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(54) **DEVICE FOR STABILIZING EAR-MOUNTED DEVICES**

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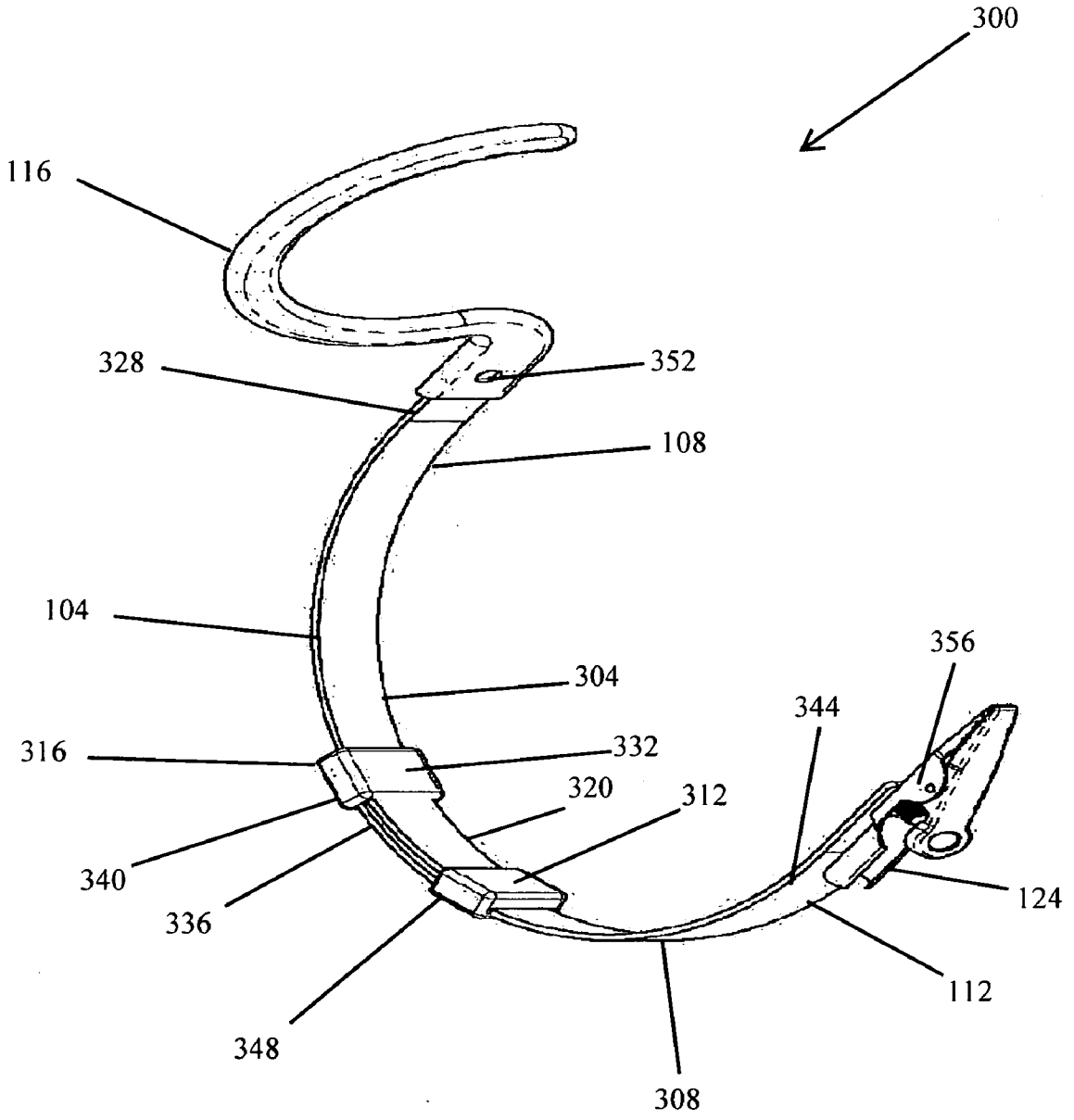
(52) **U.S. Cl.** **224/181**

(57) **ABSTRACT**

A stabilizing device includes a retainer, an earpiece coupled to a first end of the retainer, and a coupling member secured to a second end of the retainer. The retainer is configured for extending around the back of the head of a user. The earpiece is configured for looping around the ear of a user. The coupling member is configured for coupling to a plurality of different types of ear-mounted devices. The retainer may include first and second slidably adjustable pieces, first and second interlocking extenders, or a unitary piece.



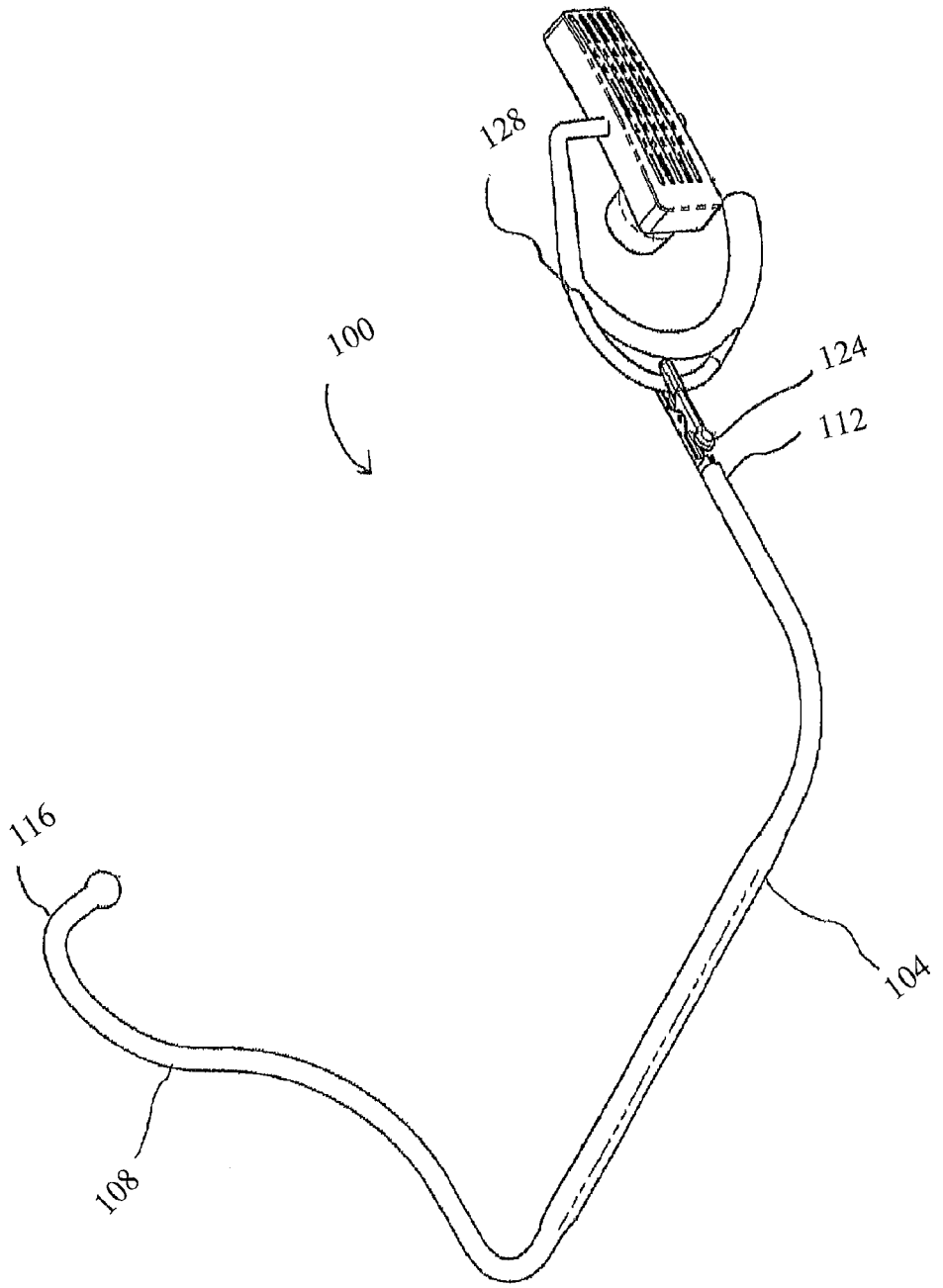


Fig. 1

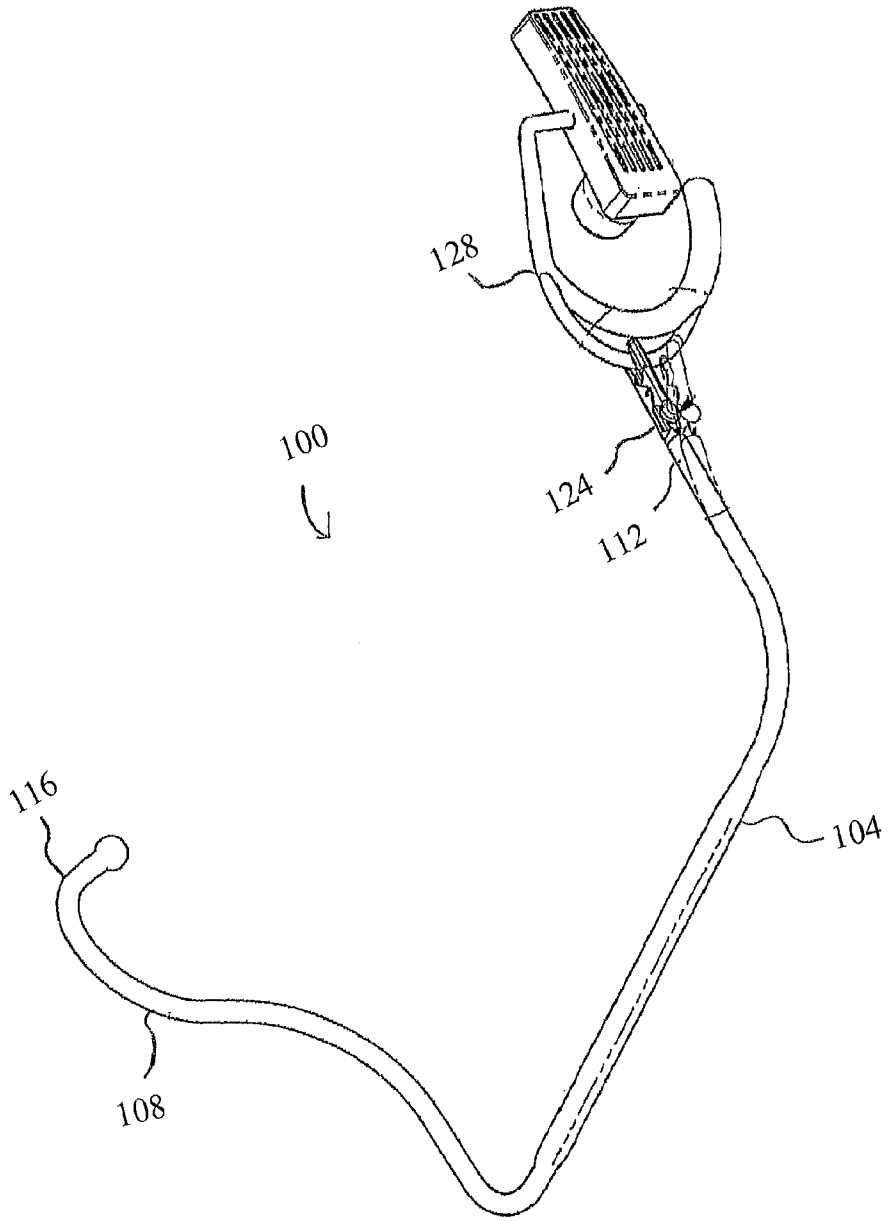


Fig. 2

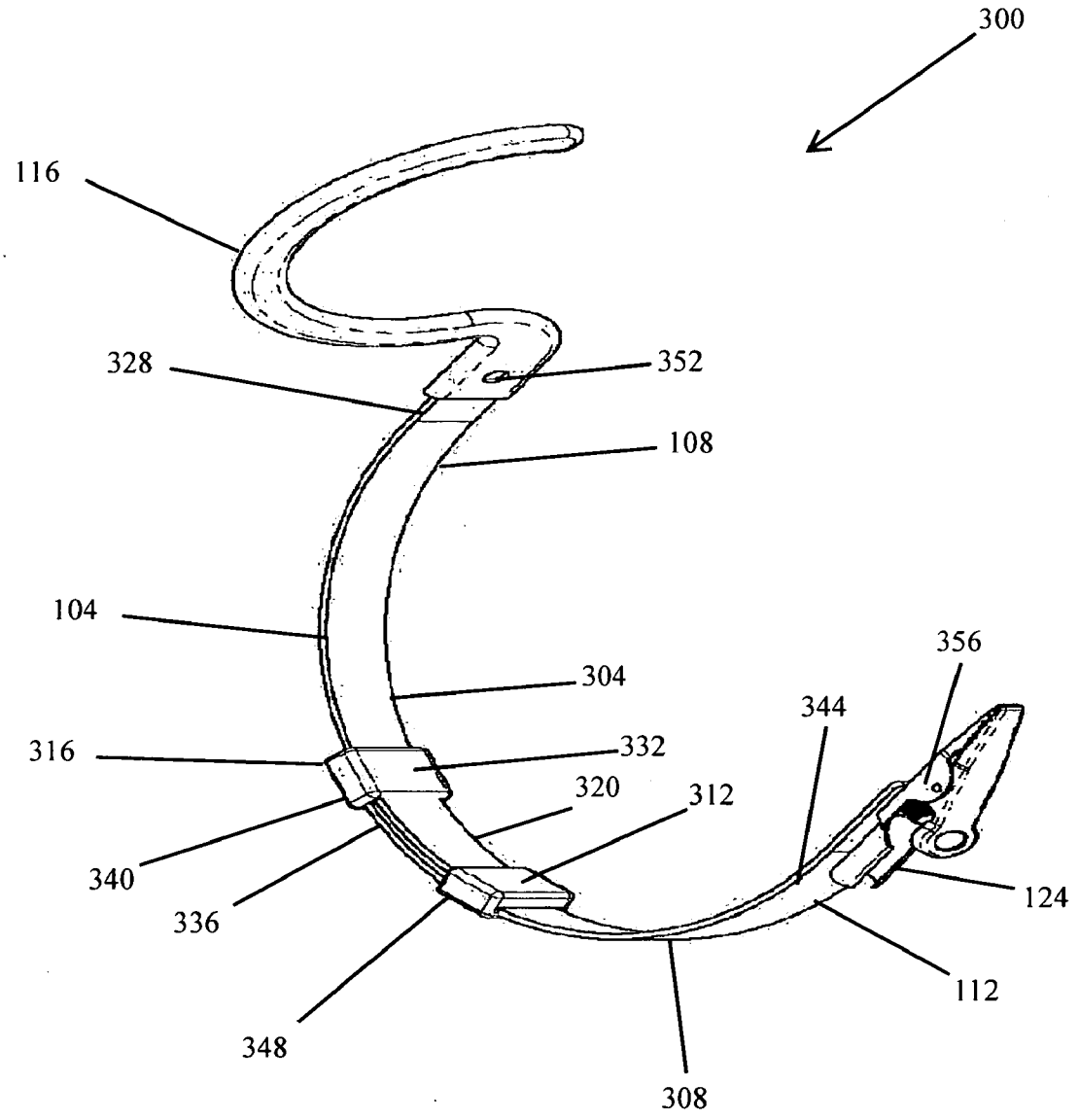

300
116
328
352
108
104
304
356
344
316
332
320
312
340
336
124
112
348
308

FIG. 3

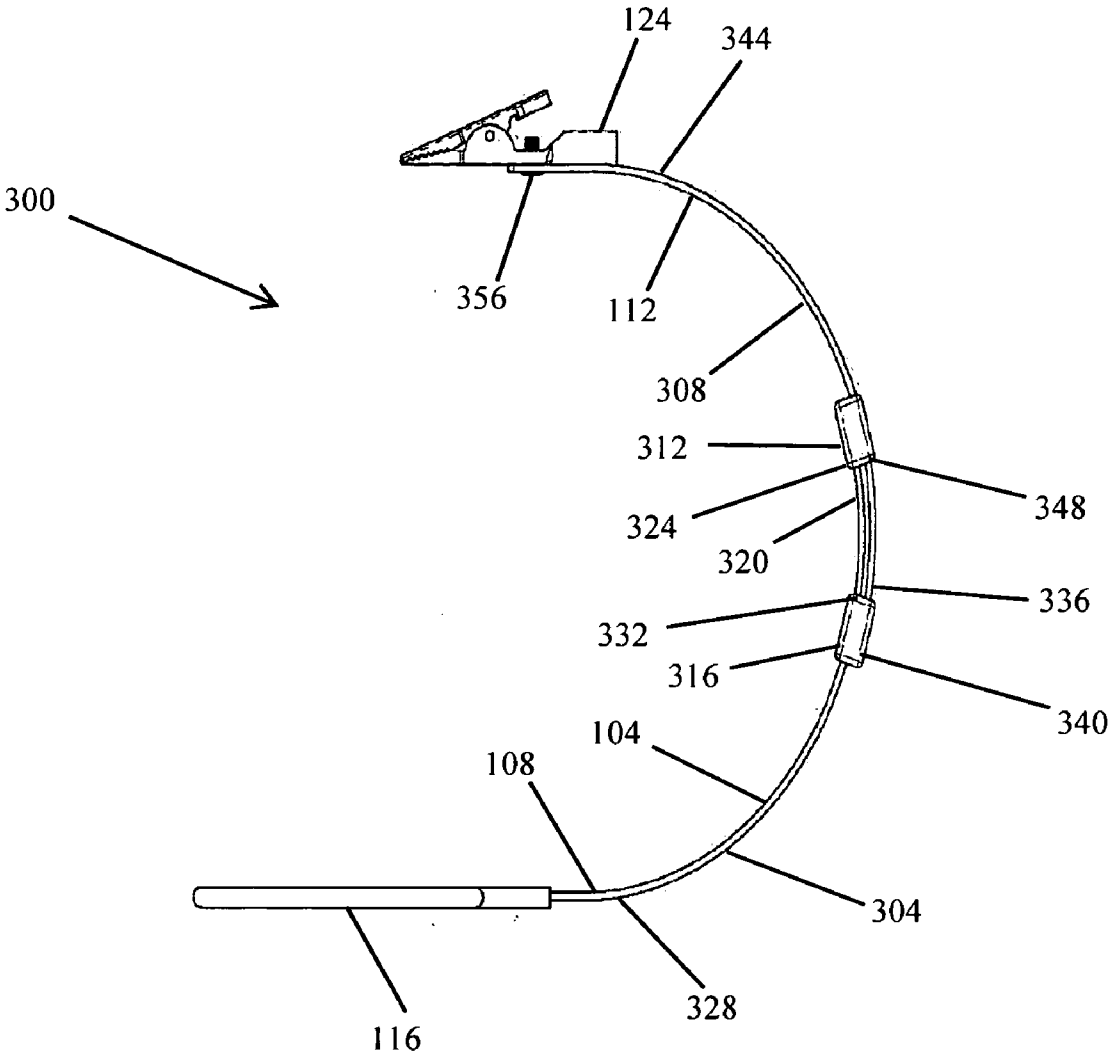

124
344
300
356
112
308
312
348
324
320
336
332
316
340
104
108
304
328
116

FIG. 4

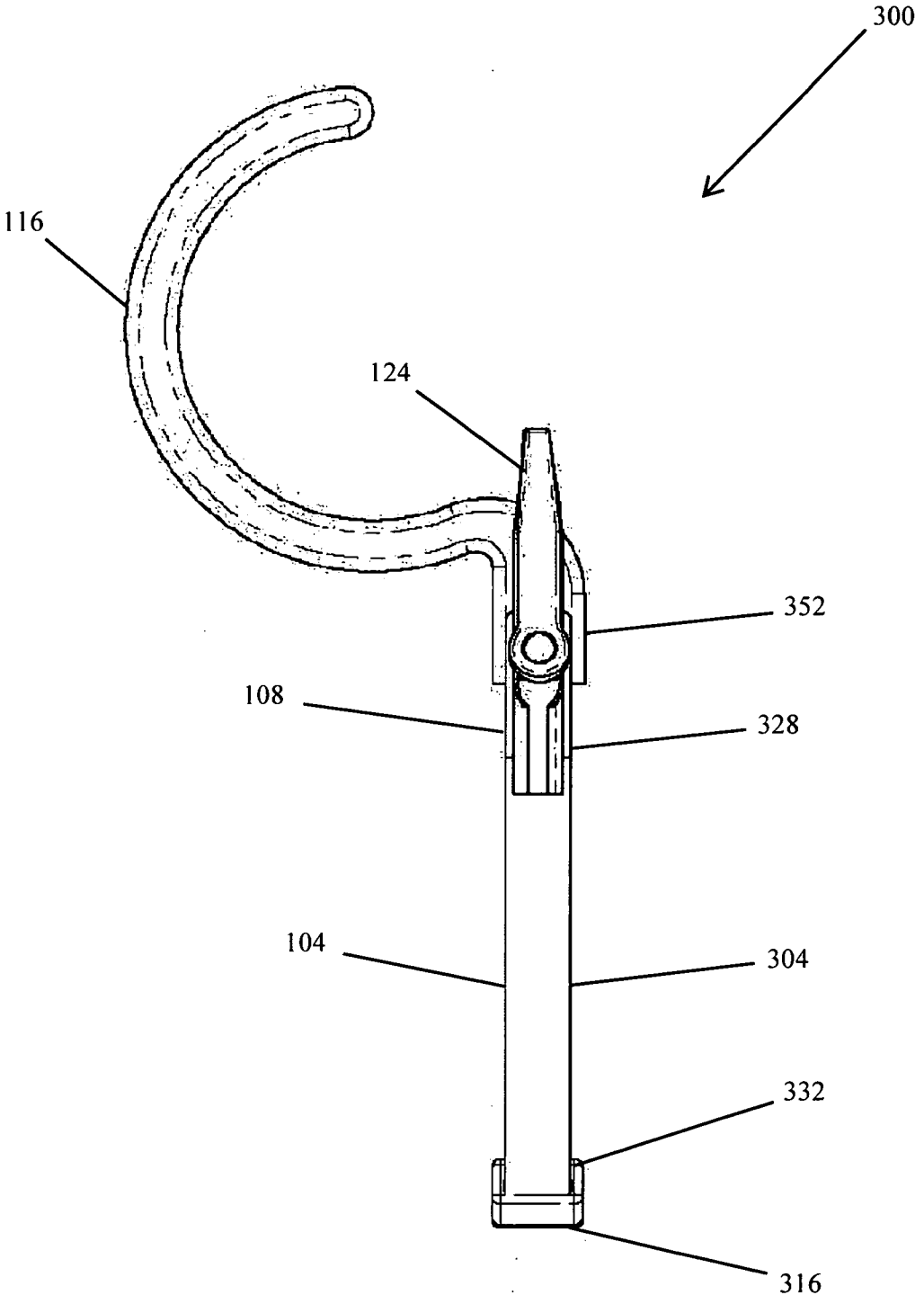


FIG. 5

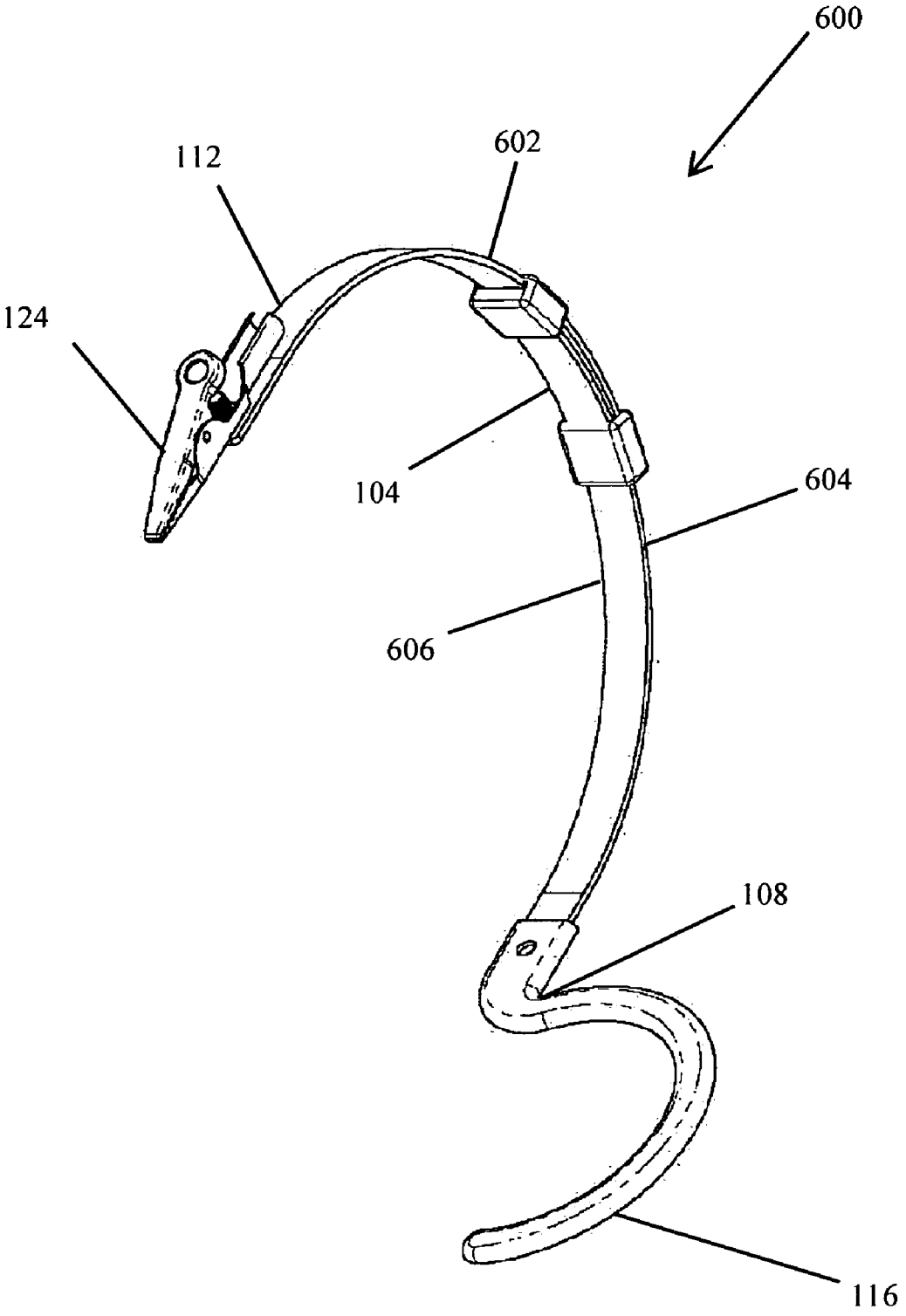


FIG. 6

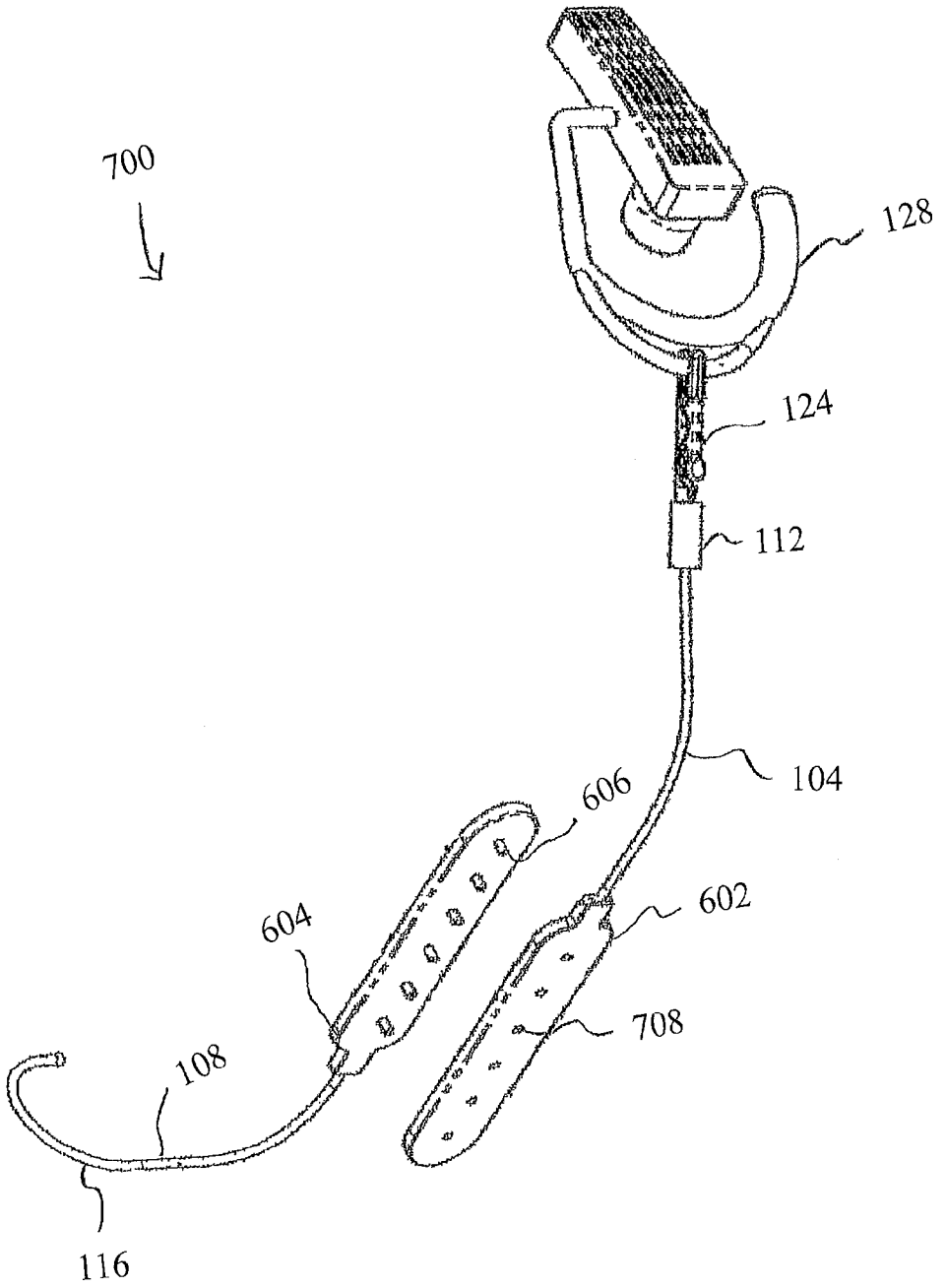


Fig. 7

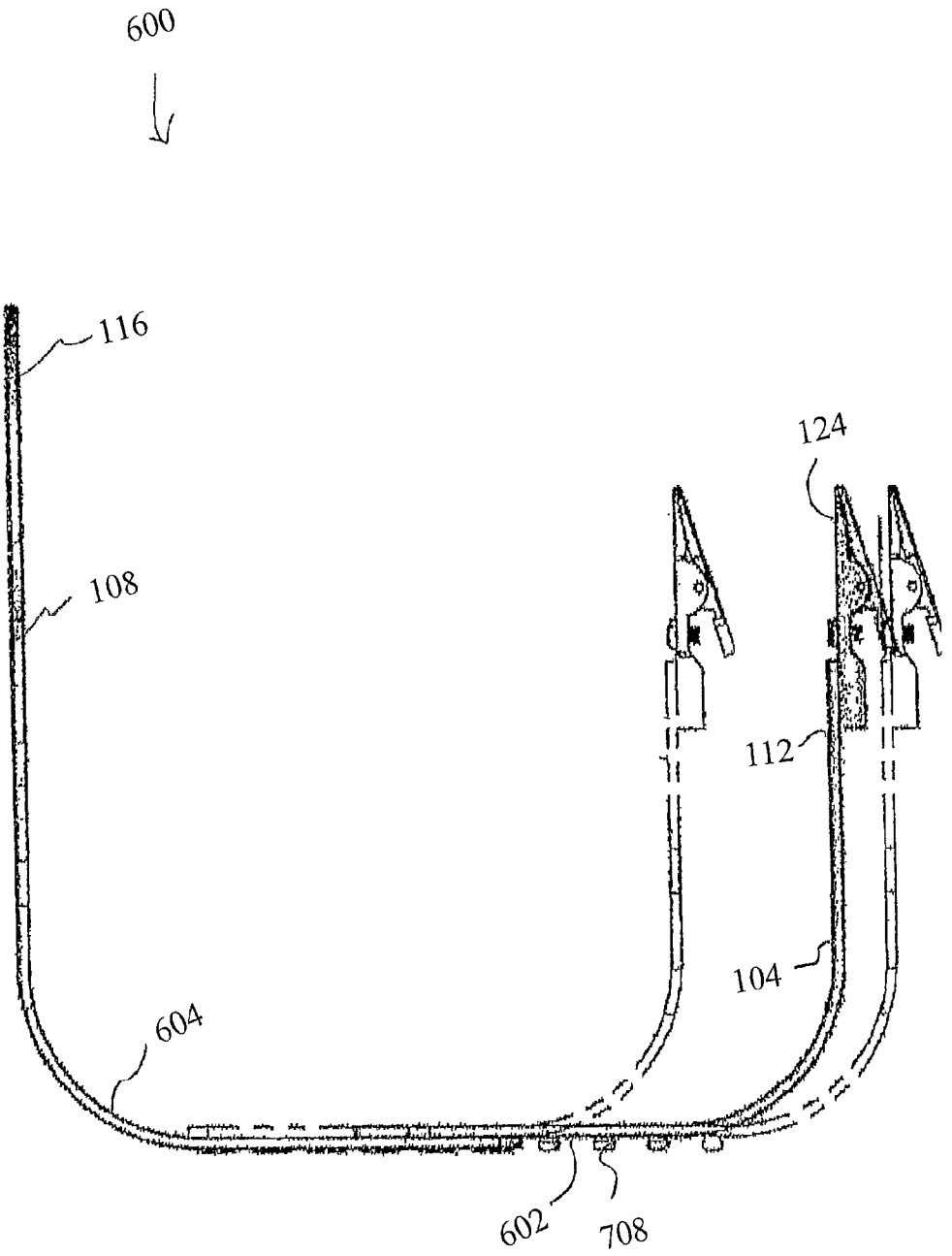


Fig. 8

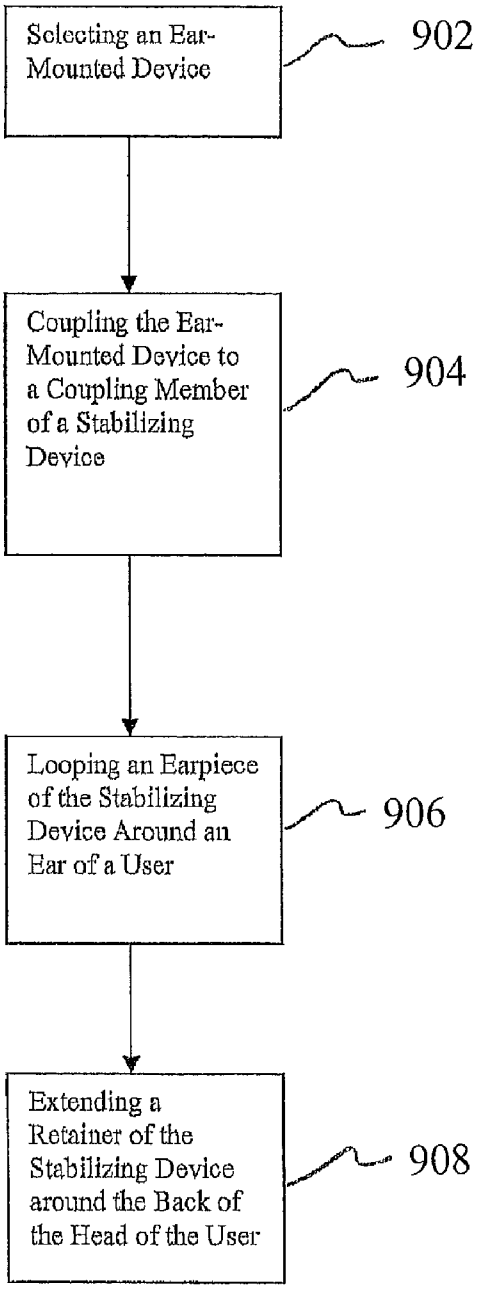

Selecting an Ear-Mounted Device
902
Coupling the Ear-Mounted Device to a Coupling Member of a Stabilizing Device
904
Looping an Earpiece of the Stabilizing Device Around an Ear of a User
906
Extending a Retainer of the Stabilizing Device around the Back of the Head of the User
908

Fig. 9

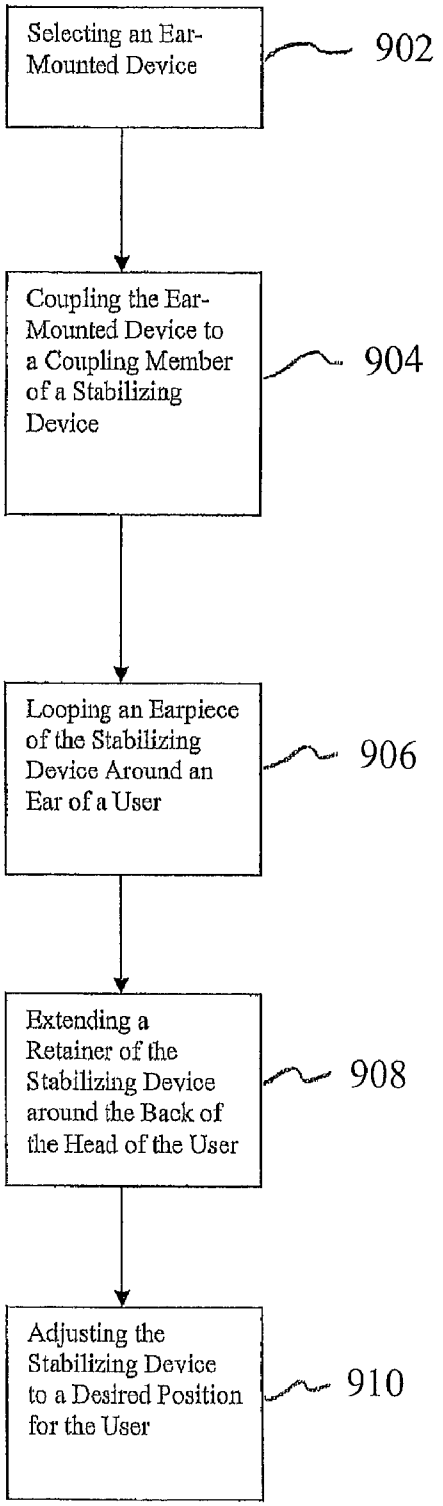

Selecting an Ear-Mounted Device
902
Coupling the Ear-Mounted Device to a Coupling Member of a Stabilizing Device
904
Looping an Earpiece of the Stabilizing Device Around an Ear of a User
906
Extending a Retainer of the Stabilizing Device around the Back of the Head of the User
908
Adjusting the Stabilizing Device to a Desired Position for the User
910

Fig. 10

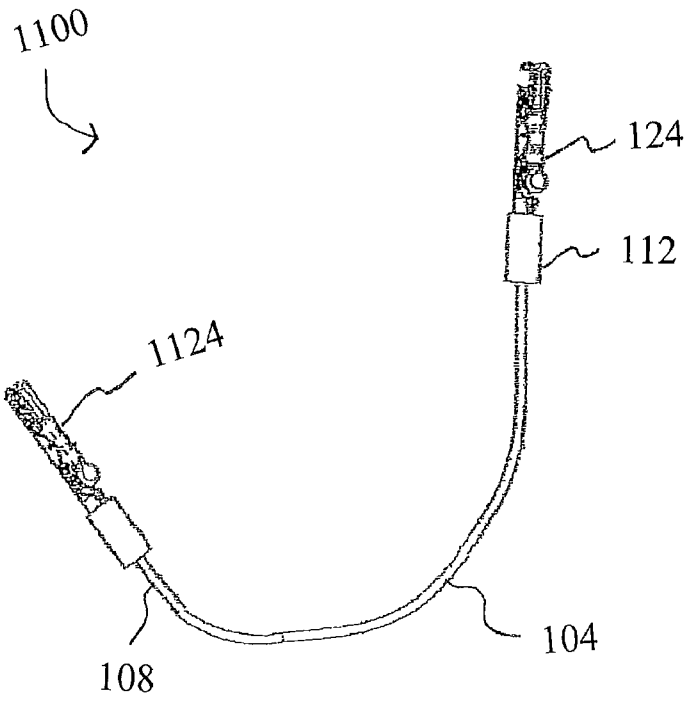


Fig. 11

DEVICE FOR STABILIZING EAR-MOUNTED DEVICES

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates to a stabilizing device, and more particularly, to a device that effectively and easily stabilizes a plurality of different types of ear-mounted devices.

[0003] 2. Related Art

[0004] Many different types of ear-mounted devices such as, for example, earphones, ear buds, Bluetooth® earpieces, and the like are worn by users in conjunction with, for example, cellular phones, CD players, MP3 players and various other electronic devices. A given ear-mounted device may be pressed into the user's ear, or may, for example, be positioned just outside the user's ear. However, ear-mounted devices often fail to remain in the desired position for the user. Activities such as walking or running increase the likelihood of ear-mounted devices failing to remain in the desired position for the user.

[0005] Existing stabilizers for ear-mounted devices fail to possess all of the desired characteristics of a stabilizing device. The desired characteristics of a stabilizing device include: light weight; portability; affordability; adjustability; an aesthetically pleasing appearance; reduction in pain caused by the interaction between the ear-mounted device and the user; reduction in pain caused by the interaction between the stabilizing device and the user; ease of use; and effectiveness in stabilizing the ear-mounted device while the user is engaged in a broad range of activities.

[0006] In view of the foregoing, there is an ongoing need for affordable, effective, portable, and compact stabilizing devices for use in conjunction with ear-mounted devices.

SUMMARY

[0007] To address the foregoing problems, in whole or in part, and/or other problems that may have been observed by persons skilled in the art, the present disclosure provides methods, apparatus, instruments, and/or devices, as described by way of example in implementations set forth below.

[0008] A device for stabilizing a plurality of different types of ear-mounted devices is provided. According to one implementation, the stabilizing device includes a retainer, an earpiece coupled to a first end of the retainer, and a coupling member secured to a second end of the retainer. The retainer is configured for extending around the back of the head of a user. The earpiece is configured for looping around the ear of a user. The coupling member is configured for coupling to a plurality of different types of ear-mounted devices.

[0009] According to another implementation, the retainer of the stabilizing device includes a first slidably adjustable piece coupled to a second slidably adjustable piece by a first connector and a second connector. A first end of the first slidably adjustable piece extends into an end-slot of the first connector. A second end of the first slidably adjustable piece extends through a through-slot of the second connector to the earpiece. A first end of the second slidably adjustable piece extends into an end-slot of the second connector. A second end of the second slidably adjustable piece extends through a through-slot of the first connector to the coupling member.

[0010] According to another implementation, the retainer of the stabilizing device includes first and second interlocking extenders. The first extender includes a plurality of male components. The second extender includes a plurality of female components configured for detachably mating with the male components of the first extender.

[0011] According to another implementation, the stabilizing device further includes an ear-mounted device secured to the coupling member.

[0012] According to another implementation, the retainer of the stabilizing device is a unitary piece.

[0013] According to another implementation, the stabilizing device includes a retainer, a first coupling member secured to a first end of the retainer, and a second coupling member secured to a second end of the retainer. The retainer is configured for extending around the back of the head of a user. The first coupling member is configured for coupling to a first end of a pair of eyeglasses. The second coupling member is configured for coupling to a second end of a pair of eyeglasses.

[0014] Other devices, apparatus, systems, methods, features and advantages of the invention will be or will become apparent to one with skill in the art upon examination of the following figures and detailed description. It is intended that all such additional systems, methods, features and advantages be included within this description, be within the scope of the invention, and be protected by the accompanying claims.

BRIEF DESCRIPTION OF THE FIGURES

[0015] The invention can be better understood by referring to the following figures. The components in the figures are not necessarily to scale, emphasis instead being placed upon illustrating the principles of the invention. In the figures, like reference numerals designate corresponding parts throughout the different views.

[0016] FIG. **1** is a perspective view of an implementation of a stabilizing device according to the present invention.

[0017] FIG. **2** is a perspective view of the stabilizing device shown in FIG. **1**, further illustrating an alternate position of a coupling member of the stabilizing device.

[0018] FIG. **3** is a perspective view of another implementation of a stabilizing device according to the present invention.

[0019] FIG. **4** is a bottom plan view of the stabilizing device shown in FIG. **3**.

[0020] FIG. **5** is a side elevation view of the stabilizing device as shown in FIGS. **3** and **4**.

[0021] FIG. **6** is a perspective view of another implementation of a stabilizing device according to the present invention.

[0022] FIG. **7** is a perspective view of another implementation of a stabilizing device according to the present invention, in which first and second interlocking extenders of a retainer of the stabilizing device are detached.

[0023] FIG. **8** is a top plan view of the stabilizing device shown in FIG. **6**, further illustrating alternate positions of a coupling member of the stabilizing device.

[0024] FIG. **9** is a flow diagram illustrating a method for stabilizing an ear-mounted device according to the present invention.

[0025] FIG. **10** is a flow diagram illustrating another method for stabilizing an ear-mounted device according to the present invention.

[0026] FIG. **11** is a perspective view of another implementation of a stabilizing device according to the present invention.

DETAILED DESCRIPTION

[0027] The foregoing description of implementations has been presented for purposes of illustration and description. It is not exhaustive and does not limit the claimed inventions to the precise form disclosed. Modifications and variations are possible in light of the above description or may be acquired from practicing the invention. The claims and their equivalents define the scope of the invention.

[0028] FIG. **1** is a perspective view of an implementation of a stabilizing device **100** according to the present invention. The stabilizing device **100** generally includes a retainer **104**, an earpiece **116** coupled to a first end **108** of the retainer **104**, and a coupling member **124** secured to a second end **112** of the retainer **104**. The retainer **104** may generally be configured for extending around the back of the head of a user. The earpiece **116** may generally be configured for extending around an ear of the user.

[0029] In the present implementation illustrated in FIG. **1**, the coupling member **124** is coupled to an ear-mounted device **128**. The coupling member **124** may be configured for coupling to a plurality of different types of ear-mounted devices (e.g., ear phones, ear buds, Bluetooth® earpieces, hearing aids, etc.). In some implementations, the ear-mounted device may include an audio-signal carrying device. As shown in FIG. **1**, the coupling member **124** may include a pair of spring-loaded clips, for example. Persons skilled in the art will appreciate that other types of coupling members **124** may be utilized. The coupling member **124** may be secured to the second end **112** of the retainer **104** by various means, such as, for example, a rivet, screw, by welding, or any other suitable means.

[0030] In some implementations, the retainer **104** may be a flexible or rigid unitary piece constructed of for example, plastic material, rubber material, and/or metal such as medical grade stainless steel. Alternatively, the retainer **104** may include two or more flexible or rigid adjustable elements. Examples of adjustable retainers in accordance with the present invention are discussed below with respect to FIG. **3** through FIG. **8**. The height of the retainer **104** may be uniform across the length of the retainer **104** at about 0.25 inches. Alternatively, the height of the retainer **104** may vary across the length of the retainer **104** in order to provide sufficient stability and comfort for the user.

[0031] The earpiece **116**, as shown in FIG. **1**, may be constructed of, for example, rubber material or plastic material. The earpiece **116** may be permanently coupled to the first end **108** of the retainer **104**. Alternatively, the earpiece **116** may be detachably coupled to the first end **108** of the retainer **104** by, for example, a press fit, slide fit, or other type of interference fit, or by a suitable fastening means. The stabilizing device **100** may be configured such that the earpiece **116** is configured for looping around either the left ear or the right ear of the user. Therefore, in some implementations, the earpiece **116**, and thus the first end **108** of the retainer **104** may be located on the left side of the head of the user when the stabilizing device **100** is worn by the user. In other implementations, the earpiece **116** and the first end **108** of the retainer may be located on the right side of the head of the user when the stabilizing device **100** is worn by the user.

[0032] FIG. **2** is a perspective view of the stabilizing device **100** shown in FIG. **1**, further illustrating an alternate position of the coupling member **124** while the coupling member **124** is secured to the second end **112** of the retainer **104**. As shown in FIG. **2**, in some implementations, the coupling member **124** may be rotatable or pivotable about a vertical and/or a horizontal axis. A rotatable coupling member **124** may allow the user to more easily couple any one of a plurality of ear-mounted devices **128** to the stabilizing device **100**.

[0033] FIG. **3** is a perspective view of another example of a stabilizing device **300** according to the present invention. As illustrated in FIG. **3**, the retainer **104** may include a first slidably adjustable piece **304** coupled to a second slidably adjustable piece **308** by a first connector **312** and a second connector **316**. A first end **320** of the first slidably adjustable piece **304** may extend into an end-slot **324** of the first connector **312**. A second end **328** of the first slidably adjustable piece **304** may extend through a through-slot **332** of the second connector **316** to the earpiece **116**. A first end **336** of the second slidably adjustable piece **308** may extend into an end-slot **340** of the second connector **316**. A second end **344** of the second slidably adjustable piece **308** may extend through a through-slot **348** of the first connector **312** to the coupling member **124**.

[0034] The slidably adjustable pieces **304**, **308** shown in FIG. **3** may be constructed of, for example, metal strips, such as medical grade stainless steel, or strips of plastic. The user of the stabilizing device **300** may adjust the length of the retainer **104** such that the retainer **104** fits comfortably around the back of the user's head by, for example, sliding both the first connector **312** and the second connector **316**, or either the first connector **312** or the second connector **316**. One example of coupling the first slidably adjustable piece **304** to the second slidably adjustable piece **308** may include, for example, pressing the first end **320** of the first slidably adjustable piece **304** into the end-slot **324** of the first connector **312** (or alternatively, molding the end-slot **324** of the first connector **312** onto the first end **320** of the first slidably adjustable piece **304**) and extending the second end **328** through the through-slot **332** of the second connector **316**; and pressing the first end **336** of the second slidably adjustable piece **308** into the end-slot **349** of the second connector **316** (or alternatively, molding the end-slot **340** of the second connector **316** onto the first end **336** of the second slidably adjustable piece **308**) and extending the second end **344** through the through-slot **348** of the first connector **312**.

[0035] As discussed above with respect to FIG. **1**, the coupling member **124** may include, for example, a pair of spring-loaded clips, or any one of a plurality of various types of coupling means known to those skilled in the art. FIG. **3** illustrates one means of securing the coupling member **124** to the second end **112** of the retainer **104**; i.e., a rivet **356**. Those skilled in the art will appreciate various other means for securing the coupling member **124** to the retainer **104**. As discussed above with respect to FIG. **1**, the earpiece **116** may be detachable and may be secured to the first end **108** of the retainer by, for example, an interference fit **352**, or by any other suitable means.

[0036] FIG. **4** is a bottom plan view of an example of the stabilizing device **300** shown in FIG. **3**. The stabilizing device **300** may be utilized as described above with respect to FIG. **3**, or as otherwise described in the present invention.

[0037] FIG. **5** is a side elevation view of the stabilizing device **300** as shown in FIG. **3** and FIG. **4**. The stabilizing

device **300** may be utilized as described above with respect to FIG. **3**, or as otherwise described in the present invention.

[0038] FIG. **6** is a perspective view of another example of a stabilizing device **600** according to the present invention. As illustrated in FIG. **6**, the retainer **104** may include a first extender **604** and a second extender **602**. The first extender **604** and the second extender **602** may be configured for interlocking. For example, the first extender **604** may include a plurality of male components **606**; and the second extender **602** may include a plurality of female components (not shown) configured for detachably mating with the male components **606** of the first extender **604**. As another example, the first extender **604** and the second extender **602** may include Velcro or adhesives along a particular length of the extenders **604**, **602** such that the first and second extenders **604**, **602** detachably interlock. Although the stabilizing device **600** in the present example is configured such that the earpiece **116** may loop around the left ear of the user, various implementations may be configured such that the earpiece **116** and the first end **108** of the retainer **104** may be located on the right side of the head of the user when the stabilizing device **600** is worn by the user. The coupling member **124** in the present example may include, for example, a pair of spring-loaded clips (as shown); hook clips; a utility fastener; or any one of a plurality of coupling means known to those skilled in the art.

[0039] FIG. **7** is a perspective view of another example of a stabilizing device **700** according to the present invention, showing detached first and second extenders **604**, **602**. FIG. **7** further illustrates a plurality of female components **708** configured for detachably mating with the male components **606** of the first extender **604**. The user of the stabilizing device **700** may easily attach the first and second extenders **604**, **602** by, for example, pressing the male components **606** into the female components **708** in the desired position such that the stabilizing device **700** is comfortably worn by the user and the stabilizing device **700** is in the most effective position for stabilizing any one of a plurality of ear-mounted devices **128** (e.g., ear buds, ear phones, and the like).

[0040] FIG. **8** is a top plan view of the stabilizing device **600** shown in FIG. **6**, further illustrating alternate positions of the coupling member **124**. As discussed above with respect to FIG. **2**, the coupling member **124** may be rotatable about a vertical and/or a horizontal axis such that the user may more easily couple any one of a plurality of ear-mounted devices to the stabilizing device **600**.

[0041] FIG. **9** is a flow diagram illustrating an example of a method for stabilizing an ear-mounted device according to the present invention. The method may be implemented by utilizing a stabilizing device **100** or **300** or **600** or **700** such as described above and illustrated in FIGS. **1**-**8**. The first step **902** in the method generally includes selecting an ear-mounted device such as ear buds, ear phones, a Bluetooth® earpiece, or the like. The second step **904** in the present example includes coupling the ear-mounted device to a coupling member of a stabilizing device. The stabilizing device of the present example may include a retainer, an earpiece coupled to a first end of the retainer, and the coupling member secured to a second end of the retainer. The retainer may generally be configured for extending around the back of the head of a user. The earpiece may generally be configured for extending around an ear of the user. Additionally, the earpiece may be detachable from the first end of the retainer. The coupling member may be rotatable about a vertical and/or a horizontal axis for coupling the stabilizing device to the selected ear-mounted device in a variety of positions. The third step **906** of the present example includes looping an earpiece of the stabilizing device around an ear of the user. The stabilizing device may be configured such that the earpiece may be looped around the left ear or the right ear of the user. The fourth step **908** in the present example includes extending the retainer of the stabilizing device around the back of the head of the user of the stabilizing device. In other implementations, the steps of the present method may be implemented in various combinations.

[0042] FIG. **10** is a flow diagram illustrating the example of the method for stabilizing an ear-mounted device shown in FIG. **9**, with an additional fifth step **910** including adjusting the stabilizing device to a desired position for the user. The user may adjust the stabilizing device for comfort; or, for example, the user may adjust the stabilizing device in order to create the most effective position of the retainer for stabilizing the ear-mounted device. In one implementation, the user may adjust the stabilizing device by, for example, slidably adjusting a first and second piece of the retainer. In another implementation, the user may adjust the stabilizing device by interlocking a first extender of the retainer to a second extender of the retainer in various positions. The first extender may include a plurality of male components; and the second extender may include a plurality of female components configured for detachably mating with the male components of the first extender.

[0043] FIG. **11** is a perspective view of another implementation of a stabilizing device **1100** according to the present invention. The stabilizing device **1100** according to the present implementation generally includes a retainer **104**, a first coupling member **1124** secured to a first end **108** of the retainer **104**, and a second coupling member **124** secured to a second end **112** of the retainer **104**. The retainer **104** may generally be configured for extending around the back of the head of a user. The first coupling member **1124** may be configured for coupling to, for example, a first end of a pair of eyeglasses (not shown). The second coupling member **124** may be configured for coupling to a second end of a pair of eyeglasses (not shown).

[0044] As shown in FIG. **11**, the first coupling member **1124** and the second coupling member **124** may include a pair of spring-loaded clips, for example. Persons skilled in the art will recognize that various types of coupling members **1124**, **124** may be utilized. The first coupling member **1124** may be secured to the first end **108** of the retainer **104** and the second coupling member **124** may be secured to the second end **112** of the retainer **104** by rivets, screws, welding, interference fits, or any other suitable means.

[0045] As discussed above with respect to FIG. **1** through FIG. **8**, the retainer **104** of the present implementation may be a flexible or rigid unitary piece, or, for example, the retainer **104** may include two or more flexible or rigid adjustable elements. The stabilizing device **1100** according to the present implementation may be used to stabilize a pair of eyeglasses while the pair of eyeglasses is being worn by a user. Similarly, the stabilizing device **1100** according to the present implementation may be used to secure a pair of eyeglasses or sunglasses around the neck of a user when the eyeglasses are not being worn by the user.

[0046] While the present implementation describes the use of the stabilizing device of the present invention with eyeglasses, persons skilled in the art will recognize that the

stabilizing device may be used in conjunction with other eyewear such as protective goggles, night vision goggles, and the like.

[0047] In general, terms such as "coupled to," and "configured for coupling to" and "secured to" (for example, a first component is "coupled to" or "is configured for coupling to" or is "secured to" a second component) are used herein to indicate a structural, functional, mechanical, electrical, signal, optical, magnetic, electromagnetic, ionic or fluidic relationship between two or more components or elements. As such, the fact that one component is said to couple to a second component is not intended to exclude the possibility that additional components may be present between, and/or operatively associated or engaged with, the first and second components.

[0048] It will be understood that various aspects or details of the invention may be changed without departing from the scope of the invention. Furthermore, the foregoing description is for the purpose of illustration only, and not for the purpose of limitation—the invention being defined by the claims.

What is claimed is:

1. A stabilizing device, comprising:
- a retainer configured for extending around the back of the head of a user, the retainer including a first end and a second end opposite the first end;
- an earpiece coupled to the first end of the retainer and configured for looping around an ear of the user; and
- a coupling member secured to the second end of the retainer and configured for coupling to a plurality of different types of ear-mounted devices.

2. The stabilizing device of claim **1**, where the height of the retainer is about 0.25 inches.

3. The stabilizing device of claim **1**, where the earpiece is detachable from the first end of the retainer.

4. The stabilizing device of claim **1**, where the coupling member includes a pair of spring-loaded clips.

5. The stabilizing device of claim **4**, where the coupling member is secured to the second end of the retainer by a rivet.

6. The stabilizing device of claim **4**, where the coupling member is rotatable.

7. The stabilizing device of claim **1**, where the retainer includes a first slidably adjustable piece coupled to a second slidably adjustable piece by a first connector and a second connector, and where:
- a first end of the first slidably adjustable piece extends into an end-slot of the first connector;
- a second end of the first slidably adjustable piece extends through a through-slot of the second connector to the earpiece;
- a first end of the second slidably adjustable piece extends into an end-slot of the second connector; and
- a second end of the second slidably adjustable piece extends through a through-slot of the first connector to the coupling member.

8. The stabilizing device of claim **1**, where the retainer includes first and second interlocking extenders, and where:
- the first extender includes a plurality of male components; and
- the second extender includes a plurality of female components configured for detachably mating with the male components of the first extender.

9. The stabilizing device of claim **1**, where the retainer is a unitary piece.

10. A stabilizing device, comprising:
- a retainer configured for extending around the back of the head of a user, the retainer including a first end and a second end opposite the first end;
- an earpiece coupled to the first end of the retainer and configured for looping around an ear of the user;
- a coupling member secured to the second end of the retainer; and
- an ear-mounted device secured to the coupling member.

11. The stabilizing device of claim **10**, where the ear-mounted device is an audio-signal carrying device.

12. The stabilizing device of claims **10**, where the coupling member includes a pair of spring-loaded clips.

13. A stabilizing device for eyewear, comprising:
- a retainer configured for extending around the back of the head of a user, the retainer including a first end and a second end opposite the first end;
- a first coupling member secured to the first end of the retainer and configured for coupling to a first end of the eyewear; and
- a second coupling member secured to the second end of the retainer and configured for coupling to a second end of the eyewear.

14. The stabilizing device of claim **13**, where the first coupling member includes a pair of spring-loaded clips and the second coupling member includes a pair of spring-loaded clips.

15. The stabilizing device of claim **14**, where the first coupling member is secured to the first end of the retainer by a rivet and the second coupling member is secured to the second end of the retainer by a rivet.

16. The stabilizing device of claim **14**, where the retainer is a unitary piece.

17. The stabilizing device of claim **14**, where the retainer includes a first slidably adjustable piece coupled to a second slidably adjustable piece by a first connector and a second connector, and where:
- a first end of the first slidably adjustable piece extends into an end-slot of the first connector;
- a second end of the first slidably adjustable piece extends through a through-slot of the second connector to the first coupling member;
- a first end of the second slidably adjustable piece extends into an end-slot of the second connector; and
- a second end of the second slidably adjustable piece extends through a through-slot of the first connector to the second coupling member.

18. The stabilizing device of claim **14**, where the retainer includes first and second interlocking extenders, and where:
- the first extender includes a plurality of male components; and
- the second extender includes a plurality of female components configured for detachably mating with the male components of the first extender.

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