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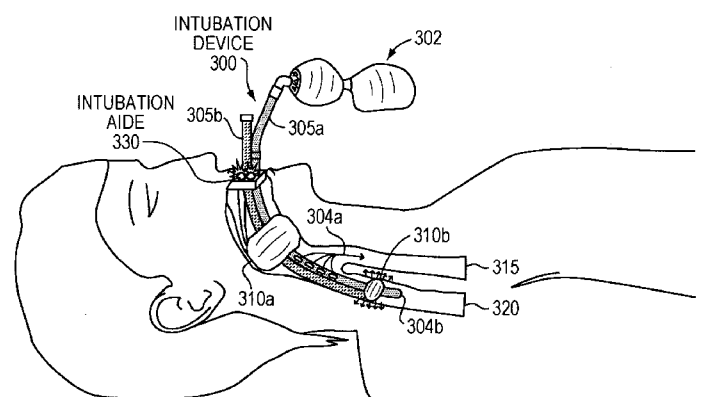


FIG. 3A-1

(57) Abstract: Intubation is a potentially dangerous invasive procedure with many plausible errors, such as over-inflation of a cuff and insertion of an intubation tube in the wrong lumen, potentially resulting in a patient's internal bleeding, suffocation, or even death. An intubation aide according to example embodiments of the present invention allows intubation of a patient, while eliminating potential injury to the patient, increasing accuracy and reliability of the placement of the intubation tube, and drastically decreasing procedural time. Within moments of insertion of the device into a patient, the medical caregiver knows, with complete certainty, the location of the intubation device without applying traditional time-consuming tasks. Embodiments also provide patient safety, if intubated for a prolonged periods, by regulating an inflation pressure of the cuff. The intubation aide can also be used for training purposes and is ideal for intubation in hospital and field settings.



# INTERNATIONAL SEARCH REPORT

International application No  
PCT/US2009/006720

**A. CLASSIFICATION OF SUBJECT MATTER**  
INV. A61M16/04 A61M25/10

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 practical, search terms used)

EP0-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         | EP 0 578 121 A1 (DEUTSCHE AEROSPACE [DE]<br>ESW EXTEL SYSTEMS WEDEL GES FU [DE])<br>12 January 1994 (1994-01-12)<br>the whole document             | 1-5                   |
| A         | -----                                                                                                                                              | 6-15                  |
| X         | WO 91/16097 A1 (SIEMENS AG [DE])<br>31 October 1991 (1991-10-31)<br>the whole document                                                             | 1-5                   |
| A         | -----                                                                                                                                              | 6-15                  |
| A         | WO 2008/123934 A1 (EZC MEDICAL LLC [US];<br>GLASSENBERG RAYMOND [US]; KIMMEL ZEBADIAH<br>[US];) 16 October 2008 (2008-10-16)<br>the whole document | 1-15                  |
|           | -----<br>-/--                                                                                                                                      |                       |

☒ 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 document 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

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## C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages                                                                   | Relevant to claim No. |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| A         | WO 2005/097246 A1 (PLASIATEK LLC [US];<br>MILLER MICHAEL [US]; HOVLAND CLAIRE T<br>[US]) 20 October 2005 (2005-10-20)<br>the whole document<br>----- | 1-15                  |
| A         | WO 89/07415 A1 (ANTEC SYSTEMS [GB])<br>24 August 1989 (1989-08-24)<br>the whole document<br>-----                                                    | 1-15                  |

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US2009/006720

## 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.: 16-27  
because they relate to subject matter not required to be searched by this Authority, namely:  
Rule 39.1(iv) PCT - Method for treatment of the human or animal body by surgery
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.:

1-27

### 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

An intubation device comprising an intubation tube having a cuff coupled thereto, and an intubation aide system for automatically determining whether the intubation tube is located in a trachea or esophagus by monitoring force(s) exerted on the cuff.

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## 2. claims: 28-43

A system for controlling inflation of at least one cuff coupled to an intubation tube of an intubation device, the system comprising: a pump configured inflate the at least one cuff responsive to an activation signal; a pump controller configured to: monitor the inflation of the at least one cuff; generate a deactivation signal as a function of a level of the inflation; and discontinue inflation of or deflate the at least one cuff responsive to the deactivation signal.

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## 3. claims: 44-46

An apparatus for use with an intubation device, comprising: a first structure having a stiffness configured to biomimick an anterior wall of a trachea or esophagus, the first structure further configured to be located proximal to a fore of at least one cuff coupled to an intubation tube of the intubation device; and a second structure having a stiffness configured to biomimick a posterior wall of the trachea or esophagus, the second structure configured to be located proximal to an aft of the at least one cuff.

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2009/006720

| Patent document<br>cited in search report | Publication<br>date | Patent family<br>member(s) | Publication<br>date                                                                                               |
|-------------------------------------------|---------------------|----------------------------|-------------------------------------------------------------------------------------------------------------------|
| EP 0578121                                | A1                  | 12-01-1994                 | DE 4222220 A1 13-01-1994<br>ES 2100399 T3 16-06-1997<br>US 5361753 A 08-11-1994                                   |
| WO 9116097                                | A1                  | 31-10-1991                 | EP 0483305 A1 06-05-1992<br>IT 1241932 B 01-02-1994                                                               |
| WO 2008123934                             | A1                  | 16-10-2008                 | US 2008029100 A1 07-02-2008                                                                                       |
| WO 2005097246                             | A1                  | 20-10-2005                 | CA 2561641 A1 20-10-2005<br>EP 1768730 A1 04-04-2007<br>JP 2007532152 T 15-11-2007<br>US 2006081255 A1 20-04-2006 |
| WO 8907415                                | A1                  | 24-08-1989                 | NONE                                                                                                              |