

Front Pages of 7 granted US patents



(12) **United States Patent**
Zachar et al.

(10) **Patent No.:** **US 10,299,978 B2**
(45) **Date of Patent:** **May 28, 2019**

(54) **SYSTEM, METHOD AND KIT FOR ORAL CARE**

(71) Applicant: **Airway Medix S.A.**, Warsaw (PL)

(72) Inventors: **Oron Zachar**, Tel Aviv (IL); **Yair Ramot**, Kfar Maas (IL); **Eizik Amar**, Ashdod (IL)

(73) Assignee: **Airway Medix S.A.**, Warsaw (PL)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **15/974,840**

(22) Filed: **May 9, 2018**

(65) **Prior Publication Data**

US 2018/0256430 A1 Sep. 13, 2018

Related U.S. Application Data

(63) Continuation-in-part of application No. PCT/IB2017/001354, filed on Oct. 2, 2017.
(Continued)

(51) **Int. Cl.**
A61G 15/16 (2006.01)
A61C 17/02 (2006.01)
(Continued)

(52) **U.S. Cl.**
CPC **A61G 15/16** (2013.01); **A46B 11/0041** (2013.01); **A46B 11/06** (2013.01);
(Continued)

(58) **Field of Classification Search**
CPC **A46B 11/0041**; **A46B 11/0051**; **A46B 11/0055**; **A46B 11/0062**; **A46B 11/06**;
(Continued)

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(Continued)

Primary Examiner — Wade Miles

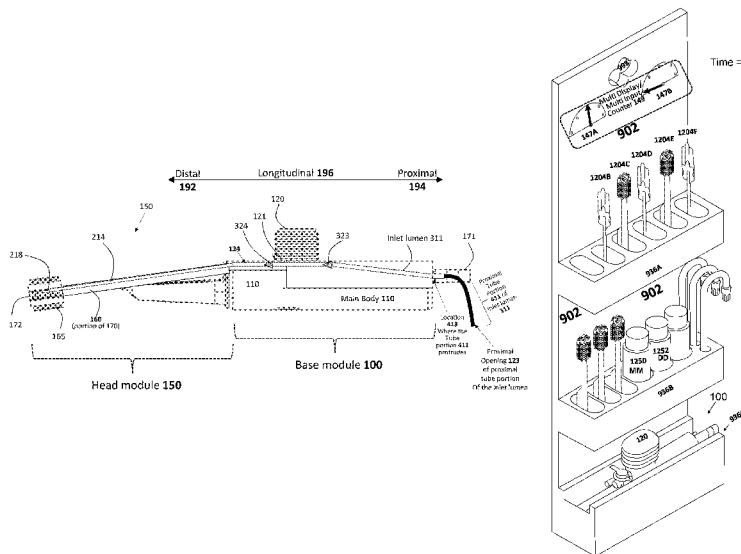
Assistant Examiner — Shannel N Wright

(74) *Attorney, Agent, or Firm* — Marc Van Dyke

(57) **ABSTRACT**

A kit comprising a base module, a plurality of rodded oral care devices, a hanger, a support element that hangs from the hanger, and a non-electronic multi-input multi-display counter is disclosed herein. The support element for supporting each rodded oral care device of the plurality of devices. Embodiments relate to fluid loading/unloading mechanism involving elements of the base module. The non-electronic multi-input multi-display counter may be used to track different types of oral care operations, e.g. at least some of which are performed using the base module and/or a rodded oral care device. Related methods are disclosed.

11 Claims, 25 Drawing Sheets





US010806884B2

(12) **United States Patent**
Einav et al.

(10) **Patent No.:** **US 10,806,884 B2**

(45) **Date of Patent:** **Oct. 20, 2020**

(54) **BALLOONED VENTILATION TUBE
CLEANING DEVICE**

(58) **Field of Classification Search**

CPC A61M 16/0463; A61M 16/0459; A61M
16/0456; A61M 16/0438; A61M 16/0057;
(Continued)

(71) Applicant: **Teleflex Life Sciences PTE. Ltd.**,
Singapore (SG)

(56) **References Cited**

U.S. PATENT DOCUMENTS

(72) Inventors: **Elad Einav**, Tel Aviv (IL); **Oron
Zachar**, Tel Aviv (IL)

3,211,150 A 10/1965 Foderick
3,502,069 A 3/1970 Silverman
(Continued)

(73) Assignee: **TELEFLEX LIFE SCIENCES PTE.
LTD.**, Singapore (SG)

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(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 0 days.

EP 0692273 A1 1/1996
EP 1239907 A1 9/2002
(Continued)

(21) Appl. No.: **16/443,755**

(22) Filed: **Jun. 17, 2019**

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(65) **Prior Publication Data**

US 2019/0298950 A1 Oct. 3, 2019

U.S. Appl. No. 61/468,990, filed Mar. 29, 2011.
(Continued)

Related U.S. Application Data

(63) Continuation of application No. 14/008,558, filed as
application No. PCT/IB2012/051532 on Mar. 29,
2012, now Pat. No. 10,322,253.

(Continued)

Primary Examiner — Lauren P Farrar

(74) *Attorney, Agent, or Firm* — BakerHostetler

(57) **ABSTRACT**

A cleaning device, system and method for use with an ETT or tracheostomy ventilation tube 60, a ventilator machine 900, a source(s) 602 of fluid (for example, pressurized or unpressurized) and a source(s) of suctioning 603 is disclosed. In some embodiments, the cleaning device is useful for cleaning an inner surface of the ventilation tube 60 and/or for preventing or hindering the accumulation of biofilm thereon. In some embodiments, it is possible to clean biofilm or any other material on the inner surface 201 by delivering fluid into an interior of the ventilation tube, wiping the tube interior with a width-expanded wiping element (e.g. an inflated balloon) by longitudinal motion of the wiping element, and suctioning material out of the ventilation tube ventilation tube.

(30) **Foreign Application Priority Data**

Sep. 26, 2011 (PL) 396436
Sep. 28, 2011 (GB) 1116735.0
Nov. 16, 2011 (GB) 1119794.4

(51) **Int. Cl.**

A61M 16/04 (2006.01)
A61M 16/00 (2006.01)

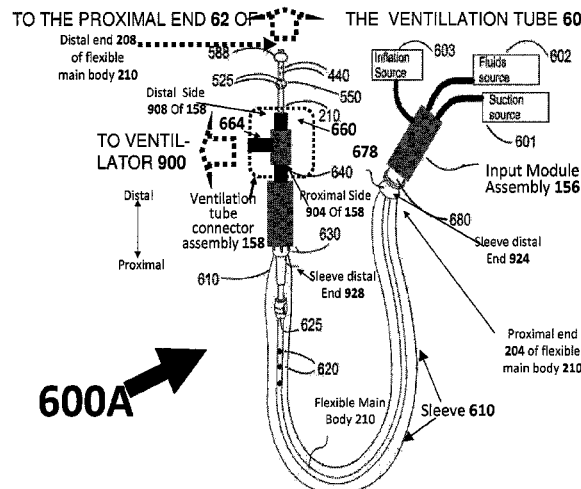
(Continued)

(52) **U.S. Cl.**

CPC **A61M 16/0463** (2013.01); **A61M 16/0057**
(2013.01); **A61M 16/0438** (2014.02);

(Continued)

7 Claims, 60 Drawing Sheets





US010206766B2

(12) **United States Patent**
Zachar et al.

(10) **Patent No.:** **US 10,206,766 B2**

(45) **Date of Patent:** **Feb. 19, 2019**

(54) **TOOTHBRUSH SYSTEM FOR TREATING INTUBATED PATIENTS**

(71) Applicant: **Airway Medix S.A.**, Warsaw (PL)

(72) Inventors: **Oron Zachar**, Tel Aviv (IL); **Yair Ramot**, Kfar Maas (IL); **Eizik Amar**, Ashdod (IL)

(73) Assignee: **Airway Medix S.A.**, Warsaw (PL)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **15/668,726**

(22) Filed: **Aug. 4, 2017**

(65) **Prior Publication Data**

US 2018/0078350 A1 Mar. 22, 2018

Related U.S. Application Data

(60) Provisional application No. 62/371,126, filed on Aug. 4, 2016.

(51) **Int. Cl.**

A61C 17/22 (2006.01)

A61C 17/02 (2006.01)

(Continued)

(52) **U.S. Cl.**

CPC **A61C 17/221** (2013.01); **A46B 5/0095**

(2013.01); **A46B 9/04** (2013.01);

(Continued)

(58) **Field of Classification Search**

CPC . **A46B 13/02**; **A46B 15/0004**; **A46B 15/0053**;
A46B 5/0095; **A46B 9/04**;

(Continued)

(56) **References Cited**

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4,466,150 A 8/1984 Jurt

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FOREIGN PATENT DOCUMENTS

EP 0992224 A2 4/2000

EP 1143876 A1 10/2001

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OTHER PUBLICATIONS

JP2013-075033 Machine Translation (by EPO and Google) published on Apr. 25, 2013 Kawabata et al.

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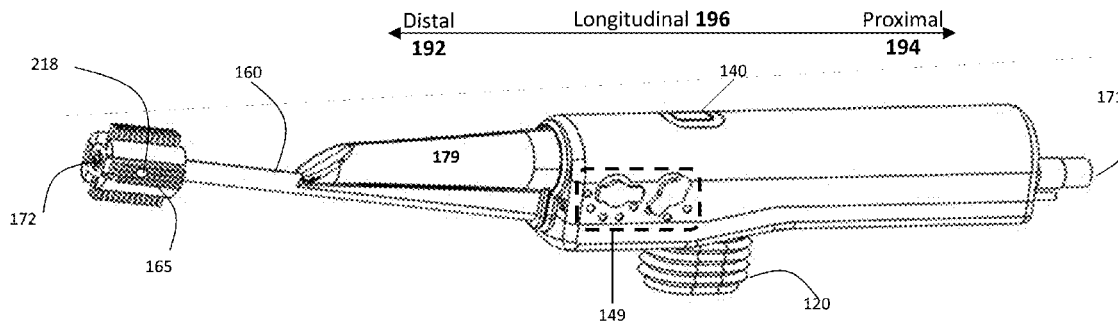
Primary Examiner — Marc Carlson

(74) *Attorney, Agent, or Firm* — Marc Van Dyke

(57) **ABSTRACT**

An oral care system for a defined oral care cleaning cycle comprising a base module **100**, a head module **150** comprising a toothbrush-bristle brush **165** disposed on a bristle-retaining surface of the head module, and a tail module **151**. A multi-input/multi-display counter **149** is disposed on a base-module main body **110** of the main body **100**. The multi-input/multi-display counter **149** independently displays first and second count-states, and includes first and second independently-operable user inputs that are respectively associated with the first and second count-states such that: (a) in response to user engagement of the first user input, the first count state is incremented or decremented; and (b) in response to user engagement of the second user input, the second count state is incremented or decremented.

4 Claims, 16 Drawing Sheets



(12) **United States Patent**
Einav et al.

(10) **Patent No.:** **US 10,322,253 B2**
(45) **Date of Patent:** **Jun. 18, 2019**

(54) **BALLOONED VENTILATION TUBE CLEANING DEVICE**

(75) Inventors: **Elad Einav**, Tel Aviv (IL); **Oron Zachar**, Tel Aviv (IL)

(73) Assignee: **TELEFLEX LIFE SCIENCES UNLIMITED COMPANY**, Hamilton (BM)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 542 days.

(21) Appl. No.: **14/008,558**

(22) PCT Filed: **Mar. 29, 2012**

(86) PCT No.: **PCT/IB2012/051532**
§ 371 (c)(1),
(2), (4) Date: **Nov. 29, 2013**

(87) PCT Pub. No.: **WO2012/131626**
PCT Pub. Date: **Oct. 4, 2012**

(65) **Prior Publication Data**
US 2014/0246015 A1 Sep. 4, 2014

Related U.S. Application Data

(60) Provisional application No. 61/539,998, filed on Sep. 28, 2011, provisional application No. 61/560,385, (Continued)

Foreign Application Priority Data

Sep. 26, 2011 (PL) 396436

(51) **Int. Cl.**
A61M 1/00 (2006.01)
A61M 16/00 (2006.01)
(Continued)

(52) **U.S. Cl.**
CPC **A61M 16/0463** (2013.01); **A61M 16/0057** (2013.01); **A61M 16/0438** (2014.02);
(Continued)

(58) **Field of Classification Search**
CPC A61M 2025/0019; A61M 16/0463; A61M 16/0459; A61M 16/0456; A61M 16/0438;
(Continued)

(56) **References Cited**

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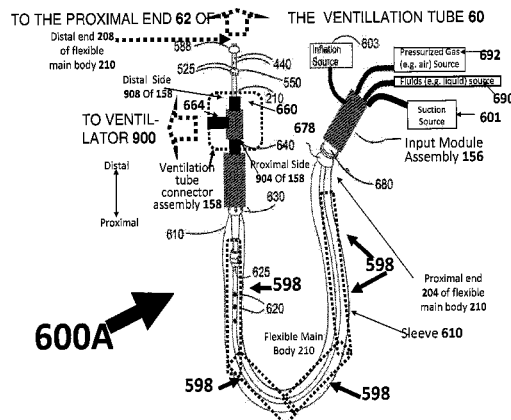
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U.S. Appl. No. 61/468,990, filed Mar. 29, 2011.
(Continued)

Primary Examiner — Lauren P Farrar
(74) *Attorney, Agent, or Firm* — Baker & Hostetler LLP

(57) **ABSTRACT**

A cleaning device, system and method for use with an ETT or tracheostomy ventilation tube **60**, a ventilator machine **900**, a source(s) **602** of fluid (for example, pressurized or unpressurized) and a source(s) of suctioning **603** is disclosed. In some embodiments, the cleaning device is useful for cleaning an inner surface of the ventilation tube **60** and/or for preventing or hindering the accumulation of biofilm thereon. In some embodiments, it is possible to clean biofilm or any other material on the inner surface **201** by delivering fluid into an interior of the ventilation tube, wiping the tube interior with a width-expanded wiping element (e.g. an inflated balloon) by longitudinal motion of
(Continued)





US00D904033S

(12) **United States Design Patent**
Zachar et al.

(10) **Patent No.:** **US D904,033 S**

(45) **Date of Patent:** **** Dec. 8, 2020**

(54) **TOOTHBRUSH ASSEMBLY**

(71) Applicant: **Airway Medix S.A.**, Warsaw (PL)

(72) Inventors: **Oron Zachar**, Tel Aviv (IL); **Yair Ramot**, Kfar Maas (IL); **Eizik Amar**, Ashdod (IL)

(73) Assignee: **Airway Medix S.A.**, Warsaw (PL)

(**) Term: **15 Years**

(21) Appl. No.: **29/659,605**

(22) Filed: **Aug. 10, 2018**

Related U.S. Application Data

(63) Continuation of application No. 29/579,688, filed on Oct. 1, 2016, now abandoned.

(51) **LOC (12) Cl.** **04-02**

(52) **U.S. Cl.**

USPC **D4/104**

(58) **Field of Classification Search**

USPC D4/100, 101, 102, 104, 105, 106, 108, D4/109, 111, 112, 128, 138; D24/119, D24/152, 176

CPC .. A46B 5/00; A46B 5/021; A46B 9/04; A46B 9/10; A46B 2200/106

See application file for complete search history.

(56) **References Cited**

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D490,981	S	*	6/2004	Hoffecker	D4/101
D533,349	S	*	12/2006	Jimenez	D4/101
D563,106	S	*	3/2008	Chan	D4/101
D619,368	S	*	7/2010	Toshima	D4/101
D630,854	S	*	1/2011	Lozov	D4/101
D660,001	S	*	5/2012	Peluso	D4/101
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Primary Examiner — Jasmine Mlinarcik

(74) *Attorney, Agent, or Firm* — Marc Van Dyke; Momentum IP

(57) **CLAIM**

The ornamental design for a toothbrush assembly, as shown and described.

DESCRIPTION

The file of this patent contains at least one drawing executed in color. Copies of this patent with color drawing(s) will be provided by the Office upon request and payment of the necessary fee.

FIG. 1 is a front view of a first embodiment of a toothbrush assembly;

FIG. 2 is a back view thereof;

FIG. 3 is a left side view thereof;

FIG. 4 is a right side view thereof;

FIG. 5 is a top view thereof;

FIG. 6 is a bottom view thereof;

FIG. 7 is a perspective view thereof;

FIG. 8 is a front view of the second embodiment of the toothbrush assembly;

FIG. 9 is a back view thereof;

FIG. 10 is a left side view thereof;

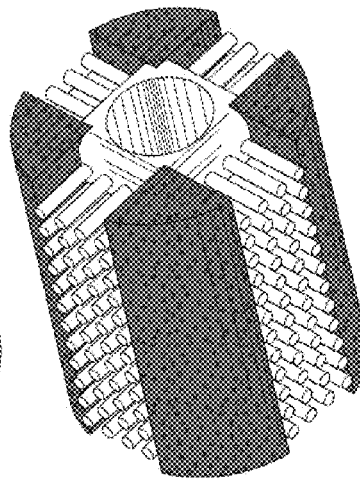
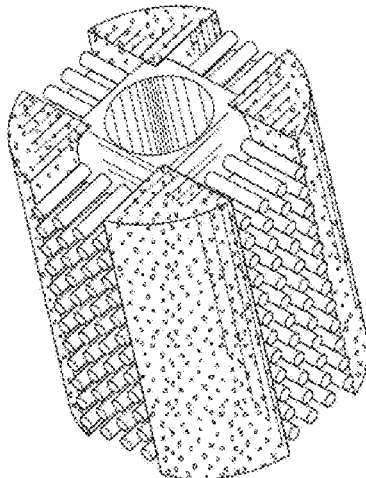
FIG. 11 is a right side view thereof;

FIG. 12 is a top view thereof;

FIG. 13 is a bottom view thereof; and,

FIG. 14 is a perspective view thereof.

1 Claim, 4 Drawing Sheets
(2 of 4 Drawing Sheet(s) Filed in Color)





US00D852509S

(12) **United States Design Patent**
Zachar et al.

(10) **Patent No.:** **US D852,509 S**

(45) **Date of Patent:** **** Jul. 2, 2019**

(54) **TOOTHBRUSH ASSEMBLY**

D455,556 S * 4/2002 Kling D4/101
D474,894 S * 5/2003 Ferber D4/101
D475,529 S * 6/2003 Wright D4/101

(71) Applicant: **Airway Medix S.A.**, Warsaw (PL)

(Continued)

(72) Inventors: **Oron Zachar**, Tel Aviv (IL); **Yair Ramot**, Kfar Maas (IL); **Eizik Amar**, Ashdod (IL)

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(73) Assignee: **Airway Medix S.A.**, Warsaw (PL)

EP 2550938 A1 * 1/2013 A61C 17/3436
JP 2016152936 A * 8/2016 A61C 17/3436

(**) Term: **15 Years**

Primary Examiner — Wan Laymon

Assistant Examiner — Clint A Samuel

(21) Appl. No.: **29/591,615**

(74) *Attorney, Agent, or Firm* — Marc Van Dyke

(22) Filed: **Jan. 21, 2017**

(57) **CLAIM**

(51) **LOC (11) Cl.** **04-02**

The ornamental design for a toothbrush assembly, as shown and described.

(52) **U.S. Cl.**

USPC **D4/111**; D4/113

DESCRIPTION

(58) **Field of Classification Search**

USPC D4/101, 104, 105, 108, 110, 111; D24/111, 152, 176

CPC A46B 5/00; A46B 5/021; A46B 5/023; A46B 5/026; A46B 5/028; A46B 5/0016; A46B 5/0095; A46B 13/00; A46B 13/02; A46B 2200/10; A46B 2200/30; A46B 2200/108; A46B 2200/302; A46B 2200/304; A46B 2200/1066; A46B 2200/1073; A46B 2200/1086; A46B 2200/3026; A46B 2200/3033; A46B 2200/3046; A61C 15/00; A61C 15/047; A61C 15/048; A61C 17/16; A61C 17/22; A61C 17/26

See application file for complete search history.

The patent or application file contains at least one drawing executed in color. Copies of this patent or patent application publication with color drawing(s) will be provided by the Office upon request and payment of the necessary fee.

FIG. 1 is a front view of a first embodiment of a toothbrush assembly showing the new design;

FIG. 2 is a back view thereof;

FIG. 3 is a left view thereof;

FIG. 4 is a right view thereof;

FIG. 5 is a top view thereof;

FIG. 6 is a bottom view thereof;

FIG. 7 is a perspective view thereof;

FIG. 8 is a front view of a second embodiment of the new design;

FIG. 9 is a back view thereof;

FIG. 10 is a left view thereof;

FIG. 11 is a right view thereof;

FIG. 12 is a top view thereof;

FIG. 13 is a bottom view thereof; and,

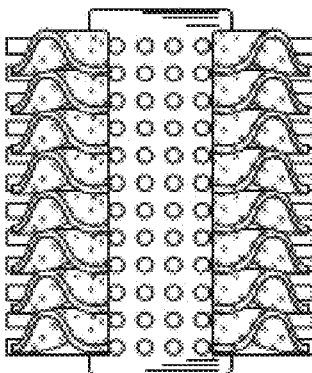
FIG. 14 is a perspective view thereof.

(56) **References Cited**

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D385,702 S * 11/1997 Okada D4/101
D424,303 S * 5/2000 Tobias D4/111
D452,775 S * 1/2002 Wright D4/101

1 Claim, 4 Drawing Sheets
(2 of 4 Drawing Sheet(s) Filed in Color)





US009533169B2

(12) **United States Patent**
Zachar

(10) **Patent No.:** **US 9,533,169 B2**

(45) **Date of Patent:** **Jan. 3, 2017**

(54) **APPARATUS AND METHOD FOR IRRADIATING BIOLOGICAL TISSUE**

(71) Applicant: **Oron Zachar**, Tel Aviv (IL)

(72) Inventor: **Oron Zachar**, Tel Aviv (IL)

(73) Assignee: **PRODOLUX SP Z O O**, Warsaw (PL)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **14/447,630**

(22) Filed: **Jul. 31, 2014**

(65) **Prior Publication Data**

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Related U.S. Application Data

(63) Continuation-in-part of application No. PCT/IB2012/050453, filed on Jan. 31, 2012.

(51) **Int. Cl.**

A61B 18/18 (2006.01)
A61N 5/04 (2006.01)
A61N 2/00 (2006.01)
A61N 2/02 (2006.01)
A61B 18/00 (2006.01)

(52) **U.S. Cl.**

CPC **A61N 5/04** (2013.01); **A61N 2/006** (2013.01); **A61B 18/1815** (2013.01); **A61B 2018/00321** (2013.01); **A61N 2/02** (2013.01)

(58) **Field of Classification Search**

CPC **A61N 5/04**; **A61N 2/02**; **A61N 2/006**; **A61B 18/1815**; **A61B 2018/00321**

USPC **607/88**; **600/9**, **13**
See application file for complete search history.

(56) **References Cited**

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Primary Examiner — Carl H Layno

Assistant Examiner — Jon Eric C Morales

(74) *Attorney, Agent, or Firm* — Marc Van Dyke

(57) **ABSTRACT**

Methods and apparatus for irradiating biological tissue by EM radiation having radiation frequency(ies) of at most 10 Gigahertz are disclosed herein. In some embodiments, the tissue is irradiated by passing converging EM waves (e.g. generated using an ellipsoidal mirror **110**) through a surrogate medium having a specially shaped ENTRY_SURFACE via which the converging EM waves enter the surrogate medium. In some embodiments, a refractive index at a sub-10 Gigahertz of the surrogate medium is at least 2 or at least 3 or at least 5 and/or substantially matches a refractive index of an irradiated biological tissue. In some embodiments, converging EM waves are formed within the surrogate medium. Some embodiments relate to methods and apparatus for irradiating neuron(s), for example, to non-invasively stimulating or otherwise modify a behavior of neuron(s) using focused or non-focused EM radiation.

1 Claim, 38 Drawing Sheets

