



(51) International Patent Classification:

B01L 3/00 (2006.01) *B01L 9/00* (2006.01)
A61B 5/097 (2006.01)

(21) International Application Number:

PCT/EP2024/066456

(22) International Filing Date:

13 June 2024 (13.06.2024)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

23179434.8 15 June 2023 (15.06.2023) EP

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(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,
GH, GM, KE, LR, LS, MW, MZ, NA, RW, SC, SD, SL, ST,

(54) Title: DEVICES AND METHODS RELATED TO GAS STORAGE

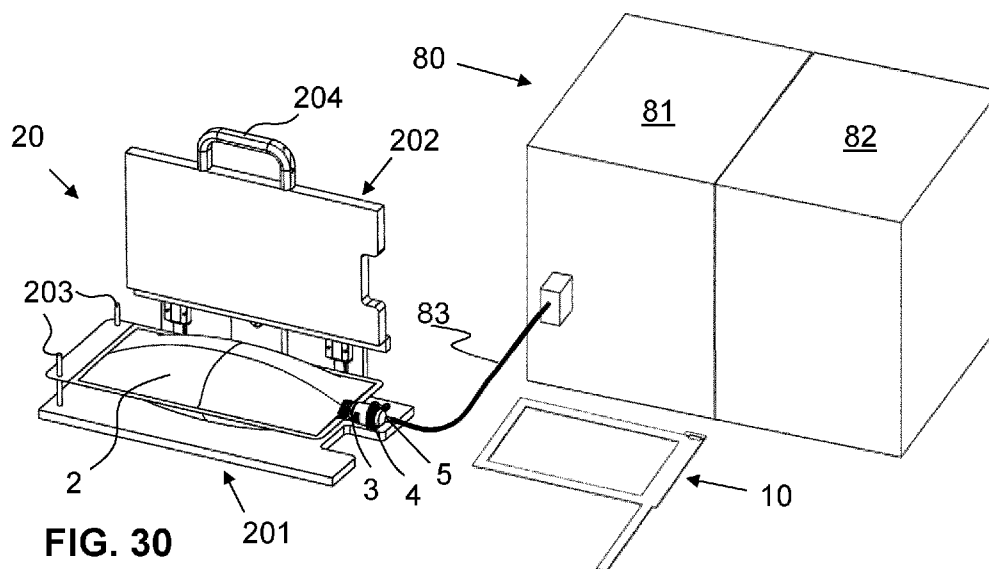


FIG. 30

(57) Abstract: A storage assembly (1) for storing a gas, preferably breath gas, comprises a bag (2) being inflatable and configured to contain the gas, an input piece (3) comprising a valve mechanism, a sealing cap (4) being connectable to the input piece (3), the sealing cap (4) comprising a sealing membrane, and a perforation device (5) being insertable into the input piece (3). The perforation device (5) is configured to perforate the sealing membrane and to cause the valve mechanism to be in the open valve state once the perforation device (5) is inserted in the input piece (3). A gauge device (10) for determining a filling state of the bag (2), a method of delivering a gas sample from the bag (2) to an analyzer assembly (80), and an extraction device (20) for controlled extraction of the gas from the bag (2) are also disclosed.

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:

- *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))*
- *in black and white; the international application as filed contained color or greyscale and is available for download from PATENTSCOPE*

(88) Date of publication of the international search report:

23 January 2025 (23.01.2025)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP2024/066456

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.:
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.

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2024/066456

A. CLASSIFICATION OF SUBJECT MATTER INV. B01L3/00 A61B5/097 B01L9/00 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) B01L A61B G01N 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	US 4 443 219 A (MEISCH CHARLES E [US] ET AL) 17 April 1984 (1984-04-17) the whole document -----	1 - 7
X	US 2014/024130 A1 (MARIN ANTOINE [FR] ET AL) 23 January 2014 (2014-01-23) the whole document -----	1 - 4
Y		11 - 13
A	WO 2019/177644 A1 (MARSH CHRIS [US]; CARLSEN CRAIG [US]; BONN SAVAGE NATE [US]) 19 September 2019 (2019-09-19) paragraph [0264] - paragraph [0271]; figures 21A-23 -----	1 - 7
X	KR 2021 0069316 A (FIRE SIS CO LTD [KR]) 11 June 2021 (2021-06-11) the whole document ----- - / - -	8 - 10
☒ 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 "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 29 November 2024		Date of mailing of the international search report 09/12/2024
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016		Authorized officer Vlassis, Maria

INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2024/066456

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Y	paragraph [0262] - paragraph [0270]; figures 23-28 -----	11-13
X	US 5 728 077 A (WILLIAMS ROBERT PAUL [AU] ET AL) 17 March 1998 (1998-03-17) the whole document -----	14,15

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2024/066456

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FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-7

Claims 1-7 directed to a storage assembly comprising an inflatable bag, an input piece with a valve mechanism, a sealing cal and a perforation device and solving the problem of providing provide a gas storage device.

2. claims: 8-10

Claims 8-10 directed to a gauge device comprising a frame structure defining an opening and a filling state marker and solving the problem of providing a device suitable for determining the filling state of a bag containing a gas.

3. claims: 11-15

Claims 11-15 directed to an extraction device comprising a support structure and a squeezing structure and a method of using an extraction device, solving the problem of the controlled extraction of a gas stored in a bag and delivering a gas sample.
