031	U.S. Patent 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

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 13,992 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: July 26, 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 July 26, 2024 a complete and entire copy of this PETITION FOR INTER PARTES REVIEW OF UNITED STATES PATENT NO. 11,656,422 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: July 26, 2024

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