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(54) **UNIPOLAR REFERENCE ELECTRODE FOR ELECTROPHYSIOLOGY MAPPING CATHETER**

(57) An apparatus includes a shaft and an end effector at a distal end of the shaft. The end effector has a distal end and a proximal end with a longitudinal intermediate point between the distal and proximal ends. The end effector is sized to fit in an anatomical passageway within a cardiovascular system. The end effector includes at least one sensor electrode and a reference electrode. The at least one sensor electrode is configured to contact

cardiovascular tissue and thereby pick up potentials. The reference electrode is configured to pick up a potential from fluid in contact with the reference electrode. The reference electrode is located proximal to the longitudinal intermediate point of the end effector. The end effector is configured to prevent the reference electrode from contacting tissue.

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EUROPEAN SEARCH REPORT

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| X | EP 2 641 556 A1 (BIOSENSE WEBSTER ISRAEL LTD [IL]) 25 September 2013 (2013-09-25) * the whole document * ----- | 1-9 | |
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| | | | TECHNICAL FIELDS SEARCHED (IPC) |
| | | | A61N |
| -The present search report has been drawn up for all claims | | | |
| Place of search Munich | | Date of completion of the search 27 November 2019 | Examiner Lins, Stephanie |
| <p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p> | | | |

EPO FORM 1503 03 02 (P04C01)



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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

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Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

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No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

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LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

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see sheet B

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All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

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As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

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Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

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None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

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The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).



**LACK OF UNITY OF INVENTION
SHEET B**

Application Number
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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

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1. claims: 1-9

An apparatus including a pair of spines

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2. claims: 10, 11

An apparatus including a sensor electrode

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3. claims: 12-14

An apparatus including an electrode cover member

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ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

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| 专利名称(译) | 用于电生理成像导管的单极参考电极 | | |
| 公开(公告)号 | EP3603493A3 | 公开(公告)日 | 2020-04-15 |
| 申请号 | EP2019189827 | 申请日 | 2019-08-02 |
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| IPC分类号 | A61B5/00 A61B18/00 A61B18/12 | | |
| CPC分类号 | A61B5/0422 A61B18/12 A61B18/1492 A61B2018/00351 A61B2018/00595 A61B2018/1253 A61B2018/1467 A61B5/6858 A61B5/6859 A61B2018/0016 A61B2018/00214 A61B2018/00357 A61B2018/00577 A61B2018/00839 A61B2018/00875 A61B18/1206 A61B2018/126 | | |
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| 外部链接 | Espacenet | | |

摘要(译)

一种设备，包括轴和在轴的远端处的末端执行器。末端执行器具有远端和近端，在远端和近端之间具有纵向中间点。末端执行器的尺寸适合于心血管系统内的解剖学通道。末端执行器包括至少一个传感器电极和参考电极。所述至少一个传感器电极被配置为接触心血管组织，从而吸收电势。基准电极被配置为从与基准电极接触的流体中拾取电位。参比电极位于末端执行器的纵向中间点附近。末端执行器被配置为防止参考电极接触组织。

| DOCUMENTS CONSIDERED TO BE RELEVANT | | Relevant to claim | CLASSIFICATION OF THE APPLICABLE IPC CLASS |
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| A | US 2016/143588 A1 (HOITINK RYAN [US] ET AL) 26 May 2016 (2016-05-26) * the whole document * | 7-9 | |
| -The present search report has been drawn up for all claims- | | | |
| Munich | | 27 November 2019 | Lins, Stephanie |
| CATEGORY OF CITED DOCUMENTS X: particularly relevant if taken alone E: document of the same category with another relevant document A: international publications P: prior art documents | | | |
| I: theory or principle underlying the invention F: patent document for publication, or D: other literature L: documents used for other reasons A: member of the same patent family, corresponding document | | | |