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(54) **INSERTION AND REMOVAL TOOL FOR A HEARING AID**

(57) A tool for inserting and removing a deep-in-canal hearing aid into/from a canal is disclosed. The tool comprises a body and an engagement mechanism. The body has an end portion, an inner space and a hole. The end portion includes a tip in a longitudinal direction of the body. The inner space is formed at the end portion. The hole is configured to connect the inner space and an outside of the body in a lateral direction of the body and to be open at the tip. The engagement mechanism is arranged in the inner space and configured to releasably engage the hearing aid.

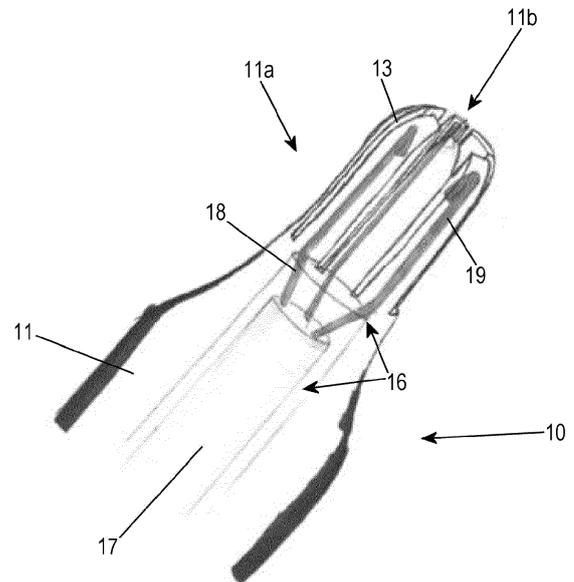


Fig. 1

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Description**FIELD**

[0001] The present disclosure relates to a tool for inserting and removing a hearing aid into/ from a canal. More particularly, the disclosure relates to a tool for inserting and removing a deep-in-canal hearing aid into/from a canal.

BACKGROUND

[0002] Having a completely invisible in-ear hearing aid, which can be worn for an extended period of time requires that the end user (user) places the hearing aid deep in the external acoustic meatus ((external) ear canal). To do this a tool is needed to easily and precisely place the hearing aid deep in the correct position/ depth in the ear canal. When the hearing aid is placed in the correct position/ depth in the ear canal, the same tool can be used to easily remove the device from the ear canal again.

[0003] Deep-in-canal hearing aids are often meant to obtain a so called bony-seal, where the hearing aid obtains a tight sealing to the ear canal wall in the innermost part of the external ear canal (the bony part of the ear canal) where the skin is very thin and the canal opening is surrounded by osseous tissue (bone tissue) instead of cartilaginous tissue. This part of the ear canal is very sensitive and vulnerable. Thus, the user might hurt himself, when inserting or removing a tool comprising an engagement mechanism protruding from the tool so as to come into contact with the ear canal walls.

[0004] Further, obtaining the desired insertion position/ depth is difficult for many potential hearing aid users. On the one hand, the hearing aid shall not be inserted too deep into the ear canal, since the hearing aid could abut the tympanic membrane (eardrum), thus causing pain or an uncomfortable feeling to the user, or could even damage the eardrum. Hence, maintaining a safe distance of approximately 3mm from the eardrum is desirable. On the other hand, the hearing aid shall not be inserted too shallow into the ear canal, since this placement of the hearing aid would result in an incorrect acoustic amplification and a risk of occlusion problems for the user. The desired or proper insertion position/ depth differs amongst the users, since each ear canal is formed individually.

[0005] Further, when the tool is worn in a bag or in the user's pocket, the protruding engagement mechanism can be damaged by other objects in the bag or pocket or by a force which is exerted from outside to the bag or pocket.

[0006] Therefore, there is a need to provide a solution that addresses at least some of the above-mentioned problems.

SUMMARY

[0007] According to an aspect, a tool for inserting and removing a deep-in-canal hearing aid into/from a canal is provided. The tool comprises a body and an engagement mechanism. The body has an end portion, an inner space and a hole. The end portion includes a tip in a longitudinal direction of the body. The inner space is formed at the end portion. The hole is configured to connect the inner space and an outside of the body in a lateral direction of the body and to be open at the tip. The engagement mechanism is arranged in the inner space and configured to releasably engage the hearing aid.

[0008] This allows for always hiding the engagement mechanism in the inner space of the body. Further, one aspect is conceivable, in which only for the engagement and release operation of the engagement mechanism and the corresponding engagement portion of the hearing aid the engagement mechanism protrudes to the outside of the body. As soon as the engagement mechanism is brought into engagement with or released from the engagement portion, the engagement mechanism is hidden in the inner space again so that it does not protrude from the body any more. Thus, the engagement mechanism can be protected from being damaged and also cannot hurt the user.

[0009] According to another aspect, a hearing device is provided. The hearing device comprises the tool according to any of the aspects presented herein, and the deep-in-canal hearing aid. The hearing aid has an engagement portion configured to be engaged by the engagement mechanism.

[0010] In other words, the hearing device is a system of at least the tool and the hearing aid.

[0011] Preferably, a tool according to any of the aspects presented herein is provided, wherein the engagement mechanism does not protrude from the body in the longitudinal or the lateral direction of the body in an engagement state or a released state.

[0012] This allows for hiding the engagement mechanism as long as possible. Thus, the engagement mechanism can be even better protected. Also injuries of the user can be better avoided.

[0013] Preferably, a tool according to any of the aspects presented herein is provided, wherein the engagement mechanism is movable between the engagement state and the released state.

[0014] This allows for facilitating the release of the engagement portion from the engagement mechanism and also allows for facilitating the engagement between the engagement mechanism and the engagement portion.

[0015] Preferably, a tool according to any of the aspects presented herein is provided, wherein the tool comprises a recess in the body. The engagement mechanism is arranged in the recess in the released state.

[0016] This allows for easily hiding and protecting the engagement mechanism using a simple structure. It further allows for facilitating the movement of the engage-

ment mechanism in the lateral direction of the body.

[0017] Preferably, a tool according to any of the aspects presented herein is provided, wherein the tool comprises an actuating mechanism configured to move the engagement mechanism between the engagement state and the released state.

[0018] This allows for facilitating the movement of the engaging mechanism between the two states.

[0019] Preferably, a tool according to any of the aspects presented herein is provided, wherein the actuating mechanism comprises a sliding element and an actor. The sliding element is connected to the engagement mechanism and is configured to slide in the longitudinal direction of the body. The actor is configured to actuate the engagement mechanism towards the engagement state.

[0020] This allows for easily implementing the actuating mechanism having a simple structure. The combination of the sliding element and the actor allows for combining a movement of the engagement mechanism in the longitudinal direction and the lateral direction of the body. Thus, hiding the engagement mechanism and releasing/engaging the engagement portion can be combined into one operation.

[0021] Preferably, a tool according to any of the aspects presented herein is provided, wherein the actuating mechanism comprises a rotating element and an actor. The rotating element is connected to the engagement mechanism and is configured to rotate in the lateral direction of the body. The actor is configured to actuate the engagement mechanism towards the engagement state.

[0022] This allows for easily implementing the actuating mechanism having a simple structure. The combination of the rotating element and the actor allows for combining a movement of the engagement mechanism in the circumferential direction of the body substantially around the longitudinal axis of the body as a center of rotation and the lateral direction of the body. Thus, hiding the engagement mechanism and releasing/engaging the engagement portion can be combined into one operation.

[0023] Preferably, a tool according to any of the aspects presented herein is provided, wherein the actor is a projection of the body.

[0024] This allows for easily implementing the actor having a simple structure and an effective functionality. The projection cooperates with a part of the engagement mechanism to actuate the engagement mechanism.

[0025] Preferably, a tool according to any of the aspects presented herein is provided, wherein the projection has an inclined surface.

[0026] This allows for even easier implementation of the actor having a simple structure and an more effective functionality. The inclined projection cooperates with a part of the engagement mechanism to actuate the engagement mechanism. The inclination makes the actuation of the engagement mechanism smoother and allows for smaller forces being necessary to actuate the

engagement mechanism. Alternatively, the engagement mechanism can have the inclined part. The inclined part of the engagement mechanism cooperates with the projection of the body to smoothly actuate the engagement mechanism and to reduce the necessary forces.

[0027] Preferably, a tool according to any of the aspects presented herein is provided, wherein the engagement mechanism comprises a hook.

[0028] This allows for easily implementing the engagement mechanism having a simple structure and an effective functionality.

[0029] Preferably, a tool according to any of the aspects presented herein is provided, wherein the engagement mechanism is made of a resilient material.

[0030] This allows for facilitating the smooth actuation of the engagement mechanism. It also allows for further reducing the forces, which are necessary to actuate the engagement mechanism. It further allows for prolonging the lifespan of the actuating mechanism and the engagement mechanism.

[0031] Preferably, a tool according to any of the aspects presented herein is provided, wherein the tool comprises a stop being configured to be fixed to the body.

[0032] This allows for ensuring the proper insertion depth of the hearing aid. Once the position of the stop has been adjusted by a hearing care professional, the user becomes independent from external support.

[0033] Preferably, a tool according to any of the aspects presented herein is provided, wherein the end portion is a cap being configured to be detachably attachable to the residual body.

[0034] This allows for access to the engagement mechanism. It further allows for easier mountability of the tool. It further allows for using differently shaped caps, which are interchangeable and adaptable to the individual shapes of the ear canals of the users. Preferably, a tool according to any of the aspects presented herein is provided, wherein the end portion is tapered.

[0035] This allows for using the cap as a stop. The size and inclination of the cap can be adapted to the individual dimensions of the ear canal of each user. Thus, the adjustment of the insertion depth of the hearing aid is facilitated.

BRIEF DESCRIPTION OF DRAWINGS

[0036] 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 effects will be apparent from and elucidated with reference to the illustrations described hereinafter in

which:

Figure 1 illustrates a tool according to an embodiment of the disclosure as a partially perspective and sectional view;

Figure 2 illustrates a tool having a stop according to an embodiment of the disclosure as a partially perspective and sectional view;

Figure 3A illustrates a tool according to an embodiment of the disclosure in which the engagement mechanism is in a released (opened) state as a schematic sectional view;

Figure 3B illustrates a tool according to an embodiment of the disclosure in which the engagement mechanism is in an engaged (closed) state as a schematic sectional view; and

Figure 4 illustrates a tool and a hearing aid according to an embodiment of the disclosure and shows a sequence of steps for inserting and removing the hearing aid into/from the ear canal of a user.

DETAILED DESCRIPTION

[0037] The detailed description set forth below in connection 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 various concepts. However, it will be apparent to those skilled in the art that these concepts may be practiced without these specific details.

[0038] A hearing device according to the disclosure includes a hearing aid and a tool for inserting the hearing aid into an ear canal and for removing the hearing aid from the ear canal. A hearing device 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. Such audible signals may be provided in the form of an acoustic signal radiated into the user's outer ear.

[0039] The hearing aid is adapted to be worn in any known way. This may include In-the-Canal (ITC)/ Completely-in-Canal (CIC) type hearing aids.

[0040] In general, a hearing aid 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 aid 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.

[0041] The input unit may include multiple input microphones, e.g. for providing direction-dependent audio signal processing. Such 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 speaker/loudspeaker/ receiver for providing an air-borne acoustic signal.

[0042] The disclosure relates to an insertion tool and removal tool for an invisible in-ear hearing aid, which is inserted into the ear canal when in use.

[0043] One particular embodiment of the suggested solution consist of (three) hooks or similar engagement elements, which are completely hidden under a (plastic) cap. This protects these hooks. These hooks move back and forward, when activated by a push button on the side of the tool. The mechanical design inside the tool is shaped in a way that pushes the hooks together inside the tool when the push button is activated. This forms a closed state.

[0044] Prior to insertion in the ear canal, the hooks are connected to a pull-out element on the hearing aid. Then the hearing aid is inserted into the ear. Subsequently, the button is activated and the tool releases the hearing aid in the ear canal.

[0045] According to one embodiment, a stop plate is on the side of the tool. This stop plate is to ensure the aid is placed at the correct depth in the ear canal. The location of the stop plate is initially determined by a hearing care professional and is fastened to the tool in a position, which cannot be changed by the user without a special tool.

[0046] Now referring to Figure 1, which illustrates a tool according to one exemplary embodiment of the disclosure as a partially perspective and a partially sectional view, the tool according to the present disclosure will be explained. Reference is also made to Figures 3A and 3B, which illustrate a tool according to an embodiment of the disclosure in which the engagement mechanism is in a released (opened) state (Figure 3A) and in an engaged (closed) state (Figure 3B) as schematic sectional views.

[0047] The tool 10 has a body 11 and an engagement mechanism 14. The body 11 has a tubular shape. In other words, the body 11 is substantially a cylinder having an inner space 12 in the radial center thereof, i.e., in the center in the lateral direction Y. The body 11 extends in the longitudinal direction X, which is perpendicular to the lateral direction Y.

[0048] The body 11 has one end portion 11a in the longitudinal direction X. At the outermost end in the longitudinal direction there is a tip (end) 11b. The inner space 12 is formed in the region of the end portion 11a.

[0049] Further, the body 11 has at least one (through)

hole 13, which has the shape of a slit in the present embodiment. There are six holes 13 in the present embodiment. The holes 13 extend in the longitudinal direction X and completely penetrate the wall of the body 11 in the lateral direction Y. Thus, the holes 13 connect the inner space 12 and the outside of the body 11.

[0050] The holes 13 are formed such that they have an end defined by the wall of the body 11 in the direction, which is opposite to the longitudinal direction X (negative X direction). The other end of the holes 13 at the tip 11b is not defined by wall material of the body 11. In other words, the holes 13 are open at the tip end 11b. As a result, an object, such as an engagement portion 31 (which is described later) can be inserted into the holes 13 in negative X direction from the tip 11b without being hindered by the wall of the body 11.

[0051] In the inner space 12, the engagement mechanism 14 is accommodated. In the present embodiment, the engagement mechanism 14 includes three hooks 19. However, it is sufficient if at least one hook 19 is used in the tool 10 according to the present disclosure. The hooks 13 are for coming into engagement with the engagement portion 31 of the hearing aid 30.

[0052] The hooks 19 do not protrude from the contour of the body 11 in the longitudinal direction X or the lateral direction Y when they are engaged with the engagement portion 31 (engagement state) or when the engagement portion 31 is released from the hooks 19 (released state). In fact, in the present embodiment, the hooks do not protrude out of the contour of the body 11 at all. However, it is conceivable that the hooks 19 are extended in the longitudinal direction X and/or the lateral direction Y beyond the body 11 (only) to grab the engagement portion 31 of the hearing aid 30 during the process of coming into engagement with the engagement portion 31 or (only) to release the engagement portion 31 during the process of disengagement.

[0053] In the present embodiment recesses 15 are additionally provided, in which the hooks 19 are accommodated in the released state. The number of recesses 15 corresponds to the number of hooks 19. The recesses 15 are formed as grooves in the present embodiment. The recesses 15 and the inner space 12 are connected. In particular, the recesses 15 are continuous with the inner space 12.

[0054] In the present embodiment, the engagement mechanism 14/ the hooks 19 is/ are connected to an actuating mechanism 16. The actuating mechanism 16 moves the engagement mechanism 14/ the hooks 19 from the released state to the engagement state and vice versa. It is to be noted that no actuating mechanism 16 is necessary in the present disclosure. In other words, the engagement mechanism 14/ the hooks 19 does/ do not have to be movable, since the engagement portion 31 could also be inserted into the holes 13 and then hooked into the hooks 19 to achieve the engagement state and afterwards could be hooked off the hooks 19 to achieve the released state again.

[0055] In the present embodiment, the actuating mechanism 16 comprises a sliding element 17 and an actor 18. The sliding element is a rod or spool 17, which is connected directly or indirectly to the engagement mechanism 14/ the hooks 19. The spool is accommodated in a part of the inner space 12, which is upstream in the longitudinal direction X as compared to the part, in which the engagement mechanism 14/ the hooks 19 are accommodated (or the grooves 15 are formed).

[0056] The spool 17 is actuated by a slider or by a button (similar to a ball pen). The spool is movable in the longitudinal direction X of the tool 10. When the spool 17 is moved toward the tip 11b, i.e., in the positive X direction, the engagement mechanism 14/ the hooks 19 is/ are in the released state. When the spool 17 is moved away from the tip 11b, i.e., in the negative X direction, the engagement mechanism 14/ the hooks 19 is/ are in the engagement state. This can be realized by providing the actor 18, which (in the present embodiment) is an edge or corner of the body 11. More particularly, the actor 18 is the edge between the recesses 15 and the residual inner space 12. The actuation of the engagement mechanism 14/ the hooks 19 can be best understood from Figures 3A and 3B.

[0057] When the spool 12 is moved backwards (in the negative X direction), the hooks 19 abut the edge 18 and are (elastically) deformed towards the center in the lateral direction Y (the radial center or the longitudinal axis of the body 11). This is facilitated by the inclined structure of the hooks 19 as shown in figure 1, where the hooks 19 slide along the edge 18, when the spool 17 is moved backwards. Alternatively, the hooks 19 could also be formed without inclined portions and the edge 18 could be formed as an inclined surface along which the hooks 19 could slide. It is noted that no inclination has to be provided at all for the actuating mechanism 16 to work. This particularly applies to the case, where the hooks 19 are made from a resilient material.

[0058] Instead of the edge or corner, any projection or protrusion can be provided as an actor 18, as long as it is configured such that the engagement mechanism 14/ the hooks 19 abuts/ abut it on its/ their way in the negative X direction. This projection or protrusion can be provided with an inclined portion as well.

[0059] Instead of providing a sliding element as part of the actuating mechanism 16, a rotating element (not shown) could be provided (also similar to a ball pen). In this case, the actor had to be configured such that the engagement mechanism 14/ the hooks 19 could abut it on its/ their way in the rotational direction. The rotational direction corresponds to the circumferential direction of the body 11 with the X axis as the rotation center. In other words, the actor could be provided, for example, as a part of the body 11, which is inclined in the circumferential direction. Alternatively, the engagement mechanism 14/ the hooks 19 could be provided with inclinations in the circumferential direction. Similarly to the actuating mechanism 16 using the sliding element 17, the actuating

mechanism 16 using the rotating element does not necessarily require an inclined part to work properly.

[0060] Figure 2 illustrates a tool 10 having a stop 20 according to an embodiment of the disclosure as a partially perspective and sectional view. The stop 20 is implemented as a plate element, which is attached to the outer wall of the body 11.

[0061] Figure 4 illustrates a tool 10 and a hearing aid 30 according to an embodiment of the disclosure and shows a sequence of steps for inserting and removing the hearing aid 30 into/from the ear canal of a user.

[0062] The hearing aid 30 has the engagement portion 31. In the present embodiment, the engagement portion 31 is a string, which is attached to the hearing aid 30. The string 31 can be inserted into the tool 10 through the holes 13.

[0063] In the first two rows in Figure 4, the insertion operation of the hearing aid 30 (HA) into the ear canal in depicted. First, the hearing aid 30 is brought into the vicinity of the tool 10. Then, the string 31 is inserted into the groove shaped openings 13. Then, the hearing aid 30 is locked to the tool 10 by sliding the slider in the backward direction (negative X direction) and bringing the engagement mechanism 14 into the engagement state. Afterwards, the tool 10 and the hearing aid 30 are inserted into the ear canal while the engagement mechanism 14 is still accommodated in the inner space 12 of the tool 10. The middle row in Figure 4 shows, how the hearing aid 30 (the string 31) is released from the engagement mechanism 14 by sliding the slider in the forward direction (positive X direction) and the tool 10 is removed from the ear canal. During the release operation of the string 31, the engagement mechanism 14 does not protrude from the body 11 of the tool 10.

[0064] The lower row in Figure 4 shows the removal operation of the hearing device 30 from the ear canal. First, if necessary, the tool 10 (the engagement mechanism 14) is brought into the released state by sliding the slider in the forward direction (positive X direction). Then, the tool 10 is inserted into the ear canal, while the engagement mechanism 14 is still accommodated in the inner space 12 of the tool 10. Subsequently, the tool 10 (the engagement mechanism 14) is locked by sliding the slider in the forward direction (positive X direction). During the engagement, the engagement mechanism 14 does not protrude from the body 11 of the tool 10. Finally, the hearing aid 30 is safely removed from the ear canal.

[0065] 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.

[0066] 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.

[0067] 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.

[0068] 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.

[0069] Accordingly, the scope should be judged in terms of the claims that follow.

Claims

1. Tool (10) for inserting and removing a deep-in-canal hearing aid (30) into/from a canal, comprising a body (11) having
 - an end portion (11a) including a tip (11b) in a longitudinal direction (X) of the body (11),
 - an inner space (12) formed at the end portion (11a), and
 - a hole (13) being configured to connect the inner space (12) and an outside of the body (11) in a lateral direction (Y) of the body (11) and to be open at the tip (11b), and
 - an engagement mechanism (14) being arranged in the inner space (12) and configured to releasably engage the hearing aid (30).

2. Tool (10) according to claim 1, wherein the engagement mechanism (14) does not protrude from the body (11) in the longitudinal or the lateral direction (X, Y) of the body (11) in an engagement state or a released state. 5
3. Tool (10) according to any of the preceding claims, wherein the engagement mechanism (14) is movable between the engagement state and the released state. 10
4. Tool (10) according to claim 3, comprising a recess (15) in the body (11), wherein the engagement mechanism (14) is arranged in the recess (15) in the released state. 15
5. Tool (10) according to any of the preceding claims, comprising an actuating mechanism (16) configured to move the engagement mechanism (14) between the engagement state and the released state. 20
6. Tool (10) according to claim 5, wherein the actuating mechanism (16) comprises 25
a sliding element (17) being connected to the engagement mechanism (14) and being configured to slide in the longitudinal direction (X) of the body (11), and
an actor (18) being configured to actuate the engagement mechanism (14) towards the engagement state. 30
7. Tool (10) according to claim 5, wherein the actuating mechanism (16) comprises 35
a rotating element being connected to the engagement mechanism (14) and being configured to rotate in the lateral direction (Y) of the body (11), and 40
an actor being configured to actuate the engagement mechanism (14) towards the engagement state.
8. Tool (10) according to claims 6 or 7, wherein the actor (18) is a projection of the body (11). 45
9. Tool (10) according to claim 8, wherein the projection (18) has an inclined surface. 50
10. Tool (10) according to any of the preceding claims, wherein the engagement mechanism (14) comprises a hook (19). 55
11. Tool (10) according to any of the preceding claims, wherein the engagement mechanism (14) is made of a resilient material.
12. Tool (10) according to any of the preceding claims, comprising a stop (20) configured to be fixed to the body (11).
13. Tool (10) according to any of the preceding claims, wherein the end portion (11a) is a cap being configured to be detachably attachable to the residual body (11).
14. Tool (10) according to any of the preceding claims, wherein the end portion (11a) is tapered.
15. Hearing device, comprising the tool (10) according to any of the preceding claims, and the deep-in-canal hearing aid (30) having an engagement portion (31) configured to be engaged by the engagement mechanism (14).

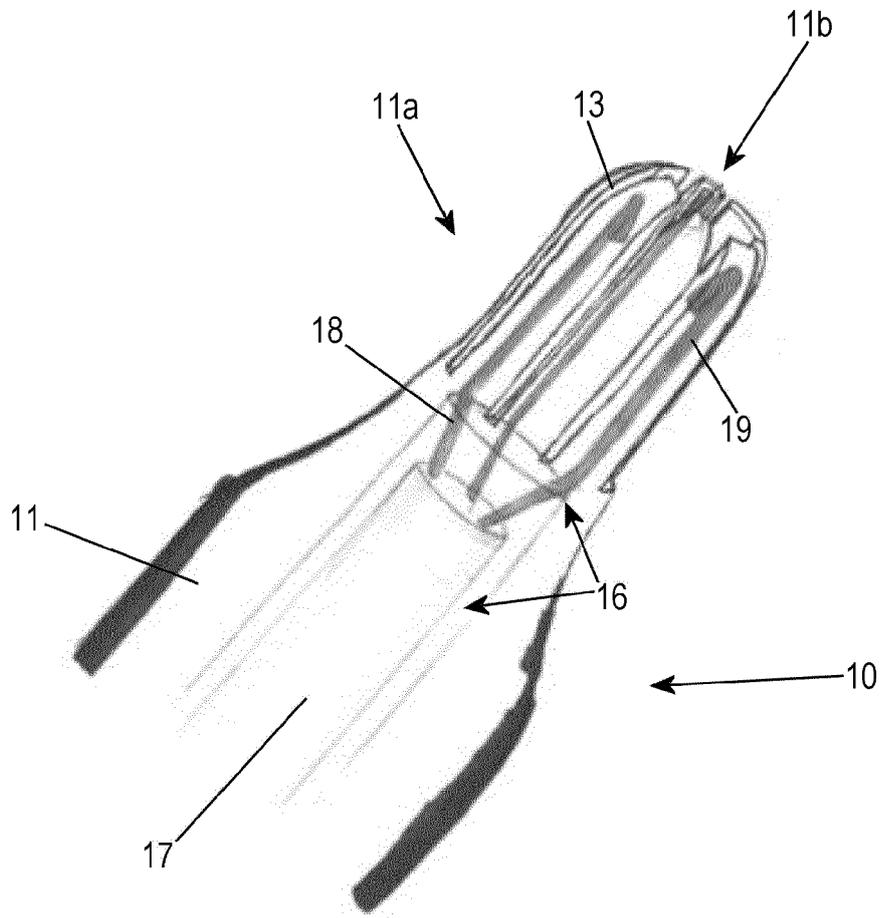


Fig. 1

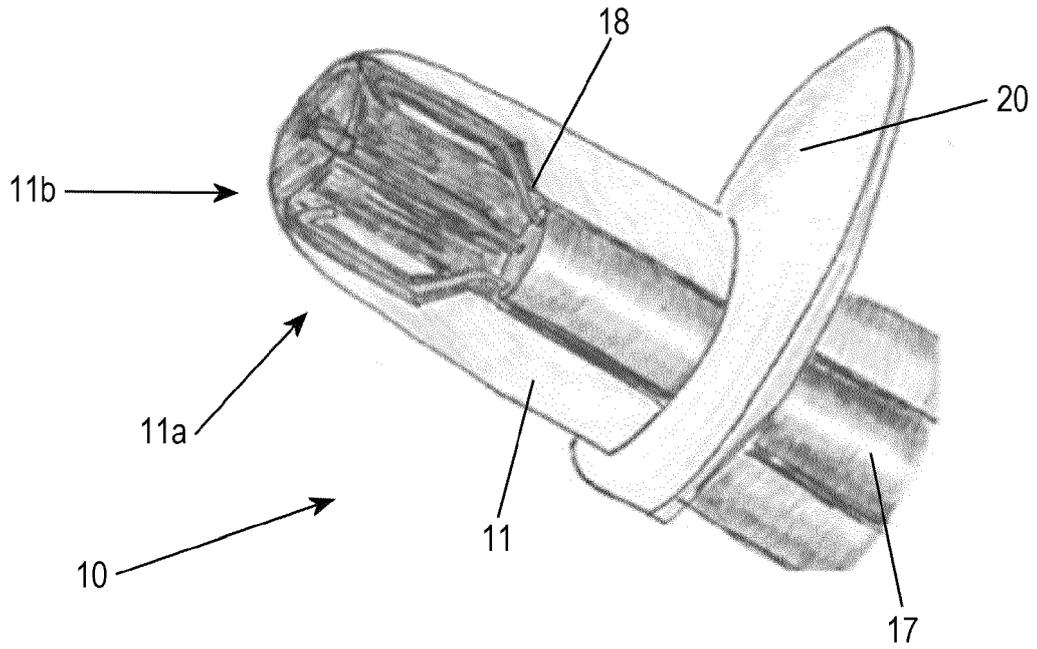


Fig. 2

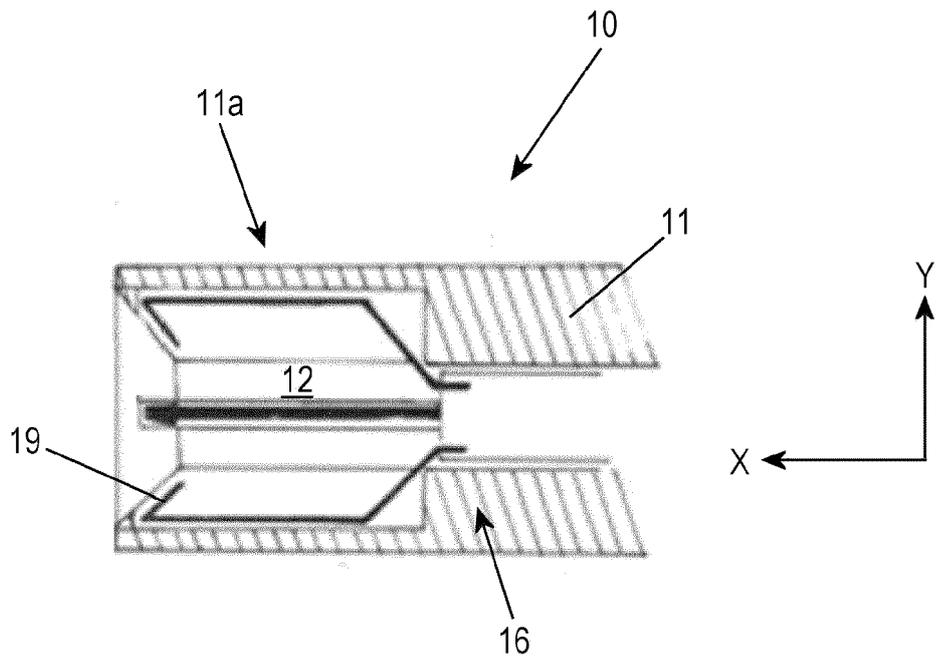


Fig. 3A

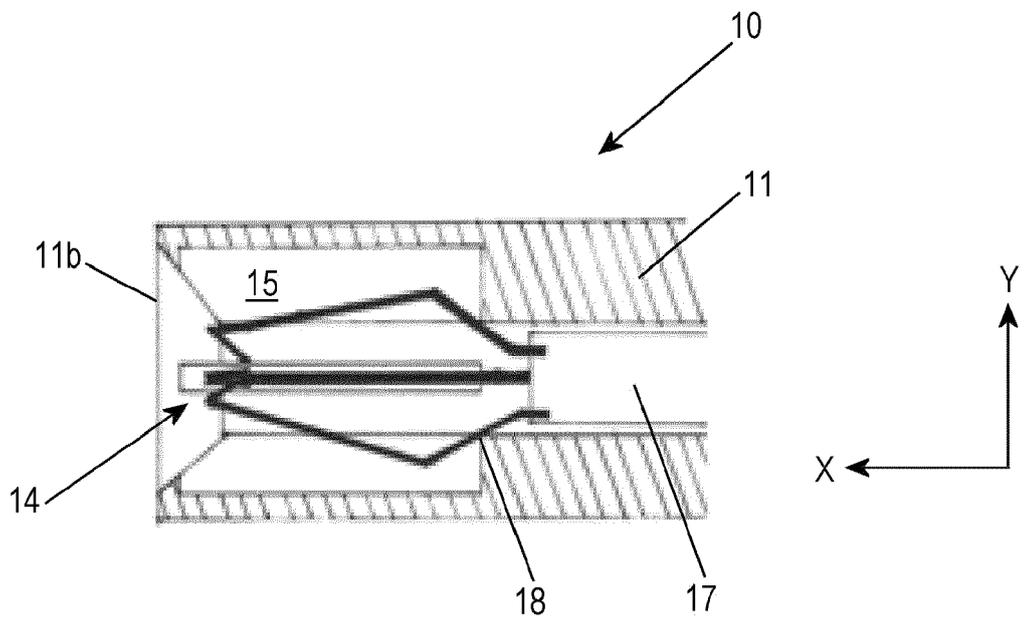


Fig. 3B

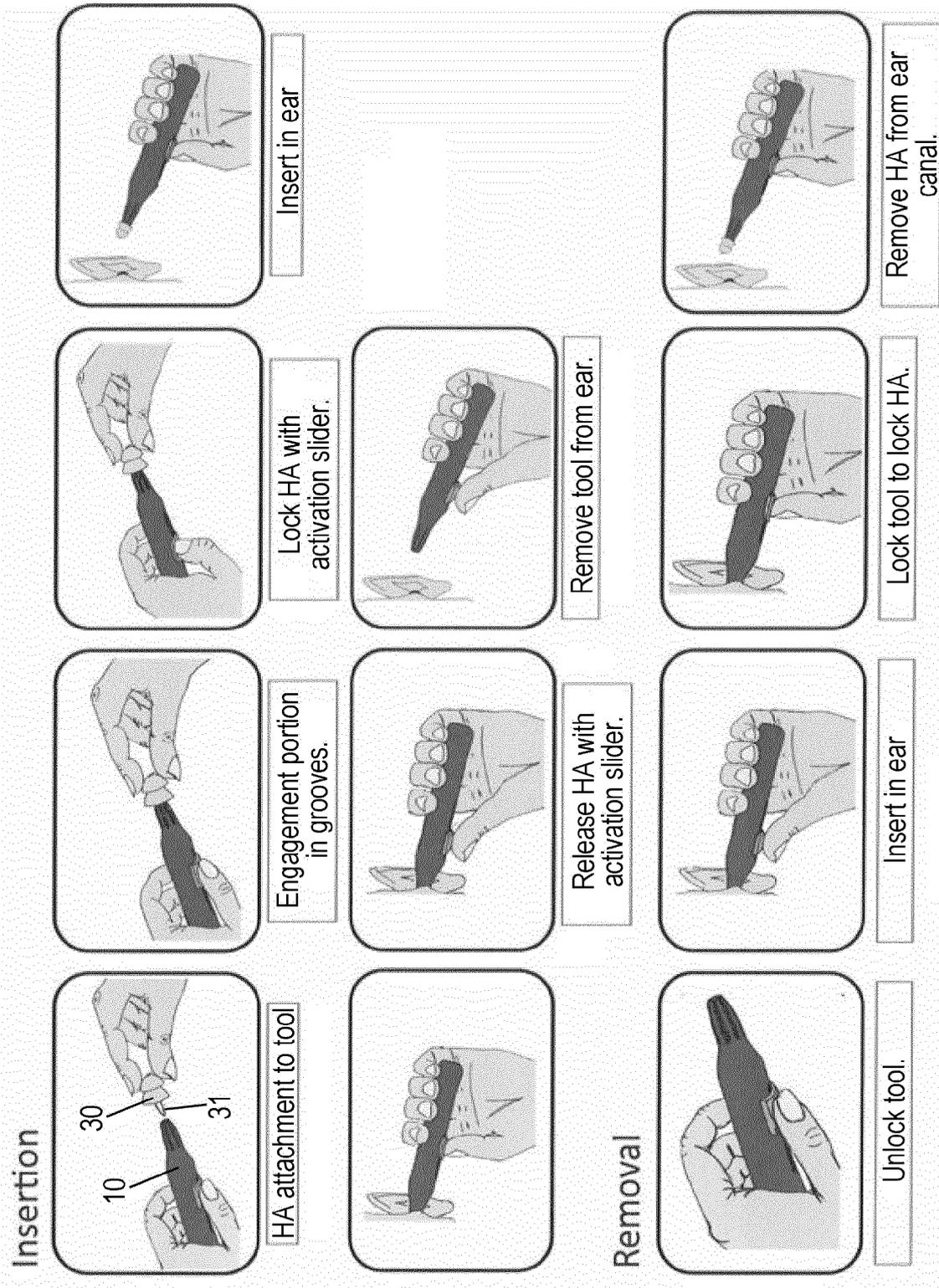


Fig. 4



EUROPEAN SEARCH REPORT

Application Number
EP 18 19 7452

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X A	US 9 161 142 B1 (WAGNER DENNIS [US]) 13 October 2015 (2015-10-13) * column 4, line 62 - column 6, line 15; figures 1-3 *	1-7, 12-14 8,9	INV. H04R25/00
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A	US 2013/294631 A1 (SHENNIB ADNAN [US] ET AL) 7 November 2013 (2013-11-07) * abstract; figures 1-6, 10 *	1-15	
			TECHNICAL FIELDS SEARCHED (IPC)
			H04R
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 7 March 2019	Examiner Righetti, Marco
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