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Andrikowich et al.

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(54) **AUDIO HEADSET WITH REMOVABLY COUPLED EARPHONES**

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(52) **U.S. Cl.**
CPC ***H04R 1/1008*** (2013.01); *H04R 2420/07* (2013.01)

(58) **Field of Classification Search**
CPC H04R 1/1008; H04R 2420/07
See application file for complete search history.

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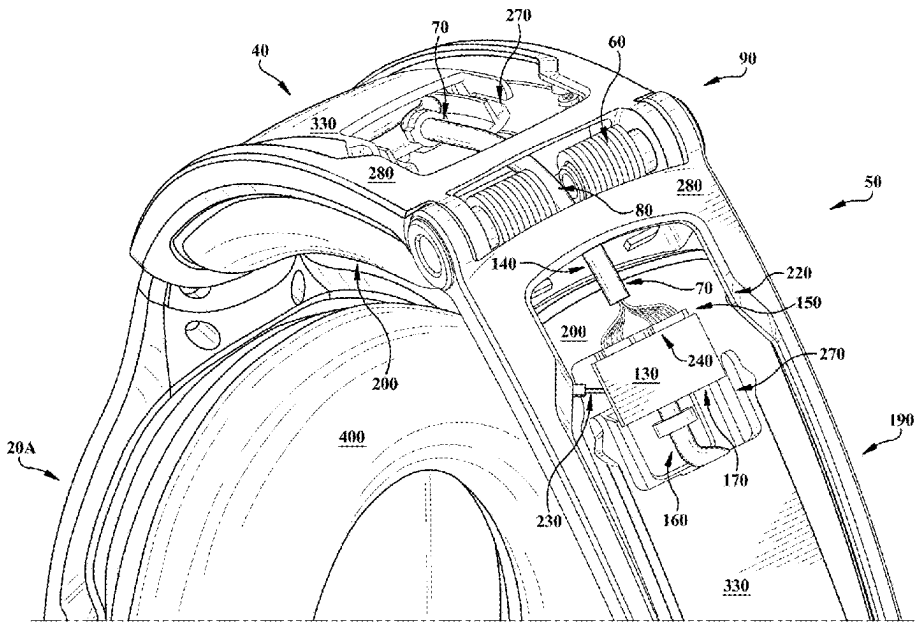
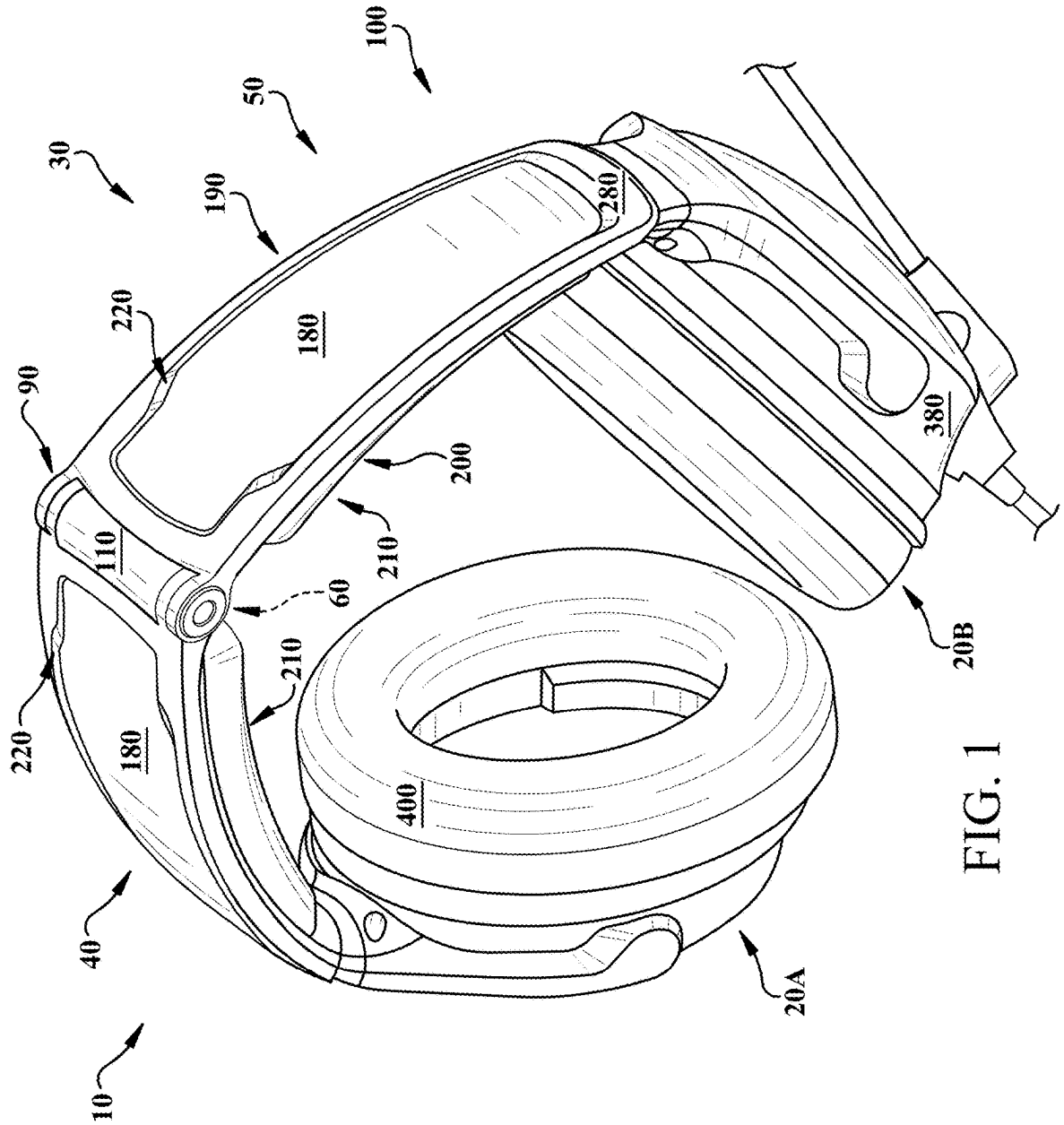
(57) **ABSTRACT**

Various implementations include audio headsets. In one implementation an audio headset includes: a pair of earphones; a headband connecting the pair of earphones; and a cable connecting the pair of earphones through the headband, where the earphones are removably coupled with one another such that the audio headset is operational with only one of the earphones.

22 Claims, 8 Drawing Sheets

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50
30
190
280
220
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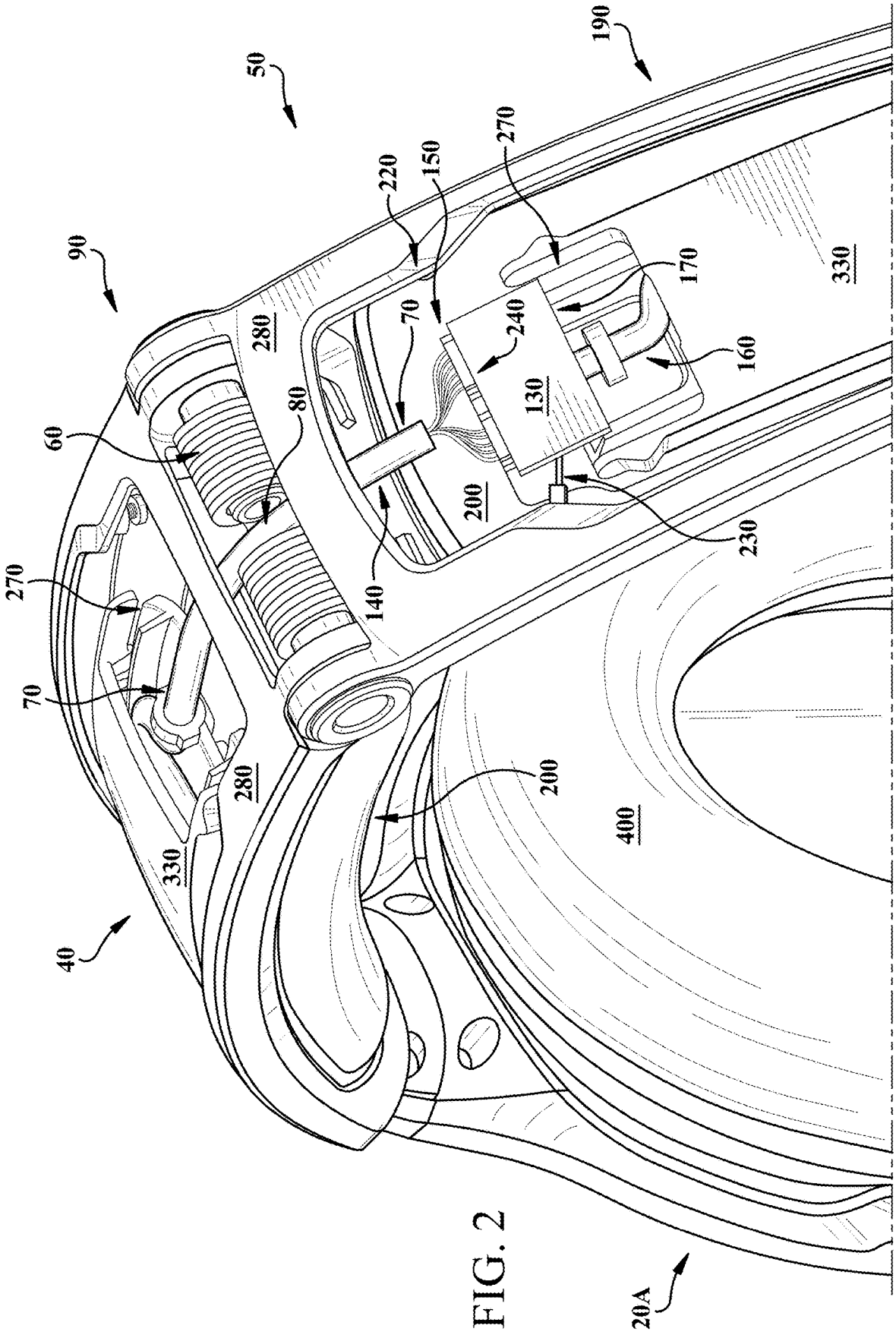
90
380
200
110
60
210
20B
210
220
180
400
40
20A
10

FIG. 1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50
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70
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200
230
140
270
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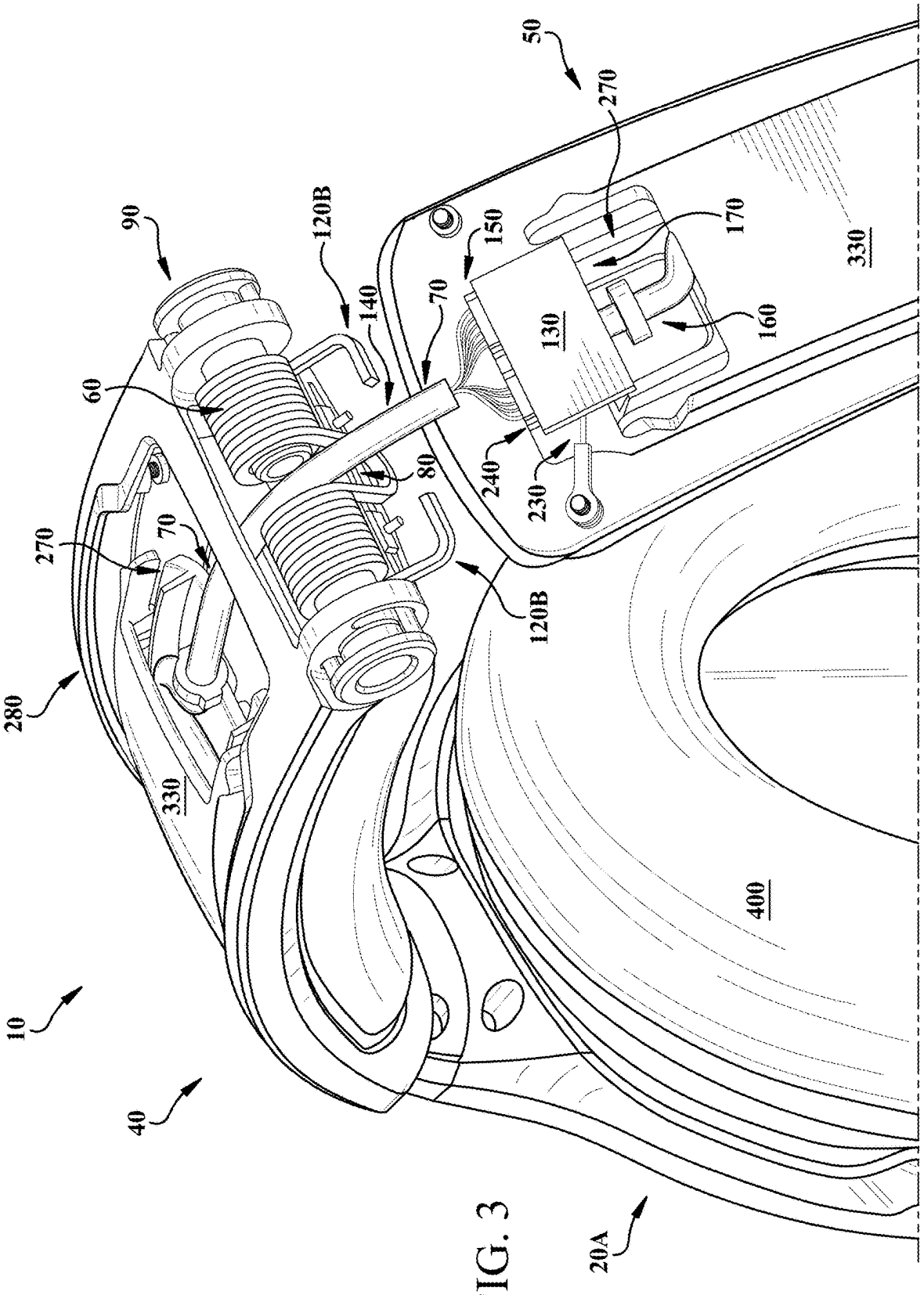
280
200
400
330
40
20A

FIG. 2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270
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150
120B
140
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230
80
270
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120B
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330
400
10
40
20A

FIG. 3

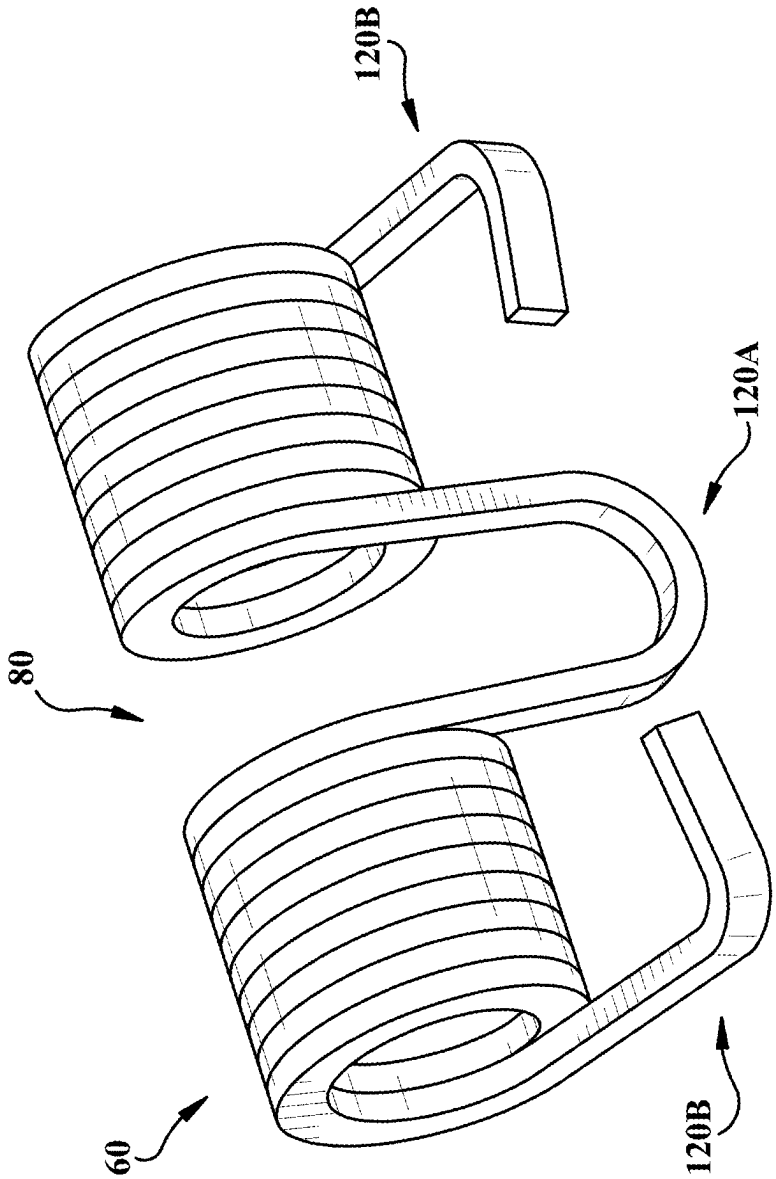


FIG. 4

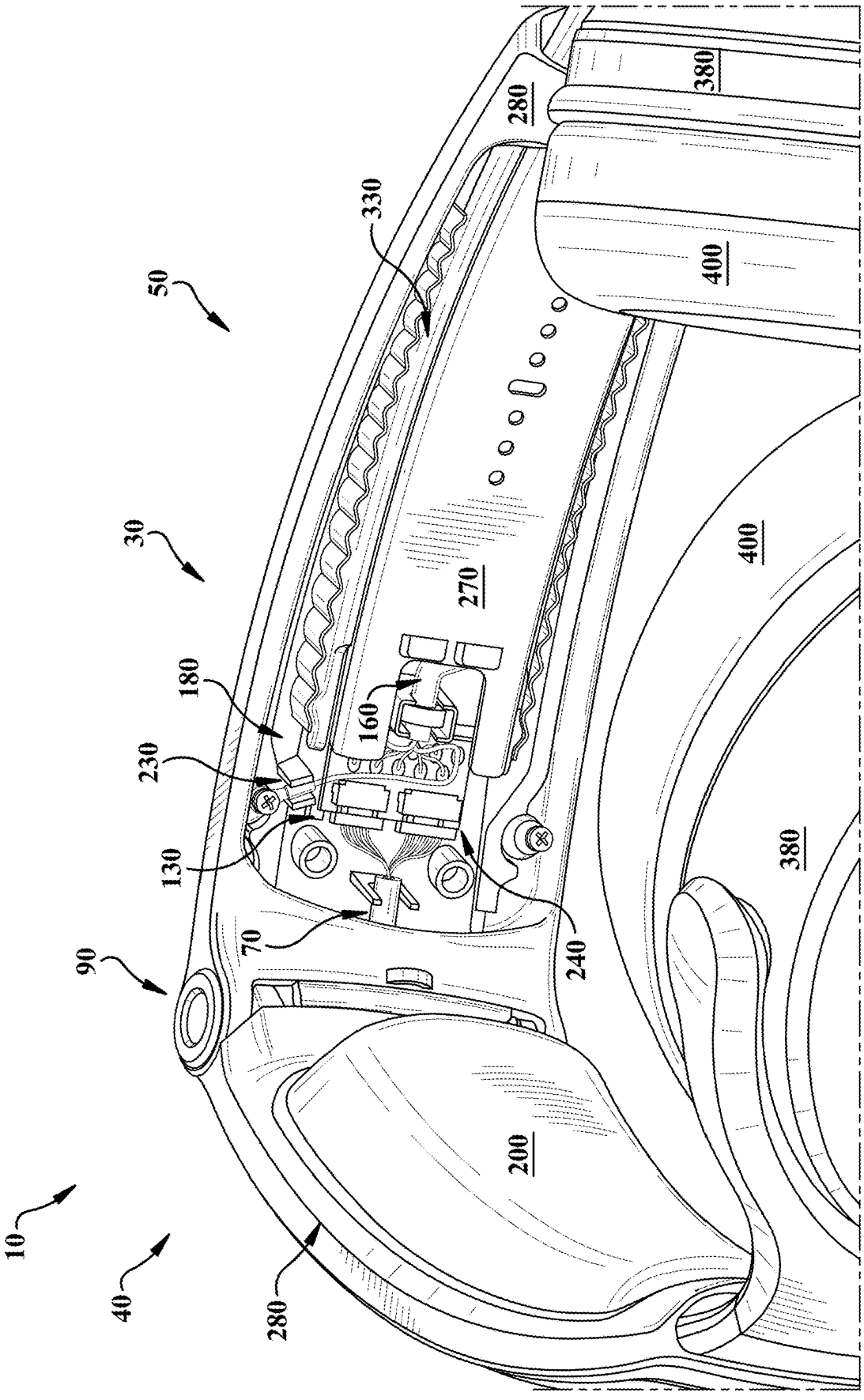
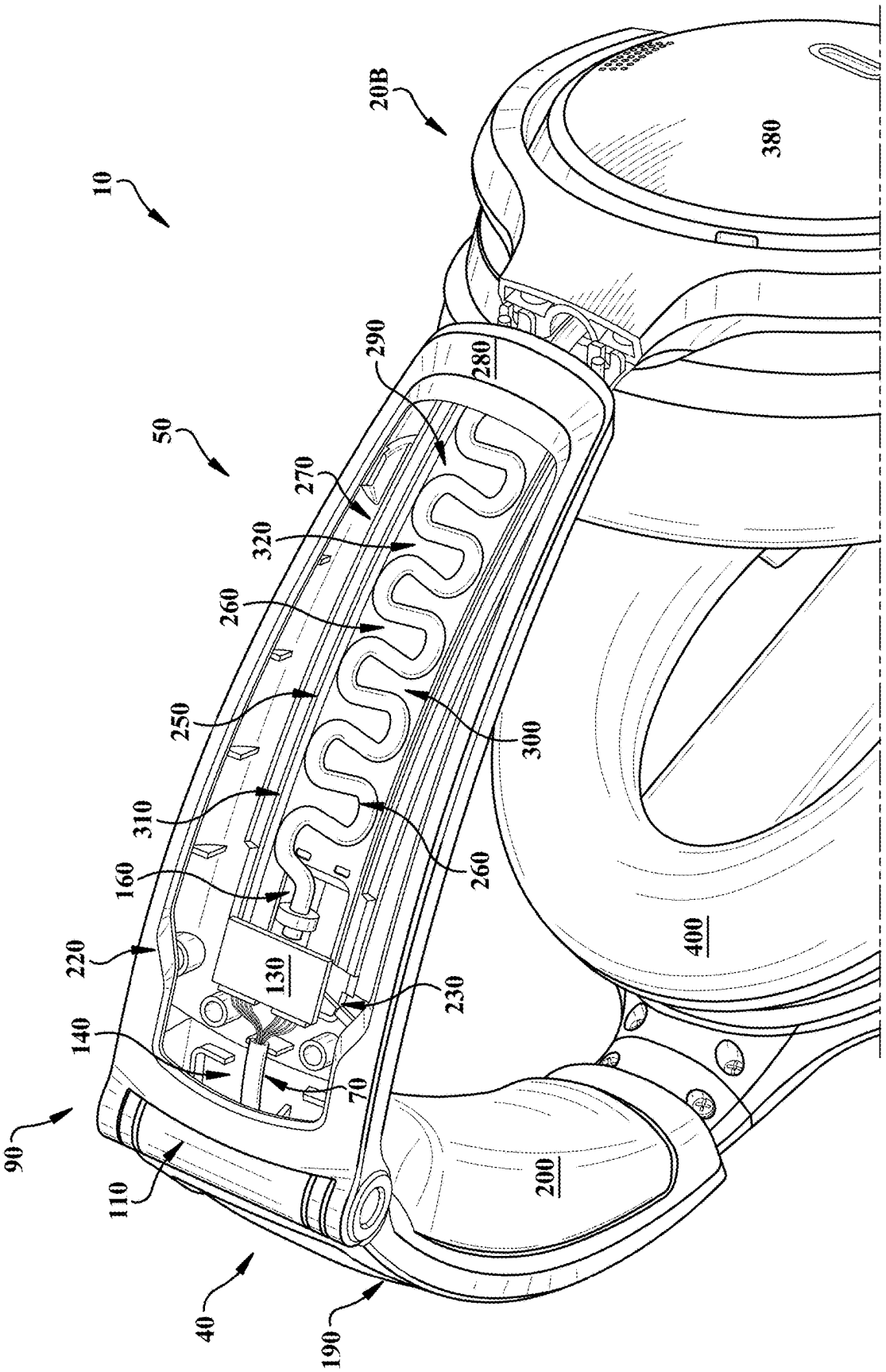

10
40
280
200
90
70
130
230
180
160
270
30
50
330
280
380
400
400
380
240

FIG. 5


10
20B
380
290
280
50
270
320
260
250
310
160
220
130
140
90
110
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70
230
300
260
400
200

FIG. 6

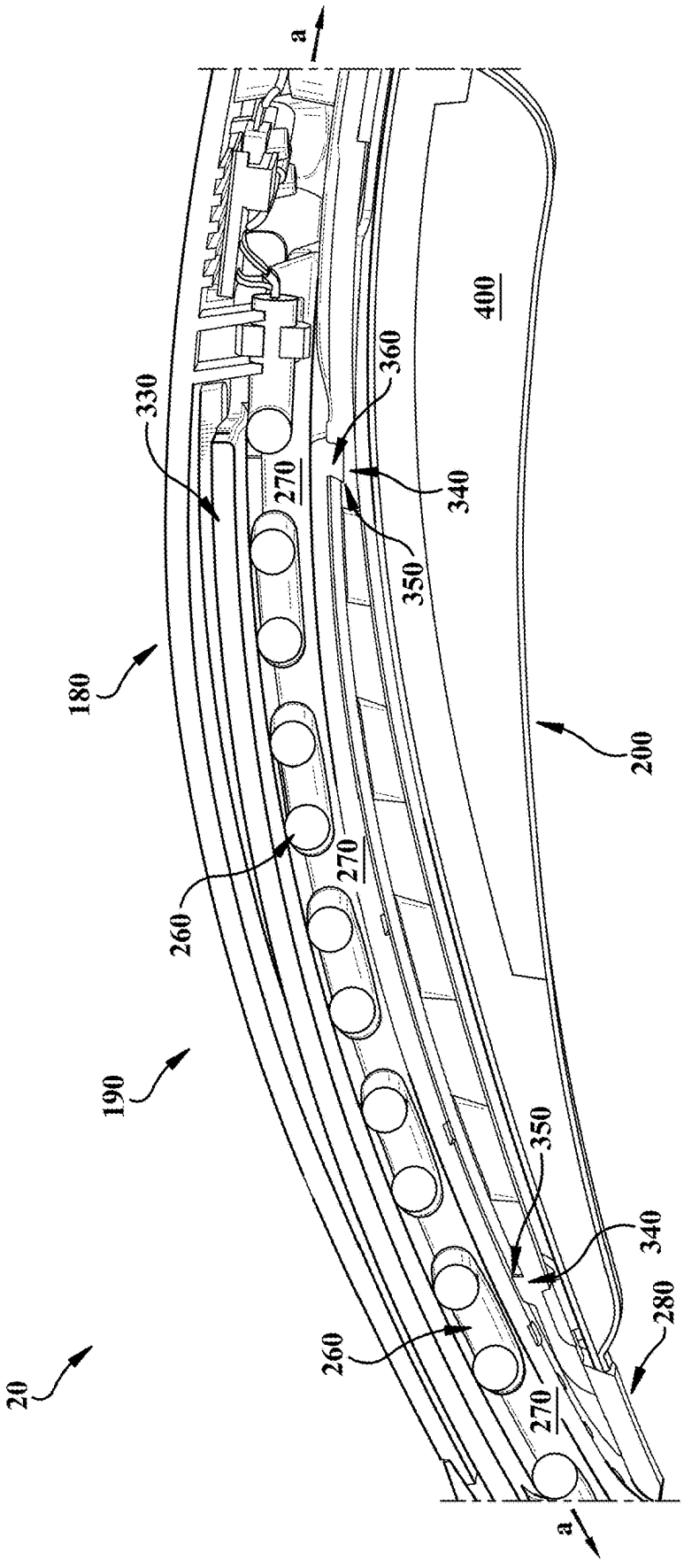
a
400
360
330
270
340
350
180
200
260
270
190
350
340
280
260
270
20
a

FIG. 7

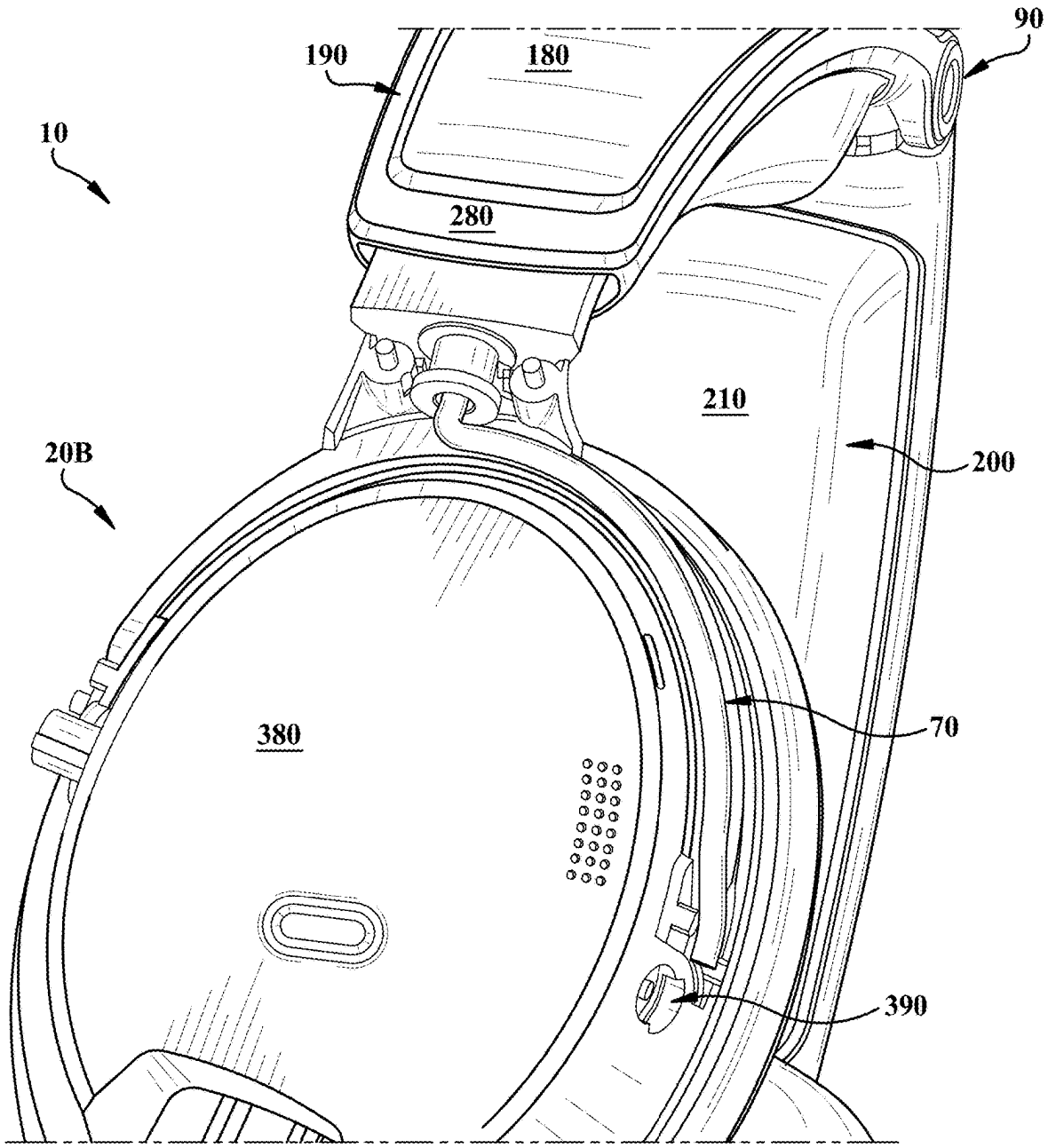

FIG. 8

AUDIO HEADSET WITH REMOVABLY COUPLED EARPHONES

TECHNICAL FIELD

This disclosure generally relates to headsets. More particularly, the disclosure relates to audio headsets with removably coupled earphones.

BACKGROUND

Conventional headphones include a set of earcups joined by a headband. In some configurations, the earcups, associated wiring, and/or electronics in the headband may benefit from servicing.

SUMMARY

All examples and features mentioned below can be combined in any technically possible way.

Various implementations include audio headsets. In particular aspects, an audio headset includes: a pair of earphones; a headband connecting the pair of earphones; and a cable connecting the pair of earphones through the headband, where the earphones are removably coupled with one another such that the audio headset is operational with only one of the earphones.

Implementations may include one of the following features, or any combination thereof.

In certain cases, the headband includes a first headband segment, a second headband segment, and a spring connecting the first headband segment and the second headband segment.

In some aspects, the spring is located at a top portion of the audio headset when worn by a user.

In particular implementations, the spring includes a slot, and the cable extends from the first headband segment to the second headband segment through the slot.

In certain cases, the spring is located at a hinge between the first headband segment and the second headband segment, where the hinge is visible from an exterior of the audio headset, and the cable is visually obstructed at the exterior of the audio headset.

In some implementations, the spring includes at least one torsion spring that provides a linear clamping force on the headband.

In particular aspects, the linear clamping force enhances acoustic performance for the audio headset across a variety of users having distinct head sizes. In some examples, the enhanced acoustic performance is characterized by an improved acoustic seal, improved communications, and/or improved noise cancelation and/or active noise reduction.

In some cases, a portion of the cable extending through the headband is positioned in an in-line switchback configuration to mitigate mechanical stress on the cable in response to adjustment (e.g., vertical adjustment) of at least one of the earphones. For example, the in-line switchback configuration can be along an arced plane or path defined by an arc axis, where the cable has a uniform height but switches back (or squiggles) around the axis. In certain cases, the switchback configuration allows for an amount of extension in the earphones to accommodate distinct head sizes. In some cases, the extension amount is equal to approximately 50 millimeters (mm) to approximately 70 mm, and in particular cases, approximately 60 mm.

In particular implementations, the headset further includes a removable cable holder in at least one section of the headband for enabling removal of the portion of the cable.

In certain aspects, the headset further includes an adjustment limiter for preventing unintentional removal of the removable cable holder.

In some cases, the headset further includes a circuit board in the headband, where the cable includes a first section connected with a first one of the earphones and a first side of the circuit board, and a second section connected with a second one of the earphones and a second side of the circuit board. In some examples, the circuit board includes a printed circuit board (PCB), such as a PCB-A.

In particular aspects, through-headband wiring of the cable mitigates mechanical stress on the connection between the first section and the circuit board and the second section and the circuit board.

In certain implementations, the headset further includes a removable cap on at least a portion of the headband, where the cap enables access to at least one of the connection between the first section and the circuit board or the connection between the second section and the circuit board.

In some cases, the headset further includes at least one grounding wire connected with the circuit board for providing electro-static discharge (ESD) protection for the audio headset. In some examples, the grounding wire provides ESD protection from the metal in the torsion spring. In further examples, the grounding wire is the only grounding point for the headband cable.

In particular aspects, the first section has a multi-pin segment connector for connecting with the circuit board.

In certain implementations, the second section is fixed to the circuit board.

In some aspects, each earcup includes a driver, and the cable connects with each earcup proximate an acoustically sealed back volume behind the driver. In certain examples, the wiring in each earcup is part of a sealed assembly behind the ear. In further examples, the sealed assembly can enhance passive noise attenuation in the headset.

In particular cases, the audio headset is operational with only one of the earphones such that with one of the earphones removed, a remaining earphone is connected to a power source, enables audio output, and enables audio communication.

In certain aspects, each of the earphones contains a separate microprocessor for enabling independent operation thereof.

In some cases, the pair of earphones includes a pair of earcups.

In particular implementations, the pair of earcups includes a pair of earbuds, a pair of on-ear headphones, or a pair of near-ear headphones.

In certain aspects, the headset further includes an electro-acoustic transducer in each of the earcups for providing an audio output to a user.

Two or more features described in this disclosure, including those described in this summary section, may be combined to form implementations not specifically described herein.

The details of one or more implementations are set forth in the accompanying drawings and the description below. Other features, objects and benefits will be apparent from the description and drawings, and from the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** shows a perspective view of a headset according to various implementations.

FIG. **2** shows a close-up partial section view of the headband section of a headset according to various implementations.

FIG. **3** shows further detail of the headband section of FIG. **2**.

FIG. **4** shows a perspective view of a spring in a headset according to various implementations.

FIG. **5** shows a partial cross-sectional view of a portion of a headband in a headset according to various implementations.

FIG. **6** shows a close-up partial section view of the headband section of a headset according to various implementations.

FIG. **7** shows a cross-sectional view of a portion of a headband section according to various implementations.

FIG. **8** shows a partial cut-away view of an earphone in a headset according to various implementations.

It is noted that the drawings of the various implementations are not necessarily to scale. The drawings are intended to depict only typical aspects of the disclosure, and therefore should not be considered as limiting the scope of the implementations. In the drawings, like numbering represents like elements between the drawings.

DETAILED DESCRIPTION

This disclosure is based, at least in part, on the realization that an audio headset can benefit from removably coupled earphones that enable servicing, replacement, and/or modularity in operation. In certain examples, an audio headset includes a removably coupled earphone. In particular examples, the audio headset is configured to operate with only one of the coupled earphones.

Commonly labeled components in the FIGURES are considered to be substantially equivalent components for the purposes of illustration, and redundant discussion of those components is omitted for clarity.

A headphone refers to a device that fits around, on, or in an ear and that radiates acoustic energy into the ear canal. Headphones are sometimes referred to as earphones, earpieces, headsets, earbuds or sport headphones, and can be wired or wireless. A headphone includes an acoustic driver to transduce audio signals to acoustic energy. The acoustic driver may be housed in an earphone, which in particular cases, is an earcup. While some of the figures and descriptions following may show a single earphone, an earphone may be a single stand-alone unit or one of a pair of earphones (each including a respective acoustic driver and earcup), one for each ear. An earphone may be connected mechanically to another earphone, for example by a headband and/or by leads that conduct audio signals to an acoustic driver in the earphone. An earphone may include components for wirelessly receiving audio signals. An earphone may include components of an active noise reduction (ANR) system. Earphones may also include other functionality such as a microphone so that they can function as a headset.

In an around or on-the-ear headset, the headset may include a headband and at least one earphone that is arranged to sit on or over an ear of the user. In order to accommodate heads of different sizes and shapes, the earphones are configured to pivot about the vertical and/or horizontal axes, and to translate for some distance along the vertical axis.

Headsets according to various implementations can include a pair of earphones (e.g., on-ear, over-ear, or in-ear) with a headband connecting the earphones. A cable extends through the headband and connects the earphones. The earphones are removably coupled with one another such that the headset is operational with only one of the earphones. In various implementations, the removably coupled earphone(s) can be serviced, replaced, and/or stored while the headset remains operational with the other one of the earphones.

FIG. **1** shows a perspective view of an audio headset (or, headset) **10** according to various implementations. As shown, headset **10** can include a pair of earphones **20** (separately denoted as **20**A, **20**B) configured to fit over the ear, or on the ear, of a user. A headband **30** spans between and connects the pair of earphones **20** (for example, depicted as earcups) and is configured to rest on the head of the user (e.g., spanning over the crown of the head or around the head). In various implementations, a position of one or both earphones **20** can be adjusted relative to the headband **30**, e.g., in terms of rotation, tilt, or vertical adjustment. In particular implementations, the headset **10** includes an aviation headset, a communications headset or a military headset. In further implementations, the headset **10** is configured for use as a personal (e.g., consumer) headset. Various examples of features of the headset **10**, along with description of example accessories to the headset **10**, are described in U.S. patent application Ser. No. 16/930,579 ("Wearable Audio Device with Modular Component Attachment," filed Jul. 16, 2020) and U.S. patent application Ser. No. 16/953,272 ("Wearable Audio Device with Control Platform," filed Nov. 19, 2020), each of which is incorporated by reference in its entirety.

In some cases, the headband **30** can include a first headband segment **40** and a second headband segment **50** that are connected by a spring **60**. In various implementations, the spring **60** is located at a top portion of the headset **10** when worn by a user, e.g., proximate the crown or mid-scalp region of the user's head. In certain examples, the spring **60** is optional, such that the headband **30** can be formed of a continuous headband spring (also called a "continuous spring section"), such as described in U.S. Pat. No. 10,743,106 ("Headphone Earcup Mount in Continuous Headband-Spring Headphone System," issued Aug. 11, 2020), which is incorporated by reference in its entirety.

In some implementations, as depicted in the partial cut-away perspective of the headset **10** in FIG. **2**, a cable **70** connects the earphones **10** through the headband **30**. In particular cases, the spring **60** includes a slot **80**, such that the cable **70** extends from the first headband segment **40** to the second headband segment **50** through the slot **80** in the spring **60**. The spring **60** can be located at a hinge **90** between the first headband segment **40** and the second headband segment **50**. In certain cases (e.g., as seen in FIG. **1**), the hinge **90** is visible from an exterior **100** of the headset **10**. In these cases, the cable **70** is visually obstructed at the exterior **100** or the headset **10**. In particular implementations, the hinge **90** includes a top cap **110** that covers the spring **60** and the cable **70**, and, e.g., provides ingress protection for the spring **60** and/or the cable **70**. Further, as illustrated in the partial cut-away view in FIG. **5**, routing of the cable **70** through the slot **80** in the spring **60** can prevent the cable **70** from escaping the housing of the headband segments **40**, **50**, and/or hinge **90** and avoid contacting the user's head during use (e.g., causing discomfort).

The spring **60** can include at least one torsion spring that provides a linear clamping force on the headband **30**, e.g., a linear clamping force between headband segments **40**, **50**. In certain cases, the spring **60** can include multiple segments, which may or may not be coupled. In a particular example, as illustrated in the cut-away view of a portion of the headset **10** in FIG. **3** and exploded view of the spring **60** in FIG. **4**,

the spring **60** can include a single torsion spring with at least one arm **120**A configured to contact the first headband segment **40** and at least one arm **120**B (two shown) configured to contact the second headband segment **50**. In various implementations, the spring **60** provides a linear clamping force on the headset **10** that enhances acoustic performance for the headset **10**, e.g., across a variety of users having distinct head sizes. In some examples, the enhanced acoustic performance is characterized by an improved acoustic seal, improved communications, and/or improved noise cancelation and/or active noise reduction.

As illustrated in FIGS. **2-4**, the headset **10** can include a circuit board **130** in the headband **30**. In the example illustrated in FIGS. **2-4**, the circuit board **130** is located in the second headband segment **50**, however, the circuit board **130** can be located in the first headband segment **40** in various implementations. In particular aspects, the cable **70** includes a first section **140** connected with a first one of the earphones **20**A and a first side **150** of the circuit board **130**, and a second section **160** connected with a second one of the earphones **20**B and a second side **170** of the circuit board **130**. In some examples, the circuit board **130** includes a printed circuit board (PCB), such as a PCB-A. In particular cases, the circuit board **130** is configured to control audio signal and/or control signals to one or both earphones **20**A, **20**B. In particular cases, the circuit board **130** can aid in controlling one or more of audio and/or signal routing, power delivery, or grounding of the headset **10**. In some cases, each earphone **20**A, **20**B includes its own microprocessor (e.g., in earphone casing **380**) for controlling audio output to an associated transducer. In these cases, each earphone **20**A, **20**B can control audio output and/or additional audio and/or signal control and communication functions independently of the other earphone. That is, as described herein, the circuit board **130** can enable modular coupling of the earphones **20**A, **20**B with the headband **30**, for example, enabling the headset **10** to operate with only one of the earphones **20** coupled with the circuit board **130**. In certain of these cases, a user may choose to remove either earphone **20**A, **20**B from the headset **10** (e.g., based on user preference, comfort, etc.) while maintaining functionality of the headset **10** with only the remaining earphone.

In particular aspects, through-headband wiring of the cable **70** mitigates mechanical stress on the connection between the first section **140** and the circuit board **130** and the second section **160** and the circuit board **130**. In certain implementations, e.g., as illustrated in FIGS. **1**, **2**, and **5-8**, the headset **10** further includes a removable cap **180** on at least a portion of the headband **20**, where the cap **180** enables access to the connection between the first section **140** and the circuit board **130** and/or the connection between the second section **160** and the circuit board **130**. In some cases, the cap **180** is located on a top (or outer, upper) side **190** of the headband **20**, e.g., in one of the segments **40**, **50**. In additional implementations, another cap **200** is located on a bottom (or inner, lower) side **210** of the headband **20**, e.g., in the same segment **40**, **50**. In particular cases, the lower cap **200** is part of the head cushion, or connected with the head cushion when installed. The upper cap **180** can be configured to engage a slot **220** in the upper side **190** of the headband, and in some cases, is mechanically coupled with a mating feature in the slot **220**, e.g., with a set of male/female mating features, snap-fit or pressure-fit features, etc. In certain examples, the upper cap **180** and/or lower cap **220** can include multiple components, e.g., sub-caps or sections that are removably coupled with the frame **280** of the headband **20**. In any case, the upper cap **180** and/or lower cap **200** can allow a user to access the connection between the first section **140** and the circuit board **130** and/or the connection between the second section **160** and the circuit board **130**.

In some cases, as seen most clearly in FIGS. **2-4**, the headset **10** further includes at least one grounding wire **230** connected with the circuit board **130** for providing electrostatic discharge (ESD) protection for the headset **10**. In some examples, the grounding wire **230** provides ESD protection from the metal in the spring **60**. In particular examples, the grounding wire **230** is the only grounding point for the headband cable **70**. As is further evident in FIGS. **2-4**, and also in FIG. **6**, in certain cases, the first section **140** of cable **70** has a multi-pin segment connector **240** for connecting with the circuit board **130** (e.g., at first side **150**). In various implementations, the multi-pin connector **240** is removably coupled with the circuit board **130**, such that the multi-pin connector **240** can be coupled and de-coupled from the circuit board **130**, e.g., by hand and/or with a tool. In some implementations, the second section **160** of the cable **70** is fixed to the circuit board **130** (e.g., at second side **170**). In these implementations, removal of earcup **20**B from headset **10** includes removal of the circuit board **130**. In these cases, as noted herein, the headset **10** is configured to operate with only the remaining earcup **20**A, e.g., functioning with the microprocessor in earcup **20**A and without direct connection to the circuit board **130**.

As noted herein, the cable **70** can connect the earphones **20** through the headband **30** and enable the earphones **20** to be removably coupled with one another (and the headband **30**). In some cases, a portion **250** of the cable **70** extending through the headband **30** is positioned in an in-line switchback configuration **260** to mitigate mechanical stress on the cable **70** in response to adjustment (e.g., vertical adjustment) of at least one of the earphones **20**. For example, the in-line switchback configuration **260** can be along an arced plane or path defined by an arc axis (a) (FIG. **7**), where the cable **70** has a uniform height but switches back (or squiggles) around the axis (a). In certain cases, the in-line switchback configuration **260** allows for an amount of extension in the earphones **20** to accommodate distinct head sizes. For example, the in-line switchback configuration **260** can allow for approximately 50 millimeters (mm) of extension to approximately 70 mm of extension. In certain cases, the in-line switchback configuration **260** allows for approximately 60 mm of extension, +/−several mm. Additionally, in certain implementations, the headset **10** includes a removable cable holder **270** (FIGS. **2**, **5**, **6**, **7**) in at least one section of the headband **30** for enabling removal of the portion of **250** of the cable **70**. In certain implementations, the removable cable holder **270** is configured to translate (e.g., slide) relative to the frame **280** of the headband **30**, and guide the cable **70** during insertion and/or removal of the cable **70** from the headband **30**. In particular cases (e.g., as seen in FIGS. **5** and **6**), the removable cable holder **270** includes a tray **290** that is sized to accommodate the in-line switchback configuration **260** of the cable **70**. In some cases, the tray **290** is defined by a platform **300** with a set of sidewalls **310** (e.g., two approximately parallel sidewalls) extending therefrom. The tray **290** can include an opening **320** (e.g., opening facing the outer, upper portion of the headband **30**) that enables access to the cable **70** while the cable **70** remains coupled with the circuit board **130**. In some cases, as illustrated in FIGS. **2** and **3**, the headset can further include a cable cover **330** that is configured to cover (or, shield) the cable **70** from the perspective of the upper, or outer portion of the headband **30**. In some cases, the cable

cover **330** is removed prior to removal of the cable **70** and the removable cable holder **270** (e.g., in decoupling of an earcup **20** from headset **10**), and is installed after installation of the cable **70** and removable cable holder **270** (e.g., in coupling of an earcup **20** to the headset **10**).

In some cases, e.g., as shown in FIG. **7**, the headset **10** includes an adjustment limiter **340** for preventing unintentional removal of the removable cable holder **270**. In certain cases, the adjustment limiter **340** includes at least one protrusion or recess **350** (e.g., lip, ridge, or edge) on an inner surface of the headband **30** for engaging a corresponding protrusion **360** on the removable cable holder **270**. For example, as shown in FIGS. **6** and **7**, the lower cap **200** can include an inner surface **370** with protrusion **360** for engaging the protrusion (or recess) **350** on the adjustment limiter **340**, and preventing translation of the adjustment limiter **340**. In certain cases, multiple protrusions **360** on the lower cap **200** can engage multiple protrusions (or recesses) **350** on the lower surface of the removable cable holder **270**. In various example implementations, in order to disconnect an earphone **20** (and associated section of the cable **70**), the lower cap **200** must be removed to free the removable cable holder **270** to slide out of the headband **30**. That is, the protrusions (or recesses) **350**, **360** can be sized to interface with enough interference to prevent translation of the removable cable holder **270** while the lower cap **200** is coupled to the headband **30**. In other example implementations, the interference between the protrusions **350**, **360** can be overcome without removal of the lower cap **200**, e.g., by manually lifting the earcup **20** (and coupled cable holder **270**) to disengage the protrusions **350**, **360**.

As noted herein, in some aspects, each earcup **20** includes a driver (also referred to as an electro-acoustic transducer herein) for providing an audio output to a user. As illustrated in the partially cut-away view of an earcup **20**B in FIG. **8**, the cable **70** connects with each earcup **20** at an outer casing **380**, e.g., an opening **390** in the outer casing **380** of the earcup **20**. In various implementations, the opening **390** is connected with an acoustically sealed back volume (not shown) behind the driver. For example, the wiring in each earcup **20** can be part of a sealed assembly behind the ear. In various implementations, the sealed assembly can enhance passive noise attenuation in the headset **10**. Additional aspects of an earcup similar to earcup **20** are included in U.S. Pat. No. 11,212,609 ("Wearable Audio Device with Tri-Port Acoustic Cavity," issued Dec. 28, 2021), which is entirely incorporated by reference herein. In some cases, the outer casing **380** is coupled (e.g., via an interface) with a cushion **400**, e.g., an ear cushion for resting on or near the ear of the user.

As noted herein, the headset **10** is operational with only one of the earphones **20** (e.g., earphone **20**A), such that with one of the earphones removed (e.g., earphone **20**B), the remaining earphone **20**A is connected to a power source, enables audio output (e.g., at the driver), and enables audio communication (e.g., via a communications device in the microprocessor at each earphone and/or the circuit board **130**).

While earphones **20** are illustrated herein as including a pair of over-ear headphones, it is understood that the earphones **20** can include any suitable form of earcup or earphone, e.g., a pair of earbuds, a pair of on-ear headphones, or a pair of near-ear headphones.

In contrast to conventional audio headsets, various implementations include audio headsets that are configured to operate modularly, for example, with one earphone removed from the headset. Further, the audio headsets disclosed according to implementations enable access to individual earphones, e.g., for servicing, replacement and/or modular operation. The audio headsets disclosed herein also include a spring system for enhancing occlusion of the earphones on the user's ear while shielding the user from internal wiring in the headset. Further, the audio headsets disclosed herein can effectively hide cabling from the user's perspective. When compared with conventional headsets, the audio headsets disclosed according to various implementations can provide enhanced modularity, servicing, aesthetic appeal, and comfort for users.

Various mating features and mechanical interfaces are illustrated and described herein. These mating features can enable snap-fit and/or friction-fit interaction between components in the headset **10**, e.g., enabling coupling and decoupling of earphones **20** from the headset **10**. Particular mating features illustrated herein can include recesses and corresponding protrusions or tabs. Additional example mating features can include pin/slot configurations, tongue/groove configurations, rivet configurations, adhesive couplings, press-fit couplings, snap-fit couplings, welded couplings and/or other known mating couplings. Certain coupling configurations can be combined, e.g., using a threaded coupling with an adhesive such as a glue. Additionally, intervening materials or components such as washers, lubricants, or sleeves can be located between mating features in some implementations.

One or more components described herein can be formed according to known manufacturing methods, e.g., molding, casting, forging or additive (e.g., three-dimensional) manufacturing, and can be formed from known materials, e.g., a metal such as aluminum or steel, a thermoplastic material (e.g., polycarbonate (PC) or acrylonitrile butadiene styrene (ABS)) or a composite material (e.g., PC/ABS). Certain components can include materials used for damping motion, such as silicone, a thermoplastic (e.g., POM) or a thermoplastic elastomer (TPE).

In various implementations, components described as being "coupled" to one another can be joined along one or more interfaces. In some implementations, these interfaces can include junctions between distinct components, and in other cases, these interfaces can include a solidly and/or integrally formed interconnection. That is, in some cases, components that are "coupled" to one another can be simultaneously formed to define a single continuous member. However, in other implementations, these coupled components can be formed as separate members and be subsequently joined through known processes (e.g., soldering, fastening, ultrasonic welding, bonding). In various implementations, electronic components described as being "coupled" can be linked via conventional hard-wired and/or wireless means such that these electronic components can communicate data with one another. Additionally, sub-components within a given component can be considered to be linked via conventional pathways, which may not necessarily be illustrated.

A number of implementations have been described. Nevertheless, it will be understood that additional modifications may be made without departing from the scope of the inventive concepts described herein, and, accordingly, other implementations are within the scope of the following claims.

We claim:

1. An audio headset, comprising:
a pair of earphones;
a headband connecting the pair of earphones;
a cable connecting the pair of earphones through the headband,
wherein the earphones are removably coupled with one another such that the audio headset is operational with only one of the earphones connected with the headband while a second one of the earphones is physically separated from the headband, wherein the earphone that remains connected with the headband is configured to operate as a single earphone while the headband rests over a head of a user;
a removable cable holder in at least one section of the headband, and
an adjustment limiter for preventing unintentional removal of the removable cable holder,
wherein a portion of the cable extending through the headband is positioned in an in-line switchback configuration to mitigate mechanical stress on the cable in response to adjustment of at least one of the earphones, and
wherein the removable cable holder enables removal of the portion of the cable.

2. The audio headset of claim 1, wherein the headband includes
a first headband segment,
a second headband segment, and
a spring connecting the first headband segment and the second headband segment.

3. The audio headset of claim 2, wherein the spring is located at a top portion of the audio headset when worn by the user.

4. The audio headset of claim 2, wherein the spring includes a slot.

5. The audio headset of claim 4, wherein the cable extends from the first headband segment to the second headband segment through the slot.

6. The audio headset of claim 2, wherein the spring is located at a hinge between the first headband segment and the second headband segment, wherein the hinge is visible from an exterior of the audio headset, and wherein the cable is visually obstructed at the exterior of the audio headset.

7. The audio headset of claim 2, wherein the spring includes at least one torsion spring that provides a linear clamping force on the headband, wherein the linear clamping force enhances acoustic performance for the audio headset across a variety of users having distinct head sizes.

8. The audio headset of claim 1, further including a circuit board in the headband, wherein the cable includes a first section connected with a first one of the earphones and a first side of the circuit board, and a second section connected with a second one of the earphones and a second side of the circuit board,
wherein through-headband wiring of the cable mitigates mechanical stress on the connection between the first section and the circuit board and the second section and the circuit board.

9. The audio headset of claim 8, further including a removable cap on at least a portion of the headband, wherein the cap enables access to at least one of the connection between the first section and the circuit board or the connection between the second section and the circuit board.

10. The audio headset of claim 9, wherein the cap enables access to at least one of the connection between the first section and the circuit board or the connection between the second section and the circuit board.

11. The audio headset of claim 8, wherein the first section has a multi-pin segment connector for connecting with the circuit board,
wherein the second section is fixed to the circuit board.

12. The audio headset of claim 1, further including:
a circuit board in the headband, and
at least one grounding wire connected with the circuit board for providing electro-static discharge (ESD) protection for the audio headset.

13. The audio headset of claim 1, wherein each earphone includes a driver, and wherein the cable connects with each earcup proximate an acoustically sealed back volume behind the driver.

14. The audio headset of claim 1, wherein the audio headset is operational with only one of the earphones such that with one of the earphones removed, a remaining earphone is connected to a power source, enables audio output and enables audio communication.

15. The audio headset of claim 1, wherein each of the earphones contains a separate microprocessor for enabling independent operation thereof.

16. The audio headset of claim 1, wherein the pair of earphones includes a pair of earcups.

17. The audio headset of claim 1, wherein the pair of earphones includes a pair of earbuds, a pair of on-ear headphones, or a pair of near-ear headphones.

18. The audio headset of claim 1, further comprising an electro-acoustic transducer in each of the earphones for providing an audio output to the user.

19. An audio headset, comprising:
a pair of earphones;
a headband connecting the pair of earphones;
a cable connecting the pair of earphones through the headband; and
a circuit board in the headband,
wherein the earphones are removably coupled with one another such that the audio headset is operational with only one of the earphones connected with the headband while a second one of the earphones is physically separated from the headband, wherein the earphone that remains connected with the headband is configured to operate as a single earphone while the headband rests over a head of a user,
wherein the cable includes a first section connected with a first one of the earphones and a first side of the circuit board, and a second section connected with a second one of the earphones and a second side of the circuit board, and
wherein through-headband wiring of the cable mitigates mechanical stress on the connection between the first section and the circuit board and the second section and the circuit board.

20. The audio headset of claim 19, further including a removable cap on at least a portion of the headband, wherein the cap enables access to at least one of the connection between the first section and the circuit board or the connection between the second section and the circuit board.

21. An audio headset, comprising:
a pair of earphones;
a headband connecting the pair of earphones, wherein the headband includes: a first headband segment, a second headband segment, and a spring connecting the first headband segment and the second headband segment, the spring including a slot; and

a cable connecting the pair of earphones through the headband,

wherein the earphones are removably coupled with one another such that the audio headset is operational with only one of the earphones connected with the headband while a second one of the earphones is physically separated from the headband, wherein the earphone that remains connected with the headband is configured to operate as a single earphone while the headband rests over a head of a user, and wherein the cable extends from the first headband segment to the second headband segment through the slot.

22. The audio headset of claim **21**, wherein each earphone includes a driver.

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