



Europäisches Patentamt  
European Patent Office  
Office européen des brevets



(11) **EP 1 208 723 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention  
of the grant of the patent:

**29.10.2003 Bulletin 2003/44**

(21) Application number: **00957131.6**

(22) Date of filing: **14.08.2000**

(51) Int Cl.7: **H04R 25/00**

(86) International application number:  
**PCT/NL00/00571**

(87) International publication number:  
**WO 01/026419 (12.04.2001 Gazette 2001/15)**

(54) **HEARING AID AND EXTERNAL UNIT FOR COMMUNICATION THEREWITH**

HÖRGERÄT UND EXTERNE EINHEIT ZUR KOMMUNIKATION MIT DEMSELBEN

APPAREIL DE CORRECTION AUDITIVE ET UNITE EXTERNE POUVANT COMMUNIQUER  
MUTUELLEMENT

(84) Designated Contracting States:  
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU  
MC NL PT SE**

(30) Priority: **02.09.1999 EP 99202848**

(43) Date of publication of application:  
**29.05.2002 Bulletin 2002/22**

(73) Proprietor: **BELTONE NETHERLANDS B.V.  
5652 AL Eindhoven (NL)**

(72) Inventor: **JANSSEN, Franciscus, Hubertus  
NL-5581 CL Waalre (NL)**

(74) Representative:  
**Dohmen, Johannes Maria Gerardus et al  
Algemeen Octrooi- en Merkenbureau  
P.O. Box 645  
5600 AP Eindhoven (NL)**

(56) References cited:  
**EP-A- 0 335 542                      EP-A- 0 341 997  
US-A- 5 210 803                      US-A- 5 838 801**

**EP 1 208 723 B1**

Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

## Description

**[0001]** The invention relates to a hearing aid comprising at least one first transducer for converting sound into an electric signal, a second transducer for converting an electric signal into sound, first means for processing and amplifying an electric signal from the first transducer and supplying the processed and amplified electric signal to the second transducer, and second means linked to said first means for storing signal processing parameters, as well as to an external unit arranged for communication with a hearing aid.

**[0002]** A hearing aid of this kind and an external unit of this kind are generally known.

**[0003]** The prior art external unit is used for storing signal processing parameters that have been set by an adjuster of hearing aids in the prior art hearing aid.

**[0004]** In practice it has become apparent, among other things, that people who are hard of hearing have a hearing aid fitted after having been unable for years to hear for example high tones and/or soft sounds and/or have not experienced high sound pressures. The setting to be made by the adjuster of the hearing aid (an audiologist, for example), is aimed at maximum audibility as regards speech, which implies amplification of high tones, among other things. Apart from that, the manner in which the ambient sound caught by the transducer is processed, for example amplified, filtered, etc., is adapted to the loss of hearing of the person in question. When a person who is hard of hearing hears high tones again after several years, he or she may experience this as highly unpleasant, partly because of the shrill sound, certainly upon first fitting of a first hearing aid. Consequently, the adjuster will probably opt for a setting with fewer high tones and thus a reduced audibility as regards speech, in order to satisfy the person who is hard of hearing upon his first visit. Otherwise there is a good chance that in the end the person who is hard of hearing will not use his hearing aid. On the other hand this risk also exists when the audibility as regards speech is not improved to a sufficient degree. The setting may be enhanced upon repeat visits towards more high tones and thus improved audibility as regards speech. Normally, the number of repeat visits will be relatively small, and consequently the adjustment steps will be relatively large. When the adjustment steps are too large, there is a possibility that the person who is hard of hearing will prefer the previous, actually less optimum setting and ask the adjuster to use the previous setting and subsequently leave it at that, or that he or she will refrain from further use of the hearing aid yet, with all its negative consequences.

**[0005]** In the above, the problem of high tones has been discussed. Problems with regard to soft sounds and high sound pressures are analogous thereto, however. Generally one adjustment parameter or a combination of adjustment parameters is concerned.

**[0006]** Returning to the problems associated with high

sound pressures, a lower than optimum maximum output will be set when the hearing aid is first being fitted, because the person who is hard of hearing may not be accustomed to high sounds pressures any more. As regards soft sounds, said person may not have heard the sound of ticking clocks, for example, or ambient noise produced by traffic or electric equipment for a prolonged period of time, and initially these sounds may be experienced as objectionable, in spite of the fact that soft sounds often contain valuable information. In this case the adjuster will set a relatively high noise suppression threshold value at a first fitting. Said noise suppression threshold value is a switching point in a noise suppression circuit which will reduce its amplification factor when only soft sounds below the noise suppression threshold value are presented.

**[0007]** The object of the invention is to provide a hearing aid and an external unit which enable an essential improvement as regards the above-described practice, and in order to accomplish that objective the invention provides a hearing aid of the kind referred to in the introduction, which is characterised in that the hearing aid comprises third means linked to said second means for the stepwise adjustment from a starting point of a predetermined range to an end point of said range of one or more signal processing parameters from the second means in response to successive trigger signals, as well as an external unit of the kind referred to in the introduction, which is characterised in that it is arranged for communication with the third means of a hearing aid according to the invention, and which comprises fourth means for the selecting and setting in said third means of one or more parameters to be adjusted, fifth means for the setting in the third means of the range of said one or more parameters to be adjusted, and sixth means for the setting in said third means of the magnitude of the steps to be used in said stepwise adjustment, and, if the hearing aid includes a time clock, seventh means for the setting of the repeat interval of the successive trigger signals in the time clock.

**[0008]** The hearing aid automatically adjusts itself in time, irrespective of the fact whether the trigger signals are generated manually or automatically. The adjustment of the setting can take place gradually, in small steps thereby. The difference between two steps hardly needs to be audible, if at all; the difference between the first step and the last step of a succession of steps must be audible, however.

**[0009]** Preferably, the starting point of a parameter range is defined by an initial setting that is acceptable to an intended user of the hearing aid, wherein the amplification of high tones is less than optimal and consequently the audibility as regards speech is less than optimal, and the end point of a parameter range is defined by a final setting that is optimal for the intended user, wherein the amplification of high tones is optimal and consequently the audibility as regards speech is optimal.

**[0010]** It is noted that the hearing aid is not limited to adjustment of the amplification parameter, but that instead thereof or in addition thereto other parameters can be used, such as filter function parameters, noise suppression parameters, etc. The time that is required for going from the initial setting to the final setting is the habituation period, it may last a number of weeks, for example. Both the initial setting and the final setting are pre-set, or in other words, pre-programmed by the adjuster. The hearing aid subsequently arranges the gradual shift from the initial setting to the final setting in sufficiently small steps. The magnitude of the steps can be programmable. Furthermore it is possible to preset the desired habituation period.

**[0011]** Technically, all this could be realised in a great many different ways, for example by: incorporating in the hearing aid a clock that adjusts the setting by one step after a predetermined period of time; adjusting the setting by one step after the hearing aid has been turned off and on again one or more times; adjusting the setting by one step after the battery has been placed anew one or more times or a new battery has been placed into service; adjusting the setting by one step after a knob on the hearing aid has been operated one or more times; etc.

**[0012]** More in particular, the hearing aid may include a time clock for supplying the successive trigger signals: a knob for supplying the successive trigger signals in response to repeated operation of the knob; eighth means for supplying the successive trigger signals in response to repeated turning on of the hearing aid; or ninth means for detecting the placing of a battery in the hearing aid and supplying the successive trigger signals in response to the repeated placing of a battery.

**[0013]** Preferably, the third means of the hearing aid and the external unit are arranged for communication with each other, in which case the second means of the hearing aid and the external unit will be arranged for communication with each other, exactly as may be the case in the prior art hearing aid.

**[0014]** The advantages that can be gained include the following.

**[0015]** At the first fitting, a person who is hard of hearing will receive a hearing aid which sounds acceptable and pleasant. After the habituation period, the hearing aid will automatically have been adjusted optimally without the person having had to go through a period of unpleasant sound and repeated visits to an adjuster.

**[0016]** An adjuster supplies a hearing aid which sounds pleasant from the outset, whilst nevertheless an optimum setting will be achieved after the habituation period without any interim adjustments.

**[0017]** At the least, the chance of an optimally adjusted hearing aid, that is, having an optimum, shrill sound, being put away for good by a person who is hard of hearing because the sound is not acceptable in the beginning will be smaller.

**[0018]** The invention will now be explained in more

detail with reference to a drawing consisting of one figure, which drawing shows the hearing aid and the external unit.

**[0019]** Hearing aid 1 comprises at least one transducer (microphone) 2 for converting sound into an electric signal, a second transducer (loudspeaker) 3 for converting an electric signal into sound, first means 4 for processing and amplifying an electric signal from the first transducer 2 and supplying the processed and amplified electric signal to the second transducer 3, second means (memory) 5 linked to said first means 4 for storing signal processing parameters, and third means 6 linked to said second means 5 for the stepwise adjustment of one or more signal processing parameters from second means 5 from a starting point of a predetermined range to an end point of said range in response to successive trigger signals 7.

**[0020]** In an embodiment of the hearing aid 1 the starting point of said range is defined by an initial setting that is acceptable to an intended user of the hearing aid, wherein the amplification of high tones is less than optimal and consequently the audibility as regards speech is less than optimal, and the end point of said range is defined by a final setting that is optimal for the intended user, wherein the amplification of high tones is optimal and consequently the audibility as regards speech is optimal.

**[0021]** Alternative or additional parameters can be used, if desired; wherein each parameter has a range which is defined by a predetermined initial setting and a predetermined final setting.

**[0022]** In the introduction, the maximum output level and the noise suppression threshold value have already been mentioned as possible examples of such alternative or additional parameters. Further possibilities will be apparent to those skilled in the art.

**[0023]** In an embodiment of the hearing aid the first, second and third means 4 - 6 form part of one or more integrated circuits.

**[0024]** An embodiment of the hearing aid 1 includes a time clock 8 for supplying the successive trigger signals 7.

**[0025]** Another embodiment of the hearing aid includes eighth means 9 for supplying the successive trigger signals 7 in response to repeated turning on of the hearing aid 1.

**[0026]** Yet another embodiment of the hearing aid 1 includes ninth means 10 for detecting the placing of a battery in the hearing aid 1 and supplying the successive trigger signals 7 in response to the repeated placing of a battery.

**[0027]** Yet another embodiment of the hearing aid 1 includes a knob 11 for supplying the successive trigger signals 7 in response to repeated operation of said knob 11.

**[0028]** Although the hearing aid 1 as shown in the drawing includes the time clock 8, eighth means 9, ninth means 10 as well as knob 11, the hearing aid 1 will gen-

erally include either the time clock 8, or the eighth means 9, or the ninth means 10 or the knob 11.

[0029] It will be appreciated by a person of average skill in the art how time clock 8, eighth and ninth means 9, 10 and knob 11, can be arranged or be provided with electronics that may form part of the aforesaid one or more integrated circuits, such that the successive trigger signals 7 will be supplied, so that this will not be discussed in more detail herein. Manuals can be consulted for this purpose, if desired.

[0030] As a matter of fact, a person of average skill in the art will be able to think of a great many other means for realising the desired successive trigger signals.

[0031] Hearing aid 1 could include fourth means (not shown) for the selecting and setting in the third means 6 of one or more parameters to be adjusted, fifth means (not shown) for the setting in the third means 6 of the range of said one or more parameters to be adjusted, sixth means (not shown) for the setting in the third means 6 of a step magnitude to be used in the stepwise adjustment, and, in the case that the hearing aid 1 includes the clock 8, seventh means (not shown) for the setting of the repeat interval of the successive trigger signals 7 in the time clock 8.

[0032] It is more practical, however, to incorporate said fourth to seventh means in an external unit 20, whereby the third means 6, and also the second means 5, and the external unit 20 are arranged for communication with each other. To that end, the external unit 20 comprises communication means 21 and the aforesaid fourth to seventh means 22 - 25, which in an embodiment comprise software which runs on a PC.

## Claims

1. A hearing aid (1) comprising at least one first transducer (2) for converting sound into an electric signal, a second transducer (3) for converting an electric signal into sound, first means (4) for processing and amplifying an electric signal from the first transducer (2) and supplying the processed and amplified electric signal to the second transducer (3), and second means (5) linked to said first means (4) for storing signal processing parameters, **characterised in that** the hearing aid comprises third means (6) linked to said second means (5) for the stepwise adjustment from a starting point of a predetermined range to an end point of said range of one or more signal processing parameters from the second means (5) in response to successive trigger signals (7).
2. A hearing aid (1) according to claim 1, **characterised in that** said one or more signal processing parameters to be adjusted are selected from high tones amplification, maximum output level and noise suppression threshold value.
3. A hearing aid (1) according to claim 1 or 2, **characterised in that** the starting point of said range is defined by an initial setting that is acceptable to an intended user of the hearing aid, wherein the amplification of high tones is less than optimal and consequently the audibility as regards speech is less than optimal, and the end point of said range is defined by a final setting that is optimal for the intended user, wherein the amplification of high tones is optimal and consequently the audibility as regards speech is optimal.
4. A hearing aid (1) according to any one of the claims 1 - 3, **characterised in that** said third means (6) are arranged for communication with an external unit (20) which comprises fourth means for the selecting and setting in said third means (6) of one or more parameters to be adjusted, fifth means for the setting in the third means (6) of the range of said one or more parameters to be adjusted, and sixth means for the setting in said third means (6) of the magnitude of the steps to be used in said stepwise adjustment.
5. A hearing aid (1) according to any one of the claims 1 - 4, **characterised in that** said hearing aid (1) includes a time clock (8) for supplying the successive trigger signals (7).
6. A hearing aid (1) according to claim 5, **characterised in that** said third means (6) are arranged for communication with an external unit (20) which comprises seventh means for the setting of the repeat interval of the successive trigger signals (7) in the time clock (8).
7. A hearing aid (1) according to any one of the claims 1 - 4, **characterised in that** said hearing aid (1) comprises eighth means (9) for supplying the successive trigger signals (7) in response to repeated turning on of the hearing aid (1).
8. A hearing aid (1) according to any one of the claims 1 - 4, **characterised in that** said hearing aid (1) comprises ninth means (10) for detecting the placing of a battery in the hearing aid (1) and supplying the successive trigger signals (7) in response to the repeated placing of a battery.
9. A hearing aid (1) according to any one of the claims 1 - 4, **characterised in that** said hearing aid (1) includes a knob (11) for supplying the successive trigger signals (7) in response to repeated operation of said knob (11).
10. An external unit (20) arranged for communication with a hearing aid, **characterised in that** said external unit (20) is arranged for communication with

the third means (6) of a hearing aid (1) according to any one of the preceding claims, and which comprises fourth means for the selecting and setting in said third means (6) of one or more parameters to be adjusted, fifth means for the setting in the third means (6) of the range of said one or more parameters to be adjusted, and sixth means for the setting in said third means (6) of the magnitude of the steps to be used in said stepwise adjustment, and, if the hearing aid (1) includes a time clock (8), seventh means for the setting of the repeat interval of the successive trigger signals (7) in the time clock (8).

## Patentansprüche

### 1. Hörgerät (1) mit:

mindestens einem ersten Transducer (2) zum Umwandeln von Schall in ein elektrisches Signal;

einem zweiten Transducer (3) zum Umwandeln eines elektrischen Signals in Schall; einer ersten Einrichtung (4) zum Verarbeiten und Verstärken eines vom ersten Transducer (2) erhaltenen elektrischen Signals und zum Zuführen des verarbeiteten und verstärkten elektrischen Signals zum zweiten Transducer (3); und

einer mit der ersten Einrichtung (4) verbundenen zweiten Einrichtung (5) zum Speichern von Signalverarbeitungsparametern;

#### **dadurch gekennzeichnet, daß**

das Hörgerät eine mit der zweiten Einrichtung (5) verbundene dritte Einrichtung (6) zum stufenweisen Einstellen eines oder mehrerer von der zweiten Einrichtung (5) erhaltener Signalverarbeitungsparameter von einem Anfangspunkt eines vorgegebenen Bereichs zu einem Endpunkt des Bereichs in Antwort auf aufeinanderfolgende Triggersignale (7) aufweist.

2. Hörgerät (1) nach Anspruch 1, **dadurch gekennzeichnet, daß** der eine oder die mehreren einzustellenden Signalverarbeitungsparameter aus einer Hochtonverstärkung, einem maximalen Ausgangssignalpegel und einem Rauschunterdrückungsschwellenwert ausgewählt werden.

3. Hörgerät (1) nach Anspruch 1 oder 2, **dadurch gekennzeichnet, daß** der Anfangspunkt des Bereichs durch eine Anfangseinstellung definiert ist, die für einen vorgesehenen Benutzer des Hörgeräts geeignet ist und bei der die Hochtonverstärkung weniger als optimal ist, so daß die Hörbarkeit bezüglich Sprache weniger als optimal ist, und der Endpunkt des Bereichs durch eine für den vorgesehe-

nen Benutzer optimale EndEinstellung definiert ist, bei der die Hochtonverstärkung optimal ist, so daß die Hörbarkeit bezüglich Sprache optimal ist.

5 4. Hörgerät (1) nach einem der Ansprüche 1 bis 3, **dadurch gekennzeichnet, daß** die dritte Einrichtung (6) dazu geeignet ist, mit einer externen Einheit (20) zu kommunizieren, die eine vierte Einrichtung zum Auswählen und Setzen eines oder mehrerer einzustellender Parameter in der dritten Einrichtung (6), eine fünfte Einrichtung zum Setzen des Bereichs des einen oder der mehreren einzustellenden Parameter in der dritten Einrichtung (6) und eine sechste Einrichtung zum Setzen der Schrittweite der für die schrittweise Einstellung zu verwendenden Schritte in der dritten Einrichtung (6) aufweist.

5. Hörgerät (1) nach einem der Ansprüche 1 bis 4, **dadurch gekennzeichnet, daß** das Hörgerät (1) einen Zeittakt (8) zum Zuführen der aufeinanderfolgenden Triggersignale (7) aufweist.

6. Hörgerät (1) nach Anspruch 5, **dadurch gekennzeichnet, daß** die dritte Einrichtung (6) dazu geeignet ist, mit einer externen Einheit (20) zu kommunizieren, die eine siebente Einrichtung zum Setzen des Wiederholungsintervalls der aufeinanderfolgenden Triggersignale (7) im Zeittakt (8) aufweist.

7. Hörgerät (1) nach einem der Ansprüche 1 bis 4, **dadurch gekennzeichnet, daß** das Hörgerät (1) eine achte Einrichtung (9) zum Zuführen der aufeinanderfolgenden Triggersignale (7) in Antwort auf ein wiederholtes Einschalten des Hörgeräts (1) aufweist.

8. Hörgerät (1) nach einem der Ansprüche 1 bis 4, **dadurch gekennzeichnet, daß** das Hörgerät (1) eine neunte Einrichtung (10) zum Erfassen der Anordnung einer Batterie im Hörgerät (1) und zum Zuführen der aufeinanderfolgenden Triggersignale (7) in Antwort auf das wiederholte Anordnen einer Batterie aufweist.

9. Hörgerät (1) nach einem der Ansprüche 1 bis 4, **dadurch gekennzeichnet, daß** das Hörgerät (1) einen Knopf (11) zum Zuführen der aufeinanderfolgenden Triggersignale (7) in Antwort auf eine wiederholte Betätigung des Knopfes (11) aufweist.

10. Externe Einheit (20), die dazu geeignet ist, mit einem Hörgerät zu kommunizieren, **dadurch gekennzeichnet, daß** die externe Einheit (20) dazu geeignet ist, mit der dritten Einrichtung (6) eines Hörgeräts (1) nach einem der vorangehenden Ansprüche zu kommunizieren, wobei die externe Einheit eine vierte Einrichtung zum Auswählen und Setzen eines oder mehrerer einzustellender Para-

meter in der dritten Einrichtung (6), eine fünfte Einrichtung zum Einstellen des Bereichs des einen oder der mehreren einzustellenden Parameter in der dritten Einrichtung (6) und eine sechste Einrichtung zum Setzen der Schrittweite der für die schrittweise Einstellung zu verwendenden Schritte in der dritten Einrichtung (6) aufweist, und, wenn das Hörgerät (1) einen Zeittakt (8) aufweist, die siebente Einrichtung zum Setzen des Wiederholungsintervalls der aufeinanderfolgenden Triggersignale (7) im Zeittakt (8).

## Revendications

1. Prothèse auditive (1) comprenant au moins un premier transducteur (2) pour convertir un son en signal électrique, un second transducteur (3) pour convertir un signal électrique en son, des premiers moyens (4) pour traiter et amplifier un signal électrique provenant du premier transducteur (2) et fournir le signal électrique traité et amplifié au second transducteur (3) et des seconds moyens (5) reliés aux dits premiers moyens (4) pour stocker des paramètres de traitement du signal, **caractérisée en ce que** la prothèse auditive comprend des troisièmes moyens (6) reliés aux dits seconds moyens (5) pour le réglage par étapes allant d'un point de départ d'une plage prédéterminée à un point d'arrivée de ladite plage d'un ou de plusieurs paramètres de traitement du signal issu des seconds moyens (5) en réponse à des signaux de déclenchement successifs (7).
2. Prothèse auditive (1) selon la revendication 1, **caractérisée en ce que** ledit ou lesdits paramètres de traitement du signal à régler sont sélectionnés à partir d'une amplification des tonalités aiguës, d'un niveau de sortie maximal et d'une valeur de seuil de suppression de bruit.
3. Prothèse auditive (1) selon la revendication 1 ou 2, **caractérisée en ce que** le point de départ de ladite plage est défini par un réglage initial qui est acceptable pour un utilisateur donné de la prothèse auditive, dans laquelle l'amplification des tonalités aiguës est inférieure à l'amplification optimale et, en conséquence, l'audibilité par rapport à la parole est inférieure à l'optimale, et le point d'extrémité de ladite plage est défini par un réglage final qui est optimal pour l'utilisateur donné, dans laquelle l'amplification des tonalités aiguës est optimale et, par conséquent, l'audibilité par rapport à la parole, est optimale.
4. Prothèse auditive (1) selon l'une quelconque des revendications 1 à 3, **caractérisée en ce que** lesdits troisièmes moyens (6) sont disposés pour une

communication avec une unité externe (20) qui comprend des quatrièmes moyens pour sélectionner et régler dans lesdits troisièmes moyens (6) l'un ou plusieurs des paramètres à régler, des cinquièmes moyens pour régler dans les troisièmes moyens (6) la plage dudit ou desdits paramètres à régler, et des sixièmes moyens pour régler dans lesdits troisièmes moyens (6) l'amplitude des étapes à utiliser dans ledit réglage par étapes.

5. Prothèse auditive (1) selon l'une quelconque des revendications 1 à 4, **caractérisée en ce que** ladite prothèse (1) comporte une horloge (8) pour fournir les signaux de déclenchement successifs (7).
6. Prothèse auditive (1) selon la revendication 5, **caractérisée en ce que** lesdits troisièmes moyens (6) sont disposés pour une communication avec une unité externe (20) qui comporte des septièmes moyens pour régler l'intervalle de répétition des signaux de déclenchement successifs (7) dans l'horloge (8).
7. Prothèse auditive (1) selon l'une quelconque des revendications 1 à 4, **caractérisée en ce que** ladite prothèse auditive (1) comporte des huitièmes moyens (9) pour fournir les signaux de déclenchement successifs (7) en réponse à la mise en route répétée de la prothèse auditive (1).
8. Prothèse auditive (1) selon l'une quelconque des revendications 1 à 4, **caractérisée en ce que** ladite prothèse auditive (1) comprend des neuvièmes moyens (10) pour détecter la mise en service d'une batterie dans la prothèse auditive (1) et fournir les signaux de déclenchement successifs (7) en réponse à la mise en service répétée d'une batterie.
9. Prothèse auditive (1) selon l'une quelconque des revendications 1 à 4, **caractérisée en ce que** ladite prothèse (1) comporte un bouton (11) pour fournir les signaux de déclenchement successifs (7) en réponse à une opération répétée dudit bouton (11).
10. Unité externe (20) disposée pour une communication avec une prothèse auditive, **caractérisée en ce que** ladite unité externe (20) est agencée pour être en communication avec les troisièmes moyens (6) d'une prothèse auditive (1) selon l'une quelconque des revendications précédentes, et qui comporte des quatrièmes moyens pour sélectionner et régler dans lesdits troisièmes moyens (6) un ou plusieurs paramètres à régler, des cinquièmes moyens pour régler dans les troisièmes moyens (6) la plage dudit ou desdits paramètre(s) à régler, et des sixièmes moyens pour régler dans lesdits troisièmes moyens (6) l'amplitude des étapes à utiliser dans ledit réglage par étapes, et, si la prothèse (1) com-

porte une horloge (8) des septièmes moyens pour régler l'intervalle de répétition des signaux de déclenchement successifs (7) dans l'horloge (8).

5

10

15

20

25

30

35

40

45

50

55

7

