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(54) **Title:** MINIATURIZED SYRINGE PUMP SYSTEM AND MODULES

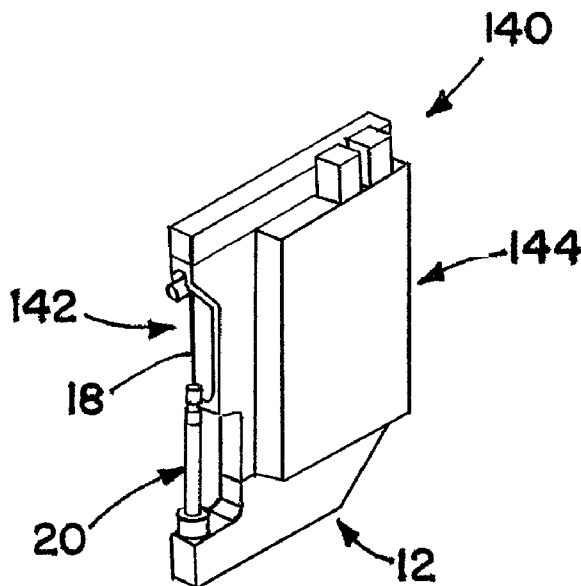


FIG. 24

(57) **Abstract:** Provided is a liquid handling device for use in a liquid handling system including a plurality of the liquid handling devices assembled in side-by-side relationship at a center-to-center spacing of X. The device includes a barrel, plunger, motive device and electronics assembled together in an envelope having a front portion including at least the barrel and plunger, and a rear portion including at least a portion of the electronics. The rear portion has a thickness greater than X but no greater than 2X, and the front portion has a thickness no greater than X and is laterally offset relative to a center plane of the envelope, whereby the liquid handling device can be assembled with another reversely oriented liquid handling device at a center-to-center spacing of X and a total combined width no greater than 2X.



WO 2011/153526 A3

GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, 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, ML, MR, NE, SN, TD, TG).

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A. CLASSIFICATION OF SUBJECT MATTER
INV. G01N35/10 B01L3/02 A61M5/145
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)
G01N B01L 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 practical, search terms used)
EPO-Internal

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Further documents are listed in the continuation of Box C. 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 | "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 |
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| "O" document referring to an oral disclosure, use, exhibition or other means | "&" document member of the same patent family |
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| Date of the actual completion of the international search 22 November 2011 | Date of mailing of the international search report 12/12/2011 |
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INTERNATIONAL SEARCH REPORT

International application No
PCT/US2011/039264

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2011/039264

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.:

1-27, 55-85
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: 1-27

Liquid handling device comprised in an envelope including a barrel and plunger in a front part and the electronics and motor into the rear part, the thickness of the rear part being bigger than the front part. The device being able to be reversely assembled with another liquid handling device.

2. claims: 28-54

Liquid handling device including a barrel and plunger and the electronics and motor, the device having a valve connected to the syringe needle, the barrel and a source of liquid.

3. claims: 55-85

Liquid handling device including a housing comprising a barrel and a plunger. The plunger being pivotally attachable and the barrel removably attachable.

4. claims: 86-100

Liquid handling device including a housing comprising a barrel, a plunger and a motor. The liquid handling device further comprising an electronics module removably mounted to the housing.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2011/039264

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