

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
28 July 2022 (28.07.2022)



(10) International Publication Number
WO 2022/159238 A1

- (51) **International Patent Classification:**
A61M 25/00 (2006.01) *A61M 25/06* (2006.01)
- (21) **International Application Number:**
PCT/US2021/065643
- (22) **International Filing Date:**
30 December 2021 (30.12.2021)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**
63/139,640 20 January 2021 (20.01.2021) US
17/565,189 29 December 2021 (29.12.2021) US
- (71) **Applicant: BECTON, DICKINSON AND COMPANY**
[US/US]; 1 Becton Drive, Franklin Lakes, New Jersey
07417 (US).
- (72) **Inventor: NATESAN, Mohankumar;** Blk 24, Bukit Batok
Street 52, 05-02, Bukit Batok 659246 (SG).

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).

Declarations under Rule 4.17:

- *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))*

- (74) **Agent: BLAIR, Whitney;** Kirton McConkie, 36 South
State Street, Suite 1900, Salt Lake City, Utah 84111 (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:** VALVE RETAINER RING AND RELATED SYSTEMS AND METHODS

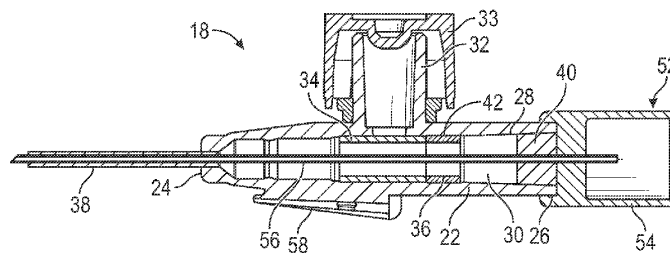


FIG. 2A

(57) **Abstract:** A catheter system may include a catheter assembly. The catheter assembly may include the catheter adapter, which may include a distal end, a proximal end, an inner surface forming a lumen, the lumen extending through the distal end and the proximal end, and a side port disposed between the distal end and the proximal end. The catheter assembly may include an annular valve, which may be disposed within the lumen and aligned with the side port. The annular valve may seal a fluid pathway from the side port to the lumen. The catheter assembly may include a retainer ring disposed proximal and/or proximate the annular valve within the lumen. The catheter assembly may include a catheter extending distally from the distal end of the catheter adapter.



WO 2022/159238 A1