(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
17 July 2003 (17.07.2003)

PCT

(10) International Publication Number
WO 03/058545 A1

(51) International Patent Classification[7]: G06K 9/00

(21) International Application Number: PCT/US02/39116

(22) International Filing Date:
10 December 2002 (10.12.2002)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/032,272 22 December 2001 (22.12.2001) US

(71) Applicant: **HALLIBURTON ENERGY SERVICES, INC.** [US/US]; 10200 Bellaire Boulevard, Houston, TX 77072 (US).

(72) Inventors: **SONG, Haoshi**; 3130 Summer Bay Drive, Sugar Land, TX 77478 (US). **TERRY, James, B.**; 1138 Bayou Island Dr., Houston, TX 77063 (US). **ESTEP, James, W.**; 14202 Lake Scene Trail, Houston, TX 77059 (US).

(74) Agents: **ROSE, David, A.** et al.; Conley Rose, P.C., P.O. Box 3267, Houston, TX 77253-3267 (US).

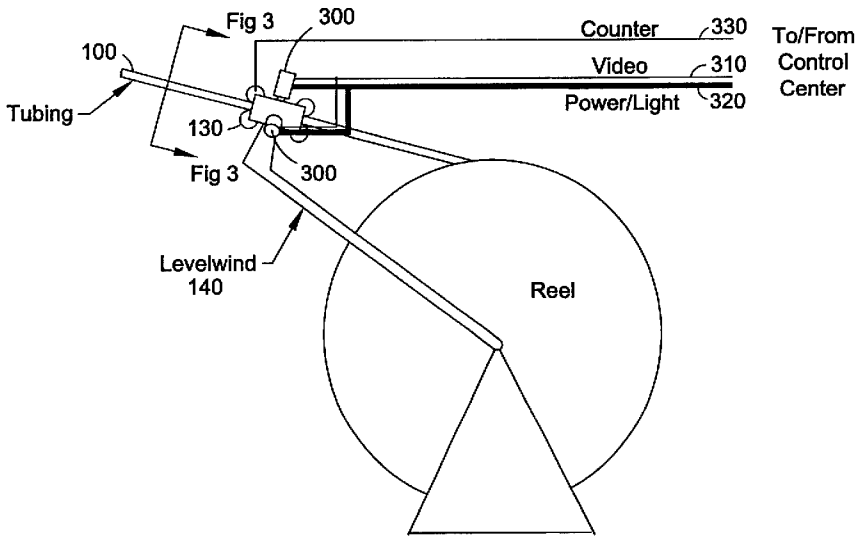
(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: A COILED TUBING INSPECTION SYSTEM USING IMAGE PATTERN RECOGNITION



(57) Abstract: An inspection system for identifying predetermined features in coiled tubing (100) comprising a computer system configured to exe cute pattern recognition software and a plurality of imaging devices (300) configured to capture video images of coiled tubing (100) as the tubing passes by the imaging devices (300). Images captured by the inspection system (310) are transmitted to the computer system and the pattern recognition software analyzes the image, extracts features from the image, and generates an indication if a defect is identified in the images. The computer system reads a counter signal (330) to identify the longitudinal location along the coiled tubing (100) at which the defect is located. The counter signal (330) may also be used to enable or disable the inspection system. The system is capable of real-time processing or post processing by optionally storing the video images. The coiled tubing (100) includes longitudinal striping as a reference to specify the annular position of a predetermined feature.

WO 03/058545 A1