

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
19 May 2023 (19.05.2023)



(10) International Publication Number
WO 2023/082170 A1

- (51) **International Patent Classification:**
H05K 13/00 (2006.01) *H05K 13/04* (2006.01)
- (21) **International Application Number:**
PCT/CN2021/130258
- (22) **International Filing Date:**
12 November 2021 (12.11.2021)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (71) **Applicant:** **ILLINOIS TOOL WORKS INC.** [US/US];
155 Harlem Avenue, Glenview, Illinois 60025 (US).
- (71) **Applicant (for MG only):** **ITW ELECTRONICS
(SUZHOU) CO., LTD.** [CN/CN]; No. 5 Xiang Street, Tai
Shan Road, Suzhou New District, Suzhou, Jiangsu 215129
(CN).
- (72) **Inventors:** **REID, Scott A.**; c/o Illinois Tool Works Inc.,
155 Harlem Avenue, Glenview, Illinois 60025 (US). **LIU,**

Guohua; c/o Illinois Tool Works Inc., 155 Harlem Avenue,
Glenview, Illinois 60025 (US).

(74) **Agent:** **TUO YING LAW OFFICES (SHANGHAI);**
Suite 306, Modern Universe Business Plaza, No.99
Huichuan Road, Changning District, Shanghai 200050
(CN).

(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, DJ, DK, DM, DO,
DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN,
HR, HU, ID, IL, IN, IR, IS, IT, JO, JP, KE, KG, KH, KN,
KP, KR, KW, KZ, LA, LC, LK, LR, LS, 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, ST, SV, SY, TH, TJ, TM, TN,
TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW.

(54) **Title:** MULTI-PATTERN TOOLING PLATE

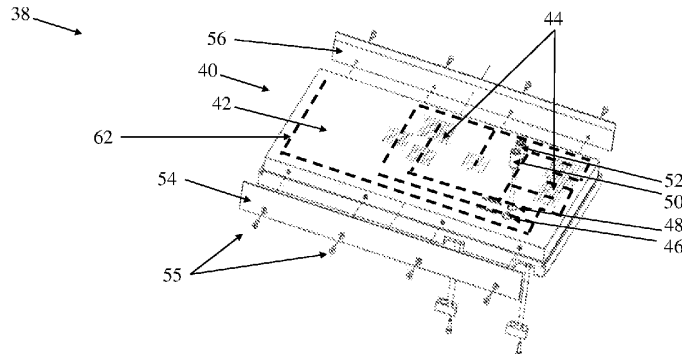


FIG. 3

(57) **Abstract:** Heated chuck plates and apparatus using the same where a heated chuck or tooling plate has a body including an external surface, the body configured to secure an electronics assembly near the external surface, and an air channel network configured to selectively direct heated air to a plurality of predetermined locations on the electronics assembly, the air channel network including: a first heating pathway configured to direct the heated air through the external surface and onto a first location of the plurality of predetermined locations, and a second heating pathway configured to direct the heated air through the external surface and onto a second location of the plurality of predetermined locations.

[Continued on next page]



WO 2023/082170 A1

(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, 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, 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).

Published:

— with international search report (Art. 21(3))