**Abstract:** A method and apparatus for automatically controlling partial pressure of oxygen in the breathing loop of a rebreather diving system. A diver may adjustbly select a control parameter to maintain partial pressure of oxygen at a setpoint that varies with ambient pressure and is within a range between a maximum safe partial pressure of oxygen at depth and a minimum safe partial pressure of oxygen for the purpose of biasing the performance of the rebreather either towards minimizing gas venting from the rebreather breathing loop or minimizing decompression time. A method and apparatus for managing and monitoring the use of dive resources in comparison with a target dive time specified by the diver, calculating and indicating remaining dive time based on dive resource values and calculating and indicating dive resource values required to meet preselected dive resource end values and dive requirements.
(88) Date of publication of the international search report:

4 October 2012
A. CLASSIFICATION OF SUBJECT MATTER

INV. B63C11/24

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

B63C F16K

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
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<tr>
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<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
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<td>US 2003/188745 AI (DEAS ALEXANDER ROGER [GB] ET AL) 9 October 2003 (2003-10-09) paragraphs [0027] - [0066] ; figures 1,3; table 1</td>
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<td>US 6 712 071 BI (PARKER MARTIN JOHN [GB]) 30 March 2004 (2004-03-30) page 6, line 11 - page 11, line 48; figure 1</td>
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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

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* "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

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* "A" document member of the same patent family

Date of the actual completion of the international search

27 March 2012

Date of mailing of the international search report

13/07/2012

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

Brumer, Alexandre
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<th>Relevant to claim No.</th>
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| X        | GB 1 530 099 A (SHELBY W)  
page 3, line 15 - page 6, line 19; figures 1,2 | 1-5,18                |
| X        | GB 2 404 593 A (DEAS ALEXANDER ROGER [GB])  
9 February 2005 (2005-02-09)  
page 7, line 2 - page 15, line 29; figure 3 | 1-5,18                |
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<td>02-02-2005</td>
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</table>
This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-5, 18

   Rebreather apparatus with automatic oxygen partial pressure control system
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2. claims: 6-17, 19-22

   Dive resource management system
   ---

3. claims: 23-26

   Apparatus comprising a valve having a loop port and a vent port, and a subsystem configured to vary a loop pressure at which the loop control valve is operable to selectively vent the volume of gas from the rebreather loop.
   ---
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).

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 fee, 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. X 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.:

1–5, 18

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.