the EEG signal, said signal processing means being adapted for, based on the EEG signal, identifying or predicting a hypoglycemic seizure, in said person, said processing part comprising decision means for deciding, based on said analyzed EEG signal, when an alarm or information must be provided. The system also comprises alarm means for providing the person with an alarm. The system further comprise a first connection between the EEG sensor part and the processing unit, adapted for transmitting EEG signal from the EEG sensor part to the processing unit. The system further comprises an external part adapted to receive wirelessly an alarm from said processing part, said external part being adapted to forward an alarm to a helper, and the system comprises a second and wireless connection between the processing unit and the external part. The EEG sensor part is adapted for subcutaneous implantation in the head. The first connection is wireless and the EEG sensor part comprises a first coil and the processing unit comprises a second coil. The first wireless connection is based on an inductive coupling between the first and the second coils, and the first wireless connection is adapted for transferring power from the processing unit to the implantation EEG sensor part. This facilitates that the implanted EEG sensor part can be driven without a battery since it is powered from the processing unit.

This solution has the advantage that correct positioning of the processing unit is easy to control if the housing of the control unit is arranged at the ear. It can directly be seen if it is correctly positioned. Furthermore, the part of the system arranged on the persons head can be made relatively small and of low weight.

It is also an advantage that the signal processing is performed directly in the processing unit. Thereby the EEG signal as such does not need to be transmitted to the external part. Only alarms or other specific information needs to be transmitted. This saves power for transmission.

In a preferred embodiment of the system for remote surveillance of an EEG signal the system comprises alarm means for providing the person with an alarm, such that the system is capable of giving a direct alarm to the person under surveillance for hypoglycemia. The alarm means could be a loudspeaker or a mechanical vibrator, and could be arranged in the processing unit. One advantage of both giving a direct alarm to the person and sending an alarm wirelessly to a helper, could be in situations where the person is in a period of training in order to learn to handle an alarm on his or her own. During such a period where the person may be getting used to the system, the alarm to the helper or caregiver may be an extra safety precaution to avoid hypoglycemic attacks.

Another advantage of a system capable of giving a wireless alarm to a helper as well as a direct alarm to the person in risk of hypoglycemia is that it will not be necessary to change the system as the needs for direct alarm and wireless alarm to a helper changes. Such a change could be that a child learns to handle the alarm on its own and therefore no longer needs the backup from a parent. An older person may also initially be able to handle an alarm, but may at some point in time need the safety of a helper who also gets the alarm. Logistically it will be simpler, and thereby cheaper, to manufacture and distribute one system capable of doing both, instead of two different systems.

A further advantage is that the possibility for both a direct alarm to the person and for the wireless alarm to the care giver implies that the same version or model of the EEG sensor and the processing unit can be applied both when only an alarm to the person is necessary and also when only an alarm to the care giver is necessary. Thereby the necessary number of different versions or models which need to be manufactured can be reduced.

~~In a preferred embodiment of the system for remote surveillance of an EEG signal t~~The EEG sensor part ~~is adapted for implantation on the head. This~~ implantation may be subcutaneous or intra cranial. The advantage is that a better contact between electrodes and tissue can be obtained. A subcutaneous EEG sensor can also be implanted relatively easy. Alternatively, the EEG sensor part could be arranged in the ear canal with the electrodes in contact with the tissue in the ear canal. Thereby any kind of surgery is avoided, but the contact between the electrodes and the tissue is less stable.

~~In a further embodiment of the system with an implanted EEG sensor part the first~~ connection is wireless and the EEG sensor part comprises a first coil and the processing unit comprises a second coil. The first wireless connection is based on an inductive coupling between the first and the second coils, and the first wireless connection is adapted for transferring power from the processing unit to the implantable EEG sensor part. This facilitates that the implanted EEG sensor part can be driven without a battery ~~since it is powered from the processing unit.~~

be set up for checking if the person has signs on hypoglycemia. This could be by asking the person to enter a code or the result of a simple calculation on the external part.

In a further embodiment of the system the second wireless connection between the processing unit and the external part is based on an inductive link. The antennae for this may be smaller compared to antennae for traditional radio communication.

~~In a~~A second aspect of the invention ~~it~~ is ~~also~~ directed to a method for EEG surveillance, detecting and supplying an alarm of an imminent hypoglycemic seizure in a person. The method comprises the steps of measuring EEG signals of said person by an EEG sensor part, said EEG sensor having electrodes for measuring one or more EEG signals, and said EEG sensor part is provided with an electronic module, transmitting the measured EEG signal from the EEG sensor part to a processing unit through a first connection between the EEG sensor part and the processing unit, said processing unit being adapted to be removable arranged at the ear of said person, processing the EEG signal in said processing unit having EEG signal processing means for analyzing the EEG signal, said signal processing means being adapted for, based on the EEG signal, identifying or predicting a hypoglycemic seizure in said person, said processing unit comprising decision means for deciding, based on said analyzed EEG signal, when an alarm must be provided, and transmitting an alarm from said processing unit to an external part through a second connection established wirelessly between the processing unit and the external part, characterized in that said first connection being wireless and said EEG sensor part has been implanted subcutaneous on the head of the person, and in that said first connection is wireless and said EEG sensor part comprises a first coil and said processing unit comprises a second coil, wherein said first wireless connection being based on an inductive coupling between said first and said second coils and is transferring power from the processing unit to the implantable EEG sensor part.

Embodiments of the invention will now be explained in further detail with reference to the figures.

Figure 1 illustrates an embodiment where the processing unit of the system is prepared to be arranged behind the ear, and the EEG sensor part is prepared to be arranged subcutaneously in the area behind the ear.

Figure 2 illustrates schematically a system for remote surveillance of an EEG signal, based on an implanted EEG sensor part.

Figure 3 illustrates a flowchart for a method for surveillance of an EEG signal.

Figure 1 shows the head 6 of a person provided with a system 1 for remote surveillance of an EEG signal. The person is being monitored wearing the implantable EEG sensor 2 and the processing unit 4. The two units 2, 4 are adapted to be in wireless communication through the skin of the person. The implanted EEG sensor 2 comprises electrodes 5. The sensor will have at least two electrodes, which may be arranged as separate electrodes along the same wire 5 as illustrated in figure 1. One wire comprising all electrodes associated with respective conductors may facilitate the implantation process. The EEG sensor is provided with an electronic module 7.