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(54) **SYSTEM FOR DETECTION AND PROCESSING OF PHYSICAL PARAMETERS OF HUMAN BODY AND METHOD THEREOF**

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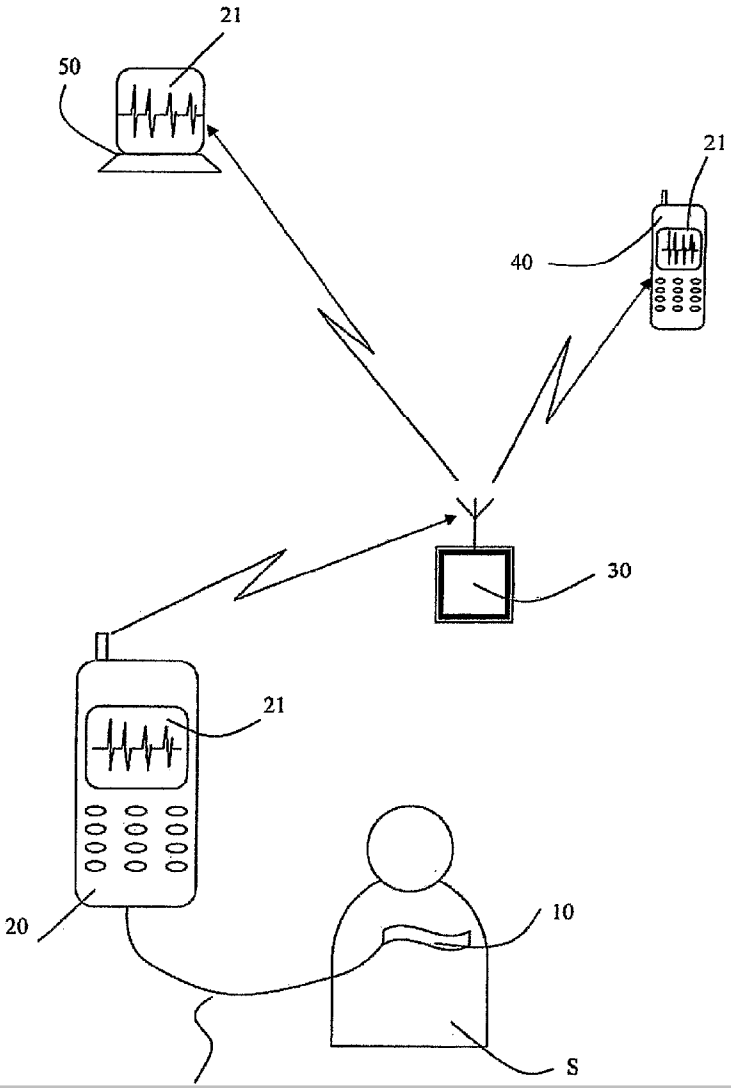
(57) **ABSTRACT**

What is disclosed is a system and a method for the detection and processing of physical parameters of the human body, which comprises a plurality of sensors which can be applied to the skin of a subject. Said system comprises at least an interface circuit for the processing of the signals coming from said sensors and at least a reception/transmission circuit for the transmission of the signals processed by the interface circuit.



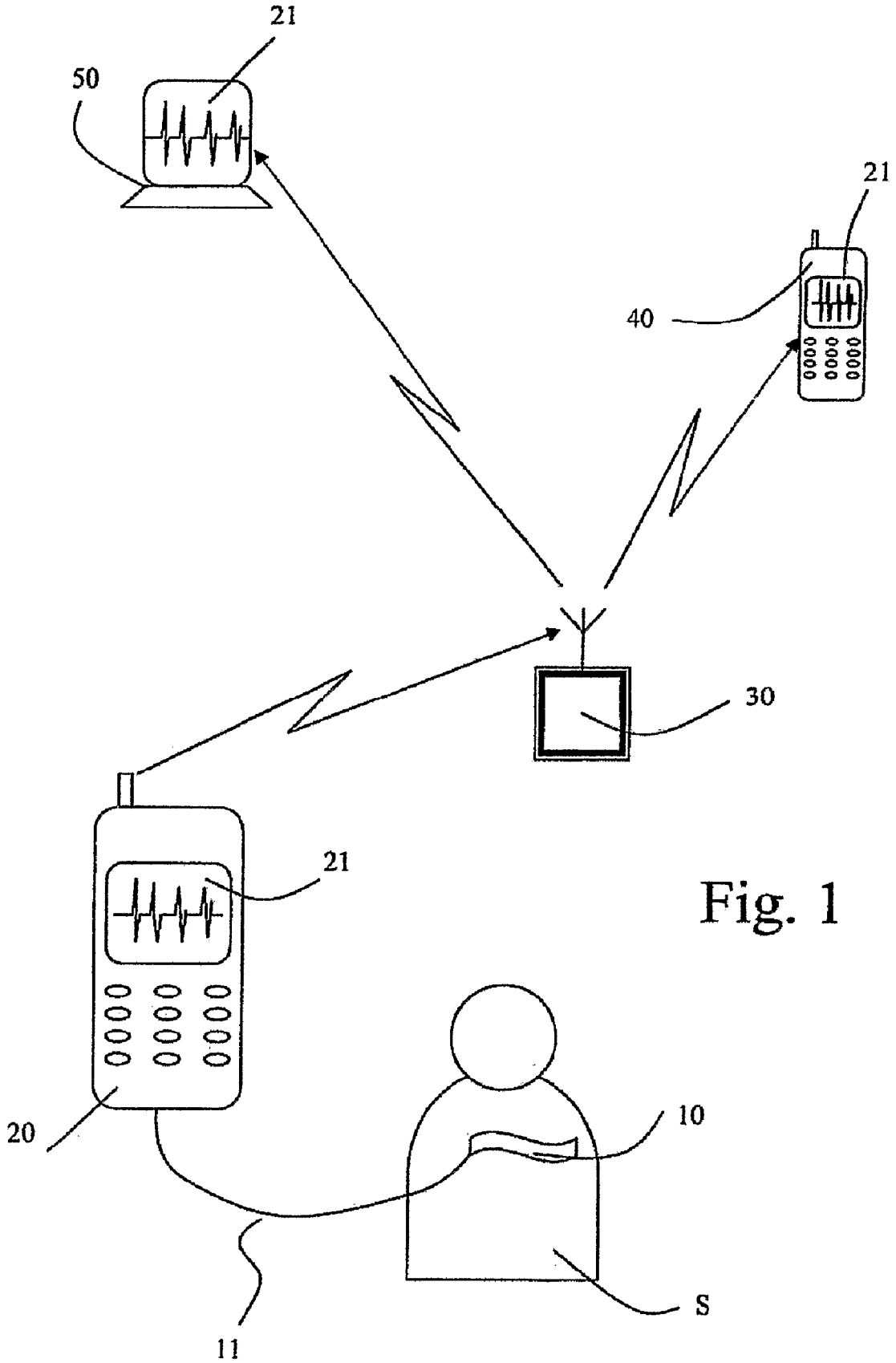


Fig. 1

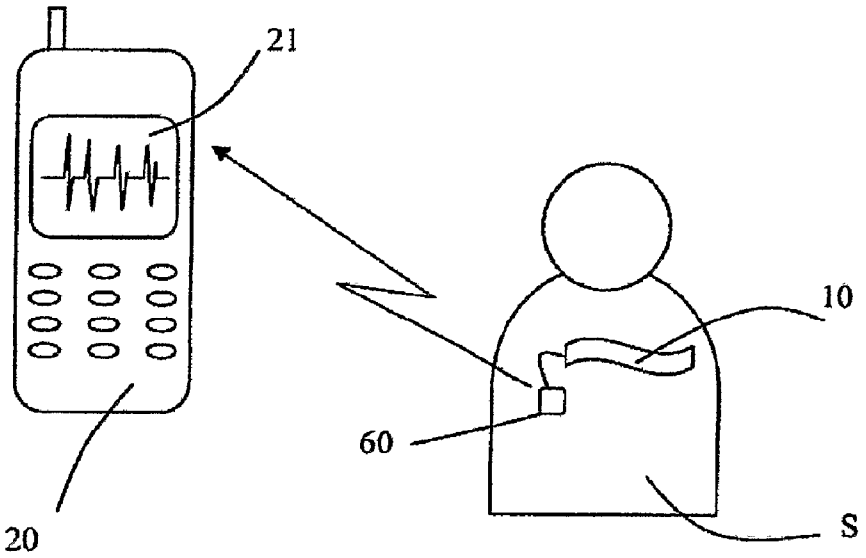


Fig. 2

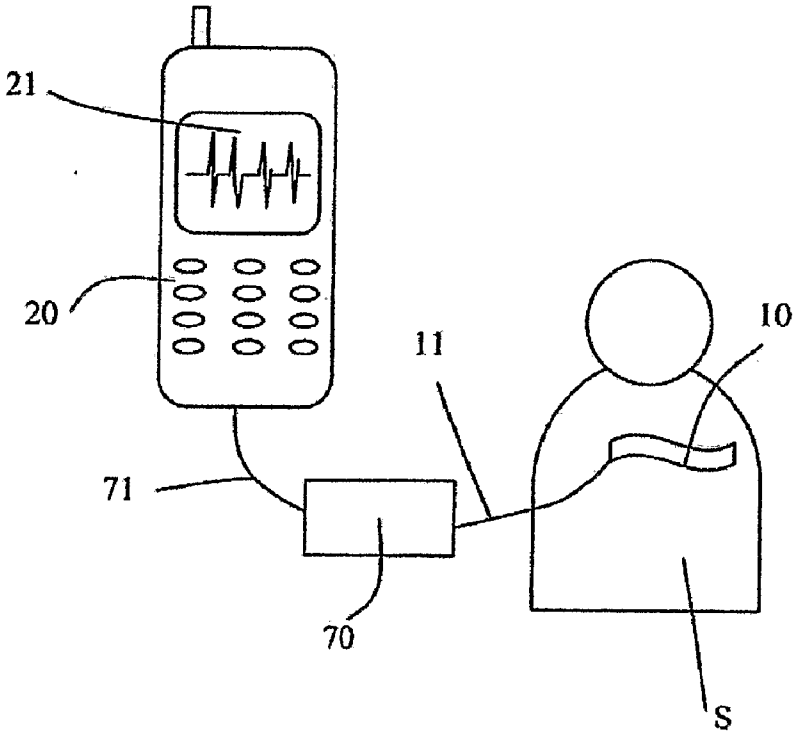


Fig. 3

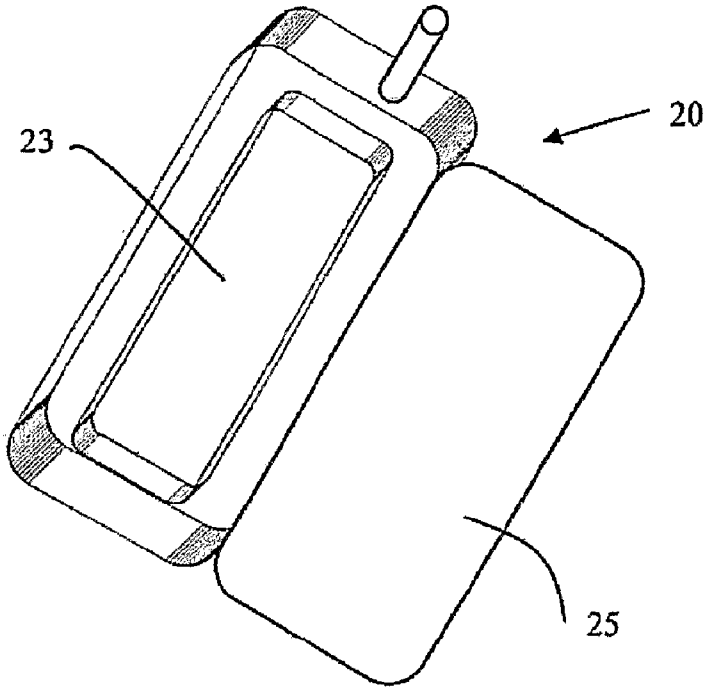


Fig. 4

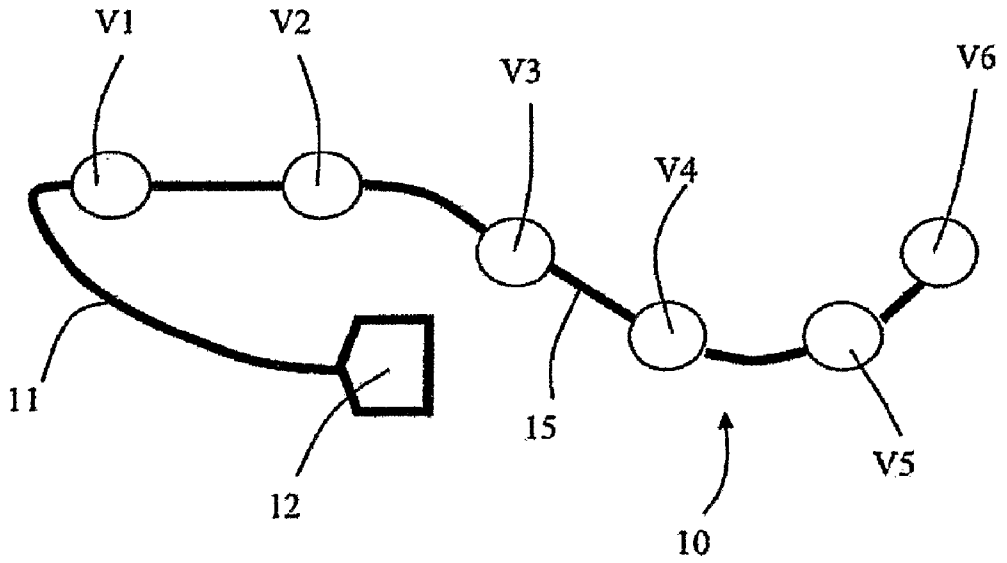


Fig. 5

SYSTEM FOR DETECTION AND PROCESSING OF PHYSICAL PARAMETERS OF HUMAN BODY AND METHOD THEREOF

TECHNICAL FIELD

[0001] The present invention refers to a system and a method for the detection and processing of physical parameters of the human body. The invention refers in particular, but not exclusively, to the detection and processing of signals of an electrocardiogram of a patient. Systems for telemedicine have been known for a long time and continuously evolve; said systems for telemedicine allow patients who suffer from particular pathologies to be remotely monitored by means of telecommunication equipment. Said telecommunication equipment allows transmitting the signal detected by particular sensors applied to a patient to a diagnostic centre of choice.

[0002] Nevertheless, several pathologies can arise without any notice also in subjects considered basically healthy. In particular, several cardiac problems may suddenly arise and, if not promptly faced, may constitute a serious danger for health, or even for life itself. Such an event may happen not only to people subjected to particular strain conditions, like athletes or other sports people during sports competition or training, but also to people in everyday life.

[0003] Time is therefore a relevant factor in order to be able to help and try effective treatments to a subject struck, for example, by a heart attack. In fact, it is deemed that a prompt intervention, which is tried within 20 minutes since arising of a heart attack, could allow limiting damages due to such a pathology or even saving a person's life. Nevertheless, a person who is considered healthy, and for this reason is not normally subjected to a remote monitoring of his health conditions, is often unable to report the arising of such problems. For this reason, the need to provide to everyone a practical and easy-to-use system, which allows a quick reporting of significant information on the nature of the problems to a remote unit exists. In general, the object of the present invention is to provide a system for detection and processing of physical parameters of the human body that can be available to a person in order to report possible health problems to a remote unit.

DESCRIPTION OF THE INVENTION

[0004] A particular object of the present invention is to provide a system and a method that allows detecting and transmitting information of a person's electrocardiogram, at any time and in any condition. Such objects can be reached by the present invention thanks to a system according to claim **1** and to a method according to claim **8**. Further characteristics and advantages of the present invention are detailed in the respective claims.

[0005] In a first aspect of the present invention, a system for the detection and the processing of physical parameters of human body is provided, which includes a plurality of sensors applicable to the skin of the subject, characterized by the fact that it comprises at least one interface circuit for processing sensor outputs and at least one reception/transmission circuit for the transmission of the signals processed by the interface circuit.

[0006] In the preferred embodiment, signals detected by [illegible] temperature, arterial blood pressure and other, can be possibly provided, as long as specific sensors for such purpose are available.

[0007] In a particularly advantageous aspect of the present invention, the reception/transmission circuit is included in a cellular phone. Since a cellular phone is an everyday object, such a solution allows everyone to be able to notify conveniently and in a particularly simple way to a remote unit the arising of cardiac problems.

[0008] In a possible embodiment of said system, also the interface circuit is included in a cellular phone. Said cellular phone being therefore arranged to process signals received by the sensors and to transmit on request significant information to a particular remote equipment, which can be either a cellular phone or a landline telephony equipment.

[0009] In the preferred embodiment, the cellular phone includes at least a compartment in which sensors can be kept when they are not applied to the skin of the subject. In such a way, sensors necessary for signal detection can be always provided to the person that uses the cellular phone and do not encumber when they are not used. Alternatively, a compartment to keep sensors can be realized in the cellular phone case, provided that the subject uses one. In this way it is possible to avoid that the sensors being separated from the cellular phone and unintentionally placed where they do not come handy.

[0010] In a possible embodiment, the connection between the sensors and the cellular phone is wireless, for example infrared transmission or radio-frequency transmission. Alternatively, said connection can also be a wired connection, by providing the set of sensors with a single connector, which is compatible with a suitable data link socket of the cellular phone it is associated with.

[0011] In a second aspect of the present invention, a method for the detection and the processing of physical parameters of the human body is provided, in which a plurality of sensors is applied to the skin of a subject, characterized by the fact that it comprises the following phases:

[0012] a) detecting sensors signals;

[0013] b) processing the detected signals in order to obtain one or more images representative of the signals;

[0014] c) transmitting images to a remote unit as radio-frequency signals.

[0015] In particular, the signals detected are preferably at least signals of an electrocardiogram of the subject, such signals being transformed into images. An image advantageously provides an information which is particularly significant and immediately decipherable by the person who receives them. Images are preferably transmitted by a cellular phone to a remote unit, for example the cellular phone of a trusted physician or to a telephony equipment, for example a telephone or a mobile phone equipped with a visualization screen, a facsimile or similar, which is present in a diagnostic centre or in a centre equipped for telemedicine services. The processing of the images is preferably realized by a suitable interface circuit included in a cellular phone. Alternatively, said interface circuit can be included in an external unit which can be connected, with a wired or wireless connection, to the mobile phone and to the sensors.

[0016] In a third aspect of the present invention, a set of sensors for the detection and the processing of physical parameters of human body is provided, characterized by the [illegible]

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