



(51) International Patent Classification:

F17D 5/02 (2006.01) *F17D 3/01* (2006.01)
F16L 55/26 (2006.01)

(21) International Application Number:

PCT/US2013/058709

(22) International Filing Date:

9 September 2013 (09.09.2013)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

13/617,625 14 September 2012 (14.09.2012) US

(71) Applicant: **HALLIBURTON ENERGY SERVICES, INC.** [US/US]; 10200 Bellaire Boulevard, Houston, TX 77072 (US).(72) Inventors: **TUNHEIM, Ola**; Eivindsholen 4, N-4340 Bryne Rogaland (NO). **FREESE, Robert, P.**; 8115 Highway NC 902, Pittsboro, NC 27312 (US). **ABNEY, Laurence, James**; Brattholen 5a, N-4313 Sandnes Rogaland (NO). **JONES, Christopher, Michael**; 3219 Cobblestone Creek Way, Houston, TX 77084 (US). **MACLENNAN, James, Robert**; 6A Canal St., Aberdeen Grampian AB24 3ET (GB).(74) Agents: **KAISER, Iona, N.** et al.; McDermott Will & Emery LLP, 500 North Capital Street, N.W., Washington, DC 20001 (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, 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, 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.

(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, KM, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

Published:

- with international search report (Art. 21(3))

(54) Title: SYSTEMS AND METHODS FOR INSPECTING AND MONITORING A PIPELINE

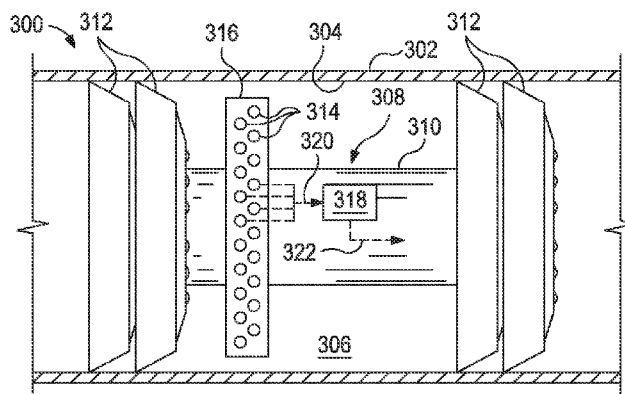


FIG. 3A

(57) **Abstract:** Disclosed are systems and methods for inspecting and monitoring an inner surface of a pipeline. One system includes a pig arranged within the pipeline and having a housing that defines a conduit therein for providing fluid communication through the pig, one or more optical computing devices arranged on the conduit for monitoring a bypass fluid flowing through the conduit. The one or more optical computing devices including at least one integrated computational element configured to optically interact with the bypass fluid and generate optically interacted light, and at least one detector arranged to receive the optically interacted light and generate an output signal corresponding to a characteristic of the bypass fluid. A signal processor is communicably coupled to the at least one detector of each optical computing device for receiving the corresponding output signals and determining the characteristic of the fluid.