



(51) International Patent Classification:  
**B21D 7/08** (2006.01)

(21) International Application Number:  
PCT/IT2009/000049

(22) International Filing Date:  
10 February 2009 (10.02.2009)

(25) Filing Language: Italian

(26) Publication Language: English

(30) Priority Data:  
RM2008A000078 12 February 2008 (12.02.2008) IT

(71) Applicant (for all designated States except US): **CML INTERNATIONAL S.P.A.** [IT/IT]; Località Annunziata, I-03030 Piedimonte San Germano (IT).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **CAPORUSSO, Alessandro** [IT/IT]; Via Pantanelle snc, I-03030 Piedimonte San Germano (FR) (IT). **SCHIARANTE, Eugenio** [IT/IT]; Via S.Marco, 37/B, I-36077 Altavilla Vicentina (VI) (IT). **ROSO, Giuseppe** [IT/IT]; Via Malga Zonta, 13, I-36014 Santorso (VI) (IT).

(74) Agent: **CIPRIANI, Guido**; C & C Brevetti e Marche s.r.l., Via Prisciano, 28, I-00136 Roma (IT).

(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, BR, BW, BY, BZ, CA, CH, 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, KM, 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, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, 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, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (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, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**Published:**

- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

[Continued on next page]

(54) Title: METHOD TO CHECK AND CONTROL A ROLLER BENDING MACHINE FOR CONTINUOUSLY BENDING AN ELONGATED WORKPIECE AT VARIABLE CURVATURE RADII, AND MACHINE SO CONTROLLED

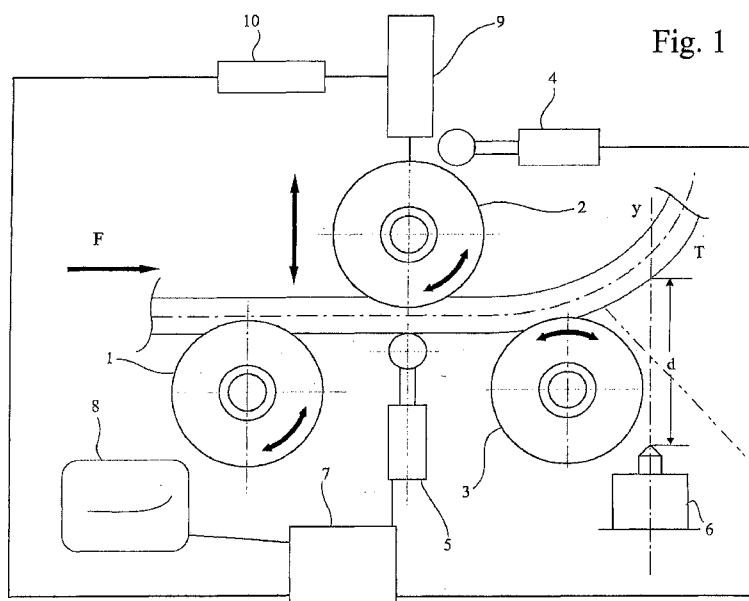


Fig. 1

(57) Abstract: A method to check and control a roller bending machine for continuously bending an elongated workpiece at variable curvature radii in a bending machine using a series of rollers for bending, comprises the steps of measuring the distance of the elongated workpiece in a point that is situated downstream the series of rollers for bending in successive instants, calculating a curvature radius of each bend section of the elongated workpiece, comparing the calculated curvature radius with the desired curvature radius and determining a difference between them, calculating the change of position to which an upstream roller has to be subjected in order to annul such a difference and operating the upstream roller on the base of the calculated change of position. A machine embodying the method is also described.



---

**(88) Date of publication of the international search report:**  
8 October 2009

# INTERNATIONAL SEARCH REPORT

International application No  
PCT/IT2009/000049

**A. CLASSIFICATION OF SUBJECT MATTER**  
INV. B21D7/08

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
B21D G05B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2006/175311 A1 (INGVARSSON LARS [SE]) 10 August 2006 (2006-08-10) cited in the application abstract figure 1 paragraphs [0005] - [0008]	1-10
Y	US 4 232 540 A (CAIN JACK C ET AL) 11 November 1980 (1980-11-11) abstract figure 1 column 6, lines 29-56	1-10
Y	US 2007/233422 A1 (MONTANARI WILLIAM [IT]) 4 October 2007 (2007-10-04) figure 3 paragraphs [0035] - [0052]	1-10
	-/--	

☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

\* Special categories of cited documents :

\*A\* document defining the general state of the art which is not considered to be of particular relevance

\*E\* earlier document but published on or after the international filing date

\*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

\*O\* document referring to an oral disclosure, use, exhibition or other means

\*P\* document published prior to the international filing date but later than the priority date claimed

\*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

\*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

\*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

\* & \* document member of the same patent family

Date of the actual completion of the international search

31 July 2009

Date of mailing of the international search report

11/08/2009

Name and mailing address of the ISA/  
European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040,  
Fax: (+31-70) 340-3016

Authorized officer

Hageman, Elodie

# INTERNATIONAL SEARCH REPORT

International application No

PCT/IT2009/000049

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 047 411 A (FOSTER GENE B) 13 September 1977 (1977-09-13) abstract figures 3,5,7 column 7, line 40 - column 8, line 50 -----	1-10
A	JP 62 033014 A (NIPPON KOKAN KK) 13 February 1987 (1987-02-13) abstract figure 1 -----	1-10

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IT2009/000049

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2006175311 A1	10-08-2006	CA 2531805 A1 EP 1644140 A1 SE 525196 C2 SE 0302082 A WO 2005005071 A1	20-01-2005 12-04-2006 21-12-2004 21-12-2004 20-01-2005
US 4232540 A	11-11-1980	NONE	
US 2007233422 A1	04-10-2007	AT 407388 T EP 1766482 A2 WO 2005119383 A2 ES 2313357 T3 JP 2008501536 T	15-09-2008 28-03-2007 15-12-2005 01-03-2009 24-01-2008
US 4047411 A	13-09-1977	NONE	
JP 62033014 A	13-02-1987	NONE	