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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
23 December 2009 (23.12.2009)

PCT

(10) International Publication Number
WO 2009/155260 A3

(51) International Patent Classification:
G05B 17/00 (2006.01) *G05B 19/00* (2006.01)

(21) International Application Number:
PCT/US2009/047450

(22) International Filing Date:
16 June 2009 (16.06.2009)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
12/143,354 20 June 2008 (20.06.2008) US

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(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, CL, 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, PE, 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).

[Continued on next page]

(54) Title: APPARATUS AND METHOD FOR MODEL PREDICTIVE CONTROL (MPC) OF A NONLINEAR PROCESS

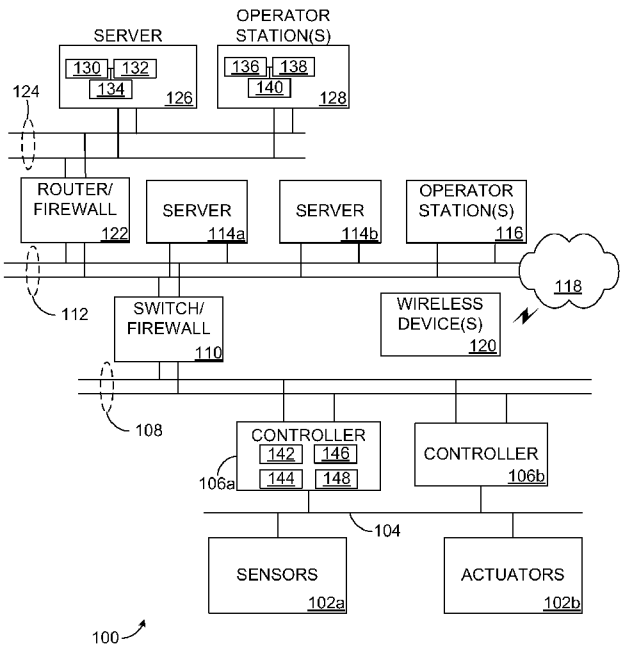

FIGURE 1

(57) Abstract: A method includes obtaining (402) a nonlinear process model (142) modeling a nonlinear process to be controlled. The method also includes obtaining (404) an objective function (144) defining how the process is controlled. The method further includes obtaining (406) a control model (146) defining a dynamic feasible region associated with a controlled variable, where the controlled variable is associated with the process. In addition, the method includes controlling (408-418) the nonlinear process by solving a control problem that includes the process model, control model, and objective function. The dynamic feasible region defined by the control model could represent a funnel region (302). The objective function could include terms for minimizing and optimizing adjustments to one or more manipulated variables associated with the process. Controlling the nonlinear process could include performing simultaneous control and optimization, where adjustments to the one or more manipulated variables are chosen to meet the control objectives and possibly to optimize and minimize the adjustments.

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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))*

(88) Date of publication of the international search report:
11 March 2010

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2009/047450

A. CLASSIFICATION OF SUBJECT MATTER

G05B 17/00(2006.01)i, G05B 19/00(2006.01)i

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)

G05B 17/00; G05B 13/02; G05B 13/04; G06F 15/18

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

Korean utility models and applications for utility models since 1975.
Japanese utility models and applications for utility models since 1975.

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

eKOMPASS(KIPO internal) & Keywords: model, predictive, control, nonlinear, process and the similar terms

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2006-086376 A3 (CELANESE INTERNATIONAL CORPORATION) 17 August 2006 See abstract; Figs 1; page 5, line 25-page 7, line 23	1-10
A	US 2005-0187643 A1 (SAYYAR-RODSARI et al.) 25 August 2005 See abstract; Figs 5a-5b, 8-9; [0098]-[0194]	1-10
A	EP 0710902 B1 (THE FOXBORO COMPANY) 08 September 1999 See abstract; Figs 1-2; [0034]-[0047]	1-10
A	EP 0907117 A1 (COMMUNAUTE EUROPEENNE) 07 April 1999 See abstract; Figs 1-2; [0028]-[0035]	1-10

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

☒ See patent family annex.

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"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	Date of mailing of the international search report
11 JANUARY 2010 (11.01.2010)	**12 JANUARY 2010 (12.01.2010)**

Name and mailing address of the ISA/KR

Korean Intellectual Property Office
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Facsimile No. 82-42-472-7140

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Telephone No. 82-42-481-5682

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2009/047450

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