

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

(19) World Intellectual Property  
Organization  
International Bureau

(43) International Publication Date  
12 June 2025 (12.06.2025)



(10) International Publication Number  
**WO 2025/122518 A1**

(51) International Patent Classification:

G01K 11/32 (2006.01) H01L 21/67 (2006.01)  
G01K 13/12 (2006.01)

(21) International Application Number:

PCT/US2024/058295

(22) International Filing Date:

03 December 2024 (03.12.2024)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

63/606,016 04 December 2023 (04.12.2023) US  
18/965,974 02 December 2024 (02.12.2024) US

(71) Applicant: **APPLIED MATERIALS, INC.** [US/US];  
3050 Bowers Avenue, Santa Clara, California 95054 (US).

(72) Inventors: **NG, Eric Chin Hong**, 3050 Bowers Avenue,  
Santa Clara, California 95054 (US). **VAEZ-IRAVANI,  
Mehdi**, 3050 Bowers Avenue, Santa Clara, California  
95054 (US).

(74) Agent: **KIMES, Benjamin A.** et al.; LOWENSTEIN SAN-  
DLER LLP, One Lowenstein Drive, Roseland, New Jersey  
07068 (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, CV, CZ, DE, DJ, DK, DM,  
DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,  
HN, HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE, KG,  
KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY,  
MA, MD, MG, MK, MN, MU, 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, ST, SV, SY, TH,

(54) Title: INTERFEROMETRY-BASED TEMPERATURE MONITORING IN MANUFACTURING SYSTEMS

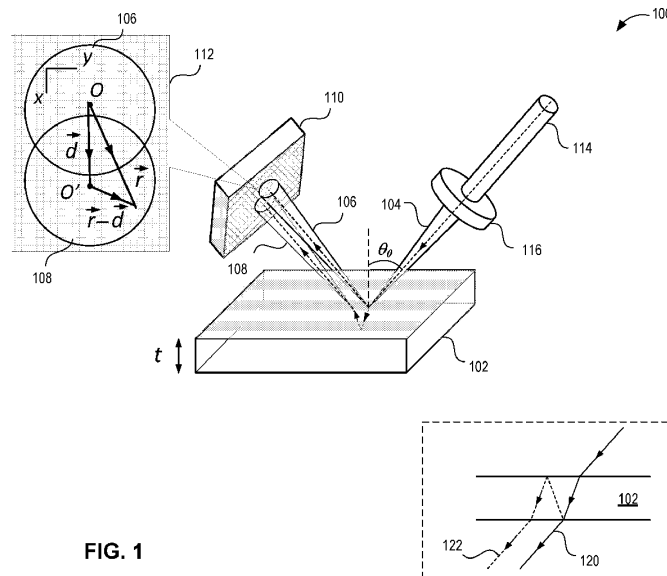


FIG. 1

(57) Abstract: Disclosed systems and techniques are directed to interferometry-based temperature monitoring of various operations performed in manufacturing systems. For example, the disclosed techniques include directing an incident light to a sample and detecting a plurality of interference patterns (IPs) associated with a light departing from the sample. The light departing from the sample can be generated upon interaction of the incident light with the sample. Each IP of the plurality of IPs can be associated with a respective temperature of a plurality of temperatures of the sample. The techniques further include determining, using the plurality of IPs, a temperature difference between a first temperature of the plurality of temperatures and a second temperature of the plurality of temperatures.

[Continued on next page]

TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS,  
ZA, ZM, ZW.

**(84) Designated States** (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, CV, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SC, SD, SL, ST, 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, ME, 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 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))*

**Published:**

- *with international search report (Art. 21(3))*