

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
18 April 2002 (18.04.2002)

PCT

(10) International Publication Number
WO 02/31487 A2

- (51) International Patent Classification⁷: **G01N 29/00**
- (21) International Application Number: PCT/US01/31537
- (22) International Filing Date: 4 October 2001 (04.10.2001)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
09/688,304 13 October 2000 (13.10.2000) US
- (71) Applicant: **CHICAGO BRIDGE & IRON COMPANY**
[US/US]; 1501 North Division Street, Plainfield, IL 60544 (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, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW.
- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Published:**
— *without international search report and to be republished upon receipt of that report*
- (72) Inventor: **KRUZIC, Ronald, W.**; 17406 Aspen Oak Court, Spring, TX 77379 (US).
- (74) Agent: **LABARGE, Richard, M.**; Marshall, Gerstein & Borun, 6300 Sears Tower, 233 South Wacker Drive, Chicago, IL 60606 (US).
- 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: ULTRASONIC AUSTENITIC WELD SEAM INSPECTION METHOD AND APPARATUS

(57) Abstract: An array of dual-element transducers for automated, ultrasonic inspection of a weld seam in austenitic material is configured through the use of a schematic representation of the weld seam. The weld is divided into zones, and separate transducers are selected to inspect each zone. A creep-wave transducer is used to inspect the uppermost zone, and an L-wave transducer is used to inspect a lower zone. The L-wave transducer is connect to a computer processor to serve "double-duty": it is used with one set of gate and gain settings to process direct reflections of the emitted sound, and with another set of gate and gain settings to process indirect, mode-converted reflections of the sound. Gate settings are determined by measuring sound path distances from the schematic. Test plates are used to determine sensitivity settings, and to confirm adequate width of field for each transducer.