



(51) International Patent Classification:

G02B 6/38 (2006.01) G02B 6/36 (2006.01)  
G02B 6/42 (2006.01)

(21) International Application Number:

PCT/US2013/036261

(22) International Filing Date:

11 April 2013 (11.04.2013)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/623,029 11 April 2012 (11.04.2012) US  
61/699,125 10 September 2012 (10.09.2012) US

(71) Applicant: **NANOPRECISION PRODUCTS, INC.**  
[US/US]; 411-B Coral Circle, El Segundo, CA 90245 (US).

(72) Inventors: **LI, Shuhe**; 1038 La Presa Drive, Pasadena, CA 91107 (US). **VALLANCE, Robert, Ryan**; 5220 Via Patrica, Newbury Park, CA 91320 (US). **BARNOSKI, Michael, K.**; 16652 Charmel Lane, Pacific Palisades, CA 90272 (US).

(74) Agent: **LIU, Wen**; Liu & Liu, 350 S. Figueroa Street, Suite 975, Los Angeles, CA 90071 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM,

AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

(88) Date of publication of the international search report:  
13 March 2014

(54) Title: OPTICAL FIBER CONNECTOR FERRULE HAVING CURVED EXTERNAL ALIGNMENT SURFACE

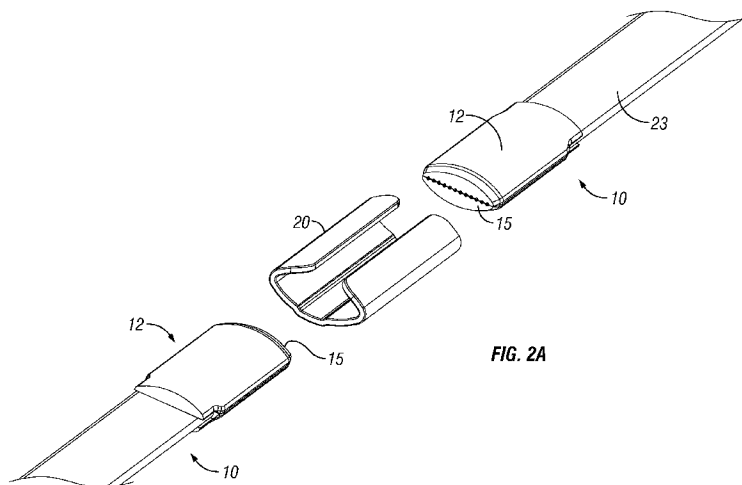


FIG. 2A

(57) Abstract: A ferrule (12) for an optical fiber connector has an external surface for alignment with a complementary surface of an alignment sleeve (i.e., the inside surface of a generally cylindrical or tubular sleeve). The external surface of the ferrule is generally cylindrical, having a sectional contact surface profile that is generally oval in shape. More specifically, a plurality of points of contact between the ferrule and the sleeve (20) are defined along a curve in cross-section, wherein the center of curvature at each of the contact points along this contact point curve (i.e., the curve containing contact points that contribute to alignment) does not lie in the plane of the axis of the array of optical fibers.



INTERNATIONAL SEARCH REPORT

International application No  
PCT/US2013/036261

A. CLASSIFICATION OF SUBJECT MATTER  
INV. G02B6/38 G02B6/42 G02B6/36  
ADD.  
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED  
Minimum documentation searched (classification system followed by classification symbols)  
G02B  
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	JP H02 154208 A (NEC CORP) 13 June 1990 (1990-06-13) abstract; figures 1, 2	1-6,9, 13,15 7,8, 10-12,14
X	----- EP 1 257 012 A2 (AUTONETWORKS TECHNOLOGIES LTD [JP]; SUMITOMO WIRING SYSTEMS [JP]; SUMI) 13 November 2002 (2002-11-13) paragraphs [0003] - [0044]; figures 2-8	1
Y	----- US 6 276 840 B1 (WEISS ROGER E [US] ET AL) 21 August 2001 (2001-08-21) column 6, line 42 - column 13, line 51; figures 1-9	7,8,14
Y	----- JP S52 72240 A (NIPPON TELEGRAPH & TELEPHONE) 16 June 1977 (1977-06-16) abstract; figure 2	10-12
	----- -/--	

Further documents are listed in the continuation of Box C.

See patent family annex.

\* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search  22 January 2014	Date of mailing of the international search report  30/01/2014
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer  Wolf, Steffen

# INTERNATIONAL SEARCH REPORT

International application No  
PCT/US2013/036261

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 39 30 062 A1 (SIEMENS AG [DE]) 7 March 1991 (1991-03-07) the whole document -----	1

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2013/036261

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP H02154208	A	13-06-1990	NONE
-----			
EP 1257012	A2	13-11-2002	EP 1257012 A2 13-11-2002
			JP 3652621 B2 25-05-2005
			JP 2002333548 A 22-11-2002
			US 2002168149 A1 14-11-2002
-----			
US 6276840	B1	21-08-2001	AU 742671 B2 10-01-2002
			AU 3354599 A 11-10-1999
			CA 2324565 A1 23-09-1999
			EP 1064577 A1 03-01-2001
			IL 138527 A 08-02-2004
			JP 2002507761 A 12-03-2002
			TW 446828 B 21-07-2001
			US 6045270 A 04-04-2000
			US 6276840 B1 21-08-2001
			WO 9947958 A1 23-09-1999
-----			
JP S5272240	A	16-06-1977	NONE
-----			
DE 3930062	A1	07-03-1991	NONE
-----			