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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
14 October 2021 (14.10.2021)

WIPO | PCT

(10) International Publication Number
WO 2021/206902 A3

(51) International Patent Classification:
A61M 5/142 (2006.01) *A61M 5/158* (2006.01)

(21) International Application Number:
PCT/US2021/023685

(22) International Filing Date:
23 March 2021 (23.03.2021)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
63/008,007 10 April 2020 (10.04.2020) US

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

(72) Inventors: **LYNESS, Alex**; 300 E. Evans Street, Apt. C310, West Chester, PA 19380 (US). **ROUIN, Geoffrey, T.**; 1 Atno Avenue, Morristown, NJ 07960 (US). **COSTELLO, Brian**; 17 Felmley Road, Whitehouse Station, NJ 08889 (US).

(74) Agent: **AKHAVANNIK, Hussein** et al.; Baker Hostetler LLP, 1050 Connecticut Avenue, N.W., Suite 1100, Washington, District of Columbia 20036 (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, 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.

WO 2021/206902 A3

(54) Title: INJECTION DEVICE HAVING A SUSPENDED PARENTERAL INTERFACE

FIG. 11A

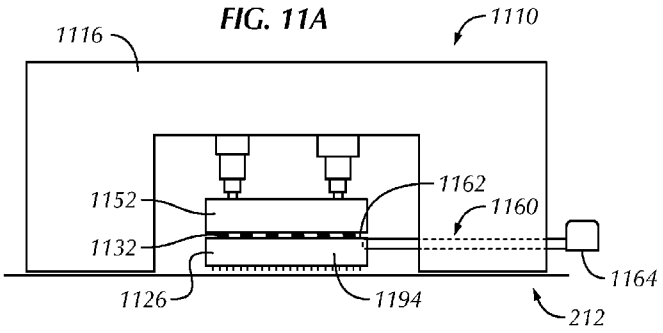
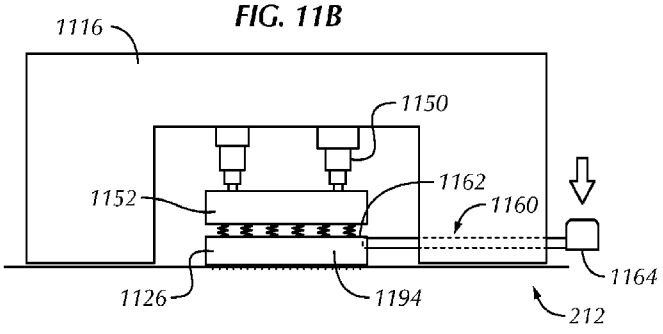


FIG. 11B



(57) Abstract: Systems and methods for drug delivery are disclosed in which an injection device comprises a parenteral interface, comprising a support and a needle assembly, suspended within a cavity in a housing of the device such that the parenteral interface is movably mounted with respect to the housing when the needle assembly is in the injection position. The parenteral interface can be configured to allow movement of the housing of the device with respect to the skin without displacing the needle assembly. The devices can be configured to passively or actively compensate for movement of the housing relative to the injection site to ensure correct delivery depth is maintained during time device is worn. For example, by mounting the support of the parenteral interface on a deformable mount or an articulated or rotatable component.

[Continued on next page]

(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))*

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

(88) Date of publication of the international search report:
02 December 2021 (02.12.2021)

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2021/023685

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61M5/142 A61M5/158
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A61M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2015/118358 A1 (OWEN MUMFORD LTD [GB]) 13 August 2015 (2015-08-13) page 9, line 8 - line 14 page 11, line 13 - line 19 page 16, line 23 - page 17, line 21 figures 1-8	1-20
A	WO 2018/152073 A1 (AMGEN INC [US]) 23 August 2018 (2018-08-23) paragraph [0106] - paragraph [0112] figures 1, 21-25	1-20

-/--

[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
18 October 2021	03/11/2021

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Koch, Kristian

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2021/023685

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2016/184512 A1 (MARBET REGINA [CH] ET AL) 30 June 2016 (2016-06-30)	60,63, 73,74, 77,78
A	paragraph [006'] - paragraph [0061] paragraph [0066] paragraph [0077] paragraph [0102] figures 1-15	61, 64-72, 75,76, 79,80

A	US 2010/152674 A1 (KAVAZOV JULIAN D [US] ET AL) 17 June 2010 (2010-06-17) paragraph [0151] paragraph [0155] figures 45, 46	60-80

A	US 2011/054390 A1 (SEARLE GARY [US] ET AL) 3 March 2011 (2011-03-03) paragraph [0079] figures 11a-11c	60-80

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2021/023685

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.

3. ☒ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

1-20, 60-80

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-20

   An injection device comprising a support with a needle mounted on a plurality of springs coupled to a spring base provided in a housing of the device.

   ---

2. claims: 21-40

   An injection device comprising a support that is movably mounted within the cavity of the housing wherein a plurality of motors is configured to move the support relative to the housing.

   ---

3. claims: 41-59

   An injection device comprising a support that is rotationally mounted relative to the housing to allow rotation of the support within the housing.

   ---

4. claims: 60-80

   An injection device comprising a support mounted within the cavity of the housing on a resiliently deformable mount coupled to the housing.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2021/023685

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2015118358 A1	13-08-2015	CN 106029127 A	12-10-2016
		EP 3110479 A1	04-01-2017
		US 2016354553 A1	08-12-2016
		WO 2015118358 A1	13-08-2015
WO 2018152073 A1	23-08-2018	AU 2018221351 A1	22-08-2019
		CA 3052204 A1	23-08-2018
		EP 3582829 A1	25-12-2019
		JP 2020508117 A	19-03-2020
		US 2019365986 A1	05-12-2019
		WO 2018152073 A1	23-08-2018
US 2016184512 A1	30-06-2016	CN 105492039 A	13-04-2016
		EP 2832390 A1	04-02-2015
		EP 3027246 A1	08-06-2016
		JP 6449280 B2	09-01-2019
		JP 2016525428 A	25-08-2016
		US 2016184512 A1	30-06-2016
		US 2018272059 A1	27-09-2018
		WO 2015015379 A1	05-02-2015
US 2010152674 A1	17-06-2010	CA 2685808 A1	06-11-2008
		EP 2150297 A1	10-02-2010
		JP 5277242 B2	28-08-2013
		JP 2010525869 A	29-07-2010
		US 2010152674 A1	17-06-2010
		WO 2008133702 A1	06-11-2008
US 2011054390 A1	03-03-2011	CA 2772496 A1	10-03-2011
		CA 3079579 A1	10-03-2011
		CN 102573810 A	11-07-2012
		CN 103877638 A	25-06-2014
		CN 107080879 A	22-08-2017
		CN 112370606 A	19-02-2021
		EP 2473162 A1	11-07-2012
		EP 3406278 A2	28-11-2018
		ES 2694079 T3	17-12-2018
		JP 5819833 B2	24-11-2015
		JP 6073975 B2	01-02-2017
		JP 6480480 B2	13-03-2019
		JP 2013503691 A	04-02-2013
		JP 2015186598 A	29-10-2015
		JP 2017094143 A	01-06-2017
		JP 2019058713 A	18-04-2019
		US 2011054390 A1	03-03-2011
		US 2016279325 A1	29-09-2016
		WO 2011028278 A1	10-03-2011