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(54) **Title:** COMBINATION OF INFUSION PUMP AND MEASURING DEVICE

(57) **Abstract:** In an insulin pump (1) at least one alarm generator (21) can be deactivated by a signal (18) sent by a blood glucose meter (11). Thus alarms by the pump can be oppressed which can be detected as being not necessary in view of measurements made. This enhances the comfort of operation for the user of the combination of pump and measuring device.

Combination of infusion pump and measuring device

Reference to related applications

This application claims the priority of European patent application Nr. 07 012 663.6 which was filed on June 28, 2007 and which is hereby incorporated by reference in its entirety.

Technical Field

The present invention relates to a combination of at least one infusion pump and at least one measuring device for measuring of a value of the body of the patient receiving the infusion and wherein the infusion pump comprises at least one alarm device. The invention further relates to an insulin pump, to an blood glucose measuring device and to a method for administering an insulin infusion.

Background Art

Infusion pumps and in particular insulin pumps that can be carried or worn, respectively, on the body of a patient are known. Such insulin pumps deliver insulin according to the set basal rate and administer additionally required insulin as a bolus, which is not explained here further. Measuring devices for values of a human body are as well known in diverse embodiments and in particular as blood glucose meters and for example blood glucose meters working with test strips. With insulin pumps it is known that the user can program alarms that serve as reminders and it is known that alarms of an alarm device of the pump are generated by the pump itself as signals that follow on an event or occurrence to di-

rect the user's attention to necessary or advisable acts to be performed. US-B-6,852,104 is an example for such an infusion pump.

Disclosure of the Invention

It is a general object of the invention to improve an arrangement or a combination, respectively, of an infusion pump and a measurement device and in particular an arrangement or combination of an insulin pump and a blood glucose meter.

Now, in order to implement this and still further objects of the invention, which will become more readily apparent as the description proceeds, the alarm of the alarm device can be deactivated by a signal of the measurement device that is received wirelessly or by wire by the infusion pump.

By providing an alarm device in the infusion pump that can be deactivated by a signal from the measurement device the number of unnecessary alarms can be reduced. For example such alarms can be suppressed or deactivated, respectively, that were used to remind the user about actions to be taken but which the user has already performed, or such alarms which are not necessary depending on the actual situation.

It is a further object of the invention to improve an insulin pump or to improve a blood glucose meter, respectively.

This object is met by the claims directed to the insulin pump or the blood glucose meter, respectively.

Yet another object of the invention is to improve a method of administering of an insulin infusion. This object is met by the features of the method claim.

Brief Description of the Drawings

The invention will be better understood and objects other than those set forth above will become apparent when consideration is given to the following detailed description thereof. Such description makes reference to the annexed drawing, wherein:

The Figure schematically shows the combination of an insulin pump and a blood glucose meter.

Detailed Description of the Invention

An insulin pump 1 is shown here as the preferred example of an infusion pump and comprises an insulin reservoir 2. The control device 4 of the pump controls a drive 3 with a piston (not shown) such that a controlled and precisely dosed amount of insulin is provided to a patient. This is done by an infusion conduit 7 and a cannula 8 introduced to the body 6 of the patient. Such insulin pumps are known and readily available on the market, so that the construction thereof needs no detailing here for the person skilled in the art. The infusion pump or insulin pump, respectively, further has operation elements 9, for example push buttons, for the input of instructions by the user and has a display 10 which is operated by the control device 4 of the pump. The power supply, which in case of a pump to be carried on the body of the user is a battery power supply, is not shown. It is known as well that the infusion pump comprises at least one alarm generator or signal generator 21, respectively, which generates an audible and/or tactile signal

for the user of the infusion pump and is thus a sound signal or vibration signal. This alarm signal may provide different functions and is as a rule provided in different forms (for example by different sequences of sounds and/or sounds of different frequency) so that the user can detect the function of the alarm signal and can distinguish each alarm from the other alarms. The alarm signal is not necessarily a signal that signals a dangerous situation and is thus an alarm to the strict meaning of the term. To the contrary such alarms that signal a danger, for example an alarm in case of an occlusion of the infusion line 7, will not be deactivatable according to the present invention. But in the present application the term alarm and alarm generator is used nevertheless even if a "normal" signal emitted during the normal pump operation and a signal generator for such a signal is meant. The infusion pump may comprise several alarm generators of which at least one alarm generator functions according to the invention. The alarm generator 21 is controlled by the control device 4 or by a separate alarm control circuit. An alarm can be triggered by an event or incidence within the pump (immediately or with a time delay), as for example by the replacement of the reservoir 2, or the alarm can be set by the user to a certain time or to happen after a certain time by a programming of the alarm. In this case the alarm of the alarm generator has the function of reminding the user of the pump which is explained later in more detail. Setting or programming, respectively, of the alarm is usually done by operating elements 9 and usually with the help of the display 10. The setting of event or incidence driven alarms is done by the control device without or with an action of the user.

The measurement device 11, in the shown example a blood glucose meter, provides in a known manner a function of measuring at least one value or characteristic of the body of the patient, which is in case of the blood glucose meter the blood glucose level. To this end a blood sample on a test strip 13 is entered into the meter 11 through a test strip opening 14. In the meter 11 the blood glucose value of the blood sample is measured in a known manner. Since such measurements are well known to the person skilled in the art and are not relevant for the present invention no further details are necessary here. Most blood glucose meters are provided with a display 12. A control circuit 16 within device 11 controls the measurement and the display 12.

According to the invention the infusion pump 1 and the measurement device 11 are provided to exchange signals. This exchange can be made by a wire connection or by a wireless connection. In the Figure a wireless radio communication is shown by module 15 in the device 11 and module 17 in the infusion pump 1 and by an arrow 18 symbolising the connection from device 11 to pump 1 (thus showing a unidirectional signal connection from signal sending device 11 to the signal receiving pump 1). Additionally a signal connection may as well be provided from the infusion pump to the device 11, preferably as well by modules 17 and 15, as is symbolised by an arrow 19. These modules may, for example, establish a wireless connection according to the Bluetooth® standard between device 11 and pump 1. Pump 1 and the measurement device 11 are preferably provided to establish a mutual identification and verification at the signal exchange so that pump and measurement device do not react on signals from other devices; such an identification of devices and verification

of devices and signals is known to the person skilled in the art and will not be detailed here.

According to the invention the infusion pump and in particular the portable insulin pump 1 designed to be carried on the body of the user is adapted so that the alarm of alarm generator 21 can be deactivated by a signal coming from the measurement device 11. This can be embodied in different ways. The signal 18 may be a specific signal of device 11 which only includes the information that a predetermined alarm of alarm generator 21 of the infusion pump shall be deactivated. Or that the alarm of a predetermined alarm generator among several alarm generators shall be deactivated. This signal is received by module 17 and evaluated by the control device 4 of pump 1 and an alarm already set will be deleted or the control 4 suppresses the next alarm triggered by an event based on the signal that the pump 1 has received from device 11. Only such alarms are suppressed that are marked in the control as being allowed to be suppressed/deactivated. The signal received by module 17 may as well act directly on the alarm generator 21, for example deactivating the alarm generator for a predetermined time, without the help of the control circuit 4. The term deactivation or suppression of an alarm shall be understood that either an alarm already set is not going off or is deleted, or as well that an alarm is not set by the pump 1 on the first place if beforehand the signal 18 from the measurement device has been received and evaluated by the control device 4. Further these terms are understood in the context of this invention, that an alarm set will be shifted in time so that it does not occur at the set alarm time but at a later time.

The infusion pump may as well comprise several alarm generators or may comprise several circuits for operating a common alarm generator. At least one of the further alarm generators or circuits can be deactivated by the signal from device 11 and preferably at least one of the other alarm generators or circuits will not be influenced by the signal. Different types of alarms are then different by the fact that they are processed as deactivatable via the corresponding alarm generator or as non deactivatable over the other alarm generator or are processed via the corresponding circuit or the other circuit, respectively.

The signal from device 11 can as well be a signal that comprises as main information typical information provided by the measurement device, for example a measurement value, and that contains the alarm deactivation information as described only as additional information. Further, the signal from device 11 may be a signal without specific alarm information and the infusion pump 1 is adapted to derive the alarm deactivating information from the measurement value signal itself, and in other words the pump 1 according to the invention is adapted to compare the measured values with predetermined measurement values or measurement value ranges stored in the pump and to decide whether an alarm within the pump shall be deactivated/suppressed or not based on this comparison. This is done by the control device 4 of the pump. The term main information is used here for the measurement value and/or alarm deactivation information in view of that the whole signal 18 or 19 transmitted will usually comprise additional information for safe transmission purposes such as for identification and synchronisation and verification of transmission which are well

known to the skilled person and are not of particular interest here.

In a preferred embodiment the infusion pump 1 is adapted such that an alarm of an alarm generator 21 can be activated by the signal from measurement device 11. In this case an alarm generator of the pump is activated by the signal from device 11 either directly or by control device 4. This can lead to an immediate alarm or to a time delayed alarm.

In another special embodiment of the invention a signal 19 is provided by infusion pump 1 to the device 11 and can influence an alarm generator 22 within device 11 in the same manner as has been described for the alarm generator of the infusion pump 1. In particular the alarm generator in the measurement device can be deactivated and/or activated.

In the following, examples are given how the deactivation/suppression of an alarm or an activation an alarm according to the invention and special embodiments thereof enhances the value of the preferrd combination of the insulin pump and the blood glucose meter to the user:

1. In known insulin pumps an alarm is generated as reminding alarm immediately or after a short predetermined time after an event has occurred at the insulin pump 1, for example the event of changing the insulin reservoir 2 or the event of releasing a meal bolus of insulin to the patient. Such reminding alarms request the user of the insulin pump to perform a blood glucose measurement. According to the present invention such a reminding alarm can be deactivated by the signal from the blood glucose meter. This is preferably done in such a way that the insulin pump deactivates the reminding alarm based on the signal of the measuring device if this sig-

nal is received or has been received by the pump within a predetermined time, for example a time that has been fixedly programmed or that may be set by the user, before the alarm time or event time. For example the reminding alarm set by the bolus event can be deactivated (by not setting this alarm in the pump at all or by setting it but not triggering the set alarm) if, for example within an hour, before the alarm time or event time a signal of the blood glucose meter has been provided. This then means that within the last hour before the alarm time or event time a blood glucose measurement has already been performed by the device 11, so that a reminder for a measurement of the blood glucose value is at present not necessary. It is as well possible to deactivate the reminding alarm by shifting it in time to a later time, so that it will be activated to a predetermined later time instead of the normal alarm time, this as well depending on the signal of device 11.

2. Another example refers to the known function of an insulin pump that an alarm is provided at a time after an event by starting a timer by the event. For example an alarm may be provided three hours after the releasing of a bolus amount of insulin by starting a timer when releasing the bolus that then triggers the alarm when the timer has reached the predetermined count. If a measurement is performed by device 11 within the time that the timer is running and thus a signal 18 is sent to the pump and is received by the pump 1, then this timer can be reset so that the alarm will not be generated or in other words has been deactivated.

3. A further example refers to the function of known insulin pumps to provide an alarm which is generated if the wearer of the pump has not operated the

pump for a certain time, for example 12 hours, by the operating elements (in the shown example push buttons 9). This alarm as well can be deactivated when device 11 has indicated by a signal 18, and in this case preferably by several such signals which are spaced in time, that the blood glucose value has been measured often enough during the time that leads normally to the alarm. As said, this special alarm is preferably only deactivated when several signals 18 of device 11 have been received by pump 1 within a certain time.

4. Another example can be given for the embodiment where a signal 18 by device 11 is able to set an alarm. If several signals 18 that include measurement values have been provided by measurement device 11 and have been evaluated by pump 1 as including measurement values that are lower than a predetermined blood glucose level an alarm will be generated by the pump requesting the user of the pump to activate a limited time reduction of the basal rate and thus reducing the amount of insulin provided to the usser of the pump. In a preferred embodiment the pump 1 may be adapted to activate this reduction by itself if no reaction to this alarm by the user is detected within a predetermined time.

5. Another example is the deactivation of a meal bolus alarm. Such an alarm reminds the user to activate a meal bolus within a predetermined time interval. Such an alarm set to a predetermined time can be deactivated when a signal 18 of the measurement device is received by the pump, preferably a signal 18 containing a measured value, which is detected by the pump as being within a predetermined range for the value.

6. Another example comprises the setting of an alarm and generation of an alarm, respectively, at the

device 11 based on a signal 19 from the pump to the device 11. In this way the user of the pump can be alerted by an alarm of the blood glucose meter 11 that a bolus command is processed by the pump but that no measurement by device 11 has been done beforehand. In this example the pump checks upon processing of a bolus command whether a signal 18 has been received by device 11 during a predetermined time span before the bolus command, which means that a measurement has taken place before the bolus command has been given. If this has not been the case, the pump 1 triggers via a signal 19 an alarm of the device 11 that reminds the pump wearer to perform the measurement. Further an alarm 11 can be given by the device 11 generally or for a certain situation after a bolus start by the pump and after a predetermined time, for example 2 hours after the bolus start.

7. In another example, timer settings and alarms, respectively, which have been set on device 11 to remind the user to perform measurements can be transmitted via a signal or signals 18 to the pump 1 and can be set there. Since the pump is always with the user, he/she will be reminded to the necessary measurements even when the blood glucose meter is not in a distance that the alarms thereof can be heard. These alarm signals are preferably selected such that the pump user understands them as requests to measure blood glucose, for example by specially selected sound and/or vibration sequences that may be the same as for the alarms of the device 11.

Thus in an insulin pump 1 at least one alarm generator 21 can be deactivated by a signal 18 sent by a blood glucose meter 11. Alarms by the pump can thus be oppressed which are detected or evaluated as being not necessary in view of measurements made. This enhances the

comfort of operation for the user of the combination of pump and measuring device.

Claims

1. A combination comprising at least one infusion pump (1) and at least one measurement device (11) for measuring of a body value of the patient receiving the infusion, wherein the infusion pump comprises at least one alarm generator (21), characterized in that the alarm of the alarm generator can be deactivated by a signal (18) of the measurement device (11) which can be received wirelessly or by wire by the infusion pump (1).

2. The combination of claim 1 characterized in that the alarm generator can be activated by a signal (18) of the measurement device (11).

3. The combination according to claim 1 or 2, characterized in that the infusion pump (1) is adapted to send a wireless signal (19) or a signal by wire which can be received by the measurement device (11) and which activates or deactivates an alarm generator (22) of the measurement device.

4. The combination according to one of claims 1 to 3, characterized in that the infusion pump is a portable insulin pump adapted to be carried on the body of the user and that the measurement device is a blood glucose meter.

5. The combination according to one of claims 1 to 3, characterized in that the infusion pump is adapted for implantation into the body of a patient and is in particular an insulin pump.

6. The combination according to one of claims 1 to 5, characterized in that main information of the signal comprises the alarm deactivation information only and/or that the signal comprises as main information a

measurement value of the measurement device and in particular a blood glucose value.

7. The combination according to one of claims 1 to 6, characterized in that an alarm can be deactivated by a signal (18) of the measurement device (11) comprising a measurement value and wherein the infusion pump (1) is adapted to evaluate whether the measurement value is within a predetermined range of values and to deactivate the alarm depending on the evaluation.

8. The combination according to one of claims 1 to 7, characterized in that the infusion pump (1) is adapted to generate a reminding alarm immediately or after a predetermined time following an event in the pump (1), which alarm can be deactivated, the event being in particular the replacement of a reservoir (2) or the start of a meal bolus, and preferably wherein the signal of the measurement device deactivates the reminding alarm if the signal (18) is provided within a predetermined time span before the alarm time, said predetermined time span being a fixed time span or a time span to be set by the user of the pump.

9. The combination according to one of claims 1 to 8, characterized in that the pump is provided with an alarm which is generated if the user of the pump fails to enter commands to the pump during a predetermined time, wherein this alarm can be deactivated if the measurement device (11) has signaled by a signal (18) and preferably by several signals (18), that the body measurement value, in particular the blood glucose value, has been measured during this time and in particular has been measured several times.

10. The combination according to one of claims 1 to 9, characterized in that the alarm can be de-

activated by the signal by shifting the alarm in time so that it is generated, depending on the signal, at a later predetermined time instead of the original alarm time.

11. The combination according to one of claims 2 to 10, characterized in that an alarm in the pump (1) can be generated by signals (18) of the measurement device (11) if, within a predetermined time span, several signals (18) by the measurement device are provided comprising measurement values which are evaluated by the pump as being below a predetermined value and in particular said values and said value being blood glucose values.

12. The combination according to claim 11, characterized in that the infusion pump (1) is adapted to act itself to a missing reaction to the alarm by the user of the pump, by activating a pumping function of the pump within a predetermined time.

13. The combination according to one of claims 3 to 12, characterized in that the setting or generation of an alarm within the measurement device (11) by the signal (19) of the pump (1) is provided depending on a bolus command that has been followed by the pump and no measurements by the measurement device (11) within a predetermined time span.

14. The combination according to one of claims 1 to 13, characterized in that a timer setting of a timer, or timer settings of several timers, set on the measurement device (11) can be transmitted to the pump (1) by the signal (18) and can be taken over by a timer, or timers, respectively, of the pump.

15. Infusion pump (1) comprising at least one alarm generator (21), characterized in that the alarm generator can be deactivated by a signal (18) from a de-

vice (11) separate from the infusion pump (1) which can be received by the pump over wire or wirelessly.

16. Infusion pump according to claim 15, characterized in that the alarm generator (21) can be activated by a signal (18) from the device (11).

17. Infusion pump according to claim 15 or 16, characterized in that the pump (1) is adapted to evaluate a signal (18) comprising a measurement value and that the alarm generator (21) is deactivated or is not deactivated depending on the evaluation result by the pump, in particular that the alarm generator is deactivated or is not deactivated depending on the evaluation of several signals with measurement values received by the pump one after another, and in particular by an evaluation which compares the value or the values with a preset value or a preset value range.

18. Infusion pump according to one of claims 15 to 18, characterized in that the infusion pump (1) is adapted to emit a signal (19) by wire or wirelessly which is adapted to be received by a measurement device (11) and adapted to activate or deactivate at least one alarm generator (22) of the measurement device.

19. Infusion pump according to one of claims 15 to 18, characterized in that said pump is a portable insulin pump adapted to be carried on the body of the pump user.

20. Infusion pump according to one of claims 15 to 18 characterized that the pump is adapted for implantation into the body of a user and is in particular an insulin pump.

21. Infusion pump according to one of claims 15 to 19 and comprising the features of the infusion pump of the combination according to one of claims 6 to 14.

22. Blood glucose meter (11) characterized in that it is adapted to emit a signal (18) by wire or wirelessly which is adapted for deactivation and/or activation of an alarm generator (21) in an insulin pump (1).

23. Blood glucose meter (11) according to claim 22, characterized in that it is adapted for receiving a signal (19) by wire or wirelessly by which an alarm generator (22) within the blood glucose meter can be activated and/or deactivated.

24. Blood glucose meter (11) according to one of claims 22 or 23 and comprising the features of the measurement device of the combination according to one of claims 1 to 14.

25. A method of administering of an insulin infusion with a portable insulin pump (1) adapted to be carried on the body of the patient and comprising besides said pump (1) at least one blood glucose meter (11) for measuring blood glucose value, said insulin pump (1) comprising at least one alarm generator (21) and wherein at least one alarm of said alarm generator is deactivated by a signal (18) from said meter (11) that is received by said insulin pump (1) by wire or wirelessly.

26. The method according to claim 25 wherein the alarm generator is activated by a signal (18) from said meter (11).

27. The method according to claim 25 or 26 wherein the insulin pump (1) emits by wire or wirelessly a signal (19) which is adapted to be received by said meter (11) and is adapted to activate and/or deactivate an alarm generator (22) within said meter.

28. The method according to one of claims 25 to 27 wherein said signal comprises as main information only the deactivation information for the alarm and/or

that said signal comprises as main information at least one blood glucose value.

29. The method according to one of claims 25 to 28 wherein an alarm is deactivated if a signal (18) by said meter comprising a measurement value is provided and wherein the pump (1) evaluates whether the value in the signal is within a preset range of values.

30. The method according to one of claims 25 to 29, wherein said pump (1) generates a reminding alarm immediately or after a predetermined time following an event in the pump (1), which alarm can be deactivated, the event being in particular the replacement of a reservoir (2) or the start of a meal bolus, and preferably wherein the signal of the measurement device deactivates the reminding alarm if the signal (18) is provided within a predetermined time span before the alarm time, said predetermined time span being a fixed time span or a time span to be set by the user of the pump.

31. The method according to one of claims 25 to 30, wherein an alarm is generated by said pump if the user of the pump fails to enter commands to the pump during a predetermined time and wherein this alarm is deactivated if the measurement device (11) has signaled by a signal (18), and preferably by several signals (18), that the body measurement value, in particular the blood glucose value, has been measured during this time and in particular has been measured several times.

32. The method according to one of claims 25 to 31, wherein the alarm is deactivated by the signal by shifting the alarm in time so that it is generated, depending on the signal, at a later predetermined time instead of the original alarm time.

33. The method according to one of claims 25 to 32, wherein an alarm in the pump (1) is generated by signals (18) of the measurement device (11) if, within a predetermined time span, several signals (18) by the measurement device are provided comprising measurement values which are evaluated by the pump as being below a predetermined value and in particular said values and said value being blood glucose values.

34. The method according to claim 33, wherein the pump (1) starts a pump action automatically after a predetermined time if the pump user does not react to the generated alarm.

35. The method according to one of claims 25 to 34, wherein an alarm within the measurement device (11) is set or generated by the signal (19) of the pump (1) depending on the steps that a bolus command has been followed by the pump and measurements by the measurement device (11) within a predetermined time span have not been performed.

36. The method according to one of claims 25 to 35, wherein a timer setting of a timer, or timer settings of several timers, set on the measurement device (11) are transmitted to the pump (1) by the signal (18) and are taken over by a timer, or timers, respectively, of the pump.

37. The method according to one of claims 25 to 36, wherein the pump (1) and the device (11) exchange identification signals to exclude a signal reception by a device not involved in the method steps.

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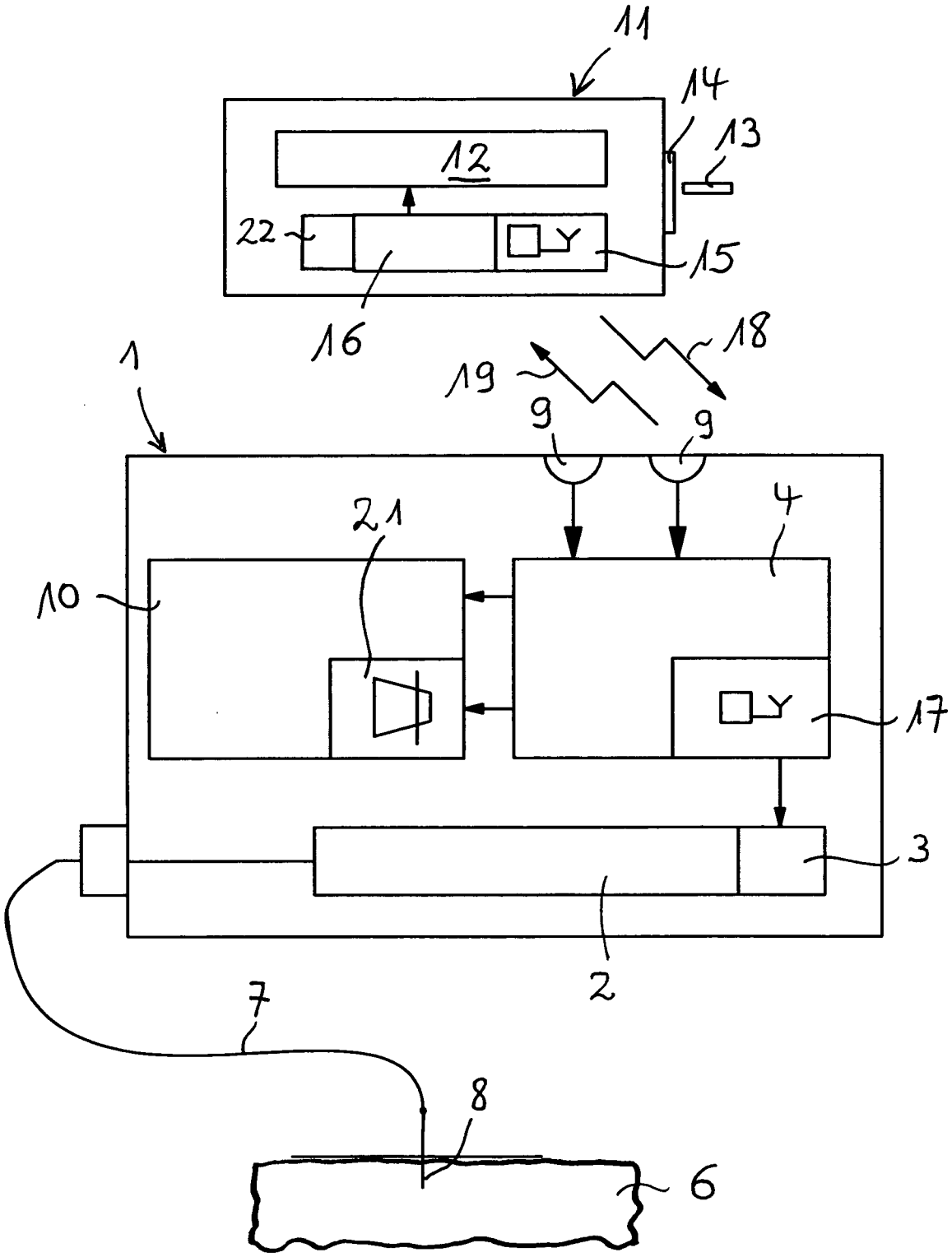

INTERNATIONAL SEARCH REPORT

International application No
PCT/CH2008/000280

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61M5/142 A61B5/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A61B A61M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2003/212379 A1 (BYLUND ADAM DAVID [US] ET AL) 13 November 2003 (2003-11-13) paragraphs [0001], [0006] - [0008], [0040], [0045], [0048], [0067] - [0069], [0075], [0077], [0078]	1-24
X	US 6 572 542 B1 (HOUBEN RICHARD [NL] ET AL) 3 June 2003 (2003-06-03) column 17, line 28 - column 18, line 3 column 19, lines 2-22 column 21, line 41 - column 22, line 26	1,2,4-6, 22
A	US 2002/065509 A1 (LEBEL RONALD J [US] ET AL LEBEL RONALD J [US] ET AL) 30 May 2002 (2002-05-30) paragraphs [0002], [0019], [0099], [0182], [0385], [0414] - [0421]; figure 3	1-24

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

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"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

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Date of the actual completion of the international search	Date of mailing of the international search report
18 September 2008	29/09/2008

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Pohjamo, Terhi

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CH2008/000280

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. [X] Claims Nos.: 25-37
because they relate to subject matter not required to be searched by this Authority, namely:

Rule 39.1(iv) PCT - Method for treatment of the human or animal body by surgery

2. [ ] Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. [ ] Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. [ ] As all required additional search fees were timely paid by the applicant, this international search report covers allsearchable claims.

2. [ ] As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.

3. [ ] As only some of the required additional search fees were timely paid by the applicant, this international search reportcovers only those claims for which fees were paid, specifically claims Nos.:

4. [ ] No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

[ ] The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

[ ] The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

[ ] No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/CH2008/000280

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2003212379 A1	13-11-2003	NONE	
US 6572542 B1	03-06-2003	NONE	
US 2002065509 A1	30-05-2002	NONE	