

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

US CONEC LTD.,
Petitioner,

v.

SENKO ADVANCED COMPONENTS, INC.,
Patent Owner.

IPR2024-00118
Patent 11,340,413 B2

Before BARBARA A. PARVIS, ELIZABETH M. ROESEL, and
BRIAN D. RANGE, *Administrative Patent Judges*.

PARVIS, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

US Conec Ltd. (“Petitioner”) filed a Petition (Paper 2 (“Pet.”)) requesting *inter partes* review of claims 1–28 (“challenged claims”) of U.S. Patent No. 11,340,413 B2 (Ex. 1001, “the ’413 patent”). Senko Advanced Components, Inc. (“Patent Owner”) did not file a preliminary response.

Under 35 U.S.C. § 314(a), an *inter partes* review may not be instituted unless the information presented in the petition and any response “shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” For the reasons below, we determine that Petitioner establishes a reasonable likelihood that it would prevail with respect to at least one claim, and we institute an *inter partes* review as to all challenged claims of the ’413 patent.

The following findings of fact and conclusions of law are not final, but are made for the sole purpose of determining whether Petitioner meets the threshold for initiating review. Any final decision will be based on the full trial record, including any response timely filed by Patent Owner. Any arguments not raised by Patent Owner in a timely-filed response may be deemed waived.

II. BACKGROUND

A. *Related Matters*

Both parties identify, as matters involving or related to the ’413 patent, the following district court proceeding: *Senko Advanced Components, Inc. v. US Conec Ltd.*, Case No. 1:23-cv-00083 (D. Del.).¹

¹ Petitioner states that “if [this proceeding is] instituted, Petitioner stipulates not to pursue in the district court the grounds in the Petition or any ground that reasonably could have been raised in the Petition.” Pet. 113. In view of Petitioner’s stipulation, we do not discretionarily deny institution. Katherine

B. The '413 Patent

The '413 patent is titled “Ultra-Small Form Factor Optical Connectors Used as Part of a Reconfigurable Outer Housing.” Ex. 1001, code (54). The '413 patent “relates generally to ultra-small form factor optical connectors and related connections within adapters and optical transceivers.” *Id.* at 1:31–33. By way of background, the '413 patent explains that “manufacturers of connectors and adaptors” look to “reduce the size” of fiber optic connectors, “while increasing the ease of deployment, robustness, and modifiability after deployment.” *Id.* at 1:51–54. The '413 patent states “[f]or example, more optical connectors may need to be accommodated in the same footprint previously used for a smaller number of connectors in order to provide backward compatibility with existing data center equipment.” *Id.* at 1:54–58. The '413 patent further describes the following:

[O]ne current footprint is known as the small form-factor pluggable transceiver footprint (SFP). This footprint currently accommodates two LC-type ferrule optical connections. However, it may be desirable to accommodate four optical connections (two duplex connections of transmit/receive) within the same footprint. Another current footprint is the quad small form-factor pluggable (QSFP) transceiver footprint. This footprint currently accommodates four LC-type ferrule optical connections.

K. Vidal, *Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation* (June 21, 2022), at 3–4, available at https://www.uspto.gov/sites/default/files/documents/interim_proc_discretionary_denials_aia_parallel_district_court_litigation_memo_20220621_.pdf; *Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12 (PTAB Dec. 1, 2020) (precedential as to section II.A).

Id. at 1:58–67.²

The '413 patent discloses “[a]n optical connector holding two or more LC-type optical ferrules.” *Id.* at 2:40–41. An exploded view of one embodiment of a connector is illustrated in Figure 3. *Id.* at 3:7–8.

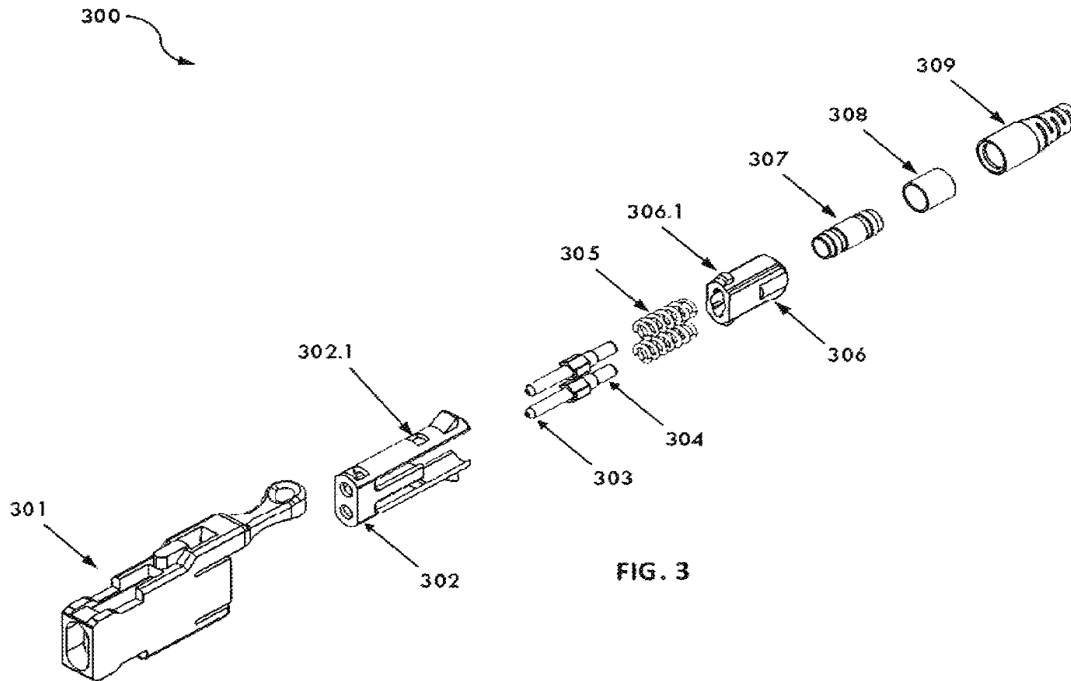


Figure 3, above, shows connector 300 that includes “an outer housing 301, a front body 302, one or more ferrules 303, one or more ferrule flanges 304, one or more springs 305, a back body 306, a back post 307, a crimp ring 308, and a boot 309.” *Id.* at 6:31–35.³ According to the '413 patent, these components are “configured such that two optical connectors having four LC-type optical ferrules may be accommodated in a small form-factor

² Petitioner relies on column 1, lines 58 through 61 and lines 63 through 67 as “Applicant Admitted Prior Art (‘AAPA’).” Pet. 66.

³ The challenged patent and prior art references use articles, such as “a” and “the” before connector elements. We include that usage in our quotations of those documents, but we otherwise do not use articles when we reference a specific connector or element, such as “connector 300.”

pluggable (SFP) transceiver footprint or at least two optical connectors having a total of eight LC-type optical ferrules may be accommodated in a quad small form-factor pluggable (QSFP) transceiver footprint.” *Id.* at 6:40–46.

A perspective view of one embodiment of a connector is illustrated in Figure 4. Ex. 1001, 3:9–10.

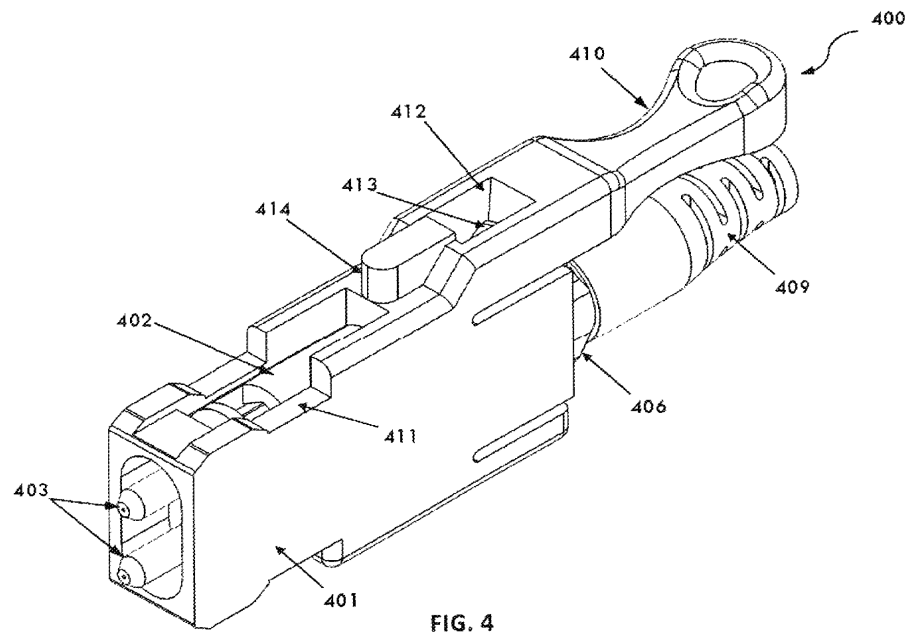


Figure 4, above, shows assembled connector 400, which has “an outer housing 401, a front body 402 positioned within the outer housing, one or more ferrules 403, one or more ferrule flanges (not shown), one or more springs (not shown), a back body 406, a back post (not shown), a crimp ring (not shown), a boot 409, and a push-pull tab 410.” *Id.* at 6:49–54. The ’413 patent describes that “the outer housing 401 may also have a key 414,” which “may keep the connector in a given orientation when inserted into a receptacle such as an adapter or transceiver.” *Id.* at 7:2–6.

One embodiment of a MT connector is illustrated in Figures 18A and 18B. Ex. 1001, 3:42–43.

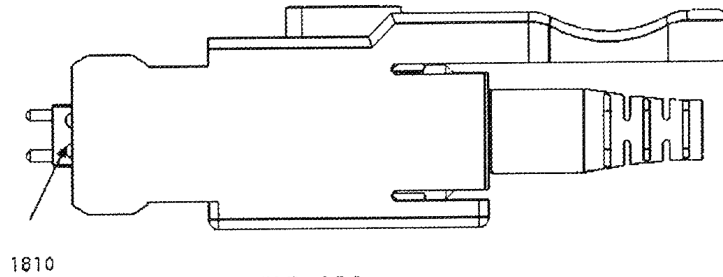


FIG. 18A

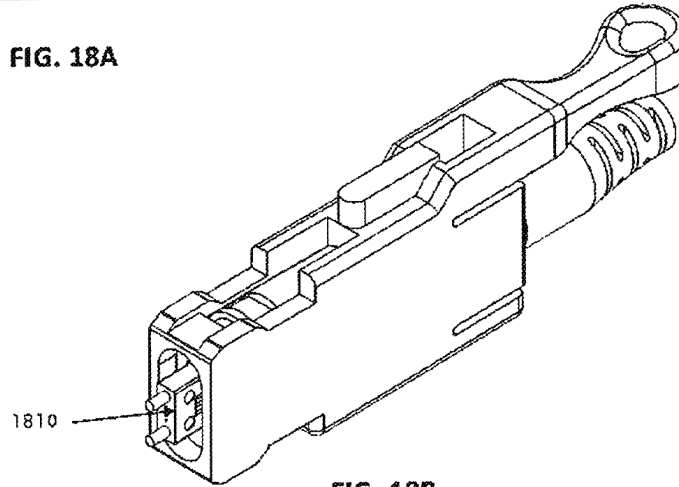


FIG. 18B

Figures 18A and 18B, above, illustrate “an optical connector including an MT ferrule 1810 in a housing that is substantially similar to the housing 301 of [Figure] 3.” *Id.* at 11:60–62. According to the ’413 patent, like the embodiment of Figure 3, “the various features of the connector are configured such that two optical connectors having two MT-type optical ferrules may be accommodated in a small form-factor pluggable (SFP) transceiver footprint or at least four optical connectors having a total of four MT-type optical ferrules may be accommodated in a quad small form-factor pluggable (QSFP) transceiver footprint.” *Id.* at 11:62–12:2.

C. Illustrative Claim

Petitioner challenges claims 1–28 of the ’413 patent. Pet. 2. Claims 1 and 17 are the independent challenged claims. Claims 2–16, 25, and 26 depend, directly or indirectly, from claim 1, and claims 18–24, 27, and 28

depend, directly or indirectly, from claim 17. Independent claim 1, reproduced below, is illustrative of the claimed subject matter.

1. [1.P⁴] An optical fiber connector comprising:
 - [1.1] a housing having a longitudinal axis and a front end portion and a rear end portion spaced apart along the longitudinal axis, [1.2] the housing comprising opposite first and second end walls spaced apart along a transverse axis oriented perpendicular to the longitudinal axis, [1.3] the housing comprising opposite first and second side walls spaced apart along a lateral axis oriented perpendicular to the longitudinal axis and the transverse axis;
 - [1.4] an MT ferrule received in the housing and exposed through the front end portion of the housing for making an optical connection, [1.5] the MT ferrule configured to receive plurality of fibers such that the fibers are spaced apart in a row that extends parallel to a fiber alignment axis, [1.6] the MT ferrule further comprising first and second guide pin openings spaced apart along the fiber alignment axis; and
 - [1.7] a polarity key disposed on the first end wall;
 - [1.8] wherein each of the first and second end walls has a lateral dimension along the lateral axis and each of the first and second side walls has a transverse dimension along the transverse axis, the lateral dimension being less than the transverse dimension;
 - [1.9] wherein the optical fiber connector is configured to latch with a mating adapter and [1.10] wherein the optical fiber connector is configured to be actuated to unlatch from the mating adapter by displacing a first portion of the optical fiber connector rearward relative to a second portion of the optical fiber connector, [1.11] wherein said displacing the first portion of the optical fiber connector rearward relative to the second portion of the optical fiber connector

⁴ Herein, we use Petitioner's designations for the limitations of claims 1 and 17. Pet., App. A.

displaces the polarity key rearward relative to the MT ferrule.

Ex. 1001, 20:32–64.

D. Evidence

Petitioner relies on the prior art references in the table below.

Name	Reference	Exhibit
Nhep	US 2016/0178850 A1, published June 23, 2016	1004
Watanabe	US 2017/0351037 A1, published Dec. 7, 2017	1005
Lin	US 2017/0227720 A1, published Aug. 10, 2017	1006
Cox	US 2021/0099229 A1, published Apr. 1, 2021	1010
Katoh	US 2012/0082416 A1, published Apr. 5, 2012	1011
Kuffel	US 2012/0099822 A1, published Apr. 26, 2012	1012

Petitioner also relies on the Declaration of James F. Brennan III, Ph.D. (Ex. 1003) to support its contentions that the challenged claims are unpatentable.

E. Asserted Grounds

Petitioner asserts that the challenged claims of the '413 patent are unpatentable based on the grounds in the table below (Pet. 2):

Claims Challenged	35 U.S.C. §⁵	Reference/Basis
1–4, 7, 8, 10–14, 17–22, 25–28	103	Nhep, Watanabe

⁵ The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284 (2011), amended 35 U.S.C. § 103, effective March 16, 2013. Because the challenged claims of the '413 patent have an apparent effective filing date after March 16, 2013, the AIA version of § 103 applies. *See* Ex. 1001, code (60).

Claims Challenged	35 U.S.C. § ⁵	Reference/Basis
5, 6	103	Nhep, Watanabe, Lin
9 ⁶	103	Nhep, Watanabe, Cox
15, 16, 23, 24	103	Nhep, Watanabe, AAPA ⁷
1–4, 7, 8, 10–14, 17–22, 25–28	103	Katoh, Kuffel
5, 6	103	Katoh, Kuffel, Lin
9	103	Katoh, Kuffel, Cox
15, 16, 23, 24	103	Katoh, Kuffel, AAPA

III. ANALYSIS

A. Legal Standard

A patent claim is unpatentable under 35 U.S.C. § 103 “if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person of ordinary skill in the art to which the claimed invention pertains.” 35 U.S.C. § 103 (2018). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) when in evidence, objective evidence of

⁶ Petitioner argues that claim 9 of the ’413 patent is “only entitled to a priority date as of the filing of the ’413 patent’s application on May 21, 2021.” Pet. 2–3 (citing Ex. 1003 ¶¶ 328–333, 539–544). At this time, Patent Owner does not challenge Petitioner’s argument.

⁷ As AAPA, Petitioner relies on the disclosure of connector formats in the background section of the ’413 patent. Pet. 66 (citing Ex. 1001, 1:58–61, 1:63–67). At this stage, we do not determine whether Petitioner’s reliance on this disclosure in combination with other prior art is proper. *See MED-EL Elektromedizinische Geräte Ges.m.b.H. v. Advanced Bionics AG*, IPR2020-01016, Paper 44 at 4 (PTAB Aug. 22, 2022) (Director Review decision).

nonobviousness, i.e., secondary considerations.⁸ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

B. Level of Ordinary Skill in the Art

Petitioner asserts that a person of ordinary skill in the art would have had

(1) at least a bachelor’s degree in mechanical engineering, electrical engineering, physics, or a related field and three years of experience in fiber optics and fiber optic connectors; (2) a master’s degree in mechanical engineering, electrical engineering, physics, or a related field and at least one year of experience in fiber optics and fiber optic connectors; or (3) industry experience (at least three years) designing fiber optic connectors in lieu of a formal degree.

Pet. 8–9 (citing Ex. 1003 ¶¶ 44–50).

For purposes of this Decision, we adopt Petitioner’s proposal as reasonable and consistent with the ’413 patent specification and the prior art.

C. Claim Construction

We interpret the challenged claims

using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b), including construing the claim in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.

37 C.F.R. § 42.100(b). Under that standard, we generally give claim terms their ordinary and customary meaning, as would be understood by a person of ordinary skill in the art at the time of the invention, in light of the language of the claims, the specification, and the prosecution history.

⁸ The present record does not include any objective evidence of nonobviousness.

Phillips v. AWH Corp., 415 F.3d 1303, 1312–14 (Fed. Cir. 2005) (en banc). “The Board is required to construe ‘only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.’” *Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

Petitioner states that it “does not believe any claim terms require specific construction and thus should receive their plain and ordinary meaning, in the context of the ’413 patent specification, under the *Phillips* standard.” Pet. 9 (citing Ex. 1003 ¶¶ 91–93). For purposes of this Decision, no claim terms require express construction.

D. Asserted Obviousness over Nhep and Watanabe

Petitioner argues that claims 1–4, 7, 8, 10–14, 17–22, and 25–28 are unpatentable as obvious over Nhep and Watanabe. Pet. 2. We begin with an overview of Nhep and Watanabe and then turn to Petitioner’s contentions.

1. Nhep

Nhep is titled “Fiber Optic Connector.” Ex. 1004, code (54). Nhep describes “fiber optic connectors used in optical fiber communication systems.” *Id.* ¶ 2. According to Nhep, “[a] typical fiber optic connector includes a ferrule assembly supported at a distal end of a connector housing” and “[t]he ferrule functions to support an end portion of at least one optical fiber (in the case of a multi-fiber ferrule, the ends of multiple fibers are supported).” *Id.* ¶ 4.

Figure 1, below, illustrates an exploded view of a fiber optic connector. Ex. 1004 ¶ 11.

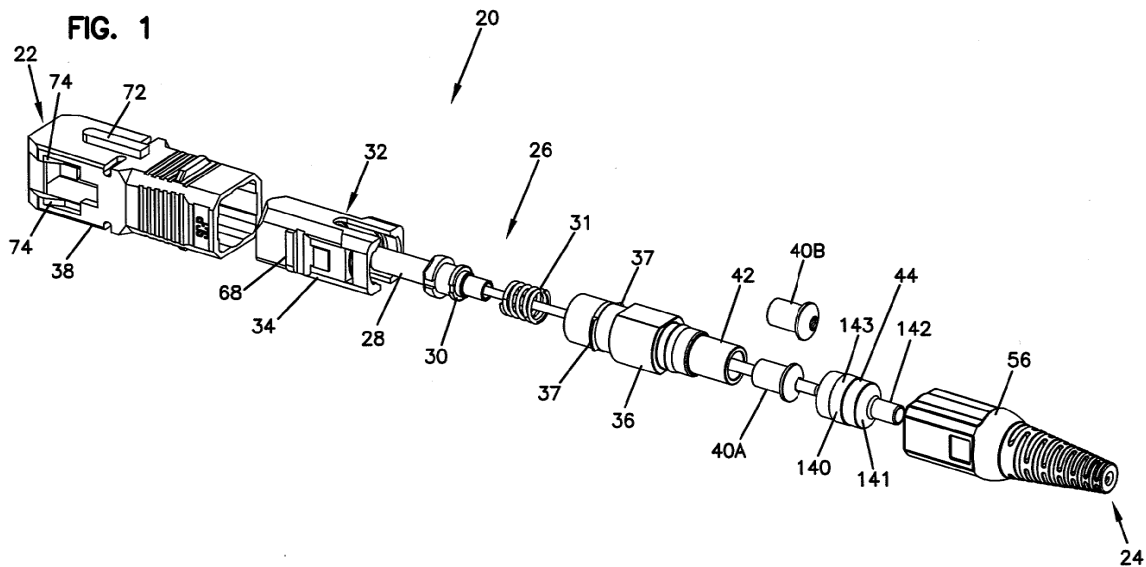


Figure 1 shows fiber optic connector 20 having, among other things, release sleeve 38 that slidably mounts over connector housing 32 and ferrule assembly 26 that mounts at least partially within connector housing 32. *Id.* ¶ 76. Nhep describes that [t]he ferrule assembly includes a ferrule 28, a hub 30 and a spring 31.” *Id.*

Nhep explains that “[f]or many fiber optic connector styles, alignment between two fiber optic connectors is provided through the use of an intermediate fiber optic adapter.” Ex. 1004 ¶ 4. Figure 25, below, provides a cross-sectional view of a fiber optic adapter. *Id.* ¶ 35.

FIG. 25

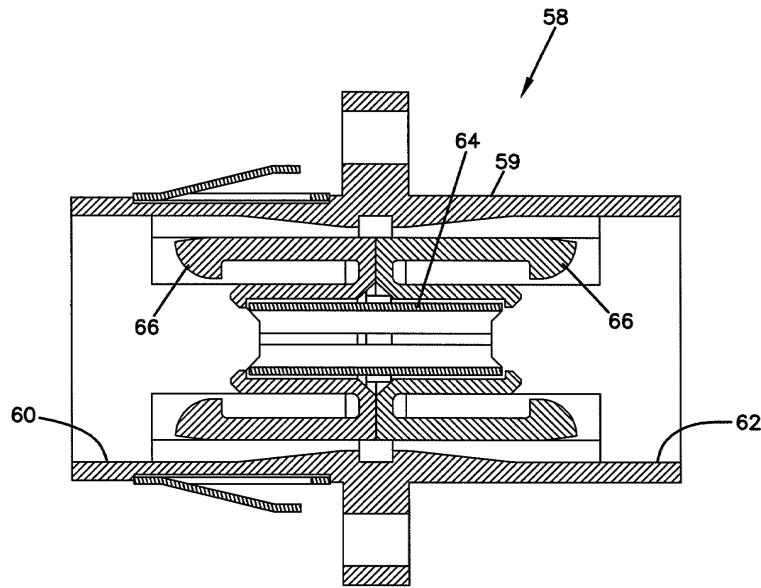


Figure 25 depicts a “fiber optic adapter 58 that can be used to couple two of the fiber optic connectors 20 together.” *Id.* ¶ 77. Nhep describes that

[t]he fiber optic adapter 58 includes an adapter housing 59 defining opposite, coaxially aligned ports 60, 62 for receiving two of the fiber optic connectors desired to be coupled together. The fiber optic adapter 58 also includes an alignment sleeve 64 for receiving and aligning the ferrules 28 of the fiber optic connectors desired to be connected together. The fiber optic adapter 58 further includes latches 66 for mechanically retaining the fiber optic connectors 20 within their respective ports 60, 62. The latches 66 can be configured to engage shoulders 68 provided on the distal housing portions 34 of the fiber optic connectors 20 being coupled together.

Id.

Fiber optic connector 20 (shown in Figure 1) also includes release sleeve 38 that slidably mounts over connector housing 32. Ex. 1004 ¶ 78. According to Nhep,

[w]hen the release sleeve 38 is mounted on the connector housing 32, the release sleeve 38 is free to slide back-and-forth in distal and proximal directions relative to the connector housing 32 along a central longitudinal axis 70 of the fiber optic connector

20. When the fiber optic connector 20 is inserted within one of the ports 60, 62 of the fiber optic adapter 58, the keying rail 72 provided on the release sleeve 38 ensures that the fiber optic connector 20 is oriented at the appropriate rotational orientation relative to the fiber optic adapter 58. When the fiber optic connector 20 is fully inserted within its corresponding port 60, 62, the latches 66 snap into a latching position in which the latches engage the shoulders 68 of the connector housing 32 to prevent the fiber optic connector 20 from being proximally withdrawn from the port 60, 62. The release sleeve 38 is provided to allow the fiber optic connector 20 to be selectively withdrawn from its respective port 60, 62. Specifically, by pulling the release sleeve 38 in a proximal direction, ramps 74 of the release sleeve disengage the latches 66 of the fiber optic adapter 58 from the shoulders 68 of the fiber optic connector 20 thereby allowing the fiber optic connector 20 to be proximally withdrawn from its respective port 60, 62.

Id.

2. *Watanabe*

Watanabe is titled “Receptacle Connector and Optical Coupling Structure.” Ex. 1005, code (54). Watanabe is directed to “a receptacle connector and an optical coupling structure capable of reducing sticking of dirt and dust to an optical coupling part.” *Id.* ¶ 4.

Figure 1, below, illustrates an optical coupling structure. Ex. 1005 ¶ 8.

Fig.1

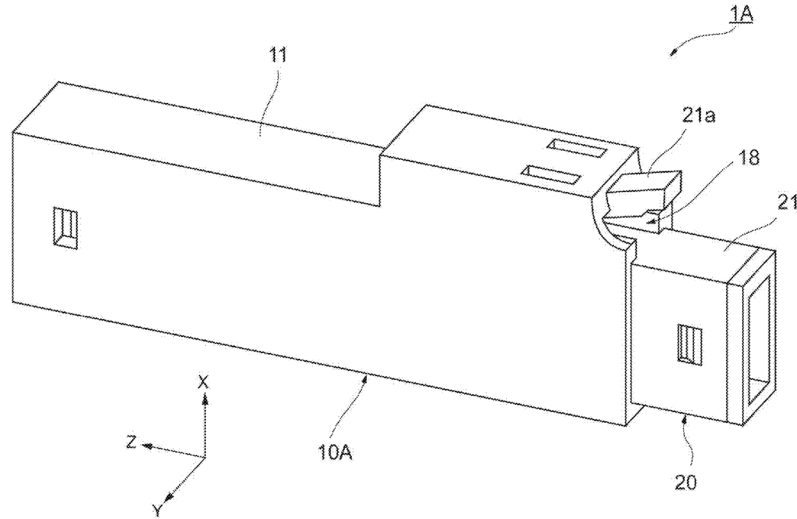


Figure 1 shows “an optical coupling structure 1A,” which “includes a receptacle connector 10A and a plug connector 20.” *Id.* ¶ 33. Watanabe describes that “[t]he receptacle connector 10A holds an end of a first optical fiber . . . , and optically couples the first optical fiber and a second optical fiber by being connected with the plug connector 20 holding an end of the second optical fiber.” *Id.* According to Watanabe, “[w]hen the plug connector 20 is inserted into the cavity 18, the latch lever 21a and the latch engaging part engage with each other and thus, getting-out of the plug connector 20 is prevented.” *Id.*

Figure 2, below, provides a cross-sectional view of optical coupling structure 1A along the inserting direction, before plug connector 20 is inserted into receptacle connector 10A. Ex. 1005 ¶¶ 9, 34.

Fig.2

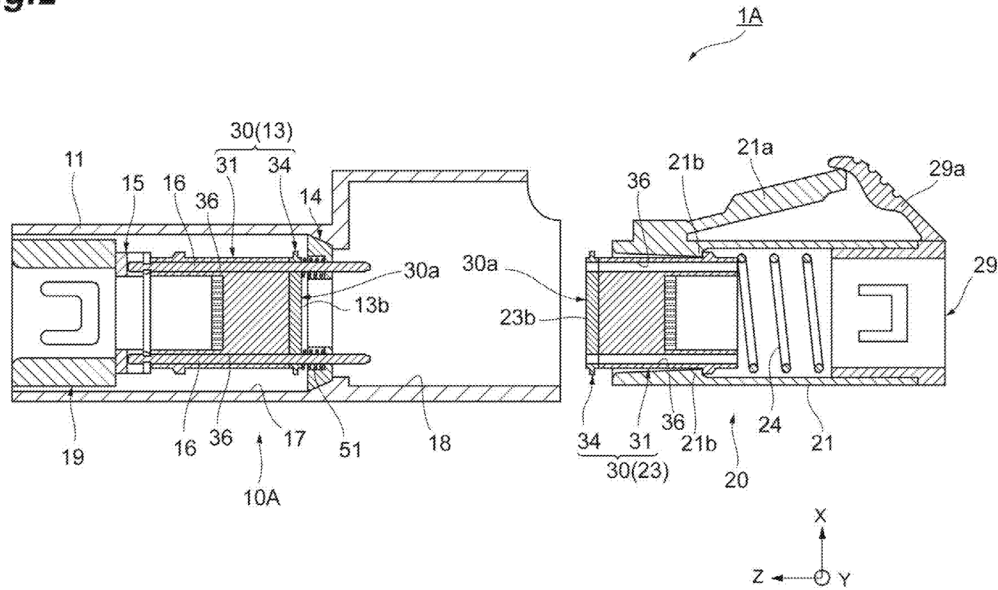


Figure 2 shows receptacle connector 10A having receptacle housing 11, receptacle ferrule 13, spacer 14, pin keeper 15, two rod-like guide pins 16 and support member 19, and plug connector 20 having plug ferrule 23 housed in plug housing 21. *Id.* ¶ 35.

Figure 4, below, provides “a perspective view illustrating a ferrule suitably used as a receptacle ferrule and a plug ferrule.” Ex. 1005 ¶ 11.

Fig.4

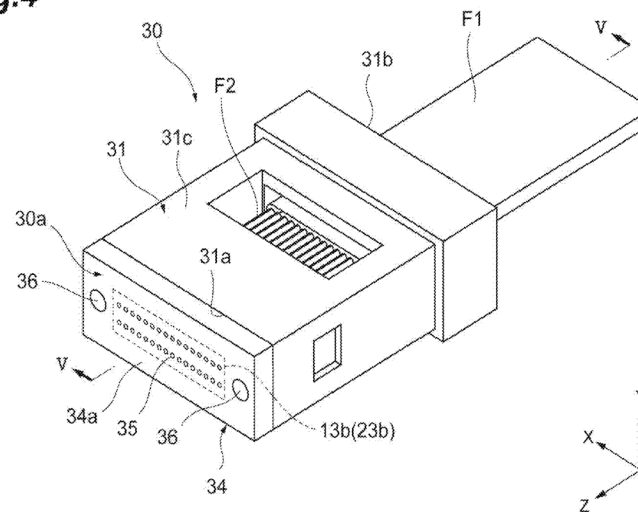


Figure 4 shows that “the ferrule 30 includes a ferrule main body part 31,” which “is a so-called MT ferrule, and has a roughly rectangular parallelepiped outer shape.” *Id.* ¶¶ 36, 37.

3. *Independent Claim 1*

a) *Reasons to Combine*

Petitioner argues that it would have been obvious to modify Nhep’s connector in two ways. Pet. 14–21. First, Petitioner argues it would have been obvious “to modify Nhep’s connector 20 to accommodate an MT ferrule as taught by Watanabe to increase the number of fiber optic connections made in a single housing.” *Id.* at 15 (Ex. 1003 ¶¶ 132–137). Second, Petitioner argues it would have been obvious “to align the fiber axis of the MT ferrule to be parallel with the transverse axis” of the connector and “to modify Nhep’s housing to accommodate the MT ferrule.” *Id.* at 16, 18 (Ex. 1003 ¶¶ 138, 143).

Starting with the first modification, Petitioner argues a person of ordinary skill in the art would have been motivated by “the known desire to increase connector density.” *Id.* at 14 (Ex. 1003 ¶ 132). Petitioner also argues that a person having ordinary skill in the art would have been motivated because it would have been “well-known” to use “multi-fiber ferrules” to increase “the number of fiber connections in a single connector” to improve “efficiency.” *Id.* at 26 (Ex. 1003 ¶ 168). Petitioner argues that Nhep’s teachings of “the existence of multi-fiber ferrules” and evidence showing that the same “SC-type” connector described in Nhep was modified “to accept multi-fiber ferrules” supports Petitioner’s position. *Id.* at 14–16 (citing Ex. 1003 ¶¶ 132, 134, 136, 137; Ex. 1004 ¶¶ 4, 78, 112; Ex. 1016, 14; Ex. 1017, 12:36–13:43; Ex. 1023).

We turn to the second modification, which is that a person of ordinary skill in the art would have been motivated to make structural changes to Nhep’s connector in light of the teachings of Watanabe, specifically, to align the fiber axis of the MT ferrule with Nhep’s transverse axis and modify Nhep’s housing to accommodate the MT ferrule. *Id.* at 16, 18 (Ex. 1003 ¶¶ 138, 143). Petitioner argues a person of ordinary skill “motivated to add Watanabe’s MT ferrule would have turned to Watanabe for any construction details to facilitate the modifications needed to be made to Nhep.” *Id.* at 18 (citing Ex. 1003 ¶ 143); *see also id.* at 17, 20 (arguing the structural modification would have been obvious because it is shown in Watanabe) (citing Ex. 1003 ¶¶ 142, 146, 147). Petitioner also argues that a person of ordinary skill in the art would have made the structural changes to allow a “groove accommodating the product key 72 to be placed into [] unused space, thereby improving connector spacing.” *Id.* at 17 (citing Ex. 1003 ¶¶ 139, 146–147). Petitioner also argues that the structural changes would have been obvious to try and that other art provides evidence that such modifications would have been obvious. *Id.* at 18 (citing Ex. 1003 ¶¶ 140, 143–145; Ex. 1006, Fig. 1; Ex. 1018, code (57), ¶¶ 12–13).

We find that Petitioner’s asserted rationale for modifying Nhep in view of Watanabe, as it relates to claim 1, is adequate for purposes of institution.

b) Limitation 1.P

The preamble of claim 1 recites “[a]n optical fiber connector.” Petitioner argues that the preamble is taught by Nhep because Nhep describes “‘a first fiber optic connector 20’ that includes ‘a ferrule assembly

26 that mounts adjacent the distal end 22 of the fiber optic connector 20.”
Pet. 21–22 (citing Ex. 1004 ¶¶ 2, 76, Fig. 1; Ex. 1003 ¶¶ 152–153).

We find that Petitioner’s contentions for claim limitation 1.P are adequate for purposes of institution.

c) Limitation 1.1

Claim limitation 1.1 recites “a housing having a longitudinal axis and a front end portion and a rear end portion spaced apart along the longitudinal axis.”

Petitioner argues that limitation 1.1 is taught by Nhep because Nhep discloses release sleeve 38, connector housing 32, and supporting elements. Pet. 22–23 (citing Ex. 1004 ¶¶ 76–77, Fig. 2; Ex. 1003 ¶¶ 154–156). Relying on the testimony of Dr. Brennan, Petitioner provides an annotated version of Nhep’s Figure 2 identifying a housing, front and rear end portions, and longitudinal and transverse axes. *Id.* at 23 (citing Ex. 1004, Fig. 2; Ex. 1003 ¶¶ 155–156).

We find that Petitioner’s contentions for claim limitation 1.1 are adequate for purposes of institution.

d) Limitations 1.2 and 1.3

Claim limitation 1.2 recites “the housing comprising opposite first and second end walls spaced apart along a transverse axis oriented perpendicular to the longitudinal axis.” Claim limitation 1.3 recites “the housing comprising opposite first and second side walls spaced apart along a lateral axis oriented perpendicular to the longitudinal axis and the transverse axis.”

Petitioner argues that limitations 1.2 and 1.3 are taught by Nhep’s fiber optic connector 20 illustrated in Figure 1. Pet. 23–25 (citing Ex. 1004 Fig. 1; Ex. 1003 ¶¶ 157–166). Relying on the testimony of Dr. Brennan,

Petitioner provides two annotated versions of Nhep's Figure 1. *Id.* The second annotated version of Figure 1 identifies a housing, first and second side walls, first and second end walls, and longitudinal, lateral, and transverse axes. *Id.* at 23–25 (citing Ex. 1004, Fig. 1; Ex. 1003 ¶¶ 157–164).

We find that Petitioner's contentions for claim limitations 1.2 and 1.3 are adequate for purposes of institution.

e) Limitation 1.4

Claim limitation 1.4 recites “an MT ferrule received in the housing and exposed through the front end portion of the housing for making an optical connection.”

Relying on the testimony of Dr. Brennan, Petitioner argues that limitation 1.4 is taught by the combination of Nhep and Watanabe. Pet. 25–26 (citing Ex. 1005 ¶ 37; Ex. 1003 ¶¶ 165–170). Petitioner argues “Watanabe discloses that its ‘ferrule main body part 31 is a so-called MT ferrule.’” *Id.* at 25 (citing Ex. 1005 ¶ 37; Ex. 1003 ¶ 167). As discussed above (*see* § III.D.3.a), Petitioner argues a person of ordinary skill in the art would have modified “Nhep's connector to include an MT ferrule” because the ordinarily skilled artisan would have known that using “multi-fiber ferrules increases the number of fiber connections in a single connector,” which improves “efficiency.” *Id.* at 26 (citing Ex. 1003 ¶ 168).

Petitioner also argues that limitation 1.4 is taught by the combination of Nhep and Watanabe because “[b]oth Nhep and Watanabe disclose their respective ferrules extending beyond a front portion of their housings.” *Id.* (citing Ex. 1003 ¶¶ 169–170). Petitioner provides annotated versions of Nhep's Figure 2 and Watanabe's Figure 2 identifying in each figure a

portion of a ferrule exposed or extending through the housing. *Id.* at 26–27 (citing Ex. 1004, Fig. 2; Ex. 1005, Fig. 2; Ex. 1003 ¶¶ 169–170).

We find that Petitioner’s contentions for claim limitation 1.4 are adequate for purposes of institution.

f) Limitation 1.5

Claim limitation 1.5 recites “the MT ferrule configured to receive plurality of fibers such that the fibers are spaced apart in a row that extends parallel to a fiber alignment axis.”

Relying on the testimony of Dr. Brennan, Petitioner argues that limitation 1.5 is taught by the combination of Nhep and Watanabe because Watanabe “explains that the MT ferrule includes ‘a plurality of GRIN lenses (optical elements) 35 optically coupled with the plurality of optical fibers.’” Pet. 28 (citing Ex. 1005 ¶ 41; Ex. 1003 ¶ 173). Petitioner argues “[t]he plurality of GRIN lenses 35 are arranged in an array of two rows.” *Id.* (citing Ex. 1005, Fig. 4; Ex. 1003 ¶¶ 173–174). Petitioner also relies on its reasons to combine (*id.*), which we discuss above. *See* § III.D.3.a.

We find that Petitioner’s contentions for claim limitation 1.5 are adequate for purposes of institution.

g) Limitation 1.6

Claim limitation 1.6 recites “the MT ferrule further comprising first and second guide pin openings spaced apart along the fiber alignment axis.”

Relying on the testimony of Dr. Brennan, Petitioner argues that limitation 1.6 is taught by the combination of Nhep and Watanabe because “Watanabe’s MT ferrule includes ‘two guide pin holes 36’ that ‘extend in the Z direction, and are lined in an X direction and formed to hold the plurality of optical fibers F2 in between.’” Pet. 29 (citing Ex. 1005 ¶ 43;

Ex. 1003 ¶¶ 177–178). Petitioner provides an annotated version of Watanabe’s Figure 4 identifying two guide pin holes along the fiber alignment axis. *Id.* at 29 (citing Ex. 1005, Fig. 4; Ex. 1003 ¶¶ 177–178). Petitioner also relies on its reasons to combine (*id.*), which we discuss above. *See* § III.D.3.a.

We find that Petitioner’s contentions for claim limitation 1.6 are adequate for purposes of institution.

h) Limitation 1.7

Claim limitation 1.7 recites “a polarity key disposed on the first end wall.”

Relying on the testimony of Dr. Brennan, Petitioner argues that limitation 1.7 is taught by Nhep because “Nhep discloses that its remote sleeve 38 includes a ‘keying rail 72’” that is “disposed on the first end wall.” Pet. 30 (citing Ex. 1004 ¶ 78, Fig. 1; Ex. 1003 ¶¶ 179–181). Petitioner provides an annotated version of Nhep’s Figure 1 identifying the polarity key and the end wall. *Id.* (citing Ex. 1004 Fig. 1; Ex. 1003 ¶¶ 179–181). Petitioner also points to Nhep’s teaching that “[w]hen the fiber optic connector 20 is inserted within one of the ports 60, 62 of the fiber optic adapter 58, the keying rail 72 provided on the release sleeve 38 ensures that the fiber optic connector 20 is oriented at the appropriate rotational orientation relative to the fiber optic adapter 58.” *Id.* (quoting Ex. 1004 ¶ 78).

We find that Petitioner’s contentions for claim limitation 1.7 are adequate for purposes of institution.

i) Limitation 1.8

Claim limitation 1.8 recites “wherein each of the first and second end walls has a lateral dimension along the lateral axis and each of the first and second side walls has a transverse dimension along the transverse axis, the lateral dimension being less than the transverse dimension.”

Relying on the testimony of Dr. Brennan, Petitioner argues that limitation 1.8 is taught by the combination of Nhep and Watanabe because “Watanabe discloses this configuration.” Pet. 18–19, 31 (citing Ex. 1005, Figs. 1, 2; Ex. 1003 ¶¶ 143, 185–187). Petitioner provides an annotated version of Watanabe’s Figure 1 identifying a housing, an end wall, a side wall, and lateral and transverse dimensions. *Id.* at 31–32 (citing Ex. 1005, Fig. 1; Ex. 1003 ¶¶ 185–187). Petitioner also relies on its reasons to combine (*id.*), which we discuss above. *See* § III.D.3.a.

We find that Petitioner’s contentions for claim limitation 1.8 are adequate for purposes of institution.

j) Limitation 1.9

Claim limitation 1.9 recites “wherein the optical fiber connector is configured to latch with a mating adapter.”

Relying on the testimony of Dr. Brennan, Petitioner argues that limitation 1.9 is taught by Nhep because “Nhep explains, ‘[w]hen the fiber optic connector 20 is fully inserted within its corresponding port 60, 62, the latches 66 snap into a latching position in which the latches engage the shoulders 68 of the connector housing 32.’” Pet. 32 (quoting Ex. 1004 ¶ 78; citing Ex. 1003 ¶¶ 188–189). Petitioner provides an annotated version of Nhep’s Figure 25 identifying bendable latches 66 and an opening for the

connector. *Id.* at 32–33 (citing Ex. 1004, Fig. 25; citing Ex. 1003 ¶¶ 188–189).

We find that Petitioner’s contentions for claim limitation 1.9 are adequate for purposes of institution.

k) Limitation 1.10

Claim limitation 1.10 recites “wherein the optical fiber connector is configured to be actuated to unlatch from the mating adapter by displacing a first portion of the optical fiber connector rearward relative to a second portion of the optical fiber connector.”

Relying on the testimony of Dr. Brennan, Petitioner argues that limitation 1.10 is taught by Nhep because “Nhep discloses that the movement of release sleeve 38 rearwards acts to unlatch the connector from the mating adapter.” Pet. 33 (citing Ex. 1004 ¶ 78; citing Ex. 1003 ¶ 190). Petitioner argues that Nhep’s release sleeve 38 teaches “a first portion of the optical fiber connector” and Nhep’s housing 32 teaches “a second portion of the optical fiber connector” and provides an annotated version of Nhep’s Figure 1 identifying first and second portions. *Id.* at 33–34 (citing Ex. 1004, Fig. 1; Ex. 1003 ¶¶ 191–192). Petitioner also argues

Specifically, Nhep states “release sleeve 38 is free to slide back-and-forth in distal and proximal directions relative to the connector housing 32” and that “by pulling the release sleeve 38 in a proximal direction, ramps 74 of the release sleeve disengage the latches 66 . . . thereby allowing the fiber optic connector 20 to be proximally withdrawn from its respective port 60, 62.” EX1004, ¶78.

Pet. 33.

We find that Petitioner’s contentions for claim limitation 1.10 are adequate for purposes of institution.

l) Limitation 1.11

Claim limitation 1.11 recites “wherein said displacing the first portion of the optical fiber connector rearward relative to the second portion of the optical fiber connector displaces the polarity key rearward relative to the MT ferrule.”

Relying on the testimony of Dr. Brennan, Petitioner argues that limitation 1.11 is taught by Nhep because

Nhep’s release sleeve 38 is the first portion that is displaced rearwards. EX1004, ¶78; Section VI.D.11. Nhep’s keying rail 72, which discloses the polarity key, is “provided on the release sleeve 38” and is a fixed element of release sleeve 38. EX1004, ¶78; EX1003, ¶193. Thus, Nhep’s keying rail 72 moves with release sleeve 38 and is displaced rearwards with respect to the ferrule, which would be an MT ferrule held by housing 32 in Nhep modified by Watanabe. EX1003, ¶¶194-195; Section VI.C. Pet. 34.

We find that Petitioner’s contentions for claim limitation 1.11 are adequate for purposes of institution.

m) Conclusion—Claim 1

For the foregoing reasons, based on the current record, we determine that Petitioner has demonstrated a reasonable likelihood that it would prevail in showing that claim 1 is unpatentable under 35 U.S.C. § 103 as obvious over the combination of Nhep and Watanabe.

4. Claims 2–4, 7, 8, 10–14, 17–22, and 25–28

Petitioner argues that claims 2–4, 7, 8, 10–14, 17–22, and 25–28 are unpatentable as obvious over Nhep and Watanabe. Pet. 2. In view of our preliminary determination for claim 1 and the lack of a Patent Owner preliminary response, we decline at this stage to provide an element-by-element analysis for claims 2–4, 7, 8, 10–14, 17–22, and 25–28.

E. Petitioner's Remaining Challenges

Petitioner argues that claims 5 and 6 are unpatentable as obvious over Nhep, Watanabe, and Lin. Pet. 2. Petitioner argues that claim 9 is unpatentable as obvious over Nhep, Watanabe, and Cox. *Id.* Petitioner argues that claims 15, 16, 23, and 24 are unpatentable as obvious over Nhep, Watanabe, and AAPA. *Id.*

Petitioner also argues that claims 1–4, 7, 8, 10–14, 17–22, and 25–28 are unpatentable as obvious over Katoh and Kuffel. Pet. 2. Petitioner argues that claims 5 and 6 are unpatentable as obvious over Katoh, Kuffel, and Lin. *Id.* Petitioner argues that claim 9 is unpatentable as obvious over Katoh, Kuffel, and Cox. *Id.* Petitioner argues that claims 15, 16, 23, and 24 are unpatentable as obvious over Katoh, Kuffel, and AAPA. *Id.*

In view of our preliminary determination for claim 1 and the lack of a Patent Owner preliminary response, we decline at this stage to provide additional analysis for these challenges.

IV. CONCLUSION

For the reasons above, we determine that the information presented in the Petition establishes a reasonable likelihood that Petitioner would prevail with respect to at least one challenged claim of the '413 patent. At this stage, we have not made a final determination with respect to the patentability of the challenged claims.

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that pursuant to 35 U.S.C. § 314(a), an *inter partes* review of claims 1–28 of the '413 patent is hereby instituted with respect to all grounds of unpatentability set forth in the Petition; and

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial; the trial will commence on the entry date of this Decision.

IPR2024-00118
Patent 11,340,413 B2

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