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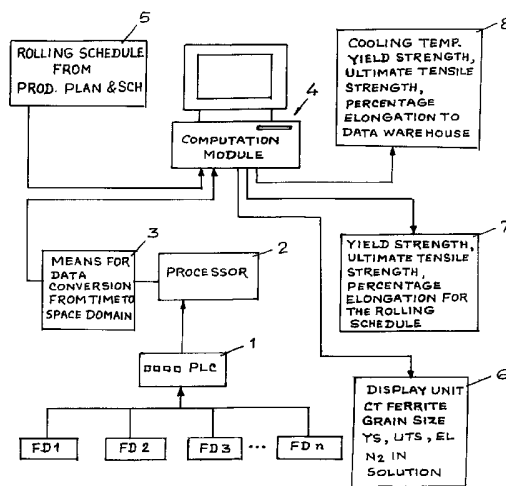
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(54) Title: A SYSTEM AND METHOD FOR ON-LINE PROPERTY PREDICTION FOR HOT ROLLED COIL IN A HOT STRIP MILL



(57) Abstract: This invention provides a system for on-line property prediction for hot rolled coils in a hot strip mill of a steel plant. The system comprises a unit (5) for capturing the chemistry from the steel making stage and providing the data on rolling schedule. Field devices (FD1 ... FDn) are provided at the instrumentation level for measuring process parameters during hot rolling. A programmable logic controller (1) is used for acquiring data of measured parameters from the field devices and feeding the data to a processor (2). Means (3) is provided for conversion of the measured data from time domain to space domain using segment tracking. A computation module (4) processes the converted space domain data for predicting mechanical properties along the length and through the thickness of the strip being rolled. A display unit (6) displays the predicted properties. The data obtained can be stored in a data warehouse (8) for future use. A unit (7) provided in the system can collect the predicted properties and feed the same to the scheduling unit (5).

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*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.*

## INTERNATIONAL SEARCH REPORT

International application No.  
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<b>A. CLASSIFICATION OF SUBJECT MATTER</b> IPC <sup>7</sup> : B21B 37/00, B21B 38/00 According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) IPC <sup>7</sup> : B21B 37/00, B21B 38/00 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 practicable, search terms used) epodoc, fi cl txtc, fi cl txtg		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 3253438 A (STRINGER) 31 May 1966 (31.05.1966) <i>figs. 1, 3, 4, 8, 10, 11.</i>	1, 2, 7
Y	DE 19941600 A1 (SIEMENS AG) 15 March 2001 (15.03.2001) <i>the whole document.</i>	1, 2, 7
A	US 3568637 A (SMITH) 9 March 1971 (09.03.1971) <i>abstract, fig. 1.</i>	1, 2
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> 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 application or patent 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
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Patent document cited in search report			Publication date	Patent family member(s)		Publication date
DE	A	19941600	2001-03-15	none		
US	A	3253438	1966-05-31	FR	A 1447915	1966-08-05
				FR	A 1381347	1964-12-14
				GB	A 982232	1965-02-03
				GB	A 982231	1965-02-03
				US	A 3248916	1966-05-03