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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/255,581	12/23/2020	Shogo Shimizu	17295-304001	5405
22511	7590	08/31/2021	EXAMINER	
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			ART UNIT	PAPER NUMBER
			2883	
			NOTIFICATION DATE	DELIVERY MODE
			08/31/2021	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary**Application No.**

17/255,581

Applicant(s)

Shimizu et al.

Examiner

RYAN A LEPISTO

Art Unit

2883

AIA (FITF) Status

Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status1) ☒ Responsive to communication(s) filed on 23 December 2020.☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on ____.2a) ☐ This action is **FINAL**.2b) ☒ This action is non-final.3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.**Disposition of Claims***5) ☒ Claim(s) 1-15 is/are pending in the application.

5a) Of the above claim(s) ____ is/are withdrawn from consideration.

6) ☐ Claim(s) ____ is/are allowed.7) ☒ Claim(s) 1-14 is/are rejected.8) ☒ Claim(s) 15 is/are objected to.9) ☐ Claim(s) ____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers10) ☐ The specification is objected to by the Examiner.11) ☒ The drawing(s) filed on 23 December 2020 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 11912) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).**Certified copies:**a) ☒ All b) ☐ Some** c) ☐ None of the:1. ☒ Certified copies of the priority documents have been received.2. ☐ Certified copies of the priority documents have been received in Application No. ____.3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)1) ☒ Notice of References Cited (PTO-892)3) ☐ Interview Summary (PTO-413)

Paper No(s)/Mail Date ____.

2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b)4) ☐ Other: ____.

Paper No(s)/Mail Date ____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Claim Rejections - 35 USC § 102

In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a)(1) the claimed invention was patented, described in a printed publication, or in public use, on sale, or otherwise available to the public before the effective filing date of the claimed invention.

Claims 1, 2, 4, 9, 12 and 13 are rejected under 35 U.S.C. 102(a)(1) as being anticipated by **Toge et al (US 8,548,294 B2)**. Toge teaches an optical fiber cable (Fig. 1) comprising:

a sheath (94); and

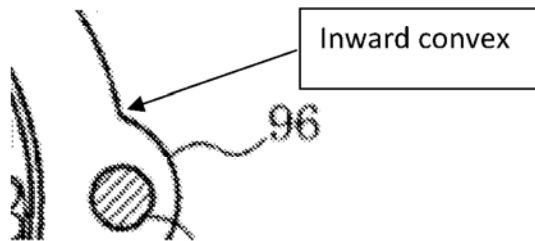
a core (93 with everything inside 93) that is housed in the sheath (94) and comprises an intermittently adhered optical fiber ribbon (Fig. 2) (C9 L19-41) comprising:

optical fibers (11); and

adhesive portions (18) that intermittently adhere the optical fibers (11) together in a longitudinal direction (Fig. 2, C9 L19-41),

wherein recesses (sheathe between 96s) and protrusions (96) are disposed alternately in a circumferential direction on an outer circumferential surface of the sheath (94) (see Fig. 1), and the recesses each comprise:

two connecting portions (portions directly adjacent to and on each side of each 96) respectively connected to radial inner ends of two adjacent protrusions (the two 96s) and having a convex surface shape that is radially inward (see reproduced picture); and



a bottom surface (portion of 94 between each 96) positioned between the two connecting portions (see Fig. 1);

wherein the core further comprises a wrapping tube (93) that wraps the intermittently-adhered optical fiber ribbon (C6 L64-67);

wherein a radius of curvature of each outer circumferential surface of the protrusions (96) is smaller than a radius of the sheath (94) (see Fig. 1; the radius of the sheath is many magnitudes larger than a radius of curvature of the protrusion);

further comprising: tensile strength members (95) embedded in the sheath (94), wherein in a transverse cross-sectional view, tensile strength members (95) are disposed inside each of the protrusions (96) on the sheath (94) (Fig. 1); and

further comprising: intermittently-adhered optical fiber ribbons (part of 10), wherein an SZ-shaped twist is applied to the sheath (94) by twisting intermittently-adhered optical fiber ribbons in an SZ shape (C8 L7-11).

Claim Rejections - 35 USC § 103

In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, 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 having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims the examiner presumes that the subject matter of the various claims was commonly owned as of the effective filing date of the claimed invention(s) absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and effective filing dates of each claim that was not commonly owned as of the effective filing date of the later invention in order for the examiner to consider the applicability of 35 U.S.C. 102(b)(2)(C) for any potential 35 U.S.C. 102(a)(2) prior art against the later invention.

Claim 3 is rejected under 35 U.S.C. 103 as being unpatentable over Toge.

Toge teaches the cable previously discussed, but does not teach what the compressive strength of the cable is. Toge does teach all the structural limitations of claims 1 and 3 and while features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function (In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997) Hewlett-Packard Co. v. Bausch & Lomb Inc., 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990)). Claim 3 does not teach any structure that distinguishes from the prior art and the compressive strength of the cable is a function of the claimed structure.

Claims 5 and 6 are rejected under 35 U.S.C. 103 as being unpatentable over Toge as applied to claims 1 and 4 above, and further in view of **Matsuzawa et al (JP 2013-88641 A)**.

Toge teaches the cable previously discussed.

Toge does not teach expressly the wrap having an overlap portion and a non-wrap portion with a particular wrap rate.

Matsuzawa teaches an optical fiber cable with a wrapping tube (5) comprising a wrap portion where a first end portion of the wrapping tube overlap with a second end portion of the wrapping tube (at 5a, 5b); and

a non-wrap portion (outside the overlapped portion) positioned between the first end portion and the second end portion (5a, 5b), wherein the wrap rate is 0-25% (page 3 of the translation).

Toge and Matsuzawa are analogous art because they are from the same field of endeavor, optical cables.

At the time of the effective filing date of the claimed invention, it would have been obvious to a person of ordinary skill in the art to modify the wrap of Toge to include an overlap and non-overlap portion with the wrap rate of Matsuzawa.

The motivation for doing so would have been to prevent disconnection of the fibers (Matsuzawa, page 3 of the translation “it is possible to prevent disconnection of the optical fiber”).

Claims 7 and 8 are rejected under 35 U.S.C. 103 as being unpatentable over Toge.

Toge teaches the cable previously discussed, but does not state if the cross-section area of the recesses that is enclosed by closed curves tangent to radial outer ends of the protrusions and all the recesses are 1.3 to 4.8 mm². It would have been obvious to one of ordinary skill in the art at the time the invention was effectively filed to try values of the closed curved tangent to radial ends of the protrusions and all the recesses in Toge, since it has been held that “it is obvious to try - choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success” is a rationale for arriving at a conclusion of obviousness. In re KSR International Co. v. Teleflex Inc. Toge teaches the protrusions and recesses with the radially inward convex shaped similar to applicants so the 1.3 to 4.8 mm² solution is predictable given the shown geometry. Further, one of ordinary skill in the art would expect such values to succeed in Toge since the geometry of the cable will still be the same or very similar.

Toge further does not teach what the twist angle of the sheath is, but it would have been obvious to one of ordinary skill in the art at the time the invention was effectively filed to try a twist angle of the sheath per 1m to be 10/m to 180m since it has been held that “it is obvious to try - choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success” is a rationale for arriving at a conclusion of obviousness. In re KSR International Co. v. Teleflex Inc. The range of twist angles is so large that it would be very predictable to one of ordinary skill in the art when considering normal twisting of an optical cable. Further, Toge teaches the strength members that would ensure the enclosed fibers would not be damaged with the claimed twist angles resulting in a reasonable expectation of success in Toge.

Claim 10 is rejected under 35 U.S.C. 103 as being unpatentable over Toge as applied to claim 1 above, and further in view of **Ino et al (JP 2004-184538 A)**.

Toge teaches the cable previously discussed including the tensile strength members embedded inside the protrusions on the sheath.

Toge does not teach expressly the protrusions and tensile strength members having a spirally twisted shape centered on a central axis of the cable.

Ino teaches an optical cable with tensile strength members (23a, 23b) embedded within a sheath (21) and centered around the central axis of the cable and wherein the members are twisted (P0023).

Toge and Ino are analogous art because they are from the same field of endeavor, optical fiber cables.

At the time of the effective filing date of the claimed invention, it would have been obvious to a person of ordinary skill in the art to modify the cable of Toge to include tensile strength members that are spirally twisted around the central axis of the cable as taught by Ino.

The motivation for doing so would have been to increase the mechanical strength of the cable.

Claim 11 is rejected under 35 U.S.C. 103 as being unpatentable over Toge as applied to claim 1 above, and further in view of **Mizuno et al (WO 2005/047950 A1)**.

Toge teaches the cable previously discussed including the tensile strength members embedded inside the protrusions on the sheath.

Toge does not teach expressly the protrusions and tensile strength members being made of PBO-FRP.

Mizuno teaches an optical cable with strength members made of PBO-FRP (page 6 of the translation).

Toge and Mizuno are analogous art because they are from the same field of endeavor, optical fiber cables.

At the time of the effective filing date of the claimed invention, it would have been obvious to a person of ordinary skill in the art to modify the cable of Toge to include tensile strength members made of PBO-FRP as taught by Mizuno.

The motivation for doing so would have been to increase the mechanical strength of the cable.

Claim 14 is rejected under 35 U.S.C. 103 as being unpatentable over Toge as applied to claim 1 above, and further in view of **Katsuya et al (JP 2006-330261 A)**.

Toge teaches the cable previously discussed.

Toge does not teach expressly the sheath made of a base material and a low friction material on the tops of the protrusions.

Katsuya teaches an optical cable with a sheath formed of a base material (15) and a low friction material surrounding the entire base material (MODE-FOR-INVENTION section of the translation).

Toge and Katsuya are analogous art because they are from the same field of endeavor, optical fiber cables.

At the time of the effective filing date of the claimed invention, it would have been obvious to a person of ordinary skill in the art to modify the cable of Toge to include the sheath made of a base material surrounded by a low friction material as taught by Katsuya including on the protrusions of Toge.

The motivation for doing so would have been to improve the cables workability (Katsuya, ADVANTAGEOUS-EFFECTS section of the translation).

Allowable Subject Matter

Claim 15 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

This claim would be allowable over the prior art of record if rewritten in independent form including all of the limitations of the base claim and any intervening claims because the latter, either alone or in combination, does not disclose nor render obvious the cable with the claimed sheath, core, ribbon, protrusions, recesses wherein tensile strength members and ripcords embedded in the sheath, wherein in a transverse cross-sectional view, the ripcords are positioned inside some of the protrusions, and the tensile strength members are positioned inside the remaining protrusions,

in combination with the rest of the claimed limitations.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following references all teach optical cables with protrusions similar to applicants:

US 6963686	CN 203519900 U	US 2015/0192748	WO 2018/174004 A1
CN 209728274 U	US 2020/0142144	US 2020/0209505	US 11029477

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to RYAN A LEPISTO whose telephone number is (571)272-1946. The examiner can normally be reached on 9AM-6PM EST M-F.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is

encouraged to use the USPTO Automated Interview Request (AIR) at
<http://www.uspto.gov/interviewpractice>.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Hollweg can be reached on 571-270-1739. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/RYAN A LEPISTO/
Primary Examiner, Art Unit 2883