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(54) **SETUP OF HEARING INSTRUMENT INCLUDING HEARING INSTRUMENT PROPERTY IDENTIFICATION**

(57) A setup device for a hearing instrument is disclosed. The setup device comprises a receiving unit configured to receive, from at least one image pickup device, at least one image of said hearing instrument. The setup device further comprises a processing unit configured to process said at least one image of said hearing instrument. Further, the setup device comprises an identifying

unit configured to identify a property of said hearing instrument based on a result of said processing unit. In addition, the setup device comprises a controlling unit configured to control a setup processing for said hearing instrument based on said property of said hearing instrument.

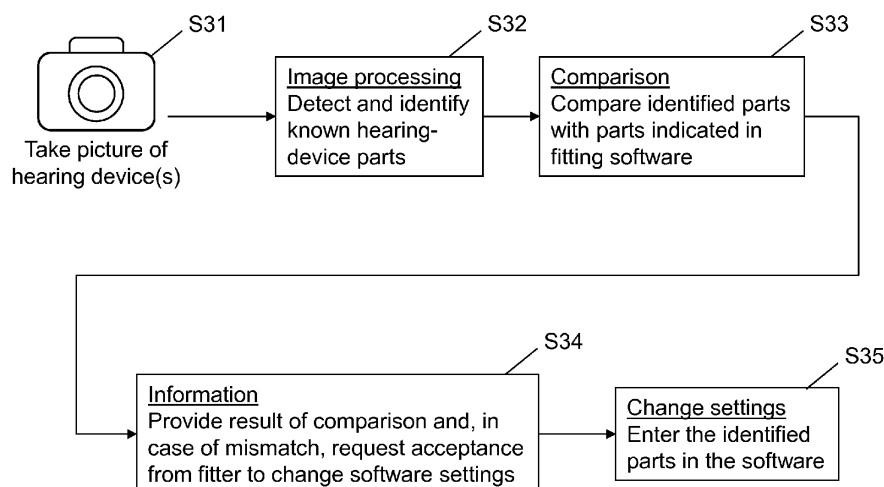


Fig. 3

Description

Field

[0001] The present disclosure relates to a device and a method for setting up a hearing instrument.

Background

[0002] When programming a hearing device via a programming software e.g. running on a hearing device programming/setup apparatus, the apparatus/software will - when a connection to the hearing device is established - be able to identify the type (and the setting) of the device.

[0003] However, the complete hearing-device system may also include one or more (additional) exchangeable parts, which are not detected automatically. This could for example be a speaker link and the dome in a receiver-in-the ear (RITE) hearing device.

[0004] The information about these additional parts has to be entered manually in the fitting software by the person who fits the device. If the information is entered incorrectly, e.g. indicating an incorrect type of dome, an error will be introduced in the estimation of the acoustic performance. The consequence may be an erroneous gain prescription and setting of the device.

[0005] Therefore, there is a need to provide a solution that allows for using machine vision to detect and verify a hearing-device configuration.

[0006] Furthermore, when performing acoustical verification measurements on hearing instruments, e.g. real-ear measurements (REM) and hearing-instrument testing (HIT), the hearing instruments have to be positioned correctly, either on the ear (in case of REM) or in a test box (in case of HIT).

[0007] Furthermore, just as mentioned above, also for the measurement scenario, the hearing instruments have to be configured correctly, e.g. be fitted with the correct earpiece (dome) and speaker link (in case of a RITE hearing instrument).

[0008] The verification of the hearing-instrument position and configuration is normally based on a subjective evaluation made by the person who performs the verification measurement. An error performed during the positioning or configuration of the hearing instrument may lead to erroneous measurements.

[0009] Therefore, there is a need to provide a solution that allows for using machine vision to verify hearing-instrument testing and real-ear measurement setups.

[0010] The present disclosure provides at least an alternative to the prior art.

Summary

[0011] According to an aspect of the present disclosure, there is provided a setup device for a hearing instrument. The setup device comprises a receiving unit configured to receive, from at least one image pickup

device, at least one image of said hearing instrument. The setup device further comprises a processing unit configured to process said at least one image of said hearing instrument. Further, the setup device comprises an identifying unit configured to identify a property of said hearing instrument based on a result of said processing unit. In addition, the setup device comprises a controlling unit configured to control a setup processing for said hearing instrument based on said property of said hearing instrument.

[0012] The property of said hearing instrument may comprise a hardware configuration of said hearing instrument.

[0013] The hardware configuration of said hearing instrument may be a type of an exchangeable part of said hearing instrument. The hardware configuration of said hearing instrument may be a type of an exchangeable part attached to said hearing instrument.

[0014] The exchangeable part of said hearing instrument may wear a type unique mark. The exchangeable part attached to said hearing instrument may wear a type unique mark.

[0015] The property of said hearing instrument may comprise a location and/or an orientation of said hearing instrument. The location may for example be a location in relation to a loudspeaker of a REM equipment, or may for example be a location in relation to a user's ear, or may for example be a location in relation to (a marker of) a desired position in a test box of a HIT equipment.

[0016] The processing unit may be configured to process said at least one image of said hearing instrument utilizing at least one of a machine-vision technique and an image recognition algorithm.

[0017] The controlling unit may be configured to compare said property of said hearing instrument with a preset property.

[0018] The controlling unit may be configured to halt or interrupt said setup processing for said hearing instrument, if said property of said hearing instrument does not match said preset property. In particular, in such case, the controlling unit may be configured to start or resume said setup processing for said hearing instrument, if said property of said hearing instrument matches said preset property.

[0019] The controlling unit may be configured to output a warning, if said property of said hearing instrument does not match said preset property.

[0020] The preset property may comprise a target state and a range of an acceptable variation from said target state.

[0021] The controlling unit may be configured to enter said property of said hearing instrument into a reserved memory or program section.

[0022] The hearing instrument may be one of a hearing aid device, an earphone, and a headset.

[0023] The setup device may comprise said at least one image pickup device.

[0024] Further, the at least one image pickup device

may be one of a web camera, a smartphone camera, and a camera integrated with said setup device.

[0025] According to another aspect of the present disclosure, there is provided a setup method for a hearing instrument. The setup method comprises receiving, from at least one image pickup device, at least one image of said hearing instrument. The setup method further comprises processing said at least one image of said hearing instrument. Further, the setup method comprises identifying a property of said hearing instrument based on a result of said processing unit. Still further, the setup method comprises controlling a setup processing for said hearing instrument based on said property of said hearing instrument.

[0026] According to another aspect of the present disclosure, there is provided a computer program product comprising computer-executable program code, which, when the program is run on a computer, is configured to cause the computer to carry out the method according to the aspect above.

Brief description of the drawings

[0027] The aspects of the disclosure may be best understood from the following detailed description taken in conjunction with the accompanying figures. The figures are schematic and simplified for clarity, and they just show details to improve the understanding of the claims, while other details are left out. Throughout, the same reference numerals are used for identical or corresponding parts. The individual features of each aspect may each be combined with any or all features of the other aspects. These and other aspects, features and/or technical effect will be apparent from and elucidated with reference to the illustrations described hereinafter in which:

Figure 1 illustrates a setup device according to an embodiment of the disclosure,

Figure 2 illustrates a method according to an embodiment of the disclosure,

Figure 3 illustrates details of a method according to an embodiment of the disclosure,

Figure 4 illustrates details of a method according to an embodiment of the disclosure,

Figure 5 illustrates a test box according to an embodiment of the disclosure, and

Figure 6 illustrates a scenario of a verification process according to an embodiment of the disclosure.

Detailed description of drawings and embodiments of the present invention

[0028] The detailed description set forth below in con-

nection with the appended drawings is intended as a description of various configurations. The detailed description includes specific details for the purpose of providing a thorough understanding of the various concepts. However, it will be apparent to those skilled in the art that these concepts may be practiced without these specific details. Several aspects of the apparatus and methods are described by various blocks, functional units, modules, components, circuits, steps, processes, algorithms, etc. (collectively referred to as "elements"). Depending upon particular application, design constraints or other reasons, these elements may be implemented using electronic hardware, computer program, or any combination thereof.

[0029] The electronic hardware may include microprocessors, microcontrollers, digital signal processors (DSPs), field programmable gate arrays (FPGAs), programmable logic devices (PLDs), gated logic, discrete hardware circuits, and other suitable hardware configured to perform the various functionality described throughout this disclosure. Computer program shall be construed broadly to mean instructions, instruction sets, code, code segments, program code, programs, subprograms, software modules, applications, software applications, software packages, routines, subroutines, objects, executables, threads of execution, procedures, functions, etc., whether referred to as software, firmware, middleware, microcode, hardware description language, or otherwise.

[0030] A hearing device (or hearing instrument) may include a hearing aid that is adapted to improve or augment the hearing capability of a user by receiving an acoustic signal from a user's surroundings, generating a corresponding audio signal, possibly modifying the audio signal and providing the possibly modified audio signal as an audible signal to at least one of the user's ears. The "hearing device" may further refer to a device such as an earphone or a headset adapted to receive an audio signal electronically, possibly modifying the audio signal and providing the possibly modified audio signals as an audible signal to at least one of the user's ears. Such audible signals may be provided in the form of an acoustic signal radiated into the user's outer ear, or an acoustic signal transferred as mechanical vibrations to the user's inner ears through bone structure of the user's head and/or through parts of the middle ear of the user, or electric signals transferred directly or indirectly to the cochlear nerve and/or to the auditory cortex of the user.

[0031] The hearing device is adapted to be worn in any known way. This may include i) arranging a unit of the hearing device behind the ear with a tube leading airborne acoustic signals into the ear canal or with a receiver/loudspeaker arranged close to or in the ear canal such as in a Behind-the-Ear type hearing aid, and/or ii) arranging the hearing device entirely or partly in the pinna and/or in the ear canal of the user such as in an In-the-Ear type hearing aid or In-the-Canal/Completely-in-the-Canal type hearing aid, or iii) arranging a unit of the hearing

device attached to a fixture implanted into the skull bone such as in Bone Anchored Hearing Aid or Cochlear Implant, or iv) arranging a unit of the hearing device as an entirely or partly implanted unit such as in Bone Anchored Hearing Aid or Cochlear Implant.

[0032] A "hearing system" refers to a system comprising one or two hearing devices, and a "binaural hearing system" refers to a system comprising two hearing devices where the devices are adapted to cooperatively provide audible signals to both of the user's ears. The hearing system or binaural hearing system may further include auxiliary device(s) that communicate(s) with at least one hearing device, the auxiliary device affecting the operation of the hearing devices and/or benefitting from the functioning of the hearing devices. A wired or wireless communication link between the at least one hearing device and the auxiliary device is established that allows for exchanging information (e.g. control and status signals, possibly audio signals) between the at least one hearing device and the auxiliary device. Such auxiliary devices may include at least one of remote controls, remote microphones, audio gateway devices, mobile phones, public-address systems, car audio systems or music players, or a combination thereof. The audio gateway is adapted to receive a multitude of audio signals such as from an entertainment device like a TV or a music player, a telephone apparatus like a mobile telephone or a computer, or a personal computer (PC). The audio gateway is further adapted to select and/or combine an appropriate one of the received audio signals (or combination of signals) for transmission to the at least one hearing device. The remote control is adapted to control functionality and operation of the at least one hearing device. The function of the remote control may be implemented in a SmartPhone or other electronic device, the SmartPhone/electronic device possibly running an application that controls functionality of the at least one hearing device.

[0033] In general, a hearing device includes i) an input unit such as a microphone for receiving an acoustic signal from a user's surroundings and providing a corresponding input audio signal, and/or ii) a receiving unit for electronically receiving an input audio signal. The hearing device further includes a signal-processing unit for processing the input audio signal and an output unit for providing an audible signal to the user in dependence on the processed audio signal.

[0034] The input unit may include multiple input microphones, e.g. for providing direction-dependent audio signal processing. Such a directional microphone system is adapted to enhance a target acoustic source among a multitude of acoustic sources in the user's environment. In one aspect, the directional system is adapted to detect (such as adaptively detect) from which direction a particular part of the microphone signal originates. This may be achieved by using conventionally known methods. The signal-processing unit may include an amplifier that is adapted to apply a frequency dependent gain to the

input audio signal. The signal processing unit may further be adapted to provide other relevant functionality such as compression, noise reduction, etc. The output unit may include an output transducer such as a loudspeaker/receiver for providing an air-borne acoustic signal to the ear canal, or a vibrator for providing a structure-borne or liquid-borne acoustic signal either transcutaneously or percutaneously. In some hearing devices, the output unit may include one or more output electrodes for providing the electric signals such as in a Cochlear Implant.

[0035] Now referring to Figure 1, which illustrates a setup device according to an embodiment of the disclosure. In general, such setup device 10 may comprise a receiving unit 11, a processing unit 12, an identifying unit 13, and a controlling unit 14. The receiving unit 11 receives, from at least one image pickup device, at least one image of said hearing instrument. The processing unit 12 processes said at least one image of said hearing instrument. The identifying unit 13 identifies a property of said hearing instrument based on a result of said processing unit. The controlling unit 14 controls a setup processing for said hearing instrument based on said property of said hearing instrument.

[0036] Figure 2 is a schematic diagram of a method according to an embodiment of the disclosure. The device according to Figure 1 may perform the method of Figure 2 but is not limited to this method. The method of Figure 2 may be performed by the device of Figure 1 but is not limited to being performed by this device.

[0037] As shown in Figure 2, in general, such method comprises an operation of receiving (S21), from at least one image pickup device, at least one image of said hearing instrument, an operation of processing (S22) said at least one image of said hearing instrument, an operation of identifying (S23) a property of said hearing instrument based on a result of said processing unit, and an operation of controlling (S24) a setup processing for said hearing instrument based on said property of said hearing instrument.

[0038] Now referring to Figure 3, which illustrates details of a method according to an embodiment of the disclosure.

[0039] According to the illustrated basic principle of the disclosure, one or more photos are taken (S31) of the hearing device (instrument) with all additional parts in place, and machine-vision techniques (image-recognition algorithms) are used to identify (S32) all the specific additional parts of the device, which affect the gain calculations done by the fitting software in the fitting the particular type of device.

[0040] The identified parts can be entered automatically in the relevant empty sections of the software.

[0041] Alternatively, the identified parts can be compared (S33) with information already entered (by the fitter), and then an error message can be generated in case of a mismatch between already entered and automatically identified data (S34). The mismatch may indicate that information was entered incorrectly by the fitter, or

that the fitter attached an incorrect part to the device (e.g. wrong type of earpiece).

[0042] Once accepted, changed settings corresponding to identified parts can be entered (S35) in the relevant empty sections of the software.

[0043] Now referring to Figure 4, which illustrates details of a method according to an embodiment of the disclosure.

[0044] In particular, Figure 4 illustrates a specific example of a preferable/intended use of the principles of the present disclosure.

[0045] Namely, in short, according to Figure 4, the additional parts of the Receiver-In-The-Ear hearing device are identified and compared to existing software settings. One mismatch is found and communicated to the fitter of the device.

[0046] In detail, in the taken picture on the left of Figure 4, a speaker link 41 and the power dome 42 are detected, and from the detected speaker link 41 a fitting level of "100" is derived.

[0047] When comparing the detected additional parts (and the derived properties thereof) with respective entries in the fitting software ("Fitting Level = 100"; "Ear-piece = Bass Dome, single") shown in the middle portion of Figure 4, a mismatch in relation to the dome is found and notified, as shown in the right of Figure 4. The notification may provide guidance to the fitter on how to solve the mismatch and/or may prompt confirmation to automatically solve the mismatch.

[0048] The image recognition algorithm is preferably able to recognize all possible additional parts of the hearing devices, which are to be fitted with the fitting software. To maximize the likelihood of correct recognition, some additional visual cues (unique mark) may be added to different parts, which have (almost) the same shape and color (e.g. some types of earpieces). These cues could, for example, be letters or symbols printed on the parts, possibly in specific colors.

[0049] Besides fitting of hearing devices/instruments, the principles of the present disclosure can also be used for setting processing in relation to earphones and headsets, in particular, in-ear types with different earpiece options.

[0050] The picture of the hearing device is taken with a camera, which allows easy and instantaneous transfer of the picture to the computer (in general, setup device) hosting the fitting software and the machine-vision software (which could be an integrated part of the fitting software).

[0051] The camera could, for example, be a smartphone camera (used via a dedicated app, which automatically connects to the fitting software and transfers the picture), it could be a personal computer (PC) webcam (controlled by the fitting software), or it could be a camera integrated in another piece of equipment, e.g. real-ear measurement (REM) equipment or hearing-instrument testing (HIT) equipment.

[0052] According to a concept of the present disclo-

sure, an automatized verification of the position and/or configuration of a hearing instrument is performed based on a use of machine vision techniques (e.g. image recognition) applied to one or more pictures taken with a camera (or multiple cameras) built into the measurement equipment.

[0053] Now referring to Figure 5, which illustrates a test box, i.e. an example of such measurement equipment, according to an embodiment of the disclosure.

[0054] The test box 51 may comprise a compartment or bay 52, which can be closed or covered by a lid or cover 54.

[0055] For measuring, the hearing instrument 53 may be placed within the compartment or bay 52.

[0056] The test box may comprise a speaker 55 and/or microphone. The speaker 55 and/or microphone may be arranged in the lid/cover 54 so as to be directed toward the inside of the compartment/bay 52 when closed.

[0057] The test box may further comprise a camera 56. The camera 56 may be arranged in the lid/cover 54 so as to be directed toward the inside of the compartment/bay 52 when closed as well. The camera 56 may further be arranged in the lid/cover 54 so as to be directed toward a wearer of a hearing instrument when the lid/cover 54 is opened. In such case, the same camera may be used for REM as well as HIT processing.

[0058] Namely, in a measurement scenario, measurement equipment (e.g. test box 51) may have the camera built into the movable/hinged lid 54 as illustrated. When the lid is open (e.g. for REM), the camera 56 is pointing at the person wearing the hearing instrument. When the lid is closed (for HIT), the camera is pointing at the hearing instrument positioned in the box.

[0059] The camera 56 is however not limited to the position shown in Figure 5.

[0060] Further, the test box is not limited to having (only) one camera. In other words, systems with multiple cameras are also possible.

[0061] The test box may further comprise a light element 57 arranged such that the light element is able to emit light (at least) into the direction in which the camera operates to pick up an image.

[0062] The measurement equipment is not limited to the test box 51 illustrated in Figure 5.

[0063] According to this concept of the present disclosure, a specified state (e.g. the correct position/orientation of a hearing instrument 53 within a test box 51) is compared with a detected state (as described by image recognition or another type of processing of a picture taken by the (built-in) camera 56).

[0064] The camera 56 and associated machine-vision software (incl. image-recognition algorithms) may according to the concept of the present disclosure be used for monitoring the position of the hearing instrument 53 (in the test box 51) when a coupler measurement is performed. This measurement is performed with the lid 54 closed and, assuming the use of a standard camera, provision of additional sufficient light 57 (to obtain a photo

with required quality) may therefore preferably be part of the system (test box).

[0065] Referring to Figure 6, which illustrates a scenario of a verification process according to an embodiment of the disclosure, the scenario of imaging when a coupler measurement is performed is shown.

[0066] In particular, in the Figure 6, an image of an exemplary correct position (on the left of Figure 6) and of an exemplary incorrect position (on the right of that Figure) of a BTE hearing instrument 61 during coupler measurement (using a measurement coupler 62) is shown.

[0067] The incorrect (displaced) position of the hearing instrument 61 e.g. in relation to a reference microphone 63 can be detected in the image and can be interpreted to give rise to a warning in the test software.

[0068] The camera 56 and associated machine-vision software (incl. image-recognition algorithms) may according to the concept of the present disclosure further be used for monitoring the position of the REM probe microphone during a calibration measurement, where the probe microphone is to be held in a certain position (distance and orientation) relative to the loudspeaker 55 (in the lid).

[0069] The camera 56 and associated machine-vision software (incl. image-recognition algorithms) may according to the concept of the present disclosure further be used for monitoring the distance from the loudspeaker 55 to the test subject, and the orientation of the test subject (who is supposed to face the loudspeaker 55), when a REM measurement is performed.

[0070] The camera 56 and associated machine-vision software (incl. image-recognition algorithms) may according to the concept of the present disclosure further be used for monitoring the configuration of the hearing instrument, e.g., verifying that the actual earpiece (dome) 42 and speaker link 41 of a RITE hearing instrument is identical to that indicated in the fitting software, see Figure 4.

[0071] The procedures involving estimates of distance and orientation (in connection with REM) may be optimized by including some easily visually recognizable landmarks on the probe microphones or a headband, which holds the used microphones in place.

[0072] The verification process - taking a picture, image processing, and providing feedback to tester - is preferably built into the relevant software (for HIT, REM, or hearing-instrument fitting), such that the verification process runs automatically, either initiated by the user as a separate task or integrated as the first step of the actual measurement.

[0073] The image-processing algorithms are preferably based on a definition of the ideal state (e.g. the ideal position of the hearing instrument in the test box) with an accompanying range of acceptable variation.

[0074] If the acceptable range is exceeded, which would indicate a violation of the specification, a warning may be given to the user of the equipment, e.g. "The

hearing instrument is placed incorrectly in the test box. Please change position to mimic the recommended position shown in this picture [...]", where a picture corresponding to the image on the left of Figure 6 may be displayed.

[0075] The position of the hearing instrument 61 may for example be a location in relation to a loudspeaker of a REM equipment, or a location in relation to a user's ear, or a location in relation to (a marker of) a test box of a HIT equipment.

[0076] In case of HIT, by just presenting the images (photos) taken (inside the test box 51) on a screen, a resulting system may be used without automatically outputting warnings (as described above), but may give the tester the option to verify (by inspection) that the hearing instrument 53 did not change position when the lid 54 was closed, which is a likely cause of an error in relation to the hearing instrument position.

[0077] In the test box scenario described in relation to Figure 5, such screen (and a related input unit) may be provided on or (communicatively) connected to the test box 51.

[0078] In an aspect, the functions may be stored on or encoded as one or more instructions or code on a tangible computer-readable medium. The computer readable medium includes computer storage media adapted to store a computer program comprising program codes, which when run on a processing system causes the data processing system to perform at least some (such as a majority or all) of the steps of the method described above and in the claims.

[0079] By way of example, and not limitation, such computer-readable media can comprise RAM, ROM, EEPROM, CD-ROM or other optical disk storage, magnetic disk storage or other magnetic storage devices, or any other medium that can be used to carry or store desired program code in the form of instructions or data structures and that can be accessed by a computer. Disk and disc, as used herein, includes compact disc (CD), laser disc, optical disc, digital versatile disc (DVD), floppy disk, and Blu-ray disc where disks usually reproduce data magnetically, while discs reproduce data optically with lasers. Combinations of the above should also be included within the scope of computer-readable media. In addition to being stored on a tangible medium, the computer program can also be transmitted via a transmission medium such as a wired or wireless link or a network, e.g. the Internet, and loaded into a data processing system for being executed at a location different from that of the tangible medium.

[0080] In an aspect, a data processing system is provided comprising a processor adapted to execute the computer program for causing the processor to perform at least some (such as a majority or all) of the steps of the method described above and in the claims.

[0081] It is intended that the structural features of the devices described above, either in the detailed description and/or in the claims, may be combined with steps of

the method, when appropriately substituted by a corresponding process.

[0082] As used, the singular forms "a," "an," and "the" are intended to include the plural forms as well (i.e. to have the meaning "at least one"), unless expressly stated otherwise. It will be further understood that the terms "includes," "comprises," "including," and/or "comprising," when used in this specification, specify the presence of stated features, integers, steps, operations, elements, and/or components, but do not preclude the presence or addition of one or more other features, integers, steps, operations, elements, components, and/or groups thereof. It will also be understood that when an element is referred to as being "connected" or "coupled" to another element, it can be directly connected or coupled to the other element but an intervening elements may also be present, unless expressly stated otherwise. Furthermore, "connected" or "coupled" as used herein may include wirelessly connected or coupled. As used herein, the term "and/or" includes any and all combinations of one or more of the associated listed items. The steps of any disclosed method is not limited to the exact order stated herein, unless expressly stated otherwise.

[0083] It should be appreciated that reference throughout this specification to "one embodiment" or "an embodiment" or "an aspect" or "features" included as "may" means that a particular feature, structure or characteristic described in connection with the embodiment is included in at least one embodiment of the disclosure. Furthermore, the particular features, structures or characteristics may be combined as suitable in one or more embodiments of the disclosure. The previous description is provided to enable any person skilled in the art to practice the various aspects described herein. Various modifications to these aspects will be readily apparent to those skilled in the art, and the generic principles defined herein may be applied to other aspects.

[0084] The claims are not intended to be limited to the aspects shown herein, but is to be accorded the full scope consistent with the language of the claims, wherein reference to an element in the singular is not intended to mean "one and only one" unless specifically so stated, but rather "one or more." Unless specifically stated otherwise, the term "some" refers to one or more.

[0085] Accordingly, the scope should be judged in terms of the claims that follow.

Claims

1. A setup device for a hearing instrument, comprising
 - a receiving unit configured to receive, from at least one image pickup device, at least one image of said hearing instrument,
 - a processing unit configured to process said at least one image of said hearing instrument,
 - an identifying unit configured to identify a prop-

erty of said hearing instrument based on a result of said processing unit, and
a controlling unit configured to control a setup processing for said hearing instrument based on said property of said hearing instrument.

2. The setup device according to claim 1, wherein said property of said hearing instrument comprises a hardware configuration of said hearing instrument.
3. The setup device according to claim 2, wherein said hardware configuration of said hearing instrument is a type of an exchangeable part of said hearing instrument.
4. The setup device according to claim 3, wherein said exchangeable part of said hearing instrument wears a type unique mark.
5. The setup device according to claim 1, wherein said property of said hearing instrument comprises a location and/or an orientation of said hearing instrument.
6. The setup device according to any of claims 1 to 5, wherein said processing unit is configured to process said at least one image of said hearing instrument utilizing at least one of a machine-vision technique and an image recognition algorithm.
7. The setup device according to any of claims 1 to 6, wherein said controlling unit is configured to compare said property of said hearing instrument with a preset property.
8. The setup device according to claim 7, wherein
 - said controlling unit is configured to halt or interrupt said setup processing for said hearing instrument, if said property of said hearing instrument does not match said preset property, and said controlling unit is configured to start or resume said setup processing for said hearing instrument, if said property of said hearing instrument matches said preset property.
9. The setup device according to claim 7 or 8, wherein said controlling unit is configured to output a warning, if said property of said hearing instrument does not match said preset property.
10. The setup device according to any of claims 7 to 9, wherein said preset property comprises a target state and a range of an acceptable variation from said target state.

11. The setup device according to any of claims 1 to 6,
wherein
said controlling unit is configured to enter said prop-
erty of said hearing instrument into a reserved mem-
ory or program section. 5
12. The setup device according to any of claims 1 to 11,
wherein
said hearing instrument is one of a hearing aid de-
vice, an earphone, and a headset. 10
13. The setup device according to any of claims 1 to 12,
wherein
said setup device comprises said at least one 15
image pickup device, and/or
said at least one image pickup device is one of
a web camera, a smartphone camera, and a
camera integrated with said setup device. 20
14. A setup method for a hearing instrument, comprising
receiving, from at least one image pickup device,
at least one image of said hearing instrument, 25
processing said at least one image of said hear-
ing instrument, identifying a property of said
hearing instrument based on a result of said
processing unit, and
controlling a setup processing for said hearing 30
instrument based on said property of said hear-
ing instrument.
15. A computer program product comprising computer-
executable computer program code which, when the 35
program is run on a computer, is configured to cause
the computer to carry out the method according to
claim 14.

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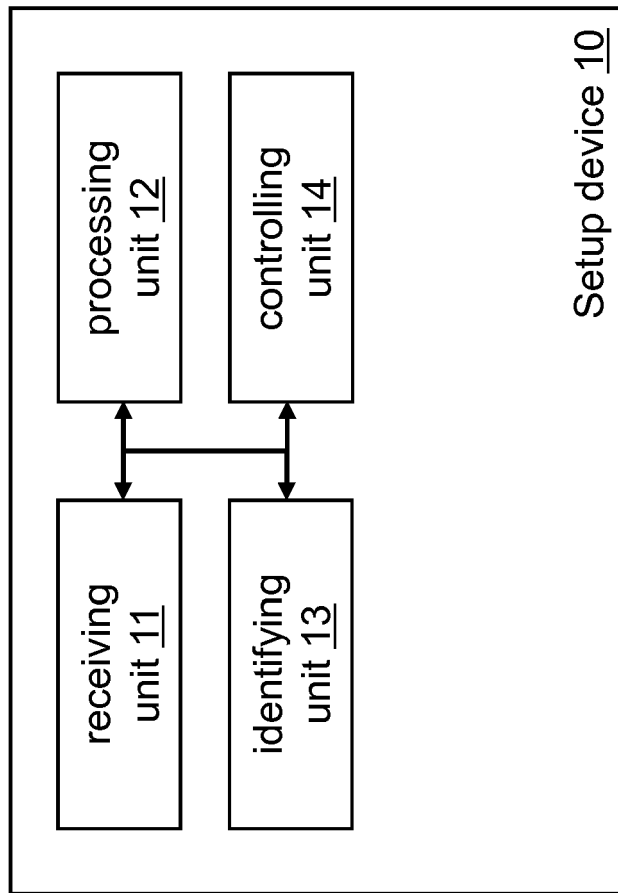


Fig. 1

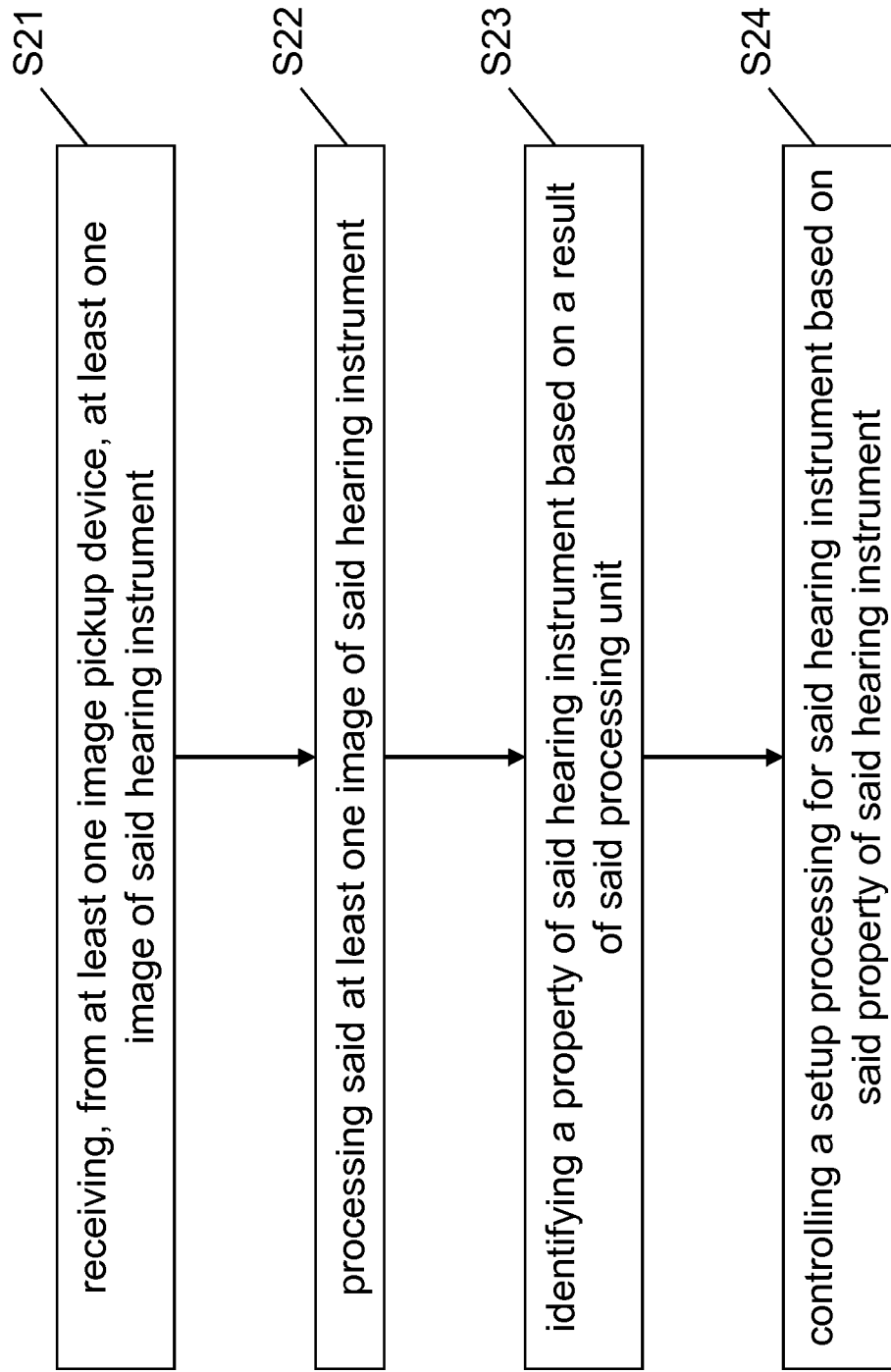


Fig. 2

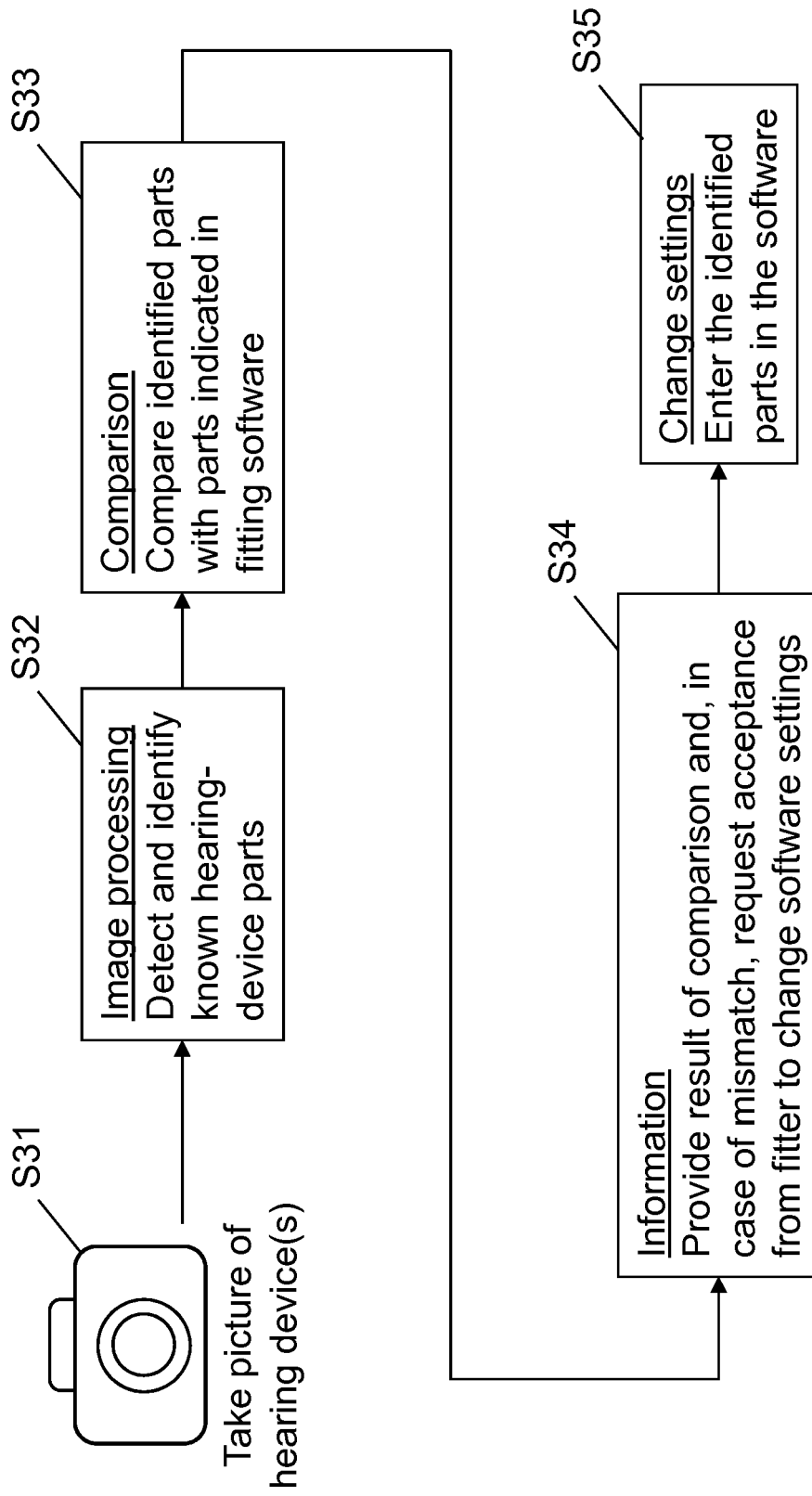


Fig. 3

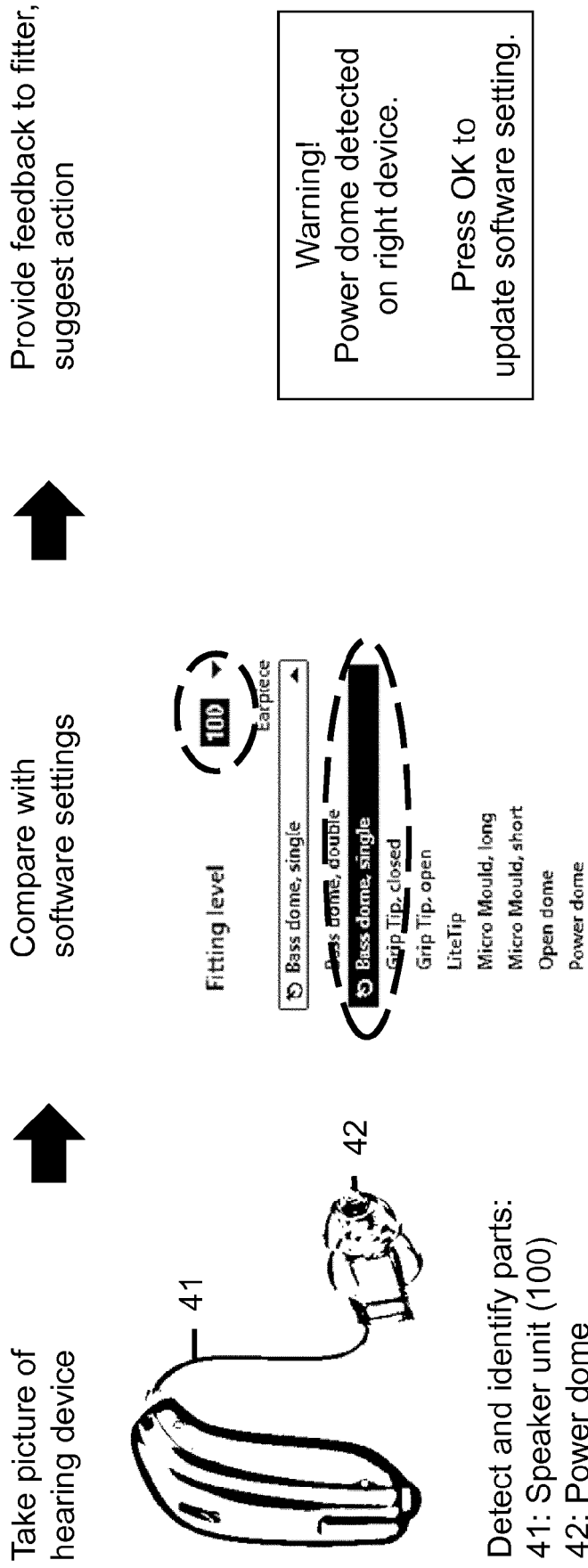


Fig. 4

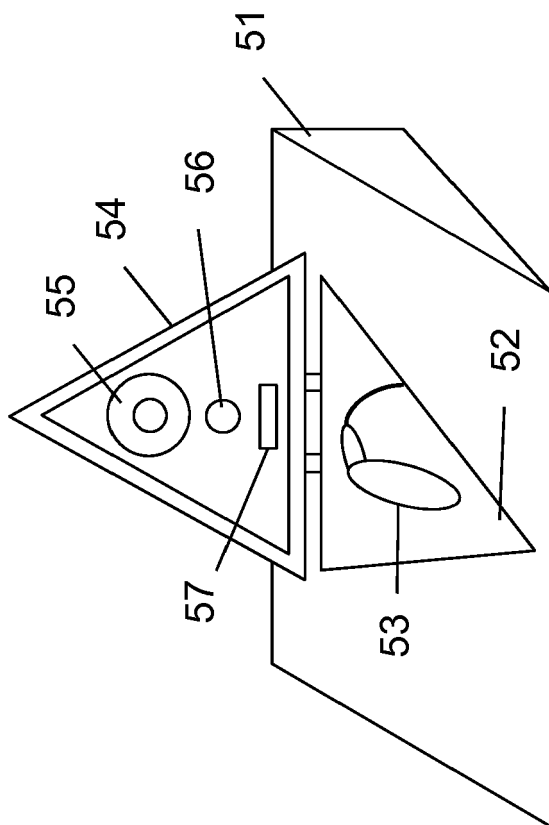


Fig. 5

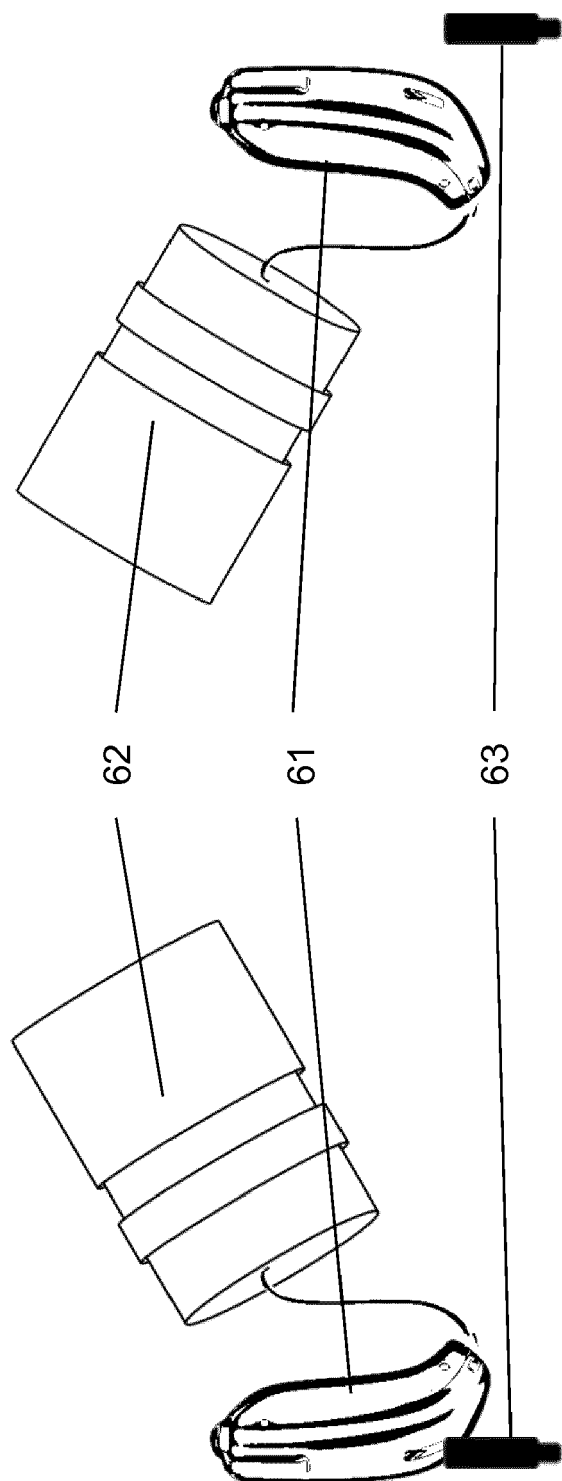


Fig. 6



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Place of search Munich		Date of completion of the search 21 September 2018	Examiner Peirs, Karel
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