



- (51) International Patent Classification:  
A61M 16/00 (2006.01) A61B 19/00 (2006.01)  
A61M 16/04 (2006.01)
- (21) International Application Number:  
PCT/US2014/047764
- (22) International Filing Date:  
23 July 2014 (23.07.2014)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
61/858,226 25 July 2013 (25.07.2013) US
- (71) Applicant: MEDICAL INSTRUMENT VENTURES, LLC [US/US]; 1484 S. Humboldt, Denver, CO 80210 (US).
- (72) Inventors: LEDGES, Matthew; 1484 S. Humboldt, Denver, CO 80210 (US). FALLON, Mike; 639 S. Gaylord Street, Denver, CO 80209 (US).

- (74) Agents: BAILEY, Robert, A. et al.; Perkins Coie LLP, P.O. Box 1247, Seattle, WA 98111-1247 (US).
- (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, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, 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, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, 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,

[Continued on next page]

(54) Title: CUFFED TRACHEAL TUBE

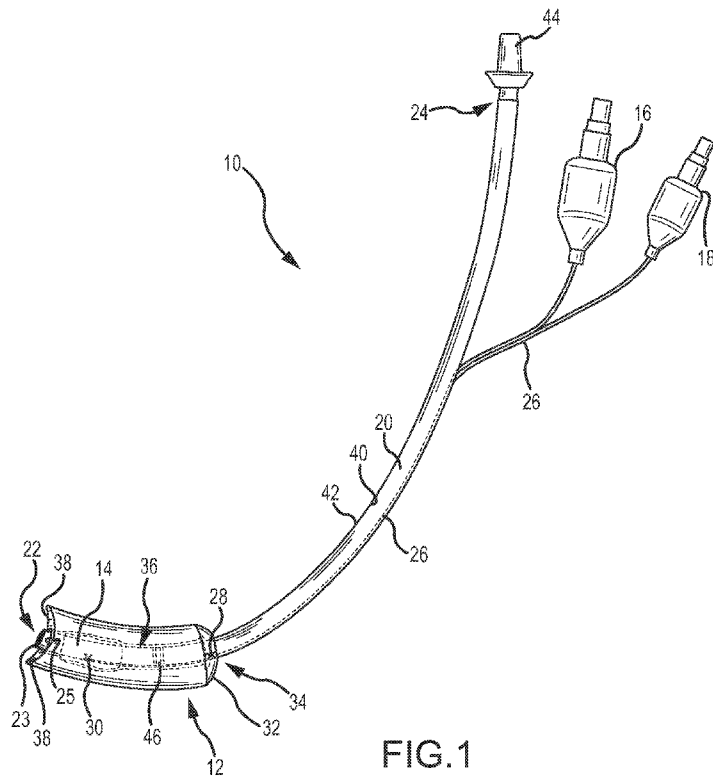


FIG. 1

(57) Abstract: An endotracheal tube assembly for intubating a patient including a fixed distal cuff and a proximal rolling cuff positionable on a tube having a distal end and a proximal end. The rolling cuff having a single attachment portion along the tube to allow the rolling cuff to roll from the distal end of the tube towards to the proximal end of the tube as it contacts the supraglottic structure and/or vocal cords of a patient. The proximal end of the tube being configured to include an adaptor to connect the tube to a ventilation device that provides an air/oxygen mixture or anesthetic to the patient through the tube.

WO 2015/013377 A3



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, KM, ML, MR, NE, SN, TD, TG).

— 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))

**Published:**

— with international search report (Art. 21(3))

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

16 April 2015

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US14/47764

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - A61B 19/00; A61M 16/00, 16/04 (2015.01)

CPC - A61B 19/34; A61M 16/04, 2025/0019

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)

IPC(8) Classification(s): A61B 19/00; A61M 5/00, 16/00, 16/04 (2015.01)

CPC Classification(s): A61B 19/34; A61M 16/04, 16/0434, 16/0463, 2025/0019, 2209/10

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)

MicroPatent (US-G, US-A, EP-A, EP-B, WO, JP-bib, DE-C,B, DE-A, DE-T, DE-U, GB-A, FR-A); Google/Google Scholar; ProQuest; Pubmed/Medline: trachea, endotracheal, medical, tube, cuff, collar, sleeve; roll, transition, unroll, fold, turn, move, movable, slide, slidable, distal, proximal, balloon, intubation, airway, passageway, instrument, anterior, posterior, backwards, forward, longitudinal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 8,152,719 B2 (TENGER, JP et al.) April 10, 2012; figures 37a-b; column 20, lines 22-38	41-42, 45
--		-----
Y		1-24, 43-44, 46
Y	US 3,769,983 A (MERAV, AD) November 6, 1973; figures 7-8; column 6, lines 6-46	1-6, 8-24, 46
Y	US 4,976,261 A (GLUCK, EH et al.) December 11, 1990; figure 3; column 4, lines 28-33	1, 7
Y	US 5,067,497 A (GREEAR, J et al.) November 26, 1991; figure 7; column 10, lines 1-17	3, 10-17, 22-24, 43
Y	US 7,040,322 B2 (FORTUNA, AO) May 9, 2006; figure 1; column 6, lines 7-19; column 7, lines 46-56)	4, 20-21, 44

Further documents are listed in the continuation of Box C.

\* 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

14 January 2015 (14.01.2015)

Date of mailing of the international search report

09 FEB 2015

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US, Commissioner for Patents  
P.O. Box 1450, Alexandria, Virginia 22313-1450  
Facsimile No. 571-273-3201

Authorized officer:

Shane Thomas

PCT Helpdesk: 571-272-4300  
PCT OSP: 571-272-7774

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US14/47764

**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.: 27  
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:

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I: Claims 1-24 and 41-46 are directed toward a medical device comprising at least one pilot balloon for inflating and deflating the rolling cuff.

Group II: Claims 25-26 and 28-40 are directed toward a medical device configured to form a seal against a passageway of a patient.

\*\*\*-Continued Within the Next Supplemental Box-\*\*\*

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 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.:  
1-24 and 41-46

**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.

-\*\*\*-Continued from Box No. III - Observations where unity of invention is lacking -\*\*\*-

The inventions listed as Groups I-II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: the special technical features of Group I include at least one pilot balloon for inflating and deflating the rolling cuff, which are not present in Group II; the special technical features of Group II include wherein the protective cuff is configured to form a seal against a passageway of a patient, which are not present in Group I.

The common technical features of Groups I and II are a medical device comprising a tube having a proximal end and a distal end capable of being inserted into an airway of a patient; a cuff having a proximal end and a distal end; the cuff associated with an end of the tube/the tube positioned within the cuff; the cuff transitions along the tube.

These common technical features are disclosed by US 8,152,719 B2 to Tenger, et al., (hereinafter "Tenger"). Tenger discloses a medical device comprising a tube having a proximal end and a distal end capable of being inserted into an airway of a patient (endotracheal tube 1420 is not numbered in the figure; figure 37a; column 20, lines 22-28); a cuff having a proximal end and a distal end (1400; figure 37a; column 20, lines 22-28); the cuff associated with an end of the tube/the tube positioned within the cuff (1400 is at a distal end during insertion figure 37a); the cuff transitions along the tube (1400 retracts proximally on 1420 to uncover 1410; figure 37b; column 20, lines 22-28).

Since the common technical features are previously disclosed by the Tenger reference, the common features are not special and so Groups I and II lack unity.