

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
26 August 2021 (26.08.2021)



(10) International Publication Number
WO 2021/167700 A1

(51) International Patent Classification:

C30B 15/00 (2006.01) C30B 29/06 (2006.01)
C30B 15/06 (2006.01) C30B 35/00 (2006.01)
C30B 15/12 (2006.01)

(21) International Application Number:

PCT/US2020/067618

(22) International Filing Date:

31 December 2020 (31.12.2020)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

16/796,482 20 February 2020 (20.02.2020) US
16/796,522 20 February 2020 (20.02.2020) US

(71) Applicant: GLOBALWAFERS CO., LTD. [CN/CN];

No. 8 Industrial East Road 2, Science-Based Industrial Park,
Hsinchu (TW).

(72) Inventors: **PHILLIPS, Richard Joseph**; 501 Pearl Drive, St. Peters, Missouri 63376 (US). **ZEPEDA, Salvador**; 501 Pearl Drive, St. Peters, Missouri 63376 (US). **BOEGEMANN, III, Patrick Fredrick**; 501 Pearl Drive, St. Peters, Missouri 63376 (US). **LUTER, William**; 501 Pearl Drive, St. Peters, Missouri 63376 (US).

(74) Agent: **SCHUTH, Richard A.** et al.; ARMSTRONG TEASDALE LLP, 7700 Forsyth Blvd., Suite 1800, St. Louis, Missouri 63105 (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, 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,

(54) Title: METHODS FOR FORMING A UNITIZED CRUCIBLE ASSEMBLY, CRUCIBLE MOLDS AND UNITIZED CRUCIBLES

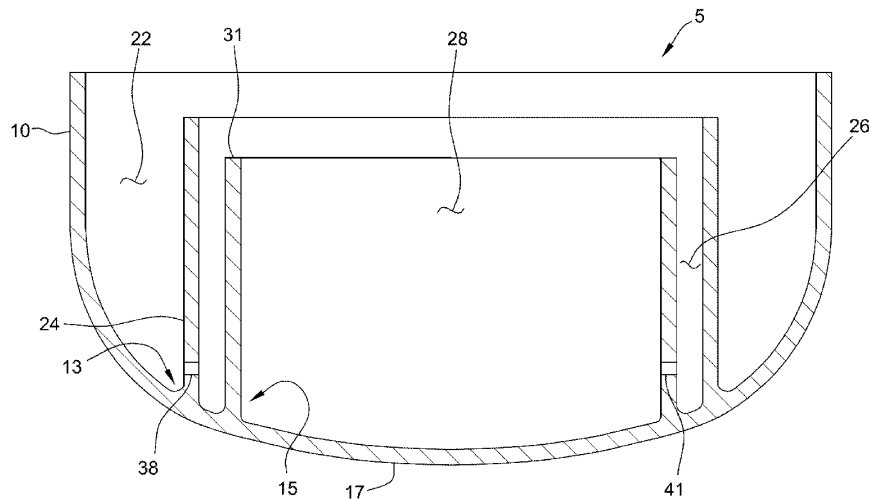


FIG. 1

(57) Abstract: Methods for forming a unitized crucible assembly for holding a melt of silicon for forming a silicon ingot are disclosed. In some embodiments, the methods involve a porous crucible mold having a channel network with a bottom channel, an outer sidewall channel that extends from the bottom channel, and a central weir channel that extends from the bottom channel. A slip slurry may be added to the channel network and the liquid carrier of the slip slurry may be drawn into the mold. The resulting green body may be sintered to form the crucible assembly.

[Continued on next page]

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.

(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))