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KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME,
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(54) Title: DEVICES FOR OBSTRUCTING PASSAGE OF AIR OR OTHER CONTAMINANTS INTO A PORTION OF A LUNG
AND METHODS OF USE

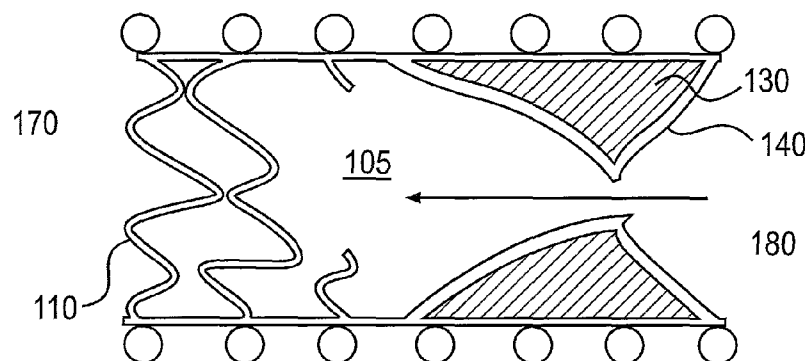


FIG. 1B

(57) Abstract: Provided are devices, systems and methods of selectively controlling air flow into one or more section of a patient's lungs. In particular, the devices may be valve devices (100) having an inner lumen (105) configured to transition between a first diameter and a second diameter smaller than the first diameter to control the airflow through the valve.



INTERNATIONAL SEARCH REPORT

International application No
PCT/US2014/032222

A. CLASSIFICATION OF SUBJECT MATTER

INV. A61B17/12

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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)

A61B A61F

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 03/041779 A1 (EMPHASYS MEDICAL INC [US]; GIFFORD HANSON S III [US]; MCCUTCHEON JOHN) 22 May 2003 (2003-05-22) page 23, line 10 - page 28, line 3; figures 8-14 -----	1-4,7,8
X	WO 2013/040198 A2 (RESMED LTD [AU]; FOOTE ROGER MERVYN LLOYD [AU]; HUBY RONALD JAMES [AU]) 21 March 2013 (2013-03-21) paragraph [0144]; figures 26A,26B -----	1,5-8
A	US 2011/226238 A1 (BARRETT MICHAEL [US] ET AL) 22 September 2011 (2011-09-22) paragraphs [0098] - [0101] -----	1-8
A	WO 2008/112797 A2 (PULMONX [US]; ALJURI NIKOLAI [US]; PERKINS RODNEY C [US]) 18 September 2008 (2008-09-18) paragraphs [0030] - [0034] -----	1-8



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

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Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2014/032222

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.: 17-20
because they relate to subject matter not required to be searched by this Authority, namely:
see FURTHER INFORMATION sheet PCT/ISA/210
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.:

1-8

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: 1-8

A device comprising an elongate member and a lumen, an inner member disposed about a portion of the lumen, wherein the inner member is configured to transition between a first configuration and a second configuration, and an actuation member for transitioning the inner member between the first configuration and the second configuration, wherein the actuation member includes an electro-active polymer disposed on the inner member, so that the device can be electrically actuated with low power consumption for improved operating time of the device.

2. claims: 9-16

A system comprising a plurality of valve devices, and a controller coupled to the plurality of valve devices configured to control power supplied to the plurality of valve devices, so that air flow in different parts of a lung can be adjusted according to the local function of the lung for an improved therapeutic effect.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.1

Claims Nos.: 17-20

Pursuant to Article 17(2)(a)(i) PCT, this Authority is not required to search the subject-matter of claims 17-20, since a method of controlling air flow in a patient comprising the step of implanting a plurality of valve devices in a lung represents a method for treatment of the human or animal body by surgery (Rule 39.1(iv) and Rule 43bis PCT).

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2014/032222

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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			22-05-2003
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			06-08-2014
			23-07-2014
			25-09-2014
			21-03-2013
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			01-10-2009
			18-09-2008