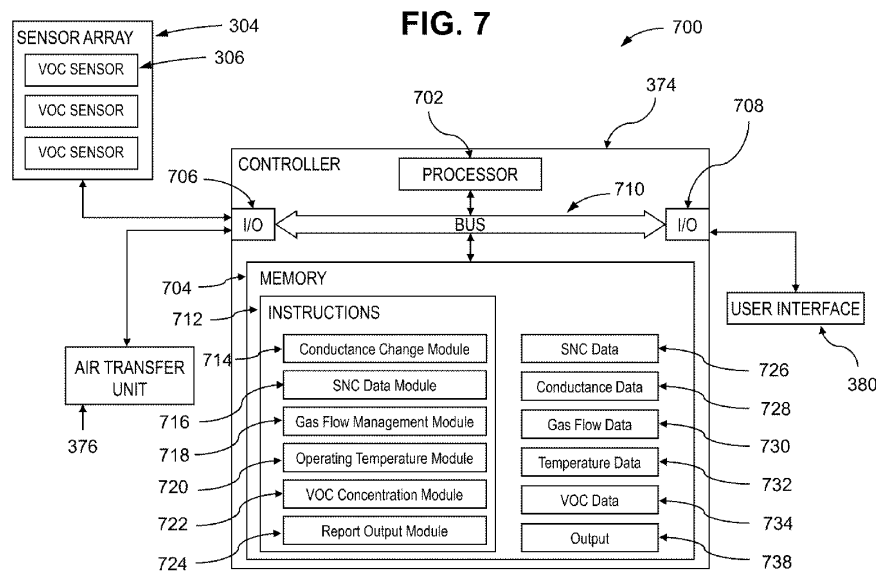




- (51) **International Patent Classification:**
G01N 33/00 (2006.01) *A01M 99/00* (2006.01)
- (21) **International Application Number:**
PCT/US2019/016335
- (22) **International Filing Date:**
01 February 2019 (01.02.2019)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**
62/625,000 01 February 2018 (01.02.2018) US
- (71) **Applicant:** **SENSOR DEVELOPMENT CORPORATION** [US/US]; 141 Innovation Dr., SM 322, Elyria, Ohio 44035 (US).
- (72) **Inventors:** **SMILANICH, Nicholas Joseph**; 22500 Lake Rd, Unit 801, Rocky River, Ohio 44116 (US). **REICHERT, Samuel Firestone**; 259 Judita Dr, Brunswick, Ohio 44212 (US). **TUDRON, Frank Bernard**; 7077 E. Jefferson Dr, Mentor, Ohio 44060 (US).
- (74) **Agent:** **DRAGO, Christian R.**; Fay Sharpe LLP, The Halle Building, 5th Floor, 1228 Euclid Avenue, Cleveland, Ohio 44115 (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, 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, 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, ST, SZ, TZ,

(54) **Title:** DEVICE FOR DETECTING INSECT LARVAE AND ADULT INSECTS IN STORED PRODUCTS BY SENSING THEIR VOLATILE PHEROMONES AND SEMIOCHEMICALS



(57) **Abstract:** Minimal-cost, high-accuracy, and portable devices used to detect the presence of insect larvae and adult insects in stored products by sensing gas phase markers such as volatile pheromones, semiochemicals, and kairomones. The methods, devices, and systems disclosed herein utilize a sensor array configured to simultaneously measure a plurality of target markers and filter background gases while remaining compact, highly accurate, and easy to operate.

[Continued on next page]

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))*