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(54) **Wireless communication system for remote medical assistance**

(57) The present invention is in the field of a wireless communication system for medical assistance, and a use of said wireless system for training and providing medical assistance, wherein assistance is typically provided over a long distance (being remote). The medical assistance is typically provided by well trained professional to laymen that at the best have been partly trained.

Title Wireless communication system for remote medical assistance

FIELD OF THE INVENTION

The present invention is in the field of a wireless communication system for medical assistance, and a use of said wireless system for training and providing medical assistance, wherein assistance is typically provided over a long distance. The medical assistance is typically provided by a well trained professional to laymen that at the best have been partly trained.

BACKGROUND OF THE INVENTION

The present invention is in the field of a system for medical assistance wherein assistance is typically provided over a long distance in view of a medical professional not being available on site. For instance on ships and water or airborne vessels no medical trained personnel may be present. Provision of medical care is therefore legally transferred to the captain of the ship and/or a ship's officer. The medical responsible people obtain some basic training, typically delivered on shore. The basic training is found to be insufficient in many cases, partly in view of insufficient experience with many medical cases, sometimes in view of inadequate training for the specific and often complex case, and also in view of lack of familiarity with cases which may result in mental hurdles.

However in many cases the legally responsible people for medical care do have to perform medical actions and carry out medical procedures, sometimes to prevent worse from happening, sometimes to save lives, sometimes to provide accurate care, and so on. In such cases they rely on their basic training and on handbooks or the like. Apart from the fact that training and handbooks are typically outdated at least a few years, they do not provide all the information typically needed to perform the medical actions required; at the best they provide generic information and instructions, which information may be of limited relevance to the case. In addition it is quite often difficult to establish what the medical disorder or disease actually is, especially from handbooks or likewise the internet. Therefore quite often there is a need to consult a

medical professional. Apart from the fact that distance, language, time zone, availability, exact knowledge of the professional, etc. are already issues to overcome, the medical professional still has to rely on spoken information from the people in charge of medical care, and vice versa. Especially when time becomes an issue a risk of wrong or inadequate treatment is significant.

Another issue is that the people in charge of medical care, as well as the medical professional, are typically trained in a different location and/or setting. As a consequence a potential risk of inconsistencies is present, which may lead to wrong diagnosis, inadequate treatment, insufficient treatment, neglect of certain aspects of treatment, etc. The "system" of treatment may as a result be considered unreliable and may form a risk for the treatment of the patient, such as in view of claims. Such may especially be the case for ships and vessels out at sea.

In addition communication over these long distance may be hampered by stability or insufficient capabilities of a communication system used, such as bandwidth, noise, disturbances, etc.

In principle complex and costly systems might be used to overcome some of the problems mentioned, but these are not used in practice, not even on very large ships.

The present invention relates to a wireless communication system for medical assistance, and a use of said wireless system for training and providing medical assistance, wherein assistance is typically provided over a long distance, which overcome one or more of the above disadvantages, without jeopardizing functionality and advantages.

## SUMMARY OF THE INVENTION

The present invention relates in a first aspect to a wireless communication system according to claim 1. The present system is wireless in view of too large distances typically being present between the person in charge of providing medical care and a medical professional, or in view of physical inability for a professional to be present. The system is intended for providing medical assistance typically to the person in charge thereof. It is spe-

cifically noted for some jurisdictions that said assistance does not relate to non-statutory subject-matter, such as methods of treatment, surgery, therapy, or diagnosis, but at the most to providing information and instructions to that extend. As mentioned above said person may be regarded to be largely a layman, despite of some training. In order to provide proper instructions it has been found essential that the layman can make use of a simple device, such as a mobile phone, a tablet, a smart phone, or even a (small) computer, which device is typically available. The device should have a display in order to present optical (visual) information, such as images. The layman is typically at a first location, such as on a ship far from the shore, where it is impossible or too complicated to provide medical assistance, such as by flying in a doctor, by transporting the patient to shore, and so on. In addition means of communication are thereby inherently limited. It is therefore important that information of a patient, such as optical information on a condition of the patient, can be made available. Thereto the first mobile device comprises a first optical input, such as a camera. With the camera an image can be taken from a patient. The image can be send and thereby shared to the medical professional and displayed on a second mobile device, which second mobile device is comparable in characteristics and/or features with the first mobile device. Thereto both devices have implemented a two-directional transmitting system, wherein the transmitting system in use receives at least one layer of first optical input 31 from the first device relating to a physical reality from the first device and transmits the at least one layer of first optical input to the second mobile device and receives at least one layer of second optical input 32 relating to a physical reality from the second device from the second optical input and transmits the at least one layer of second optical input to the first mobile device. In addition thereto the first device in use displays second optical input of the second device superimposed over the first optical input, and wherein the second device in use displays first optical input of the first device subimposed

over the second optical input, and wherein the displayed input on the first device is preferably equal or partly equal to the displayed input on the second device. It is noted that the terms “superimposed” and “subimposed” are relative and in principle are considered interchangeable as long as the various layers of input are projected over one and another in a usable fashion. Therewith both devices are provided with at least one layer of augmented reality superimposed over an image representing reality at the first or second location, respectively. Therewith effectively the use of a first device and the user of the second device look at the same image, or at least part thereof; in other words the displayed images on the first and second devices respectively are the same, though the full display need not be used for displaying said images. The image may be displayed together with at least one further image, or not. The medical professional now can give input to the layman, such as directions, advice, can provide medical details, etc. which input can be directly seen by the layman. The present image may likewise relate to a continuous optical recording.

In principle more than one layer of optical and augmented reality can be provided to the first and/or second mobile device, such as 2-5 layers, such as 3-4 layers. A first layer may represent direct input, a second layer may represent input from a database, a third input may represent actions to be taken, a fourth input may represent graphical input, and so on.

The at least one layer of (first or second) optical input may be provided against a, for recording, neutral background, such as a blue background.

In addition to the above the use of the first or second device, respectively, can each independently switch layers of graphical input on or off, therewith increasing or reducing an amount of augmented reality. For instance a first use may look at the first reality and augmented reality layers 2 and 3 provided by the second user, whereas the second user looks at the first physical reality (being typically augmented reality layer 1 for the second device) and

physical reality from the second device, and so on. Therewith the present system is very flexible and versatile.

In addition to the above the first and second user may each independently use further functionality of the mobile devices, such as audio, vibration, recording, measurement capabilities, etc.

Thereby the present invention provides a solution to one or more of the above mentioned problems.

Advantages of the present invention are detailed throughout the description.

## DETAILED DESCRIPTION OF THE INVENTION

The present invention relates in a first aspect to a wireless communication system according to claim 1.

In an exemplary embodiment the present system further comprises a tracking system for recording of instructions and actions performed.

In an exemplary embodiment of the present system the first optical input is provided by a first camera, that may or may not use an additional optical system such as lenses.

In an exemplary embodiment of the present system the second optical input is provided by a second camera, that may or may not use an additional optical system such as lenses.

In an exemplary embodiment of the present system the first device and/or second device displays further optical input.

In an exemplary embodiment of the present system optical input is further provided by a touch screen, a mouse pad, and graphics.

In an exemplary embodiment the present system further comprises at least one further mobile device having a further optical input, and a (wireless) transceiver, and implemented thereon the two-directional transmitting system.

In an exemplary embodiment of the present system at least one location is a remote location, such as at least 200 km from a shore or at least 200 km from a medical professional.

In an exemplary embodiment the present system further comprises a digitally and/or physically accessible reference

document or images, that may or may not be presented in an additional augmented reality layer, the reference document comprising in view of medical actions instructions for preparation thereof, instructions for triaging, instructions for diagnosing, instructions for performing measurements, instructions for carrying out, instructions for logging data, instructions for after care, a database, and an overview of contents, preferably organized in a layered manner. As such available, and typically regularly updated information, is directly available. In addition also artificial intelligence may be used to further support the layman.

In an exemplary embodiment the present system further comprises a coordinator for establishing contact between the first mobile device and a second mobile device, wherein the coordinator selects the second device based on at least one of availability, distance, language capabilities of the owner, specific medical expertise of the owner, time zone, and stability of the transmitting system. As such the best available support can be delivered to a subject.

In an exemplary embodiment the present system further comprises at least one of an identity checker, credentials checker, a unique session identifier, such as a calibration sticker. Therewith secured information can be transferred as well as information on the condition of the subject.

In an exemplary embodiment the present system further comprises a data-logging system, and a sensor, such as a medical sensor, such as for ECG, blood pressure, for vital parameters, blood and urine analysis, and blood oxygen level. Therewith information on the treatment of a subject as well as details of the subject can be transmitted and stored.

In an exemplary embodiment the present system further comprises a switch for activating or deactivating superimposed display on one or both devices. For some applications the superimposed display may interfere with a process of treating the subject and can better be switched off.

In an exemplary embodiment of the present system the second device retrieves input from a database. Therewith the layman can be assisted directly by a computer or the like.

In a second aspect the present invention relates to a use of the present system for training and for providing real-time medical assistance.

The invention is further detailed by the accompanying figures and examples, which are exemplary and explanatory of nature and are not limiting the scope of the invention. To the person skilled in the art it may be clear that many variants, being obvious or not, may be conceivable falling within the scope of protection, defined by the present claims.

SUMMARY OF THE FIGURES

Figure 1 shows schematics of the present invention.

DETAILED DESCRIPTION OF THE FIGURES

Figure 1 shows schematics of the present invention. With respect to the first two schematics shown: Therein a person with a broken leg is shown representing a first reality. The present helper uses device 11 to take a picture 31. The picture, as well as an ECG, (representing augmented reality layer 1 of the second device) is transmitted to device 12 of the present professional, represented by the arrow directed to the right. Note that device 12 at this point has no (or a blank) image. Devices 11 and 12 are in contact with one and another (represented by the double headed arrow), typically real time contact (only involving a transmitting delay, if any). With respect to the third and fourth schematics shown: The professional looks at the image and ads input 32 to the picture 31 on his device 12 and points towards the fraction using his hand, representing a second reality. The input 32 is transmitted to device 11 (represented by the arrow directed to the right) and superimposed over the picture 31 on device 11. Likewise a superimposed image of input 32 (representing augmented reality layer 1 of the first device) and picture 31 is formed on device 12. Therewith a virtual reality is created in which the helper and professional look at the same image.

**EXAMPLES/EXPERIMENTS**

The invention although described in detailed explanatory context may be best understood in conjunction with the accompanying examples.

**Practical example**

**Step by Step instructions on using AR system for remote medical support**

The example relates to a situation wherein Device 1 is on a remote location and Device 2 is a device on medical support location (doctor's device). Additional devices may be present, in so far as required and feasible and it may relate to any additional unit. It is the combination of devices (minimum two: device 1 and 2) that may be regarded as the present basic system.

In order to start the (both) devices should be powered up, meet minimum technical specifications, use a compatible software platform (Android/iOS/Windows/Linux etc.), have additional drivers and software installed for two-directional transmitting, be connected to the internet and/or have an IP address. When using the present AR-application/platform the two devices should connect, identify and use a secure connection.

The following steps are typically performed.

1) The person(s) using device 1 (hereafter: helper, typically a layman) and the person(s) using device 2 (hereafter: the medical professional, typically a doctor) and the patient or object (hereafter: the subject) can be positively identified by voice, vision, available ID or any other legal or required means.
2) If possible they agree to: their role and accept terms and conditions of use by 1) signing in with known and verified credentials of by 2) direct input (typing, touching, clicking) or clearly stating verbally and the patient/object responsible for accepting and consenting to the help offered.
3) Device 1 may be positioned either:
   - static, using a fixing device that will hold device 1 in place,
   - or dynamic, by being attached to the helper in their line of sight, using goggles or any other means to comfortably attach the device,

- or is positioned in such a way relative to subject, that the helper can work, manipulate and use instruments/tools on the subject, while keeping the subject in view/on screen of the device.

4) Device 2 may be positioned either:
   - static, using a fixing device that will hold device 2 in place,
   - or dynamic, by being attached to professional in their line of sight, using goggles or any other means to comfortably attach the device,
   - or is positioned in such a way, that the professional can work, manipulate and use instruments/tools in front device while keeping the subject on screen of the device.

5) A calibration sticker can (but does not need to) be used: it has a unique session number, a color calibration print and a fixed size for reference and will be placed close or next to the subject within the vision frame of device 1 (camera) and device 2 can calibrate after detection of the sticker.

6) By using device 2 the professional can in so far as required:
   - make drawings, display pictures, project video(s) using device 2 as input device, by touching the screen, or using any input device (mouse, stylus, touchpad, controller, etc.) or retrieving pictures, images and video material from a database or any other source
   - manipulate his hands, arms and any other part of his body, such as to indicate to the helper to perform certain actions, manipulate instruments of tools in such manner that the camera of device 2 captures these movements, pictures or projections, such as to provide a visual example.

7) These inputs created by the professional using device 2 can be projected on device 1 (and likewise device 2) onto an overlaying visual layer that results in a projection of the reality (the actual view of the subject, relating to a physical reality) with the visual (AR) layer (relating to at least one of a further physical reality, images,

graphics, pictures, etc.) superimposed on the screen of device 1. The helper will see both the subject as well as the (superimposed) input made by professional on device 2.

8) By using device 1, the helper can see the subject (in reality and on screen), see directly what professional shows, explains, and/or instructs him to do (in AR overlay), see pictures, images, supporting information from database or any other source (in AR overlay), see video's on how to carry out certain skills and techniques (in AR overlay), can switch the AR layer on- and off on device 1, can see and train and prepare for copying and re-doing the manipulations and instructions shown by professional, and can execute or perform the manipulations, instructions or skills shown in the AR layer in reality on the subject.

9) The professional can see the subject, see the AR overlay as visible on device 1, including any visual input used, see any actions by helper, give directions and instructions to the helper, using voice, text, video and/or AR overlay, and can switch the AR layer on and off on device 1 and 2.

10) All actions on device 1 and 2 are logged and saved in a database.

In view of operation additional functionality may be added. For instance device 1 can have sensors attached, that will help to monitor the condition of subject. In case of a patient ECG, heartrate, blood pressure and other vital parameters can be monitored and made visible on device 1 and 2. The helper can use device 1 without a professional (no device 2) and using images, video's, explanations on skills and techniques retrieved from a database or any other source, that can be superimposed (via AR layer) on the subject. Using artificial intelligence and machine learning, the collected input from the database can be used to recognize, diagnose certain conditions and predict any required actions to be taken by helper.

For the purpose of searching the following section is provided, of which the next section represents a translation into Dutch.

1. Wireless communication system for medical assistance comprising

a first mobile device (11) at a first location, the first device having a first optical input, a display, and a transceiver, preferably a wireless transceiver,

a second mobile device (12) at a second location, the second device having a second optical input, a display, and a transceiver, preferably a wireless transceiver,

implemented on both the two devices a two-directional transmitting system, wherein the transmitting system in use receives at least one layer of first optical input (31) relating to a physical reality from the first device and transmits the at least one layer of first optical input to the second mobile device and receives at least one layer of second optical input (32) relating to a physical reality from the second device and transmits the at least one layer of second optical input to the first mobile device,

wherein the first device in use displays the at least one layer of second optical input of the second device superimposed over the first optical input, and wherein the second device in use displays the at least one layer of first optical input of the first device subimposed over the second optical input, and wherein the displayed input on the first device is preferably equal to the displayed input on the second device.

2. System according to embodiment 1, further comprising a tracking system for recording of instructions and actions performed.

3. System according to any of the preceding embodiments, wherein the first optical input is provided by a first camera.

4. System according to any of the preceding embodiments, wherein the second optical input is provided by at least one of a second camera, a graphical input, a video input, a touch screen, a mouse, a touch pad, a stylus, a controller, or a database.

5. System according to any of the preceding embodiments, wherein the first device and/or second device displays further optical input.

6. System according to any of the preceding embodiments, wherein optical input is further provided by a touch screen, a mouse pad, and graphics.

7. System according to any of the preceding embodiments, comprising at least one further mobile device having a further optical input, and a (wireless) transceiver, and implemented thereon the two-directional transmitting system.

8. System according to any of the preceding embodiments, wherein at least one location is a remote location, such as at least 200 km from a shore or at least 200 km from a medical professional.

9. System according to any of the preceding embodiments, further comprising a digitally and/or physically accessible reference document, the reference document comprising in view of medical actions instructions for preparation thereof, instructions for triaging, instructions for diagnosing, instructions for performing measurements, instructions for carrying out, instructions for logging data, instructions for after care, a database, and an overview of contents, preferably organized in a layered manner.

10. System according to any of the preceding embodiments, further comprising a coordinator for establishing contact between the first mobile device and a second mobile device, wherein the coordinator selects the second device based on at least one of availability, distance, language capabilities of the owner, specific medical expertise of the owner, time zone, and stability of the transmitting system.

11. System according to any of the preceding embodiments, further comprising at least one of an identity checker, credentials checker, a unique session identifier, such as a calibration sticker, a data-logging system, and a sensor, such as a medical sensor, such as for ECG, blood pressure, for vital parameters, blood and urine analysis, and blood oxygen level.

12. System according to any of the preceding embodiments, further comprising a switch for activating or deactivating superimposed display on one or both devices.

13. System according to any of the preceding embodiments, wherein the second device retrieves input from a database.

14. Use of a system according to any of the preceding embodiments for training and for providing real-time medical assistance.

## CONCLUSIES

1. Draadloos communicatiesysteem voor medische hulp omvattend
een eerste mobiel apparaat (11) op een eerste plaats, waarbij het eerste apparaat een eerste optische ingang heeft, een beeldscherm, en een zendontvanger, bij voorkeur een draadloze zendontvanger,
een tweede mobiel apparaat (12) op een tweede plaats, waarbij de tweede inrichting een tweede optische ingang heeft, een beeldscherm, en een zendontvanger, bij voorkeur een draadloze zendontvanger,
geïmplementeerd op beide apparaten een tweerichtingstransmissie systeem, waarbij het transmissiesysteem in gebruik ten minste één laag eerste optische invoer (31) ontvangt die betrekking heeft op een fysieke realiteit van het eerste apparaat en de ten minste ene laag van eerste optische invoer aan het tweede mobiele apparaat zendt en ontvangt ten minste één laag tweede optische invoer (32) die betrekking heeft op een fysieke realiteit van het tweede apparaat en de ten minste ene laag van tweede optische ingang naar het eerste mobiele apparaat zendt,
waarbij het eerste apparaat in gebruik de ten minste ene laag tweede optische invoer van het tweede apparaat over de eerste optische ingang toont, en waarbij het tweede apparaat in gebruik de ten minste ene laag van de eerste optische invoer van het eerste apparaat onder de tweede optische invoer toont, en waarbij de weergegeven invoer op het eerste apparaat bij voorkeur gelijk is aan de weergegeven invoer op het tweede apparaat.

2. Systeem volgens conclusie 1, verder omvattende een volgsysteem voor het opnemen van instructies en uitgevoerde acties.

3. Systeem volgens een van de voorgaande conclusies, waarbij de eerste optische invoer is verschaft door een eerste camera.

4. Systeem volgens een der voorgaande conclusies, waarbij de tweede optische invoer is verschaft door ten minste één van een tweede camera, een grafische invoer, een video-ingang, een

aanraakscherm, een muis, een touchpad, een stylus, een controller, of een database.

5. Systeem volgens een van de voorgaande conclusies, waarbij het eerste apparaat en/of tweede apparaat verdere optische invoer toont.

6. Systeem volgens een van de voorgaande conclusies, waarbij de optische invoer verder is verschaft door een aanraakscherm, een muismat, en grafische afbeeldingen.

7. Systeem volgens een van de voorgaande conclusies, omvattende ten minste één verder mobiel apparaat met een verdere optische invoer, en een (draadloze) zendontvanger, en daarop geïmplementeerd het tweerichtingstransmissie systeem.

8. Systeem volgens een der voorgaande conclusies, waarbij ten minste één locatie een afgelegen locatie is, zoals ten minste 200 km van een kust of tenminste 200 km van een medische professional.

9. Systeem volgens een der voorgaande conclusies, verder omvattende een digitaal en/of fysiek toegankelijk referentiedocument, waarbij het referentiedocument bestaat uit instructies voor het voorbereiden van medische handelingen, instructies voor triaging, instructies voor diagnose, instructies voor het uitvoeren van metingen, instructies voor het uitvoeren, instructies voor het loggen van gegevens, instructies voor nazorg, een database, en een overzicht van de inhoud, bij voorkeur op een gelaagde wijze georganiseerd.

10. Systeem volgens een der voorgaande conclusies, verder omvattende een coördinator voor het opzetten van contact tussen het eerste mobiele apparaat en een tweede mobiel apparaat, waarbij de coördinator het tweede apparaat selecteert gebaseerd op ten minste een van de beschikbaarheid, afstand, taalvaardigheden van de eigenaar, specifieke medische expertise van de eigenaar, tijdzone, en stabiliteit van het zendsysteem.

11. Systeem volgens een van de voorgaande conclusies, verder omvattende ten minste één van een identiteitscontroleur, referentiecontroleur, een unieke sessieidentificatie, zoals een kalibratie sticker, een data-logging systeem, en een sensor, zoals een medische sensor, zoals voor ECG, bloeddruk, voor vitale parameters, en zuurstofniveau van het bloed.

12. Systeem volgens één of meer van de voorgaande conclusies, verder omvattende een schakelaar voor het activeren of deactiveren van het over elkaar leggen op één of beide apparaten.

13. Systeem volgens een van de voorgaande conclusies, waarbij het tweede apparaat invoer uit een databank haalt.

14. Gebruik van een systeem volgens één der voorgaande conclusies voor training en voor het verstrekken van real-time medische hulp.

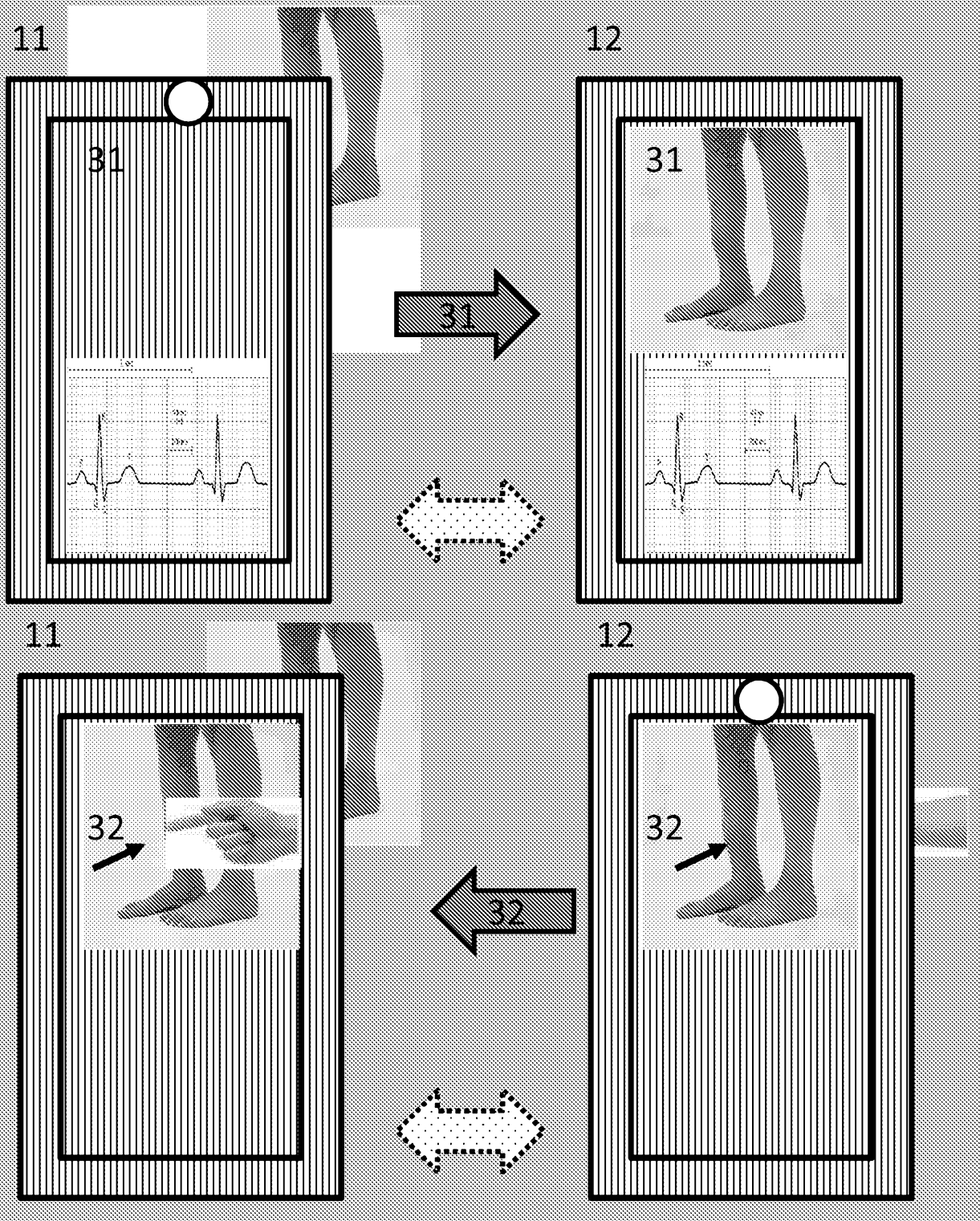


Fig. 1

## ABSTRACT

The present invention is in the field of a wireless communication system for medical assistance, and a use of said wireless system for training and providing medical assistance, wherein assistance is typically provided over a long distance (being remote). The medical assistance is typically provided by well trained professional to laymen that at the best have been partly trained.

# SAMENWERKINGSVERDRAG (PCT)

## RAPPORT BETREFFENDE NIEUWHEIDSONDERZOEK VAN INTERNATIONAAL TYPE

| IDENTIFICATIE VAN DE NATIONALE AANVRAGE | KENMERK VAN DE AANVRAGER OF VAN DE GEMACHTIGDE |
|---|---|
| | **017490 NL-PD** |
| Nederlands aanvraag nr.<br>**2019059** | Indieningsdatum<br>**13-06-2017** |
| | Ingeroepen voorrangsdatum |
| Aanvrager (Naam)<br>**Maritime Medical Applications B.V.** | |
| Datum van het verzoek voor een onderzoek van internationaal type<br>**15-07-2017** | Door de Instantie voor Internationaal Onderzoek aan het verzoek voor een onderzoek van internationaal type toegekend nr.<br>**SN69321** |

**I. CLASSIFICATIE VAN HET ONDERWERP** (bij toepassing van verschillende classificaties, alle classificatiesymbolen opgeven)

Volgens de internationale classificatie (IPC)

**A61B5/00;G16H80/00;A61B5/021;A61B5/145**

**II. ONDERZOCHTE GEBIEDEN VAN DE TECHNIEK**

Onderzochte minimumdocumentatie

| Classificatiesysteem | Classificatiesymbolen |
|---|---|
| **IPC** | **A61B;G06F;G16H;H04N** |

Onderzochte andere documentatie dan de minimum documentatie, voor zover dergelijke documenten in de onderzochte gebieden zijn opgenomen

| | | | |
|---|---|---|---|
| III. | ☐ | **GEEN ONDERZOEK MOGELIJK VOOR BEPAALDE CONCLUSIES** | (opmerkingen op aanvullingsblad) |
| IV. | ☐ | **GEBREK AAN EENHEID VAN UITVINDING** | (opmerkingen op aanvullingsblad) |

# ONDERZOEKSRAPPORT BETREFFENDE HET RESULTAAT VAN HET ONDERZOEK NAAR DE STAND VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE

Nummer van het verzoek om een onderzoek naar de stand van de techniek
NL 2019059

A. CLASSIFICATIE VAN HET ONDERWERP
INV. A61B5/00 G16H80/00
ADD. A61B5/021 A61B5/145

Volgens de Internationale Classificatie van octrooien (IPC) of zowel volgens de nationale classificatie als volgens de IPC.

B. ONDERZOCHTE GEBIEDEN VAN DE TECHNIEK

Onderzochte minimum documentatie (classificatie gevolgd door classificatiesymbolen)
A61B G06F G16H H04N

Onderzochte andere documentatie dan de minimum documentatie, voor dergelijke documenten, voor zover dergelijke documenten in de onderzochte gebieden zijn opgenomen

Tijdens het onderzoek geraadpleegde elektronische gegevensbestanden (naam van de gegevensbestanden en, waar uitvoerbaar, gebruikte trefwoorden)
EPO-Internal, WPI Data, EMBASE, INSPEC, COMPENDEX, BIOSIS

C. VAN BELANG GEACHTE DOCUMENTEN

| Categorie * | Geciteerde documenten, eventueel met aanduiding van speciaal van belang zijnde passages | Van belang voor conclusie nr. |
|---|---|---|
| X | US 2017/069227 A1 (DIALAMEH ORANG [US] ET AL) 9 maart 2017 (2017-03-09)<br>* alinea [0036] *<br>* alinea [0041] - alinea [0051] *<br>* alinea [0098] - alinea [0129] *<br>* figuren 1,2,6,7 *<br>----- | 1-8,11, 13 |
| X<br>Y | WO 2017/072616 A1 (KONINKLIJKE PHILIPS NV [NL]) 4 mei 2017 (2017-05-04)<br>* alinea [0054] - alinea [0081] *<br>* figuren *<br>----- | 1,9,12, 14<br>10 |

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[X] Verdere documenten worden vermeld in het vervolg van vak C.

[X] Leden van dezelfde octrooifamilie zijn vermeld in een bijlage

* Speciale categorieën van aangehaalde documenten

"A" niet tot de categorie X of Y behorende literatuur die de stand van de techniek beschrijft

"D" in de octrooiaanvrage vermeld

"E" eerdere octrooi(aanvrage), gepubliceerd op of na de indieningsdatum, waarin dezelfde uitvinding wordt beschreven

"L" om andere redenen vermelde literatuur

"O" niet-schriftelijke stand van de techniek

"P" tussen de voorrangsdatum en de indieningsdatum gepubliceerde literatuur

"T" na de indieningsdatum of de voorrangsdatum gepubliceerde literatuur die niet bezwarend is voor de octrooiaanvrage, maar wordt vermeld ter verheldering van de theorie of het principe dat ten grondslag ligt aan de uitvinding

"X" de conclusie wordt als niet nieuw of niet inventief beschouwd ten opzichte van deze literatuur

"Y" de conclusie wordt als niet inventief beschouwd ten opzichte van de combinatie van deze literatuur met andere geciteerde literatuur van dezelfde categorie, waarbij de combinatie voor de vakman voor de hand liggend wordt geacht

"&" lid van dezelfde octrooifamilie of overeenkomstige octrooipublicatie

| Datum waarop het onderzoek naar de stand van de techniek van internationaal type werd voltooid | Verzenddatum van het rapport van het onderzoek naar de stand van de techniek van internationaal type |
|---|---|
| 19 februari 2018 | |

| Naam en adres van de instantie | De bevoegde ambtenaar |
|---|---|
| European Patent Office, P.B. 5818 Patentlaan 2<br>NL - 2280 HV Rijswijk<br>Tel. (+31-70) 340-2040,<br>Fax: (+31-70) 340-3016 | Görlach, Tobias |

1

**ONDERZOEKSRAPPORT BETREFFENDE HET RESULTAAT VAN HET ONDERZOEK NAAR DE STAND VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE**

Nummer van het verzoek om een onderzoek naar de stand van de techniek
NL 2019059

C.(Vervolg). VAN BELANG GEACHTE DOCUMENTEN

| Categorie ° | Geciteerde documenten, eventueel met aanduiding van speciaal van belang zijnde passages | Van belang voor conclusie nr. |
|---|---|---|
| Y | US 2015/077502 A1 (JORDAN CHARLES S [US] ET AL) 19 maart 2015 (2015-03-19) | 10 |
| A | * alinea [0095] - alinea [0096] * | 1-9, |
| | * alinea [0100] - alinea [0102] * | 11-14 |
| | * alinea [0109] - alinea [0111] * | |
| | * alinea [0118] - alinea [0122] * | |
| | * alinea [0126] - alinea [0131] * | |
| | * alinea [0134] - alinea [0136] * | |
| | * alinea [0149] * | |
| | * alinea [0178] - alinea [0179] * | |
| | * figuren 28-C, 6-11, 13-14C,18A-B,29 * | |
| | --- | |
| A | US 2014/267662 A1 (LAMPO PIERRE-YVES [CH]) 18 september 2014 (2014-09-18) | 1-14 |
| | * alinea [0048] - alinea [0050] * | |
| | * alinea [0070] - alinea [0072] * | |
| | * alinea [0117] - alinea [0129] * | |
| | * figuren 1A-D, 5, 6 * | |
| | --- | |



Formulier PCT/ISA/201 (vervolg tweede blad) (januari 2004)

**ONDERZOEKSRAPPORT BETREFFENDE HET RESULTAAT VAN HET ONDERZOEK NAAR DE STAND VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE**

Informatie over leden van dezelfde octrooifamilie

Nummer van het verzoek om een onderzoek naar de stand van de techniek: NL 2019059

| In het rapport genoemd octrooigeschrift | Datum van publicatie | Overeenkomend(e) geschrift(en) | Datum van publicatie |
|---|---|---|---|
| US 2017069227 A1 | 09-03-2017 | CN 102906810 A | 30-01-2013 |
| | | EP 2539883 A1 | 02-01-2013 |
| | | JP 5709906 B2 | 30-04-2015 |
| | | JP 2013520757 A | 06-06-2013 |
| | | KR 20130039720 A | 22-04-2013 |
| | | KR 20150008840 A | 23-01-2015 |
| | | US 2011216179 A1 | 08-09-2011 |
| | | US 2014218493 A1 | 07-08-2014 |
| | | US 2017069227 A1 | 09-03-2017 |
| | | WO 2011106520 A1 | 01-09-2011 |
| WO 2017072616 A1 | 04-05-2017 | GEEN | |
| US 2015077502 A1 | 19-03-2015 | US 2015077502 A1 | 19-03-2015 |
| | | US 2016283685 A1 | 29-09-2016 |
| US 2014267662 A1 | 18-09-2014 | AU 2014237893 A1 | 03-09-2015 |
| | | CA 2901899 A1 | 25-09-2014 |
| | | CN 105163653 A | 16-12-2015 |
| | | EP 2967389 A1 | 20-01-2016 |
| | | JP 2016512070 A | 25-04-2016 |
| | | US 2014267662 A1 | 18-09-2014 |
| | | WO 2014149728 A1 | 25-09-2014 |

# WRITTEN OPINION

| File No. | Filing date *(day/month/year)* | Priority date *(day/month/year)* | Application No. |
|---|---|---|---|
| SN69321 | 13.06.2017 | | NL2019059 |

International Patent Classification (IPC)
INV. A61B5/00 G16H80/00 ADD. A61B5/021 A61B5/145

Applicant
Maritime Medical Applications B.V.

This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the application
- ☒ Box No. VIII Certain observations on the application

| | Examiner |
|---|---|
| | Görlach, Tobias |

Application number

# WRITTEN OPINION

NL2019059

## Box No. I Basis of this opinion

1. This opinion has been established on the basis of the latest set of claims filed before the start of the search.

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the application and necessary to the claimed invention, this opinion has been established on the basis of:

   a. type of material:

   ☐ a sequence listing

   ☐ table(s) related to the sequence listing

   b. format of material:

   ☐ on paper

   ☐ in electronic form

   c. time of filing/furnishing:

   ☐ contained in the application as filed.

   ☐ filed together with the application in electronic form.

   ☐ furnished subsequently for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

## Box No. V Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | | |
|---|---|---|---|
| Novelty | Yes: | Claims | 9, 10, 12, 14 |
| | No: | Claims | 1-8, 11, 13 |
| Inventive step | Yes: | Claims | |
| | No: | Claims | 1-14 |
| Industrial applicability | Yes: | Claims | 1-14 |
| | No: | Claims | |

2. Citations and explanations

**see separate sheet**

# WRITTEN OPINION

## Box No. VIII Certain observations on the application

see separate sheet

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1.1 As a general remark, expressions such as "preferably" ("bij voorkeur") indicate optional features, which are therefore not limiting for the subject-matter of the respective claim.

1.2 It is further noted that "for" ("voor") in a device or system claim is interpreted as meaning "suitable for".

2 Reference is made to the following documents:

D1 US 2017/069227 A1 (DIALAMEH ORANG [US] ET AL) 9 maart 2017 (2017-03-09)

D2 WO 2017/072616 A1 (KONINKLIJKE PHILIPS NV [NL]) 4 mei 2017 (2017-05-04)

D3 US 2015/077502 A1 (JORDAN CHARLES S [US] ET AL) 19 maart 2015 (2015-03-19)

D4 US 2014/267662 A1 (LAMPO PIERRE-YVES [CH]) 18 september 2014 (2014-09-18)

3 The present application does not meet the conditions of patentability, because the subject-matter of claim 1 is not new.

3.1 Document D1 discloses the subject-matter of claim 1 (the references in parentheses applying to this document):

Draadloos communicatiesysteem voor medische hulp omvattend

- een eerste mobiel apparaat (610) op een eerste plaats, waarbij het eerste apparaat een eerste optische ingang heeft (para [0100]), een beeldscherm (para [0100]: smartphone), en een zendontvanger, bij voorkeur een draadloze zendontvanger (para [0100]: smartphone),
- een tweede mobiel (para [0114]) apparaat (660) op een tweede plaats, waarbij de tweede inrichting een tweede optische ingang (624,626) heeft, een beeldscherm (650), en een zendontvanger, bij voorkeur een draadloze zendontvanger (622),
- geïmplementeerd op beide apparaten een tweerichtingstransmissie systeem (615), waarbij het transmissiesysteem in gebruik ten minste één laag eerste optische invoer (635) ontvangt die betrekking heeft op

een fysieke realiteit van het eerste apparaat en de ten minste ene laag van eerste optische invoer aan het tweede mobiele apparaat zendt (para [0100]) en ontvangt ten minste één laag tweede optische invoer (752,761) die betrekking heeft op een fysieke realiteit van het tweede apparaat (paras [0118] - [0122]) en de ten minste ene laag van tweede optische ingang naar het eerste mobiele apparaat zendt (paras [0113], [0126]),

waarbij het eerste apparaat in gebruik de ten minste ene laag tweede optische invoer van het tweede apparaat over de eerste optische ingang toont (paras [0118] - [0122]; Fig. 7), en waarbij het tweede apparaat in gebruik de ten minste ene laag van de eerste optische invoer van het eerste apparaat onder de tweede optische invoer toont, en waarbij de weergegeven invoer op het eerste apparaat bij voorkeur gelijk is aan de weergegeven invoer op het tweede apparaat (paras [0113], [0126]: "shared panorama").

4 Notwithstanding the above-mentioned lack of novelty, the present application does not meet the conditions of patentability, because the subject-matter of claims 1 and 14 does not involve an inventive step.

4.1 Document D2, which is regarded as relevant prior art to the subject-matter of claim 1, discloses (the references in parentheses applying to this document):

Draadloos communicatiesysteem voor medische hulp omvattend

- een eerste mobiel apparaat (22,36) op een eerste plaats, waarbij het eerste apparaat een eerste optische ingang heeft (para [0061]), een beeldscherm, en een zendontvanger, bij voorkeur een draadloze zendontvanger (para [0054], Figs. 1,3),
- een tweede ~~mobiel~~ apparaat (12) op een tweede plaats, waarbij de tweede inrichting een tweede optische ingang heeft (60-68), een beeldscherm (30), en een zendontvanger (54), bij voorkeur een draadloze zendontvanger,
- geïmplementeerd op beide apparaten een tweerichtingstransmissie systeem (20,24), waarbij het transmissiesysteem in gebruik ten minste één laag eerste optische invoer ontvangt die betrekking heeft op een fysieke realiteit van het eerste apparaat en de ten minste ene laag van eerste optische invoer aan het tweede mobiele apparaat zendt (para [0057]) en ontvangt ten minste één laag tweede optische invoer die betrekking heeft op een fysieke realiteit van het tweede apparaat en de ten minste ene laag van tweede optische ingang naar het eerste mobiele apparaat zendt (paras [0069], [0070]),

waarbij het eerste apparaat in gebruik de ten minste ene laag tweede optische invoer van het tweede apparaat over de eerste optische ingang toont (para [0078], Fig. 5), en waarbij het tweede apparaat in gebruik de ten minste ene laag van de eerste optische invoer van het eerste apparaat onder de tweede optische invoer toont, en waarbij de weergegeven invoer op het eerste apparaat bij voorkeur gelijk is aan de weergegeven invoer op het tweede apparaat (paras [0069] - [0077], Fig. 4).

4.2 The subject-matter of claim 1 therefore differs from this known communication system in that the second device is a mobile device.

4.3 The problem to be solved by this feature may therefore be regarded as increasing the flexibility of the system.

4.4 However, mobile devices increasingly take the place of stationary workstations, so that it would be obvious for a person skilled in the art to replace the workstation of D2 by a mobile device. See also document D1, paragraph [0114]; or D3, passages cited in the search report. Hence, the subject-matter of claim 1 does not involve an inventive step in view of document D2.

4.5 This reasoning also applies, *mutatis mutandis*, to the subject-matter of claim 14, which is therefore also considered not inventive in view of document D2

5 The dependent claims listed below do not contain any features which, in combination with the features of any claim to which they refer, meet the criteria of patentability in respect of novelty and/or inventive step for the following reasons:

5.1 Novelty:

- Claim 2: see D1, paragraph [0036].
- Claim 3: see D1, paragraph [0043], [0100].
- Claims 4-6: see D1, paragraphs [0118] - [0122] and Fig. 7.
- Claim 7: see D1, paragraph [0126].
- Claim 8: not limiting (see section 1.1 above).
- Claim 11: see D1, paragraph [0100].
- Claim 13: see D1, paragraphs [0103], [0104].

5.2 Inventive Step:

- Claim 9: see D2, Figs. 4,5.
- Claim 10: see D3, paragraphs [0095], [0096].
- Claim 12: obvious GUI element.

**Re Item VIII**

**Certain observations on the application**

1 Claims 1, 5, 8 and 10 are not clear.

1.1 In claim 8, the location of one of the mobile devices is specified as being a remote location ("afgelegen locatie"). However, in the context of a system claim, the location of a mobile device is not limiting (the location of a system component would only be limiting if there is a clearly defined spatial relationship between the system components, which does not appear to be the case for mobile devices).

1.2 At least some features of claims 1, 5 and 10 are defined in terms of activities (e.g. "zendt", "toont", "selecteert"), which is not appropriate for a device or system claim, because a device or system does not necessarily perform a certain activity, but is rather configured to perform this activity.