(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 0 992 295 A3

(12) EUROPEAN PATENT APPLICATION

(88) Date of publication A3:
18.12.2002 Bulletin 2002/51

(43) Date of publication A2:
12.04.2000 Bulletin 2000/15

(21) Application number: **99119817.7**

(22) Date of filing: **07.10.1999**

(51) Int Cl.[7]: **B21B 37/66**

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **08.10.1998 AT 168298**

(71) Applicant: **Voest Alpine Industrieanlagenbau Gmbh**
4020 Linz (AT)

(72) Inventors:
- **Kugi, Andreas**
  4040 Linz (AT)
- **Frank, Helge**
  3363 Ulmerfeld-Hausmening (AT)
- **Aistleitner, Karl**
  4283 Bad Zell (AT)

(74) Representative: **VA TECH Patente GmbH & Co**
Penzinger Strasse 76
1141 Wien (AT)

(54) Method and device for the active compensation of periodic disturbances during hot or cold rolling

(57) In a method and a corresponding device for the active compensation of periodic disturbances of known frequency during hot or cold rolling, such as roll eccentricities, by means of a control system, with the aid of a linear dynamic controller (2) which comprises a model ($\bar{P}_u$) that describes one part of the dynamic behaviour of the controlled system (1), an output variable ($\bar{y}$) is determined from an input variable (u) on the basis of a reference variable (r), and a compensation signal (u_{LMS}) is generated on the basis of said output variable and a measured output variable (y) of the controlled system (1) and is impressed on the input variable (u) fed to the controlled system (1). As a result, the tracking control is decoupled from the disturbance control, and the controller according to the invention can therefore be inserted into existing control loops for the thickness of the rolling material and/or for the position of the rolls and/or for the rolling force and/or for the roll bending. The compensation signal is generated without prior identification of the eccentricity, which thus permits a more rapid correction of the disturbances.

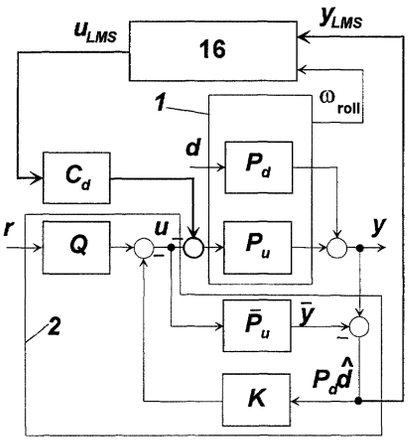

Fig. 4

EP 0 992 295 A3

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 99 11 9817

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
D,A	EP 0 424 709 A (SCHLOEMANN SIEMAG AG) 2 May 1991 (1991-05-02) * the whole document *	1-9	B21B37/66
A	PATENT ABSTRACTS OF JAPAN vol. 016, no. 450 (M-1312), 18 September 1992 (1992-09-18) & JP 04 157009 A (NIPPON STEEL CORP), 29 May 1992 (1992-05-29) * abstract *	1-9	
A	US 4 685 063 A (WEIHRICH GEORG ET AL) 4 August 1987 (1987-08-04) * abstract; figure 1 *	1-9	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

B21B
G05D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
MUNICH	22 October 2002	Forciniti, M

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 99 11 9817

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

22-10-2002

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0424709 A	02-05-1991	DE 3935434 A1	02-05-1991
		AT 142915 T	15-10-1996
		DE 59010507 D1	24-10-1996
		EP 0424709 A2	02-05-1991
		JP 2877937 B2	05-04-1999
		JP 3156615 A	04-07-1991
		US 5077997 A	07-01-1992
JP 04157009 A	29-05-1992	JP 2583657 B2	19-02-1997
US 4685063 A	04-08-1987	AT 39069 T	15-12-1988
		CA 1234613 A1	29-03-1988
		DE 3566627 D1	12-01-1989
		EP 0170016 A1	05-02-1986
		JP 7022768 B	15-03-1995
		JP 61027114 A	06-02-1986
		ZA 8505052 A	26-02-1986

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82