

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
11 April 2024 (11.04.2024)



(10) International Publication Number
WO 2024/076590 A2

(51) International Patent Classification:

B01F 25/441 (2022.01) **A61J 1/20** (2006.01)
B01F 35/00 (2022.01) **B29C 33/76** (2006.01)

(21) International Application Number:

PCT/US2023/034399

(22) International Filing Date:

03 October 2023 (03.10.2023)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

63/378,230 03 October 2022 (03.10.2022) US

(71) Applicant: **WEST PHARMACEUTICAL SERVICES, INC.** [US/US]; 530 Herman O. West Drive, Exton, Pennsylvania 19341 (US).

(72) Inventors: **LENNON, Dan**; 530 Herman O. West Drive, Exton, Pennsylvania 19341 (US). **MOLONEY, Emer**; 530 Herman O. West Drive, Exton, Pennsylvania 19341 (US). **BYRNE, Aidan**; 530 Herman O. West Drive, Exton, Pennsylvania 19341 (US). **MCGARRY, Martin**; 530 Herman O. West Drive, Exton, Pennsylvania 19341 (US). **DOWLING, Patrick**; 530 Herman O. West Drive, Exton, Pennsylvania 19341 (US). **SULLIVAN, Michael J.**; 530

Herman O. West Drive, Exton, Pennsylvania 19341 (US). **KUMAR, Rajiv**; 530 Herman O. West Drive, Exton, Pennsylvania 19341 (US). **HASAN, Md Abu**; 530 Herman O. West Drive, Exton, Pennsylvania 19341 (US). **SANTOS, Jorge**; 530 Herman O. West Drive, Exton, Pennsylvania 19341 (US). **BROUGH, Richard J.**; 530 Herman O. West Drive, Exton, Pennsylvania 19341 (US).

(74) Agent: **AKHAVANNIK, Hussein**; BLANK ROME LLP, 1825 Eye Street NW, Washington, District of Columbia 20006 (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, 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,

(54) Title: METHODS AND ADAPTERS FOR MIXING PHARMACEUTICAL COMPLEXES

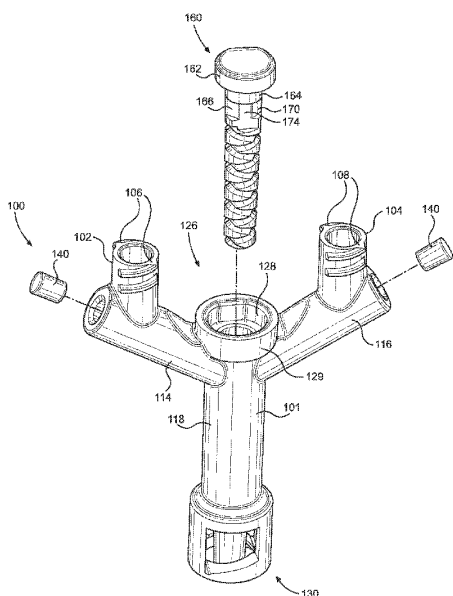


FIG. 2

(57) Abstract: Embodiments of an adapter, a system including the adapter, and methods of using the adapter may be for mixing a first substance and a second substance. The adapter may include a body having a first port configured to connect with a first container to receive a first substance, a second port configured to connect with a second container to receive a second substance, a third port configured to connect with a recipient container to output a mixture of the first substance and the second substance, and a mixing chamber having a first portion in communication with the first port and the second port and a second portion in communication with the third port. The adapter may further include a mixing pin inserted into the mixing chamber. In some embodiments, the mixing pin at least partially defines at least one microfluidic path for mixing the first substance and the second substance. In some embodiments, at least one of the first channel and the second channel are oriented offset of a central plane of the body.

WO 2024/076590 A2

[Continued on next page]

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).

Published:

- *without international search report and to be republished upon receipt of that report (Rule 48.2(g))*