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## (54) System, hearing aid, and method for improving synchronization of an acoustic signal to a video display

(57) The present invention relates to a system 2, a hearing aid 4 and a method 40 for improving synchronization of an acoustic signal to a video display. The system 2 comprises a hearing aid 4 and a delay unit 6 that may be integrated in the hearing aid 4. The hearing aid 4 is configured for receiving a first audio signal intended for synchronous (i.e. at least substantially synchronous) presentation to a viewer of the video display. The hearing aid 4 is configured for generating a first acoustic signal to be presented to the user of the hearing aid 4. The first acoustic signal comprises at least a first part being generated in response to the first audio signal. The delay unit 6 is configured for applying a delay, such that synchronization of the at least first part of the first acoustic signal to the video display is improved.

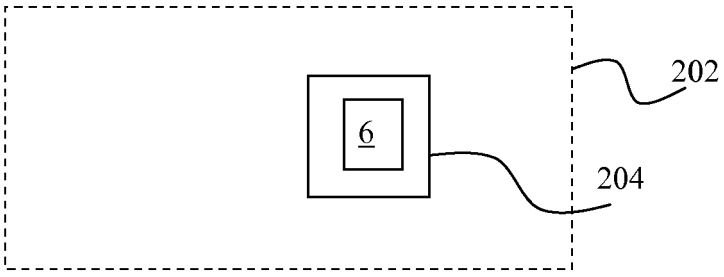


**Fig. 2**

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## Description

**[0001]** The present invention relates to the field of hearing aids. More in particular, the present invention relates to presentation of an acoustic signal to a user of a hearing aid, which acoustic signal is accompanying (or is intended to be accompanied by) concurrent display of video.

**[0002]** When a user of a hearing aid is using a media system (such as a TV) for presentation/display of audio and video, the user of the hearing aid may receive the audio from the system via a microphone of the hearing aid. This may reduce the quality of the audio as perceived by the user of the hearing aid.

**[0003]** The inventors have realized that an audio signal (e.g. such as may be streamed from an audio output, such as RCA phone connector, of a TV) may not be in sync with a corresponding video display by the TV. In particular, the audio signal may be in advance in time compared to the video display. This off-sync (out of sync) may e.g. at least partly be due to the processing (e.g. encoding) that is carried out in order to generate a video signal and an audio signal, respectively. Thus, the processing of the signals may not result in a synchronized generation (e.g. stream) of the video signal and the audio signal, respectively. The processing of the video stream may be more complex and may therefore take longer than the processing of the audio stream.

**[0004]** The inventors have noticed that if the video and audio presentations are too far off-sync, e.g. more than about 40 ms, it may be a noticeable and disturbing factor for the user (i.e. the viewer and listener).

**[0005]** Thus, the inventors have realized that there is a need for providing specific solutions for a hearing aid, for a system comprising a hearing aid, and for a method comprising utilization of a hearing aid for provision of improved synchronization between the presentations of inter-related audio and video signals.

**[0006]** According to a first aspect of the present invention, there is provided a system for improving synchronization of an acoustic signal to a video display. The system comprises a hearing aid and a delay unit that may be integrated in the hearing aid. The hearing aid comprises a hearing loss processor configured for processing in accordance with a hearing loss of a user of the hearing aid. The hearing aid is configured for receiving a first audio signal intended for synchronous (i.e. at least substantially synchronous) presentation to a viewer of the video display. The hearing aid is configured for generating a first acoustic signal to be presented to the user of the hearing aid. The first acoustic signal comprises at least a first part being generated in response to the first audio signal. The delay unit is configured for applying a delay, such that synchronization of the at least first part of the first acoustic signal to the video display is improved.

**[0007]** According to a second aspect of the present invention, there is provided a hearing aid configured for improving synchronization of an acoustic signal to a video display. The hearing aid comprises a hearing loss processor configured for processing in accordance with a hearing loss of a user of the hearing aid. The hearing aid is configured for receiving a first audio signal being intended for synchronous (i.e. at least substantially synchronous) presentation to a viewer of the video display. The hearing aid is configured for generating a first acoustic signal to be presented to the user of the hearing aid. The first acoustic signal comprises at least a first part being generated in response to the first audio signal. The hearing aid comprises a delay unit configured for applying a delay, such that synchronization of the at least first part of the first acoustic signal to the video display is improved.

**[0008]** According to a third aspect of the present invention, there is provided a method for improving synchronization of an acoustic signal to a video display. The method comprises receiving a first audio signal by a hearing aid. The first audio signal is intended for synchronous (i.e. at least substantially synchronous) presentation to a viewer of the video display. The hearing aid comprises a hearing loss processor configured for processing in accordance with a hearing loss of a user of the hearing aid. The method comprises generating a first acoustic signal by the hearing aid. The first acoustic signal is presented to the user of the hearing aid. The first acoustic signal comprises at least a first part being generated in response to the first audio signal. The method comprises applying a delay, such that synchronization of the at least first part of the first acoustic signal to the video display is improved.

**[0009]** It is an advantage of the present invention that drawbacks of the prior art are reduced. In particular it is an advantage of the improvement of the synchronization of the present invention that the user experience may be improved in that less off-sync may be experienced by the user and therefore fewer disturbances and/or inconveniences may be experienced by the user.

## BRIEF DESCRIPTION OF THE DRAWINGS

**[0010]** The above and other features and advantages of the present invention will become readily apparent to those skilled in the art by the following detailed description of exemplary embodiments thereof with reference to the following attached drawings.

Fig. 1 schematically illustrates a first embodiment of a system according to the present invention.

Fig. 2 schematically illustrates a second embodiment of a system according to the present invention.

Fig. 3 schematically illustrates a third embodiment of a system according to the present invention.

Fig. 4 schematically illustrates a fourth embodiment of a hearing aid according to the present invention.

Fig. 5 schematically illustrates a fourth embodiment of a system according to the present invention.

Fig. 6 schematically illustrates an embodiment of an intermediate unit according to the present invention.

Fig. 7 schematically illustrates a fifth embodiment of a hearing aid according to the present invention.

Fig. 8 schematically illustrates a fifth embodiment of a system according to the present invention.

Fig. 9 schematically illustrates a sixth embodiment of a system according to the present invention.

Fig. 10 schematically illustrates a seventh embodiment of a system according to the present invention.

Fig. 11 schematically illustrates a first embodiment of a method according to the present invention.

Fig. 12 schematically illustrates a second embodiment of a method according to the present invention.

Fig. 13 schematically illustrates an embodiment of a system according to the present invention, wherein the system comprises a binaural hearing aid system.

**[0011]** The figures are schematic and simplified for clarity, and they may merely show details which are essential to the understanding of the invention, while other details may have been left out. Throughout, the same reference numerals may be used for identical or corresponding parts.

**[0012]** It should be noted that in addition to the exemplary embodiments of the invention shown in the accompanying drawings, the invention may be embodied in different forms and should not be construed as limited to the embodiments set forth herein. Rather, these embodiments are provided so that this disclosure will be thorough and sufficient, and will fully convey the concept of the invention to those skilled in the art.

## DETAILED DESCRIPTION

**[0013]** The hearing aid may comprise one or more microphones, e.g. a first microphone and/or a second microphone for reception of acoustic signal(s) and generation of corresponding audio signal(s).

**[0014]** The hearing aid may comprise an analogue-to-digital (AD) converter unit for converting the audio signal(s), which have been generated by the one or more microphones, to digital signal(s). The AD converter unit may be embedded in the hearing loss processor or may form part of the microphone.

**[0015]** The hearing aid may comprise a memory unit. The memory unit may be connected to or may be incorporated in (form part of) the hearing loss processor. The memory unit may be configured for storing data and/or hearing aid parameters, such as configured for storing data for generation of the delay.

**[0016]** The hearing aid may comprise a communication unit that may be configured for receiving and/or transmitting signals, for example radio signals wirelessly, e.g. in order to enable the hearing aid to communicate wirelessly with another device, such as a hearing device and/or a wireless interface. The communication may be one-way. The communication unit may be configured for receiving the first audio signal.

**[0017]** The hearing aid may comprise a digital-to-analogue (DA) converter unit. The DA converter unit may be incorporated into the hearing loss processor.

**[0018]** The hearing aid may comprise a receiver (may also be denoted speaker or loudspeaker) configured for generating the first acoustic signal to the user.

**[0019]** The one or more microphones may be connected to or integrated with the AD converter unit. The AD converter unit may be connected to or integrated with the hearing loss processor. The AD converter unit may convert or transform audio signals from the one or more microphones and send a corresponding digital audio signal to the hearing loss processor. The hearing loss processor may send control signals to the AD converter unit to configure and control operation of the AD converter unit. The hearing loss processor may be connected to a user interface. The receiver may be connected to the hearing loss processor and/or the DA converter. The communication unit may be connected to the hearing loss processor.

**[0020]** The first acoustic signal may comprise a second part generated in response to a signal received by at least one microphone (e.g. of the hearing aid), which signal may be processed (e.g. by the hearing loss processor) in accordance with a hearing loss of the user of the hearing aid. The first and second part of the first acoustic signal may be mixed and presented simultaneously to the user, i.e. presented as a combined signal.

**[0021]** The delay unit may be incorporated by the hearing loss processor.

**[0022]** A Bluetooth protocol or a similar or anther protocol or dedicated protocol may be used for wireless communication via the communication unit. For instance, communication of the first audio signal to the hearing aid may be by wireless communication.

**[0023]** According to the present invention, signals that are intended for synchronous presentation includes signals that are intended for at least substantially synchronous presentation, such as known from a motion picture with an inter-related sound signal.

**[0024]** The first audio signal may be an electromagnetic signal representing a sound signal. The first acoustic signal may be a sound signal. A sound signal may be defined as a signal in form of a mechanical wave that is an oscillation of pressure transmitted through the medium in the ear of the user of hearing aid (which medium is usually air), wherein the signal is comprises frequen-

cies within the range of hearing of the user of the hearing aid and of a level sufficiently strong to be heard by the user of the hearing aid.

**[0025]** The system may comprise a control interface configured for enabling the user of the hearing aid to control the delay. Control of the delay may include adjustment and/or setting of the delay. Provision of the control interface may improve the user experience since the delay may be controlled according to current individual needs and/or habits.

**[0026]** The control interface may comprise one or more push buttons.

**[0027]** The control interface (or another user interface) may be configured for enabling the user of the hearing aid to control the volume of the first acoustic and/or of the first part of the acoustic signal and/or of the second part of the acoustic signal.

**[0028]** The control interface may form part of the hearing aid. Having the control interface forming part of the hearing aid may facilitate the control since the control will always be at the user of the hearing aid.

**[0029]** The control interface may form part of an auxiliary device configured for remote control of the delay. The auxiliary device may comprise a hearing aid remote control and/or a smart phone or pda etc. Having the control interface forming part of an auxiliary device may enable an improved user-friendly experience and/or a detailed control.

**[0030]** The system may be configured for provision of automatic control of the delay by improving synchronization of the at least first part of the first acoustic signal to a second acoustic signal received by at least one microphone of the system, such as at least one microphone of the hearing aid. That is, a signal generated by the at least one microphone of the hearing aid (i.e. generated from the second acoustic signal) may be used for comparing with the first acoustic signal (or a signal derived there from). This may be an advantage if a version of the signal that is intended for synchronous presentation is provided acoustically to the hearing aid, e.g. via a speaker of a TV-set. Provision of automatic control may improve user-friendliness since it may alleviate and/or reduce the needed interaction (e.g. control) by the user of the hearing aid.

**[0031]** The automatic control may be configured to be overruled by interaction by the user via the control interface.

**[0032]** The automatic control may be configured to be activated and/or deactivated by the user, e.g. via the control interface.

**[0033]** The delay may comprise a preset value. Provision of a preset value may improve user-friendliness since it may alleviate the needed interaction (e.g. control) by the user of the hearing aid.

**[0034]** The system may comprise an intermediate unit configured for receiving a second audio signal intended for synchronous presentation to a viewer of the video display. The intermediate unit may be configured for transmitting the first audio signal in response to the received second audio signal. Thus, the aim of the intermediate unit may be to provide the first audio signal in a form (e.g. protocol) that is intended (or at least usable) for a hearing aid.

**[0035]** The delay unit may form part of the intermediate unit. Having the delay unit may forming part of the intermediate unit may reduce or eliminate the need for the hearing aid to provide any delay

**[0036]** The delay unit may form part of the hearing aid. This may improve the usability of the system and/or the hearing aid, since the hearing aid then is configured for receiving a signal that needs to be delayed in order to reduce discomfort caused by an off-sync signal.

**[0037]** Having both the delay unit and the control interface forming part of the hearing aid may reduce the need for transmission of signals

**[0038]** The system may comprise a second delay unit. For instance the delay unit may form part of the hearing aid and the second delay unit may form part of the intermediate unit.

**[0039]** The system may comprise a binaural hearing aid system including the hearing aid and a second hearing aid. At least one of the hearing aids of the binaural hearing aid system may be configured for applying a delay such as both of them. Alternatively, or additionally a delay may be applied to the first audio signal, i.e. a delay is included in the signal received by the hearing aids.

**[0040]** Control of delay/delays for a binaural hearing aid system may be by means of a common control interface, e.g. a control interface forming part of one of the hearing aids or forming part of an auxiliary device.

**[0041]** The delay may be controllable by the user. Having the delay controllable may improve the user experience since the delay may be controlled according to current individual needs and/or habits of the user.

**[0042]** The delay may be controllable in steps of at least 2 ms, such as at least 5 ms, such as at least 10 ms, such as at least 15 ms, such as at least 20 ms, such as at least 25 ms. Having a step of a large time scale may reduce the needed interaction with the control interface. Having a step of a low time scale may improve the option to fine-tune the delay.

**[0043]** The method may comprise automatic control of the delay by improving synchronization of the at least first part of the first acoustic signal to a second acoustic signal received by at least one microphone, such as at least one microphone of the hearing aid.

**[0044]** The system and/or the hearing aid according to the present invention may be configured for carrying out the method according to the present invention.

**[0045]** In the following figures, a connecting line may indicate that a transfer of a signal will or may take place between the connected parts.

**[0046]** Fig. 1 schematically illustrates a first embodiment of a system 2 according to the present invention for improving synchronization of an acoustic signal to a video display (the video display is not illustrated). The

system 2 comprises a hearing aid 4 and a delay unit (not illustrated in Fig. 1) that may be integrated in the hearing aid 4. The hearing aid 4 comprises a hearing loss processor (not illustrated in Fig. 1) configured for processing in accordance with a hearing loss of a user of the hearing aid 4. The hearing aid 4 is configured for receiving a first audio signal intended for synchronous (i.e. at least substantially synchronous) presentation to a viewer of the video display. The hearing aid 4 is configured for generating a first acoustic signal to be presented to the user of the hearing aid 4. The first acoustic signal comprises at least a first part being generated in response to the first audio signal. The delay unit is configured for applying a delay, such that synchronization of the at least first part of the first acoustic signal to the video display is improved.

**[0047]** Fig. 2 schematically illustrates a second embodiment of a system 202 according to the present invention for improving synchronization of an acoustic signal to a video display (the video display is not illustrated). The system 202 comprises a hearing aid 204 and a delay unit 6 that forms part of the hearing aid 204. The hearing aid 204 comprises a hearing loss processor (not illustrated in Fig. 2) configured for processing in accordance with a hearing loss of a user of the hearing aid 204. The hearing aid 204 is configured for receiving a first audio signal intended for synchronous (i.e. at least substantially synchronous) presentation to a viewer of the video display. The hearing aid 204 is configured for generating a first acoustic signal to be presented to the user of the hearing aid 204. The first acoustic signal comprises at least a first part being generated in response to the first audio signal. The delay unit 6 is configured for applying a delay, such that synchronization of the at least first part of the first acoustic signal to the video display is improved.

**[0048]** Fig. 3 schematically illustrates a third embodiment of a system 302 according to the present invention for improving synchronization of an acoustic signal to a video display (the video display is not illustrated). The system 302 comprises a hearing aid 304 and a delay unit 6. The system 302 is configured such that an output from the delay unit 6 may be received by the hearing aid 304 either directly or via another device. The hearing aid 304 comprises a hearing loss processor (not illustrated in Fig. 3) configured for processing in accordance with a hearing loss of a user of the hearing aid 304. The hearing aid 304 is configured for receiving a first audio signal intended for synchronous (i.e. at least substantially synchronous) presentation to a viewer of the video display. The system 302 is configured such that the first audio signal may be received by the hearing aid 304 via the delay unit 6. The hearing aid 304 is configured for generating a first acoustic signal to be presented to the user of the hearing aid 304. The first acoustic signal comprises at least a first part being generated in response to the first audio signal. The delay unit 6 is configured for applying a delay, such that synchronization of the at least first part of the first acoustic signal to the video display is improved.

**[0049]** The delay unit 6 of the system 302 is situated outside the hearing aid 304. Thus, the first acoustic signal received by the hearing aid will already have been delayed, thus synchronization may have been improved.

**[0050]** Fig. 4 schematically illustrates a fourth embodiment of a hearing aid 404 according to the present invention. The hearing aid 404 is configured for improving synchronization of an acoustic signal to a video display (not illustrated). The hearing aid 404 comprises a hearing loss processor 8 configured for processing in accordance with a hearing loss of a user of the hearing aid. The hearing aid 404 is configured for receiving a first audio signal being intended for synchronous presentation to a viewer of the video display. The hearing aid 404 is configured for generating a first acoustic signal to be presented to the user of the hearing aid. The first acoustic signal comprises at least a first part being generated in response to the first audio signal. The hearing aid comprises a delay unit 6 configured for applying a delay, such that synchronization of the at least first part of the first acoustic signal to the video display is improved. The hearing aid 404 comprises a first microphone 12 and a receiver (alternatively denoted speaker or loudspeaker) 14. The receiver 14 is configured for generating the first acoustic signal. The hearing aid 404 comprises a communication unit 10 configured for receiving the first audio signal. The communication unit 10 is configured for wireless communication. The wireless communication comprises at least receiving the first audio signal. The delay unit 6 is included in the hearing loss processor 8 of the hearing aid 404.

**[0051]** Fig. 5 schematically illustrates a fourth embodiment of a system 502 according to the present invention. In addition to what is described in connection to the system 2 of Fig. 1, the system 502 comprises an intermediate unit 18 configured for receiving a second audio signal intended for synchronous presentation to a viewer of the video display. The intermediate unit 18 is configured for transmitting the first audio signal in response to the received second audio signal.

**[0052]** Fig. 6 schematically illustrates an embodiment of the intermediate unit 618 according to the present invention, wherein the delay unit 6 forms part of the intermediate unit 618. The intermediate unit 18 comprises a processor 20, a receiver (i.e. a signal receiving unit) 22, and a transmitter 24. The receiver 22 and the transmitter 24 may be integrated in a transceiver 26. The receiver 22 is configured for receiving the second audio signal. The transmitter 24 is configured for transmitting the first audio signal. The processor 20 incorporates the delay unit 20 and is configured for applying a delay.

**[0053]** Fig. 7 schematically illustrates a fifth embodiment of a hearing aid 704 according to the present invention. In addition to what is described in connection to the hearing aid 404 of Fig. 4, the hearing aid 704 comprises a control interface 16 configured for enabling the user of the hearing aid 704 to control the delay. Thus, the control interface 16 forms part of the hearing aid 704. In one or more alternative embodiments, the control interface may be configured for controlling a delay unit sit-

uated outside the hearing aid, which hearing aid may or may not comprise a delay unit.

**[0054]** Thus, a system according to the present invention, which system comprises the hearing aid, accordingly comprises a control interface configured for enabling the user of the hearing aid to control the delay.

**[0055]** Fig. 8 schematically illustrates a fifth embodiment of a system 802 according to the present invention. In addition to what is described in connection to the system 2 of Fig. 1, the system 802 comprises a control interface 16 configured for enabling the user of the hearing aid to control the delay. The control interface 16 forms part of an auxiliary device 28 configured for remote control of the delay. The auxiliary device 28 may be considered to form part of the system 802. Alternatively, any parts of the auxiliary device 28 that are not specifically related to the control interface 16 are not considered part of the system 802. This may be the case for a software program running on e.g. a smart phone, where only the specific software program may be considered part of the system 802.

**[0056]** Fig. 9 schematically illustrates a sixth embodiment of a system 902 according to the present invention. The system 902 is a combination of the systems 502 and 802, where however, the communication the auxiliary device 28 to the hearing aid 4 may be in form of a communication from the auxiliary device 28 to the intermediate unit 18 instead, or from the auxiliary device 28 to both the hearing aid 4 and the intermediate unit 18. This is indicated by the dashed lines, which represents that communication is by either the one signal way, or the other, or both. The communication may be a wireless electromagnetic communication.

**[0057]** Fig. 10 schematically illustrates a seventh embodiment of a system 1002 according to the present invention. In addition to what is described in connection to the system 902 of Fig. 9, the system 1002, i.e. control interface 16, may be used to control the delay via the signal emitter 30, e.g. a TV set, transmitting the second audio signal to the intermediate unit 18, or transmitting the first audio signal directly to the hearing aid, e.g. to a system not including the intermediate unit 18.

**[0058]** Fig. 11 schematically illustrates a first embodiment of a method 40 according to the present invention for improving synchronization of an acoustic signal to a video display. The method 40 comprises receiving 42 a first audio signal by a hearing aid. The first audio signal is intended for synchronous presentation to a viewer of the video display.

**[0059]** The hearing aid comprises a hearing loss processor configured for processing in accordance with a hearing loss of a user of the hearing aid. The method 40 comprises applying 44 a delay, such that synchronization of the at least first part of the first acoustic signal to the video display is improved. The method 40 comprises generating 46 a first acoustic signal by the hearing aid. The first acoustic signal is presented to the user of the hearing aid. The first acoustic signal comprises at least a first part being generated in response to the first audio signal.

**[0060]** Fig. 12 schematically illustrates a second embodiment of a method 1240 according to the present invention for improving synchronization of an acoustic signal to a video display. The method 1240 comprises applying 44 a delay, such that synchronization of the at least first part of the first acoustic signal to the video display is improved. The method 1240 comprises receiving 42 a first audio signal by a hearing aid. The first audio signal is intended for synchronous presentation to a viewer of the video display.

**[0061]** The hearing aid comprises a hearing loss processor configured for processing in accordance with a hearing loss of a user of the hearing aid. The method 1240 comprises generating 46 a first acoustic signal by the hearing aid. The first acoustic signal is presented to the user of the hearing aid. The first acoustic signal comprises at least a first part being generated in response to the first audio signal.

**[0062]** Fig. 13 schematically illustrates an embodiment of a system according to the present invention, wherein the system comprises a binaural hearing aid system. The system comprises a binaural hearing aid system comprises the two hearing aids indicated by "left ear" and "right ear". Each hearing aid comprises a hearing aid processor (i.e. a hearing loss processor) and a transceiver that comprises a communication unit. Each transceiver may receive the first acoustic signal from a wireless network (i.e. e.g. a protocol) that may be generated by the intermediate unit.

**[0063]** The hearing aid 4 may be constituted by any of the hearing aids 204, 304, 404, and 704. The hearing aid 204 may be constituted by any of the hearing aids 404, and 704. The intermediate unit 18 may be constituted by the intermediate unit 618.

LIST OF REFERENCES

**[0064]**

2, 202, 302, 502, 802, 902, 1002: System
4, 204, 304, 404, 704: Hearing aid
6: Delay unit
8: Processor in hearing aid
10: Communication unit (e.g. for wireless communication)
12: Microphone
14: Receiver (speaker)
16: Control interface
18, 618: Intermediate unit
20: Processor in intermediate unit
22: Receiver (signal receiving unit)
24: Transmitter
26: Transceiver
28: Auxiliary device
30: Extern audio signal provider
40, 1240: Method

42: Receiving a first audio signal
44: Applying a delay
46: Generating a first acoustic signal

## Claims

1. System for improving synchronization of an acoustic signal to a video display, the system comprising:

   - a hearing aid comprising a hearing loss processor configured for processing in accordance with a hearing loss of a user of the hearing aid, the hearing aid being configured for receiving a first audio signal intended for synchronous presentation to a viewer of the video display, the hearing aid being configured for generating a first acoustic signal to be presented to the user of the hearing aid, the first acoustic signal comprising at least a first part being generated in response to the first audio signal, and
   - a delay unit configured for applying a delay, such that synchronization of the at least first part of the first acoustic signal to the video display is improved.

2. System according to claim 1, wherein the system comprises a control interface configured for enabling the user of the hearing aid to control the delay.

3. System according to claim 2, wherein the control interface forms part of the hearing aid.

4. System according to claim 2 or 3, wherein the control interface forms part of an auxiliary device configured for remote control of the delay.

5. System according to any of the claims 1-4, wherein the system is configured for provision of automatic control of the delay by improving synchronization of the at least first part of the first acoustic signal to a second acoustic signal received by at least one microphone of the system, such as at least one microphone of the hearing aid.

6. System according to any of the claims 1-5, wherein the delay comprises a preset value.

7. System according to any of the claims 1-6, wherein the system comprises an intermediate unit configured for receiving a second audio signal intended for synchronous presentation to a viewer of the video display, the intermediate unit being configured for transmitting the first audio signal in response to the received second audio signal.

8. System according to claim 7, wherein the delay unit forms part of the intermediate unit.

9. System according to any of the claims 1-8, wherein the delay unit forms part of the hearing aid.

10. System according to any of the claims 1-9, wherein the system comprises a binaural hearing aid system including the hearing aid and a second hearing aid.

11. Hearing aid configured for improving synchronization of an acoustic signal to a video display, the hearing aid comprising a hearing loss processor configured for processing in accordance with a hearing loss of a user of the hearing aid, the hearing aid being configured for receiving a first audio signal being intended for synchronous presentation to a viewer of the video display, the hearing aid being configured for generating a first acoustic signal to be presented to the user of the hearing aid, the first acoustic signal comprising at least a first part being generated in response to the first audio signal, the hearing aid comprising a delay unit configured for applying a delay, such that synchronization of the at least first part of the first acoustic signal to the video display is improved.

12. Method for improving synchronization of an acoustic signal to a video display, the method comprising:

   - receiving a first audio signal by a hearing aid, the first audio signal being intended for synchronous presentation to a viewer of the video display, the hearing aid comprising a hearing loss processor configured for processing in accordance with a hearing loss of a user of the hearing aid,
   - generating a first acoustic signal by the hearing aid, the first acoustic signal being presented to the user of the hearing aid, the first acoustic signal comprising at least a first part being generated in response to the first audio signal, and
   - applying a delay, such that synchronization of the at least first part of the first acoustic signal to the video display is improved.

13. Method according to claim 12, wherein the delay is controllable by the user.

14. Method according to claim 13, wherein the delay is controllable in steps of at least 10ms.

15. Method according to any of the claims 12-14, wherein the method comprises automatic control of the delay by improving synchronization of the at least first part of the first acoustic signal to a second acoustic signal received by at least one microphone, such as at least one microphone of the hearing aid.

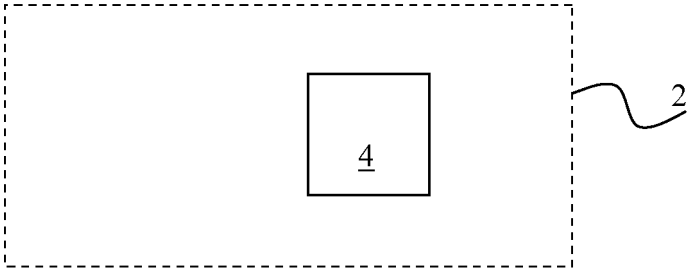


Fig. 1

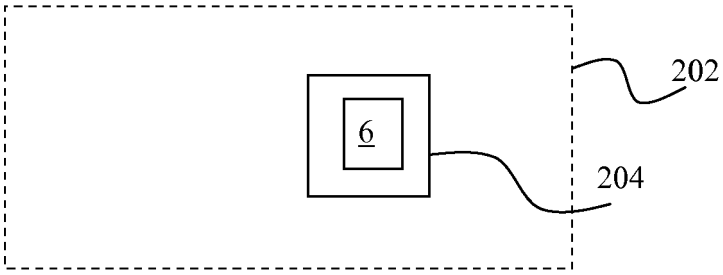


Fig. 2

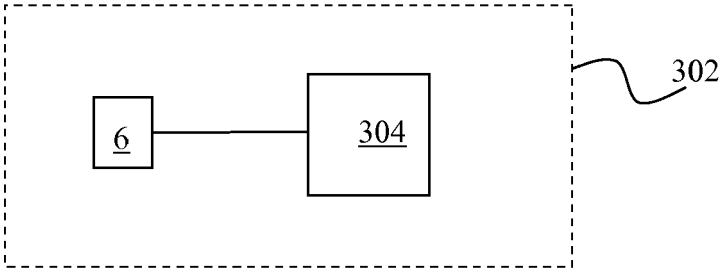


Fig. 3

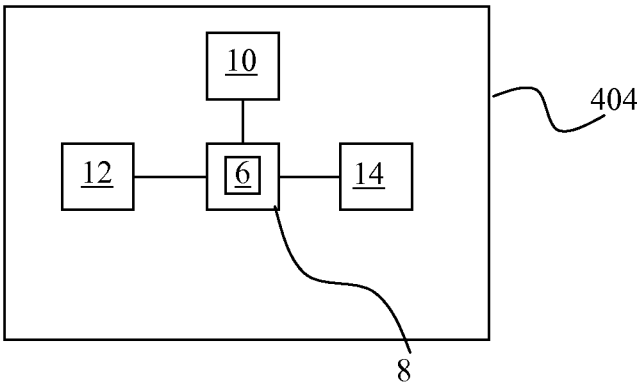


Fig. 4

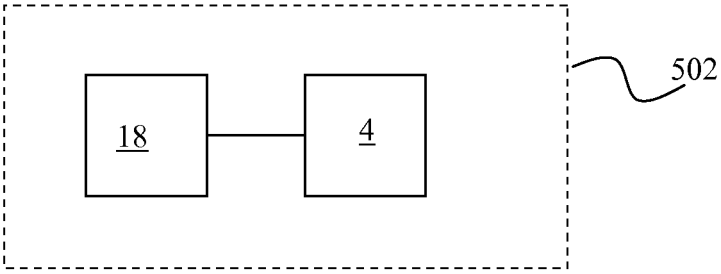


Fig. 5

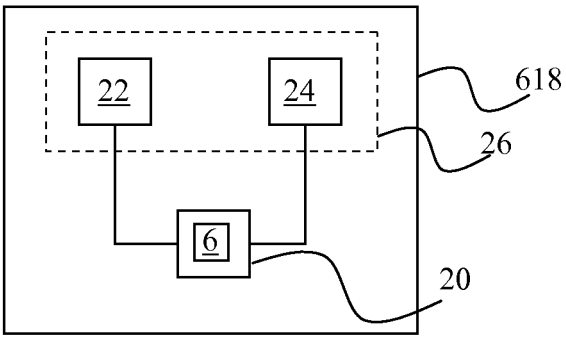


Fig. 6

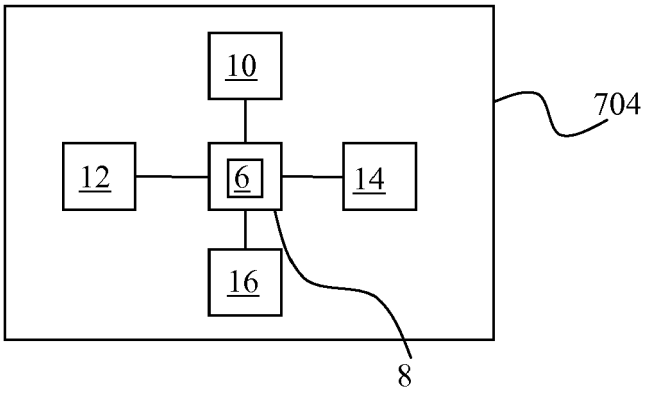


Fig. 7

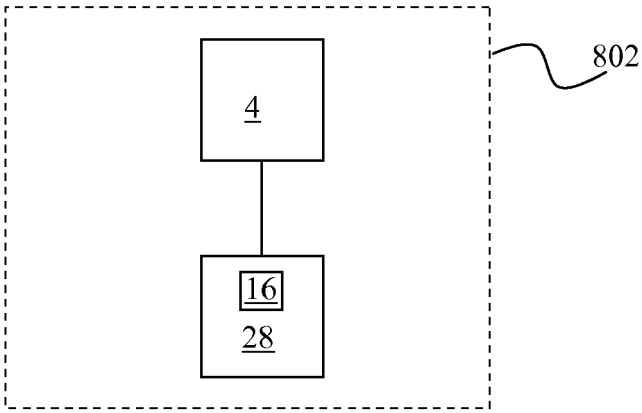


Fig. 8

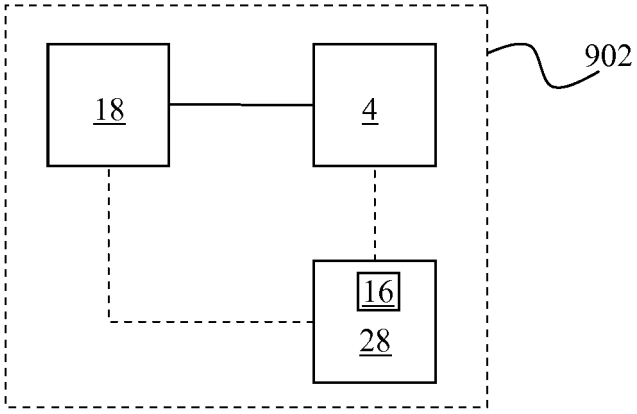


Fig. 9

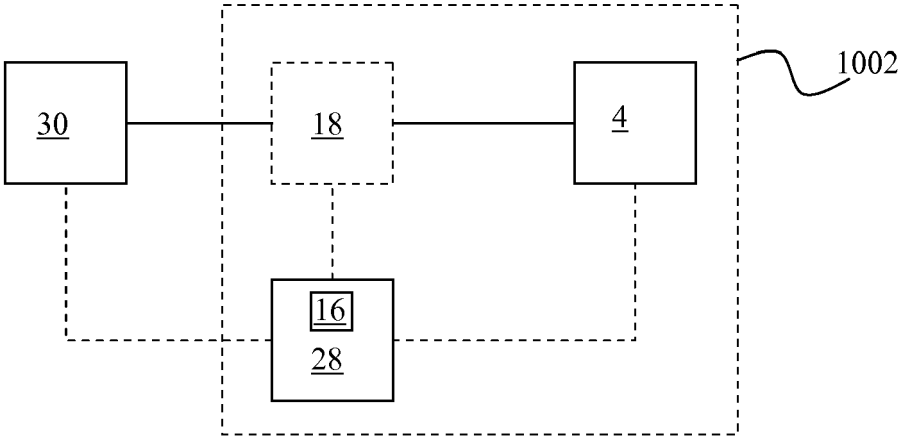


Fig. 10

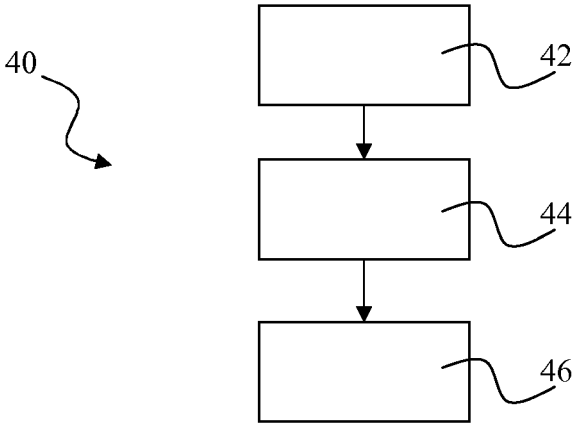


Fig. 11

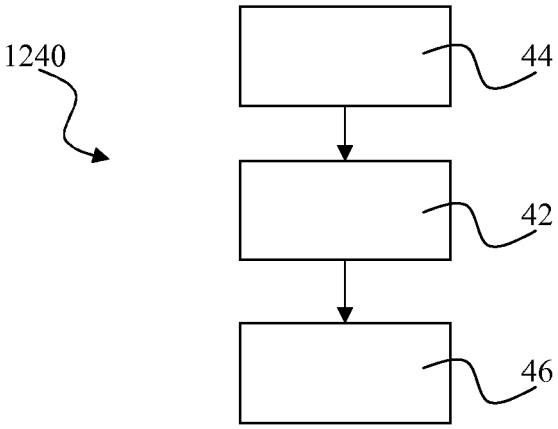


Fig. 12

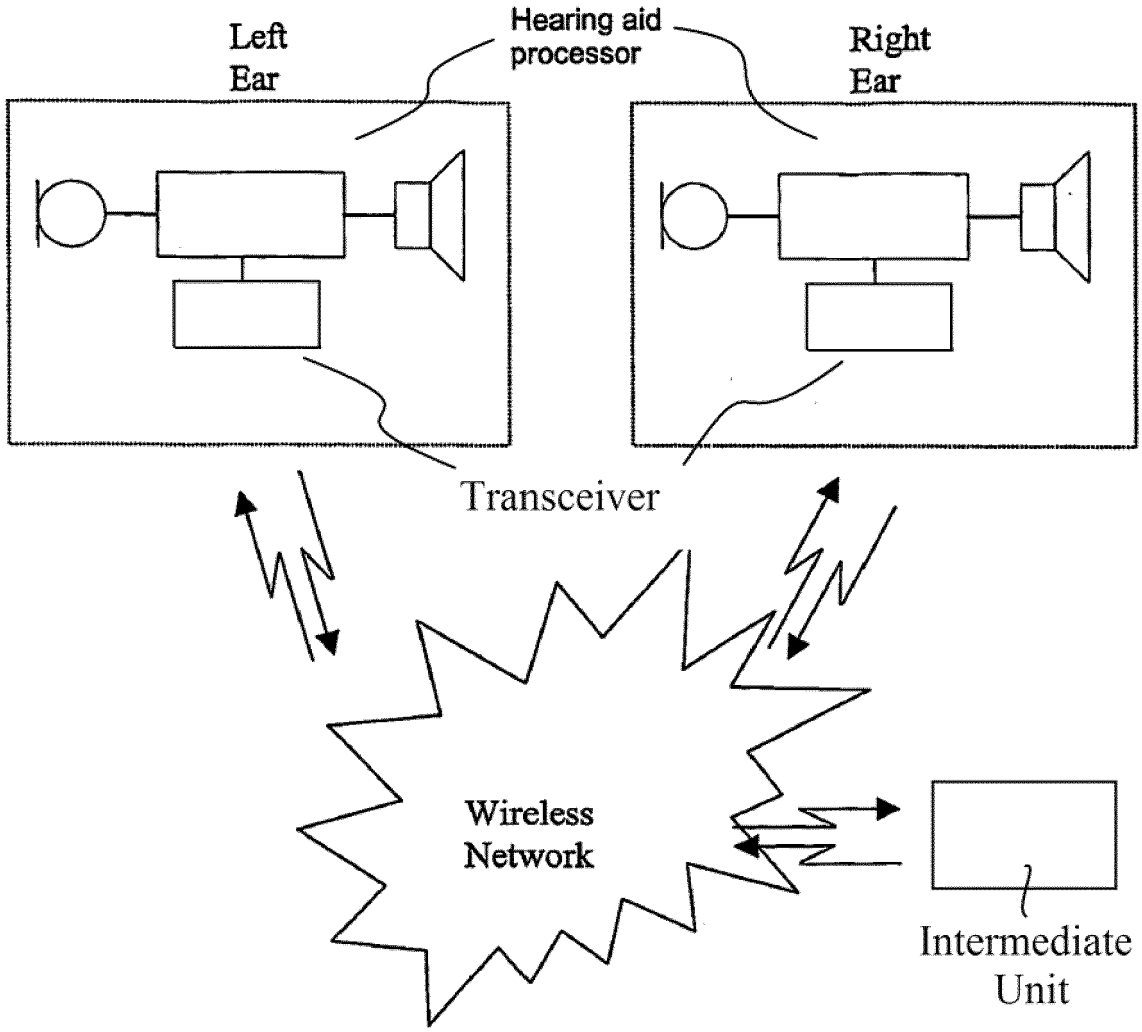
Left
Ear
Hearing aid
processor
Right
Ear
Transceiver
Wireless
Network
Intermediate
Unit

Fig. 13

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# EUROPEAN SEARCH REPORT

Application Number
EP 12 16 6569

## DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (IPC) |
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| Y<br>A | EP 2 071 849 A1 (SONY CORP [JP]) 17 June 2009 (2009-06-17)<br>* paragraph [0037] - paragraph [0038] *<br>* paragraph [0161] - paragraph [0163] *<br>* figures 1,10 *<br>----- | 6,7,10, 15<br>1-5,8,9, 11-14 | |
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| | | | TECHNICAL FIELDS SEARCHED (IPC)<br>H04R |

The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| Munich | 20 August 2012 | Meiser, Jürgen |

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20-08-2012

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