

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

(19) World Intellectual Property  
Organization  
International Bureau

(43) International Publication Date  
31 May 2018 (31.05.2018)



(10) International Publication Number  
**WO 2018/095993 A1**

(51) International Patent Classification:

C21D 7/02 (2006.01) C22C 38/38 (2006.01)  
C22C 38/04 (2006.01)

(21) International Application Number:

PCT/EP2017/080115

(22) International Filing Date:

22 November 2017 (22.11.2017)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

16200246.3 23 November 2016 (23.11.2016) EP

(71) Applicant: **OUTOKUMPU OYJ** [FI/FI]; Salmisaarenranta 11, 00180 HELSINKI (FI).

(72) Inventors: **FRÖHLICH, Thomas**; Schützenstrasse 36, 40878 RATINGEN (DE). **LINDNER, Stefan**; Mittelstrasse 120, 47877 WILlich (DE).

(74) Agent: **OUTOKUMPU OYJ, GROUP R&D**; P.O. Box 245, 00181 Helsinki (FI).

(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, 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.

(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, ST, 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))
- of inventorship (Rule 4.17(iv))

**Published:**

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

(54) Title: METHOD FOR MANUFACTURING A COMPLEX-FORMED COMPONENT

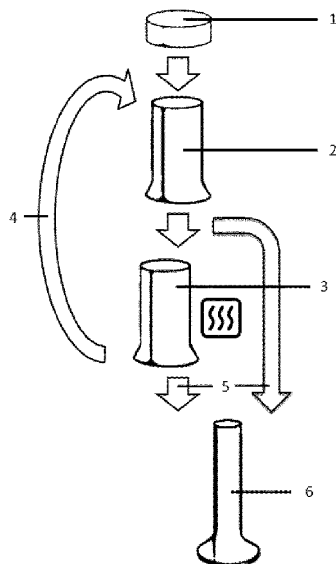


FIG. 7

(57) Abstract: The present invention relates to a method for manufacturing a complex-formed component (6) by using austenitic steels in a multi-stage process (4) where cold forming (2) and heating (3) are alternated for at least two multi-stage process (4) steps. The material during every process step and a component produced has an austenitic microstructure with non-magnetic reversible properties.

WO 2018/095993 A1