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Lin

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(54) **EYEWEAR WITH CONDUCTIVE TEMPLE JOINT**

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(51) **Int. Cl.**

G02C 1/00	(2006.01)
G02C 5/14	(2006.01)
G06F 1/16	(2006.01)

(52) **U.S. Cl.**
CPC ***G02C 5/14*** (2013.01); ***G06F 1/163*** (2013.01)

(58) **Field of Classification Search**
CPC G02C 11/10; G02C 5/006; G02C 7/101; G02C 7/14
USPC 351/158, 41, 116, 121, 153; 16/228; 455/347, 90, 344
See application file for complete search history.

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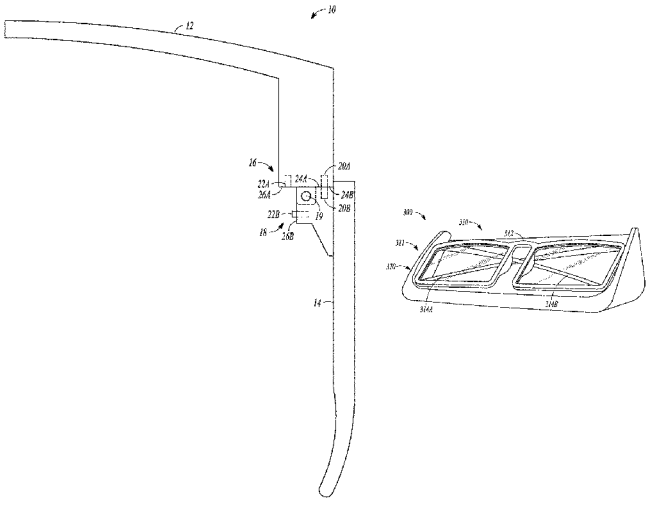
(57) **ABSTRACT**

Apparatuses and systems for wearable devices such as eyewear are described. According to one embodiment, the wearable device includes a frame, a temple, onboard electronics components, and a coupling mechanism. The frame is configured to hold one or more optical elements. The temple is connected to the frame at an articulated joint such that the temple is disposable between a collapsed condition and a wearable condition in which the device is wearable by a user to hold the one or more optical elements within user view. The onboard electronics components comprise at least a pair of electronics components carried by the frame and the temple respectively. The coupling mechanism is incorporated in the articulated joint and that is configured to electrically connect the pair of electronics components across the articulated joint both when the temple is in the wearable condition and when the temple is in the collapsed condition.

18 Claims, 11 Drawing Sheets



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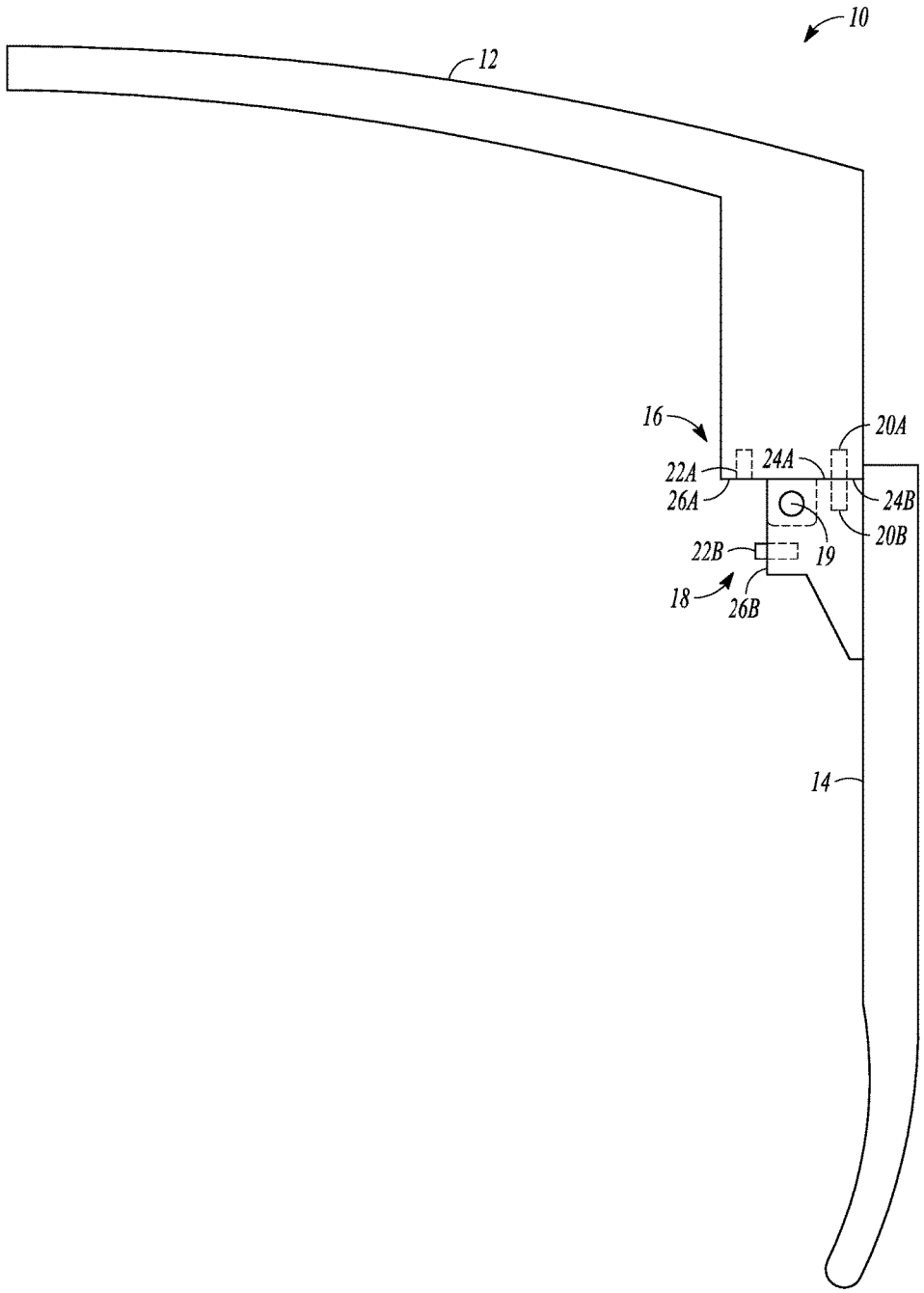


FIG. 1A

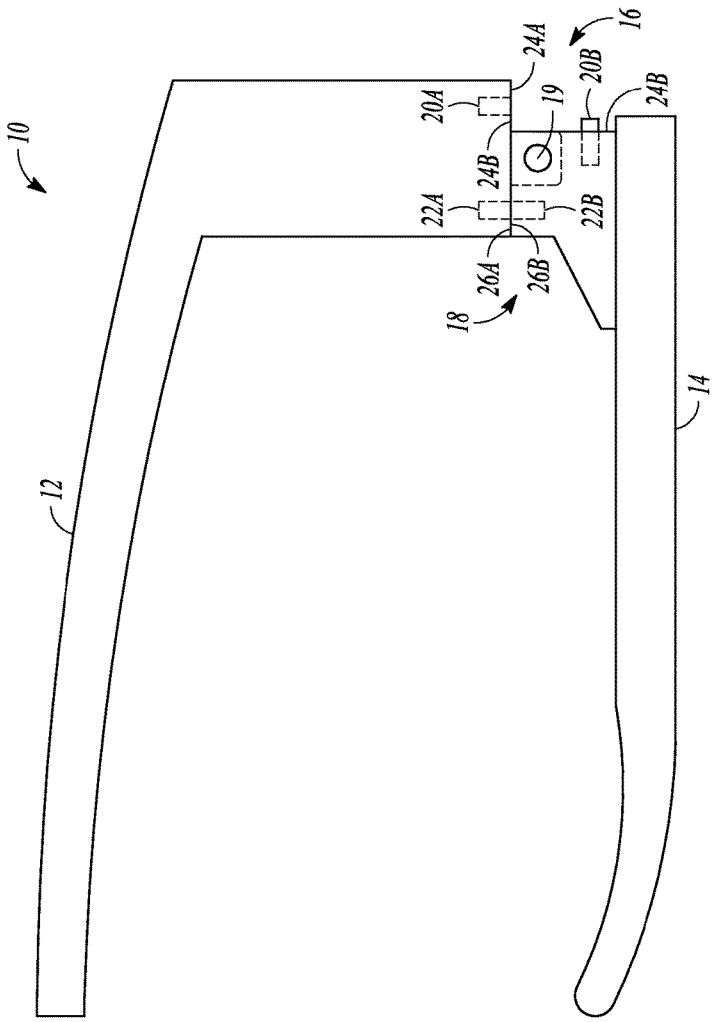


FIG. 1B

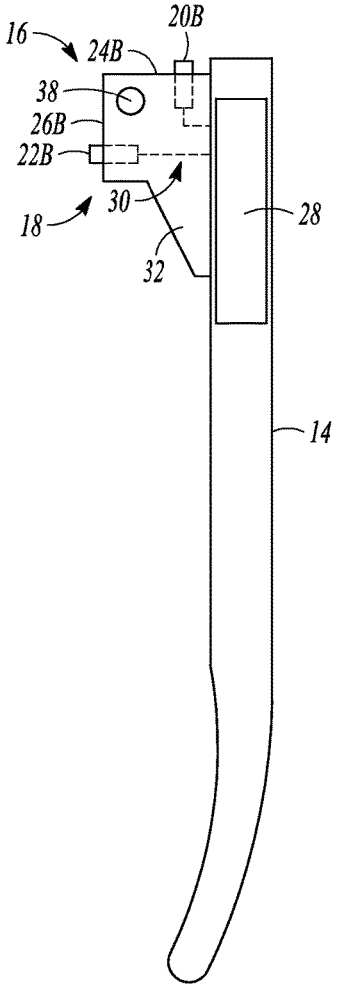


FIG. 2A

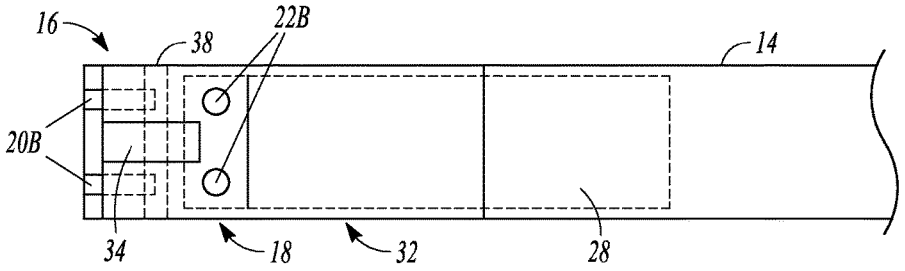


FIG. 2B

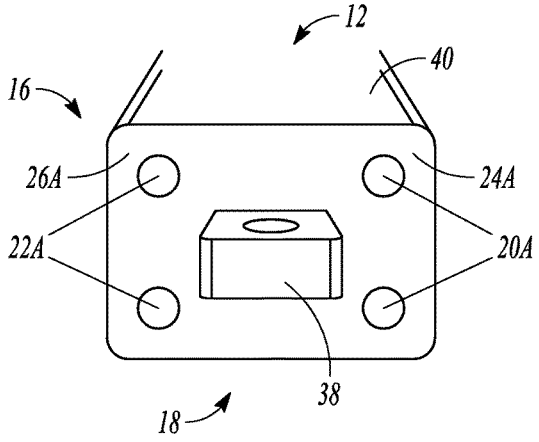


FIG. 3

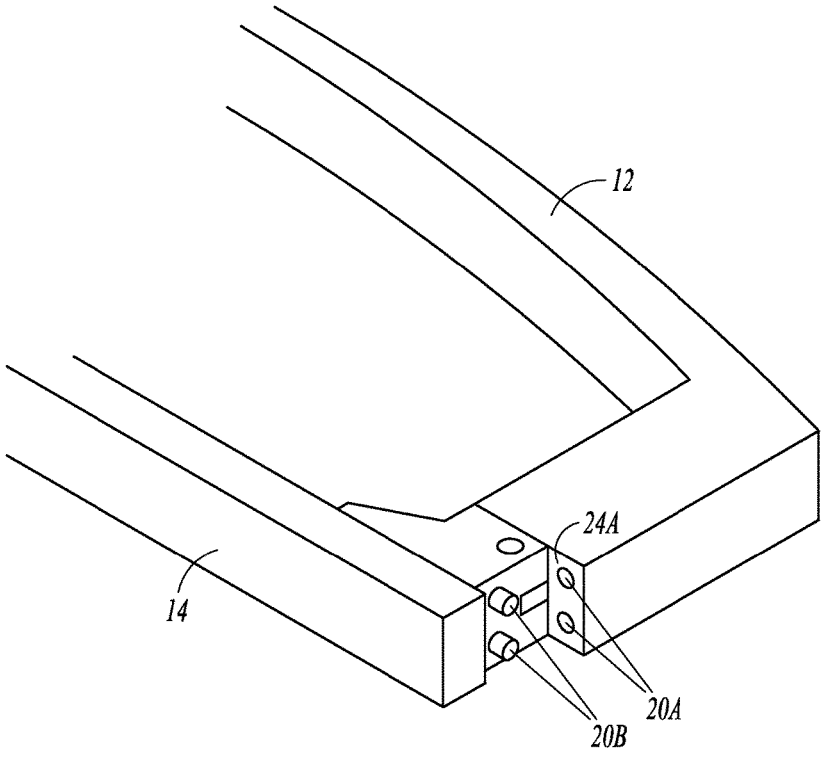


FIG. 4

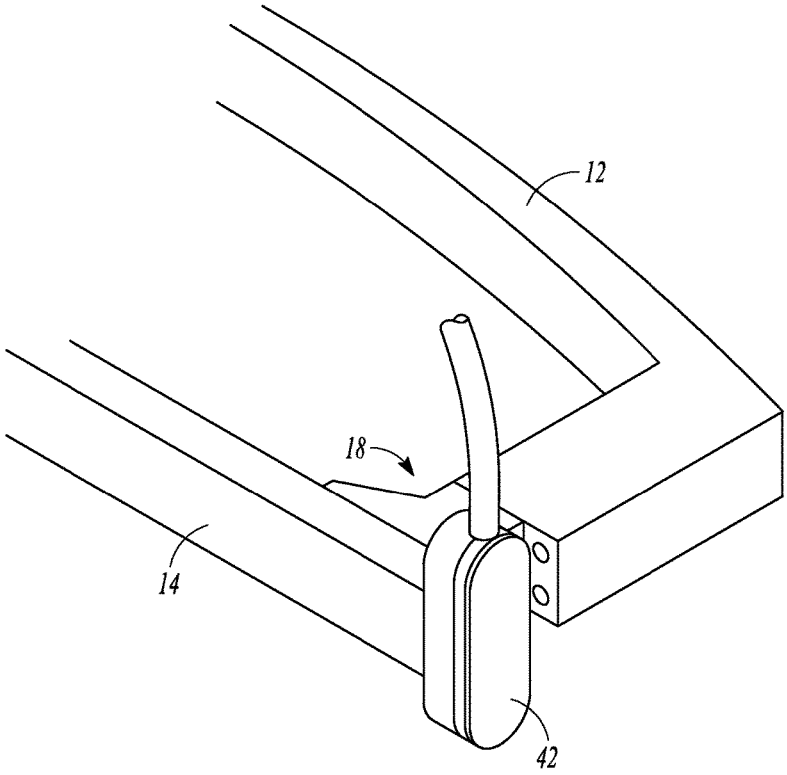


FIG. 5

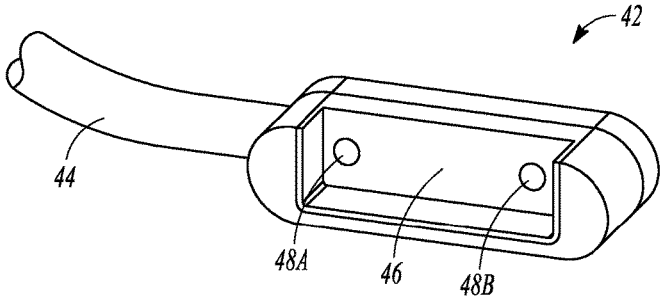
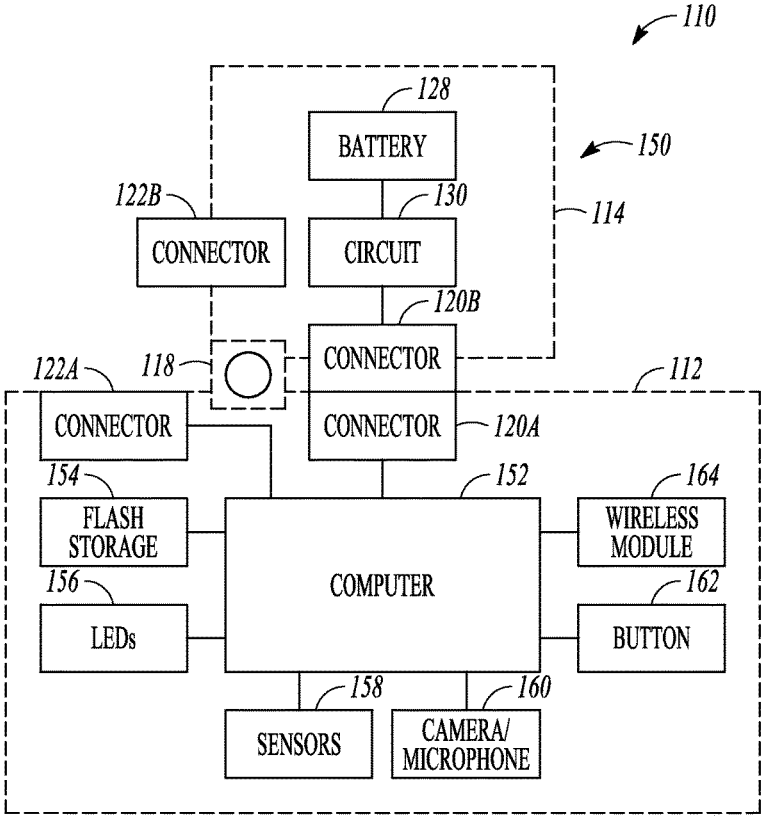


FIG. 5A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120A
154
152
164
FLASH STORAGE
COMPUTER
WIRELESS MODULE
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162
LEDs
BUTTON
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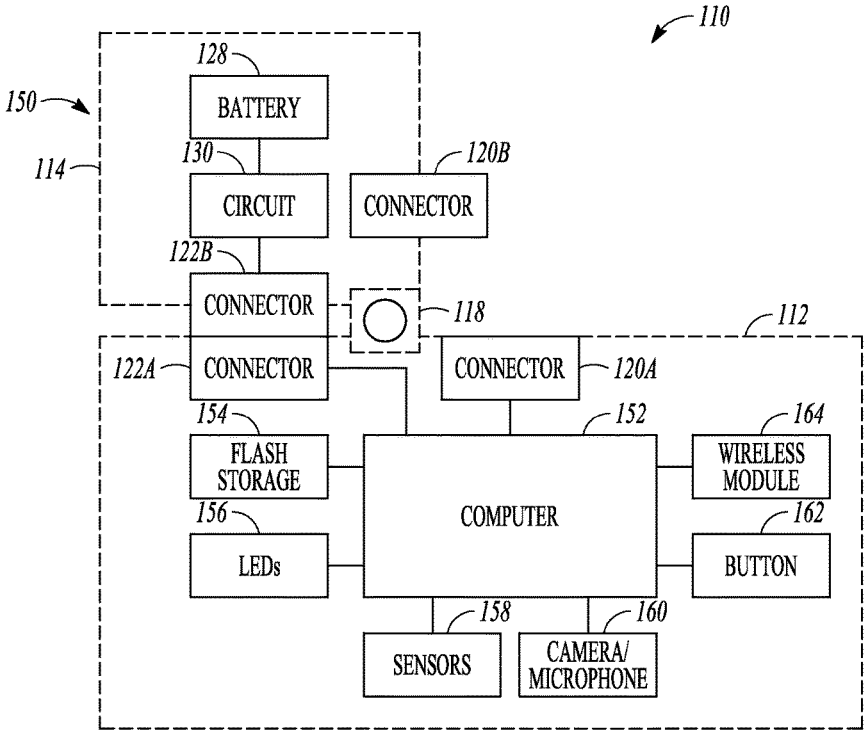
160
SENSORS
CAMERA/ MICROPHONE

FIG. 6A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WIRELESS MODULE
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SENSORS
CAMERA/ MICROPHONE

FIG. 6B

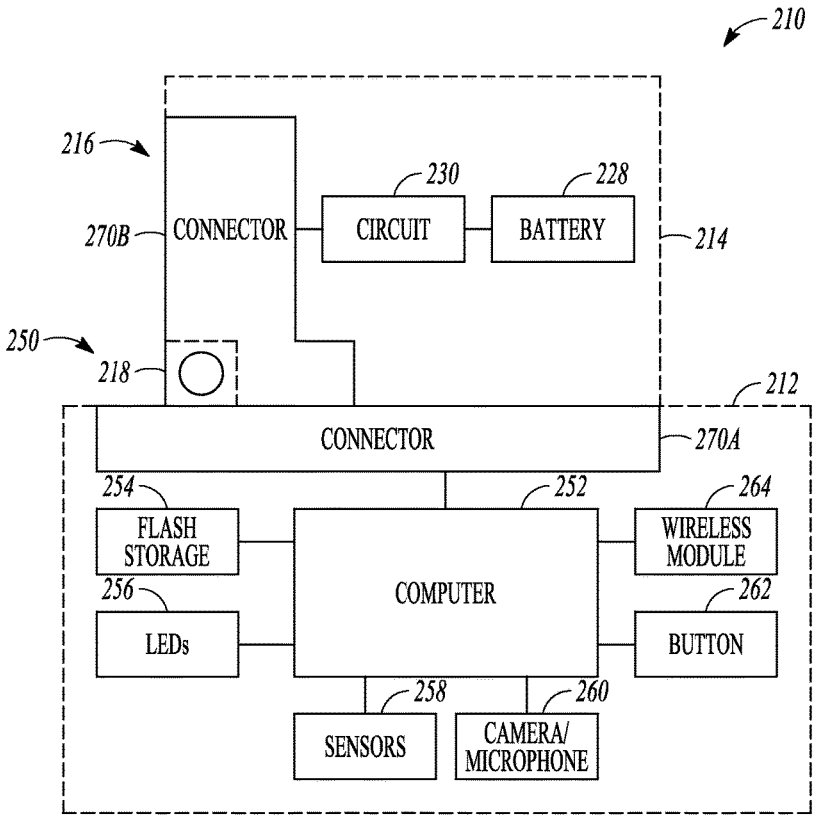
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FIG. 7A

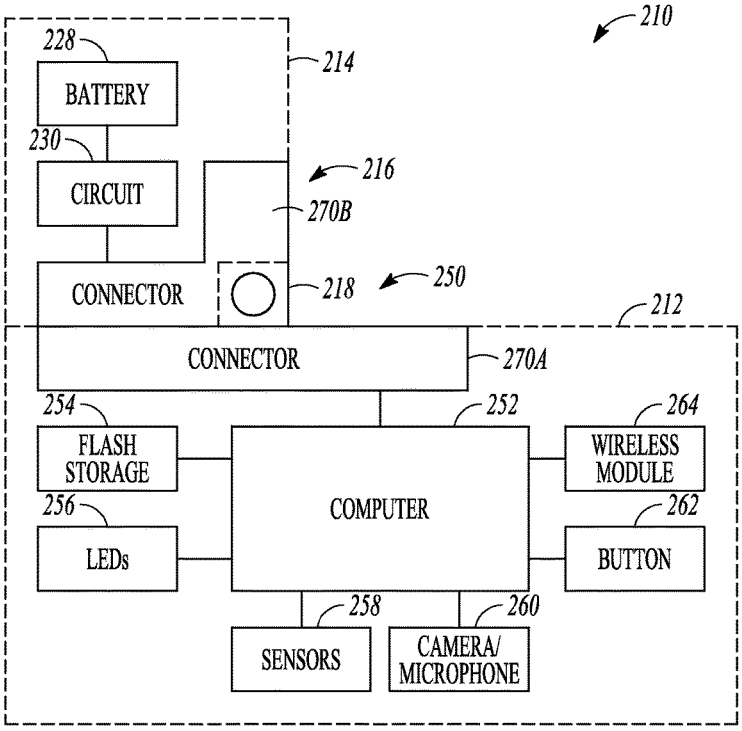
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FIG. 7B

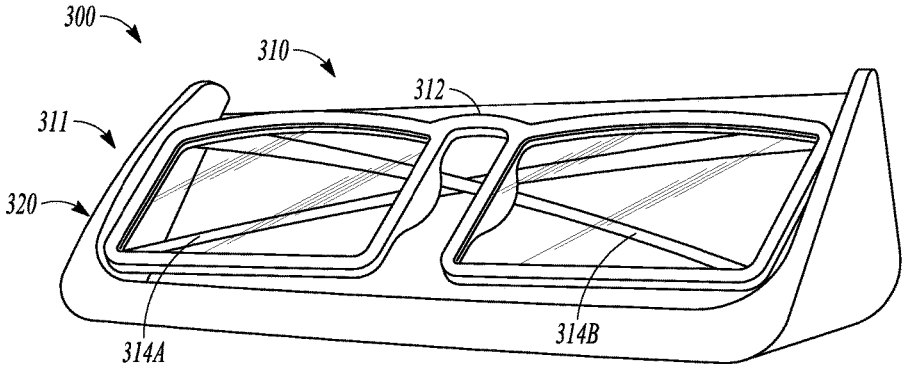

FIG. 8A

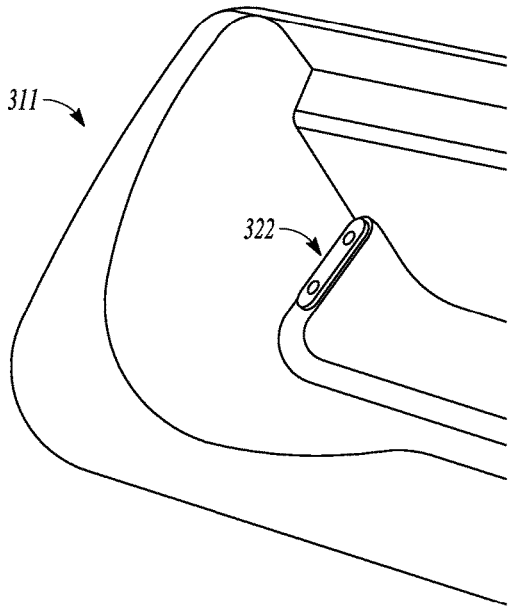

FIG. 8B

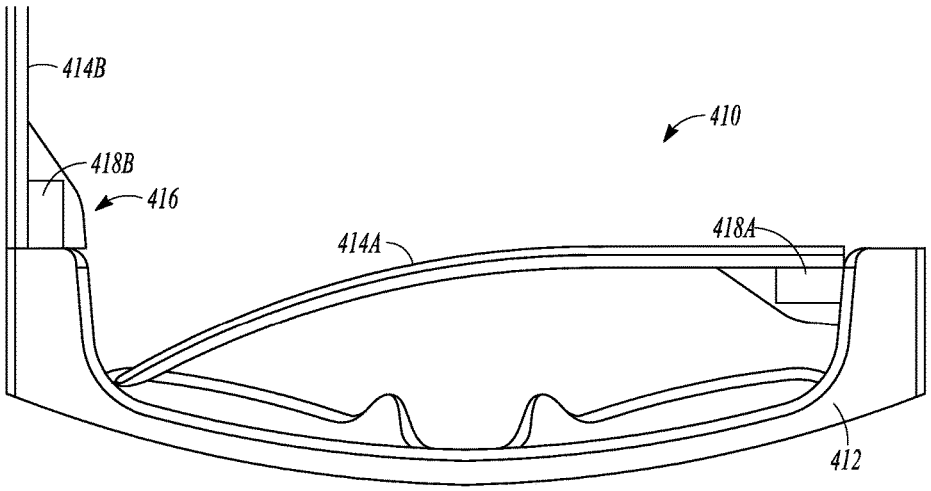

FIG. 9

EYEWEAR WITH CONDUCTIVE TEMPLE JOINT

TECHNICAL FIELD

The subject matter disclosed herein generally relates to eyewear, and more specifically to electronics-enabled eyewear.

BACKGROUND

Eyewear, especially those carrying onboard electronics, can be bulky, making them difficult to wear and to transport when not being worn. These and other factors often cause electronically-enabled eyewear to be unwieldy and less than desirable to wear or transport.

BRIEF DESCRIPTION OF THE DRAWINGS

The present disclosure is illustrated by way of example, and not by way of limitation, in the figures of the accompanying drawings, in which:

FIG. **1**A is a plan view of a portion of eyewear including a temple and a frame mechanically coupled together by a hinge joint assembly with the temple disposed in a wearable position relative to the frame according to one embodiment.

FIG. **1**B is a plan view of the eyewear including the temple and the frame coupled together by the hinge joint assembly with the temple disposed in a folded storage position according to one embodiment.

FIG. **2**A is a plan view of a top face of the temple of FIGS. **1**A and **1**B showing an electrically conductive coupling mechanism and electronics such as a battery in phantom according to one embodiment.

FIG. **2**B is a plan view of a side face of a portion of the temple of FIG. **2**A according to one embodiment.

FIG. **3** is a perspective view of a portion of the frame of the eyewear of FIGS. **1**A and **1**B showing a portion of the hinge joint assembly and a portion of the conductive coupling mechanism on the frame according to one embodiment.

FIG. **4** is a perspective view of the portion of the frame of the eyewear of FIG. **3** showing the temple positioned in the folded storage position and showing a portion of the conductive coupling mechanism on the temple according to one embodiment.

FIG. **5** is a perspective view of the portion of the frame of the eyewear of FIGS. **3** and **4** showing a portion of a charger mounted to the temple and electrically coupled to the conductive coupling mechanism on the temple according to an example embodiment.

FIG. **5**A is a perspective view of the charger of FIG. **5** according to an example embodiment.

FIG. **6**A is a schematic view eyewear comprising smart glasses with electronics carried by a temple and a frame, the temple positioned in a wearable position relative to the frame according to an example embodiment.

FIG. **6**B is a schematic view of the smart glasses of FIG. **6**A with the temple moved to a folded storage position relative to the frame according to an example embodiment.

FIGS. **7**A and **7**B show alternative embodiments of the smart glasses with a single conductive coupling mechanism between the temple and the frame, with the single conductive coupling mechanism being part of a hinge joint assembly.

FIG. **8**A is a front perspective view of a system including eyewear and a case according to one embodiment.

FIG. **8**B is an enlargement of an interior portion of a case from FIG. **8** illustrating a conductive coupling mechanism can be used within the case that is adapted to mate with the conductive coupling mechanism of the temple according to an example embodiment.

FIG. **9** shows smart glasses according to another example embodiment that includes a battery in each temple.

OVERVIEW

A brief overview of some aspects of the disclosure with reference to selected drawings follows, after which various features of the disclosed subject matter will be described in greater detail.

One aspect of this disclosure is an eyewear article with onboard electronics, the eyewear article includes a conductive coupling mechanism (e.g., an interface or port) that allows power from a battery in the temple to be provided to the onboard electronics in the frame when the temple is in a wearable configuration (e.g., FIG. **1**A) and when the eyewear article is in a folded or collapsed configuration (e.g., FIG. **1**B). Such configuration allows the onboard electronics to be supplied with power in either the wearable configuration and folded configuration. This allows the eyewear article to be operable even in the folded configuration such as to run software and perform other tasks that can improve efficient and performance thereby improving the user experience.

According to further aspects the conductive coupling mechanism of the temple can be configured to interface with and receive charge from an external power source (e.g., a case as shown in FIGS. **8** and **8**A, a personal computer, or an outlet via a charger as shown in FIG. **5**) when the eyewear article is in the folded or collapsed configuration. Such conductive coupling mechanism can be used for recharging of the battery of the eyewear article, for example. In some embodiments, the conductive coupling mechanism may include a data component for transmitting data signals, enabling information upload and/or download between the external source (e.g., a personal computer) and the eyewear article or between components of the eyewear article (e.g., the temple and the frame).

For ease of description, the article of eyewear is further in this overview and description referred to as smart glasses. The electrically conductive coupling mechanism may comprise any suitable connector configured for contact and coupling with a complementary connector to establish an electrical and/or electronic link, including for example a port, a link, a socket, a plug, a cord, a contact pin, a contact pad, micro-USB, or the like. Although referred to herein as an electrically conductive coupling mechanism, in some cases the electrically conductive coupling mechanism can facilitate the transfer of both data and charge.

The smart glasses may have a body comprising the lens-carrying frame and a pair of the temples hingedly mounted on opposite ends of the frame. The smart glasses are in such cases in the wearable configuration or mode when at least one of both temples are substantially fully unfolded for reception along a side of the user's head. In contrast, the smart glasses are in the folded condition when at least one of the temples is hingedly folded towards the frame sufficiently to create the conductive coupling mechanism between a battery in the temple and onboard electronics in the frame. The folded condition thus can include both a fully folded condition in which one or both of the temples are hinged fully inwardly towards the frame (e.g., FIG. **1**B), and a partially folded condition. However, in some cases the

partially folded condition can break the conductive coupling mechanism between the battery (or batteries) in the temple(s) and the onboard electronics in the frame such as to power off or restart the electronics.

In some embodiments, the conductive coupling mechanism extends across (e.g., is located at) an articulated hinge joint where one of the temples is hingedly connected to the frame. The conductive coupling mechanism may be located on several of the joint faces provided by the frame and the temple respectively, the joint faces being in face-to-face abutment when in the wearable condition (see e.g., faces **24**A and **24**B in FIG. **1**A), and being in face-to-face abutment when in the folded condition (see, e.g., faces **26**A and **26**B in FIG. **1**B). In other embodiments, dual conductive coupling mechanisms may be implemented one on each temple, with the conductive coupling mechanism on each temple. To facilitate conductive coupling mechanism, the temple and the frame may carry cooperating features such as pins and pads configured for automatic contact and coupling when the smart glasses are in either the wearing condition or the folded condition, to provide a conductive coupling mechanism (and in some cases a data connection) between electronics in the temple and electronics in the frame.

In some embodiments, electrical/electronic components may be carried both by the frame and at least one of the temples. In other embodiments, the battery will be carried by one or both of the temples while substantially all other electrical/electronic components (see, e.g., computer, sensors, camera, microphone, wireless module, and the like, of FIGS. **6**A, **6**B, and **7**) are carried only by the frame. This allows for a slimmer frame that can be more desirable for the user to wear and easier for the user to transport.

DETAILED DESCRIPTION

The description that follows includes apparatuses, systems and techniques that embody illustrative examples of the disclosure. In the following description, for the purposes of explanation, numerous specific details are set forth in order to provide an understanding of various embodiments of the inventive subject matter. It will be evident, however, to those skilled in the art, that embodiments of the inventive subject matter maybe practiced without these specific details. In general, well-known structures and techniques are not necessarily shown in detail.

FIGS. **1**A and **1**B show an example embodiment of eyewear **10** comprising smart glasses from a position above the eyewear **10**. As shown in the FIGS. **1**A and **1**B, the eyewear **10** includes a frame **12**, a temple **14**, a hinge joint assembly **16** and a conductive coupling mechanism **18**. The conductive coupling mechanism **18** allows power from a battery (e.g., battery **24** in FIGS. **2**A and **2**B) in the temple **14** to be provided to the onboard electronics in the frame **12** when the temple is in the wearable configuration (e.g., FIG. **1**A) and when the eyewear **10** is in a folded or collapsed configuration (e.g., FIG. **1**B). It should be recognized that such arrangement can be reversed in some embodiments such that the battery can be carried by the frame **12** and the onboard electronics can be carried by the temple **14**. Such configurations allow the onboard electronics to be supplied with power in either the wearable configuration and folded configuration. This allows the eyewear **10** to be operable not only in the wearable configuration but also in the folded configuration such as to run software and perform other tasks.

FIGS. **1**A and **1**B also illustrate that the hinge joint assembly **16** can be shared between the temple **14** and the frame **12** to couple the temple **14** to the frame **12**. The hinge joint assembly **16** can include a pin connection **19** that can comprise a single pin or multiple pins with different connection points between the temple **14** and the frame **12**. The hinge joint assembly **16** facilitates mechanical movement of the temple **14** relative to the frame **12** about the pin connection **19**. Such movement can be between the wearable configuration/position of FIG. **1**A and the collapsed folded configuration/position of FIG. **1**B.

According to the embodiment of FIGS. **1**A and **1**B, the conductive coupling mechanism **18** can be incorporated in the articulated hinge joint assembly **16** and can be configured to electrically connect the battery with other onboard electronics across the hinge joint assembly **16**. As shown in FIGS. **1**A and **1**B, the conductive coupling mechanism **18** can include a first connector **20**A positioned on a first face **24**A of frame **12** and a second connector **22**A positioned on a second face **26**A of the frame **12**. At least one of the first or second portion **24**A and/or **26**A can comprise a portion of the hinge joint assembly **16** and/or can be disposed closely adjacent the hinge joint assembly **16**. The conductive coupling mechanism **18** can also include a first connector **20**B positioned on a first face **24**B or portion of the temple **14** and a second connector **22**B positioned on a second face **26**B or portion of the temple **14**. At least one of the first or second portion **24**B and/or **26**B can comprise a portion of the hinge joint assembly **16** and/or can be disposed closely adjacent the hinge joint assembly **16**. First face **24**A is configured to interface with first face **24**B when the temple **14** is in the wearable position. Similarly, second face **26**A is configured to interface with the second face **26**B when the temple **14** is in the folded position.

The conductive coupling mechanism **18** can be configured for automatic contact and electrical coupling in both the wearable position (FIG. **1**A) and the folded position (FIG. **1**B). More particularly, the connectors **20**A and **20**B are designed to interface with and electrically couple with one another such that they are complementary in design (e.g., one comprises a pad and one a pin, etc.). Similarly, the connectors **22**A and **22**B are designed to interface with and electrically couple with one another such that they are complimentary in design. As shown in FIGS. **1**A and **1**B, the connectors **20**A and **22**A comprise contact pads, while the connectors **20**B and **22**B comprise contact pins. However, the arrangement can be reversed or another known connector, for example, a port, a link, a socket, a plug, a cord, a micro-USB, or the like can be utilized.

FIGS. **2**A and **2**B show the temple **14** which can house a battery according to one embodiment. FIGS. **2**A and **2**B show the temple **14**, a portion of the hinge joint assembly **16**, and a portion of the conductive coupling mechanism **18** from various views. FIGS. **2**A and **2**B additionally illustrate that the temple **14** can be configured to house and carry battery **28** therein. The battery **28** can be configured to operationally store charge and a circuit **30** (FIG. **2**A) can be coupled to the battery **28** and configured to deliver a charge to and from the battery **28**. As discussed previously **28** the battery **28** can power electronics in the frame **12** (FIGS. **1**A and **1**B) when the temple **14** is in both the wearable configuration and the folded configuration.

FIGS. **2**A and **2**B show the features previously discussed including the first connector **20**B, the second connector **22**B, the first face **24**B, and the second face **26**B. FIGS. **2**A and **2**B additionally illustrate a projection portion **32** of the hinge joint assembly **16**. The projection portion **32** forms the first and second faces **24**B and **26**B and includes a receptacle **34** (FIG. **2**B) configured to receive a mating projection of the

frame **12**. The projection portion **32** of the temple **14** and the mating projection **36** (FIG. **3**) of frame **12** can be connected together by pin connection **19** (FIGS. **1**A and **1**B), for example, which is received in an aperture **38** in the projection portion **32**.

FIG. **3** shows a view of a portion of the frame **12**, a portion of the hinge joint assembly **16**, and a portion of the conductive coupling mechanism **18** with the temple removed. The conductive coupling mechanism **18** is disposed at or closely adjacent the hinge joint assembly **16** that connects the temple to the frame **12**. FIG. **3** illustrates a portion **40** of the frame **12** having the hinge joint assembly **16** and the conductive coupling mechanism **18** mounted thereto. In particular, the portion **40** forms the first face **24**A, the second face **26**A, and the mating projection **38**. As shown in FIG. **3**, the connectors **20**A and **22**A can comprise contact pads that are disposed to interface at the first face **24**A and the second face **26**A. In particular, the connector **20**A is disposed at the first face **24**A and the connector **22**A is disposed at the second face **26**A in the embodiment of FIG. **3**. As shown in FIG. **3**, the first and second connectors **20**A and **22**A can be comprised of a pair contact pads, each pair comprising a negative pad and a positive pad that are electrically isolated from one another.

FIG. **4** shows the temple **14** coupled to the frame **12** and moved to the folded position relative to the frame **12** such that connectors **22**A and **22**B (FIG. **3**) come into contact as previously described with reference to FIG. **1**B. This configuration creates an electrical connector that allows electrical charge from the battery (e.g., battery **28** in FIGS. **2**A and **2**B) carried by the temple **14** to pass to other electronics carried by the frame **12**. Connectors **20**A and **20**B are exposed in the folded position allowing for coupling to an external power source as described subsequently in reference to FIGS. **5**, **5**A, **8**, and **8**A, for example. As shown in the embodiment of FIG. **4**, each of the connectors **20**B (and **22**B not shown) can comprise a pair of connectors (e.g., positive and negative contact pins) that are configured to make contact with respective pads on the faces **24**A and **26**A (FIG. **3**) of the frame **12**.

FIG. **5** shows the conductive coupling mechanism **18** as well as the temple **14** and frame **12** can be configured for coupling with an external connector **42**, which in turn, is electrically coupled to an external power source when the temple **14** is in the collapsed condition. The external power source can comprise a personal computer, an electrical outlet connected to the power grid, or another battery powered device, for example. The connector **42** can be configured to mount on the temple **14** and is configured to interface with and couple to the connectors **20**B (FIG. **4**) to allow the external power source to charge the battery (i.e. battery **28** in FIGS. **2**A and **2**B) carried by the temple **14**.

FIG. **5**A provides an example of the external connector **40** which includes a cord **44**, a charging face **46**, and pads **48**A and **48**B. In the example embodiment of FIG. **5**A, the charging face **46** is recessed to facilitate mounting to an edge of the temple **14** as shown in FIG. **5**. The pads **48**A and **48**B are configured to be complementary to with the pins (e.g., pins of FIG. **4**) of connector **20**B. In other embodiments, the pads **48**A and **48**B can be another connector type designed to be complimentary to the connector type used by the glasses **10**. Cord **44** can be configured with a plug, USB or the like on a second end (not shown) to couple with an external power source (or data source) such as a personal computer or outlet.

FIGS. **6**A and **6**B are schematics of glasses **110** that incorporate various aspects of the eyewear previously discussed but may differ therefrom. For example, the glasses **110** can be configured to electrically couple in a first position (e.g., the wearable position as shown in FIG. **6**A) and a second position (e.g., the folded position as shown in FIG. **6**B). The glasses **110** can be constructed in a manner similar to glasses **10** previously discussed, and thus, can include two temples (only one temple **114** is illustrated in FIGS. **6**A and **6**B) and a frame **112**. However, a conductive coupling mechanism **118** and a hinge joint assembly **116** of the glasses **110** can differ from those previously discussed with regard to specific embodiment of FIGS. **1**A-**5**. According to the embodiment illustrated in FIGS. **6**A and **6**B, the glasses **110** comprise smart glasses which carry electronics **150**.

The frame **112** and temple **114** can be provided with complimentary connectors **120**A, **120**B, **122**A, **122**B configured to electrically and physically couple with one another as generally illustrated. The connectors **120**A, **120**B, **122**A, **122**B can be disposed adjacent the hinge joint assembly **116** or can be incorporated into the hinge joint assembly **116**. In some cases, the connectors **120**A, **120**B, **122**A, **122**B can be disposed at other portions of the frame **112** and temple **114** from the locations previously discussed with reference to FIGS. **1**A-**5**.

The smart glasses **110** of FIGS. **6**A and **6**B can include various electronics **150**. For example, the temple **114** can be configured to carry and/or house a battery **128** and a circuit **130**, such as a protection circuit, in addition to the connectors **120**B and **122**B. The battery **128** is configured to operationally store charge. The circuit **130** is coupled to the battery **128** (and to the connectors **120**B and **122**) and is configured to deliver the charge to and from the battery **130**.

The frame **112** can be configured to carry and/or house further electronics **150** such as a computer **152**, a memory **154** (e.g., flash storage), a display **156** (e.g., LCD, LED, and the like), a sensor **158**, a camera/microphone **160**, a capture device **162** (e.g., a button), and a wireless module **164**. Although not illustrated, the temple **114** and/or frame **112** can carry further electronics **150** in some instances such as further sensors, ancillary batteries, peripheral devices or other peripherals.

Many if not all of the electronics **150** run software and perform other tasks that require electrical charge from the battery **128**. Thus, the ability to provide charge from the battery **128** to the electronics **150** carried by the frame **112** when the glasses are in the folded position (in addition to the wearable position) allows software and/or tasks to be performed even when the glasses are stowed. Therefore, performance of the glasses **110** and user experience can be improved as software can run and tasks can be performed even when the glasses are stowed. According to some examples, moving the temple **114** to the folded position can put the electronics **150** in low power mode of operation where sufficient power is provided to the electronics **150** such that software and other tasks can be performed by one or more of the electronic devices but excessive power is not utilized. Thus, battery life can be preserved even as software and tasks are performed when the glasses are in the folded position.

As shown in FIGS. **6**A and **6**B the connectors **120**A, **120**B and **122**A, **122**B, respectively are adapted to interface and couple together to form conductive coupling mechanism **118** capable of passing electrical charge. The computer **152** can be of any suitable type (e.g., make use of a low-power circuitry, high-speed circuitry, and/or a display processor) to be carried by the frame **112** and can communicate with the other electronics **150**. The computer **152** can include one or more processors with memory, wireless communication

modules and circuitry, a power source, and the like. Additional details of aspects of computer **152** may be implemented with use of the display **156**, the sensor **158**, the camera/microphone **160**, the capture device **162** (e.g., a button), and/or other components or peripherals. Further aspects of the computer **152** may be implemented remotely via wireless, bluetooth, or the like.

Although described as a signal unit the camera/microphone **160** can comprise separate components or can be only a camera or only a microphone. The camera/microphone **160** can comprise multiple cameras and/or multiple microphones in some instances. The computer can be configured to communicate with and/or control various of the electronics **150** such as the display **156**, the sensor **158**, the capture device **162**, the wireless module **164** and/or other peripheral devices. The electronics **150** can additionally include a video processor (not shown) such as a microprocessor integrated circuit (IC) customized for processing sensor data from the camera/microphone **160**, along with volatile memory used by the microprocessor to operate. The memory **154** can comprise any suitable storage device capable of storing data generated by the electronics **150** including the camera/microphone **160**. Memory can be integrated with high-speed circuitry, can be an independent standalone element, or can be remote or integrated into the glasses **110**.

FIGS. **7**A and **7**B are schematics of glasses **210** that incorporate various aspects of the eyewear previously discussed including glasses **110**. Therefore, the construction and components of glasses **210** will not be discussed in great detail. Similar to glasses **110**, the glasses **210** include temples (only one temple **214** is illustrated in FIGS. **7**A and **7**B) and a frame **212**. The temple **214** and frame **212** carry electronics **250** such as a battery **228**, a circuit **230**, a computer **252**, a memory **254** (e.g., flash storage), a display **256** (e.g., LCD, LED, and the like), a sensor **258**, a camera/microphone **260**, a capture device **262** (e.g., a button), and a wireless module **264**. The electronics **250** can be connected and operate in the manner previously discussed.

FIGS. **7**A and **7**B illustrate a conductive coupling mechanism **218** that differs from the connectors discussed previously. The conductive coupling mechanism **218** can be incorporated into so as to be part of a hinge joint assembly **216** that mechanically couples the temple **214** to the frame **212**. Additionally, the coupling mechanism **218** can comprise a connector **270**A on the frame **212** and a connector **270**B on the temple **214**. The connector **270**A is configured to be electrically coupled to the connector **270**B in various different positions of the temple **214** relative to the frame **212**. These positions include the wearable position of FIG. **7**A, the folded position of FIG. **7**B, and intermediate positions therebetween. Thus, the glasses **210** provide the ability to supply charge from the battery **228** to the electronics **250** carried by the frame **212** when the glasses are in various positions including the folded position as well as the wearable position. This allows software and/or tasks to be performed by the electronics **250** even when the glasses are stowed.

FIG. **8** illustrates a smart eyewear kit **300** including, for example, a pair of smart glasses **310** and a container or holder such as a case **311**. As discussed with regard to previous embodiments, the glasses **310** can generally include a frame **312**, temples **314**A and **314**B, and electronics (as illustrated and discussed in previous embodiments); the details of each will not be discussed in great detail as aspects of these items have been previously described. The case **311** and glasses **310** can include electrical connectors **320** (FIG. **8**) in the example form of a base or internal connector **322** (FIG. **8**A) or port on the case **311** and a corresponding connector (not shown) on the glasses **310**.

As illustrated variously in FIGS. **8** and **8**A, the glasses **310**, the case **311** and a cable (e.g., external connector **42** of FIGS. **5** and **5**A) can interact together in various ways and for various purposes. For example, the case **311** can be used to transport and protect the glasses **310**, to charge or provide power to the electronics (including the battery housed in the temple **314**A) incorporated in the glasses **310**, and/or to communicate with the electronics of the glasses **310**. Thus, in some embodiments the case **311** can house a supplemental battery to those of the glasses **310**. Thus, the case **311** can be an external source of power for the glasses **310**.

The internal connector **322** of the case **311** is configured to couple to a corresponding connector of the glasses **310** (e.g., in a manner previously described such as in reference to FIGS. **5** and **5**A) for power and/or data communication when the temples **314**A and **314**B are in a folded position and docked in the case **311**. As such, the interior of the case **311** can be shaped to receive the glasses **310** only when the temples **314**A and **314**B are in the folded position. The shape of the interior also can be such that the connector (e.g., connector **20**B) of the glasses **310** interfaces directly with the internal connector **322** when the glasses are docked in the case **311** with little slippage or movement occurring between the case **311** and the glasses **312**. Although illustrated as pogo pin/pad connectors, the connectors can be of virtually any type known in the art for power and/or data communication such as micro-USB, or the like.

FIG. **8**A illustrates the internal connector **322** disposed in the interior of the case **311**. The interior of the case **311** is configured to dispose the connector of the temple **314**A (FIG. **8**) of the eyewear **312** to interface with and couple with the internal connector **322**. As illustrated, the internal connector **322** comprises a pad type connector design to interface with pogo pins on the temple **314**A although other types of connectors such as micro-USB are anticipated.

FIG. **9** shows smart glasses **410** according to another example embodiment. As discussed with regard to previous embodiments, the glasses **410** can generally include a frame **412**, temples **414**A and **414**B, and electronics (as illustrated and discussed in previous embodiments); the details of each will not be discussed in great detail as aspects of these items have been previously described.

The glasses **410** of the embodiment of FIG. **9** have electronics **416** that include a first battery **418**A and a second battery **418**B. The first battery **418**A is housed in and carried by the first temple **414**A and the second battery **418**B is housed in and carried by the second temple **414**B. Similar to previously discussed embodiments, the glasses **410** can include a conductive coupling mechanism (e.g., an interface or port) incorporated into the joint between each temple **414**A and **414**B and the frame **412** that allows power from the batteries **418**A and **418**B to be provided to the onboard electronics in the frame **412** when the temples **414**A and **414**B are in a wearable configuration (i.e. the position of temple **414**B) and when the eyewear article is in a folded or collapsed configuration (i.e., the position of temple **414**A). Power can be drawn from each battery **418**A and **418**B in substantially equal amounts (e.g., in parallel) and at substantially the same time in some embodiments. In other embodiments, the second battery **418**B can be used as a reserve battery and can provide power to the electronics when power provided by the first battery **418**A becomes lower than desired. In yet further embodiments, the first battery **418**A can provide power to the electronics when in

the wearable configuration and the second battery **418**B can provide power to the electronics in the folded or collapsed configuration.

Language

Throughout this specification, plural instances may implement components, operations, or structures described as a single instance. Although individual operations of one or more methods are illustrated and described as separate operations, one or more of the individual operations may be performed concurrently, and nothing requires that the operations be performed in the order illustrated. Structures and functionality presented as separate components in example configurations may be implemented as a combined structure or component. Similarly, structures and functionality presented as a single component may be implemented as separate components. These and other variations, modifications, additions, and improvements fall within the scope of the subject matter herein.

Although an overview of the inventive subject matter has been described with reference to specific example embodiments, various modifications and changes may be made to these embodiments without departing from the broader scope of embodiments of the present disclosure. Such embodiments of the inventive subject matter may be referred to herein, individually or collectively, by the term "invention" merely for convenience and without intending to voluntarily limit the scope of this application to any single disclosure or inventive concept if more than one is, in fact, disclosed.

The embodiments illustrated herein are described in sufficient detail to enable those skilled in the art to practice the teachings disclosed. Other embodiments may be used and derived therefrom, such that structural and logical substitutions and changes may be made without departing from the scope of this disclosure. The Detailed Description, therefore, is not to be taken in a limiting sense, and the scope of various embodiments is defined only by the appended claims, along with the full range of equivalents to which such claims are entitled.

As used herein, the term "or" may be construed in either an inclusive or exclusive sense. Moreover, plural instances may be provided for resources, operations, or structures described herein as a single instance. Additionally, boundaries between various resources, operations, modules, engines, and data stores are somewhat arbitrary, and particular operations are illustrated in a context of specific illustrative configurations. Other allocations of functionality are envisioned and may fall within a scope of various embodiments of the present disclosure. In general, structures and functionality presented as separate resources in the example configurations may be implemented as a combined structure or resource. Similarly, structures and functionality presented as a single resource may be implemented as separate resources. These and other variations, modifications, additions, and improvements fall within a scope of embodiments of the present disclosure as represented by the appended claims. The specification and drawings are, accordingly, to be regarded in an illustrative rather than a restrictive sense.

What is claimed is:

1. A wearable device comprising:

a frame configured to hold one or more optical elements, a temple connected to the frame at an articulated joint such that the temple is disposable between a collapsed condition and a wearable condition in which the device is wearable by a user to hold the one or more optical elements within user view;

onboard electronics components comprising at least a pair of electronics components carried by the frame and the temple respectively; and

a coupling mechanism that is incorporated in the articulated joint and that is configured to electrically connect the pair of electronics components across the articulated joint both when the temple is in the wearable condition and when the temple is in the collapsed condition;

wherein the coupling mechanism comprises a first connector on a first face of the temple and a second connector on a second face of the temple, wherein the articulated joint comprises a hinge assembly that is configured such that the first connector conductively contacts with a complementary connector on the frame when the temple is in the wearable condition, and such that the second connector conductively contacts a second complementary connector on the frame when the temple is in the collapsed condition.

2. The wearable device of claim **1**, wherein one of the pair of electronics components includes a battery carried by the temple.

3. The wearable device of claim **2**, further comprising a second temple, and wherein the second temple carries a second battery the second temple being connected to the frame by a second articulated joint, the device further comprising a second coupling mechanism incorporated in the second articulated joint for electrically connecting the second battery across the second articulated joint to at least one of the pair of electronics components carried by the frame.

4. The wearable device of claim **1**, wherein first connection comprises one of a pair of pins or pads and the second connection comprises one of a second pair of pins or pads.

5. The wearable device of claim **1**, wherein the coupling mechanism is further configured for coupling at least one of the pair of electronics components carried by the device to an external power source when the temple is in the collapsed condition.

6. The wearable device of claim **5**, wherein the at least one of the pair of electronics components comprises a battery carried by the temple.

7. The wearable device of claim **1**, wherein the at least a pair of electronics components comprises:

a battery configured to operationally store charge; and

a circuit coupled to the battery and configured to deliver a charge to and from the battery.

8. The wearable device of claim **1** wherein the at least a pair of electronics components comprises:

a computer; and

one or more of a camera, a microphone, a sensor, a display device, an indicator, a memory, an actuator, and a wireless module in communication with the computer.

9. The wearable device of claim **1**, wherein the coupling mechanism is configured to transfer both data signals and electrical power across the articulated joint.

10. A system including a wearable device, the system comprising:

eyewear comprising:

a frame, a temple, onboard electronics components comprising at least a pair of electronics components carried by the temple and frame respectively, a coupling mechanism that is incorporated in an articulated joint between the temple and the frame, the coupling mechanism is configured to electrically connect the pair of electronics components across the

articulated joint both when the temple is in the wearable condition and when the temple is in the collapsed condition; and

a case configured to receive the frame and the temple therein with the temple disposed in the collapsed condition, the case including a connector configured to couple to the coupling mechanism of the eyewear, the case configured to charge at least one of the at least the pair of electronics components.

11. The system of claim **10**, further comprising:

a cable with a connector configured to couple to the coupling mechanism of the eyewear when the temple is disposed in the folded position, wherein the cable is configured to couple with an external source of power, data, or power and data for at least one of at least the pair of electronics components carried by the eyewear.

12. The system of claim **10**, wherein at least one of the at least the pair of electronics components comprise:

a computer; and

one or more of a camera, microphone, a sensor, a display device, an indicator, a memory, an actuator, and a wireless module in communication with the computer.

13. The system of claim **10**, further comprising a second temple, and wherein the second temple carries a second battery the second temple being connected to the frame by a second articulated joint, the device further comprising a second coupling mechanism incorporated in the second articulated joint for electrically connecting the second battery across the second articulated joint to at least one of the pair of electronics components carried by the frame.

14. The system of claim **10**, wherein the coupling mechanism comprises sets of pins or pads on at least two faces of the temple and complementary sets of pins or pads on one or more faces of the frame.

15. A wearable device comprising:

a frame configured to hold one or more optical elements, a temple connected to the frame at an articulated joint such that the temple is disposable between a collapsed condition and a wearable condition in which the device is wearable by a user to hold the one or more optical elements within user view;

one or more onboard electronics components carried by the frame and a battery carried by the temple; and

a coupling mechanism that is incorporated in the articulated joint and that is configured to electrically connect the battery with the one or more electronics components across the articulated joint both when the temple is in the wearable condition and when the temple is in the collapsed condition;

wherein the coupling mechanism comprises a first connector on a first face of the temple and a second connector on a second face of the temple, wherein the articulated joint comprises a hinge assembly that is configured such that the first connector conductively contacts with a complementary connector on the frame when the temple is in the wearable condition, and such that the second connector conductively contacts a second complementary connector on the frame when the temple is in the collapsed condition, and wherein the coupling mechanism is configured such that the battery is electrically disconnected from the one or more electronics components across the articulated joint when the temple is in a partially folded condition.

16. The wearable device of claim **15**, further comprising a second temple, and wherein the second temple carries a second battery the second temple being connected to the frame by a second articulated joint, the device further comprising a second coupling mechanism incorporated in the second articulated joint for electrically connecting the second battery across the second articulated joint to at least one of the pair of electronics components carried by the frame.

17. The wearable device of claim **15**, wherein the coupling mechanism comprises one of a pair of pins or pads and the second connection comprises one of a second pair of pins or pads.

18. The wearable device of claim **15**, wherein the first face of the temple defines a plane that is generally transverse to a plane defined by the second face of the temple, and wherein the complementary connectors on the frame are located at faces with planes that with substantially align with one another.

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