



(51) International Patent Classification:

A61C 17/20 (2006.01) A61C 17/22 (2006.01)
A61C 17/34 (2006.01) A61N 1/26 (2006.01)
A46B 15/00 (2006.01) A61N 1/30 (2006.01)

(21) International Application Number:

PCT/US2014/041735

(22) International Filing Date:

10 June 2014 (10.06.2014)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/832,980 10 June 2013 (10.06.2013) US

(71) Applicant: GLOBAL IONICS LLC [US/US]; 39 Washington Avenue, Pleasantville, NY 10570 (US).

(72) Inventor: DAVIDOV, Kenneth; 89 McDonald Road, Ossining, NY 10562 (US).

(74) Agents: FLEMING, Porter, F. et al.; Frommer Lawrence & Haug LLP, 745 Fifth Avenue, 10th Floor, New York, NY 10151 (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.

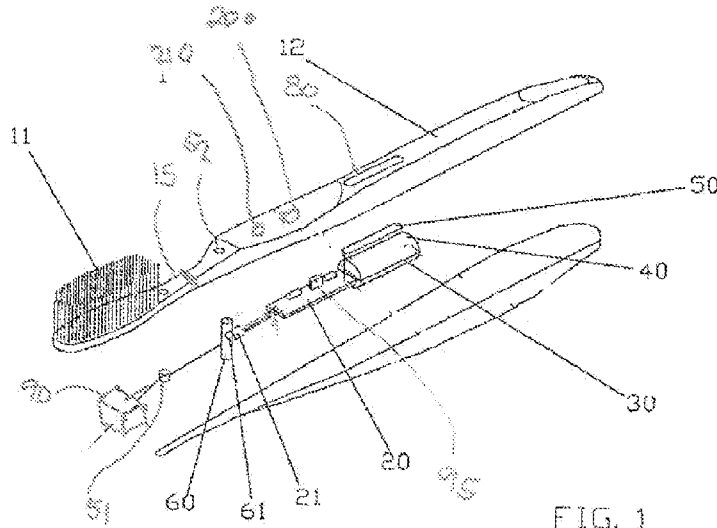
(84) Designated States (unless otherwise indicated, for every kind of regional protection available):

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, 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).

Published:

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

(54) Title: CLEANSING DEVICE



(57) Abstract: A cleansing device includes a toothbrush body having a handle on a first end and brush bristles on a second end. The second end movable with respect to the first end. A vibrating device is enabled to vibrate the brush bristle end to produce sonic vibrations. A metal anode is the handle and exposed on an outside of the handle and an cathode is positioned near or at the brush bristle end. An electronic circuit substantially within the handle has a mode switch operable to provide electrical potential to the metal anode, the mode switch also operable to cause activation of the vibrating device. A user using the toothbrush completes an electrical circuit to enable ions to flow from the cathode.

WO 2014/201019 A1

CLEANSING DEVICE

BACKGROUND

Field of the Invention:

5 This application concerns a cleansing device. In particular, the toothbrush is equipped to provide sonic vibrations and negative ions during brushing.

Description of Related Art:

10 The surface of a tooth has a negative electrical charge, and plaque has a positive charge. Opposite ions attract, so the plaque adheres to the teeth. When generating ions, the surface of the teeth is temporarily turned into a positive charge, so that loosening and repelling occurs. Also, the electrical circuit causes the bristles of the toothbrush to carry a negative electrical charge, which attracts the positive charge of the plaque.

15 Conventional toothbrushes generally available in the market usually have multiple rows of bristles disposed on an end of a handle for removing residuals found in gaps between teeth to maintain oral health when used in conjunction with toothpaste. However, they fail to reach deeper to the skin in one's mouth to improve cellular activity. With rapid development of technology, toothbrushes having embedded electronic devices can be generally found in the
20 market. The electronic devices, including circuits and associated electronic parts are essentially soldered together. Therefore, the electronic device is limited in function and deprived of becoming more practical in use by consumers.

 Manual toothbrushes are the most basic in design, and are generally characterized by a single-piece handle design and brush head or refill. The consumer's expectation of this segment

is that most of the work of brushing will be done by the brusher. Some features that differentiate manual toothbrushes from each other are brush head size (often expressed in number of tufts: *i.e.*, 35, 40, 60), bristle stiffness, bristle pattern, bristle color or concentration (power tip), indicator bristles that fade away to show loss of cleaning effectiveness over time, handle materials (soft, elastomeric, clear) or design (decoration, color, shape or ergonomics).

SUMMARY OF THE DISCLOSURE

Disclosed is a cleansing device, such as toothbrush or facial cleanser, with a circuit that is capable of improving oral cavity health, by providing either or both ionic application to the tooth surface and sonic vibrations during brushing.

A sonic (vibrating)-ionic (ion emitting) toothbrush includes a toothbrush body having a handle on a first end and brush bristles on a second end, the second end movable with respect to the first end. A vibrating device to move the second end. A metal anode in the handle is exposed on an outside of the handle. A cathode at the first end. An electronic circuit substantially within the handle and has a mode switch operable to provide electrical potential to the metal anode, the mode switch also operable to cause activation of the ionic function.

In an embodiment of the sonic-ionic toothbrush, the mode switch in a first position provides electrical potential to the metal anode, in a second position causes activation of the vibrating device, and in a third position provides electrical potential to the metal anode and causes activation of the vibrating device. In the first position potential is provided to the metal anode such that when a user touches the metal anode and brushes the user's teeth, ions are caused to flow out of the cathode. In the second position of the mode switch, the brush bristles are caused to vibrate. A third position of the switch can enable both the sonic and ionic functions.

In an embodiment, the mode switch is an on/off switch for both the sonic and ionic functions.

In an embodiment, a second switch has multiple positions to alter the frequency of vibration. In a particular embodiment, a light or lights are enabled to indicate which of the
5 multiple positions the second switch is in.

It is noted that in this disclosure and particularly in the claims and/or paragraphs, terms such as “comprises”, “comprised”, “comprising” and the like can have the meaning attributed to it in U.S. Patent law; e.g., they can mean “includes”, “included”, “including”, and the like.

The above and other objects, features, and advantages of various embodiments as set
10 forth in the present disclosure will be more apparent from the following detailed description of embodiments taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an exploded view of an embodiment of the present invention.

15 FIG. 2 is a perspective view of an embodiment of the present invention as assembled.

DETAILED DESCRIPTION

Referring to FIG. 1 and FIG. 2, is a cleansing device 100 of the present invention includes a handle portion 12 and a bristle brush end portion 15. A metal strip 50 can act as an
20 anode and be positioned through an opening 80 in the handle 12 of the sonic-ionic toothbrush that touches a user hand when the toothbrush is being used. The user's hand can be wet or does not need to be wet because the skin (hand) is naturally moist (resistance). A metal cathode 51 is located adjacent the bristles 11 of the toothbrush.

An electrical circuit 20 powered by one or more batteries 40 internal to the handle provides electrical potential to the anode. The battery or batteries can be housed in a holder 30. When the toothbrush is in use and the user is touching the metal strip 50 an electrical circuit is completed such that the electrical potential from the battery 40 at the cathode 51 causes ions to flow from the cathode to the metal strip 50 thereby causing the emitted ions to be imparted to the surface of the user's teeth.

Body's energy (hand) starts the circuitry as a conductor, but also the body plays an important role in the overall ionic function as the flow of negative ions from toothbrush head bristle brush from the cathode (ion emitter) through the teeth and gums and back into the user's body or hand on the metal strip 50 to complete the electrical loop.

The bristle brush end portion 15 with toothbrush bristles 11 are movable with respect to the toothbrush handle 12. A vibrating device 90 can cause the bristles 11 to vibrate with respect to the handle 12. Such vibrating devices are well-known to those of ordinary skill. The bristle end 15 of the toothbrush may be removable and replaceable as is known in the art. Sonic or vibrating function usually provides 20,000 to 30,000 strokes or vibrations per minute. The most common mass market sonic toothbrushes are 20,000 strokes per minute. An ultrasonic toothbrush function can be added and combined with ionic function or the user can use solely ultrasonic function.

A mode switch 95 on the toothbrush handle is provided so the bristles 11 can be selected by the user to concurrently or alternatively vibrate with the emitting of ions. Ionic function can loosen and repel plaque and bacteria through polarization technology. Sonic function (sonic vibration) will move around plaque and bacteria, but may not loosen and repel it as the ionic function will (through polarization technology). Also, the ionic function at 9 V to 12 V power

(which are safe power levels for the human body) loosens and repels plaque faster. The new combination of ionic and sonic in one toothbrush should provide the best results and performance for users. A light 51, which may be mounted on handle 12 through an opening 52 can be used to indicate when the ionic function is active.

5 A second switch 200 can have multiple settings to alter the number of vibrations per minute. A second light or lights 210, which may be mounted on handle 12 can be used to indicate which of the multiple settings the mode switch is in.

 One battery 40, for example a AAA battery, can be used to power the electrical circuit 20. The battery can be located within the handle and be replaceable. Voltage booster circuitry
10 (not shown) within the handle can boost 1.5 V up to about between 9 V to 12 V or any voltage necessary to activate the vibration device and provided ion flow. Alternatively, there can be multiple single cell batteries to power the toothbrush.

 The voltage booster circuit can generates 9 to 12 volts from a 1.5 volt AAA battery, which generates more negative ions (6x to 8x) and power during 1.5 to 2 minutes of brushing.
15 This elevated voltage can provide better results for less plaque accumulation and less inflammation of the gums than at a lower voltage. The sonic-ionic toothbrush combines sonic vibration and 9 to 12 volts of ionic polarization power. It can do the work of 6 to 8 batteries in a small amount of time and in a small amount of space. Thus, the single cell 1.5 volt battery (coupled with the booster circuit) powers both sonic and ionic functions.

20 The user does not need to operate both ionic and sonic functions at same time. The user can use solely ionic function or solely sonic function, or both sonic and ionic together. The mode switch 95 as discussed above is provided for this purpose.

Alternatively, ionic function can operate using 1.5 V or 3 V and does not need to have booster circuit for the ionic function. Although 9 V or 12 V is preferable to improve the ionic function and yield better results for loosening and repelling plaque and bacteria from the teeth and mouth.

5 A light 60 can turn on to show that ions are flowing and output is 9 V or 12 V (or an output that is required between 1.5 V and 12 V). This light can work at the same time sonic function is powered on or when user is solely using ionic function and sonic function is powered off. The light will glow to show the ionic function works when the user is holding the toothbrush and brushing their teeth. The user's body's energy starts the circuitry. In an
10 implementation, the light 60 can include a light emitting device 21 electrically connected to the electronic circuit 20, and a light guide post 61 mounted to the handle located adjacent the light emitting device 21. The light guide post has a portion extending to the exterior the handle so as to transmit light from light emitting device. That is, the light source is visible through the light guide post and the light guiding and refracting material. In an implementation, light emitted by
15 the light emitting device 21 is visible as shown in FIG 2 on the same side of the handle as the bristles 11. In another implementation, the light emitted from the light emitting device 21 is visible on the opposite side of the handle on which the bristles are located. That is, the light is not directly visible to the user when the toothbrush bristles are facing the user, as in when the user is brushing their teeth. Rather the light may be visible by reflection in a mirror in front of
20 the user.

Bristles of the toothbrush are typically soft and made of Nylon or other synthetic materials. While soft bristles are recommend, any medium or hard toothbrush bristles can be used.

The ionic function and power loosens plaque easily, so users do not need to brush hard. However, users can brush at any level they wish. The sonic or ultrasonic toothbrush function can have an ON/OFF switch 200. This switch may have multiple settings to offer options for speed and power. This switch may have a power light to indicate the ON position and a light or lights
5 to indicate which of the multiple settings the device is in.

In use the present toothbrush can be a single-use device or have a replaceable bristle head with soft polypropylene handle and nylon bristles. Despite its advanced function and benefits, the toothbrush can look and feel much like an ordinary toothbrush. The handle can be fully sealed to keep out water or substantially watertight and have a replaceable battery. The light,
10 can be a light-emitting diode (LED) or other lamp to indicate when the user has completed the electrical connection and the ionic action is functioning.

The user simply touches a finger or hand, preferably wet, to the metal anode on the handle while brushing to engage the ionic action and see the light on the handle illuminate. The brush head can be any size and the bristles are soft with a staggered brush trim that emphasizes
15 the soft feel of the bristles in the mouth. The bristle pattern is designed to toothpaste well. Both a large brush head size and the ability to hold toothpaste are attributes appreciated by some users.

The sonic-ionic toothbrush will allow users to have an interactive brushing experience. Users can brush with ionic polarization for 1 minute to loosen plaque at 9 volts and top it off with sonic vibration for 1 minute to finish off with sonic power and hit the gum lines and hard to
20 reach areas. Or users can brush with both sonic and ionic together, or sonic only. Users can make their own brushing plan for what they feel is best suited for their teeth and how they feel or want to feel.

The sonic-ionic toothbrush technology can provide relief from painful dental sensitivity. It is hypothesized that the ionic action of the toothbrush facilitates the deposit of fluoride onto the teeth, which is often used in the treatment of tooth sensitivity.

Other embodiments are within the scope of the following claims.

What is claimed is:

1. A cleansing device, comprising:
 - a toothbrush body having a handle on a first end and brush bristles on a second end, the second end movable with respect to the first end;
 - 5 a vibrating device to move the second end;
 - a metal anode in the handle and exposed on an outside of the handle;
 - a cathode at the second end;
 - an electronic circuit substantially within the handle;
 - a mode switch operable to provide electrical potential to the metal anode, the mode
 - 10 switch also operable to cause activation of the ionic function.

2. The cleansing device of claim 1, having a second switch that in a first position causes activation of the vibrating device.

- 15 3. The cleansing device of claim 1, wherein a user touch the metal anode and applying the brush bristles to the user's teeth complete an electrical circuit to cause ions to flow from the metal anode and be emitted from the cathode.

4. The cleansing device of claim 1, comprising at least one battery in the handle.
- 20 5. The cleansing device of claim 4, wherein the battery is single 1.5 V.

6. The cleansing device of claim 5, comprising a booster circuit in the handle, the booster circuit to boost a 1.5 V battery voltage to about 9 - 12 V.

7. The cleansing device of claim 4, wherein the at least one battery provides about 3 V.

5

8. The cleansing device of claim 2, wherein the vibration device when activated causes the second end to vibrate about 20,000 to 30,000 vibrations per minute.

9. The cleansing device of claim 2, comprising a light that illuminates when ions are being emitted from the cathode.

10

10. The cleansing device of claim 8, wherein the second switch has multiple settings to alter the number of vibrations per minute.

11. The cleansing device of claim 10, wherein one or more second lights indicate which of the multiple settings the second switch is in.

15

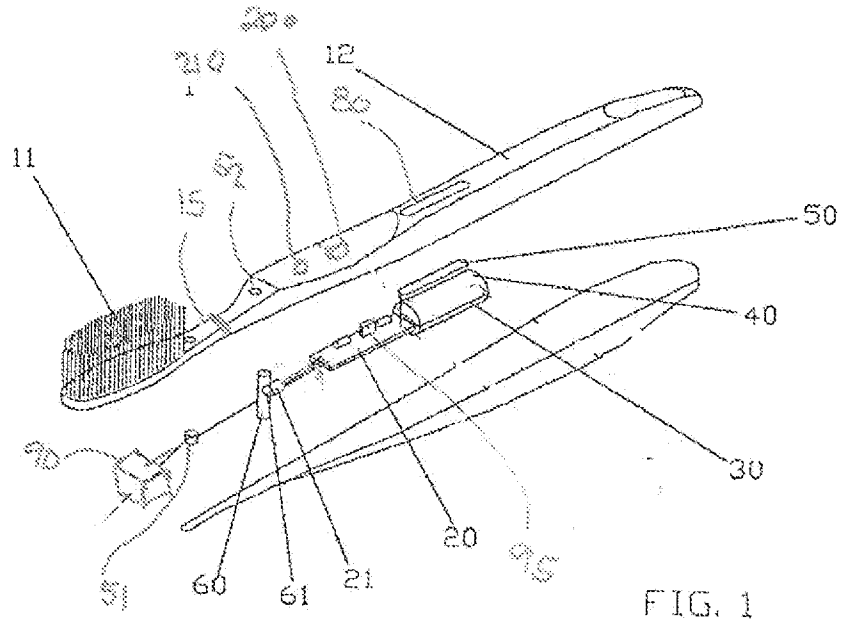


FIG. 1

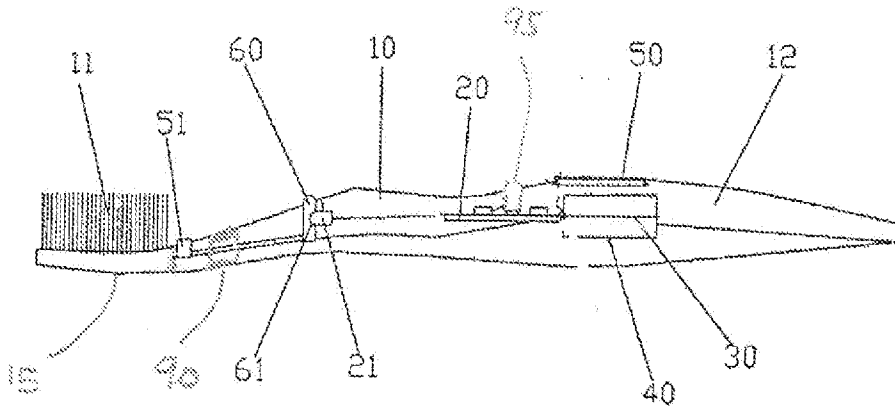


FIG. 2

INTERNATIONAL SEARCH REPORT

International application No PCT/US2014/041735

A. CLASSIFICATION OF SUBJECT MATTER INV. A61C17/20 A61C17/34 A46B15/00 A61C17/22 A61N1/26 A61N1/30 ADD. 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 A46B A61C A61N 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, COMPENDEX, INSPEC				
C. DOCUMENTS CONSIDERED TO BE RELEVANT				
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.		
X	US 2013/071805 A1 (DOLL ALEXANDER FRANZ [DE] ET AL) 21 March 2013 (2013-03-21)	1-10		
Y	paragraphs [0025] - [0091] figures 1-11	11		
X	----- EP 1 908 434 A1 (MATSUSHITA ELECTRIC WORKS LTD [JP] PANASONIC ELEC WORKS CO LTD [JP]) 9 April 2008 (2008-04-09)	1-8		
A	paragraphs [0017] - [0025] figures 1-5	9-11		
Y	----- US 2008/313829 A1 (DABROWSKI CHRISTOPHER J [US]) 25 December 2008 (2008-12-25)	11		
A	paragraphs [0010] - [0027] figures 1-3	1-10		
	----- -/--			
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.				
* Special categories of cited documents : <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none; vertical-align: top;"> "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 </td> <td style="width: 50%; border: none; vertical-align: top;"> "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 </td> </tr> </table>			"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
"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	Date of mailing of the international search report			
2 September 2014	10/09/2014			
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Pisseloup, Arnaud			

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2014/041735

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2009/143914 A1 (COOK CHARLES B [US] ET AL) 4 June 2009 (2009-06-04) paragraphs [0024] - [0064] figures 1-14 -----	1-11

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2014/041735

Patent document cited in search report	Publication date	Patent family member(s)	Publication date	
US 2013071805	A1	21-03-2013	CA 2849243 A1	28-03-2013
			CA 2849441 A1	28-03-2013
			CA 2849457 A1	28-03-2013
			CN 103796711 A	14-05-2014
			CN 103796712 A	14-05-2014
			CN 103813830 A	21-05-2014
			CN 103813831 A	21-05-2014
			EP 2758121 A1	30-07-2014
			EP 2758122 A1	30-07-2014
			EP 2758123 A1	30-07-2014
			EP 2758124 A1	30-07-2014
			KR 20140046073 A	17-04-2014
			KR 20140048326 A	23-04-2014
			KR 20140048328 A	23-04-2014
			US 2013071805 A1	21-03-2013
			US 2013071806 A1	21-03-2013
			US 2013071807 A1	21-03-2013
			US 2013072851 A1	21-03-2013
			WO 2013043474 A1	28-03-2013
			WO 2013043769 A1	28-03-2013
WO 2013043770 A1	28-03-2013			
WO 2013043771 A1	28-03-2013			

EP 1908434	A1	09-04-2008	AT 452594 T	15-01-2010
			CN 101156975 A	09-04-2008
			CN 201115747 Y	17-09-2008
			EP 1908434 A1	09-04-2008
			JP 4218721 B2	04-02-2009
			JP 2008093038 A	24-04-2008
			KR 20080031839 A	11-04-2008
			US 2008086189 A1	10-04-2008

US 2008313829	A1	25-12-2008	CA 2634392 A1	28-06-2007
			CN 101340856 A	07-01-2009
			EP 1965724 A2	10-09-2008
			JP 5225859 B2	03-07-2013
			JP 2009520555 A	28-05-2009
			US 2008313829 A1	25-12-2008
WO 2007072430 A2	28-06-2007			

US 2009143914	A1	04-06-2009	CA 2649473 A1	01-11-2007
			CN 101426450 A	06-05-2009
			EP 2010095 A2	07-01-2009
			JP 5222284 B2	26-06-2013
			JP 2009534081 A	24-09-2009
			JP 2013135913 A	11-07-2013
			KR 20090009881 A	23-01-2009
			US 2009143914 A1	04-06-2009
WO 2007122491 A2	01-11-2007			
