US 20180035908A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2018/0035908 A1**

WEI (43) **Pub. Date: Feb. 8, 2018**

(54) **ELECTROCARDIOGRAM MEASURING DEVICE**

(71) Applicant: **EKG TECHNOLOGY LAB, INC.**, Funabashi-shi (JP)

(72) Inventor: **DAMING WEI**, Funabashi-shi (JP)

(21) Appl. No.: **15/667,179**

(22) Filed: **Aug. 2, 2017**

(30) **Foreign Application Priority Data**

Aug. 5, 2016 (JP) 2016-154434

Publication Classification

(51) **Int. Cl.**

A61B 5/0408 (2006.01)

A61B 5/00 (2006.01)

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

CPC ***A61B 5/04085*** (2013.01); ***A61B 5/6804*** (2013.01); ***A61B 5/6891*** (2013.01)

(57) **ABSTRACT**

An electrocardiogram measuring device includes: chest measuring electrodes **113** that acquire electrocardiographic signals of a chest; a T-shirt **100** having an attachment holes of the chest measuring electrodes opened; a chair **200** on which limb measuring electrodes **212** and **214** that acquire electrocardiographic signals of limbs are arranged; and an electrocardiogram generating unit **310** that generates an electrocardiogram of a subject from the electrocardiographic signals of the chest and the limbs respectively acquired by the chest measuring electrodes attached to a body surface of the subject through the attachment holes of the T-shirt **100** and the limb measuring electrodes with which both hands and feet of the subject are brought into contact.

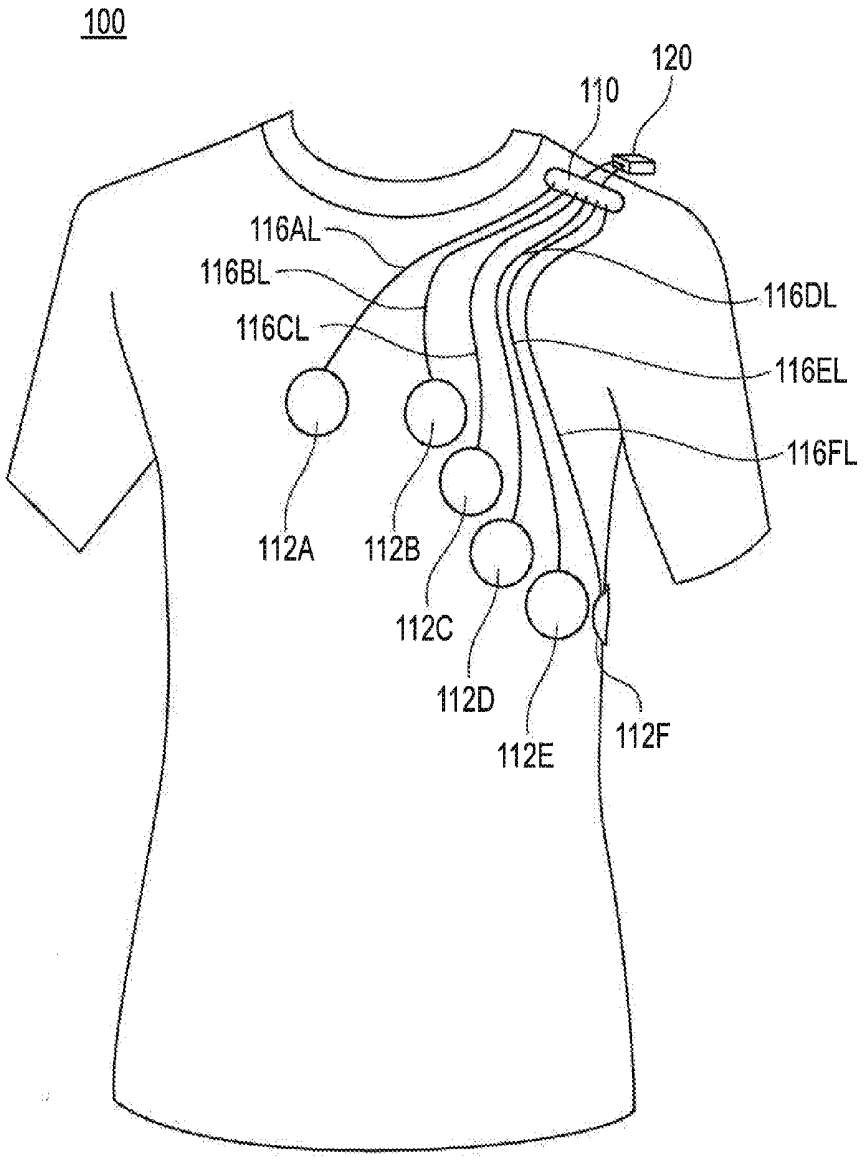


FIG.1

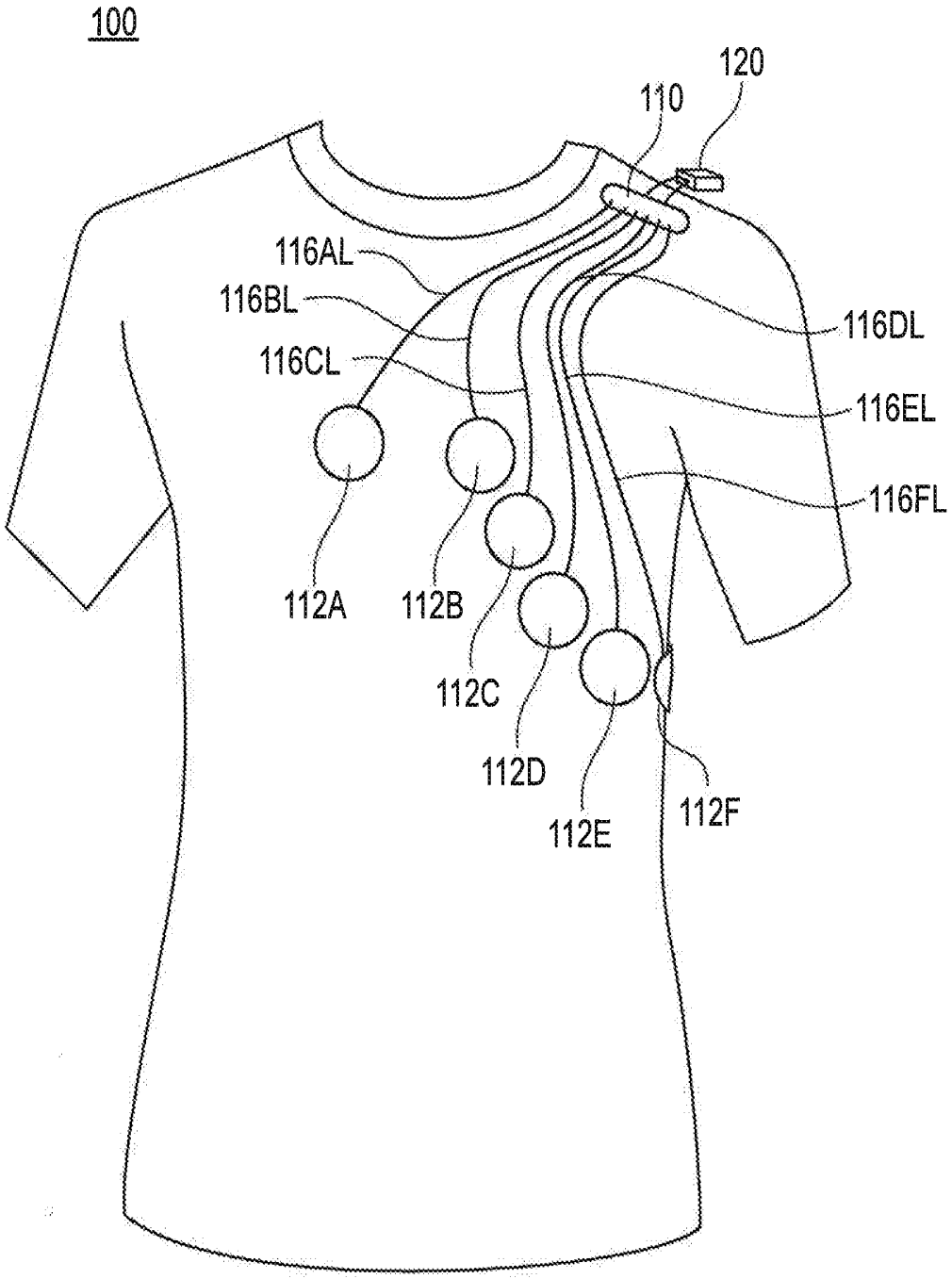

100
120
110
116AL
116BL
116CL
116DL
116EL
116FL
112A
112B
112C
112D
112E
112F

FIG.2

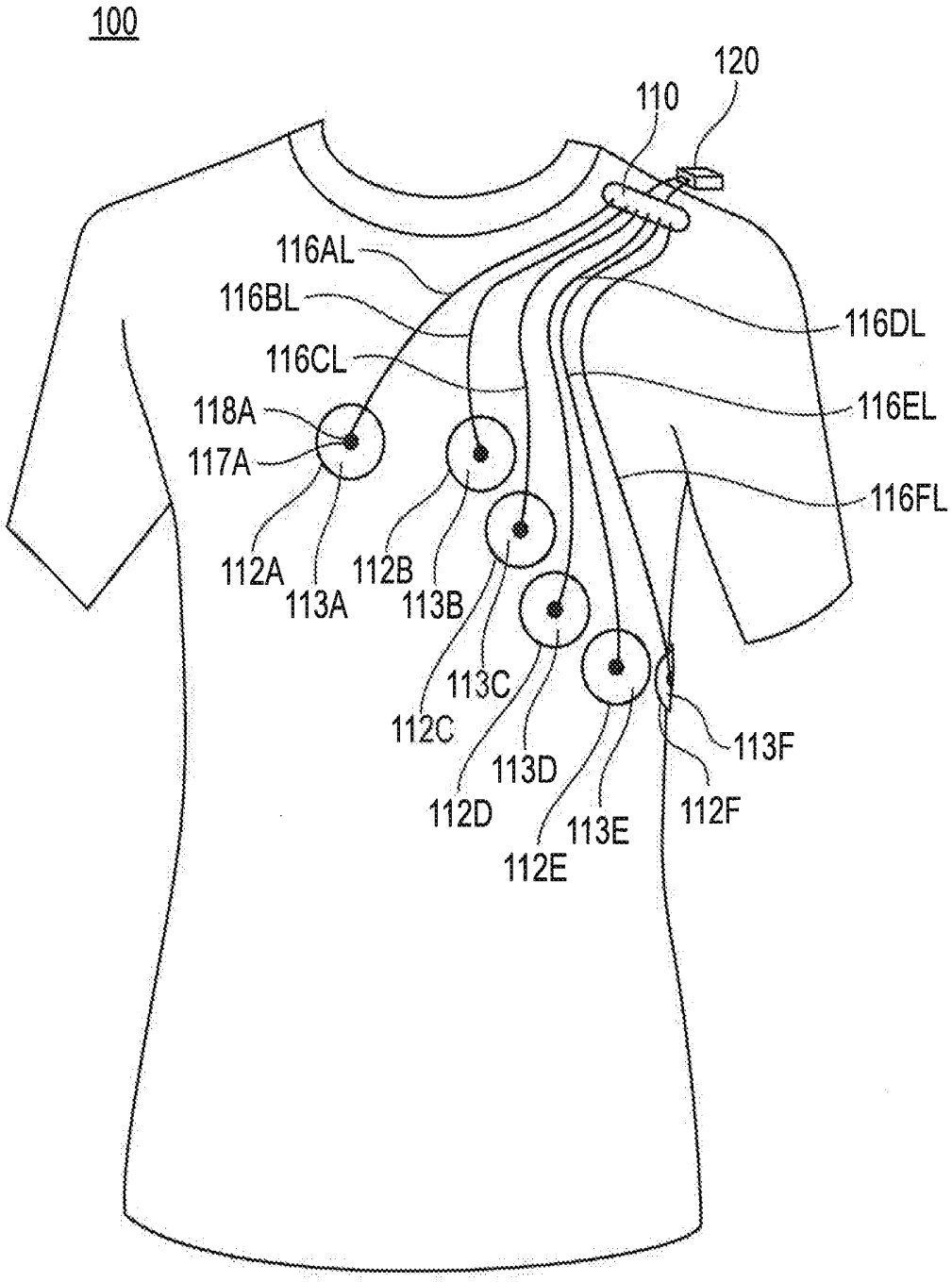

100
120
110
116AL
116BL
116CL
116DL
116EL
116FL
118A
117A
112A
113A
112B
113B
113C
112C
113D
112D
113E
112E
113F
112F

FIG.3

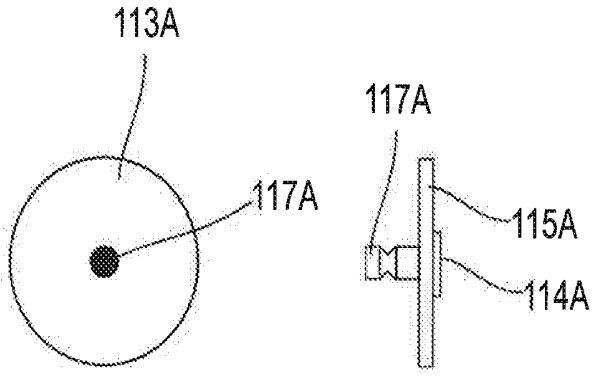


FIG.4

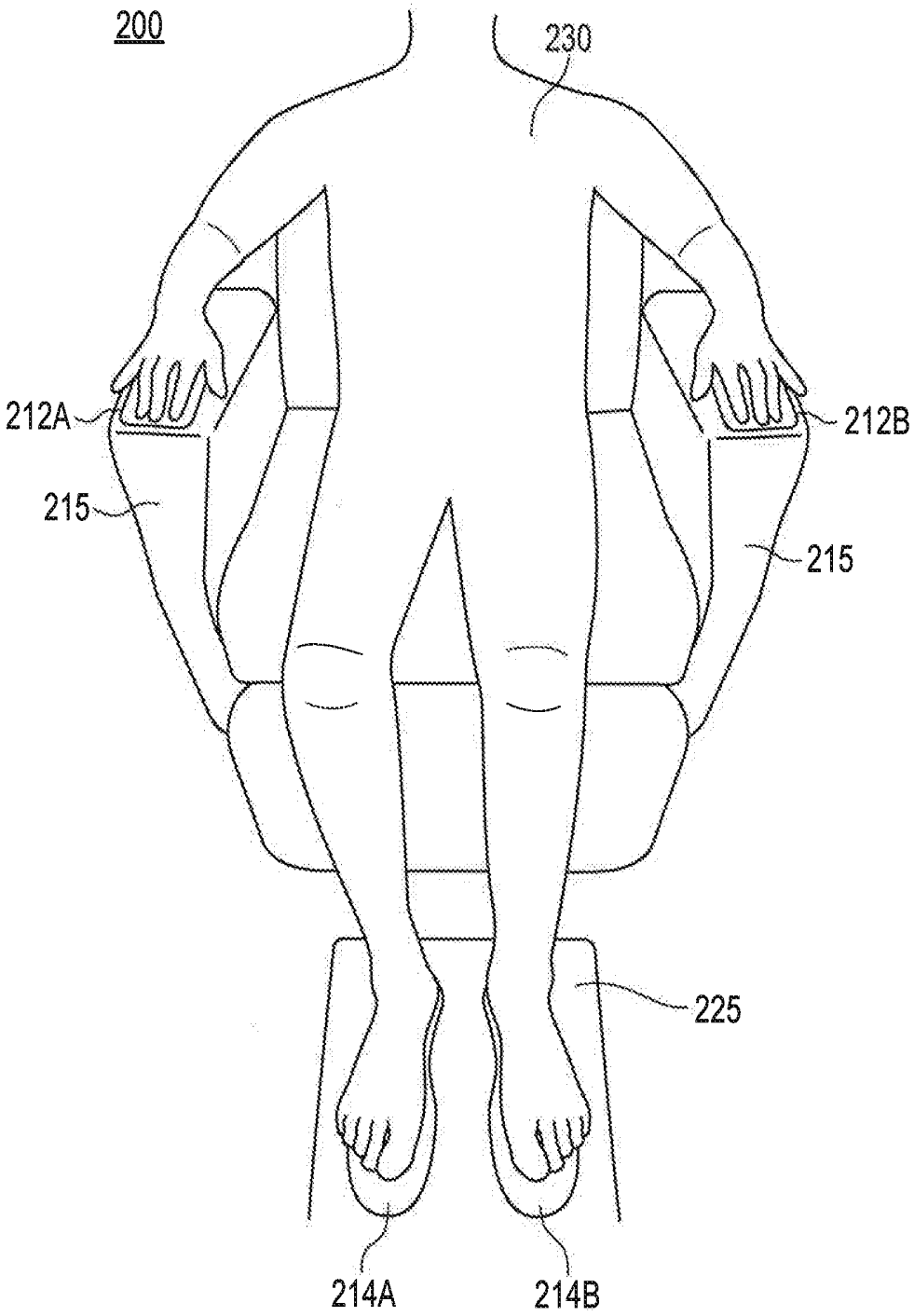


FIG.5

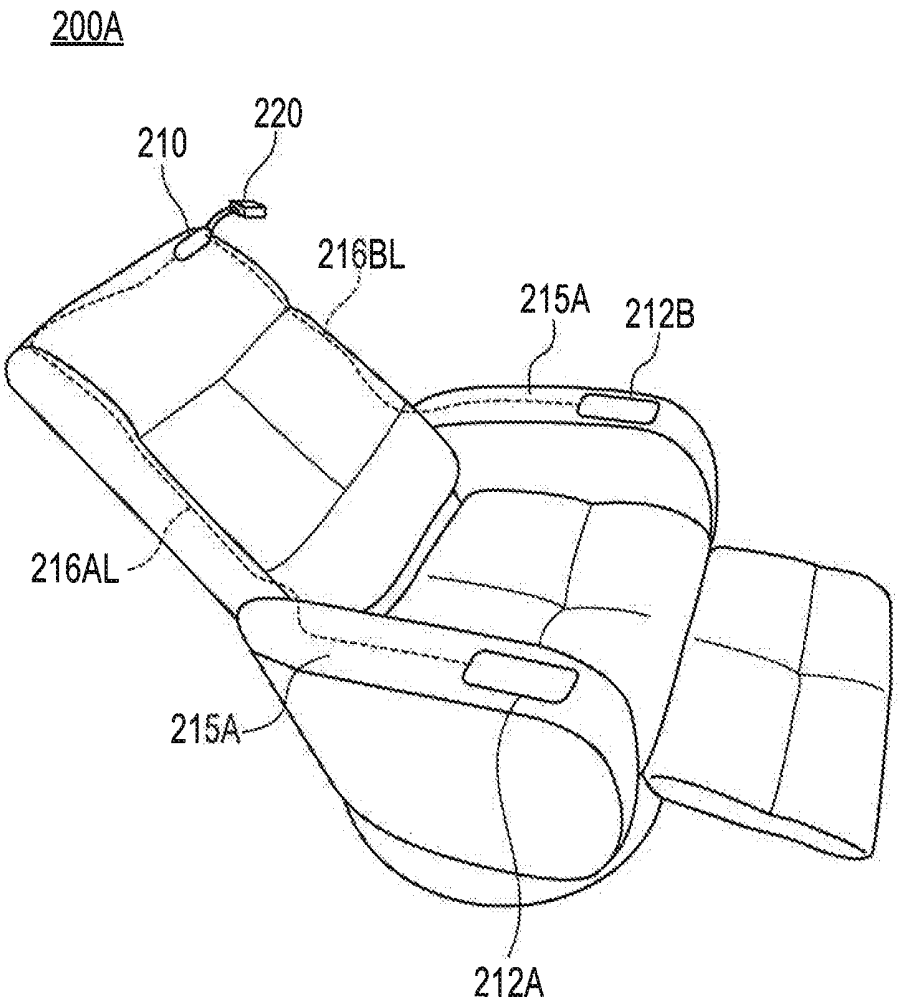


FIG.6

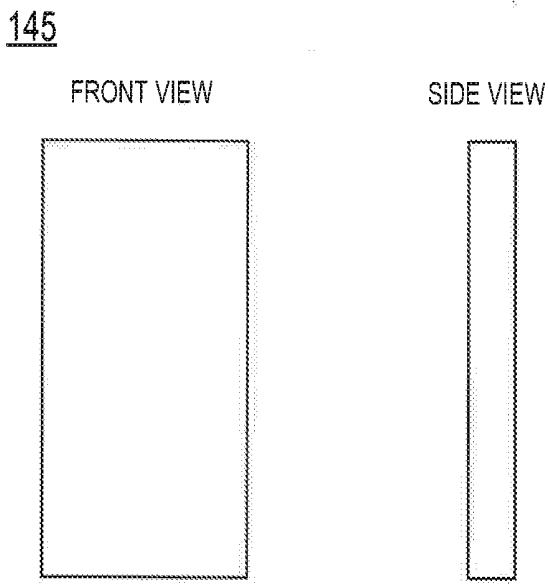


FIG.7

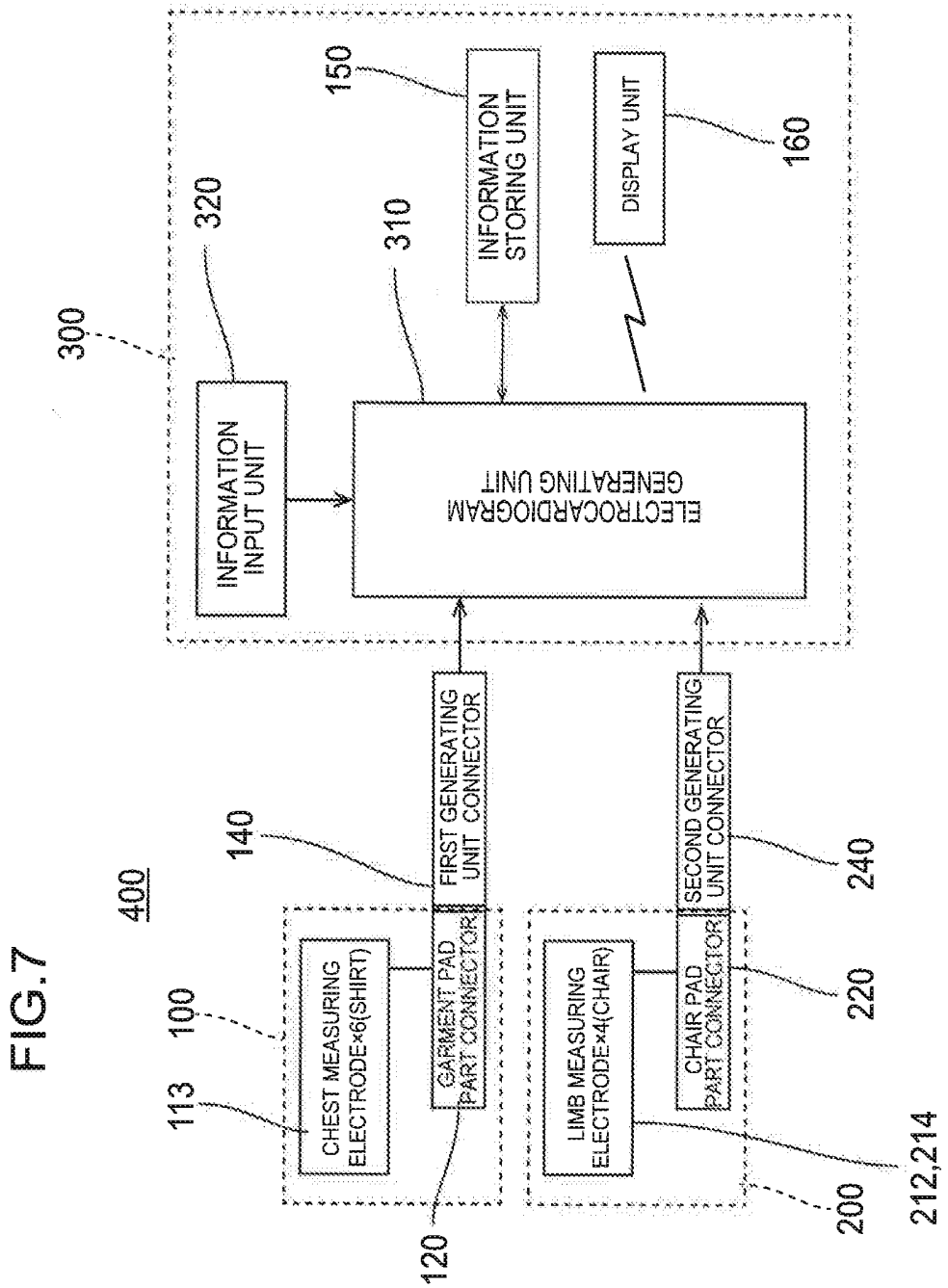
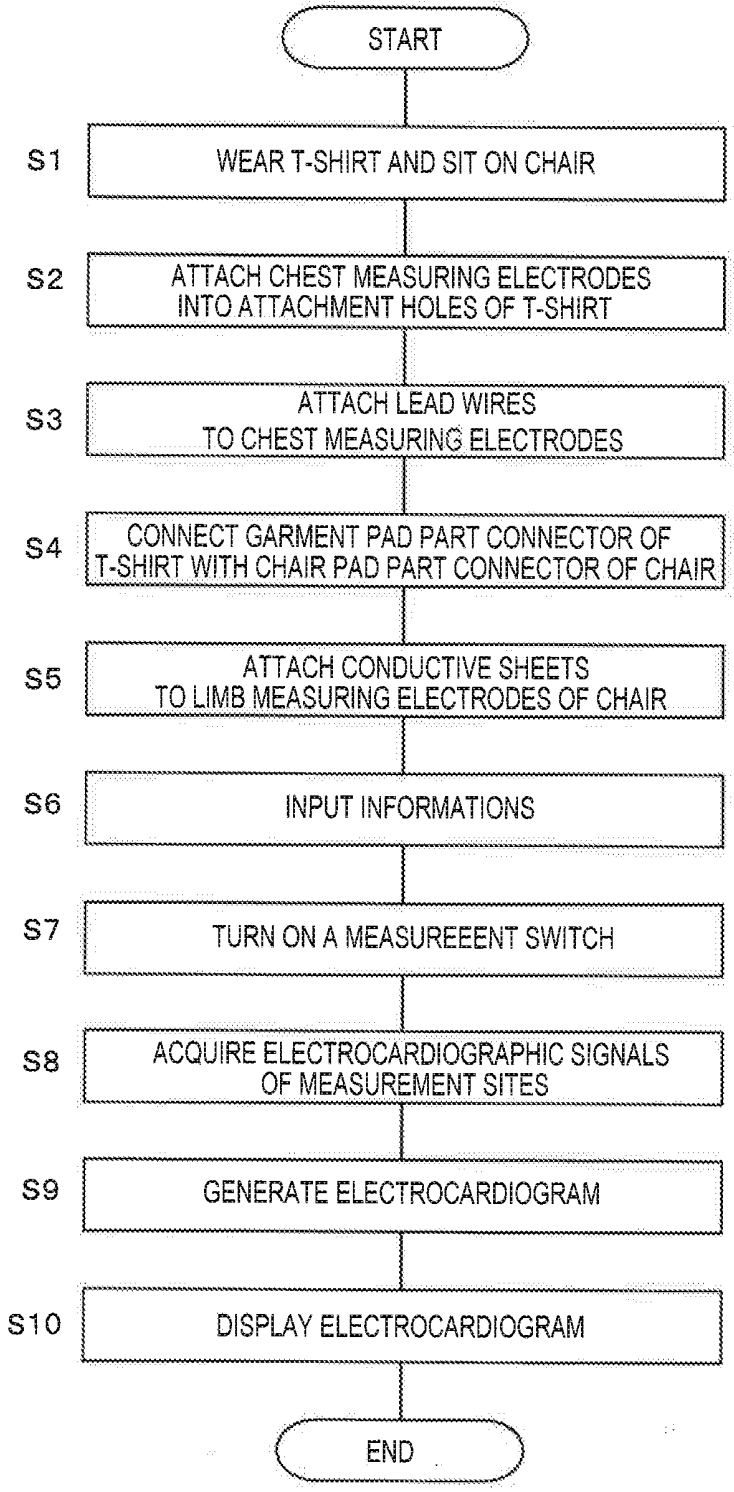

400
300
320
310
150
160
INFORMATION INPUT UNIT
ELECTROCARDIOGRAM GENERATING UNIT
INFORMATION STORING UNIT
DISPLAY UNIT
140
240
FIRST GENERATING UNIT CONNECTOR
SECOND GENERATING UNIT CONNECTOR
100
113
CHEST MEASURING ELECTRODE×6(SHIRT)
GARMENT PAD PART CONNECTOR
LIMB MEASURING ELECTRODE×4(CHAIR)
CHAIR PAD PART CONNECTOR
220
120
200
212,214

FIG.8


START
S1
WEAR T-SHIRT AND SIT ON CHAIR
S2
ATTACH CHEST MEASURING ELECTRODES INTO ATTACHMENT HOLES OF T-SHIRT
S3
ATTACH LEAD WIRES TO CHEST MEASURING ELECTRODES
S4
CONNECT GARMENT PAD PART CONNECTOR OF T-SHIRT WITH CHAIR PAD PART CONNECTOR OF CHAIR
S5
ATTACH CONDUCTIVE SHEETS TO LIMB MEASURING ELECTRODES OF CHAIR
S6
INPUT INFORMATIONS
S7
TURN ON A MEASUREEENT SWITCH
S8
ACQUIRE ELECTROCARDIOGRAPHIC SIGNALS OF MEASUREMENT SITES
S9
GENERATE ELECTROCARDIOGRAM
S10
DISPLAY ELECTROCARDIOGRAM
END

ELECTROCARDIOGRAM MEASURING DEVICE

CROSS-REFERENCE TO RELATED APPLICATION

[0001] The present application claims priority under 35 U.S.C. § 119 to Japanese Patent Application No. 2016-154434, filed Aug. 5, 2016. The contents of this application are incorporated herein by reference in their entirety.

BACKGROUND

1. Technical Field

[0002] The present invention relates to an electrocardiogram measuring device with which a subject can take an electrocardiogram by him/herself.

2. Description of Related Arts

[0003] Generally, as an electrocardiogram, a 12-lead electrocardiogram is used as an industry standard. When the 12-lead electrocardiogram is taken, a subject lies on a simple bed, and a measurer attaches electrodes for limb lead measurement to four positions, both wrists and both ankles, and electrodes for chest lead measurement to predetermined six positions of a chest of the subject, respectively.

[0004] In this way, since it is necessary that the measurer attaches the electrodes to the predetermined 10 positions of the subject's body for taking the 12-lead electrocardiogram, measurement of the 12-lead electrocardiogram can only be performed at a medical institution such as a hospital. Thus, the measuring operation becomes restrictive, and the subject is forced to have some conscious tension. For this reason, it is difficult to measure the 12-lead electrocardiogram at home.

[0005] In recent years, as the aging progresses, there is a desire to make it possible to measure the 12-lead electrocardiogram at home. However, a general subject generally does not know exact attachment positions of the electrodes, and thus depends only on measurement at a hospital. An electrocardiograph that the subject him/herself can attach a plurality of electrodes is described in Japanese Patent Publication No. 2012-49195. However, even if this electrocardiograph is applied, it is difficult for the subject to make it possible to measure the 12-lead electrocardiogram by him/herself.

SUMMARY

[0006] The present invention is made to solve the problems of the conventional electrocardiograph, and has an object to provide an electrocardiogram measuring device with which a subject can take an electrocardiogram by him/herself.

[0007] An electrocardiogram measuring device according to the present invention for achieving the above object, includes: chest measuring electrodes that acquire electrocardiographic signals of a chest; a garment having attachment holes of the chest measuring electrodes opened; a chair on which limb measuring electrodes that acquire electrocardiographic signals of limbs are arranged; and an electrocardiogram generating unit that generates an electrocardiogram of a subject from the electrocardiographic signals of the chest and the limbs respectively acquired by the chest measuring electrodes attached to a body surface of the subject through the attachment holes of the garment and the limb measuring electrodes with which both hands and feet of the subject are brought into contact.

[0008] According to the present invention, since the subject him/herself can attach the chest measuring electrodes to optimal positions and the limb lead electrodes are arranged on the chair, the subject can unconstrainedly and unconsciously measure the electrocardiogram by him/herself. Thus, measurement of the electrocardiogram can be easily performed at home other than a medical institution, for example.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] FIG. **1** shows a configuration of a garment of an electrocardiogram measuring device according to the present embodiment.

[0010] FIG. **2** is a diagram in which chest measuring electrodes of the electrocardiogram measuring device according to the present embodiment is attached to a subject.

[0011] FIG. **3** shows a configuration of the chest measuring electrode.

[0012] FIG. **4** shows a use mode of a chair of the electrocardiogram measuring device according to the present embodiment.

[0013] FIG. **5** shows a configuration of the chair shown in FIG. **4**.

[0014] FIG. **6** shows a configuration of a conductive sheet used for the chair in FIGS. **4** and **5**.

[0015] FIG. **7** is a block diagram of a control system of the electrocardiogram measuring device according to the present embodiment.

[0016] FIG. **8** is a flow chart showing a measurement procedure of an electrocardiogram using the electrocardiogram measuring device according to the present embodiment.

DETAILED DESCRIPTION

[0017] Next, an electrocardiogram measuring device according to the present embodiment will be described in detail with reference to the drawings.

[0018] FIG. **1** shows a configuration of a garment of an electrocardiogram measuring device according to the present embodiment, and FIG. **2** is a diagram in which chest measuring electrodes of the electrocardiogram measuring device according to the present embodiment is attached to a subject. In the present embodiment, a T-shirt **100** is used as a garment. However, in addition to the T-shirt, a Y-shirt, a polo shirt and the like can also be used as a garment. As shown in FIG. **2**, in the present embodiment, in order to attach six chest measuring electrodes **113**A to **113**F that acquire electrocardiographic signals of a chest, a general T-shirt has attachment holes **112**A to **112**F (white portions in the figure) opened, as shown in FIG. **1**. An opening diameter of the attachment holes **112**A to **112**F is equal to or larger than a size of the chest measuring electrodes **113**A to **113**F.

[0019] The attachment holes **112**A to **112**F opened in the T-shirt **100** are arranged at predetermined positions of the subject by measurements, for acquiring optimal electrocardiographic signals of the subject. Optimal positions of the respective chest measuring electrodes **113**A to **113**F are different depending on the subject. Accordingly, the positions of the attachment holes **112**A to **112**E are determined so that the chest measuring electrodes **113**A to **113**F are

attached to the positions optimal for the subject. The attachment holes **112**A to **112**F serve as guides when the subject him/herself attaches the chest measuring electrodes **113**A to **113**F. It is to be noted that, in the present embodiment, six attachment holes **112**A to **112**F opened in the general T-shirt are illustrated, but attachment holes other than six attachment holes (for example, 1 to 5, 7 or more attachment holes) may be opened in the T-shirt to correspond to an electrocardiogram other than a 12-lead electrocardiogram.

[0020] The T-shirt **100** has a garment pad part **110** that bundles lead wires **116**AL to **116**FL (corresponding to chest measuring electrode lead wires) connected to the chest measuring electrodes **113**A to **113**F on a shoulder part of the T-shirt **100**. A garment pad part connector **120** to which the bundled lead wires **116**AL to **116**FL are connected is attached to the garment pad part **110**. Since the lead wires **116**AL to **116**FL are bundled by the garment pad part **110**, they are loosened when not attached to the chest measuring electrodes **113**A to **113**F. To prevent the above situation, the garment may be provided with a stopper part that restrains each lead wire **116**AL to **116**FL.

[0021] The chest measuring electrodes **113**A to **113**F have male connecting parts **117**A for connecting the lead wires **116**AL to **116**FL, and the lead wires **116**AL to **116**FL have female connecting parts **118**A for connecting to the male connecting parts **117**A.

[0022] FIG. **3** shows a configuration of the chest measuring electrode **113**A. As shown, an electrode part **114**A that directly contacts a body surface of the subject, and an adhesive part **115**A for bringing the electrode part **114**A into close contact with the body surface are provided on a back surface of the chest measuring electrode **113**A. The electrode part **114**A penetrates through the adhesive part **115**A to be connected to the male connecting part **117**A. The male connecting part **117**A of the chest measuring electrode **113**A engages with the female connecting part **118**A provided on a tip end of the lead wire **116**AL (see FIG. **2**).

[0023] Since the T-shirt **100**, the chest measuring electrodes **113**A to **113**F, and the lead wires **116**AL to **116**FL are configured as described above, when measuring the 12-lead electrocardiogram, the subject can complete measurement preparation of the chest lead by simply wearing the T-shirt **100**, attaching the chest measuring electrodes **113**A to **113**F into the attachment holes **112**A to **112**F, and attaching the lead wires **116**AL to **116**FL to the chest measuring electrodes **113**A to **113**F.

[0024] FIG. **4** shows a use mode of a chair of the electrocardiogram measuring device according to the present embodiment. Furthermore, FIG. **5** shows a configuration of the chair shown in FIG. **4**. As shown in FIGS. **4** and **5**, a chair **200** has armrest parts **215** on which both arms of a subject **230** are placed, and a footrest part **225** on which both feet of the subject **230** are placed. Limb measuring electrodes **212**A and **212**B that acquire electrocardiographic signals from both hands of the subject **230** are arranged on the armrest parts **215**. Limb measuring electrodes **214**A and **214**B that acquire electrocardiographic signals from both feet of the subject **230** are arranged on the footrest part **225**. Note that when the electrocardiogram of the limbs are taken with the posture as shown in FIG. **4**, it is sufficient to place the foot of the subject **230** on the footrest part **225** as in FIG. **4**. However, when the electrocardiogram of the limbs are taken with the reclined posture as in FIG. **5**, the footrest part **225** cannot be used, so that a clip electrodes are attached to ankles of the subject **230**.

[0025] The chair **200** has a chair pad part **210** that bundles lead wires (**216**AL and **216**BL shown in FIG. **5**, corresponding to limb measuring electrode lead wires) that are connected to the limb measuring electrodes **212**A, **212**B, **214**A, and **214**B (see FIGS. **4** and **5**), and a chair pad part connector **220** to which the bundled lead wires are connected is attached to the chair pad part **210** (see FIG. **5**).

[0026] The lead wire **216**AL connects the limb measuring electrodes **212**A and **214**A with the chair pad part **210**. The lead wire **216**BL connects the limb measuring electrodes **212**B and **214**B with the chair pad part **210**. The lead wires **216**AL and **216**BL are routed within a structural material of a chair **200**A from the respective limb measuring electrodes **212**A, **214**A, **212**B and **214**B to the chair pad part **210**.

[0027] Since the chair **200** has a reclining function, the subject can relax during measurement.

[0028] The limb measuring electrodes **212**A and **212**B of the armrest parts **215** are flat, and have an area to the extent that the entire palm of the subject **230** can be placed. The limb measuring electrodes **212**A and **212**B of the armrest parts **215** have surfaces on which conductive sheets (not shown, corresponding to armrest part conductive sheets) are mounted, and acquire electrocardiographic signals by putting of the palm of the subject **230** as shown in FIG. **4**. Furthermore, the limb measuring electrodes **214**A and **214**B of the footrest part **225** are flat, and have an area to the extent that the entire foot sole of the subject **230** can be placed. The limb measuring electrodes **214**A and **214**B of the footrest part **225** have surfaces on which conductive sheets (not shown, corresponding to footrest part conductive sheets) are mounted, and acquire electrocardiographic signals by putting of the foot sole of the **230** as shown in FIG. **4**.

[0029] As shown in FIG. **5**, the chair **200** has the chair pad part **210** that bundles the lead wires connected to the limb measuring electrodes **212**A, **212**B, **214**A, and **214**B on a shoulder part of a backrest part of the chair **200**. The chair pad part connector **220** to which the bundled lead wires are connected is attached to the chair pad part **210**.

[0030] FIG. **6** shows a configuration of a conductive sheet used for the chair in FIGS. **4** and **5**. The conductive sheets is mounted on the limb measuring electrodes **212**A, **212**B, **214**A, and **214**B.

[0031] A conductive sheet **145** has a quadrangular shape when viewed from the plane according to a shape of the limb measuring electrodes **212**A, **212**B, **214**A, and **214**B. The conductive sheet **145** is a gel-like sheet having a thickness of about several millimeters when viewed from the side face. When the palm or the foot sole is put on the conductive sheet **145**, the conductive sheet **145** deforms and adheres to conform to a shape of the surface of the palm or the foot sole. The limb electrocardiographic signals of the subject is transmitted to the limb measuring electrodes **212**A, **212**B, **214**A, and **214**B via the conductive sheets **145**.

[0032] FIG. **7** is a block diagram of a control system of the electrocardiogram measuring device according to the present embodiment. An electrocardiogram measuring device **400** according to the present embodiment includes the T-shirt **100**, the chair **200**, and a control unit **300**.

[0033] As shown in FIG. **2**, the T-shirt **100** includes six chest measuring electrodes **113** (the general name of the

chest measuring electrodes **113**A to **113**F in FIG. **1**), and the garment pad part connector **120** connected to these chest measuring electrodes **113**.

[0034] As shown in FIGS. **4** and **5**, the chair **200** includes four limb measuring electrodes **212** and **214** (the general name of the limb measuring electrodes **212**A and **212**B and the limb measuring electrodes **214**A and **214**B in FIG. **2**), and the chair pad part connector **220** connected to these limb measuring electrodes **212** and **214**.

[0035] The control unit **300** includes an electrocardiogram generating unit **310**, an information input unit **320**, an information storing unit **150**, and a display unit **160**. A first generating unit connector **140** for collectively connecting garment connecting electric wires connected to the electrocardiogram generating unit **310** to the garment pad part connector **120**, and a second generating unit connector **240** for collectively connecting chair connecting electric wires connected to the electrocardiogram generating unit **310** to the chair pad part connector **220** are attached to the electrocardiogram generating unit **310**.

[0036] The electrocardiogram generating unit **310** generates an electrocardiogram of the subject from the electrocardiographic signals of the chest and the limbs respectively acquired by the chest measuring electrodes **113** attached to the body surface of the subject and the limb measuring electrodes **212** and **214** with which both hands and feet of the subject are brought into contact. A conventional generating method of the 12-lead electrocardiogram is used for generation of the electrocardiogram.

[0037] The information input unit **320** inputs subject information such as sex and age of the subject. The display unit **160** displays the electrocardiogram generated by the electrocardiogram generating unit **310**. The electrocardiogram generating unit **310** and the display unit **160** are wirelessly connected to each other. The information storing unit **150** stores the subject information input by the information input unit **320** and the electrocardiogram generated by the electrocardiogram generating unit **310**.

[0038] FIG. **8** is a flow chart showing a measurement procedure of an electrocardiogram using the electrocardiogram measuring device according to the present embodiment. The operation of this flow chart will be described in detail with reference to FIGS. **1** to **7**. In this flow chart, the procedure from step S**1** to step S**7** is performed by the subject. Next, the procedure from step S**8** to step S**10** is performed by the electrocardiogram generating unit **310** shown in FIG. **7**.

[0039] When the subject tries to take an electrocardiogram, the subject first wears the T-shirt **100** as shown in FIG. **1**, and sits on the chair **200** or **200**A as shown in FIG. **4** or FIG. **5** (S**1**).

[0040] The subject attaches the chest measuring electrodes **113**A to **113**F into the attachment holes **112**A to **112**F of the T-shirt **100**. Since the positions of the attachment holes **112**A to **112**F are the predetermined positions of the subject, the subject can take the optimal electrocardiographic signals of the chest by simply attaching the chest measuring electrodes **113**A to **113**F into the attachment holes **112**A to **112**F (S**2**).

[0041] The subject connects the female connecting parts **118**A of the lead wires **116**AL to **116**FL to the male connecting parts **117**A of the chest measuring electrodes **113**A to **113**F (see FIGS. **2** and **3**). As a result, the lead wires **116**AL to **116**FL are attached to the chest measuring electrodes **113**A to **113**F (S**3**).

[0042] Next, the subject couples the garment pad part connector **120** of the T-shirt **100** shown in FIGS. **1** and **2** with the first generating unit connector **140** shown in FIG. **7**, and connects the chest measuring electrodes **113**A to **113**F of the T-shirt **100** to the electrocardiogram generating unit **310**. Furthermore, the subject couples the chair pad part connector **220** of the chairs **200** and **200**A shown in FIGS. **4** and **5** with the second generating unit connector **240** shown in FIG. **7**, and connects the limb measuring electrodes **212**A and **212**B, and the limb measuring electrodes **214**A and **214**B to the electrocardiogram generating unit **310** (S**4**).

[0043] Next, the subject attaches the conductive sheets **145** shown in FIG. **6** to the limb measuring electrodes **212**A and **212**B arranged on the armrest parts **215**A, and to the limb measuring electrodes **214**A and **214**B arranged on the footrest part **225** of the chairs **200** and **200**A shown in FIG. **4** or FIG. **5** (S**5**).

[0044] Next, the subject inputs the subject information such as sex and age of the subject from the information input unit **320**. The subject information is input so that an accurate electrocardiogram according to the sex and age can be generated (S**6**). The subject turns on a measurement switch (not shown) of the electrocardiogram measuring device **400** (S**7**).

[0045] The subject puts the palms on the conductive sheets **145** of the limb measuring electrodes **212**A and **212**B, puts the foot soles on the conductive sheets **145** of the limb measuring electrodes **214**A and **214**B, and performs measurement of the electrocardiogram in a relaxed state.

[0046] The electrocardiogram generating unit **310** acquires the electrocardiographic signals of measurement sites of the subject from the chest measuring electrodes **113** and the limb measuring electrodes **212** and **214** (S**8**). The electrocardiogram generating unit **310** creates the electrocardiogram using the acquired electrocardiographic signals (S**9**).

[0047] Based on cardiac potentials detected by 10 electrodes attached to the subject, the electrocardiogram generating unit **310** calculates limb 6-lead waveforms (I, II, III, aVR, aVL, and aVF) of a standard 12 lead and chest 6-lead waveforms (V1, V2, V3, V4, V5, and V6) of the standard 12 lead.

[0048] Generally, a relationship between the lead waveforms for obtaining a standard 12-lead electrocardiogram and the cardiac potentials at the measurement sites is as follows.

I	lead:	vL − vR
II	lead:	vF − vR
III	lead:	vF − vL
aVR	lead:	vR − (vL + vF)/2
aVL	lead:	vL − (vR + vF)/2
aVF	lead:	vF − (vL + vR)/2
V1	lead:	v1 − (vR + vL + vF)/3
V2	lead:	v2 − (vR + vL + vF)/3
V3	lead:	v3 − (vR + vL + vF)/3
V4	lead:	v4 − (vR + vL + vF)/3
V5	lead:	v5 − (vR + vL + vF)/3
V6	lead:	v6 − (vR + vL + vF)/3

Where, v is a potential detected at an each electrode attaching position.

[0049] Then, the display unit **160** displays the electrocardiogram generated by the electrocardiogram generating unit **310** (S**10**).

[0050] As described above, according to the electrocardiogram measuring device of the present embodiment, the electrocardiographic signals of the chest and the electrocardiographic signals of the limbs can be acquired respectively by the chest measuring electrodes attached into the attachment holes of the T-shirt and the limb measuring electrodes attached to the chair. Accordingly, the subject can acquire the electrocardiogram by simply wearing the T-shirt, attaching the chest measuring electrodes, and sitting on the chair, and thus the subject can take the electrocardiogram by him/herself.

[0051] Accordingly, the subject does not need to go to a hospital for taking the electrocardiogram, and can comfortably perform measurement at his/her home.

What is claimed is:

1. An electrocardiogram measuring device comprises:

chest measuring electrodes that acquire electrocardiographic signals of a chest;

a garment having attachment holes of the chest measuring electrodes opened;

a chair on which limb measuring electrodes that acquire electrocardiographic signals of limbs are arranged; and

an electrocardiogram generating unit that generates an electrocardiogram of a subject from the electrocardiographic signals of the chest and the limbs respectively acquired by the chest measuring electrodes attached to a body surface of the subject through the attachment holes of the garment and the limb measuring electrodes with which both hands and feet of the subject are brought into contact.

2. The electrocardiogram measuring device according to claim **1**, wherein the garment has a garment pad part that bundles chest measuring electrode lead wires connected to the chest measuring electrodes, and

a garment pad part connector to which the chest measuring electrode lead wires are connected is attached to the garment pad part to collectively connect the bundled chest measuring electrode lead wires to the electrocardiogram generating unit.

3. The electrocardiogram measuring device according to claim **2**, wherein a first generating unit connector to which garment connecting electric wires are connected is attached to the electrocardiogram generating unit to connect the garment connecting electric wires connected to the electrocardiogram generating unit to the garment pad part connector.

4. The electrocardiogram measuring device according to claim **2**, wherein the chest measuring electrodes have male connecting parts for connecting the chest measuring electrode lead wires, and the chest measuring electrode lead wires have female connecting parts for connecting to the male connecting parts.

5. The electrocardiogram measuring device according to claim **1**, wherein the attachment holes opened in the garment are arranged at predetermined positions of the subject to acquire optimal electrocardiographic signals of the subject.

6. The electrocardiogram measuring device according to claim **1**, wherein the chair has armrest parts on which both arms of the subject are placed, and footrest parts on which both feet of the subject are placed,

the limb measuring electrodes are arranged on the armrest parts and the footrest parts,

the chair has a chair pad part that bundles limb measuring electrode lead wires connected to the limb measuring electrodes, and

a chair pad part connector to which the limb measuring electrode lead wires are connected is attached to the chair pad part to collectively connect the bundled limb measuring electrode lead wires to the electrocardiogram generating unit.

7. The electrocardiogram measuring device according to claim **6**, wherein a second generating unit connector to which chair connecting electric wires are connected is attached to the electrocardiogram generating unit to connect the chair connecting electric wires connected to the electrocardiogram generating unit to the chair pad part connector.

8. The electrocardiogram measuring device according to claim **6**, wherein the limb measuring electrodes of the armrest parts have surfaces on which armrest part conductive sheets are mounted, and acquire electrocardiographic signals from both palms of the subject via the armrest part conductive sheets, and the limb measuring electrodes of the footrest parts have surfaces on which footrest part conductive sheets are mounted, and acquire electrocardiographic signals from both feet soles of the subject via the footrest part conductive sheets.

9. The electrocardiogram measuring device according to claims **1**, wherein the number of the attachment holes of the chest measuring electrodes opened in the garment is one or more.

* * * * *

专利名称(译)	心电图测量装置		
公开(公告)号	US20180035908A1	公开(公告)日	2018-02-08
申请号	US15/667179	申请日	2017-08-02
[标]发明人	WEI DAMING		
发明人	WEI, DAMING		
IPC分类号	A61B5/0408 A61B5/00		
CPC分类号	A61B5/04085 A61B5/6891 A61B5/6804 A61B5/0402 A61B5/6805		
优先权	2016154434 2016-08-05 JP		
外部链接	Espacenet USPTO		

摘要(译)

一种心电图测量装置，包括：胸部测量电极 113 ，其获取胸部的心电图信号;一件T恤 100 ，胸部测量电极的连接孔打开;椅子 200 ，其上布置有获取肢体的心电信号的肢体测量电极 212 和 214 ;和心电图生成单元 310 ，其根据胸部和四肢的心电图信号产生对象的心电图，所述胸部和四肢的心电图信号分别通过附接到对象的身体表面的胸部测量电极获取。 T恤 100 和肢体测量电极，使受试者的双手和双脚接触。