

Title (en)

HEAT-TREATED DEFORMED STEEL WIRE, AND METHOD AND APPARATUS FOR MANUFACTURING THE SAME

Title (de)

WÄRMEBEHANDELTER VERFORMTER STAHL DRAHT UND VERFAHREN UND VORRICHTUNG ZUR HERSTELLUNG DESSELBEN

Title (fr)

FIL D'ACIER DEFORME PAR TRAITEMENT THERMIQUE ET PROCEDE ET APPAREIL DE FABRICATION D'UN TEL FIL D'ACIER

Publication

EP 1402965 A4 20080820 (EN)

Application

EP 01954408 A 20010801

Priority

- JP 0106624 W 20010801
- JP 2001139429 A 20010510

Abstract (en)

[origin: EP1402965A1] Rolling/heating means (6), a four-way roll rolling machine (7) and a quenching/cooling means (8) are arranged close to each other in tandem. An untreated steel wire (W1) is quickly heated to a rolling temperature by the heating means (6) and is rolled into a deformed steel wire (W2) having a predetermined section by the four-way roll rolling machine (7). Just after this rolling, the steel wire (W2) is quenched by the quenching/cooling means (8) while applying tension by a pinch roll (9), thus form-hardening it. At this time, the pinch roll (9) is driven by a motor (9a) having a torque converter, so that the tension is hardly varied to give no size variation to the deformed steel wire. Downstream of the quenching/cooling means, there is also arranged in tandem a tempering/heating coil (10) to temper the steel wire continuously. Thus, there is manufactured at one step a heat-treated deformed steel wire quenched and heat-treated without any small curve.

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IPC 8 full level

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Citation (search report)

- [Y] AT 396073 B 19930525 - BOEHLER GMBH [ST]
- [Y] US 5058410 A 19911022 - LOSCH HANS [AT], et al
- [Y] JP 2000233202 A 20000829 - KAWASAKI STEEL CO
- [Y] JP H0299203 A 19900411 - DAIDO STEEL CO LTD
- See references of WO 02092250A1

Cited by

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EP 1402965 A1 20040331; **EP 1402965 A4 20080820**; **EP 1402965 B1 20101201**; DE 60143591 D1 20110113; KR 100662963 B1 20061228; KR 20030023601 A 20030319; TW I235768 B 20050711; US 2004060619 A1 20040401; WO 02092250 A1 20021121

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