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(54) **Title**: AED DEVICE

(57) **Abstract**: An AED device comprising at least one electrode pad, where said AED device is formed as a stiff or woven housing having a display and a sound emitting devise and accommodating an electrical system and the electrode pads. The electrode pads are positioned fixed in the housing i.e. non moveable I relation to the housing. In this way an AED device is provided that in use is easy and logical to use, where the whole AED device with fixed electrode pads can be placed on the breast of a patient, after which instructions in form of sounds and images are provided to a user operating the AED device

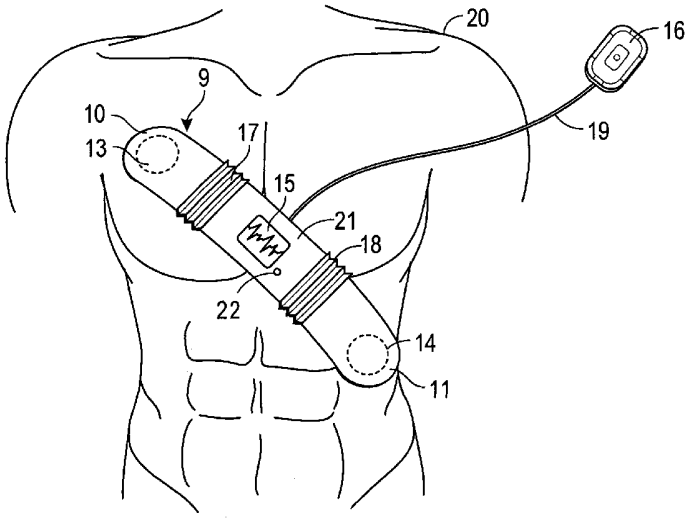

FIG. 2

WO 2017/020910 A1

AED device

This invention relates to an AED device that is stored in a packaging, and where the AED device comprises at least one electrode pad being located on the breast of a patient, where one or more electrode pads are connected to an electrical system being adapted to transmit an electrical pulse to the one or more electrode pads when an activating unit is activated, and where the AED device formed as a compact unit consisting of a housing in which a sound emitting device and a display are built-in.

WO 2010/111028 A1 discloses a pacemaker, where a more electrodes are positioned on a breast of a patient. In an embodiment, the pacemaker can be used as an AED device, but it is not explained precisely how. Nothing in the publication suggests, how the pacemaker can be used as an AED device.

US 8,798.743 B1 discloses an AED device where electrodes are positioned individually on the breast of a patient. Further the electrodes are connected to an independent electrical device by a wire.

WO 2014/088626 A1 discloses another compact AED device. In this AED device the electrodes are pulled out of a housing. Further the housing is equipped with a sound emitting device from which instructions can be transmitted to a user.

An AED device of the type defined in the preamble of claim 1 is known from EP 2 408 521 B1, in which the electrodes are positioned in each module, from those the electrode pads can be pulled out of each module and being positioned on a breast of a patient. Moreover, this known AED device is equipped with sound emitting device and a display.

On this background it is a purpose with the invention to provide an AED device, that is easy to operate and with minimal risk to wrongly operate and positioning the AED device.

The purpose is fulfilled with an AED device of the type defined in the preamble of claim 1, that is characterized in, that the housing is formed in a stiff or woven material and such that the one or more electrode pads and the electrical system are constructed such that the one or more electrode pads in the housing are fixed in the same position in the housing.
In this way an AED device is provided that in use is easy and logical to use, since the whole AED device shall be placed on the breast of a patient, after which instructions in form of sounds and images are provided.

Expedient embodiments of the invention are if, as stated in claim 2, that the AED device has two electrode pads, or as stated in claim 3, that the AED device has one electrode pad.

Further it is advantageous if, as stated in claim 4, that the housing has two end sections being connected to an intermediate section and where the electrode pads are positioned in the two end sections whereas the electrical system is poisoned in the intermediate section or in the end sections.

In case that the size of the breast differs from the normal size, it is advantageous if, as sated in claim 5, that at least a spunky element is positioned between the end sections and the intermediate section.

It is expedient if, as stated in claim 6, that the housing is formed oblong, or as stated in claim 7, that the geometry of the housing is formed as three straight parts.

Further it is expedient, if, as stated in claim 8, that the activating unit is formed with a connection wire to the electrical system or, as stated in claim 9, that the activating unit is formed with a wireless connection to the electrical system, such as a Bluetooth connection, an IR connection or other NFR connections.

Finally, it is expedient, if, as stated in claim 10, that the AED device is formed as a disposable device.

The invention will now be explained in connection with the drawing on which

Fig. 1 discloses a prior art AED device.

Fig. 2 discloses an AED device according to the invention in a first embodiment.

Fig 3 discloses a preferred second embodiment of the AED device according to the invention, whereas

Fig. 4 discloses an AED device according to the invention in a third embodiment.

The AED device illustrated on fig. 1 is in its entirety denoted 1. 4 and 5 denotes electrode pads, that via connection parts 2,3 are connected to each other.

Through the connection parts 2,3 wires are led, where one wire is denoted 8 in an area where the connection between the connection part 3 and the electrode pad 4 can be extended. From the connection part 2 a wire 6 is lead being connected to an electric unit 7 having a display 7a and a sound emitting device 7b. The AED device works on the way such that when the electrode pads are positioned on the breast of a patient 20, the electric unit is activated for transferring a pulse, (current impulse) to the electrode pads 4,5. The entire process is settled with that on the display information is transmitted to a user that operates the AED device, and further what the user shall do.

The connection part 2 is positioned in an area, where it is possible for a user to give heart massage. Further the connection parts can be equipped with a sensor, being able to registration whether the heart massage activity is performed correct.

Having regard to fig. 2 and fig. 3, it will be explained how the AED device is constructed in a first embodiment and a variant of the first embodiment.

As it can be seen on fig. 2 the AED device consists of a housing 9, that can be rigid although it can be formed in a woven material.
Inside the housing all necessary electronics are accommodated in the housing 9.
The housing on fig 2 is shown with an oblong form, being constructed of two end sections 10,11 being connected to each other by an intermediate section 21. Under the end sections 10,11 electrode pads 13, 14 are placed. 17, 18 denotes spunky elements, that makes it possible to adjust the length of the housing 9, corresponding to the size of a patient's breast. In most cases it is not necessary to adjust the length, meaning that the spunky elements are not ultimate necessary to incorporate in the housing 9
Moreover 15 denotes a display having a sound emitting device, said display on the figure is placed centrally but can also be placed f. inst. in one of the end sections 10,11. In the latter case the area in the intermediate section can be used to mounting of sensors monitoring heart rhythm, pressure and the possibility to guide the correct heart massage and further having makings for indication of pressure places by heart massage, or it can be formed with a thin part for providing heart massage.
Finally, 16 denotes a push button that via a wire 19 is connected to in the housing built in electronic unit, that function as the prior art electrical unit on fig. 1, said push button function to electrical activation of pulse emission.

On fig. 3 the preferred embodiment of the invention is seen. It differs from fig. 2 in the geometry of the AED device, as shown, with three straight parts with a middle part 21 being connected to two parts 10,11 perpendiculars to the middle part. In the same way, as explained in connection with fig. 2, there can be provided sensors at the area 23 reading heart rhythm, deep of a user´s massage pressure and possibility to correct optimal heart rhythm, said sensors can be connected by a wire or wireless to the electrical unit, that in turn informs whether the user do the heart massage correct. As shown on fig. 3 the

AED device have two displays 15, but it is of course also possible to have only one display. The electrical unit can be mounted in the middle part 21 or where it is appropriate.

Moreover, it is possible for both fig. 2 and 3 embodiments, via a wireless connection, to establish connection from the electrical unit to an external unit by which it is possible to survey and/or control/operate f. inst. a prehospital staff.

The AED device as described in the figures 2 and 3 in relation to fig. 1 is that the electrode pads in the housing 9 are fixed mounted, and that the electrical unit is built in the housing 9.

This means that a user operating the AED device with few instructions and actions can position the AED device correct and safe control it including operate the same with a great overview.

The embodiment differs from those on fig. 2 and 3 in that only one electrode pad is used. As it can be seen the AED device consists of a compact housing 9a having a display 15b including a sound emitting device and a push bottom 16a.

The electrical unit inside the housing is able to control the only electrode pad in order to lead it function as if there were two electrodes.

Another possibility is to construct the only electrode as two parts being connected together with an isolation material.

Claims

1. AED device that is stored in a packaging, and where the AED device comprises at least one electrode pad being located on the breast of a patient, where one or more electrode pads are connected to an electrical system being adapted to transmit an electrical pulse to the one or more electrode pads when an activating unit is activated, and where the AED device formed as a compact unit consisting of a housing in which a sound emitting device and a display are built-in, **characterised in**, that the housing is formed in a stiff or woven material and such that the one or more electrode pads and the electrical system are constructed such that the one or more electrode pads in the housing are fixed in the same position in the housing.

2. AED device according to claim 1, **characterised in**, that the AED device has two electrode pads.

3. AED device according to claim 1, **characterised in**, that the AED device has one electrode pad.

4. AED device according to claim 1 - 2, **characterised in**, that the housing has two end sections being connected to an intermediate section and where the electrode pads are positioned in the two end sections whereas the electrical system is poisoned in the intermediate section or in the end sections.

5. AED device according to claim 1 – 2 or 4, **characterised in**, that at least a spunky element is positioned between the end sections and the intermediate section.

6. AED device according to claim 1 - 5, **characterised in**, that the housing is formed oblong.

7. AED device according to claim 1 - 5, **characterised in**, that the geometry of the housing is formed as three straight parts.

8. AED device according to claim 1 - 7, **characterised in**, that the activating unit is formed with a connection wire to the electrical system.

9. AED device according to claim 1 - 8, **characterised in**, that the activating unit is formed with a wireless connection to the electrical system, such as a Bluetooth connection, an IR connection or other NFR connections.

10. AED device according to claim 1 - 5, **characterised in**, that the AED device is formed as a disposable device.

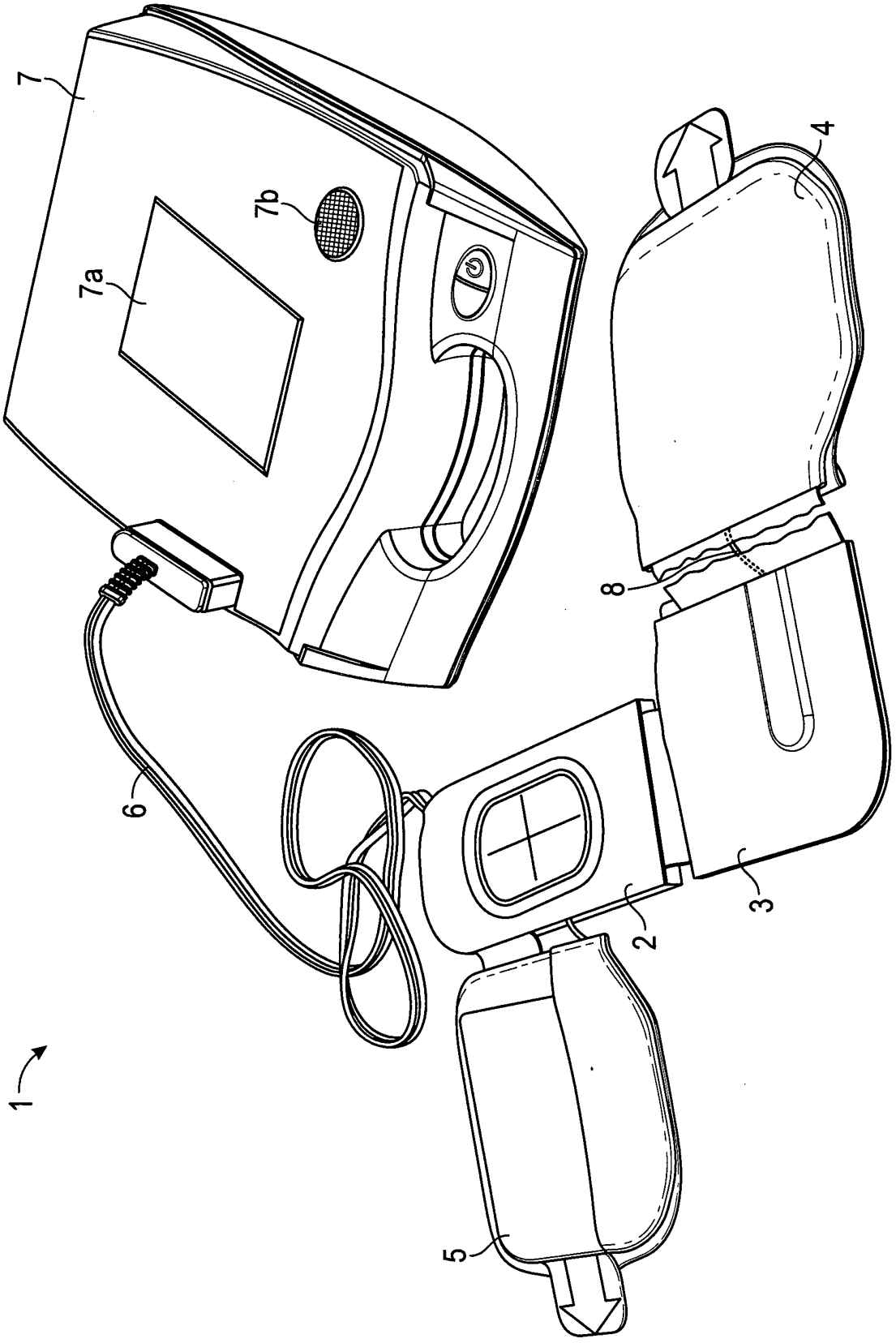

FIG.1 (Prior Art)

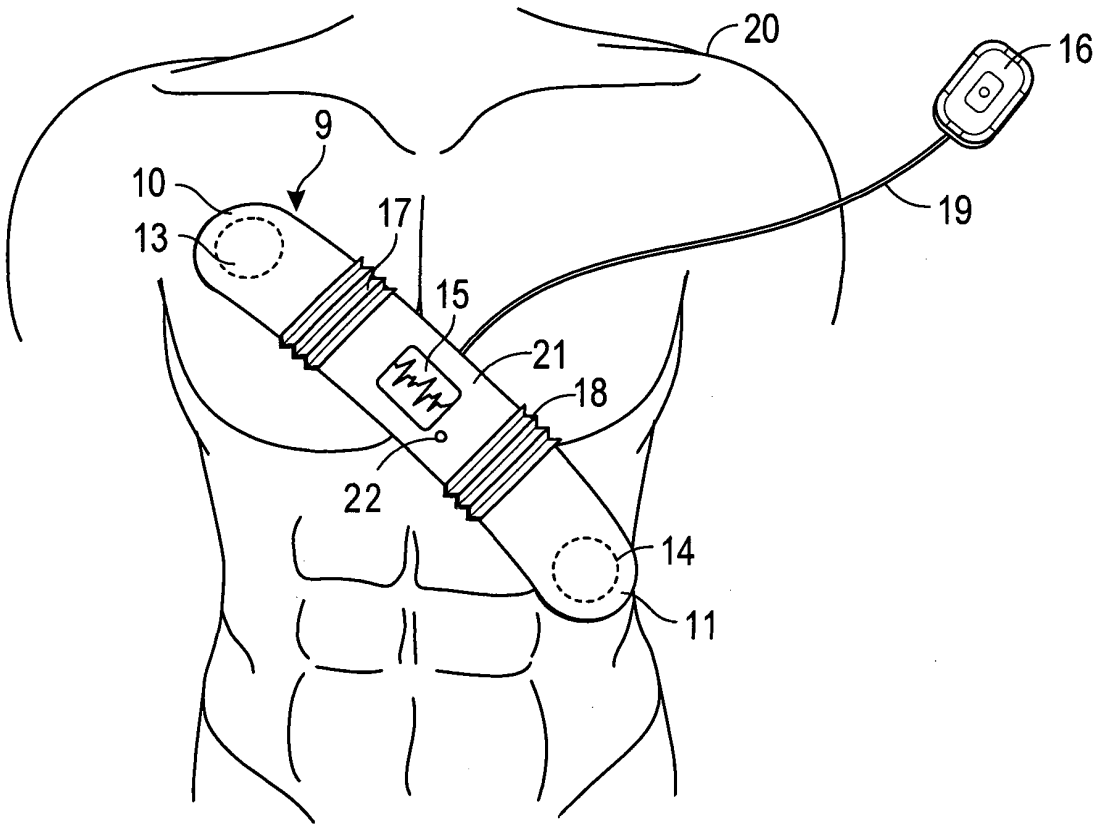

FIG. 2

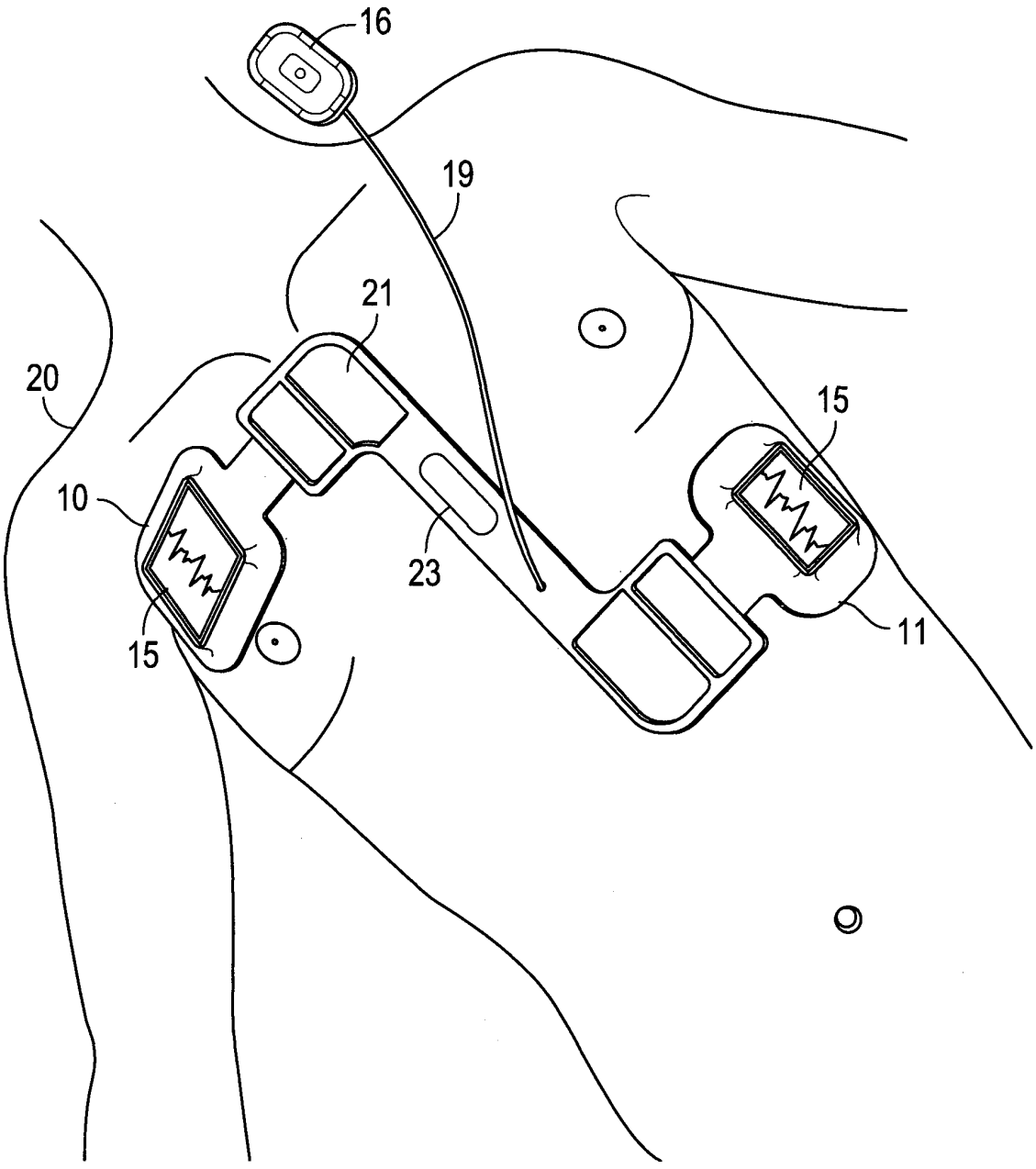

FIG. 3

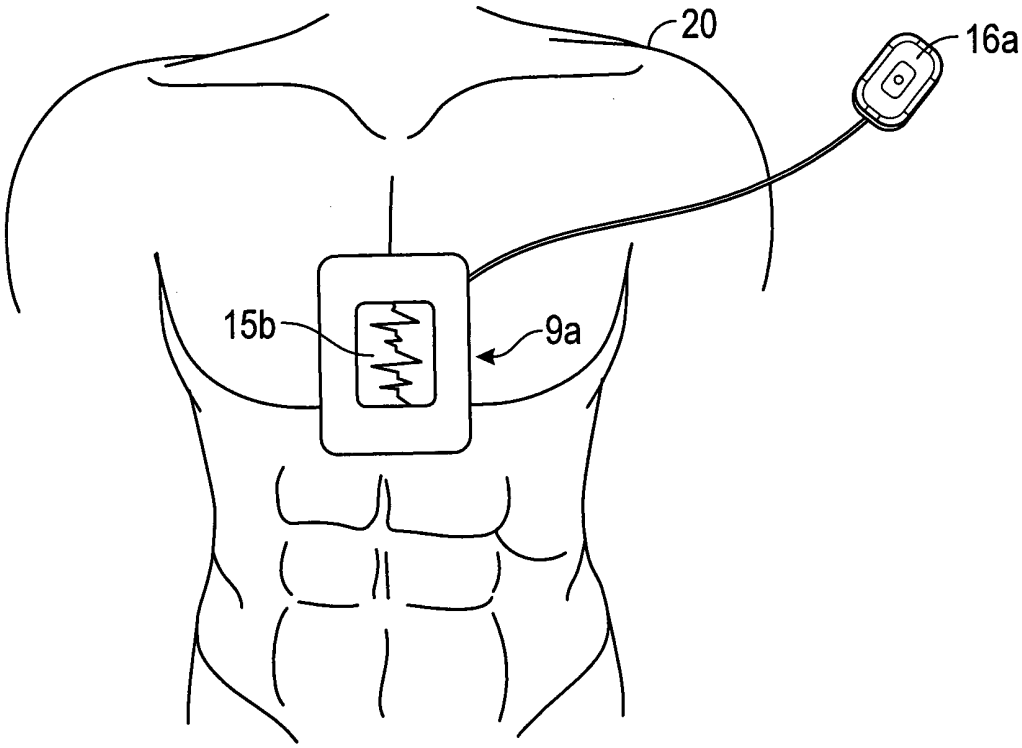

FIG. 4

INTERNATIONAL SEARCH REPORT

International application No
PCT/DK2016/000021

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61N1/39
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)
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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2011/288606 A1 (KUMAR UDAY N [US]) 24 November 2011 (2011-11-24) abstract; figures 1-3 paragraph [0003] paragraph [0020] - paragraph [0022] paragraph [0031] - paragraph [0036] paragraph [0040] - paragraph [0042] -----	1-6,8-10
X	US 2014/222096 A1 (HU YU-FENG [TW] ET AL) 7 August 2014 (2014-08-07) abstract; figures 1-3 paragraph [0002] paragraph [0009] - paragraph [0010] paragraph [0024] - paragraph [0026] paragraph [0028] - paragraph [0030] -----	1-5,7-10

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

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"&" 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 August 2016	12/08/2016

Name and mailing address of the ISA/	Authorized officer
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2

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No
PCT/DK2016/000021

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 2010/241181 A1 (SAVAGE WALTER T [US] ET AL) 23 September 2010 (2010-09-23) the whole document	1-10
A	US 4 023 573 A (PANTRIDGE JAMES FRANCIS ET AL) 17 May 1977 (1977-05-17) the whole document	1-10
A	WO 2012/151160 A1 (ZOLL MEDICAL CORP [US]; KAIB THOMAS E [US]; OSKIN EMIL [US]; SKALOS PH) 8 November 2012 (2012-11-08) the whole document	1-10
A	WO 2010/111028 A1 (CARDIAC PACEMAKERS INC [US]; SHUROS ALLAN C [US]; MOKELKE ERIC A [US];) 30 September 2010 (2010-09-30) the whole document	1-10

2

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/DK2016/000021

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2011288606 A1	24-11-2011	US 2008033495 A1	07-02-2008
		US 2011288606 A1	24-11-2011
US 2014222096 A1	07-08-2014	TW 201431579 A	16-08-2014
		US 2014222096 A1	07-08-2014
US 2010241181 A1	23-09-2010	CN 102427851 A	25-04-2012
		EP 2408521 A2	25-01-2012
		JP 5563652 B2	30-07-2014
		JP 2012520738 A	10-09-2012
		US 2010241181 A1	23-09-2010
		US 2014039593 A1	06-02-2014
		US 2014039594 A1	06-02-2014
		US 2014324113 A1	30-10-2014
		WO 2010107707 A2	23-09-2010
US 4023573 A	17-05-1977	DE 7534247 U	02-09-1976
		FR 2289166 A1	28-05-1976
		GB 1481469 A	27-07-1977
		US 4023573 A	17-05-1977
WO 2012151160 A1	08-11-2012	EP 2704625 A1	12-03-2014
		JP 2014516654 A	17-07-2014
		US 2012283794 A1	08-11-2012
		WO 2012151160 A1	08-11-2012
WO 2010111028 A1	30-09-2010	US 2010249860 A1	30-09-2010
		WO 2010111028 A1	30-09-2010