

(19)



(11)

EP 2 871 864 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
22.05.2019 Bulletin 2019/21

(51) Int Cl.:
H04R 25/00 (2006.01)

(21) Application number: **13192513.3**

(22) Date of filing: **12.11.2013**

(54) **Battery assembly for a hearing device and associated method**

Batterieanordnung für ein Hörgerät und zugehöriges Verfahren

Ensemble de batterie pour dispositif auditif et procédé associé

(84) Designated Contracting States:
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**

(43) Date of publication of application:
13.05.2015 Bulletin 2015/20

(73) Proprietor: **GN Hearing A/S**
2750 Ballerup (DK)

(72) Inventor: **Johansen, Jan**
4600 Køge (DK)

(74) Representative: **Zacco Denmark A/S**
Arne Jacobsens Allé 15
2300 Copenhagen S (DK)

(56) References cited:
EP-A1- 2 503 796 WO-A1-03/105308
DE-U1-202008 016 136 US-A1- 2012 033 839
US-A1- 2013 127 404

EP 2 871 864 B1

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Description

[0001] The present invention relates to a battery assembly for a hearing device, and in particular to a battery assembly for wirelessly powering a hearing device.

BACKGROUND

[0002] With the developments in rechargeable battery technology, hearing devices with rechargeable batteries that can be charged by wire or wirelessly are emerging. A hearing device user is required to recharge the hearing device regularly during periods where the hearing device is not in use, e.g. during the night or other non-use periods, where the hearing device is detached from the user and turned off. If a user forgets to recharge the hearing device and the battery runs out, the user is required to detach the hearing device and place in a charger for recharging the battery before being able to use it. This is inconvenient and may reduce user friendliness.

SUMMARY

[0003] There is a need for devices and methods that improves the user friendliness of a hearing device with rechargeable batteries, in particular wirelessly rechargeable batteries.

[0004] Accordingly, a battery assembly for powering a hearing device while the hearing device is in use and performs hearing compensation is provided. The battery assembly comprises a main part having at least a first surface and a second surface and comprising a first electrode formed as an inductive coil; a first attachment member on at least a primary part of the first or second surface for attaching the main part to a hearing device housing of the hearing device. The battery assembly comprises a second attachment member for attaching a battery to the main part; and an electronic circuit having a first input terminal and a second input terminal connectable to a first output terminal and a second output terminal, respectively, of the battery, wherein the electronic circuit is connected to the first electrode, and wherein the electronic circuit is configured for converting direct current from the battery to alternating current in the inductive coil.

[0005] Further, a method for powering a hearing device with an external battery while the hearing device is in use and performs hearing compensation is provided. The method comprises: providing a battery assembly as described herein; attaching a battery to the main part of the battery assembly; and activating the battery.

[0006] The battery assembly enables external powering of a hearing device configured for inductive charging of a battery in the hearing device by using a charging coil/circuit of the hearing device or a separate power coil in the hearing device. Thus, the battery assembly provides an emergency power source or an external power source that the user can keep in his possession, e.g. in a wallet. If the user has forgotten to charge his hearing

device, or the hearing device for any other reason runs out of power, the user may utilize the battery assembly for powering the hearing device until an inductive charging is again available. Further, the battery assembly is able to power the hearing device while the hearing device is in use and performs hearing compensation.

[0007] It is an important advantage of the present invention that the user experience for a user using a rechargeable hearing aid or hearing device is greatly improved, by providing an external power supply for e.g. emergency use, when the internal battery cannot feed power to the hearing device.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] The above and other features and advantages of the present invention will become readily apparent to those skilled in the art by the following detailed description of exemplary embodiments thereof with reference to the attached drawings, in which:

- Fig. 1 schematically illustrates an exemplary hearing device with an exemplary battery assembly attached thereto;
- Fig. 2 schematically illustrates an exemplary battery assembly;
- Fig. 3 schematically illustrates an exemplary battery assembly;
- Fig. 4 schematically illustrates a exemplary battery assembly;
- Fig. 5 schematically illustrates a exemplary battery assembly;
- Fig. 6 schematically illustrates a exemplary battery assembly;
- Fig. 7 schematically illustrates an interface between a battery and a sheet;
- Fig. 8 schematically illustrates an exemplary hearing device with an exemplary battery assembly attached thereto; and
- Fig. 9 is a flow diagram of an exemplary method according to the invention.

DETAILED DESCRIPTION

[0009] The disclosed battery assembly enables a user to use a rechargeable hearing device even when the rechargeable battery in the hearing device runs out by providing a secondary power supply that is easy and convenient to use for a hearing device user.

[0010] The electronic circuit comprises a first input terminal or input node and a second input terminal or input node. The first input terminal is connected, connectable or configured to connect to a first output terminal of a direct current (DC) source, i.e. a battery, and the second input terminal is connected, connectable or configured to connect to a second output terminal of the DC source. The input terminals may be connectable or configured to connect to the DC source via a number of pads connected

to the input terminals via input electrodes.

[0011] The electronic circuit comprises one or more output terminals or nodes including a first output terminal and optionally a second output terminal. First and second output terminals of the electronic circuit may be connected to respective ends or points of the first electrode forming an inductive coil.

[0012] The electronic circuit may comprise an oscillator for converting DC from the DC source to alternating current (AC). The oscillator may be configured to provide an output signal with a frequency in the range from 125 kHz to 15 MHz.

[0013] The battery assembly may comprise one or more first pads connected to the first input terminal of the electronic circuit via first input electrode(s).

[0014] The battery assembly may comprise one or more second pads connected to the second input terminal of the electronic circuit via second input electrode(s). The battery assembly may comprise a primary second pad, a secondary second pad and optionally a tertiary second pad each connected to the second input terminal via second input electrode(s). A pad facilitates electrical connection between an input terminal of the electronic circuit and an output terminal of the DC source for feeding power from the DC source to the electronic circuit.

[0015] The first attachment member may be a first adhesive layer or part. A first adhesive layer or part on a first surface of the battery assembly enables removable attachment of the battery assembly to a hearing device housing. The first adhesive layer may cover or at least partly cover the first inductive coil, e.g. for ensuring accurate and stable positioning of the inductive coil in relation to an inductive charging or power coil of the hearing device.

[0016] The first adhesive layer for attaching the battery assembly to a hearing device housing may be arranged on the first surface or a second surface of the main part.

[0017] The first attachment member may be the first adhesive layer.

[0018] The first attachment member may be a resilient spring clamp configured for fitting partially or completely around the hearing device housing of the hearing device.

[0019] The first attachment member may be an engagement member configured for engaging the hearing device housing and fitting partially or completely around the hearing device housing of the hearing device. The first attachment member may comprise an elastic band or strap.

[0020] The battery assembly may comprise one or more removable protective sheets, including a first protective sheet. The first protective sheet may cover or at least partly cover the first adhesive layer. The purpose of the removable first protective sheet may be that the user may handle the battery assembly without the first adhesive layer being exposed, and when the user wishes to attach the battery assembly to the hearing device, the first adhesive layer can be exposed by removal of the first protective sheet and the battery assembly can then

be attached to the hearing device.

[0021] The direct current source is a battery. The direct current source may be any type of battery. The battery may be of the same type as conventionally used in hearing devices, e.g. a zinc-air battery. The DC source may provide a supply voltage in the range from 1.1 V to 3 V.

[0022] Some batteries, e.g. zinc-air batteries, aluminum-air batteries or lithium-air batteries, rely on a reaction with oxygen, and may be activated by unsealing or revealing activation opening(s) to let air into the battery. Thus, the direct current source may be a battery having a housing with one or more activation openings. The one or more activation openings may be sealed with a battery activation tab. The one or more activation openings may alternatively or additionally be sealed and/or covered by a part of the main part, e.g. the primary part of the first surface with the first attachment member, such as the first adhesive layer.

[0023] In an exemplary battery assembly, the main part of the battery assembly may be in the form of a sheet. The battery assembly may also be configured for holding or attaching a DC source to the sheet or the battery assembly may comprise a DC source. The battery assembly may comprise one or more second attachment members for attaching the DC source to the battery assembly and/or providing electrical contact between pad(s) and output terminal(s) of the DC source.

[0024] The one or more second attachment members may include one or more second adhesive layers.

[0025] The second adhesive layer or second adhesive layers, such as a primary second adhesive layer and/or a secondary second adhesive layer may each be configured for electrically connecting a pad or an input terminal of the plurality of input terminals of the electronic circuit to an output terminal of the direct current source. Hence, the direct current source may be fixed to the battery assembly by the second adhesive layer(s).

[0026] The primary second adhesive layer or the secondary second adhesive layer may be integrated in the first adhesive layer.

[0027] The second attachment member may be a battery seat or compartment with electrical connector members or pads connected to the first input terminal and the second input terminal, respectively. The battery seat or compartment may be configured for holding a battery or other DC source, e.g. in a press-fit engagement.

[0028] In exemplary battery assemblies, the second attachment member fix the direct current source to the battery assembly, e.g. the first and/or second output terminals of the direct current source is fixed to the battery assembly. For example, electrically conductive glue or other fastener, may be used for fixing the DC source to the battery assembly and forming electrical connections between respective output terminals and pads.

[0029] The battery assembly may comprise a plurality of removable protective sheets, including the removable first protective sheet and optionally removable second protective sheet(s).

[0030] The removable second protective sheet(s) may cover the second adhesive layer(s). Hence before use, the user may handle the battery assembly without exposing the second adhesive layer(s). When the direct current source is ready to be attached to the sheet and/or ready to be activated, the user may remove the second protective sheet, thereby exposing the second adhesive layer in order to affix an input terminal of the electronic circuit to an output terminal of the direct current source. A single protective sheet, e.g. the first protective sheet, may cover the first adhesive layer and the second adhesive layer(s).

[0031] The removable second protective sheet may include a plurality of removable second protective sheets, such as a primary second protective sheet, a secondary second protective sheet and/or a tertiary second protective sheet. Each of the plurality of removable second protective sheets may cover one of the plurality of second adhesive layers. Whether second protective sheets are employed depends on whether a DC source is pre-attached or not. One or more second protective sheets, e.g. all second protective sheets, are optional and may be dispensed with in case of a DC source being pre-attached to the battery assembly.

[0032] To allow an electrical connection between an input terminal of the electronic circuit and an output terminal of the direct current source, the second adhesive layer may be made of an electrically conducting material. Alternatively, the second adhesive layer(s) may leave a part of the input terminals/pads exposed, such that an electrical connection is possible even if the second adhesive layer is made of an electrically insulating material.

[0033] The battery assembly may comprise an activation part between an input terminal of the electronic circuit and an output terminal of the direct current source. The activation part may be an electrically insulating layer between an input terminal of the electronic circuit and an output terminal of the direct current source. Hence, unintentional discharging of the direct current source before use is avoided or at least limited.

[0034] In an exemplary battery assembly, the first adhesive layer may adhere to the direct current source. Hence, the first adhesive layer may be configured to adhere to the hearing device and to the direct current source. This may lower production costs, since a single adhesive layer, i.e. the first adhesive layer, can be applied to a substantial part of the first and/or second surface.

[0035] The first adhesive layer may be an adhesive that allows the battery assembly to be detached from the hearing device after use.

[0036] The second adhesive layer may be an adhesive that does not allow easy detachment.

[0037] Hence, the second adhesive layer may prevent easy detachment of the direct current source from the battery assembly. This may be beneficial to ensure a firm connection between an input terminal of the electronic circuit and an output terminal of the direct current source, and to eliminate or at least limit the risk of the direct cur-

rent source unintentionally detaching from the battery assembly.

[0038] The main part may be a printed circuit board. Hence, manufacturing is easy and production costs can be lowered. If the main part is embodied as a sheet, the sheet may be a printed circuit board.

[0039] The main part may be an elongated sheet having a first end and a second end. The sheet and/or the main part may have a length in the range from 10 mm to 50 mm. The sheet and/or the main part may have a shape selected from T-shaped, L-shaped, I-shaped or cross-shaped. Different shapes may be beneficial for different purposes, and may further be a compromise between reliability and production costs.

[0040] The sheet and/or the main part may comprise one or more folding lines including a first folding line. One or more of the folding lines, e.g. the first folding line, may be configured to bring an input terminal of the electronic circuit in contact with an output terminal of the direct current source. In an exemplary battery assembly, the first folding line may be configured to bring the second input terminal in contact with the second output terminal.

[0041] The sheet and/or the main part may comprise a plurality of folding lines including the first folding line, a second folding line, a third folding line, a fourth folding line and/or a fifth folding line. In an exemplary battery assembly, the first folding line may be configured to bring a second primary input terminal in contact with the second output terminal, and a second folding line may be configured to bring a second secondary input terminal in contact with the second output terminal.

[0042] The direct current source and the sheet may be bundled together, or distributed individually. The battery assembly may be provided together with the direct current source. Alternatively, the battery assembly may be provided without the direct current source, and thus be configured to receive a direct current source.

[0043] Further, a method for powering a hearing device is disclosed. The method comprises: providing a battery assembly as described herein; attaching a battery to the main part of the battery assembly; and activating the battery.

[0044] The method may further comprise attaching the battery assembly to the hearing device, e.g. to a hearing device housing of the hearing device.

[0045] Activating the DC source, i.e. battery, may comprise connecting one or more output terminals, e.g. the second output terminal and/or the first output terminal, of the DC source with a pad of the battery assembly.

[0046] Activating the DC source may comprise removing or peeling off a battery activation tab from the DC source.

[0047] Activating the DC source may comprise removing or peeling of one or more protective sheets of the battery assembly.

[0048] Attaching the battery assembly to the hearing device may comprise attaching the first attachment member to the hearing device housing.

[0049] Attaching the battery assembly to the hearing device may comprise aligning the first inductive coil with an inductive coil of the hearing device.

[0050] Attaching the battery assembly to the hearing device may comprise exposing a first adhesive layer, e.g. by removing a first protective sheet covering the first adhesive layer.

[0051] Fig. 1 schematically illustrates an exemplary hearing device system 1 comprising a hearing device 3 with an exemplary battery assembly 2 attached thereto. The battery assembly 2 comprises a main part 4A in the form of a sheet 4, an electronic circuit 22, and a direct current source 12 attached to or attachable to the sheet 4. The DC source 12 has a first output terminal 16 and a second output terminal 18 and may be attached to the sheet during manufacture or by the user prior to attachment to a hearing device. A first attachment member (not shown), such as a first adhesive layer on at least a primary part of the first surface, affix the sheet/battery assembly to the hearing device 3.

[0052] The sheet 4 has a first surface 6 and a second surface 8 and comprises a first electrode 10 formed as an inductive coil 11.

[0053] The electronic circuit 22 has a first input terminal 23 and a second input terminal 27 that are connected to the direct current source 12 via first pad 24 and second pad 26. The electronic circuit 22 converts direct current from the direct current source 12 to alternating current in the inductive coil 11.

[0054] The alternating current in the inductive coil 11 generates an alternating magnetic field that induces electromagnetic power in an inductive coil (not shown) in the hearing device 3 when the inductive coil 11 of the battery assembly 2 is in close vicinity of the inductive coil in the hearing device 3.

[0055] The illustration in Fig. 1 depicts the battery assembly 2 with an attached direct current source 12, here exemplified as a button cell battery. The battery assembly 2 is attached to the hearing device 3 and creates an inductive coupling between the inductive coil 11 of the battery assembly 2 and an inductive coil (not shown) of the hearing device 3. Hence, the battery assembly 2 allows the direct current source 12 to power and/or charge the hearing device 3 via an inductive coupling.

[0056] A user may on a daily basis charge an internal battery of the hearing device 3. However, the internal battery (not shown) of the hearing device 3 may run out of power while no inductive charger is available, or the hearing device is in use. If the internal battery should run out of power, the battery assembly 2 can easily and conveniently be attached to the hearing device 3 as shown. The hearing device 3 is then able, via an inductive coupling, to be powered by power provided by the direct current source 12.

[0057] Fig. 2 schematically illustrates an exemplary battery assembly 2. The battery assembly comprises a main part 4A in the form of a sheet 4 and a direct current source 12. The direct current source 12 comprises a

housing 14 and has a first output terminal 16 and a second output terminal 18.

[0058] The battery assembly 2 comprises an electronic circuit 22 having a first input terminal 23 and a second input terminal 27. The first input terminal 23 is connected to the first output terminal 16 of the direct current source 12 via a first pad 24. The first output terminal 16 is glued or fastened to the sheet 4 with an electrically conductive glue or other fastener, which attaches the DC source 12 to the sheet 4 and electrically connects the first pad 24 and the first output terminal 16. The second input terminal 27 is connectable to the second output terminal 18 of the direct current source 12 via second pad 26. The electronic circuit 22 is connected to the first pad 24 and second pad 26 for converting direct current from the direct current source 12 to alternating current in the inductive coil 11.

[0059] In Fig. 2, the second input terminal 27 is connected to the second output terminal 18 by performing a folding of the sheet 4 along a first folding line 28 as shown by the arrow. The battery assembly 2 in Fig. 2 comprises a first attachment member 19 in the form of a first adhesive layer 20 and a second attachment member 21' in the form of a second adhesive layer 21. The second adhesive layer 21 is adapted to adhere to the direct current source 12 and to electrically connect the second output terminal 18 and the second pad 26 by contact and/or via electrically conductive second adhesive layer 21.

[0060] A first protective sheet 34 covers and protects the first adhesive layer 20 prior to use. The first protective sheet 34 is removed when a user wishes to attach the battery assembly to a hearing device. A second protective sheet 36 covers and protects the second adhesive layer 21 prior to use. The second protective sheet 36 is removed when a user wishes to activate the battery assembly/DC source.

[0061] Fig. 3 schematically illustrates an exemplary battery assembly 2 with a main part 4A formed as an I-shaped sheet 4. The direct current source 12 is in Fig. 3 exemplified as a battery that is activated by air and comprises a battery activation tab 13 sealing one or more activation openings in the housing 14. Upon removal of the battery activation tab 13 air is allowed to enter the activation openings of the housing 14, thus activating the battery 12.

[0062] The battery assembly 2 comprises two second adhesive layers 21A and 21B configured for adhering the direct current source 12 to the sheet 4. Further, the primary second adhesive layer 21A electrically connects the first pad 24 and the first output terminal 16 of the battery 12, and the secondary second adhesive layer 21B electrically connects the second pad 26 and the second output terminal 18 of the battery 12.

[0063] Optionally, the sheet 4 has a second folding line 30 and/or a third folding line 32 to allow folding of the sheet 4 around the battery 12 to provide a more compact battery assembly with DC source.

[0064] Fig. 4-6 schematically illustrates exemplary

main parts 4A in the form of sheets 4 of different shapes but comprising similar functional features.

[0065] Fig. 4 shows an exemplary sheet 4 comparable to the sheet as explained in relation to Fig. 3, wherein the initial shape of the sheet 4 is I-shaped. The first folding line 28 guides a folding along a line perpendicular to a longitudinal direction of the sheet 4.

[0066] Fig. 5 shows an exemplary sheet 4 wherein the initial shape of the sheet 4 is T-shaped. The sheet 4 comprises a first folding line 28 and a second folding line 30. Further, the sheet 4 as illustrated in Fig. 5 comprises a primary second pad 26A and a secondary second pad 26B. The first folding line 28 allows the primary second pad 26A to connect to a second output terminal of an attached direct current source. The second folding line 30 allows the secondary second pad 26B to connect to a second output terminal of an attached direct current source.

[0067] The sheet 4 as illustrated in Fig. 5 comprises a plurality of second adhesive layers 21A, 21B, 21C including a primary second adhesive layer 21A, a secondary second adhesive layer 21B and a tertiary second adhesive layer 21C. The plurality of second adhesive layers 21A, 21B, 21C allow each of the first pad 24, primary second pad 26A and secondary second pad 26B, respectively, to adhere to a direct current source 12. The first folding line 28 and the second folding line 30 as illustrated in Fig. 5, guides a folding of the sheet 4 along a line parallel to a longitudinal direction of the sheet 4.

[0068] Fig. 6 shows an exemplary sheet 4 wherein the initial shape of the sheet 4 is L-shaped. The sheet 4 comprises a first folding line 28, wherein the first folding line 28 guides a folding of the sheet along a line parallel to a longitudinal direction of the sheet 4.

[0069] Fig. 7 schematically shows an exemplary interface between a direct current source 12 and the sheet 4. The direct current source 12 comprises a first output terminal 16 and a second output terminal 18. Further, the direct current source 12 encloses an electrolyte 44. The sheet 4 has a base layer 40 and a non conductive layer 42 with a first surface 6 and a second surface 8. A primary second adhesive layer 21 on the first surface 6 electrically connects the first pad 24 and the first terminal 16.

[0070] Fig. 8 schematically shows an inductive coupling between a battery assembly 2 and a hearing device 3. The battery assembly 2 comprises a direct current source 12, an electronic circuit 22 and an inductive coil 11. The electronic circuit 22 comprises an oscillator 58 that converts the direct current from the direct current source 12 to an alternating current which induces an alternating electromagnetic field in the inductive coil 11. The hearing device 3 comprises an inductive coil 60, a diode 62, a capacitor circuit 64, a processing unit 66, a microphone 68 and a receiver 70. The inductive coil 11 induces an alternating electromagnetic field in the inductive coil 60 of the hearing device 3 giving rise to an alternating current. The alternating current thus produced by the inductive coil 60 of the hearing device 3 is rectified

by the diode 62 and capacitor circuit 64 and a direct current is fed to the functional parts of the hearing device 3, effectively powering the hearing device circuit, here illustrated as being fed to the processing unit 66.

[0071] Fig. 9 illustrates a flow-diagram of a method of powering a hearing device 100. The method 100 comprises providing a battery assembly with a direct current source 102, activating the direct current source 104 and attaching the battery assembly to the hearing device housing 106. The battery assembly provided may be a battery assembly as described herein and in particular in relation to Figs. 1-8.

LIST OF REFERENCES

[0072]

1	hearing device system
2	battery assembly
3	hearing device
4A	main part
4	sheet
6	first surface
8	second surface
10	first electrode
11	inductive coil
12	direct current source
13	battery activation tab
14	housing
16	first output terminal
18	second output terminal
19	first attachment member
20	first adhesive layer
21'	second attachment member
21	second adhesive layer
21A	primary second adhesive layer
21B	secondary second adhesive layer
21C	tertiary second adhesive layer
22	electronic circuit
23	first input terminal
24	first pad
26	second pad
26A	primary second pad
26B	second secondary pad
27	second input terminal
28	first folding line
30	second folding line
32	third folding line
34	first protective sheet
36	second protective sheet
40	sheet base layer
42	non-conductive layer
44	electrolyte
58	oscillator
60	inductive coil
62	diode
64	capacitor circuit
66	processing unit

68 microphone
 70 receiver
 100 method of powering a hearing device
 102 providing battery assembly
 104 activating direct current source
 106 attach battery assembly to hearing device

Claims

1. Battery assembly (10) for powering a hearing device (3) while the hearing device (3) is in use and performs hearing compensation, the battery assembly (2) comprising

- a main part (4A) having at least a first surface (6) and a second surface (8) and comprising a first electrode (10) formed as an inductive coil (11);
- first attachment member (19) on at least a primary part of the first surface (6) for attaching the main part (4A) to a hearing device housing (106) of the hearing device (3);
- second attachment member (21') for attaching a battery to the main part (4A); and
- an electronic circuit (22) having a first input terminal (23) and a second input terminal (27) connectable to a first output terminal (16) and a second output terminal (18), respectively, of the battery, wherein the electronic circuit (22) is connected to the first electrode (10), and wherein the electronic circuit (22) is configured for converting direct current from the battery to alternating current in the inductive coil (11).

2. Battery assembly (10) according to claim 1, wherein the main part (4A) is embodied as a sheet.

3. Battery assembly (10) according to any of claims 1-2, wherein the first attachment member (19) is a first adhesive layer (20).

4. Battery assembly (10) according to any of the preceding claims, wherein the second attachment member (21') comprises second, electrically conductive, adhesive layer(s) (21) electrically connected to the first input terminal (23) and/or the second input terminal (27).

5. Battery assembly (10) according to claim 3, wherein the battery assembly (10) comprises a removable first protective sheet (34) covering the first adhesive layer (20).

6. Battery assembly (10) according to any of the preceding claims, wherein the battery assembly (10) comprises the battery having a housing with one or more activation openings sealed with a battery acti-

vation tab (13) or a part of the first surface (6).

7. Battery assembly (10) according to claim 4, wherein the battery assembly (10) comprises second protective sheet(s) (36) covering the second adhesive layer(s) (21).

8. Battery assembly (10) according to any of the preceding claims, the battery assembly (10) comprising an activation part between an input terminal of the electronic circuit (22) and an output terminal of the battery.

9. Battery assembly (10) according to any of the preceding claims, wherein the main part (4A) is a printed circuit board.

10. Battery assembly (10) according to claim 3, wherein the first adhesive layer (20) is configured to adhere to a hearing device (3) housing of the hearing device (3).

11. Battery assembly (10) according to any of the preceding claims, wherein the main part (4A) or sheet is an elongated sheet having a first end and a second end with a length in the range from 10 mm to 50 mm.

12. Battery assembly (10) according to any of the preceding claims, wherein the main part (4A) or sheet has a shape selected from T-shaped, L-shaped, I-shaped or cross-shaped.

13. Method for powering a hearing device (3) with an external battery while the hearing device (3) is in use and performs hearing compensation, the method comprising:

- providing a battery assembly (10) comprising

- a main part (4A) having at least a first surface (6) and a second surface (8) and comprising a first electrode (10) formed as an inductive coil (11);
- first attachment member (19) on at least a primary part of the first surface (6) for attaching the main part (4A) to a hearing device housing (106) of the hearing device (3);
- second attachment member (21') for attaching a battery to the main part (4A); and
- an electronic circuit (22) having a first input terminal (23) and a second input terminal (27) respectively connectable to a first output terminal (16) and a second output terminal (18) of the battery, the electronic circuit (22) connected to the first electrode (10) for converting direct current from the battery to alternating current in the inductive coil (11);

- attaching the battery to the main part (4A) of the battery assembly (10); and
 - activating the battery.
14. Method according to claim 13, wherein the method comprises attaching the battery assembly (10) to the hearing device (3) and aligning the first inductive coil with an inductive coil (11) of the hearing device (3).
15. Method according to claim 14, wherein attaching the battery assembly (10) to the hearing device (3) comprises exposing a first adhesive layer (20) by removing a first protective sheet (34) covering the first adhesive layer (20).

Patentansprüche

1. Batterieanordnung (10) zur Stromversorgung eines Hörgeräts (3), während das Hörgerät (3) in Gebrauch ist und einen Hörausgleich durchführt, wobei die Batterieanordnung (2) umfasst
- einen Hauptteil (4A), welcher mindestens eine erste Oberfläche (6) und eine zweite Oberfläche (8) aufweist und eine als eine induktive Spule (11) ausgebildete erste Elektrode (10) umfasst;
 - ein erstes Befestigungselement (19) auf zumindest einem primären Teil der ersten Oberfläche (6) zur Befestigung des Hauptteils (4A) an einem Hörgerätegehäuse (106) des Hörgeräts (3);
 - ein zweites Befestigungselement (21') zur Befestigung einer Batterie am Hauptteil (4A); und
 - eine elektronische Schaltung (22), welche einen ersten Eingangsanschluss (23) und einen zweiten Eingangsanschluss (27) aufweist, die mit einem ersten Ausgangsanschluss (16) bzw. einem zweiten Ausgangsanschluss (18) der Batterie verbindbar sind, wobei die elektronische Schaltung (22) mit der ersten Elektrode (10) verbunden ist, und wobei die elektronische Schaltung (22) zur Umwandlung eines Gleichstroms von der Batterie in einen Wechselstrom in der induktiven Spule (11) ausgelegt ist.
2. Batterieanordnung (10) nach Anspruch 1, wobei der Hauptteil (4A) als eine Platte ausgestaltet ist.
3. Batterieanordnung (10) nach einem der Ansprüche 1 bis 2, wobei das erste Befestigungselement (19) eine erste Klebschicht (20) ist.
4. Batterieanordnung (10) nach einem der vorhergehenden Ansprüche, wobei das zweite Befestigungselement (21') zweite, elektrisch leitende Klebschicht(en) (21) umfasst, die mit dem ersten Eingangsanschluss (23) und/oder dem zweiten Ein-

gangsanschluss (27) verbunden ist bzw. sind.

5. Batterieanordnung (10) nach Anspruch 3, wobei die Batterieanordnung (10) eine entfernbare erste Schutzschicht (34) umfasst, welche die erste Klebschicht (20) abdeckt.
6. Batterieanordnung (10) nach einem der vorhergehenden Ansprüche, wobei die Batterieanordnung (10) die Batterie umfasst, welche ein Gehäuse mit einer oder mehreren Aktivierungsöffnungen aufweist, die mit einer Batterieaktivierungslasche (13) oder einem Teil der ersten Oberfläche (6) abgedichtet sind.
7. Batterieanordnung (10) nach Anspruch 4, wobei die Batterieanordnung (10) zweite Schutzschicht(en) (36) umfasst, welche die zweite(n) Klebschicht(en) (21) abdeckt bzw. abdecken.
8. Batterieanordnung (10) nach einem der vorhergehenden Ansprüche, wobei die Batterieanordnung (10) einen Aktivierungsteil zwischen einem Eingangsanschluss der elektronischen Schaltung (22) und einem Ausgangsanschluss der Batterie umfasst.
9. Batterieanordnung (10) nach einem der vorhergehenden Ansprüche, wobei der Hauptteil (4A) eine Leiterplatte ist.
10. Batterieanordnung (10) nach Anspruch 3, wobei die erste Klebschicht (20) so ausgelegt ist, dass sie an einem Hörgeräte-(3)-Gehäuse des Hörgeräts (3) haftet.
11. Batterieanordnung (10) nach einem der vorhergehenden Ansprüche, wobei der Hauptteil (4A) oder die Platte eine längliche Platte ist, welche ein erstes Ende und ein zweites Ende mit einer Länge im Bereich von 10 mm bis 50 mm aufweist.
12. Batterieanordnung (10) nach einem der vorhergehenden Ansprüche, wobei der Hauptteil (4A) oder die Platte eine Form aufweist, die aus einer T-förmigen, L-förmigen, I-förmigen oder kreuzförmigen Form besteht.
13. Verfahren zur Stromversorgung eines Hörgeräts (3) mit einer externen Batterie, während das Hörgerät (3) in Gebrauch ist und einen Hörausgleich durchführt, welches Verfahren umfasst:

- Bereitstellen einer Batterieanordnung (10) umfassend

- einen Hauptteil (4A), welcher mindestens eine erste Oberfläche (6) und eine zweite

- Oberfläche (8) aufweist und eine als eine induktive Spule (11) ausgebildete erste Elektrode (10) umfasst;
- ein erstes Befestigungselement (19) auf zumindest einem primären Teil der ersten Oberfläche (6) zur Befestigung des Hauptteils (4A) an einem Hörgerätegehäuse (106) des Hörgeräts (3);
 - ein zweites Befestigungselement (21') zur Befestigung einer Batterie am Hauptteil (4A); und
 - eine elektronische Schaltung (22), welche einen ersten Eingangsanschluss (23) und einen zweiten Eingangsanschluss (27) aufweist, die mit einem ersten Ausgangsanschluss (16) bzw. einem zweiten Ausgangsanschluss (18) der Batterie verbindbar sind, wobei die elektronische Schaltung (22) mit der ersten Elektrode (10) verbunden ist, um einen Gleichstrom von der Batterie in einen Wechselstrom in der induktiven Spule (11) umzuwandeln;
- Befestigen der Batterie am Hauptteil (4A) der Batterieanordnung (10); und
 - Aktivieren der Batterie.
- 14.** Verfahren nach Anspruch 13, wobei das Verfahren das Befestigen der Batterieanordnung (10) am Hörgerät (3) und das Ausrichten der ersten induktiven Spule auf eine induktive Spule (11) des Hörgeräts (3) umfasst.
- 15.** Verfahren nach Anspruch 14, wobei das Befestigen der Batterieanordnung (10) am Hörgerät (3) das Freilegen einer ersten Klebschicht (20) durch Entfernen einer die erste Klebschicht (20) abdeckenden ersten Schutzschicht (34) umfasst.
- Revendications**
- 1.** Ensemble de batterie (10) pour alimenter une prothèse auditive (3) lorsque la prothèse auditive (3) est utilisée et réalise une compensation auditive, l'ensemble de batterie (2) comprenant
- une partie principale (4A) ayant au moins une première surface (6) et une deuxième surface (8) et comprenant une première électrode (10) formée sous la forme d'une bobine inductive (11);
 - un premier élément de fixation (19) sur au moins une partie primaire de la première surface (6) pour fixer la partie principale (4A) à un boîtier de prothèse auditive (106) de la prothèse auditive (3);
 - un deuxième élément de fixation (21') pour fixer
- une batterie à la partie principale (4A); et
- un circuit électronique (22) ayant une première borne d'entrée (23) et une deuxième borne d'entrée (27) pouvant être connectées respectivement à une première borne de sortie (16) et à une deuxième borne de sortie (18) de la batterie, dans lequel le circuit électronique (22) est connecté à la première électrode (10), et dans lequel le circuit électronique (22) est configuré pour convertir le courant continu provenant de la batterie en courant alternatif dans la bobine inductive (11).
- 2.** Ensemble de batterie (10) selon la revendication 1, dans lequel la partie principale (4A) est réalisée sous la forme d'une feuille.
- 3.** Ensemble de batterie (10) selon l'une quelconque des revendications 1 à 2, dans lequel le premier élément de fixation (19) est une première couche adhésive (20).
- 4.** Ensemble de batterie (10) selon l'une quelconque des revendications précédentes, dans lequel le deuxième élément de fixation (21') comprend une ou plusieurs deuxième couches adhésives électriquement conductrices (21) connectées électriquement à la première borne d'entrée (23) et / ou à la deuxième borne d'entrée (27).
- 5.** Ensemble de batterie (10) selon la revendication 3, dans lequel l'ensemble de batterie (10) comprend une première feuille de protection amovible (34) recouvrant la première couche adhésive (20).
- 6.** Ensemble de batterie (10) selon l'une quelconque des revendications précédentes, dans lequel l'ensemble de batterie (10) comprend la batterie ayant un boîtier avec une ou plusieurs ouvertures d'activation obturées avec une languette d'activation de batterie (13) ou une partie de la première surface (6).
- 7.** Ensemble de batterie (10) selon la revendication 4, dans lequel l'ensemble de batterie (10) comprend une ou plusieurs deuxième feuilles de protection (36) recouvrant la ou les deuxième couches adhésives (21).
- 8.** Ensemble de batterie (10) selon l'une quelconque des revendications précédentes, l'ensemble de batterie (10) comprenant une partie d'activation entre une borne d'entrée du circuit électronique (22) et une borne de sortie de la batterie.
- 9.** Ensemble de batterie (10) selon l'une quelconque des revendications précédentes, dans lequel la partie principale (4A) est une carte de circuit imprimé.

10. Ensemble de batterie (10) selon la revendication 3, dans lequel la première couche adhésive (20) est configurée pour adhérer à un boîtier de prothèse auditive (3) de la prothèse auditive (3). 5
11. Ensemble de batterie (10) selon l'une quelconque des revendications précédentes, dans lequel la partie principale (4A) ou la feuille est une feuille allongée ayant une première extrémité et une deuxième extrémité avec une longueur dans la plage de 10 mm à 50 mm. 10
12. Ensemble de batterie (10) selon l'une quelconque des revendications précédentes, dans lequel la partie principale (4A) ou la feuille a une forme choisie parmi une forme en T, une forme en L, une forme en I ou une forme en croix. 15
13. Procédé pour alimenter une prothèse auditive (3) avec une batterie extérieure lorsque la prothèse auditive (3) est utilisée et réalise une compensation auditive, le procédé comprenant : 20
- la fourniture d'un ensemble de batterie (10) comprenant 25
 - une partie principale (4A) ayant au moins une première surface (6) et une deuxième surface (8) et comprenant une première électrode (10) formée sous la forme d'une bobine inductive (11) ; 30
 - un premier élément de fixation (19) sur au moins une partie primaire de la première surface (6) pour fixer la partie principale (4A) à un boîtier de prothèse auditive (106) de la prothèse auditive (3) ; 35
 - un deuxième élément de fixation (21') pour fixer une batterie à la partie principale (4A) ; et
 - un circuit électronique (22) ayant une première borne d'entrée (23) et une deuxième borne d'entrée (27) pouvant être connectées respectivement à une première borne de sortie (16) et à une deuxième borne de sortie (18) de la batterie, dans lequel le circuit électronique (22) est connecté à la première électrode (10) pour convertir le courant continu provenant de la batterie en courant alternatif dans la bobine inductive (11) ; 40
 - la fixation de la batterie à la partie principale (4A) de l'ensemble de batterie (10) ; et 45
 - l'activation de la batterie. 50
14. Procédé selon la revendication 13, dans lequel le procédé comprend la fixation de l'ensemble de batterie (10) à la prothèse auditive (3) et l'alignement de la première bobine inductive avec une bobine in-

ductive (11) de la prothèse auditive (3).

15. Procédé selon la revendication 14, dans lequel la fixation de l'ensemble de batterie (10) à la prothèse auditive (3) comprend l'exposition d'une première couche adhésive (20) en retirant une première feuille de protection (34) recouvrant la première couche adhésive (20). 55

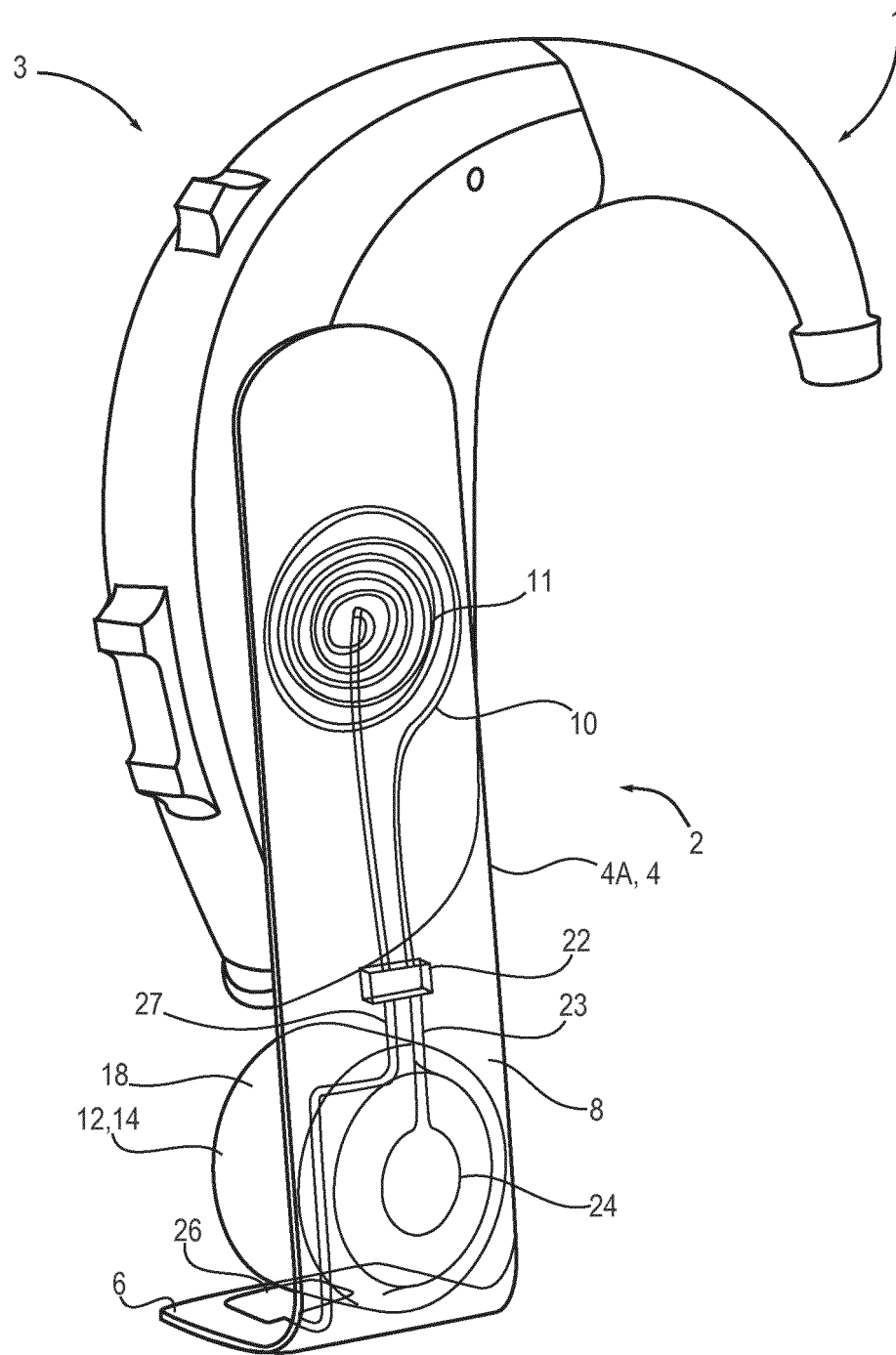
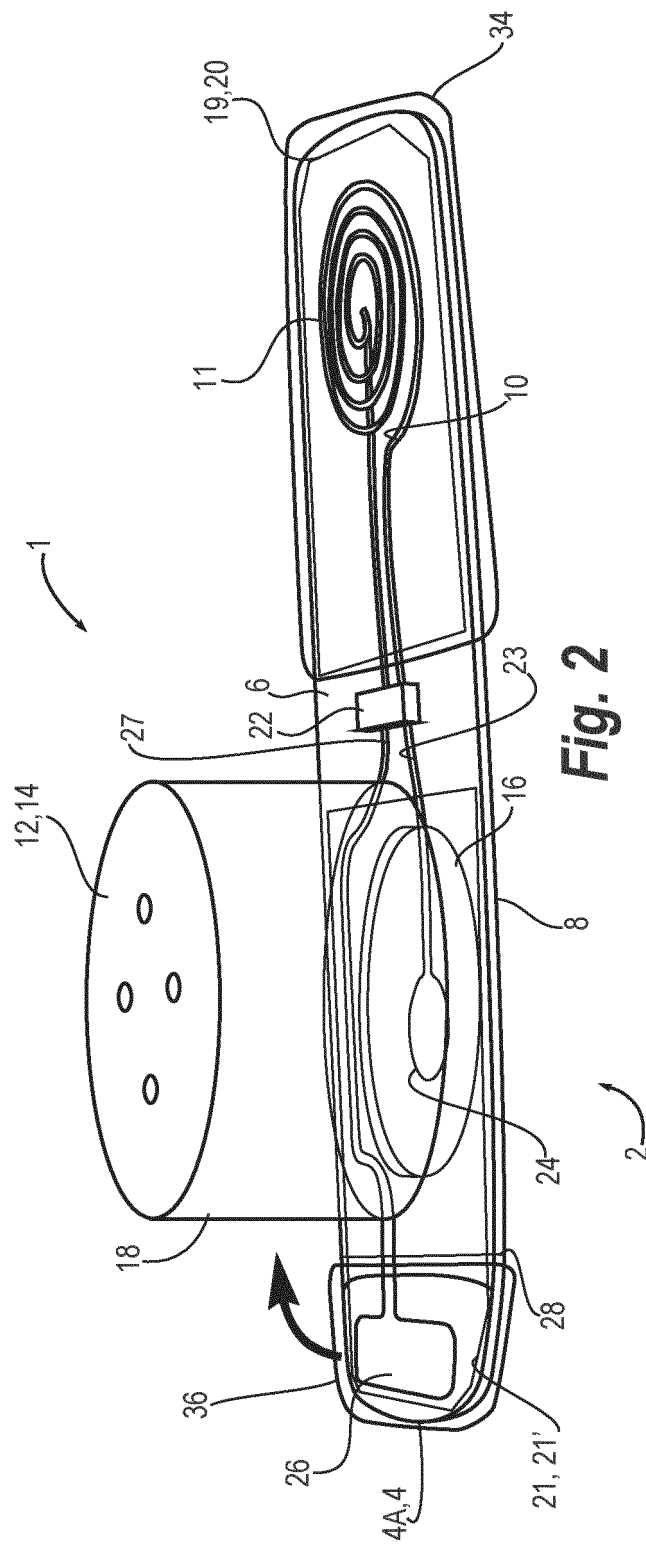
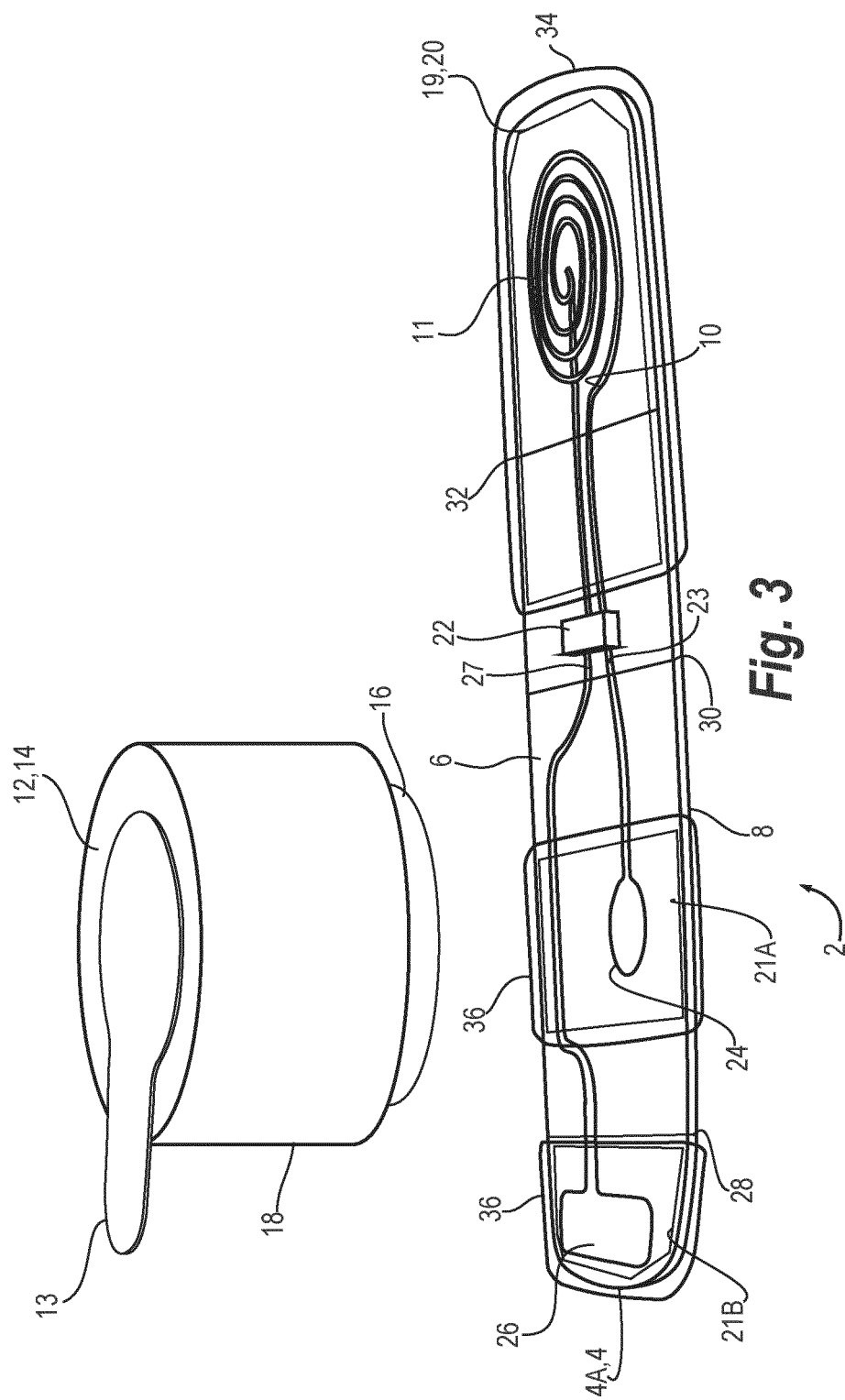


Fig. 1





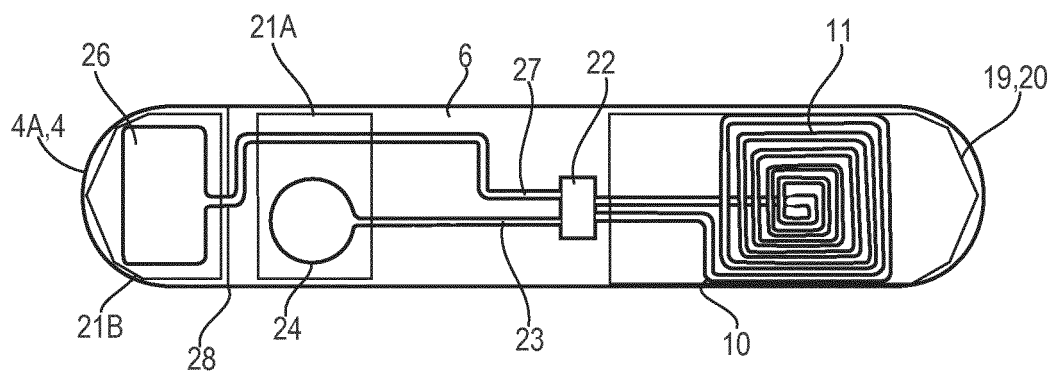


Fig. 4

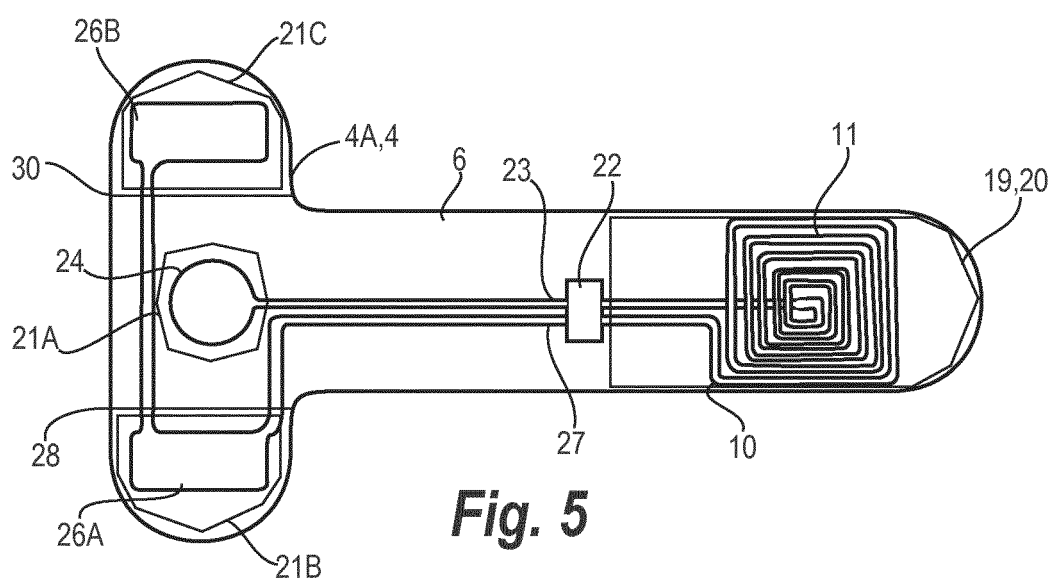


Fig. 5

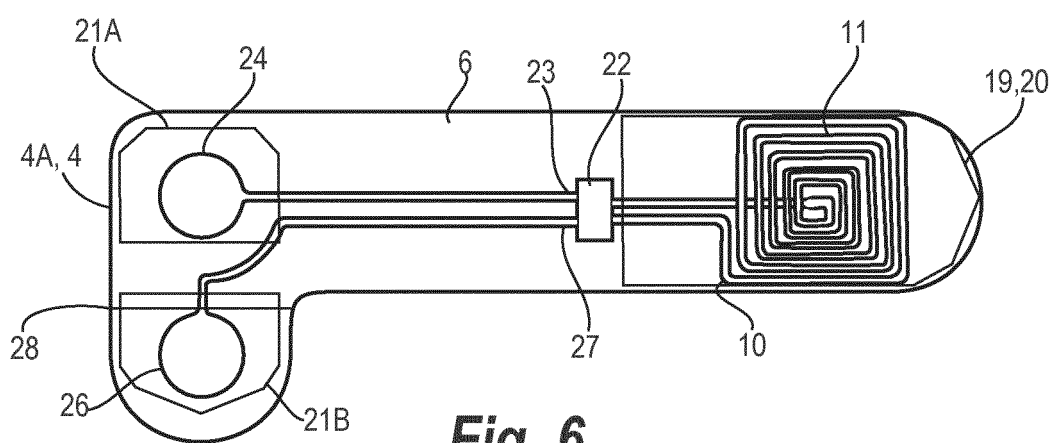


Fig. 6

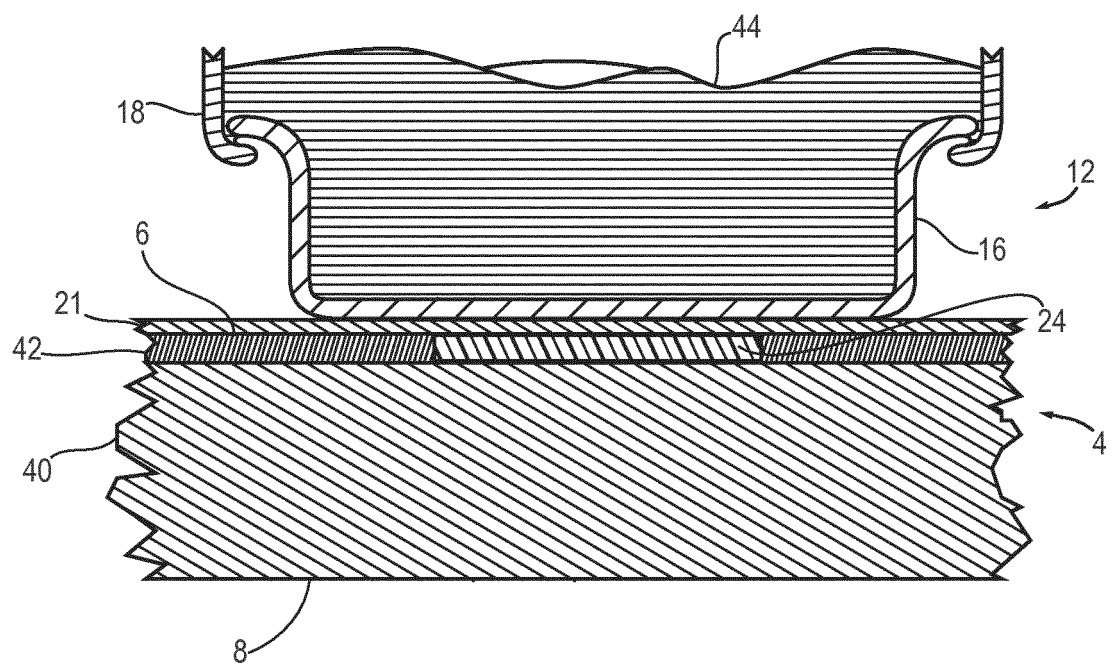


Fig. 7

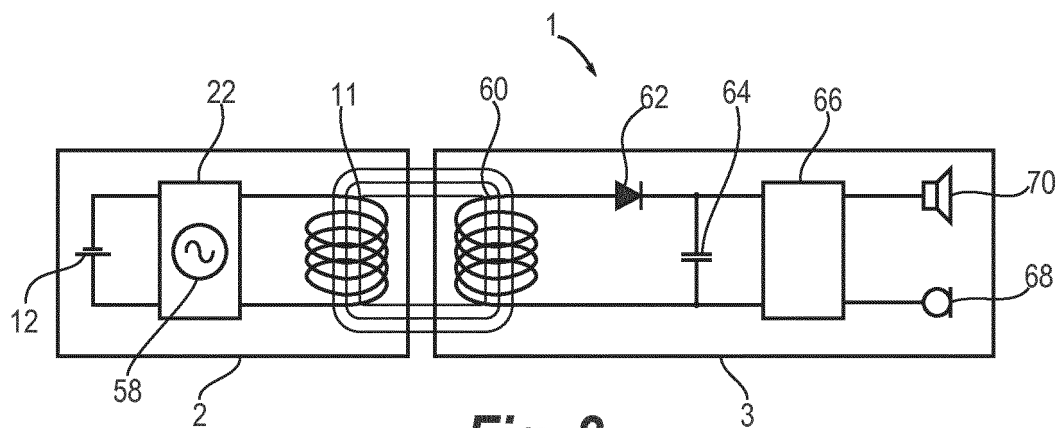


Fig. 8

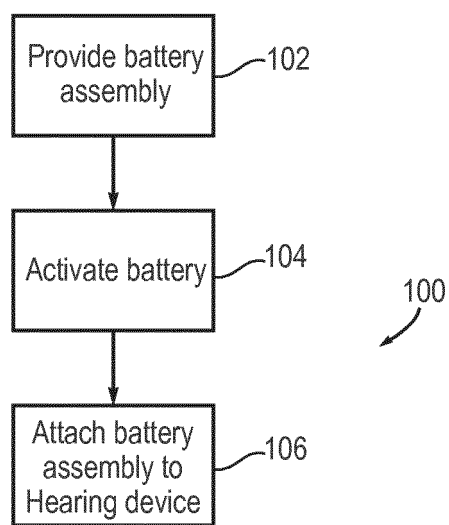


Fig. 9