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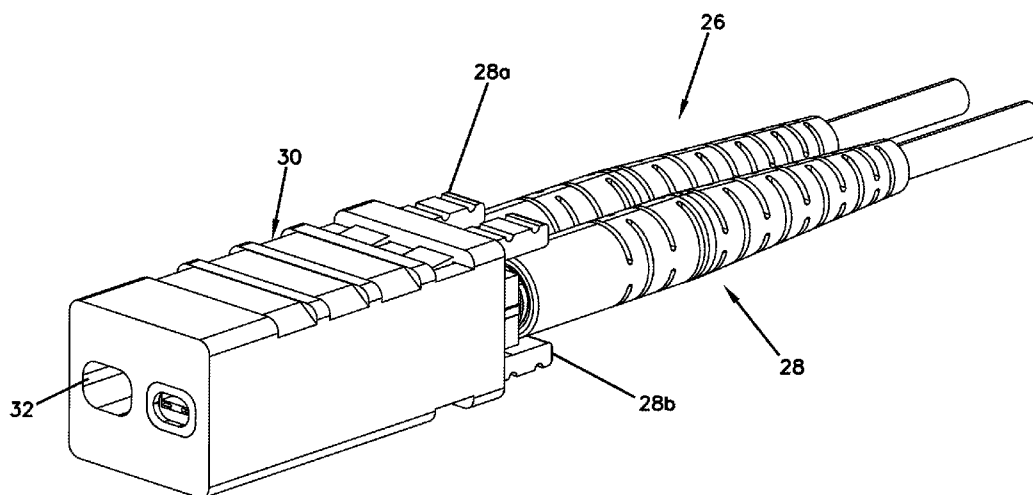
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(81) Designated States (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP,

(54) Title: MULTI-FIBER FERRULE-LESS DUPLEX FIBER OPTIC CONNECTORS WITH MULTI-FIBER ALIGNMENT DEVICES

FIG. 3



(57) Abstract: Aspects and techniques of the present disclosure relate to an alignment device that includes a groove-type alignment structure with a support region for receiving an optical fiber inserted along a fiber insertion axis. The optical fiber has a first side and a second, opposite side. The groove-type alignment structure engages the first side of the optical fiber. The alignment device includes a stabilization structure that engages the first side of the optical fiber and a first angled transition surface that engages the second, opposite side of the optical fiber. The present disclosure also relates to an alignment system that includes a first housing piece; a second housing piece adapted to mate with the first housing piece; and a flat structure positioned between the first and second housing pieces.



KR, KW, KZ, LA, LC, LK, LR, LS, 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, SA, 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.

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**A. CLASSIFICATION OF SUBJECT MATTER****A61B 1/00(2006.01)i**

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**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

A61B 1/00; A61B 005/02; A61B 1/04; A61B 17/04; A61B 17/94; G02B 6/245; G02B 6/38; G02B 6/40

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) &amp; Keywords: fiber, alignment, optic, projection, hole

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2016-0097904 A1 (VASCULAR IMAGING CORPORATION) 07 April 2016 See paragraphs [32]-[51]; claim 2; and figures 3-6.	1-4, 8-11, 23-26
Y		22
A		16-21, 31-51
Y	US 2002-0035310 A1 (NOBUAKI AKUI et al.) 21 March 2002 See paragraphs [72]-[79]; claim 1; and figure 7.	22
A	US 2010-0076461 A1 (FRANK VIOLA et al.) 25 March 2010 See paragraphs [333]-[338]; claim 1; and figure 17.	1-4, 8-11, 16-26 , 31-51
A	US 2005-0148884 A1 (THOMAS R. PARKS et al.) 07 July 2005 See paragraphs [65]-[67]; claim 1; and figure 1.	1-4, 8-11, 16-26 , 31-51
A	US 2013-0071066 A1 (LIANG-JU LU) 21 March 2013 See paragraphs [39]-[47]; claim 1; and figure 5.	1-4, 8-11, 16-26 , 31-51

 Further documents are listed in the continuation of Box C. See patent family annex.

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