



(51) International Patent Classification:

A61L 2/02 (2006.01) A23L 3/16 (2006.01)
A23L 3/00 (2006.01)

(21) International Application Number:

PCT/IB2013/058702

(22) International Filing Date:

20 September 2013 (20.09.2013)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/704,705 24 September 2012 (24.09.2012) US

(71) Applicant: NESTEC S.A. [CH/CH]; Avenue Nestle 55,
CH-1800 Vevey (CH).(72) Inventor: CUMMINGS, Daniel Louis; 4944 Brookside
Lane, Fremont, Michigan 49412 (US).(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, 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, 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, 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, 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 the identity of the inventor (Rule 4.17(i))
- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))
- of inventorship (Rule 4.17(iv))

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))

(54) Title: METHODS AND SYSTEMS FOR ENERGY BALANCE CONTROL FOR FEED FLOW AND FEED TEMPERATURE DISTURBANCES

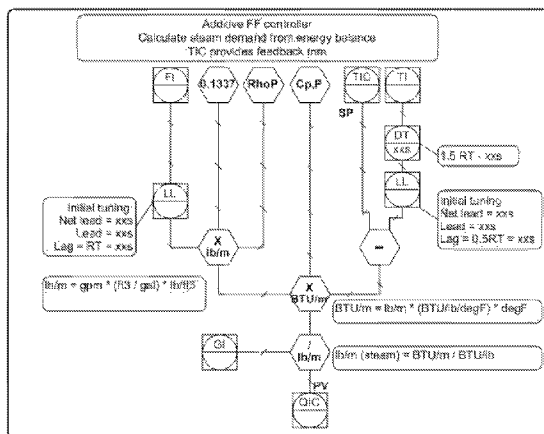


FIG. 1

(57) **Abstract:** The present disclosure provides methods and systems for mitigating finished product temperature transients caused by changes in product flow, raw product temperature, or other disturbances in an aseptic sterilization process. The methods and systems include applying an energy balance feedforward control scheme to the aseptic sterilization process to compensate for raw product temperature changes and changes in product flow. The methods and systems prevent damage to a finished product from occurring based on adverse transient temperature responses of heaters and coolers in an aseptic sterilization process.