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UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.	IPVCP003X1C4X1C1
First Named Inventor	HOWELL et al.
Title	SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PER
Priority Mail Express® Label No.	

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

1. [✔] **Fee Transmittal Form** (PTO/SB/17 or equivalent)
2. [ ] **Applicant asserts small entity status.** See 37 CFR 1.27
3. [ ] **Applicant certifies micro entity status.** See 37 CFR 1.29. Applicant must attach form PTO/SB/15A or B or equivalent.
4. [✔] **Specification** [*Total Pages* 74] Both the claims and abstract must start on a new page. *(See MPEP § 608.01(a) for information on the preferred arrangement)*
5. [✔] **Drawing(s)** (35 U.S.C. 113) [*Total Sheets* 20]
6. **Inventor's Oath or Declaration** [*Total Pages* 4] *(including substitute statements under 37 CFR 1.64 and assignments serving as an oath or declaration under 37 CFR 1.63(e))*
   a. [ ] Newly executed (original or copy)
   b. [✔] A copy from a prior application (37 CFR 1.63(d))
7. [✔] **Application Data Sheet** ** See note below.* See 37 CFR 1.76 (PTO/AIA/14 or equivalent)
8. **CD-ROM or CD-R** in duplicate, large table, or Computer Program (*Appendix*)
   [ ] Landscape Table on CD
9. **Nucleotide and/or Amino Acid Sequence Submission** (*if applicable, items a. – c. are required*)
   a. [ ] Computer Readable Form (CRF)
   b. [ ] Specification Sequence Listing on:
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ACCOMPANYING APPLICATION PAPERS

10. [ ] **Assignment Papers** (cover sheet & document(s))
    Name of Assignee _____
11. [✔] **37 CFR 3.73(c) Statement** (*when there is an assignee*) [✔] **Power of Attorney**
12. [ ] **English Translation Document** (*if applicable*)
13. [✔] **Information Disclosure Statement** (PTO/SB/08 or PTO-1449)
    [ ] Copies of citations attached
14. [ ] **Preliminary Amendment**
15. [ ] **Return Receipt Postcard** (*MPEP § 503*) (*Should be specifically itemized*)
16. [ ] **Certified Copy of Priority Document(s)** (*if foreign priority is claimed*)
17. [ ] **Nonpublication Request** Under 35 U.S.C. 122(b)(2)(B)(i). Applicant must attach form PTO/SB/35 or equivalent.
18. [ ] **Other:** _____

Note*: (1) Benefit claims under 37 CFR 1.78 and foreign priority claims under 1.55 **must be included in an Application Data Sheet (ADS).
(2) For applications filed under 35 U.S.C. 111, the application must contain an ADS specifying the applicant if the applicant is an assignee, person to whom the inventor is under an obligation to assign, or person who otherwise shows sufficient proprietary interest in the matter. See 37 CFR 1.46(b).

19. CORRESPONDENCE ADDRESS

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Signature	/C. Douglass Thomas/	Date	October 2, 2023
Name (Print/Type)	C. Douglass Thomas	Registration No. (Attorney/Agent)	32947

This collection of information is required by 37 CFR 1.53(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
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SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC APPARATUS

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation of U.S. Patent Application No. 16/182,969, filed November 7, 2018, and entitled "EYEWEAR HOUSING FOR CHARGING EMBEDDED BATTERY IN EYEWEAR FRAME" which is incorporated herein by reference, which in turn is a continuation of U.S. Patent Application No. 16/127,957, now U.S. Patent No. 11,086,147, filed September 11, 2018, and entitled "EYEWEAR SUPPORTING ELECTRICAL COMPONENTS AND APPARATUS THEREFOR" which is incorporated herein by reference, which in turn is a continuation of U.S. Patent Application No. 14/715,501, now U.S. Patent No. 10,330,956, filed May 18, 2015, and entitled "EYEWEAR SUPPORTING ELECTRICAL COMPONENTS AND APPARATUS THEREFOR" which is incorporated herein by reference, which in turn is a continuation of U.S. Patent Application No. 13/367,346, filed February 6, 2012, now U.S. Patent No. 9,033,493, and entitled "EYEWEAR SUPPORTING ELECTRICAL COMPONENTS AND APPARATUS THEREFOR" which is incorporated herein by reference, which in turn is a continuation of U.S. Patent Application No. 12/462,286, filed July 31, 2009, now U.S. Patent No. 8,109,629, and entitled "EYEWEAR SUPPORTING ELECTRICAL COMPONENTS AND APPARATUS THEREFOR" which is incorporated herein by reference, which in turn is a continuation of U.S. Patent Application No. 11/580,222, filed October 11, 2006, now U.S. Patent No. 7,581,833, and entitled "EYEWEAR SUPPORTING AFTER-MARKET ELECTRICAL COMPONENTS" which is hereby incorporated herein by reference.

[0002] This application and U.S. Patent Application No. 11/580,222 references U.S. Patent Application No. 11/183,269, filed July 15, 2005, now U.S. Patent No. 7,922,321, and entitled "EYEGLASSES SUPPORTING AFTER MARKET ELECTRICAL COMPONENTS," which is hereby incorporated herein by reference, which references U.S. Patent Application No. 10/964,011, filed October 12, 2004,

now U.S. Patent No. 7,192,136, and entitled "TETHERED ELECTRICAL COMPONENTS FOR EYEGLASSES" which is hereby incorporated herein by reference, which in turn references each of: (i) U.S. Provisional Patent Application No. 60/509,631, filed October 9, 2003, and entitled "TETHERED ELECTRICAL COMPONENTS FOR EYEGLASSES," which is hereby incorporated herein by reference; (ii) U.S. Provisional Patent Application No. 60/527,565, filed December 8, 2003, and entitled "ADAPTABLE COMMUNICATION TECHNIQUES FOR ELECTRONIC DEVICES," which is hereby incorporated herein by reference; (iii) U.S. Provisional Patent Application No. 60/562,798, filed April 15, 2004, entitled "EYEWEAR WITH ULTRAVIOLET DETECTION SYSTEM," and which is hereby incorporated herein by reference; (iv) U.S. Provisional Patent Application No. 60/583,169, filed June 26, 2004, entitled "ELECTRICAL COMPONENTS FOR USE WITH EYEWEAR, AND METHODS THEREFOR," and which is hereby incorporated herein by reference; (v) U.S. Provisional Patent Application No. 60/592,045, filed July 28, 2004, entitled "EYEGLASSES WITH A CLOCK OR OTHER ELECTRICAL COMPONENT," and which is hereby incorporated herein by reference; and (vi) U.S. Provisional Patent Application No. 60/605,191, filed August 28, 2004, entitled "ELECTRICAL COMPONENTS FOR USE WITH EYEWEAR, AND METHODS THEREFOR," and which is hereby incorporated herein by reference.

[0003] This application and U.S. Patent Application No. 11/580,222 also claim priority to each of: (i) U.S. Provisional Patent Application No. 60/725,999, filed October 11, 2005, and entitled "EYEWEAR SUPPORTING AFTER-MARKET ELECTRICAL COMPONENTS," which is hereby incorporated herein by reference; (ii) U.S. Provisional Patent Application No. 60/725,896, filed October 11, 2005, and entitled "EYEGLASSES WITH ELECTRICAL COMPONENTS," which is hereby incorporated herein by reference; (iii) U.S. Provisional Patent Application No. 60/787,850, filed April 1, 2006, and entitled "EYEGLASSES WITH A HEART RATE MONITOR," which is hereby incorporated herein by reference; and (iv) U.S. Provisional Patent Application No. 60/846,150, filed September 20, 2006, and

entitled "EYEGLASSES WITH ACTIVITY MONITORING," which is hereby incorporated herein by reference.

[0004] This application, by way of U.S. Patent Application No. 16/182,969, is a continuation of U.S. Patent Application No. 16/049,120, filed July 30, 2018, and entitled "EYEWEAR SUPPORTING EMBEDDED ELECTRONIC COMPONENTS," which is hereby incorporated herein by reference, which in turn is a continuation of U.S. Patent Application No. 15/375,423, filed December 12, 2016, and entitled "EYEWEAR SUPPORTING EMBEDDED ELECTRONIC COMPONENTS," which is hereby incorporated herein by reference, which in turn is a continuation of U.S. Patent Application No. 14/557,409, filed December 1, 2014, and entitled "EYEWEAR SUPPORTING EMBEDDED ELECTRONIC COMPONENTS," now U.S. Patent No. 9,547,184, which is hereby incorporated herein by reference, which in turn is a continuation of U.S. Patent Application No. 13/955,336, filed July 31, 2013, and entitled "EYEWEAR SUPPORTING BONE CONDUCTING SPEAKER," now U.S. Patent No. 8,905,542, which is hereby incorporated herein by reference, which in turn is a continuation of U.S. Patent Application No 13/085,402, filed April 12, 2011, and entitled "EYEWEAR SUPPORTING AFTER-MARKET ELECTRICAL COMPONENTS," now U.S. Patent No. 8,500,271, which is hereby incorporated herein by reference, which in turn references U.S. Patent Application No. 11/183,269, filed July 15, 2005, and entitled "EYEWEAR SUPPORTING AFTER-MARKET ELECTRICAL COMPONENTS," now U.S. Patent No. 7,922,321, which is hereby incorporated herein by reference, which in turn references U.S. Patent Application No. 10/964,011, filed October 12, 2004, and entitled "TETHERED ELECTRICAL COMPONENTS FOR EYEGLASSES," now U.S. Patent No. 7,192,136, which in turn references each of: (i) U.S. Provisional Patent Application No. 60/509,631, filed October 9, 2003, and entitled "TETHERED ELECTRICAL COMPONENTS FOR EYEGLASSES," which is hereby incorporated herein by reference; (ii) U.S. Provisional Patent Application No. 60/527,565, filed December 8, 2003, and entitled "ADAPTABLE COMMUNICATION TECHNIQUES FOR ELECTRONIC DEVICES," which is hereby incorporated herein by reference; (iii)

U.S. Provisional Patent Application No. 60/562,798, filed April 15, 2004, entitled "EYEWEAR WITH ULTRAVIOLET DETECTION SYSTEM," which is hereby incorporated herein by reference; (iv) U.S. Provisional Patent Application No. 60/583,169, filed June 26, 2004, entitled "ELECTRICAL COMPONENTS FOR USE WITH EYEWEAR, AND METHODS THEREFOR," which is hereby incorporated herein by reference; and (v) U.S. Provisional Patent Application No. 60/592,045, filed July 28, 2004, entitled "EYEGLASSES WITH A CLOCK OR OTHER ELECTRICAL COMPONENT," which is hereby incorporated herein by reference; and (vi) U.S. Provisional Patent Application No. 60/605,191, filed August 28, 2004, entitled "ELECTRICAL COMPONENTS FOR USE WITH EYEWEAR, AND METHODS THEREFOR," which is hereby incorporated herein by reference.

[0005] This application, by way of U.S. Patent Application No. 11/183,269, also references each of: (i) U.S. Provisional Patent Application No. 60/592,045, filed July 28, 2004, entitled "EYEGLASSES WITH A CLOCK OR OTHER ELECTRICAL COMPONENT," which is hereby incorporated herein by reference; (ii) U.S. Provisional Patent Application No. 60/605,191, filed August 28, 2004, entitled "ELECTRICAL COMPONENTS FOR USE WITH EYEWEAR, AND METHODS THEREFOR," which is hereby incorporated herein by reference; (iii) U.S. Provisional Patent Application No. 60/618,107, filed October 12, 2004, and entitled "TETHERED ELECTRICAL COMPONENTS FOR EYEGLASSES," which is hereby incorporated herein by reference; (iv) U.S. Provisional Patent Application No. 60/620,238, filed October 18, 2004, entitled "EYEGLASSES WITH HEARING ENHANCED AND OTHER AUDIO SIGNAL-GENERATING CAPABILITIES," which is hereby incorporated herein by reference; (v) U.S. Provisional Patent Application No. 60/647,836, filed January 31, 2005, and entitled "EYEGLASSES WITH HEART RATE MONITOR," which is hereby incorporated herein by reference; and (vi) U.S. Provisional Patent Application No. 60/647,826, filed January 31, 2005, and entitled "EYEWEAR WITH ELECTRICAL COMPONENTS," which is hereby incorporated herein by reference.

[0006] This application, by way of U.S. Patent Application No. 16/182,969, is a continuation of U.S. Patent Application No. 15/409,723, filed January 19, 2017, and entitled "EYEWEAR HOUSING FOR CHARGING EMBEDDED BATTERY IN EYEWEAR FRAME" which is hereby incorporated herein by reference, which in turn is a continuation of U.S. Patent Application No. 13/831,512, filed March 14, 2013, and entitled "EYEWEAR SUPPORTING AFTER-MARKET ELECTRICAL COMPONENTS" which is hereby incorporated herein by reference, which in turn is a continuation of U.S. Patent Application No. 12/806,312, filed August 10, 2010, and entitled "EYEWEAR WITH MULTI-PART TEMPLE FOR SUPPORTING ONE OR MORE ELECTRICAL COMPONENTS" (now U.S. Patent No. 8,465,151) which is hereby incorporated herein by reference, which in turn is a continuation-in-part of U.S. Patent Application No. 12/462,286, filed July 31, 2009, and entitled "EYEWEAR SUPPORTING ELECTRICAL COMPONENTS AND APPARATUS THEREFOR" (now U.S. Patent No. 8,109,629) which is hereby incorporated herein by reference, which in turn is a continuation of U.S. Patent Application No. 11/580,222, filed October 11, 2006, and entitled "EYEWEAR SUPPORTING AFTER-MARKET ELECTRICAL COMPONENTS" (now U.S. Patent No. 7,581,833) which is hereby incorporated herein by reference.

[0007] This application, by way of U.S. Patent Application No. 10/964,011, also references each of: (i) U.S. Provisional Patent Application No. 60/509,631, filed October 9, 2003, and entitled "TETHERED ELECTRICAL COMPONENTS FOR EYEGLASSES," which is hereby incorporated herein by reference; (ii) U.S. Provisional Patent Application No. 60/527,565, filed December 8, 2003, and entitled "ADAPTABLE COMMUNICATION TECHNIQUES FOR ELECTRONIC DEVICES," which is hereby incorporated herein by reference; (iii) U.S. Provisional Patent Application No. 60/562,798, filed April 15, 2004, entitled "EYEWEAR WITH ULTRAVIOLET DETECTION SYSTEM," and which is hereby incorporated herein by reference; (iv) U.S. Provisional Patent Application No. 60/583,169, filed June 26, 2004, entitled "ELECTRICAL COMPONENTS FOR USE WITH EYEWEAR, AND METHODS THEREFOR," and which is hereby incorporated herein by reference; (v)

U.S. Provisional Patent Application No. 60/592,045, filed July 28, 2004, entitled "EYEGLASSES WITH A CLOCK OR OTHER ELECTRICAL COMPONENT," and which is hereby incorporated herein by reference; and (vi) U.S. Provisional Patent Application No. 60/605,191, filed August 28, 2004, entitled "ELECTRICAL COMPONENTS FOR USE WITH EYEWEAR, AND METHODS THEREFOR," and which is hereby incorporated herein by reference.

[0008] This application via U.S. Patent Application No. 12/806,312 is also a continuation-in-part of U.S. Patent Application No. 12/317,043, filed December 18, 2008, and entitled "EYEGLASSES WITH MONITORING CAPABILITY," (now U.S. Patent No. 7,771,046) which is hereby incorporated herein by reference, which in turn is a continuation of U.S. Patent Application No. 12/214,435, filed June 19, 2008, and entitled "EYEGLASSES WITH USER MONITORING," (now U.S. Patent No. 7,481,531), which is hereby incorporated herein by reference, which in turn is a continuation of U.S. Patent Application No. 11/891,411, filed August 9, 2007, and entitled "EYEGLASSES WITH ACTIVITY MONITORING" (now U.S. Patent No. 7,401,918), which is hereby incorporated herein by reference, which in turn references U.S. Patent Application No. 11/183,276, filed July 15, 2005, and entitled "EYEGLASSES WITH ACTIVITY MONITORING" (now U.S. Patent No. 7,255,437), which is hereby incorporated herein by reference, which in turn references U.S. Patent Application No. 10/964,011, filed October 12, 2004, and entitled "TETHERED ELECTRICAL COMPONENTS FOR EYEGLASSES" (now U.S. Patent No. 7,192,136), which is hereby incorporated herein by reference.

[0009] This application via U.S. Patent Application No. 11/183,276 also references each of: (i) U.S. Provisional Patent Application No. 60/592,045, filed July 28, 2004, entitled "EYEGLASSES WITH A CLOCK OR OTHER ELECTRICAL COMPONENT," and which is hereby incorporated herein by reference; (ii) U.S. Provisional Patent Application No. 60/605,191, filed August 28, 2004, entitled "ELECTRICAL COMPONENTS FOR USE WITH EYEWEAR, AND METHODS THEREFOR," and which is hereby incorporated herein by reference; (iii) U.S. Provisional Patent Application No. 60/618,107, filed October 12, 2004, and entitled

"TETHERED ELECTRICAL COMPONENTS FOR EYEGLASSES," which is hereby incorporated herein by reference; (iv) U.S. Provisional Patent Application No. 60/620,238, filed October 18, 2004, entitled "EYEGLASSES WITH HEARING ENHANCED AND OTHER AUDIO SIGNAL-GENERATING CAPABILITIES," and which is hereby incorporated herein by reference; (v) U.S. Provisional Patent Application No. 60/647,836, filed January 31, 2005, and entitled "EYEGLASSES WITH HEART RATE MONITOR," which is hereby incorporated herein by reference; and (vi) U.S. Provisional Patent Application No. 60/647,826, filed January 31, 2005, and entitled "EYEWEAR WITH ELECTRICAL COMPONENTS," which is hereby incorporated herein by reference.

[0010] This application via U.S. Patent Application No. 12/806,312 also references U.S. Patent Application No. 10/822,218, filed April 12, 2004, and entitled "EYEGLASSESS FOR WIRELESS COMMUNCIATIONS," (now U.S. Patent No. 7,792,552, which is hereby incorporated herein by reference, which in turn references each of: (i) U.S. Provisional Patent Application No. 60/462,591, filed April 15, 2003, and entitled "EYEGLASSES FOR WIRELESS COMMUNICATION," which is hereby incorporated herein by reference; (ii) U.S. Provisional Patent Application No. 60/509,631, filed October 9, 2003, and entitled "TETHERED ELECTRICAL COMPONENTS FOR EYEGLASSES," which is hereby incorporated herein by reference; and (iii) U.S. Provisional Patent Application No. 60/527,565, filed December 8, 2003, and entitled "ADAPTABLE COMMUNICATION TECHNIQUES FOR ELECTRONIC DEVICES," which is hereby incorporated herein by reference.

[0011] In addition, this application is related to each of: (i) U.S. Patent Application 10/822,218, filed April 12, 2004, and entitled "EYEGLASSES FOR WIRELESS COMMUNICATIONS," which is hereby incorporated herein by reference; (ii) U.S. Patent Application No. 10/964,011, filed October 12, 2004, and entitled "TETHERED ELECTRICAL COMPONENTS FOR EYEGLASSES," which is hereby incorporated herein by reference; (iii) U.S. Patent Application No. 11/006,343, filed December 7, 2004, and entitled "ADAPTABLE COMMUNICATION TECHNIQUES FOR ELECTRONIC DEVICES," (now U.S. Patent No. 7,116,976) which is hereby

incorporated herein by reference; (iv) U.S. Patent Application No. 11/078,855, filed March 11, 2005, and entitled "EYEWEAR WITH RADIATION DETECTION SYSTEM," (now U.S. Patent No. 7,500,746) which is hereby incorporated herein by reference; (v) U.S. Patent Application No. 11/078,857, filed March 11, 2005, and entitled "RADIATION MONITORING SYSTEM," which is hereby incorporated herein by reference; (vi) U.S. Patent Application No. 11/183,283, filed July 15, 2005, and entitled "EVENT EYEGLASSES," which is hereby incorporated herein by reference; (vii) U.S. Patent Application No. 11/183,262, filed July 15, 2005, and entitled "EYEGLASSES WITH HEARING ENHANCED AND OTHER AUDIO SIGNAL-GENERATING CAPABILITIES," (now U.S. Patent No. 7,760,898) which is hereby incorporated herein by reference; (viii) U.S. Patent Application No. 11/183,256, filed July 15, 2005, and entitled "EYEGLASSES WITH ELECTRICAL COMPONENTS," (now U.S. Patent No. 7,500,747) which is hereby incorporated herein by reference; (ix) U.S. Patent Application No. 11/183,263, filed July 15, 2005, and entitled "EYEGLASSES WITH A CLOCK OR OTHER ELECTRICAL COMPONENT," (now U.S. Patent No. 7,380,936) which is hereby incorporated herein by reference; (x) U.S. Patent Application No. 11/183,276, filed July 15, 2005, and entitled "EYEGLASSES WITH ACTIVITY MONITORING," now U.S. Patent No. 7,255,437) which is hereby incorporated herein by reference; and (xi) U.S. Patent Application No. 11/546,685, filed October 11, 2006, and entitled "EYEGLASSES HAVING A CAMERA", (now U.S. Patent No. 7,806,525) which is hereby incorporated herein by reference.

BACKGROUND OF THE INVENTION

[0012] Traditionally, eyeglasses have not contained or made any use of electrical components. In recent years, attempts to include electrical components within eyeglasses have had limited success. Even incorporating a small electrical component, such as a microphone, into an eyeglass frame may not be a simple task because, for example, of the necessary electrical connections with the electrical component. Clearly, larger scale electrical components would be more difficult to be provided in or attached to eyeglass frames. Many eyeglass frames tend to be very compact and lightweight and thus may not have a lot of space for electrical components. Moreover, since eyeglass frames are often fashionable items whose designs are important, there are substantial design tradeoffs involved with providing or attaching electrical components to eyeglass frames.

[0013] Even if electrical components are provided in an eyeglass frame, the ability to alter or change electrical components is problematic. Conventionally, once an eyeglass frame is manufactured, electrical components embedded in the eyeglass frame may not be removed, nor can addition electrical components be added into the eyeglass frame. Attachment of electrical components to eyeglass frames has not proven to be reliable, design friendly or commercially successful. Hence, there is a need for improved approaches to facilitate modifications or alterations to electrical components used with eyeglasses.

[0014] Typically, to participate in wireless communications, a user holds a mobile phone (e.g., wireless or a cellular phone) against his ear to hear an audio communication received in a wireless manner. The user usually also speaks towards a microphone embedded in the mobile phone to participate in the audio communication, again in a wireless manner. More recently, to facilitate hands-free operation of mobile phones, head-sets have been produced and utilized. Typically, a headset clips over or into an ear of the user to provide a speaker and a microphone in proximity to the ear and the mouth, respectively, of the user. Traditionally, the head-set was connected to the mobile phone by a cord (i.e., wire).

In recent times, head-sets have been developed to operate in a wireless manner, without the need of a cord connected to the mobile phone. For example, one popular type of wireless head-set uses Bluetooth wireless transmissions to communicate between the head-set and the corresponding mobile phone.

[0015] Mobile phones often support both voice calls and text messaging. When the user does not make use of a head-set, the user often holds the mobile phone against their ear when participating in a voice call. One problem this presents is that the user is not able to see the screen of the mobile phone. As a result, the user has difficultly interacting with the keypad or screen of the mobile phone when the mobile phone is held against the user's head. Alternatively, when the user of a mobile phone makes use of a head-set, the user can receive and participate in voice calls in a hands-free manner. Unfortunately, however, the user would need to view a screen of the mobile phone to participate in text messaging.

[0016] Accordingly, there is a need for improved wireless communication techniques for users of mobile communication devices.

SUMMARY

[0017] Generally speaking, the invention pertains to techniques for providing eyewear or other head-worn personal electronic apparatus with electrical components. The electrical components can provide electrical technology to eyewear (e.g., eyeglasses) or other head-worn personal electronic apparatus without having to substantially compromise aesthetic design principles of the eyewear. The electrical components can operate independently or together with other electrical components provided elsewhere. Apparatus can also be provided to present after-market electrical components.

[0018] The electrical components can support signal capturing, signal processing, signal transmission, signal display, signal storage and/or power provision. The signals can be, for example, analog or digital signals. The electrical components can, for example, be used to provide audio output and/or audio pick-up. The electrical components may include and/or control one or more sensors to monitor and/or signal the conditions of a user of the eyewear. The electrical components may also include and/or control one or more operation indicators to signal operational status of at least some other electrical components. In addition, the electrical components can be or pertain to a circuit board or module, which includes a plurality of electrical components.

[0019] The invention can be implemented in numerous ways, including a method, system, device, apparatus, and a computer readable medium. Several embodiments of the invention are discussed below.

[0020] Other aspects and advantages of the invention will become apparent from the following detailed description taken in conjunction with the accompanying drawings which illustrate, by way of example, the principles of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021] The invention will be readily understood by the following detailed description in conjunction with the accompanying drawings, wherein like reference numerals designate like structural elements, and in which:

[0022] FIG. 1 is a perspective view of a pair of glasses according to one embodiment of the invention.

[0023] FIG. 2 illustrates a diagram of a number of different embodiments of temple arrangements according to the invention.

[0024] FIG. 3A is a diagram of a temple arrangement according to one embodiment of the invention.

[0025] FIG. 3B is a diagram of a temple cover that at least partially covers a temple (e.g., temple and/or temple tip) according to one embodiment of the invention.

[0026] FIG. 3C is a diagram of a fit-over temple that at least partially fits over a temple (e.g., temple and/or temple tip) according to one embodiment of the invention.

[0027] FIG. 3D and 3E are diagrams of a temple arrangement according to another embodiment of the invention.

[0028] FIGs. 3F-3H are diagrams of exemplary multi-part temples according to different embodiments of the invention.

[0029] FIGs. 3I-3K are diagrams of exemplary rearward portions of multi-part temples according to several embodiments of the invention.

[0030] FIGs. 3L-3O are diagrams of exemplary forward portions of multi-part temples according to several embodiments of the invention.

[0031] FIG. 3P is a diagram of an eyewear products display apparatus according to one embodiment of the invention.

[0032] FIG. 4 shows examples of different electrical components according to the invention.

[0033] FIG. 5 is a chart that depicts examples of sensors suitable for use according to the invention.

[0034] FIG. 6 illustrates a diagram of a number of different embodiments of temple adapters according to the invention.

[0035] FIG. 7A is a diagram of a temple adapter according to one embodiment of the invention.

[0036] FIG. 7B is a diagram of a temple adapter according to another embodiment of the invention.

[0037] FIGs. 8A and 8B are diagrams of a temple adapter according to another embodiment of the invention.

[0038] FIG. 9A is a diagram of a temple adapter according to one embodiment of the invention.

[0039] FIGs. 9B and 9C are diagrams of a temple adapter according to another embodiment of the invention.

[0040] FIG. 9D is a diagram of a temple adapter according to still another embodiment of the invention.

[0041] FIGs. 10A-10C are diagrams of a temple having a bone conducting element according to still other embodiments of the invention.

[0042] FIG. 11A illustrates a pair of glasses according to one embodiment of the invention.

[0043] FIG. 11B illustrates a pair of glasses according to another embodiment of the invention.

[0044] FIGs. 12A-12E illustrate a side view of eyeglass frames having an extended temples according to several embodiment of the invention.

[0045] FIG. 13A illustrates a temple having multiple parts according to one embodiment of the invention.

[0046] FIG. 13B illustrates a portion of an eyeglass frame according to one embodiment of the invention.

[0047] FIG. 13C illustrates a portion of an eyeglass frame according to another embodiment of the invention.

DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS OF THE INVENTION

[0048] The invention pertains to techniques for providing eyewear or other head-worn personal electronic apparatus with electrical components. The electrical components can provide electrical technology to eyewear (e.g., eyeglasses) or other head-worn personal electronic apparatus without having to substantially compromise aesthetic design principles of the eyewear. The electrical components can operate independently or together with other electrical components provided elsewhere. Apparatus can also be provided to present after-market electrical components.

[0049] One aspect of the invention relates to temple arrangements for use with eyeglasses. According to this aspect, a temple arrangement includes one or more electrical components. The one or more electrical components are attached to or at least partially embedded in the temple arrangement.

[0050] Another aspect of the invention relates to a temple adapter for use with eyeglasses. According to this aspect, a temple adapter includes one or more electrical components that are able to be mechanically (and optionally electrically) coupled to a temple (including a temple tip) of the eyeglasses.

[0051] Still another aspect of the invention relates to one or more swappable temple portions for a pair of glasses. In one aspect, a temple has a forward portion and a rearward portion which can removably couple to one another. In one embodiment, different rearward portions can be used with the same forward portion. In other words, the different rearward portions can be swapped with one another. In one implementation, the different rearward portions can offer different electrical components/functionalities to the pair of glasses. For example, the different rearward portions can provide different electrical components/functionalities such as: battery/power, wireless communication, radio, headset, GPS, pedometer, sun sensor, hearing enhancement, image/video capturing, etc. In another embodiment, different forward portions can be used with the same rearward portion.

[0052] The electrical components can support signal capturing, signal processing, signal transmission, signal display, signal storage and/or power

provision. The signals can be, for example, analog or digital signals. The electrical components can, for example, be used to provide audio output and/or audio pick-up. The electrical components may include and/or control one or more sensors to monitor and/or signal the conditions of a user of the eyewear. The electrical components may also include and/or control one or more operation indicators to signal operational status of at least some other electrical components. In addition, the electrical components can be or pertain to a circuit board or module, which includes a plurality of electrical components.

[0053] Embodiments of different aspects of the invention are discussed below with reference to FIGs. 1 – 13C. However, those skilled in the art will readily appreciate that the detailed description given herein with respect to these figures is for explanatory purposes as the invention extends beyond these limited embodiments.

[0054] FIG. 1 is a perspective view of a pair of glasses 100 according to one embodiment of the invention. The glasses 100 include a frame and a pair of lenses 102. The frame has lens holders 104 that hold the lenses 102 in position. The frame also has a bridge 106. The glasses 100 further include a pair of temples (or arms) 108. The temples 108 are considered part of the frame. As shown in FIG. 1, each of the temples 108 is coupled to one of the lens holders 104 by a hinge 109. In one embodiment, the temples 108 can be removed from the frame (e.g., at the hinge 109).

[0055] In addition, temple arrangements 110 are attached to the temples 108. Here, one or both of the temples 108 can include a temple arrangement 110. A temple arrangement 110 can include one or more electrical components 112. In one embodiment, the temple arrangements 110 can be considered separate parts that can be attached to respective temples 108. Once attached, the temple arrangements 110 can be considered part of, or an extension to, the temples 108.

[0056] By having one or more electrical components 112 in one or more of the temple arrangements 110, electrical capabilities can be provided to the glasses 100

without burdensome impact to the design of other parts of the frames. Moreover, by providing electrical components in one or more of the temple arrangements 112, electrical capabilities can be added to eyeglasses in an after-market manner. Still further, by replacing temple arrangements, a user could alter the electrical capabilities of his eyeglasses.

[0057] In one embodiment, the glasses 100 do not have any other embedded electrical components, such as within the frame, except those in one or both of the temple arrangements 112. In another embodiment, the glasses 100 include one or more other electrical components embedded or attached to the frame of the glasses 100 and the components are electrically coupled to the one or more electrical components 112 in one or both of the temple arrangements 110.

[0058] In different embodiments, the glasses 100 can be, for example, a pair of sunglasses, fit-over glasses, prescription glasses, reading glasses, or safety glasses.

[0059] FIG. 2 illustrates a diagram of a number of different embodiments of temple arrangements 200 according to the invention. A temple arrangement 200 can be a temple tip, a temple fit-over, or a temple cover. In one embodiment, a temple tip is a structure that attaches to a rearward portion of a temple. In one embodiment, a temple tip can pertain to an enclosure that grabs onto a rearward portion of a temple. A temple tip is particularly common for wire frame eyeglass where the temple tip attaches to the rearward end of the temple and provides a surface suitable for positioning proximate to the user's ear. For example, FIG. 1 illustrates the temple arrangement 112 implemented as a temple tip.

[0060] In one embodiment, a temple tip is removable from its corresponding temple so that it can be replaced. The temple tip can be originally provided with the purchase of a pair of eyeglasses. Alternatively, the temple tip can be a replacement part that can be purchased separately and subsequently mounted onto a rearward portion of a temple of a pair of eyeglasses after removing any original temple tip. In

another embodiment, a temple tip is permanently held onto the corresponding temple, for example, by an adhesive (e.g., epoxy, glue, etc.).

[0061] In one embodiment, a temple fit-over fits over at least a portion of the rearward end of a temple. If the rearward end of the temple has a temple tip, at least a portion of the temple tip can be fitted over by the temple fit-over. In one embodiment, a temple cover slides over and at least partially covers a portion of the rearward end of a temple. If the rearward end of the temple has a temple tip, at least a portion of the temple tip can be covered by the temple cover.

[0062] A temple cover is typically made of a material that is more flexible than a temple fit-over. For example, a temple cover can be made of a fabric or other materials, such as a sock or sleeve; while a temple fit-over can be made of plastic.

[0063] A temple arrangement 200 can be made of the same or different materials than the temple or other parts of the frame of the pair of eyeglasses. To illustrate, a pair of glasses with a metal frame can have non-metallic temple tips. A temple arrangement 200 can be of a color that is the same as, or similar to, or different from, that of the temple.

[0064] A temple arrangement 200 can be held onto a temple by frictional force. For example, if the temple arrangement 200 is a temple fit-over, it can be held onto an existing temple or temple tip by frictional force. Here, the temple fit-over is often removable. In another embodiment, the temple arrangement 200 can be permanently held onto its corresponding temple or temple tip. For example, the temple arrangement can be permanently held onto the corresponding temple or temple tip, for example, by an adhesive (e.g., epoxy, glue, etc.).

[0065] Depending on applications, a temple arrangement can be of different shapes. The shape can depend on the type of glasses. For example, a temple arrangement for fit-over glasses can be bigger than a temple arrangement for prescription glasses. The shape of the temple arrangement can also depend on applications for the electronic component(s) that are fully or partially embedded in

the temple arrangement. Of course, aesthetic reasons can also influence shape (e.g., design, size, style) of a temple arrangement.

[0066] In one embodiment, the temple arrangement is a structure that has at least one electrical component attached thereto or at least partially embedded therein. In another embodiment, all of the electrical components to be provided with the temple arrangement are at least partially embedded in the temple arrangement.

[0067] FIG. 3A is a diagram of a portion 300 of a pair of eyeglasses according to one embodiment of the invention. The portion 300 includes a temple 302 that is associated with a pair of eyeglasses. Over the end of the temple 302 that is opposite the associated lens holder, a temple tip 304 is provided. The temple tip 304 can, for example, be held to the temple 302 by frictional forces and/or adhesive. The temple tip 304 includes at least one electrical component 306 that is at least partially embedded therein. A wide range of functionalities can be provided by the at least one electrical component 306. The temple tip 304 can be considered separate from or part of the temple 302. For example, when the temple tip 304 is not attached to the temple 302, the temple tip 304 is considered a separate part. As another example, when the temple tip 304 is attached to the temple 302, the temple tip 304 can be considered separate from or part of the temple 302.

[0068] The temple tip 304 can be manufactured and delivered to resellers or retailers and thereafter sold attached to eyeglasses. Alternatively, the temple tip 304 can be separately provided as an optional replacement temple tip for an original temple tip. Hence, after or during purchasing a pair of eyeglasses, upgrade of the eyeglasses can be had by replacing an existing temple tip with a replacement temple tip. The colors and shapes of the temple tip 304 can vary widely. In the after-manufacturing environment, the reseller or retailer can be provided with a range of different colors and shapes so that a user can receive a replacement temple tip that reasonably matches the color and shape of the temple or that provides an altered appearance as desired by the user.

[0069] A number of embodiments have been described regarding one or more electrical components at least partially embedded in a pair of glasses. In one embodiment, one or more electrical components are at least partially embedded in a temple tip of a pair of glasses. Temple tips are relatively common for wire or metal frames which have wire or metal temples. The pair of glasses has a first and a second lens holders for receiving lenses. Each of the lens holders has a first side and a second side. The pair of glasses has a bridge element that couples the first side of the first lens holder to the second side of the second lens holder. The pair of glasses also includes a first temple and a second temple. The first temple is pivotally secured to the second side of the first lens holder through a joint, while the second temple is pivotally secured to the first side of the second lens holder through another joint. A temple typically has two ends, a first end and a second end. The first end can be the end that is pivotally secured to a lens holder through a joint, and the second end can be the other end of the temple. It is not uncommon that a temple includes a main body and an enclosure that grabs onto the main body of the temple. The second end is typically where the enclosure grabs onto the main body. The enclosure can be made of a different material than the main body of the temple. In one embodiment, such an enclosure is a temple tip, and there is an electrical component, partially or fully, embedded in the temple tip. There can also be a connector at the temple tip. In another embodiment, the temple tip can include a female connector. In still another embodiment, as a temple tip grabs onto the main body of the temple, a connector at the temple tip (such as a female connector) can make electrical contact with another connector (such as a male connector) at the main body of the temple. Typically, particularly before a pair of glasses has been extensively worn, the temple tip can be removed and re-inserted back on to the main body of the temple without much difficulty. Such a temple tip can be an after-market component, with different temple tips having different electrical components to serve different functions.

[0070] Besides a temple tip such as illustrated in FIG. 3A, a temple tip can also be effectively modified by a fit-over temple or temple cover.

[0071] FIG. 3B is a diagram of a temple cover 320 that at least partially covers a temple (e.g., temple and/or temple tip) according to one embodiment of the invention. As an example, the temple cover 320 can be made of a fabric or other material, such as a sock or sleeve, that slides over and at least partially covers a temple or a temple tip. The temple cover 320 can include at least one electrical component 322 that is either attached thereto or at least partially embedded therein. The temple cover 320 can also include an opening 324 so as to receive a temple or a temple tip. In one embodiment, the temple cover 320 is placed over a substantial portion of a temple tip, and the opening 324 can extend to a far end 326 so as to receive all or a substantial part of the temple tip. The temple cover 320 can, for example, be held to a temple or a temple tip by frictional forces and/or adhesive.

[0072] FIG. 3C is a diagram of a fit-over temple 340 that at least partially fits over a temple (e.g., temple and/or temple tip) according to one embodiment of the invention. For example, the fit-over temple 340 can at least partially fit-over a temple tip. The fit-over temple 340 includes at least one electrical component 342 that is either attached thereto or at least partially embedded therein. The fit-over temple 340 can also include an opening 344 so as to receive a temple or a temple tip. The depth and/or width of the opening 344 within the fit-over temple 340 can vary depending on the extent to which it is being fit over a temple or a temple tip. The fit-over temple 340 can, for example, be held to a temple or temple tip by frictional forces and/or adhesive. As an example, the fit-over temple 340 can be plastic or other material. The colors and shapes of the fit-over temple 340 can have a lot of variations.

[0073] A wide range of functionalities can be provided by the at least one electrical component (e.g., electrical component 322 and 342). In the after-manufacturing environment, the reseller or retailer can be provided with a range of different colors and shapes so that a user can receive a replacement temple cover or fit-over temple that reasonably matches the color and shape of the temple or that provides an altered appearance as desired by the user.

[0074] FIG. 3D and 3E are diagrams of a temple arrangement 360 according to another embodiment of the invention. FIG. 3D is a side view of the temple arrangement 360, and FIG. 3E is a front view of the temple arrangement 360. In this embodiment, the temple arrangement 360 is a temple tip that can be attached to a temple (e.g., temple body) of a pair of eyeglasses. The temple arrangement 360 includes a speaker housing 362 allowing a speaker 364 to be at least partially embedded within the temple arrangement 360. An audio sound output by the speaker 364 is coupled to an ear plug 366 by way of the speaker housing 362 and a tube 368. Typically, the tube 368 is a flexible tube, such as a flexible plastic tube. A user of the eyeglasses having the temple arrangement 360 can place the ear plug 366 within her ear to facilitate coupling of the audio sound from the speaker 364 to the ear. The tube 368 can have a disconnection region 370 whereby at least a section of the tube 368 and the attached ear plug 366 can be removed from the temple arrangement 360, such as when audio output is not being listened to. The tube 368 and/or the speaker housing 362 can also be capable of rotating with respect to the temple arrangement 360 to facilitate ease of use. Still further, the temple arrangement 360 can include a connector 372, such as a male audio connector (e.g., 2.5 mm, stereo mini-phone connector). The connector 372 provides a means to electrically connect an external audio source to the speaker 364 within the temple arrangement 360. For example, at least one wire (not shown) that is internal to the temple arrangement 360 can be used to electrically connect the speaker 364 to the connector 372.

[0075] In one embodiment, an electrical component is a component of an electrical circuit or system, and the electrical circuit or system is for performing at least a desired, intended or predetermined function.

[0076] In one embodiment, a temple tip, fit-over temple or temple cover according to the invention can further include a connector or cable to facilitate electrical connection with the at least one electrical component that is either attached to a temple or a temple tip or at least partially embedded therein.

[0077] Still another aspect of the invention relates to one or more swappable temple portions for a pair of glasses. According to this aspect, a temple has a forward portion and a rearward portion which can removably couple to one another. In one embodiment, different rearward portions can be used with the same forward portion. In other words, the different rearward portions can be swapped with one another. In one implementation, the different rearward portions can offer different electrical components/functionalities to the pair of glasses. For example, the different rearward portions can provide different electrical components/functionalities such as: battery/power, wireless communication, radio, headset, GPS, pedometer, sun sensor, hearing enhancement, image/video capturing, etc. In another embodiment, different forward portions can be used with the same rearward portion.

[0078] In one embodiment, only one of the temples of an eyeglass frame has swappable part(s). In another embodiment, both of the temples of an eyeglass frame have swappable part(s). Regardless, viewed in one way, each of the swappable parts at a temple can be viewed as a removable peripheral device to the eyeglass frame.

[0079] In one embodiment, a temple is a multi-part temple. The multi-part temple includes at least a forward (or first) part and a rearward (or second) part. The forward part is typically integral with or coupled to an eyeglass frame (such as at the lens holder or hinge region of an eyeglass frame). The rearward part removably connects with the forward part. The removable connection allows the rearward part to be removed for any of a variety of reasons. For example, the rearward part can be removed to: (1) connect a different rearward part; (2) connect to a peripheral bus (e.g., for data download); or (3) charge a battery (e.g., located in forward or rearward part).

[0080] The removable connection between the forward and rearward parts of the multi-part temple physically attaches and secures the rearward part to the forward part by way of at least a mechanical connection. The mechanical connection

can be provided in a variety of ways, such as through use of one or more connectors, snaps, detents, bayonets, etc.

[0081] In addition, the removable connection between the forward and the rearward parts of the multi-part temple can provide (or facilitate) an electrical connection between the forward and rearward parts. In one embodiment, the forward part of the temple (or some other part of the eyeglass frame) includes one or more electrical components, and the rearward part includes one or more electrical components. In such case, the electrical connection serves to electrically connect one or more of the electrical components of the forward part (or other part of the eyeglass frame) with one or more of the electrical components of the rearward part. For example, the forward part of the temple can include one or more electronic components (e.g., integrated circuit) that are electrically connected to one or more electronic components in the rearward part.

[0082] However, in the event that all needed electrical components are within the rearward part of the multi-part temple, electrical connection between the forward part and the rearward part may not be needed. Accordingly, in some embodiments, no electrical components will be needed in the forward part; instead, all the needed electrical components will be provided in the rearward part.

[0083] Various embodiments of eyewear can utilize the multi-part temples to provided electrical components to eyeglass frames in a convenient and user-friendly manner. As one example, consider an eyeglass frame that supports a camera. The electrical components can include an image sensor, a memory, a microcontroller, and a battery. One or more of these electrical components can be in the forward part (or other part of the eyeglass frame) and the remaining one or more electrical components can be in the rearward part. For example, the image sensor and the microcontroller can be in the forward part and the battery and the memory can be in the rearward part. Additionally, if the camera makes use of a display (e.g., LCD), the display could be in either the forward part or the rearward part. The eyeglass frame might also include other electrical components for additional functionality. Examples

of additional functionality include: global positioning system, antenna, user interface (e.g., buttons, switches, etc), display, microphone, earphone, etc. In another example, all of the electrical components supporting the camera functionality can be provided in the rearward part of the multi-part temple.

[0084] In one embodiment, the electrical components provided in the forward part are able to be shared with different rearward parts. In other words, different rearward parts can be swapped. For example, a different rearward part can be connected to the forward part to provide the eyeglass frame with different functionality. Examples of some of the different functionality that can be provided in this matter include: radio receiver (e.g., satellite radio), media player, pedometer, wireless communication, sun monitor, hearing enhancement, global positioning, etc. In a first example, in the case of a radio receiver, the forward part can include a display, while the rearward part can include a tuner, a rechargeable battery, an amplifier, and earphones or earphone connectors. In a second example, in the case of a media player, the forward part can include a display, while the rearward part can include a media player module, a memory, a rechargeable battery, a switch and earphones or earphone connectors. In a third example, in the case of a pedometer, the forward part can include a display, while the rearward part can include an accelerometer, a rechargeable battery, a memory and a microcontroller. In a fourth example, in the case of a wireless communication device, the forward part can include a display, while the rearward part can include a battery, an antenna, a wireless module, earphones or earphone connectors, and a user interface. The user interface, for example, can include buttons, which, for example, can facilitate user input with respect to on/off, volume, and accept or decline call. In this case, information displayed can include battery status, device status, caller ID, etc. In these four examples, the forward part includes a display and thus the forward part can be used (i.e., shared) with any of the different rearward parts to thereby provide different functionality to the eyeglass frames. Hence, by swapping one of these different rearward parts, the same pair of eyeglasses can provide different functionality.

[0085] A multi-part temple can be manufactured and delivered to resellers or retailers and thereafter sold attached to eyeglasses. Alternatively, a rearward part can be separately provided as a separate part or as an optional rearward part that can be swapped with an original rearward part. Hence, after or during purchasing a pair of eyeglasses, alteration, upgrade or conversion of the eyeglasses can be had by swapping in another rearward part. The electrical components or functions supported by the rearward part can vary widely. The colors and shapes of the rearward parts also can vary widely. For example, in the retailing or after manufacturing environment, the reseller or retailer can be provided with a range of different colors and shapes so that a user can receive a rearward part that reasonably matches the color and shape of the multi-part temple or that provides an altered appearance as desired by the user.

[0086] FIG. 3F is a diagram of a multi-part temple 1300 according to one embodiment of the invention. The multi-part temple 1300 has a forward part 1302 and a rearward part 1304. The rearward part 1304 is removably connected to the forward part 1302 such that the rearward part 1304 is removable. Once removed, the same rearward part or a different rearward part can be later connected to the forward part 1302. Alternatively, a cable can be connected to the forward part 1302 when the rearward part 1304 is removed. The cable can facilitate data transfer, battery charging, etc, depending on the electrical components in the forward part 1302.

[0087] FIG. 3G is a diagram of a multi-part temple 1310 according to one embodiment of the invention. The multi-part temple 1310 can represent the multi-part temple 1300 shown in FIG. 1 in one embodiment. In FIG. 3G, a forward part 1312 and a rearward part 1314 are shown disconnected. The forward part 1312 has a mechanical element 1316 and the rearward part 1314 has a corresponding opening 1318. Once connected together, the mechanical element 1316 of the forward part 1312 is inserted into the opening 1318, thereby mechanically coupling the rearward part 1314 to the forward part 1312. Once mechanically coupled the rearward part 1314 is secured to the forward part 1312, but remains removable.

[0088] FIG. 3H is a diagram of a multi-part temple 1320 according to one embodiment of the invention. The multi-part temple 1320 can represent the multi-part temple 1300 shown in FIG. 1 in one embodiment. In FIG. 3H, a forward part 1322 and a rearward part 1324 are shown disconnected. The forward part 1322 has a connector 1326 and the rearward part 1324 has a corresponding connector 1328 embedded therein. Once connected together, the connector 1326 of the forward part 1322 is inserted into the corresponding connector 1328, thereby mechanically coupling the rearward part 1324 to the forward part 1322. Once mechanically coupled the rearward part 1324 is secured to the forward part 1322, but remains removable. Additionally, the connection of the connector 1326 and the corresponding connector 1328 can also provide an electrical connection. An electrical connection would serve to enable electrical components in the forward part 1322 (or other parts of an eyeglass frame) to electrically connect to electrical components in the rearward part 1324. For example, the electrical connection can provide electrical connections for one or more electrical wires. An example of one suitable type of connector is a USB connector which can provide mechanical and electrical connection.

[0089] As noted above, a rearward part of a multi-part temple can include one or more electrical components. FIG. 3I is a diagram of a rearward part 1330 of a multi-part temple according to one embodiment of the invention. The rearward part 1330 has a body 1332 with electrical circuitry 1334 internal to the body 1332. As one example, the electrical circuitry 1334 can pertain to data storage (e.g., memory). In such an example, the rearward part 1330 can be considered a memory stick or a memory card. As other examples, the electrical circuitry 1334 can pertain to a battery/power source, a sun sensor, a pedometer, a media player, a wireless module, etc.

[0090] FIG. 3J is a diagram of a rearward part 1340 of a multi-part temple according to another embodiment of the invention. The rearward part 1340 has a body 1342 with an ear bud 1344 and an ear bud arm 1346 extending therefrom. In addition, the body 1342 includes at least one conductor 1347 and electrical circuitry

1348 internal to the body 1342. The at least one conductor 1347 can electrically connect the electrical circuitry 1348 with the ear bud 1344, where the at least one conductor 1347 extends through the ear bud arm 1346 to the ear bud 1344. Optionally, the body 1342 can further include an antenna 1349 internal to the body 1342. In the case where the electrical circuitry 1348 includes a wireless receiver (e.g., Bluetooth, XM, FM), the antenna 1349 can enhance reception. As an example, the electrical circuitry 1348, can be a wireless module for wireless communications or a receiver for XM or FM signals. Additionally or alternatively, the electrical circuitry 1348 can, for example, pertain to one or more of a data storage device, battery/power source, a sun sensor, a pedometer, a media player, etc.

[0091] FIG. 3K is a diagram of a rearward part 1350 of a multi-part temple according to another embodiment of the invention. The rearward part 1330 has a body 1352 with a printed circuit board 1354 internal to the body 1352. A display device 1356 (e.g., LCD) can be provided on the body 1352. In one example, the display device 1356 can be mounted to the circuit board 1354 and exposed through an opening in the body 1352 so as to be visible by a user of the eyeglasses using the multi-part temple. Optionally, at least a portion of the printed circuit board 1354 can conform to the shape of the body 1352. The ability to conform, even partially, allows the printed circuit board 1354 to yield greater surface area within a temple, which tends to be small and stylized. The integrated circuit board 1354 can have one or more electronic components (e.g., integrated circuits) mounted thereon.

[0092] FIGs. 3L – 3O are diagrams of representative forward parts for multi-part temples according to different embodiments of the invention. FIG. 3L is a diagram of an exemplary forward part 1360 having a mechanical element 1362 that includes one or more detents 1364. When a rearward part is connected to the forward part 1360, the mechanical element 1362 is inserted into an opening (e.g., opening 1318) and held securely in place by mechanical forces facilitated by the mechanical element 1362 and the detents 1364. This can be accomplished through different methods, such as with corresponding protruding portions in the opening

that can, for example, be aligned with the detents 1364. For example, the protruding portions can snap into place or biased by springs (e.g., spring–loaded).

[0093] FIG. 3M is a diagram of an exemplary forward part 1370 having a mechanical element 1372 that includes one or more protrusions 1374. When a rearward part is connected to the forward part 1370, the mechanical element 1372 is inserted into an opening (e.g., opening 1318) and held securely in place by mechanical forces facilitated by the mechanical element 1372 and the protrusions 1374. In one embodiment, the protrusions 1374 are spring-loaded to facilitate connection with the opening.

[0094] FIG. 3N is a diagram of an exemplary forward part 1380 having a mechanical element 1382 that includes one or more bayonet structures 1384. To connect a rearward part to the forward part 1380, the mechanical element 1382 is inserted into an opening (e.g., opening 1318) that has groves (in the direction substantially parallel to the axis of the mechanical element 1382) for receiving the bayonet structures 1384. The rearward part can be connected with the forward part 1380 when the groves within the opening of the rearward part are aligned with the bayonet structures 1384. Once the mechanical element 1382 is so inserted, the rearward part can be rotated with respect to the forward part 1380. The rotation causes the bayonet structures 1384 to no longer be aligned with the grooves. As a result, the rearward part is mechanically secured to the forward part 1380 (and thus the eyeglass frame) in a bayonet like manner.

[0095] In one embodiment, a connector is used to removably couple the rearward portion to the forward portion of a multi-part temple. For example, the connector can be standard connector. One example of a suitable connector is a Universal Serial Bus (USB) connector.

[0096] FIG. 3O is a diagram of an exemplary forward part 1390 having an electrical connector 1392. The connector 1392 facilitates mechanical and/or electrical connections between the forward part 1390 and a rearward part. When a rearward part is connected to the forward part 1390, the connector 1392 is inserted

into an opening (e.g., opening 1328) and held securely in place by mechanical forces. There can be additional mechanical connecting mechanisms to further secure the connection.

[0097] In one embodiment, the opening receiving the connector 1392 can include a corresponding (i.e., counterpart) connector. When the connector 1392 is connected with the corresponding connector within the opening, the rearward part is physically secured to the forward part 1390. For example, mechanical forces can hold the connector 1392 and the corresponding connector in a connected position. In addition, when the connector 1392 and the corresponding counterpart connector are coupled together, one or more electrical connections are facilitated. For example, each connector can be coupled to one or more electrical wires at the other connector so that wires from one part are able to be connected to corresponding wires on the other part. As a result, electrical component(s) in the rearward part are able to be electrically connected with electrical component(s) in the forward part 1390 (or elsewhere in the eyeglass frame). In one implementation, the connectors pertain to or resemble a Universal Serial Bus (USB) type connector.

[0098] In another embodiment, the opening receiving the connector 1392 does include a corresponding counterpart connector. In this embodiment, mechanical forces can hold the connector 1392 within the opening. Also, in this embodiment, electrical connections are not facilitated.

[0099] Although FIGs. 3G-3N pertain to connections having a male connector at the forward part and a female connector at the rearward part, it should be understood that alternatively the male connector can be at the rearward part and the female connector can be at the forward part.

[00100] Also, although FIGs. 3G-3N pertain to connections showing only one elongated portion (like a male connector) to be received by an opening (like a female connector), in other embodiments, there can be more than one elongated portion to be received by more than one opening. Also, the connections can be formed on the sides (i.e., outer surface), instead of by having elongated portions and openings

positioned in the middle of (i.e., internal to) the forward and rearward parts. For example, there can be two prongs, one on the top surface and one on the bottom surface of a forward part. Each prong can be received by a counterpart detent in a rearward part, such as the prong on the top surface of the forward part to be received by a detent on the top surface of the rearward part.

[00101] In a number of embodiments, the forward part of the multi-part temple is substantially smaller than the rearward part. For example, in FIG. 3F, the forward part 1302 is substantially smaller than the rearward part 1304. In one embodiment, a forward part is large enough to house a connection mechanism used to couple with a rearward part and not too much larger. In another embodiment, a forward part and a rearward part are about the same size. In still another embodiment, a forward part is larger than a rearward part.

[00102] In one embodiment, neither the forward part nor the rearward part of a multi-part temple contains any electrical components. In such case, the rearward part can still be removable from the forward part. Such an embodiment enables a user to swap one (which can be substantially all of the temple) or both the rearward portions of both temples, with another rearward portion(s), such as for aesthetic, configuration or design reasons.

[00103] In one implementation, a connector is used to removably couple the rearward portion to the forward portion of the multi-part temple. For example, the connector can be a Universal Serial Bus (USB) connector.

[00104] In one embodiment, a forward part can be part of or integral with a corresponding region of a lens holder. In such case, there need not be any hinges for coupling the temples to the lens holders.

[00105] As noted above, connectors can be use to removably attach a temple to an eyeglass frame (e.g., lens holder) or to removably attach different portion(s) of a temple. These connectors can be provided for one or both temples of the eyeglass frames. With such temples being easily removable by users without the need for any

special skill or tools, the temple parts can be interchangeable and can be separately sold or leased.

[00106] Further, to display various eyewear products, such as in a retail environment, an eyewear products display apparatus (e.g., stand) can include corresponding connectors or connector structures so that (i) separate temples (ii) separate parts of temples and/or (iii) eyeglass frames without temples can be connected to the eyewear products display apparatus for display. For example, if the eyewear products (e.g., frames, temples, etc.) use connectors, then the eyewear products display apparatus can support those same connectors (e.g., USB connectors) or compatible structures. This eyewear products display apparatus opens up new ways to organize and present eyewear products at retail stores. It also allows users to separately select a base eyewear frame and temples to be used therewith. The temples and the frames can be displayed detached from one another, such that a user can separately select and try different temples with frames.

[00107] FIG. 3P is a diagram of an eyewear products display apparatus 1400 according to one embodiment of the invention. The apparatus 1400 has a first region 1404 of first type connectors (or compatible protrusions) integral with the apparatus 1400. A plurality of eyeglass frames having second type connectors can be attached and displayed on the apparatus 1400 by connecting one or two of the second type connector of the eyeglass frames to those of the first type connectors of the first region of the apparatus 1400.

[00108] The apparatus 1400 also can include a second region 1402 of second type connectors (or compatible openings) integral with the apparatus 1400. A plurality of removable temples (and/or removable temple parts) having first type connectors can be attached and displayed on the apparatus 1400 by connecting the first type connectors of the removable temples (and/or removable temple parts) to those of the second type connectors (or compatible openings) in the second region 1402 of the apparatus 1400.

[00109] In one embodiment, the first type connectors are male connectors and the second type connectors are corresponding female connectors which provide a secure mechanical connection. In one embodiment, the first type connectors and/or the second type connectors provided integral with the apparatus 1400 are not electrical connectors but compatible structures (e.g., protrusions and openings) such that a secure mechanical connect can be had.

[00110] In one embodiment, the orientation of at least some of the connectors in the apparatus 1400 is substantially horizontal. In other words, for example, when a rearward part of a temple is inserted into such a connector in the apparatus 1400, the rearward part is substantially perpendicular to the surface of the apparatus 1400 as shown. In another embodiment, the orientation of at least some of the connectors in the apparatus 1400 is substantially facing upward or downward in a vertical manner. In other words, for example, when a rearward part of a temple is inserted into such a connector in the apparatus 1400, the rearward part is substantially parallel to the surface of the apparatus 1400 as shown. In yet another embodiment, the orientation is at an acute angle relative to the surface of the apparatus 1400 as shown. In other words, for example, when a rearward part of a temple is inserted into a connector in the apparatus 1400, the rearward part is at an acute angle relative to the surface of the apparatus 1440 as shown. The connectors in the apparatus 1400 can also be rotatable or movable, such as between different positions and/or angles.

[00111] Although FIG. 3P only depicts one side of the eyewear products display apparatus 1400, the apparatus can have other like sides. For example, the apparatus 1400 can be a one, two, three or four sided apparatus.

[00112] In still another embodiment, at least one connector of the apparatus 1400 is connected to at least one electrical component in the apparatus 1400. For example, when a selected temple part is connected to the connector, the at least one electrical component in the apparatus 1400 is electrically connected to an

electrical component in the temple part, and together can perform an electrical operation.

[00113] In yet another embodiment, at least one connector of the apparatus 1400 is connected to another connector of the apparatus 1400. This allows electrical connection between the different eyewear parts connected to the apparatus 1400. For example, when a selected temple part is connected to the connector and an eyeglass frame is connected to the other connector, an electrical component within the eyeglass frame is electrically connected to an electrical component in the temple part, and together can perform an electrical operation.

[00114] FIG. 4 shows examples of different electrical components according to the present invention. Different embodiments of temple arrangements, temple adapters or temple parts according to the invention can use one or more of these different electrical components.

[00115] In one embodiment, the electrical component is an electrical connector. The connector can be a male connector or a female connector. Examples of different types of connectors have previously been described in the related patent applications, which have been incorporated by reference.

[00116] In one embodiment, the embedded electrical component is an electrical switch, such as one or more of those previously described in the related patent applications, which have been incorporated by reference.

[00117] In one embodiment, one electrical component can be a power source. The power source can be a battery, a solar cell or other type of power source.

[00118] In one embodiment, one electrical component can include a circuit board. The circuit board can be a rigid or a flexible circuit board.

[00119] In one embodiment, one electrical component can be an indicator. The indicator can be audio, visual, or physical (e.g., vibration). For example, the indicator can signal an event or condition to a user of the glasses.

[00120] In one embodiment, one electrical component can be a display, such as an LCD display.

[00121] In one embodiment, one electrical component can be a speaker. The speaker can provide an audio output for the benefit of the wearer of the glasses. The speaker can directly transmit sound to a user, such as a speaker mounted on an exterior surface of an eyeglass frame, or partially or fully embedded in an eyeglass frame, or a bone conducting type of speaker. Alternatively, the speaker can indirectly transmit sound to a user, such as through the use of a tube to deliver audio output proximate to a user's ear.

[00122] In one embodiment, one electrical component can be a controller. The controller can, for example, be a microprocessor.

[00123] In one embodiment, one electrical component can be a memory device. The memory device can be non-volatile memory, such as FLASH memory. The data stored in the memory device can be user data or data provided by other electrical components.

[00124] In one embodiment, one electrical component is a frequency receiver or a frequency transmitter. They can be in the radio frequency range.

[00125] In one embodiment, one electrical component can be a sensor. The sensor can be a temperature sensor. The temperature sensor can be used to sense the temperature of the wearer. In one embodiment, such a temperature sensor is in a temple tip. In measuring the temperature, the user can further press the temple tip towards his head to ensure better connection. One can also put the temple under one's tongue to measure body temperature.

[00126] In other different embodiments, one electrical component can be a motion detector, a speed sensor, a rate of ascent (or descent) detector, a pressure detector, or a detector for radiation, such as an ultraviolet (UV) detector.

[00127] In one embodiment, one electrical component is a radio frequency identification (RFID) tag. A RFID tag typically includes a memory chip and a radio

antenna. The memory chip usually has a small storage capacity and thus does not include a large amount of information. A portion of such information can provide identifying information for the glasses. The memory chip may only have a few kilobytes, sufficient to encode information, such as a serial number, where and when the product (such as eyeglasses) was manufactured, and other relevant information.

[00128] The RFID tags can come in a number of configurations. For example, an active tag uses a battery-powered transponder to constantly emit signals which can carry information programmed into the memory chip. Active tags are more applicable to situations where readers are not close to the tags. A semi-passive tag likewise has a battery, but may not be activated until it receives a signal from a reader. They are more applicable to situations that do not need continuous connection and accessing. A passive tag has no battery; its antenna extracts power from a reader's radio wave signal to transmit the identifying information. Passive tags are typically relatively inexpensive, but may have to be within a few feet of a reader to extract power. The electrical component can be a passive RFID tag, or some other type of tag.

[00129] In one embodiment, one electrical component can be for locating the corresponding glasses. For example, the electrical component can produce a beeping tone when it receives a specific radio signal. A handheld device (such as a key chain accessory, can generate the specific radio signal (e.g., when a button is pushed). Through the beeping tone, one can locate the glasses.

[00130] As noted above, in one embodiment, the electrical component can be a sensor. More generally, a pair of glasses can include one or more sensors that can be used individually or in combination. FIG. 5 is a chart 500 that depicts examples of sensors suitable for use in or attached to the glasses.

[00131] In one embodiment, the sensor is a "being worn" sensor. The "being worn" sensor indicates whether the glasses are being worn by its user. The "being worn" operation can be performed using, for example, a thermal sensor, a motion detector, a stress sensor or a switch.

[00132] In one embodiment, a motion detector is used as a "being worn" sensor. A threshold can be set, such that if the amount of motion exceeds the threshold, the glasses are assumed to be worn. The motion detector can, for example, be achieved by a mechanical mechanism or an accelerometer.

[00133] In another embodiment, the "being worn" sensor includes two thermal sensors. One sensor can be at approximately the middle of a temple, such as in a region that touches the head of the user wearing the glasses. The other sensor can be at one end of the temple, the end that is close to its hinge. If the temperature differential between the two sensors is beyond a certain preset value, the glasses would be assumed to be worn. The differential is presumed to be caused by a person wearing the pair of glasses.

[00134] In yet another embodiment, the "being worn" sensor includes a stress sensor at the hinge of the temple. The assumption is that when the eyewear is worn, the hinge is typically slightly stretched because typically, the width of the head of the user is slightly wider than the width between the temples when the two temples are in the extended positions. If the value of the stress sensor is beyond a certain preset value, the glasses would be assumed to be worn.

[00135] In a further embodiment, the "being worn" sensor can be a switch. For example, at the hinge between a temple and its corresponding lens holder, there is a switch. When that temple is in its extended position, i.e., fully extended outwards, the switch is turned on. The switch can be a pin-type switch. When the temple is fully extended outwards, the pin is pressed. When both temples are fully extended outwards, in one embodiment, the glasses would be assumed to be worn by the user.

[00136] In one embodiment, another type of sensor is an environmental sensor. The environmental sensor can sense environmental conditions, such as one or more of radiation (e.g., ultraviolet radiation or light), temperature (e.g., ambient temperature), pressure, humidity and toxins (e.g., chemicals, etc.).

[00137] In another embodiment, another type of sensor is a condition sensor. The condition sensor can sense the conditions of the user of the glasses. Examples of condition sensors include sensing one or more of distance traveled, location, speed, calories consumed, temperature and vital signs associated with the user of the glasses. The distance traveled could represent the horizontal distance traveled or the vertical distance (i.e., elevation) traveled. The speed can be the rate of movement along the horizontal distance traveled and/or the vertical distance. In yet another embodiment, the condition sensor can indirectly sense emotional conditions of the user of the glasses.

[00138] The sensors can be provided in a redundant or fault-tolerant manner. For example, sensors can come in pairs in the glasses. When one malfunctions, the other one will take over its operation. In another embodiment, the sensor information can be processed in a differential manner to examine changes to the sensor information. The differential can be based on time. The sensors can be powered by a battery, solar energy, or kinetic energy. For reduced power consumption, the sensors can remain in a low-power state unless data is being acquired by the sensors. In yet another embodiment, two or more of the sensors can communicate with one another (wired or wirelessly) to exchange data or control information.

[00139] FIG. 6 illustrates a diagram of a number of different embodiments of temple adapters 600 according to the invention. The temple adapters 600 serve to adapt a temple (i.e., a temple body or temple tip) of a pair of eyeglasses to provide for at least one electrical component. In one embodiment, a temple adapter can clip onto a temple body or a temple tip. In another embodiment, a temple adapter can mount to a post provided on a temple body or a temple tip. In still another embodiment, a temple adapter can mount to a hole provided in a temple body or a temple tip. In yet another embodiment, a temple adapter can be bonded (or adhered) to a temple body or a temple tip.

[00140] The temple adapter is particularly well suited to adapt a pair of eyeglasses with communication components, such as a speaker and/or a

microphone. As an example, a standard pair of eyeglasses can be transformed into an operational headset by attaching a temple adapter to a temple body or temple tip of the pair of eyeglasses, wherein the temple adapter includes at least one speaker and at least one microphone.

[00141] The temple adapter can be rigid or malleable. The benefit of being malleable is that the particular geometric arrangement/assembly of the temple adapter can be altered by its user for better user comfort or operation.

[00142] In one embodiment, the temple adapter is a structure that has at least one electrical component attached thereto or at least partially embedded therein. In another embodiment, all of the electrical components to be provided with the temple adapter are at least partially embedded in the temple adapter.

[00143] FIG. 7A is a diagram of a temple adapter 700 according to one embodiment of the invention. The temple adapter 700 attaches to a temple 702 (including any temple tip using a clip 704. The clip 704 can use force, such as an interference fit force or spring-induced force, to attach the temple adapter 700 to the temple 702. Besides the clip 704, the temple adapter 700 includes an angled arm 706 and an ear bud 708. The angled arm 706 can be malleable. When a pair of eyeglasses associated with the temple 702 is being worn by a user, the ear bud 708 can be placed in or near the user's ear canal. The ear bud 708 contains a speaker and receives electrical signals via a wire, such wire can be provided internal or external to the temple adapter 700 and can originate at the temple 702 or external to the temple 702.

[00144] FIG. 7B is a diagram of a temple adapter 720 according to another embodiment of the invention. The temple adapter 720 attaches to a temple 722 (including any temple tip) using a clip 724. The clip 724 can use force, such as an interference fit force or spring-induced force, to hold the temple adapter 720 to the temple 722. Besides the clip 724, the temple adapter 720 includes an angled arm 726, an ear bud 728, a microphone 730, an extension arm 732 and a cord 734. In this embodiment, the cord 734 includes a wire that connects to the speaker within

the ear bud 728 and another wire that connects to the microphone 730. There can be one or more conductors inside a given wire. For example, a wire might have one conductor serving as a signal line and another conductor serving as ground. Such wires can be provided internal to the extension arm 732 and the angled arm 726. The arm 732 can serve to guide the cord 734 away from the user's ear or rearward. The angled arm 726 can be malleable. The placement or position of the microphone 730 can vary with implementation. As shown in FIG. 7B, the microphone 730 is directed forward to a user's front when a pair of eyeglasses associated with the temple 722 are being worn. Alternatively, the microphone 730 could be directed outward away from the user's head when the pair of eyeglasses are being worn. When a pair of eyeglasses associated with the temple 722 is being worn by a user, the ear bud 728 can be placed in or near the user's ear canal. The ear bud 728 contains a speaker and receives electrical signals via a wire of the cord 734. The cord 734 can have another end (not shown) with a connector for coupling with an audio output device (e.g., radio, MP3 player) or a communication device (e.g., mobile phone).

[00145] FIGs. 8A and 8B are diagrams of a temple adapter 800 according to another embodiment of the invention. FIG. 8A is a side view of the temple adapter 800, and FIG. 8B is a front view of the temple adapter 800. The temple adapter 800 has a support body 802 which has a support arm 803. An ear bud 804 is attached to an end of the support arm 803. A connector 806, such as a male audio connector, is attached to one end of the support body 802. A microphone 808 can be optionally provided and attached to the support body 802 or the support arm 803. Additionally, an elastic member 810 can be provided to facilitate attachment of the support body 802 to a temple 812 of a pair of eyeglasses. The temple 812 can have a tip region 814, which can be referred to as a temple tip. When the temple adapter 800 is attached to the tip region 814 of the temple 812, the tip region 814 is placed in or through an opening 816 in the elastic member 810, as shown, for example, in FIG. 8B. The temple adapter 800 is thereby held in place relative to the tip region 814. Additionally, although not shown, the support body 802 would carry a first internal

wire from the connector 806 to the microphone 808, and the support body 802 and the support arm 803 would carry a second internal wire from the connector 806 to the ear bud 804.

[00146] FIG. 9A is a diagram of a temple adapter 900 according to another embodiment of the invention. In FIG. 9A, a side-view of the temple adapter 900 is depicted. The temple adapter 900 attaches to a temple 902 of a pair of eyeglasses. The temple 902 can have a tip region 904, which can be referred to as a temple tip. The temple adapter 900 has a support member 906. A first end 908 of the support member 906 couples to the temple 902 of a pair of eyeglasses. In one embodiment, the first end 908 serves to attach the temple adapter 900 to the temple 902. For example, the first end 908 can provide a clip, clamp, post, or hole to provide or assist with the attachment. As another example, the first end 908 can alternatively or additionally use an adhesive, bonding or fastener (e.g., hook and loop system, such as Velcro) to provide or assist with the attachment. A second end 910 of the support member 906 provides an opening through which an arm 912 extends. One end of the arm 912 has an ear bud 914 attached thereto. The arm 912 can be angled and/or malleable. When a pair of eyeglasses associated with the temple 902 is being worn by a user, the ear bud 914 can be placed in or near the user's ear canal. The ear bud 914 contains a speaker and receives electrical signals via a wire, such wire can be provided internal or external to the temple adapter 900 and can originate at the temple 902 or external to the temple 902.

[00147] FIGs. 9B and 9C are diagrams of a temple adapter 920 according to still another embodiment of the invention. FIG. 9B is a side view of the temple adapter 920, and FIG. 9C is a front view of the temple adapter 920. The temple adapter 920 attaches to a temple 922 of a pair of eyeglasses. The temple 922 can have a tip region 924, which can be referred to as a temple tip. The temple adapter 920 has a support member 926. A first end 928 of the support member 926 couples to the temple 922 of a pair of eyeglasses. In one embodiment, the first end 928 serves to attach the temple adapter 920 to the temple 922. For example, the first end 928 can provide a clip, clamp, post, or hole to provide or assist with the

attachment. As another example, the first end 928 can alternatively or additionally use an adhesive, bonding or fastener (e.g., hook and loop system, e.g., Velcro) to provide or assist with the attachment. The first end 928 also has a bracket 930 having a connector 932 at one end, and an elastic member 934 for coupling about the tip region 924. The connector 932, such as a male audio connector, is attached to one end of the bracket 930. A microphone 936 can be optionally provided and, for example, attached to the support body 926.

[00148] A second end 938 of the support member 926 provides an opening through which an arm 940 extends. One end of the arm 940 has an ear bud 942 attached thereto. The arm 940 can be angled and/or malleable. The arm 940 is also re-positionable within the opening at the second end 938 so as to permit user adjustment. When a pair of eyeglasses associated with the temple 922 is being worn by a user, the ear bud 942 can be placed in or near the user's ear canal. The ear bud 942 contains a speaker and receives electrical signals via a wire, such wire can be provided internal or external to the temple adapter 920 and can originate at the temple 902 or external to the temple 902. In this embodiment, a wire 944 is shown as passing through the arm 940 to provide signals to the speaker within the ear bud 942. More particularly, in one embodiment, although not shown in FIGs. 9B and 9C, a first wire would connect the speaker within the ear bud 942 to the connector 932 (e.g., wire 944), and a second wire would connect the microphone 936 to the connector 932. Such wires can be internal or external, or partially internal and partially external, to the temple adapter 920.

[00149] FIG. 9D is a diagram of a temple adapter 960 according to still another embodiment of the invention. In FIG. 9D, a side-view of the temple adapter 960 is depicted. The temple adapter 960 attaches to a temple 962 of a pair of eyeglasses. The temple 962 can have a tip region 964, which can be referred to as a temple tip. The temple adapter 900 has a support member 966. A first end 968 of the support member 966 couples to the temple 962 of a pair of eyeglasses. In one embodiment, the first end 968 serves to attach the temple adapter 960 to the temple 962. For example, the first end 968 can provide a clip, clamp, post, or hole to provide or

assist with the attachment. As another example, the first end 968 can alternatively or additionally use an adhesive, bonding or fastener (e.g., hook and loop system, e.g., Velcro) to provide or assist with the attachment. A second end 970 of the support member 906 provides an opening through which an arm 972 extends. One end of the arm 972 has an ear bud 974 attached thereto. The arm 972 can be angled and/or malleable. When a pair of eyeglasses associated with the temple 962 is being worn by a user, the ear bud 974 can be placed in or near the user's ear canal. The ear bud 974 contains a speaker and receives electrical signals via a wire, such wire can be provided internal or external to the temple adapter 960 and can originate at the temple 962 or external to the temple 962. Further, the temple adapter 960 can include a microphone 976. In this embodiment, the microphone 976 is attached to the support member 966. In addition, an arm 978 is used to support an end of a cable 980 that is coupled to the arm 978. The cable 980 can include at least one wire for the microphone 976 and one wire for the speaker within the ear bud 974.

[00150] To the extent that any of the embodiments of the temple adapters discussed above use a microphone, a tube can be optionally attached to the microphone to facilitate voice pick-up of the user. One end of the tube can be placed over the microphone, and the other end of the tube is then positioned closer to the user's mouth than is the microphone. With a temple adapter on both temples, each providing a microphone and speaker to a pair of eyeglasses, only one temple adapter would typically make use of such a tube. Alternatively, the tube and the microphone could be replaced by a boom microphone.

[00151] FIG. 10A-10C are diagrams of a temple having a bone conducting element according to still other embodiments of the invention. The bone conducting elements can replace a traditional speaker to provide audio output to a user. Although not shown, electrical signals would be internally or externally supplied to the bone conducting element.

[00152] FIG. 10A illustrates a temple 1000 for a pair of eyeglasses. The temple 1000 includes a bone conducting element 1002 that can provide audio sound to a

user by coupling vibrations to at least one bone of the user's face. The bone conducting element 1002 is held relative to the temple 1000 by an arm 1004. Hence, in this embodiment, the temple 1000, the arm 1004 and the bone conducting element 1002 can all be integrally formed.

[00153] FIG. 10B illustrates a temple 1020 for a pair of eyeglasses. The temple 1020 includes a bone conducting element 1022 that can provide audio sound to a user by coupling vibrations to at least one bone of the user's face. The bone conducting element 1022 is held relative to the temple 1020 by a support 1024 that removably attaches to the temple 1020.

[00154] FIG. 10C illustrates a temple 1040 for a pair of eyeglasses. The temple 1040 includes a bone conducting element 1042 that can provide audio sound to a user by coupling vibrations to at least one bone of the user's head. In this embodiment, the bone conducting element 1042 is positioned in the vicinity of the user's ear, such as behind the user's ear. The placement of the bone conducting element 1042 in this embodiment can reduce impact to the design of the eyeglasses.

[00155] In one embodiment, the electrical components associated with a temple arrangement, a temple adapter or a removable temple part is for enhancing the hearing of the person wearing the corresponding pair of glasses. There can be at least a microphone and a speaker in a temple arrangement, a temple adapter or removable temple part. The microphone can be close to an ear of the user when the glasses are worn by the user, and can be a directional microphone. The microphones can be a microphone in a temple adapter, such as the microphone 730 in FIG. 7B, 808 in FIG. 8A, 936 in FIG. 9B, or 976 in FIG. 9D. The microphones can be in a temple arrangement. The microphone in a temple arrangement can be attached to a temple tip, a temple fit-over or a temple cover. The microphones can be positioned to be in front of the user's ears so that the microphones will not be affected by the shadowing effect of the ears. The speaker can be inserted into the ear, as in some of the speakers previously described.

[00156] In another embodiment, there are two sets of microphones and speakers, such as in two temple arrangements, temple adapters or removable temple part. In the vicinity of each ear, there is a temple arrangement, temple adapter or removable temple part with its corresponding microphone and speaker. The microphones again can be directional, one pointing generally outwards in a position close to the left ear, and one pointing generally outwards in a position close to the right ear. Alternatively, the microphones can point forward.

[00157] The microphone and the speaker close to an ear do not have to be in very close proximity to each other, as in many hearing aids existing nowadays. They can be spaced apart by, such as, one to several inches, with the microphone being directional and pointing to the front and to either the left or the right of the user, and with the speaker pointing toward or inserted into the corresponding ear of the user. Such a distance apart can significantly reduce feedback effect of existing hearing aids. Another advantage of such a hearing enhancement device is that users may not need to be fitted into ears with ear molds. In any case, additional details on hearing enhancement are further described in the related applications that have been incorporated herein by reference, such as U.S. Provisional Patent Application No. 60/620,238, filed October 18, 2004, and entitled "EYEGLASSES WITH HEARING ENHANCED AND OTHER AUDIO SIGNAL-GENERATING CAPABILITIES."

[00158] The various embodiments of the invention noted above, whether temple arrangement, temple adapter or removable temple part, can have a cable or cord attached or attachable thereto. The cable or cord has one or more conductors. The cable or cord can serve to provide electrical signals to or receive electrical signals from the temple arrangement, the temple adapter or removable temple part. In one embodiment, one end of a cable or cord attaches to a temple arrangement, temple adapter or removable temple part (either permanently or via a connector) and the other end of the cable or cord attaches (either permanently or via a connector) to an electronic device. As an example, the electronic device can be an audio output device (e.g., audio player) or a communication device (e.g., mobile telephone). In a

first example, the cable or cord could provide a male audio (stereo) connector at one end, and a pair of female audio connectors at the opposite end, each being for use with a different temple. In a second example, the cable or cord could provide a set of connectors, such as a male mini-phone connector (2.5 mm) and a male audio (stereo) connector, at one end, and one or a pair of female phone connectors at the opposite end.

[00159] In one embodiment, the cable or cord can also have a switch coupled thereto so as to permit a user to switch modes. For example, if the temple arrangement, temple adapter or removable temple part provides a speaker and microphone to a pair of eyeglasses, a switch on a cable or cord that connects the temple arrangement or temple adapter to an electronic device could provide different switch positions for different electronic devices or different functional modes of operation of a single electronic device. As an example, if the electronic device is (or operates as) an audio player, a first switch position could be used. Alternatively, if the electronic device is (or operates as) a mobile telephone, a second switch position could be used. Additional discussion of suitable cables and cords is provided in the related applications that have been incorporated herein by reference.

[00160] Electrical components can form an electronic module. The electronic module can provide radiation monitoring, wireless communication, enhanced hearing, etc. A radiation monitoring system can be partially or fully contained in a temple arrangement, temple adapter or removable temple part associated with a temple of a pair of glasses. Typically, the temple arrangement or temple adapter can be removable from the temple. The removable temple part is obviously removable from a corresponding remaining temple part.

[00161] In another embodiment, an electronic component in a temple arrangement, temple adapter or removable temple part interacts with another electronic component in another part (e.g., frame) of the glasses or in a device tethered to the glasses. For example, a temple of a pair of glasses holds one portion of an electronic circuit. That portion can include generic parts, such as a battery, that

are applicable to different applications. Another portion of the electronic circuit is in a temple arrangement, temple adapter or removable temple part. This portion can be application specific, such as an electronic clock without a battery, or a temperature sensor.

[00162] In yet another embodiment, the electrical components can provide audio player capabilities. In such an embodiment, the electrical components can include audio file storage, an audio player and a battery. The electrical components may or may not include wireless communication circuitry.

[00163] Further, in an alternative embodiment, the output of an operation indicator can be audio. The audio output can be from one or more speakers associated with the frame of the eyeglasses. Such audio output can signal the user using natural language, voice synthesis, pre-recorded messages, etc.

[00164] In another embodiment, the electrical components can include a memory module. The memory module provides non-volatile data storage. For example, the memory module can be a portable (or removable) memory device (e.g., memory card). The memory module can, for example, store sensor information (which can be over an extended period of time). Such memory module can be remotely interrogated using wireless communication circuitry, or can be accessed through a wired connection with a tethered device.

[00165] In one embodiment, the electrical connection(s) can alternatively be used to allow information stored in the electrical components to be accessed or queried by a device. For example, when the electrical components include a memory module, the memory module can be accessed to read data (e.g., status information) stored therein.

[00166] As previously noted, the electrical components associated with a temple arrangement, a temple adapter and/or removable temple part can pertain to radiation monitoring circuitry. In such case, the electrical components within the temple arrangement, temple adapter or removable temple part alone or together with eyeglass electrical components can implement a radiation monitoring system. The

radiation being monitored can, for example, pertain to one or more of UV, infrared and gamma radiation. In one embodiment, sunlight is considered as a type of radiation. In any case, additional details on radiation monitoring are further described in the related applications that have been incorporated herein by reference.

[00167] Also, the electrical components can pertain to health or fitness monitoring circuitry. In such case, the electrical components within the temple arrangement, the temple adapter removable temple part alone or together with eyeglass electrical components can implement a health or fitness monitoring system. Additional details on health or fitness monitoring are further described in the related applications that have been incorporated herein by reference.

[00168] In yet another embodiment, an electronic component in a temple arrangement, a temple adapter or removable temple part of a frame of eyeglasses interacts with an electronic component of an apparatus tethered to the eyeglasses to perform an operation. For example, a temple arrangement, a temple adapter removable temple part of a pair of eyeglasses holds one portion of an electronic system, and a tethered apparatus that tethers to the pair of eyeglasses includes another portion of the electronic system.

[00169] Still further, the invention can provide a new approach to marketing accessories, namely, electrical accessories, for eyewear. According to one method for providing temple arrangements, temple adapters and/or removable temple part for use with a pair of glasses, the method can initially provide a plurality of temple arrangements, temple adapters and/or removable temple part for a customer. This enables the customer to browse and select at least one temple arrangement, temple adapter or removable temple part. Each of the temple arrangements, temple adapters or removable temple part can have one or more electrical components at least partially embedded therein, with different temple arrangements, temple adapters or removable temple parts providing different electrical capabilities. Once a temple arrangement, temple adapter or removable temple part has been selected, the selected temple arrangement, temple adapter or removable temple part can be

coupled to one of the corresponding temples of the eyewear (e.g., a pair of glasses). In the case where the selected temple arrangement is a temple tip, the selected temple tip is inserted onto (e.g., slid over) an end of the corresponding temple (after removing any previously installed temple tip if there was one). In the case where the selected temple adapter is to be coupled, the selected temple adapter can be attached to the corresponding temple. In the case where the selected removable temple part is to be coupled, the selected removable temple part can be attached to a remaining part (e.g., forward part) of the corresponding temple. Thereafter, the customer can make use of the eyewear with its associated electrical capabilities provided by the temple arrangement, temple adapters or removable temple part.

[00170] In one embodiment, once a temple arrangement, a temple adapter and/or removable temple part is provided to a customer, the customer can test the electrical capabilities of the pair of glasses. If the customer does not like the current selected temple arrangement, temple adapter or removable temple part, the customer can repeat the process by selecting and testing another temple arrangement, temple adapter or removable temple part. Before providing the eyewear with the temple arrangement, temple adapter or removable temple part, the customer can be required to pay a purchase (or rental) price for at least the temple arrangement, temple adapter or removable temple part. Thereafter, the customer can be permitted to return and replace the temple arrangement, temple adapter or removable temple part with another temple arrangement, temple adapter or removable temple part. Such returns or replacements can be available only for a limited period of time following their purchase.

[00171] Yet still another aspect of the invention relates to eyewear having an extended endpiece so as to facilitate placement of one or more electrical components at the extended endpiece. In one embodiment, a conventional pair of glasses has two endpieces, one on its left and the other on its right side of the frame. For example, the left endpiece is the region of the frame approximately between the left hinge (or joint) and the left lens holder of the frame. Similarly, the

right endpiece is the region of the frame approximately between the right hinge (or joint) and the right lens holder of the frame.

[00172] The one or more electrical components at an extended endpiece can operate independently or together with other electrical components provided elsewhere. For example, other electrical components can be provided in other regions of the frame for the eyewear. In another example, the other electrical components can be located in a bridge area of the frame for the eyewear. In such an example, given that the endpiece is extended, the one or more electrical components can be placed at the endpiece and thereby communicate with other electrical components in a front area (e.g., lens holder region or bridge region) or the other endpiece (which can also be extended) without having to communicate through a hinge or connector.

[00173] FIG. 11A illustrates a pair of glasses 1100 according to one embodiment of the invention. The pair of glasses 1100 includes a first lens holder 1102 and a second lens holder 1104. The lens holders 1102 and 1104 are capable of receiving lenses. The lenses can be prescription lenses or non-prescription lenses. The first lens holder 1102 has a first side and a second side. The second lens holder 1104 has a first side and a second side. The pair of glasses 1100 also has a bridge 1106 in between the first lens holder 1102 and the second lens holder 1104. The bridge 1106 is coupled to the second side of the first lens holder 1102 and the first side of the second lens holder 1104. The lens holders 1102 and 1104 and the bridge 1106 can be separate pieces or a single integral piece. The glasses 1100 can also be referred to as eyeglasses.

[00174] The pair of glasses 1100 also includes a first extended endpiece 1112 and a second extended endpiece 1113. In addition, the pair of glasses 1100 includes a pair of temples, namely, a first temple 1108 and a second temple 1110. The first extended endpiece 1112 connects to the first temple 1108 via a joint (or hinge) 1114. The second extended endpiece 1113 connects to the second temple 1110 via a joint (or hinge) 1115. In one embodiment, the extended endpieces 1112

and 1113 are larger as compared to conventional endpieces. As a result, the respective joints (or hinges) 1114 and 1115 are set back from the respective lens holders 1102 and 1104. For example, in one embodiment, the hinge 1115 is set back from the lens holder 1104 by about 1 to 5 centimeters. One advantage of utilizing enlarged (or extended) endpieces 1112 and 1113 as illustrated in FIG. 11A is that electrical components 1116 are able to be comfortably provided in the extended endpieces 1112 and 1113. Moreover, another advantage is that the electrical components 1116 within the extended endpiece 1113 can electrically couple to other electrical components provided within the forward portion or front area of the frame without having to electrically connect through a joint or hinge. As illustrated in FIG. 11A, the extended endpiece 1113 provides electrical components 1116 with at least a portion at an inner surface of the extended endpiece 1113. The electrical components 1116, in this example, include a display 1118 and a plurality of switches 1120 (e.g., buttons). As an example, the electrical components 1116 can, for example, implement an electrical system (e.g., pedometer system, UV monitoring system, or other physical condition monitoring system, etc.). In the embodiment of the glasses 1100 illustrated in FIG. 11A, the electrical components 1116 are provided in the extended endpiece 1113.

[00175] FIG. 11B illustrates the pair of glasses 1100 according to another embodiment of the invention. More particularly, FIG. 11B illustrates the pair of glasses 1100 illustrated in FIG. 11A where the electrical components 1116 are provided as a module 1122 embedded internal to the extended endpiece 1113. The module 1122 includes a plurality of interconnected electrical components, including the display 1118 and the switches 1120. In addition, the glasses 1100 further include a separate electrical component 1124. As illustrated in FIG. 11B, the separate electrical component 1124 can be provided at the bridge 1106. Still further, a conductive element (e.g., a wire) that electrically connects the module 1122 with the separate electrical component 1124 can be provided internal to the eyeglass frame, such as internal to the lens holder of 1104. The nature of the separate electrical component 1124 can vary depending upon application. In the case in which the

module 1122 pertains to a pedometer or health system, the separate electrical component 1124 can pertain to a sensor used to measure the heart rate of the user of the glasses 1100. For additional details on a sensor utilized in this context, see U.S. Provisional Patent Application No. 60/787,850, filed April 1, 2006, and entitled "EYEGLASSES WITH HEART RATE MONITOR," which is hereby incorporated herein by reference. Although not illustrated in FIG. 11B, the extended end piece 1113 can also include a cavity (or opening) and a cover or a door. The module 1122 can be inserted or removed from the cavity by way of the cover or door.

[00176] FIGs. 12A-12E illustrate a side view of eyeglass frames having an extended temples according to several embodiment of the invention. In FIG. 12A, a side view of an eyeglass frame 1200 includes a lens holder (or a region immediately proximate to a lens holder) 1202, an extended endpiece 1204 and a temple 1206. The extended endpiece 1204 includes one or more electrical components 1208 partially or completely internal to the extended endpiece 1204. In this embodiment, the manner by which the temple 1206 connects to the extended endpiece 1204 is not depicted. Hence, the temple 1206 can be integral with the extended endpiece 1200, can be permanently coupled to the extended endpiece 1204, or can be removably or pivotally coupled to the extended endpiece 1204.

[00177] The side view of an eyeglass frame 1220 illustrated in FIG. 12B is similar to the eyeglass frame 1200 illustrated in FIG. 12A. However, in this embodiment, the temple 1206 is coupled to the extended endpiece 1204 by way of a joint (or hinge) 1210. FIG. 12C illustrates the eyeglass frame 1220 with the temple 1206 being substantially closed with respect to the eyeglass frame 1220. As noted in FIG. 12C, the temple 1206 can rotate (or pivot) with respect to the extended endpiece 1204 by way of the joint (or hinge) 1210. In this embodiment, the temple 1206 is able to be rotated (or pivoted) as in conventional eyewear such that (i) the temples can be closed or folded inwards towards the lens holders when not being worn, which can facilitate storage or (ii) the temples can be extended to an open position or extended outwards away from the lens holders, so that the eyeglasses can be worn. While retaining the traditional notion of the folding temples, the

eyeglass frame 1220 causes the joint 1210 to be set back from the lens holder 1202 so that the endpiece is extended, which can facilitate including or storing one or more electoral components within the endpiece.

[00178] The side view of an eyeglass frame 1230 illustrated in FIG. 12D is similar to the eyeglass frame 1200 illustrated in FIG. 12A. However, in this embodiment, the temple 1206 is coupled to the extended endpiece 1204 by a linking temple piece 1232. The linking temple piece 1232 couples to the extended endpiece 1204 by way of a joint (or hinge) 1234. The joint 1234 allows the linking temple piece 1232 to rotate (or pivot) with respect to the extended endpiece 1204. In addition, the linking temple piece 1232 includes a connector 1236 that is capable of receiving a corresponding connector 1238 associated with the temple 1206. In this embodiment, the temple 1206 couples to the linking temple piece 1232 using the connectors 1236 and 1238 which provide physical connection (and optionally also electrical connection). The linking temple piece 1232 in turn can couple to the extended endpiece 1204 by way of the joint (or hinge) 1234. The temple 1206 is thus easily removable from the linking temple piece 1232 of the eyeglass frame 1230.

[00179] The side view of an eyeglass frame 1240 illustrated in FIG. 12E is similar to the eyeglass frame 1200 illustrated in FIG. 12A. However, in this embodiment, the extended endpiece 1204 includes a first connector 1242, and the temple 1206 includes a corresponding connector 1244. Here, the temple 1206 can be removably connected to the extended endpiece 1204 by way of the connectors 1242 and 1244.

[00180] According to still another embodiment of the invention, temples for eyeglass frames can be not only removable but also piecewise replaceable. In other words, an entire temple can be removed and replaced with respect to an eyeglass frame. In another implementation, a portion of a temple can be removed and replaced with another portion. Allowing temples of eyeglass frames to be removed and replaced facilitates incorporating different electronic modules that are internal to, integral with, or at least partially embedded in the temples (or temple portions) to the

changed. Also, the different temple portions can have different design appearances that allow the design of the eyeglasses, namely the temples, to be altered as desired by a user. In other words, the temples or temple portions can be swappable.

[00181] FIG. 13A illustrates a temple 1400 having multiple parts according to one embodiment of the invention. The temple 1400 includes a temple base 1402 that couples to a forward portion 1404 of an eyeglass frame. The forward portion 1404 can, for example, pertain to an endpiece or a portion in the vicinity of a hinge (or joint) of a temple. In addition, the temple 1400 includes a temple tip 1406 (or rearward portion). One end of the temple base 1402 can connect to the forward portion 1404 and the other end of the temple base can connect to the temple tip (or rearward portion) 1406. In one embodiment, the temple base 1402 and the temple tip 1406 of an eyeglass frame can be replaced (individually or in combination) with other temple bases and temple tips. For example, the temple base 1402 and/or the temple tip 1406 could be removed and replaced with another temple base and/or temple tip having a different functional capability or a different ornamental appearance.

[00182] FIG. 13B illustrates a portion of an eyeglass frame 1420 according to one embodiment of the invention. The portion of the eyeglass frame 1420 is similar to a portion of the eyeglass frames 1200 illustrated in FIG. 12A. One difference is that the temple 1206 now explicitly illustrates a temple base 1422 and a temple tip 1424. The temple base 1422 and the temple tip 1424 can be removed and replaced (individually or in combination) with respect to the eyeglass frame, such as the extended endpiece 1204.

[00183] FIG. 13C illustrates a portion of an eyeglass frame 1340 according to another embodiment of the invention. The portion of the eyeglass frame 1440 is similar to a portion of the eyeglass frame 1200 illustrated in FIG. 12A. However, in FIG. 13C, the portion of the eyeglass frame 1440 includes a temple insert 1442. The temple insert 1442 can include one or more electrical components 1444 internal to, integral with, or at least partially embedded in the temple insert 1442. As

illustrated in FIG. 13C, the temple insert 1442 can be provided between the extended endpiece 1204 and the temple 1206 or the rearward portion of the temple. Although not shown in FIG. 13C, the connection between the temple insert 1442 and the extended endpiece 1204 or the temple 1206 can be through use of a joint (or hinge) or by way of connectors as discussed above. In this embodiment, the temple insert 1442 can provide electrical components that can interact with the electrical components 1208 within the extended endpiece 1204 or elsewhere within the eyeglass frame. Hence, a user can optionally include the temple insert 1442 between the temple 1206 and the extended endpiece 1204 to provide additional functionality to the eyeglasses. In one embodiment, when the additional functionalities are not desired, the temple insert 1442 can be removed from the temple configuration, or the one or more electrical components 1444 can be removed from the temple insert 1442.

[00184] Another feature of the wireless eyeglasses that may be provided is one or more electrical connections on the frame of the wireless eyeglasses so as to facilitate electrical connection with a battery charger. For example, when the power source for the wireless eyeglasses is a rechargeable battery, the ability to charge the battery without removing the battery from the frame (e.g., arm) of the wireless eyeglasses is advantageous. Hence, in one embodiment, the frame of the eyeglasses includes at least one connector or conductive element (e.g., terminal, pin, pad, trace, etc.) so that the electrical coupling between the rechargeable battery and the charger can be achieved. In this regard, the electrical connector or conductive element is provided on the frame of the eyeglasses and electrically connected to the battery. The placement of the electrical connector or conductive element on the frame serves to allow the wireless eyeglasses to be simply placed within a charger and consequently have the electrical connector or conductive element be in electrical contact with a counterpart or corresponding electrical connector or conductive element of the charger.

[00185] In one embodiment, the charger can be considered a docking station, upon which the wireless eyeglasses are docked so that the battery within the

wireless eyeglasses is able to be charged. Hence, the frame of the wireless eyeglasses can likewise include an electrical connector or conductive element that facilitates electrical connection to the docking station when docked.

[00186] Power (e.g., external power source) can be coupled to the glasses through a connector. In one embodiment, the power source is embedded inside or inserted into the glasses. Different types of power sources are applicable. For example, the power source can be a battery, a fuel cell, a solar cell, or a re-chargeable battery. The rechargeable battery can be charged through a connector at the glasses.

[00187] In an earlier application, namely, U.S. Provisional Patent Application No. 60/509,631, filed October 9, 2003, and entitled "TETHERED ELECTRICAL COMPONENTS FOR EYEGLASSES," which has been incorporated herein by reference, there can be a base connected to the glasses through a cord. The cord can be just a piece of flexible conductor encapsulated by a flexible insulator. Typically, a cord includes a number of electrical wires or conductors. There can be one or more electrical components in the base, and there can also be one or more electrical components in the cord. The different types of connectors previously described can be located in the base. In one embodiment, a power source is an electrical component in the base tethered to a pair of glasses. In another embodiment, the glasses are tethered to a base that has a connector. The connector is connected to and draws power from an external electronic device. In this embodiment, electrical components in the glasses draw power from the external electronic devices.

[00188] In yet another embodiment, the power sources are in a base or portable device connected to the glasses through a wire connection, and the power sources can be rechargeable.

[00189] An arm for a frame of a pair of eyeglasses according to one embodiment can further include additional eyeglass electrical components, such as a light source. The light source can, for example, be a Light Emitting Diode (LED).

The light source can provide ornamental lighting to the frame or can serve as an indicator light.

[00190] As explained, in a number of embodiments, the glasses include a switch, which typically is at least partially embedded in the glasses.

[00191] The switch in the glasses can have different attributes. It can be activated by different type of forces, including mechanical, radiation, magnetic, electrical, and temperature. The switch can also be activated remotely by a remote device. The switch can be based on one or more detectors. The switch can have different degrees or ranges of control, such as binary, multiple discrete steps or incremental control. The switch can be placed at different position on the glasses, such as on the side or top surface of a temple or at a joint. The control can take perception into consideration, such as based on texture, height and lateral position of multiple switches.

[00192] The switch can be activated by magnetic forces. For example, there can be a magnetic sensor or a Hall effect detector inside a temple proximate to a joint of a pair of glasses. A pair of glasses with such a detector can electrically connect the detector to a printed circuit board. When its temple is in its extended position, as when the glasses are ready to be worn, the detector will be directly adjacent to a magnet inside a lens holder at the corresponding joint. The magnet would activate the Hall effect detector. In another embodiment, a magnetic switch is activated based on changing the inductance of a coil. For example, the switch includes a steel rod that can be positioned in or out of a coil. The switch's range of control is based on the position of the rod with respect to the coil.

[00193] In still yet another embodiment, the "being worn" sensor can be implemented as a switch. For example, the switch can utilize optical, magnetic or mechanical means. In one embodiment, the switch can be positioned at the temple of the eyewear, such as a forward end of the temple proximate to a corresponding lens holder. Different embodiments of such sensors are also described in U.S. Provisional Patent Application No. 60/583,169, filed June 26, 2004, entitled

"ELECTRICAL COMPONENTS FOR USE WITH EYEWEAR, AND METHODS THEREFOR," which has been incorporated herein by reference, see, e.g., section entitled "EYEGLASSES WITH USER INPUT CAPABILITY."

[00194] The various aspects, embodiments, implementations and features of the invention noted above can be combined in various ways or used separately. Those skilled in the art will understand from the description that the invention can be equally applied to or used in other various different settings with respect to various combinations, aspects, embodiments, implementations or features provided in the description herein.

[00195] Certain aspects of the invention can be implemented in software, hardware or a combination of hardware and software. Certain aspects of the invention can also be embodied as computer readable code on a computer readable medium. The computer readable medium is any data storage device that can store data which can thereafter be read by a computer system. Examples of the computer readable medium include read-only memory, random-access memory, CD-ROMs, magnetic tape, optical data storage devices, and carrier waves. The computer readable medium can also be distributed over network-coupled computer systems so that the computer readable code is stored and executed in a distributed fashion.

[00196] The advantages of the invention are numerous. Different embodiments or implementations may yield one or more of the following advantages. One advantage of the invention is that electrical components can be provided integral with or attached to a temple arrangement, a temple adapter or a removable temple part for use with a pair of eyeglasses. Another advantage of the invention is that after-market changes to electrical capabilities of eyeglasses can be relatively easily achieved. Another advantage of the invention is that communication, computation, information capturing or sensing, and/or operational capabilities can be provided for eyeglasses without substantial interference to style or design choices of the glasses. Still another advantage of the invention is that wireless communications, radiation monitoring, fitness monitoring and/or health monitoring can be supported by the

electrical components. Yet another advantage of the invention is the ability to provide hands-free wireless communications capability.

[00197] As noted above, this application incorporates by reference, each of the following: (i) U.S. Patent Application 10/822,218 (now U.S. Patent No. 10/822,218),, filed April 12, 2004, and entitled "EYEGLASSES FOR WIRELESS COMMUNICATIONS;" (ii) U.S. Patent Application No. 10/964,011 (now U.S. Patent No. 7,192,136), filed October 12, 2004, and entitled "TETHERED ELECTRICAL COMPONENTS FOR EYEGLASSES;" (iii) U.S. Patent No. 7,116,976; (iv) U.S. Patent No. 7,500,746; (v) U.S. Patent Application No. 11/078,857, filed March 11, 2005, and entitled "RADIATION MONITORING SYSTEM;" (vi) U.S. Patent Application No. 11/183,283, filed July 15, 2005, and entitled "EVENT EYEGLASSES;" (vii) U.S. Patent No. 7,760,898; (viii) U.S. Patent No. 7,500,747; (ix) U.S. Patent No. 7,380,936; (x) U.S. Patent No. 7,255,437; and (xi) U.S. Patent No. 7,806,525.

[00198] Numerous specific details are set forth in order to provide a thorough understanding of the present invention. However, it will become obvious to those skilled in the art that the invention may be practiced without these specific details. The description and representation herein are the common meanings used by those experienced or skilled in the art to most effectively convey the substance of their work to others skilled in the art. In other instances, well-known methods, procedures, components, and circuitry have not been described in detail to avoid unnecessarily obscuring aspects of the present invention.

[00199] In the foregoing description, reference to "one embodiment" or "an embodiment" means that a particular feature, structure, or characteristic described in connection with the embodiment can be included in at least one embodiment of the invention. The appearances of the phrase "in one embodiment" in various places in the specification are not necessarily all referring to the same embodiment, nor are separate or alternative embodiments mutually exclusive of other embodiments. Further, the order of blocks in process flowcharts or diagrams representing one or

more embodiments of the invention do not inherently indicate any particular order nor imply any limitations in the invention.

[00200] Many features and advantages of the present invention are apparent from the written description. Since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation as illustrated and described. Hence, all suitable modifications and equivalents may be resorted to as falling within the scope of the invention.

What is claimed is:

CLAIMS

1. A system, comprising:

a head-worn personal electronic apparatus, including at least:

a head-worn structure configured to be worn by a user;

at least one speaker at least partially internal to the head-worn structure, the at least one speaker being configured to be worn proximate to an ear of the user when the head-worn structure is being worn by the user;

a touch sensitive surface at least partially contained within the head-worn structure and configured to sense a touch input associated with the user;

a rechargeable battery contained within the head-worn structure;

electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery, and the electronic circuitry being electrically connected to the touch sensitive surface;

wireless communication circuitry at least partially contained within the head-worn structure, the wireless communication circuitry being electrically connected to at least the rechargeable battery; and

at least one conductive element at least partially included within the head-worn structure, the at least one conductive element being at least partially exposed to enable interconnection therewith, the at least one conductive element being electrically connected to at least the rechargeable battery; and

a charging apparatus having a charging connector,

wherein on placement of the head-worn personal electronic apparatus in the charging apparatus, electrical connection results from the at least one conductive element connecting with the charging connector, and thereby the rechargeable battery of the head-worn personal electronic apparatus is able to be recharged while the head-worn personal electronic apparatus is placed in the charging apparatus.

2. A system as recited in claim 1, wherein the sensed touch input by the touch sensitive surface operates to at least alter operation of the head-worn personal electronic apparatus.

3. A system as recited in claim 2, wherein head-worn personal electronic apparatus is configured to support voice calls to the user, and

wherein the at least one operation of the head-worn personal electronic apparatus being altered concerns at least accepting or declining a voice call to the user.

4. A system as recited in claim 2, wherein head-worn personal electronic apparatus is configured to support audio output to the user, and

wherein the at least one operation of the head-worn personal electronic apparatus being altered concerns control of the audio output being provided to the user.

5. A system as recited in claim 2, wherein the head-worn personal electronic apparatus is configured to distinguish at least a direction of the user input with respect to the touch sensitive surface.

6. A system as recited in claim 2, wherein the head-worn personal electronic apparatus is configured to detect at least a sliding of a finger action with respect to the touch sensitive surface.

7. A system as recited in claim 2, wherein the head-worn personal electronic apparatus is configured to facilitate determination at least whether the user input pertains to a forward sliding action or a backward sliding action with respect to the touch sensitive surface.

8. A system as recited in claim 1, wherein the head-worn structure comprises:

a physical condition sensor at least partially contained within the head-worn structure and configured to acquire data pertaining to a physical condition of the user, the physical condition sensor being provided at least partially internal to the head-worn structure.

9. A system as recited in claim 8, wherein the acquired data by the physical condition sensor includes at least data pertaining to or dependent on heart beats of the user.

10. A system as recited in claim 1, wherein the head-worn personal electronic apparatus comprises:

at least one magnetic element at least partially internal to the head-worn structure and configured to support a magnetic force that facilitates an electrical connection.

11. A system as recited in claim 1, wherein the head-worn personal electronic apparatus comprises:

a microphone at least partially internal to the head-worn structure,

wherein the head-worn personal electronic device is configured to receive a voice input via the microphone, determine a requested operation from the voice input using voice recognition, and control an operation by the head-worn personable electronic device based on the requested operation.

12. A system as recited in claim 1, wherein the head-worn structure comprises:

a radiation sensor, operatively connected to the rechargeable battery, at least partially contained within the head-worn structure and configured to sense radiation.

13. A system as recited in claim 1, wherein the head-worn personal electronic apparatus comprises:

a sensor at least partially contained within the head-worn structure and configured to sense data indicative of whether the head-worn personal electronic apparatus is being worn by the user.

14. A system as recited in claim 13, wherein the sensor is electrically connected to the electronic circuitry, and wherein the electronic circuitry contained within the head-worn structure of the head-worn personal electronic apparatus is configured to at least alter operation of the head-worn personal electronic apparatus based at least in part on the sensed data from the sensor.

15. A system as recited in claim 14, wherein head-worn personal electronic apparatus is configured to support audio output to the user, and

wherein the operation of the head-worn personal electronic apparatus being altered concerns control of the audio output being provided to the user.

16. A system as recited in claim 14, wherein head-worn personal electronic apparatus is configured to support audio output to the user, and

wherein the operation of the head-worn personal electronic apparatus being altered concerns operation of the head-worn personal electronic apparatus in a lower power operation.

17. A system as recited in claim 1, wherein the head-worn personal electronic apparatus comprises:

a Hall effect detector at least partially contained within the head-worn structure and configured to capture data associated with a magnetic characteristic, the Hall effect detector being operatively connected to the electronic circuitry.

18. A system as recited in claim 1, wherein the head-worn personal electronic apparatus comprises:

a bone conducting element at least partially contained within the head-worn structure and configured to operate in accordance with acoustic characteristics, the bone conducting element being operatively connected to the electronic circuitry.

19. A system, comprising:

a head-worn personal electronic apparatus, including at least:

a head-worn structure configured to be worn by a user;

at least one speaker at least partially internal to the head-worn structure, the at least one speaker being configured to be worn proximate to an ear of the user when the head-worn structure is being worn by the user;

a first microphone at least partially contained within the head-worn structure, the first microphone being positioned to pick up at least audio input from at least the user;

a second microphone at least partially contained within the head-worn structure, the second microphone being positioned to pick up at least environmental audio input associated with an environment around the head-worn personal electronic apparatus;

a rechargeable battery contained within the head-worn structure;

electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery;

wireless communication circuitry at least partially contained within the head-worn structure, the wireless communication circuitry being electrically connected to at least the rechargeable battery; and

at least one conductive element at least partially included within the head-worn structure, the at least one conductive element being at least partially

exposed to enable interconnection therewith, the at least one conductive element being electrically connected to at least the rechargeable battery; and

a charging apparatus having a charging connector,

wherein on placement of the head-worn personal electronic apparatus in the charging apparatus, electrical connection results from the at least one conductive element connecting with the charging connector, and thereby the rechargeable battery of the head-worn personal electronic apparatus is able to be recharged while the head-worn personal electronic apparatus is placed in the charging apparatus.

20. A system as recited in claim 19, wherein the electronic circuitry is configured to process the audio input from at least the user via the first microphone to remove at least a portion of the environmental audio input associated with the environment picked up via the second microphone.

21. A system as recited in claim 20, wherein the head-worn personal electronic apparatus comprises:

a touch sensitive surface at least partially contained within the head-worn structure and configured to sense a touch input associated with the user, wherein the sensed touch input operating to at least alter operation of the head-worn electronic personal audio apparatus.

22. A system as recited in claim 21, wherein head-worn electronic personal audio apparatus is configured to support audio output to the user, and

wherein the at least one operation of the head-worn electronic personal audio apparatus being altered concerns control of the audio output being provided to the user.

23. A system as recited in claim 21, wherein the head-worn electronic personal audio apparatus comprises:

a Hall effect detector at least partially contained within the head-worn structure and configured to capture data associated with a magnetic characteristic.

24. A system as recited in claim 19, wherein the head-worn personal electronic apparatus comprises:

a sensor at least partially contained within the head-worn structure and configured to capture data,

wherein the electronic circuitry provided within the head-worn structure and electrically connected to the sensor, the electronic circuitry configured to process at least the data captured by the sensor.

25. A system as recited in claim 24, wherein the electronic circuitry is configured to determine whether the head-worn structure is being worn by a user based on at least the processed sensor data.

26. A system as recited in claim 19, wherein the head-worn personal electronic apparatus comprises:

wherein the head-worn personal electronic device is configured to receive a voice input via the first microphone, determine a requested operation from the voice input using voice recognition, and control an operation by the head-worn personal electronic device based on the requested operation.

27. A system as recited in claim 19, wherein the head-worn structure comprises:

a radiation sensor, operatively connected to the rechargeable battery, at least partially contained within the head-worn structure and configured to sense radiation.

28. A system as recited in claim 19, wherein the head-worn personal electronic apparatus comprises:

a sensor at least partially contained within the head-worn structure and configured to sense data indicative of whether the head-worn personal electronic apparatus is being worn by the user.

29. A system as recited in claim 28, wherein the head-worn personal electronic apparatus is configured to at least alter operation of the head-worn personal electronic apparatus based at least in part on the sensed data from the sensor.

30. A system as recited in claim 29, wherein head-worn personal electronic apparatus is configured to support audio output to the user, and

wherein the operation of the head-worn personal electronic apparatus being altered concerns control of the audio output being provided to the user.

31. A system as recited in claim 19, wherein the head-worn personal electronic apparatus comprises:

a user input device supported by the head-worn structure, the user input device being configured to receive a user input, the user input device is based on at least capacitive effect, wherein the user input being received induces at least a capacitive change to produce at least an electrical response.

32. A system as recited in claim 31, wherein the user input device is configured to distinguish at least a direction of the user input with respect to the user input device.

33. A system as recited in claim 31, wherein the electronic circuitry is electrically connected to the user input device to receive user input data from the user input device, and wherein the head-worn personal electronic apparatus is configured to detect at least a sliding of a finger action with respect to the user input device using at least the electronic circuitry and the user input data.

34. A system as recited in claim 31, wherein the electronic circuitry is electrically connected to the user input device to receive user input data from the user input

device, and wherein the head-worn personal electronic apparatus is configured to distinguish at least whether the user input pertains to a forward sliding action or a backward sliding action with respect to the user input device using at least the electronic circuitry and the user input data.

35. A system as recited in claim 19, wherein the head-worn personal electronic apparatus:

a radiation emitter at least partially contained within the head-worn structure and configured to at least direct radiation towards the user when at least the head-worn structure of the head-worn personal electronic apparatus is being worn; and

a radiation detector at least partially contained within the head-worn structure and configured to detect radiation reflected back from the user when at least the head-worn structure of the head-worn personal electronic apparatus is being worn.

36. A system as recited in claim 35, wherein the radiation detector is operatively connected to the electronic circuitry, and wherein electronic circuitry within the head-worn structure is configured to facilitate determining whether the head-worn structure of the head-worn personal electronic apparatus is being worn by the user based on at least the detected radiation.

37. A system as recited in claim 36, wherein the detected radiation is at least infrared radiation.

38. A system as recited in claim 19, wherein the head-worn electronic personal audio apparatus comprises:

a Hall effect detector at least partially in the head-worn structure and configured to capture data associated with a magnetic characteristic.

39. A system as recited in claim 19, wherein the head-worn personal electronic apparatus comprises:

a bone conducting element at least partially contained within the head-worn structure and configured to operate based on signals associated with sound, the bone conducting element being operatively connected to the electronic circuitry.

40. A system as recited in claim 19, wherein the head-worn personal electronic apparatus comprises:

a radiation detector configured to capture radiation data,

wherein the electronic circuitry is electrically connected to the radiation detector, the electronic circuitry configured to process at least the radiation data captured by the radiation detector, and

wherein the electronic circuitry is configured to determine whether the head-worn personal electronic apparatus is being worn by a user based on at least the processed radiation data.

41. A system as recited in claim 40, wherein the radiation detector comprises a photodetector.

42. A system as recited in claim 19, wherein the conductive element is a conductive pad.

43. A system, comprising:

a head-worn personal electronic apparatus, including at least:

a head-worn structure configured to be worn by a user;

at least one speaker at least partially internal to the head-worn structure, the at least one speaker being configured to be worn proximate to an ear of the user when the head-worn structure is being worn by the user;

a motion detector at least partially contained within the head-worn structure and configured to provide motion data pertaining to the head-worn personal electronic apparatus;

a first microphone at least partially contained within the head-worn structure, the first microphone being positioned to pick up at least audio input from at least the user;

a second microphone at least partially contained within the head-worn structure, the second microphone being positioned to pick up at least environmental audio input associated with an environment around the head-worn personal electronic apparatus;

a touch sensitive surface at least partially contained within the head-worn structure and configured to sense a touch input associated with the user, wherein the sensed touch input operating to at least alter operation of the head-worn electronic personal audio apparatus.

a rechargeable battery contained within the head-worn structure;

electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery;

wireless communication circuitry at least partially contained within the head-worn structure, the wireless communication circuitry being electrically connected to at least the rechargeable battery; and

at least one conductive element at least partially included within the head-worn structure, the at least one conductive element being at least partially exposed to enable interconnection therewith, the at least one conductive element being electrically connected to at least the rechargeable battery; and

a charging apparatus having a charging connector,

wherein on placement of the head-worn personal electronic apparatus in the charging apparatus, electrical connection results from the at least one conductive element connecting with the charging connector, and thereby the

rechargeable battery of the head-worn personal electronic apparatus is able to be recharged while the head-worn personal electronic apparatus is placed in the charging apparatus.

44. A system as recited in claim 43, wherein the head-worn personal electronic apparatus comprises:

wherein the electronic circuitry is configured to process the audio input from at least the user via the first microphone to remove at least a portion of the environmental audio input associated with the environment picked up via the second microphone,

wherein the head-worn personal electronic device is configured to receive a voice input via the first microphone, determine a requested operation from the voice input using voice recognition, and control an operation by the head-worn personal electronic device based on the requested operation,

wherein head-worn electronic personal audio apparatus is configured to support audio output to the user, and

wherein the at least one operation of the head-worn electronic personal audio apparatus being altered concerns control of the audio output being provided to the user.

45. A system as recited in claim 44, wherein the head-worn personal electronic apparatus comprises:

at least one magnetic element at least partially internal to the head-worn structure and configured to support a magnetic force that facilitates an electrical connection;

46. A system as recited in claim 44, wherein the head-worn personal electronic apparatus comprises:

a sensor at least partially contained within the head-worn structure and configured to sense data indicative of whether the head-worn personal electronic apparatus is being worn by the user,

wherein the head-worn personal electronic apparatus is configured to at least alter operation of the head-worn personal electronic apparatus based at least in part on the sensed data from the sensor.

47. A system as recited in claim 46, wherein head-worn personal electronic apparatus is configured to support audio output to the user, and

wherein the operation of the head-worn personal electronic apparatus being altered concerns control of the audio output being provided to the user.

48. A system as recited in claim 46, wherein head-worn personal electronic apparatus is configured to support audio output to the user, and

wherein the operation of the head-worn personal electronic apparatus being altered concerns operation of the head-worn personal electronic apparatus in a lower power operation.

SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC APPARATUS

ABSTRACT OF THE DISCLOSURE

Techniques for providing eyewear or other head-worn personal electronic apparatus with electrical components are disclosed. The electrical components can provide electrical technology to eyewear or other head-worn personal electronic apparatus without having to substantially compromise aesthetic design principles. The electrical components can be partially or completely internal to eyewear or other head-worn personal electronic apparatus. The electrical components can operate independently or together with other electrical components provided elsewhere. Apparatus for presenting after-market electrical components are also disclosed.

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DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	EYEWEAR SUPPORTING ONE OR MORE ELECTRICAL COMPONENTS

As the below named inventor, I hereby declare that:

This declaration is directed to:

- ☐ The attached application, or
- ☒ United States application or PCT international application number 13/831,512 filed on March 14, 2013

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

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LEGAL NAME OF INVENTOR

Inventor: THOMAS A. HOWELL Date (Optional): 12/22/2016

Signature: Thomas A. Howell

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

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LEGAL NAME OF INVENTOR

Inventor: DAVID CHAO Date (Optional):

Signature:

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LEGAL NAME OF INVENTOR

Inventor: PETER P. TONG Date (Optional): 12/22/16

Signature: Peter Tong

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LEGAL NAME OF INVENTOR

Inventor: C. DOUGLASS THOMAS Date (Optional): 12/22/2016

Signature:

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Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC APPARATUS
First Named Inventor/Applicant Name:	Thomas A. Howell
Filer:	Peter P. Tong/Angela Nijim
Attorney Docket Number:	IPVCP003X1C4X1C1

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
UTILITY APPLICATION FILING	1011	1	320	320
UTILITY SEARCH FEE	1111	1	700	700
UTILITY EXAMINATION FEE	1311	1	800	800
Pages:				
Claims:				
CLAIMS IN EXCESS OF 20	1202	28	100	2800
Miscellaneous-Filing:				
Petition:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**4620**

Electronic Acknowledgement Receipt	
EFS ID:	48654610
Application Number:	18375893
International Application Number:	
Confirmation Number:	4776
Title of Invention:	SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC APPARATUS
First Named Inventor/Applicant Name:	Thomas A. Howell
Customer Number:	34071
Filer:	Peter P. Tong/Angela Nijim
Filer Authorized By:	Peter P. Tong
Attorney Docket Number:	IPVCP003X1C4X1C1
Receipt Date:	02-OCT-2023
Filing Date:	
Time Stamp:	19:07:40
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$4620
RAM confirmation Number	E202302J08329409
Deposit Account	503874
Authorized User	Angela Nijim
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.21 (Miscellaneous fees and charges)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	WebADS.pdf	332556 6d976876615ddf5b42767e69dafd242d6479e6a2	no	11
Warnings:					
Information:					
2	Assignee showing of ownership per 37 CFR 3.73	IPVCP003X1C4X1C1_Statement 373c.pdf	121973 5c79ede741d4d8ff5db566d741db7a4bf552a716	no	3
Warnings:					
Information:					
3	Power of Attorney	IPVCP003X1C4X1C1_PoA.pdf	452755 23b640e21a3f3503289eb05e9a1bfb4ed057a7ac	no	2
Warnings:					
Information:					
4	Transmittal Letter	IPVCP003X1C4X1C1_IDSTrans.pdf	20894 d3178989b2cbc67747530798b765e07370e7edba	no	2
Warnings:					
Information:					
5	Information Disclosure Statement (IDS) Form (SB08)	IPVCP003X1C4X1C1_1449.pdf	146320 b499dc320622310e74136c41dcc1445cc2bbbde5	no	16
Warnings:					
Information:					
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6	Drawings-only black and white line drawings	IPVCP003X1C4X1C1-FormalDrawings_AsFiled.pdf	3303493 cce6c2d96e85897fbdb96511ee409507fed21605	no	20
Warnings:					

Information:					
7	Transmittal of New Application	IPVCP003X1C4X1C1_AppTrans.pdf	285588 4af1508ade97c3715c5c97707b2ade50af3d43a5	no	2
Warnings:					
Information:					
8		IPVCP003X1C4X1C1-app-ASFILED-final-final.pdf	349939 5646ffc5d3ea9e5cd097eaeee0bf994bc9df2c63	yes	74
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Specification		1	60	
	Claims		61	73	
	Abstract		74	74	
Warnings:					
Information:					
9	Oath or Declaration filed	IPVCP003X1C4X1C1_ExecDecs-Parent_CUTE.pdf	3532606 57f47aef0b68566495474a428a66d13ccf8f9230	no	4
Warnings:					
Information:					
10	Fee Worksheet (SB06)	fee-info.pdf	46575 632ee8d895f408d3c39032ff627590aaf9e670e5	no	2
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New International Application Filed with the USPTO as a Receiving Office

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	IPVCP003X1C4X1C1
	Application Number	
Title of Invention	SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC APPARATUS	

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This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

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Inventor Information:

Inventor 1

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Thomas	A.	Howell	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	San Jose	State/Province	CA	Country of Residence i	US

Mailing Address of Inventor:

Address 1	924 S. 8th St.		
Address 2			
City	San Jose	State/Province	CA
Postal Code	95112	Country i	US

Inventor 2

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	David		Chao	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Saratoga	State/Province	CA	Country of Residence i	US

Mailing Address of Inventor:

Address 1	14137 Sobey Road		
Address 2			
City	Saratoga	State/Province	CA
Postal Code	95070	Country i	US

Inventor 3

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	C.	Douglass	Thomas	

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	IPVCP003X1C4X1C1
	Application Number	
Title of Invention	SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC APPARATUS	

Residence Information (Select One)	◉ US Residency	○ Non US Residency	○ Active US Military Service

City	Saratoga	**State/Province**	CA	**Country of Residence** i	US

Mailing Address of Inventor:

Address 1	4010 Moorpark Avenue		
Address 2	Suite 211		
City	San Jose	**State/Province**	CA
Postal Code	95117	**Country** i	US

Inventor 4

Legal Name

Prefix	**Given Name**	**Middle Name**	**Family Name**	**Suffix**
	Peter	P.	Tong	

Residence Information (Select One)	◉ US Residency	○ Non US Residency	○ Active US Military Service

City	Mountain View	**State/Province**	CA	**Country of Residence** i	US

Mailing Address of Inventor:

Address 1	1807 Limetree Lane		
Address 2			
City	Mountain View	**State/Province**	CA
Postal Code	94040	**Country** i	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. [Add]

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	34071		
Email Address	doug@ipventure.com	[Add Email]	[Remove Email]

Application Information:

Title of the Invention	SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC APPARATUS		
Attorney Docket Number	IPVCP003X1C4X1C1	**Small Entity Status Claimed**	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	20	**Suggested Figure for Publication (if any)**	1

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	IPVCP003X1C4X1C1
	Application Number	
Title of Invention	SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC APPARATUS	

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	34071		

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix	Remove
Registration Number					
Prefix	**Given Name**	Middle Name	**Family Name**	Suffix	Remove
Registration Number					

Additional Representative Information blocks may be generated within this form by selecting the **Add** button.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	IPVCP003X1C4X1C1
	Application Number	
Title of Invention	SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC APPARATUS	

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.
When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	Continuation of	16182969	2018-11-07

Prior Application Status	Patented			Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
16182969	Continuation of	16127957	2018-09-11	11086147	2021-08-10

Prior Application Status	Patented			Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
16127957	Continuation of	14715501	2015-05-18	10330956	2019-06-25

Prior Application Status	Patented			Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
14715501	Continuation of	13367346	2012-02-06	9033493	2015-05-19

Prior Application Status	Patented			Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
13367346	Continuation of	12462286	2009-07-31	8109629	2012-02-07

Prior Application Status	Patented			Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
12462286	Continuation of	11580222	2006-10-11	7581833	2009-09-01

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
11580222	Claims benefit of provisional	60725999	2005-10-11

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	IPVCP003X1C4X1C1
	Application Number	
Title of Invention	SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC APPARATUS	

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
11580222	Claims benefit of provisional	60725896	2005-10-11

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
11580222	Claims benefit of provisional	60787850	2006-04-01

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
11580222	Claims benefit of provisional	60846150	2006-09-20

Prior Application Status	Patented				Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
16182969	Continuation of	16049120	2018-07-30	11243416	2022-02-08

Prior Application Status	Patented				Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
16049120	Continuation of	15375423	2016-12-12	10061144	2018-08-28

Prior Application Status	Patented				Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
15375423	Continuation of	14557409	2014-12-01	9547184	2017-01-17

Prior Application Status	Patented				Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
14557409	Continuation of	13955336	2013-07-31	8905542	2014-12-09

Prior Application Status	Patented				Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
13955336	Continuation of	13085402	2011-04-12	8500271	2013-08-06

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	IPVCP003X1C4X1C1
	Application Number	
Title of Invention	SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC APPARATUS	

Prior Application Status	Abandoned		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
16182969	Continuation of	15409723	2017-01-19

Prior Application Status	Patented			Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
15409723	Continuation of	13831512	2013-03-14	9690121	2017-06-27

Prior Application Status	Patented			Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
13831512	Continuation of	12806312	2010-08-10	8465151	2013-06-18

Prior Application Status	Patented			Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
12806312	Continuation in part of	12462286	2009-07-31	8109629	2012-02-07

Prior Application Status	Patented			Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
12462286	Continuation of	11580222	2006-10-11	7581833	2009-09-01

Prior Application Status	Patented			Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
12806312	Continuation in part of	12317043	2008-12-18	7771046	2010-08-10

Prior Application Status	Patented			Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
12317043	Continuation of	12214435	2008-06-19	7481531	2009-01-27

Prior Application Status	Patented			Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
12214435	Continuation of	11891411	2007-08-09	7401918	2008-07-22

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.

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	Application Number	
Title of Invention	SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC APPARATUS	

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX) the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Application Number	Country	Filing Date (YYYY-MM-DD)	Access Code (if applicable)

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	IPVCP003X1C4X1C1
	Application Number	
Title of Invention	SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC APPARATUS	

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	IPVCP003X1C4X1C1
	Application Number	
Title of Invention	SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC APPARATUS	

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

◉ Assignee	○ Legal Representative under 35 U.S.C. 117	○ Joint Inventor
○ Person to whom the inventor is obligated to assign.	○ Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. ☒

Organization Name	IngenioSpec, LLC		
Mailing Address Information For Applicant:			
Address 1	4010 Moorpark Avenue		
Address 2	Suite 211		
City	San Jose	**State/Province**	CA
Country[i]	US	Postal Code	95117
Phone Number	650-903-9200	Fax Number	650-903-9800
Email Address	doug@ipventure.com		

Additional Applicant Data may be generated within this form by selecting the Add button.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	IPVCP003X1C4X1C1
	Application Number	
Title of Invention	SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC APPARATUS	

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1			
Address 2			
City		**State/Province**	
Country i		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	IPVCP003X1C4X1C1
	Application Number	
Title of Invention	SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC APPARATUS	

Signature:

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). **However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).**

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e. g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/C. Douglass Thomas/			Date (YYYY-MM-DD)	
First Name	C.	Last Name	Thomas	Registration Number	32947

Additional Signature may be generated within this form by selecting the Add button.

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STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: IngenioSpec, LLC

Application No./Patent No.: Not Yet Assigned Filed/Issue Date: Herewith

Titled: SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC APPARATUS

IngenioSpec, LLC, a corporation

(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that, for the patent application/patent identified above, it is (choose **one** of options 1, 2, 3 or 4 below):

1. ☑ The assignee of the entire right, title, and interest.

2. ☐ An assignee of less than the entire right, title, and interest (check applicable box):

   ☐ The extent (by percentage) of its ownership interest is _____%. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.

   ☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

   Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3. ☐ The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

   Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4. ☐ The recipient, via a court proceeding or the like (*e.g.*, bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose **one** of options A or B below):

A. ☐ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.

B. ☑ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: Howell et al. To: Ipventure, Inc.

   The document was recorded in the United States Patent and Trademark Office at
   Reel 024907, Frame 0821, or for which a copy thereof is attached.

2. From: IpVenture, Inc. To: Peter P. Tong and C. Douglass Thomas

   The document was recorded in the United States Patent and Trademark Office at
   Reel 038965, Frame 0750, or for which a copy thereof is attached.

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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STATEMENT UNDER 37 CFR 3.73(c)

3. From: Peter P. Tong and C. Douglass Thomas To: Smart iGlasses, LLC

The document was recorded in the United States Patent and Trademark Office at
Reel 038965, Frame 0985, or for which a copy thereof is attached.

4. From: Smart iGlasses, LLC To: IngenioSpec, LLC

The document was recorded in the United States Patent and Trademark Office at
Reel 039113, Frame 0596, or for which a copy thereof is attached.

5. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

6. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☑ As required by 37 CFR 3.73(c)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/C. Douglass Thomas/	September 27, 2023
Signature	Date
C. Douglass Thomas	32947
Printed or Typed Name	Title or Registration Number

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

PTO/AIA/80 (07-17)
Approved for use through 01/31/2018. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(c).

I hereby appoint:

[X] Practitioners associated with Customer Number: 34071

OR

[ ] Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

As attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(c).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(c) to:

[X] The address associated with Customer Number: 34071

OR

[ ]

Firm or individual name		
Address		
City	State	Zip
Country		
Telephone	Email	

Assignee name and address: IngenioSpec, LLC
4010 Moorpark Avenue
Suite 211
San Jose, CA 95051

A copy of this form, together with a statement under 37 CFR 3.73(c) (Form PTO/AIA/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(c) may be completed by one of the practitioners appointed in this form, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee.

Signature /C. Douglass Thomas/	Date September 28, 2023
Name C. Douglass Thomas	Telephone 650-903-9200, x103
Title Member	

This collection of information is required by 37 CFR 1.31, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public, which is to update (and by the USPTO to process) the file of a patent or reexamination proceeding. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 18 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: HOWELL et al.	Attorney Docket No.: IPVCP003X1C4X1C1
Application No.: Not Yet Assigned	Examiner: Not Yet Assigned
Filed: Herewith	Group: Not Yet Assigned
Title: SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC APPARATUS	

INFORMATION DISCLOSURE STATEMENT
37 CFR §§1.56 AND 1.97(b)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

The references listed in the attached PTO Form 1449 may be material to examination of the above-identified patent application. Applicants submit the list of these references in compliance with their duty of disclosure pursuant to 37 CFR §§1.56 and 1.97. The Examiner is requested to make these references of official record in this application. The above-identified application is a Continuation of prior application U.S. Patent Application No. 16/182,969. This prior application is being relied upon for an earlier filing date under 35 U.S.C. § 120. Because the listed references (to the extent that copies are required) were either cited by the PTO, or submitted to the PTO in the prior application, under 37 CFR § 1.98(d) Applicants submit that copies need not be provided.

This Information Disclosure Statement is not to be construed as a representation that a search has been made, that additional information material

to the examination of this application does not exist, or that these references indeed constitute prior art.

This Information Disclosure Statement is: (i) filed within three (3) months of the filing date of the above-referenced application, (ii) believed to be filed before the mailing date of a first Office Action on the merits, or (iii) believed to be filed before the mailing of a first Office Action after the filing of a Request for Continued Examination under §1.114.

Accordingly, it is believed that no fees are due in connection with the filing of this Information Disclosure Statement. However, if it is determined that any fees are due, the Commissioner is hereby authorized to charge such fees to Deposit Account 50-3874 (Order No. IPVCP003X1C4X1C1).

Respectfully submitted,

/C. Douglass Thomas/

C. Douglass Thomas
Registration No. 32,947

4010 Moorpark Avenue
Suite 211
San Jose, CA 95117

Form 1449 (Modified) Information Disclosure Statement By Applicant (Use Several Sheets if Necessary)	Atty. Docket No.	IPVCP003X1C4X1C1
	Application No.:	Not Yet Assigned
	Applicant	HOWELL et al.
	Filing Date	Filed Herewith
	Group	Not Yet Assigned
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U.S. Patent Documents

Examiner Initial	No.	Patent No.	Date	Patentee	Class	Sub-class	Filing Date
	1.	2001/0005230 A1	Jun-01	Ishikawa			
	2.	2001/0028309 A1	Oct-01	Torch			
	3.	2001/0050754 A1	Dec-01	Hay et al.			
	4.	2002/0021407 A1	Feb-02	Elliot			
	5.	2002/0017997 A1	Feb-02	Felkowitz			
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	7.	2002/0084990 A1	Jul-02	Peterson, III			
	8.	2002/0089639 A1	Jul-02	Starner et al.			
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	12.	2002/0109600 A1	Aug-02	Mault et al.			
	13.	2002/0136414 A1	Sep-02	Jordan et al.			
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	17.	2003/0018274 A1	Jan-03	Takahashi et al.			
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Examiner	Date Considered

Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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	30.	2003/0231293 A1	Dec-03	Blum et al.			
	31.	2004/0000733 A1	Jan-04	Swab et al.			
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	147.	2015/0277123 A1	Oct-15	CHAUM et al.			
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Examiner	Date Considered

Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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	Filing Date	Filed Herewith
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	150.	2016/0246075 A9	Aug-16	Howell et al.			
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	160.	2018/0335650 A1	Nov-18	Howell et al.			
	161.	2018/0348050 A1	Dec-18	Howell et al.			
	162.	2019/0004325 A1	Jan-19	Connor			
	163.	2019/0033622 A1	Jan-19	Olgun et al.			
	164.	2019/0033623 A1	Jan-19	Howell et al.			
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	169.	2019/0318589 A1	Oct-19	Howell et al.			
	170.	2019/0369402 A1	Dec-19	Woodman et al.			
	171.	2019/0378493 A1	Dec-19	KIM et al.			
	172.	2019/0387351 A1	Dec-19	Lyren et al.			
	173.	2020/0012127 A1	Jan-20	Howell et al.			
	174.	2020/0218094 A1	Jul-20	Howell et al.			
	175.	2020/0364992 A1	Nov-20	Howell et al.			
	176.	2021/0000347 A1	Jan-21	Stump			
	177.	2021/0026146 A1	Jan-21	Harder et al.			
	178.	2021/0271116 A1	Sep-21	Chao et al.			

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	179.	2021/0364828 A1	Nov-21	Howell et al.			
	180.	2021/0379425 A1	Dec-21	Tran			
	181.	2022/0008763 A1	Jan-22	SALEH et al.			
	182.	2022/0011603 A1	Jan-22	Howell et al.			
	183.	2022/0034542 A1	Feb-22	Peters et al.			
	184.	2022/0054092 A1	Feb-22	Howell et al.			
	185.	2022/0178743 A1	Jun-22	Howell et al.			
	186.	2022/0335792 A1	Oct-22	Howell et al.			
	187.	2022/0357599 A1	Nov-22	Howell et al.			
	188.	2022/0415338 A1	Dec-22	Howell et al.			
	189.	2023/0017635 A1	Jan-23	Howell et al.			
	190.	2023/0033660 A1	Feb-23	Howell et al.			
	191.	2023/0057654 A1	Feb-23	Howell et al.			
	192.	2023/0236444 A1	Jul-23	Howell et al.			
	193.	2023/0273464 A1	Aug-23	Howell et al.			
	194.	320,558	Jun-1885	Hull			
	195.	669,949	Mar-1901	Underwood			
	196.	1,255,265	Feb-1918	Zachara			
	197.	1,917,745	Jul-33	Weiss			
	198.	2,249,572	Jul-41	Lieber			
	199.	2,638,532	May-53	Brady			
	200.	2,725,462	Nov-55	Vorgang			
	201.	2,794,085	May-57	De Angelis			
	202.	2,818,511	Dec-57	Ullery et al.			
	203.	2,830,132	Apr-58	Borg			
	204.	2,874,230	Feb-59	Carlson			
	205.	2,904,670	Sep-59	Calmes			
	206.	3,060,308	Oct-62	Fortuna			
	207.	3,104,290	Sep-63	Rosemond et al.			
	208.	3,119,903	Jan-64	Rosemond et al.			

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	209.	3,597,054	Aug-71	Winter			
	210.	3,710,115	Jan-73	Jubb			
	211.	3,858,001	Dec-74	Bonne			
	212.	3,883,701	May-75	Delorenzo			
	213.	4,165,487	Aug-79	Corderman			
	214.	4,254,451	Mar-81	Cochran, Jr.			
	215.	4,283,127	Aug-81	Rosenwinkel et al.			
	216.	4,322,585	Mar-82	Liautaud			
	217.	4,348,664	Sep-82	Boschetti et al.			
	218.	4,389,217	Jun-83	Baughman et al.			
	219.	4,526,473	Jul-85	Zahn, III			
	220.	4,535,244	Aug-85	Burnham			
	221.	4,608,492	Aug-86	Burnham			
	222.	4,683,587	Jul-87	Silverman			
	223.	4,751,691	Jun-88	Perera			
	224.	4,757,714	Jul-88	Purdy et al.			
	225.	4,773,095	Sep-88	Zwicker et al.			
	226.	4,806,011	Feb-89	Bettinger			
	227.	4,822,160	April-89	Tsai			
	228.	4,822,161	Apr-89	Jimmy			
	229.	4,851,686	Jul-89	Pearson			
	230.	4,856,086	Aug-89	McCullough			
	231.	4,859,047	Aug-89	Badewitz			
	232.	4,882,769	Nov-89	Gallimore			
	233.	4,904,078	Feb-90	Gorike			
	234.	4,942,629	Jul-90	Stadlmann			
	235.	4,962,469	Oct-90	Ono et al.			
	236.	4,967,268	Oct-90	Lipton et al.			
	237.	4,985,632	Jan-91	Bianco et al.			
	238.	5,008,548	Apr-91	Gat			

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	239.	5,015,086	May-91	Okaue et al.			
	240.	5,020,150	May-91	Shannon			
	241.	5,026,151	Jun-91	Waltuck et al.			
	242.	5,036,311	Jul-91	Moran et al.			
	243.	5,050,150	Sep-91	Ikeda			
	244.	5,064,410	Nov-91	Frenkel et al.			
	245.	5,093,576	Mar-92	Edmond et al.			
	246.	5,106,179	Apr-92	Kamaya et al.			
	247.	5,144,344	Sep-92	Takahashi et al.			
	248.	5,148,023	Sep-92	Hayashi et al.			
	249.	5,151,600	Sep-92	Black			
	250.	5,161,250	Nov-92	Ianna et al			
	251.	5,172,256	Dec-92	Sethofer et al.			
	252.	5,264,877	Nov-93	Hussey			
	253.	5,306,917	Apr-94	Black et al.			
	254.	5,353,378	Oct-94	Hoffman et al.			
	255.	5,359,370	Oct-94	Mugnier			
	256.	5,359,444	Oct-94	Piosenka et al.			
	257.	5,367,345	Nov-94	da Silva			
	258.	5,379,464	Jan-95	Schleger et al.			
	259.	5,382,986	Jan-95	Black et al.			
	260.	5,394,005	Feb-95	Brown et al.			
	261.	5,452,026	Sep-95	Marcy, III			
	262.	5,452,480	Sep-95	Ryden			
	263.	5,455,637	Oct-95	Kallman et al.			
	264.	5,455,640	Oct-95	Gertsikov			
	265.	5,457,751	Oct-95	Such			
	266.	5,463,428	Oct-95	Lipton et al.			
	267.	5,475,798	Dec-95	Handlos			
	268.	5,500,532	Mar-96	Kozicki			

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	269.	5,510,961	Apr-96	Peng			
	270.	5,513,384	Apr-96	Brennan et al.			
	271.	5,519,781	May-96	Kurkurudza			
	272.	5,533,130	Jul-96	Staton			
	273.	5,541,641	Jul-96	Shimada			
	274.	5,581,090	Dec-96	Goudjil			
	275.	5,585,871	Dec.-96	Linden			
	276.	5,589,398	Dec-96	Krause et al.			
	277.	5,590,417	Dec-96	Rydbeck			
	278.	5,606,743	Feb-97	Vogt et al.			
	279.	5,608,808	Mar-97	da Silva			
	280.	5,634,201	May-97	Mooring			
	281.	5,671,035	Sep-97	Barnes			
	282.	5,686,727	Nov-97	Reenstra et al.			
	283.	5,694,475	Dec-97	Boyden			
	284.	5,715,323	Feb-98	Walker			
	285.	5,737,436	Apr-98	Boyden et al.			
	286.	5,777,715	Jul-98	Kruegle et al.			
	287.	5,818,381	Oct-98	Williams			
	288.	5,819,183	Oct-98	Voroba et al.			
	289.	5,835,185	Nov-98	Kallman et al.			
	290.	5,900,720	May-99	Kallman et al.			
	291.	5,903,395	May-99	Rallison et al.			
	292.	5,923,398	Jul-99	Goldman			
	293.	5,941,837	Aug-99	Amano et al.			
	294.	5,946,071	Aug-99	Feldman			
	295.	5,949,516	Sep-99	McCurdy			
	296.	5,966,746	Oct-99	Reedy et al.			
	297.	5,980,037	Nov-99	Conway			
	298.	5,988,812	Nov-99	Wingate			

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	299.	5,991,085	Nov-99	Rallison et al.			
	300.	5,992,996	Nov-99	Sawyer			
	301.	5,995,592	Nov-99	Shirai et al.			
	302.	6,091,546	Jul-00	Spitzer			
	303.	6,010,216	Jan-00	Jesiek			
	304.	6,013,919	Jan-00	Schneider et al.			
	305.	6,028,627	Feb-00	Helmsderfer			
	306.	6,046,455	Apr-00	Ribi et al.			
	307.	6,060,321	May-00	Hovorka			
	308.	6,061,580	May-00	Altschul et al.			
	309.	6,091,546	Jul-00	Spitzer			
	310.	6,091,832	Jul-00	Shurman et al.			
	311.	6,115,177	Sep-00	Vossler			
	312.	6,132,681	Oct-00	Faran et al.			
	313.	6,145,983	Nov-00	Schiffer			
	314.	6,154,552	Nov-00	Koroljow et al.			
	315.	6,176,576 B1	Jan-01	Green et al.			
	316.	6,225,897 B1	May-01	Doyle et al.			
	317.	6,231,181 B1	May-01	Swab			
	318.	6,236,969 B1	May-01	Ruppert et al.			
	319.	6,243,578 B1	Jun-01	Koike			
	320.	6,259,367 B1	Jul-01	Klein			
	321.	6,270,466 B1	Aug-01	Weinstein et al.			
	322.	6,292,213 B1	Sep-01	Jones			
	323.	6,292,685 B1	Sep-01	Pompei			
	324.	6,301,050 B1	Oct-01	DeLeon			
	325.	6,301,367 B1	Oct-01	Boyden et al.			
	326.	6,307,526 B1	Oct-01	Mann			
	327.	6,311,155 B1	Oct-01	Vaudrey et al.			
	328.	6,343,858 B1	Feb-02	Zelman			

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	329.	6,346,929 B1	Feb-02	Fukushima et al.			
	330.	6,349,001 B1	Feb-02	Spitzer			
	331.	6,349,422 B1	Feb-02	Schleger et al.			
	332.	6,409,335 B1	Jun-02	Lipawsky			
	333.	6,409,338 B1	Jun-02	Jewell			
	334.	6,426,719 B1	Jul-02	Nagareda et al.			
	335.	6,431,705 B1	Aug-02	Linden			
	336.	6,474,816 B2	Nov-02	Butler et al.			
	337.	6,478,736 B1	Nov-02	Mault			
	338.	6,506,142 B2	Jan-03	Itoh et al.			
	339.	6,511,175 B2	Jan-03	Hay et al.			
	340.	6,513,532 B2	Feb-03	Mault et al.			
	341.	6,517,203 B1	Feb-03	Blum et al.			
	342.	6,539,336 B1	Mar-03	Vock et al.			
	343.	6,542,081 B2	Apr-03	Torch			
	344.	6,546,101 B1	Apr-03	Murray et al.			
	345.	6,554,763 B1	Apr-03	Amano et al.			
	346.	6,582,075 B1	Jun-03	Swab et al.			
	347.	6,619,799 B1	Sep-03	Blum et al.			
	348.	6,629,076 B1	Sep-03	Haken			
	349.	6,678,381 B1	Jan-04	Manabe			
	350.	6,717,737 B1	Apr-04	Haglund			
	351.	6,729,726 B2	May-04	Miller et al.			
	352.	6,736,759 B1	May-04	Stubbs et al.			
	353.	6,764,194 B1	Jul-04	Cooper			
	354.	6,769,767 B2	Aug-04	Swab et al.			
	355.	6,771,423 B2	Aug-04	Geist			
	356.	6,788,309 B1	Sep-04	Swan et al.			
	357.	6,792,401 B1	Sep-04	Nigro et al.			
	358.	6,816,314 B2	Nov-04	Shimizu et al.			

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	359.	6,824,265 B1	Nov-04	Harper			
	360.	6,857,741 B2	Feb-05	Blum et al.			
	361.	6,871,951 B2	Mar-05	Blum et al.			
	362.	6,879,930 B2	Apr-05	Sinclair et al.			
	363.	6,912,386 B1	Jun-05	Himberg et al.			
	364.	6,929,365 B2	Aug-05	Swab et al.			
	365.	6,932,090 B1	Aug-05	Reschke et al.			
	366.	6,947,219 B1	Sep-05	Ou			
	367.	7,004,582 B2	Feb-06	Jannard et al.			
	368.	7,013,009 B2	Mar-06	Warren			
	369.	7,023,594 B2	Apr-06	Blum et al.			
	370.	7,030,902 B2	Apr-06	Jacobs			
	371.	7,031,667 B2	Apr-06	Horiguchi			
	372.	7,033,025 B2	Apr-06	Winterbotham			
	373.	7,059,717 B2	Jun-06	Bloch			
	374.	7,073,905 B2	Jul-06	Da Pra'			
	375.	7,079,876 B2	Jul-06	Levy			
	376.	7,123,215 B2	Oct-06	Nakada			
	377.	7,192,136 B2	Mar-07	Howell et al.			
	378.	7,255,437 B2	Aug-07	Howell et al.			
	379.	7,265,358 B2	Sep-07	Fontaine			
	380.	7,274,292 B2	Sep-07	Velhal et al.			
	381.	7,289,767 B2	Oct-07	Lai			
	382.	7,312,699 B2	Dec-07	Chornenky			
	383.	7,331,666 B2	Feb-08	Swab et al.			
	384.	7,376,238 B1	May-08	Rivas et al.			
	385.	7,380,936 B2	Jun-08	Howell et al.			
	386.	7,401,918 B2	Jul-08	Howell et al.			
	387.	7,405,801 B2	Jul-08	Jacobs			
	388.	7,429,965 B2	Sep-08	Weiner			

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	389.	7,438,409 B2	Oct-08	Jordan			
	390.	7,438,410 B1	Oct-08	Howell et al.			
	391.	7,445,332 B2	Nov-08	Jannard et al.			
	392.	7,481,531 B2	Jan-09	Howell et al.			
	393.	7,500,746 B2	Mar-09	Howell et al.			
	394.	7,500,747 B2	Mar-09	Howell et al.			
	395.	7,512,414 B2	Mar-09	Jannard et al.			
	396.	7,517,083 B2	Apr-09	Blum et al.			
	397.	7,527,374 B2	May-09	Chou			
	398.	7,543,934 B2	Jun-09	Howell et al.			
	399.	7,581,833 B2	Sep-09	Howell et al.			
	400.	7,621,634 B2	Nov-09	Howell et al.			
	401.	7,648,236 B1	Jan-10	Dobson			
	402.	7,677,723 B2	Mar-10	Howell et al.			
	403.	7,760,898 B2	Jul-10	Howell et al.			
	404.	7,771,046 B2	Aug-10	Howell et al.			
	405.	7,792,552 B2	Sep-10	Thomas et al.			
	406.	7,801,570 B2	Sep-10	Cheung et al.			
	407.	7,806,525 B2	Oct-10	Howell et al.			
	408.	7,922,321 B2	Apr-11	Howell et al.			
	409.	7,976,159 B2	Jul-11	Jacobs et al.			
	410.	8,109,629 B2	Feb-12	Howell et al.			
	411.	8,142,015 B2	Mar-12	Paolino			
	412.	8,174,569 B2	May-12	Tanijiri et al.			
	413.	8,337,013 B2	Dec-12	Howell et al.			
	414.	8,430,507 B2	Apr-13	Howell et al.			
	415.	8,434,863 B2	May-13	Howell et al.			
	416.	8,465,151 B2	Jun-13	Howell et al.			
	417.	8,485,661 B2	Jul-13	Yoo et al.			
	418.	8,500,271 B2	Aug-13	Howell et al.			

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	419.	8,582,789 B2	Nov-13	Cheung et al.			
	420.	8,770,742 B2	Jul-14	Howell et al.			
	421.	8,849,185 B2	Sep-14	Cheung et al.			
	422.	8,905,542 B2	Dec-14	Howell et al.			
	423.	9,033,493 B2	May-15	Howell et al.			
	424.	9,244,292 B2	Jan-16	Swab et al.			
	425.	9,400,390 B2	Jul-16	Osterhout et al.			
	426.	9,405,135 B2	Aug-16	Sweis et al.			
	427.	9,488,520 B2	Nov-16	Howell et al.			
	428.	9,547,184 B2	Jan-17	Howell et al.			
	429.	9,690,121 B2	Jun-17	Howell et al.			
	430.	9,922,236 B2	Mar-18	Moore et al.			
	431.	10,042,186 B2	Aug-18	Chao et al.			
	432.	10,060,790 B2	Aug-18	Howell et al.			
	433.	10,061,144 B2	Aug-18	Howell et al.			
	434.	10,310,296 B2	Jun-19	Howell et al.			
	435.	10,345,625 B2	Jul-19	Howell et al.			
	436.	10,359,311 B2	Jul-19	Howell et al.			
	437.	10,515,623 B1	Dec-19	Grizzel			
	438.	10,539,459 B2	Jan-20	Howell et al.			
	439.	10,624,790 B2	Apr-20	Chao et al.			
	440.	10,571,715 B2	Feb-20	Rizzo, III et al.			
	441.	10,777,048 B2	Sep-20	Howell et al.			
	442.	10,802,582 B1	Oct-20	Clements			
	443.	10,964,190 B2	Mar-21	Peyrard			
	444.	11,042,045 B2	Jun-21	Chao et al.			
	445.	11,069,358 B1	Jul-21	Harper			
	446.	11,086,147 B2	Aug-21	Howell et al.			
	447.	11,204,512 B2	Dec-21	Howell et al.			
	448.	11,243,416 B2	Feb-22	Howell et al.			

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	449.	11,326,941 B2	May-22	Howell et al.			
	450.	11,513,371 B2	Nov-22	Howell et al.			
	451.	11,536,988 B2	Dec-22	Howell et al.			
	452.	11,630,331 B2	Apr-23	Howell et al.			
	453.	11,644,361 B2	May-23	Howell et al.			
	454.	11,644,693 B2	May-23	Howell et al.			
	455.	11,721,183 B2	Aug-23	Howell et al.			
	456.	11,733,549 B2	Aug-23	Howell et al.			
	457.	DES. 369,167	Apr-96	Hanson et al.			

Foreign Documents

							Translation	
Init.		Document No.	Date	Country	Class	Subclass	Yes	No

Other Documents (Including Author, Title, Date, Pertinent Pages, etc.)

	A	
	B	
	C	

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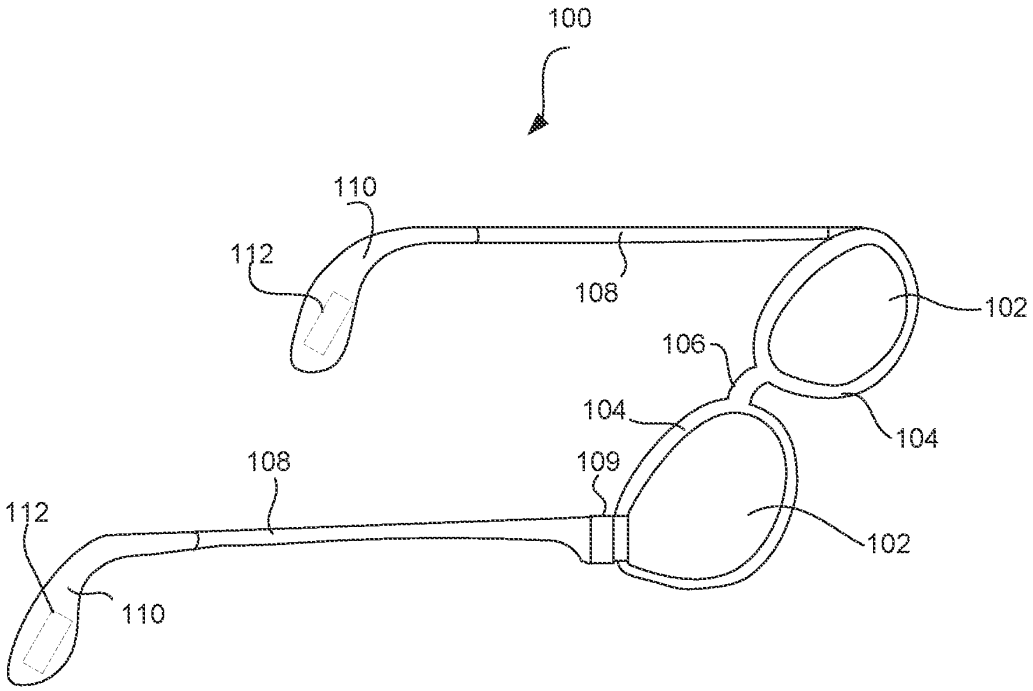


FIG. 1

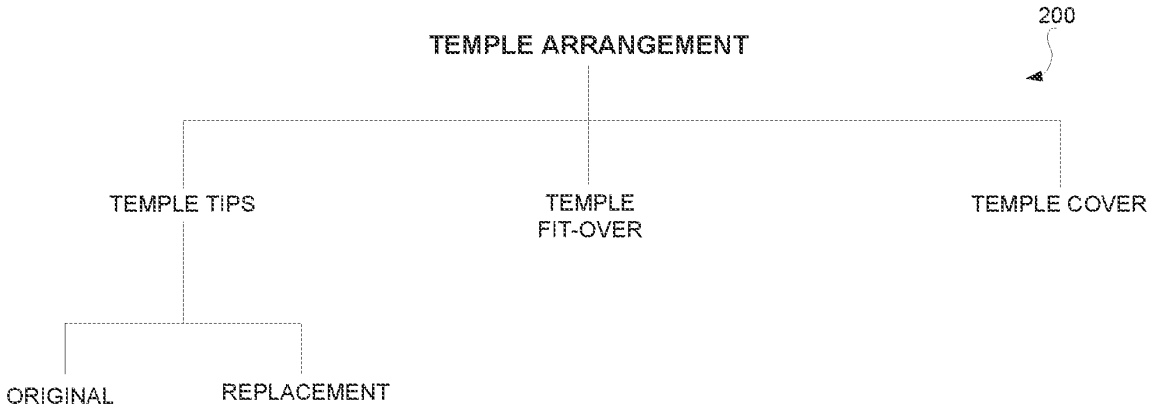

TEMPLE ARRANGEMENT
200
TEMPLE TIPS
TEMPLE FIT-OVER
TEMPLE COVER
ORIGINAL
REPLACEMENT

FIG. 2

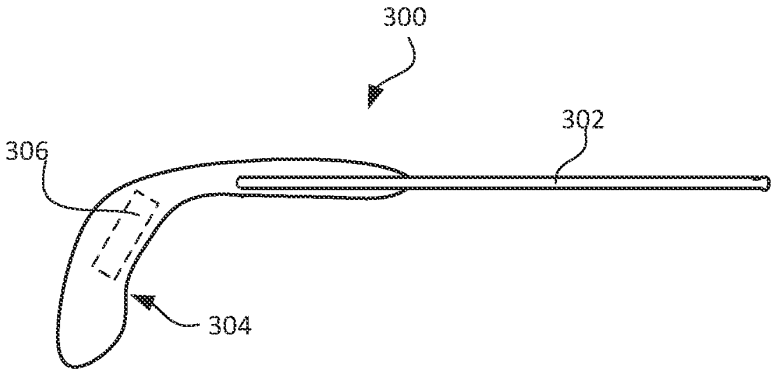


FIG. 3A

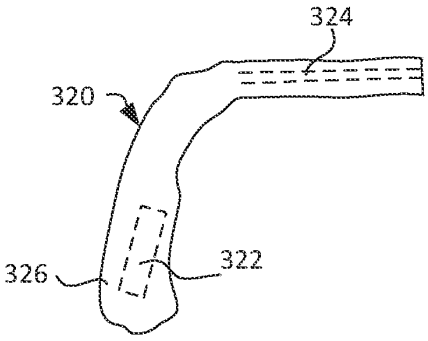


FIG. 3B

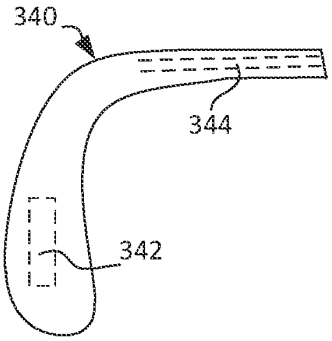


FIG. 3C

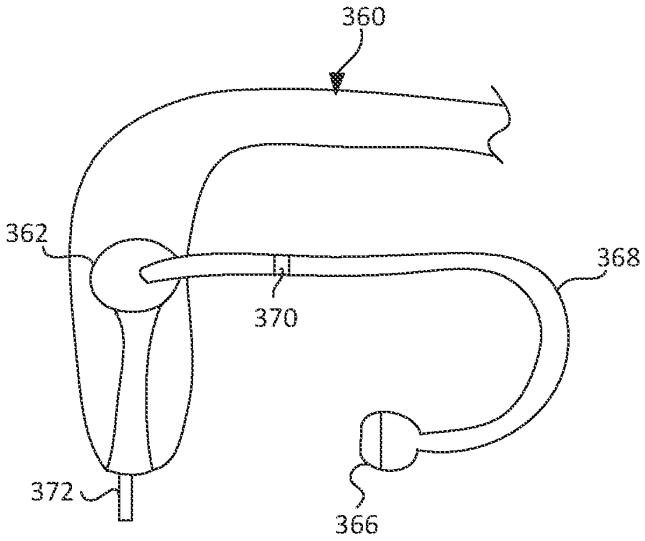


FIG. 3D

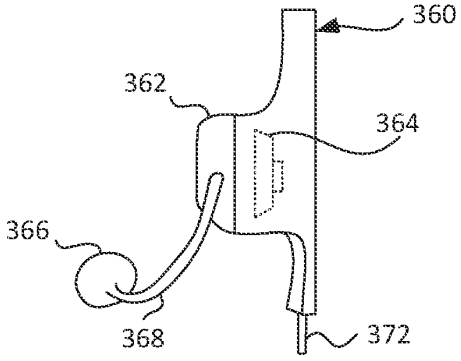


FIG. 3E

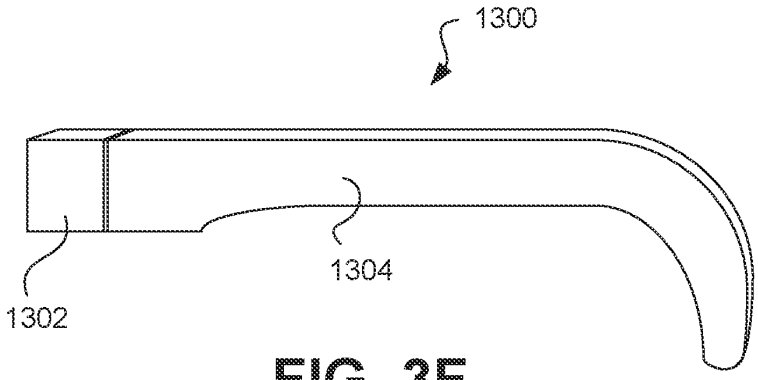


FIG. 3F

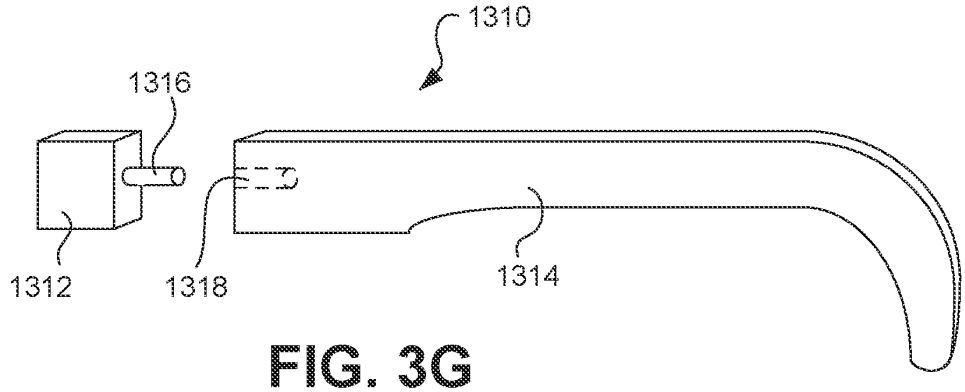


FIG. 3G

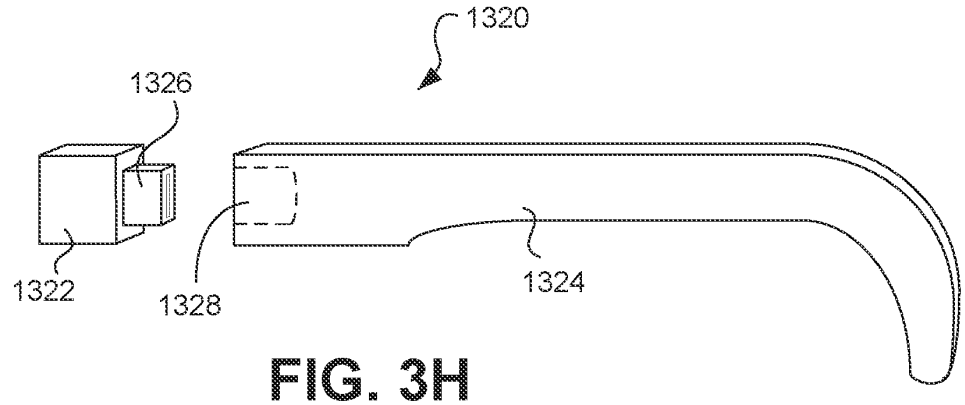


FIG. 3H

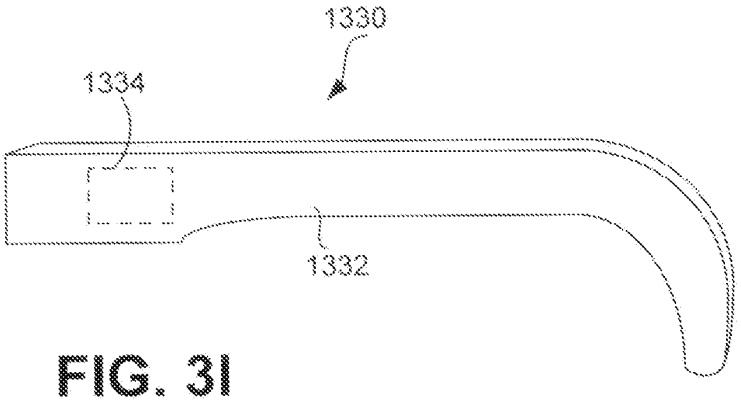


FIG. 3I

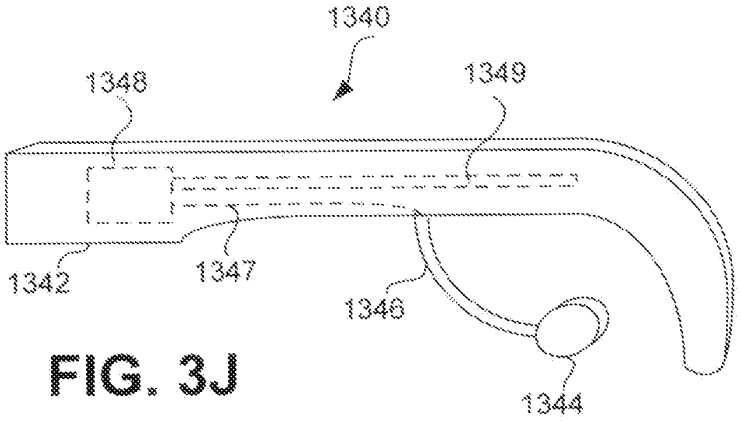


FIG. 3J

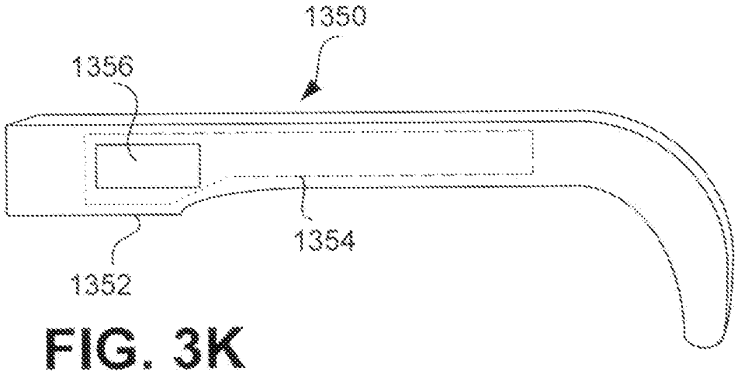


FIG. 3K

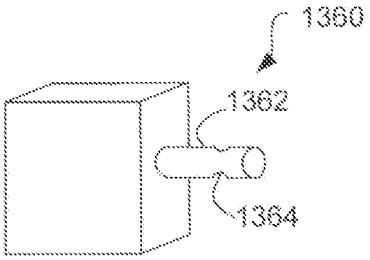


FIG. 3L

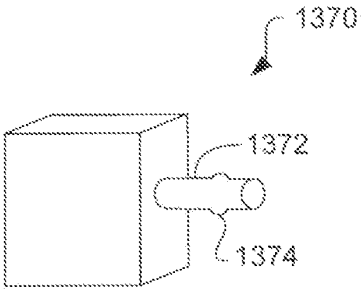


FIG. 3M

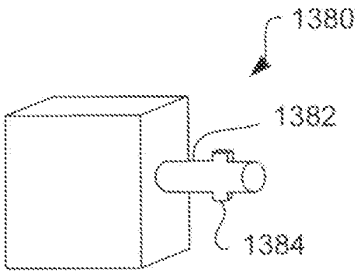


FIG. 3N

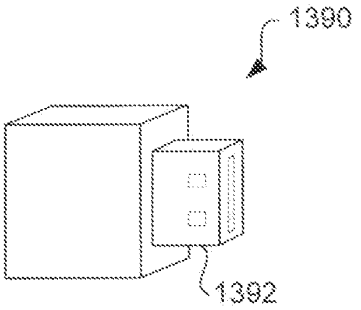


FIG. 3O

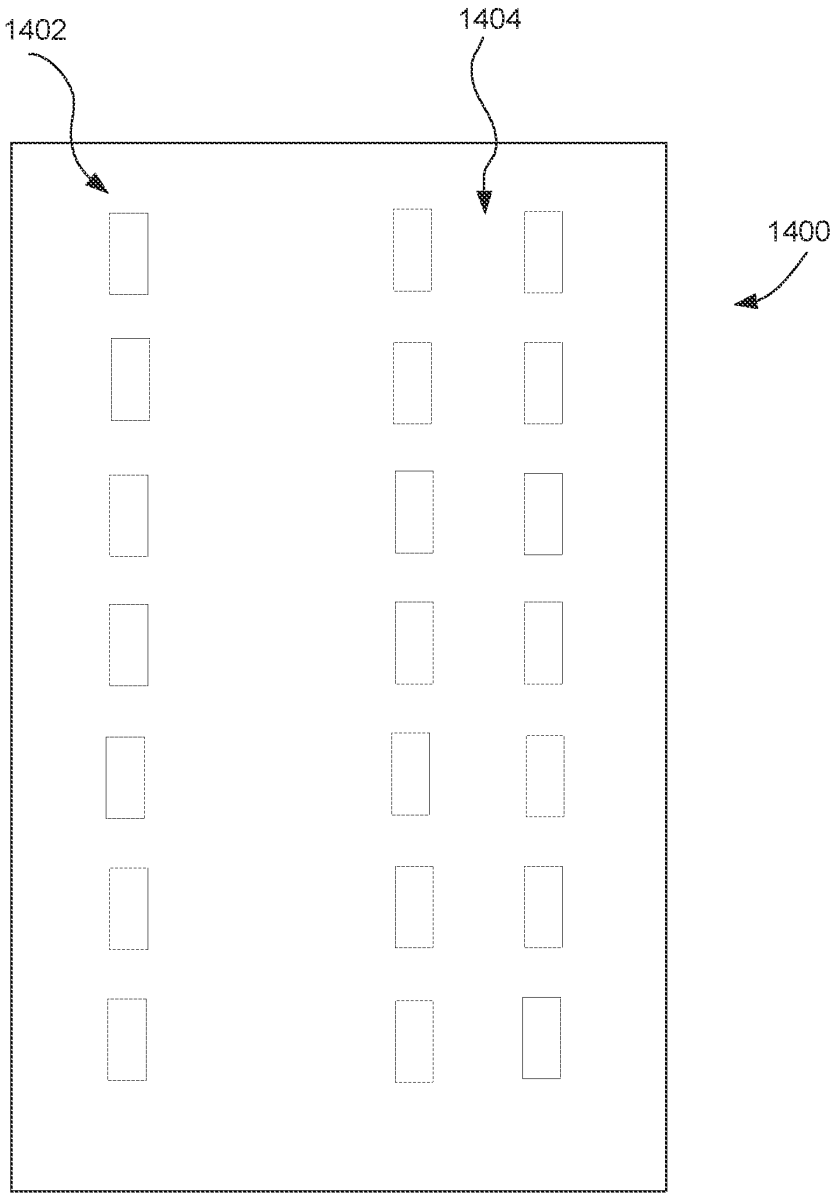


FIG. 3P

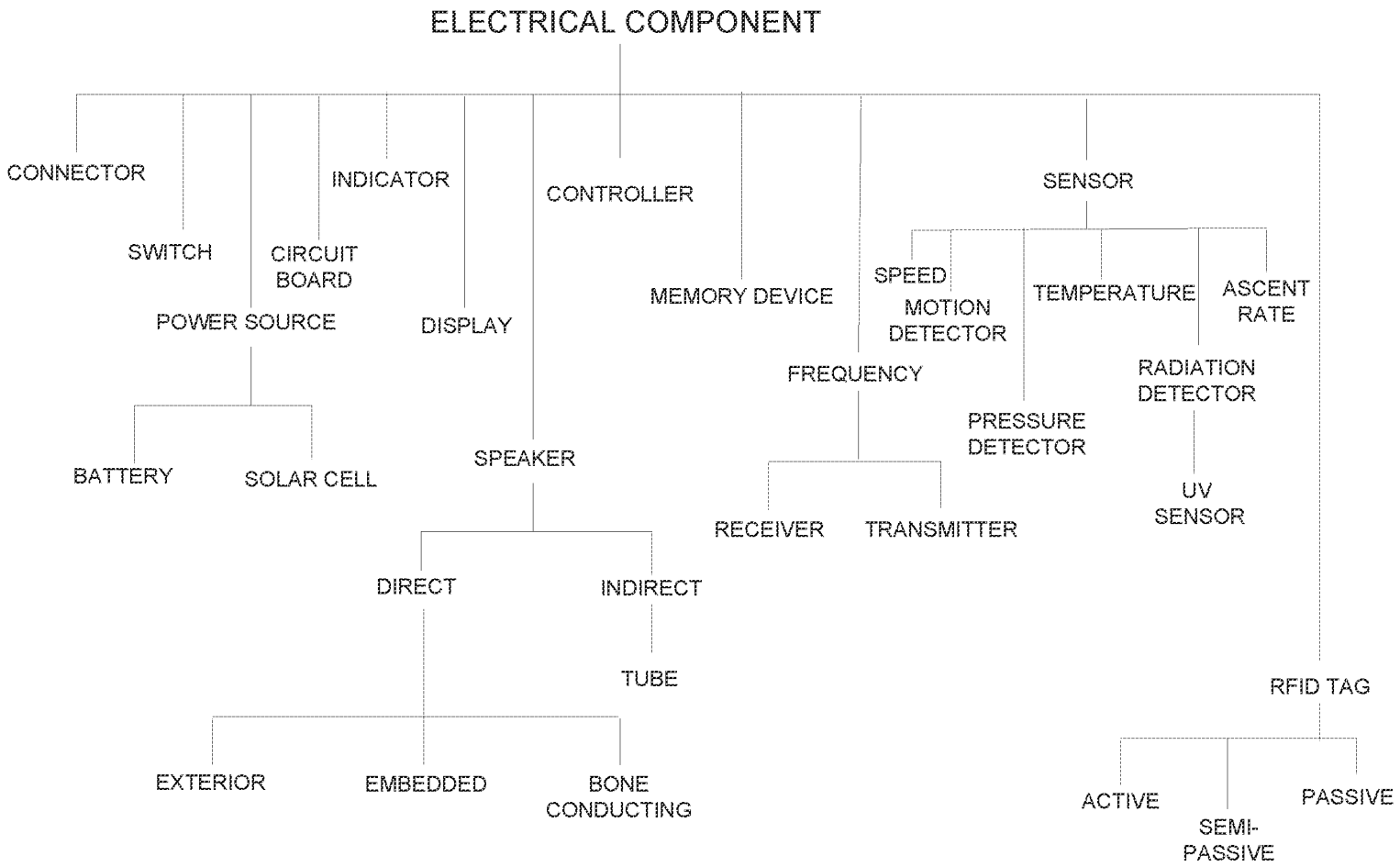

ELECTRICAL COMPONENT
CONNECTOR
SWITCH
CIRCUIT BOARD
INDICATOR
POWER SOURCE
DISPLAY
CONTROLLER
MEMORY DEVICE
SENSOR
SPEED
MOTION DETECTOR
TEMPERATURE
ASCENT RATE
FREQUENCY
RADIATION DETECTOR
PRESSURE DETECTOR
UV SENSOR
BATTERY
SOLAR CELL
SPEAKER
RECEIVER
TRANSMITTER
DIRECT
INDIRECT
TUBE
RFID TAG
EXTERIOR
EMBEDDED
BONE CONDUCTING
ACTIVE
SEMI-PASSIVE
PASSIVE

FIG. 4

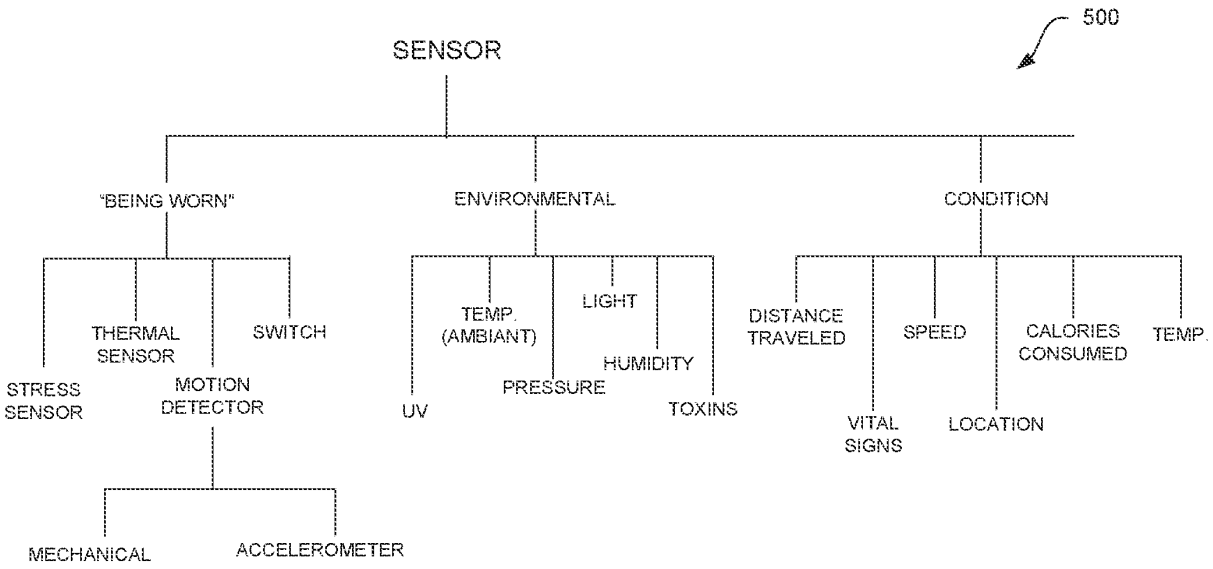

500
SENSOR
"BEING WORN"
ENVIRONMENTAL
CONDITION
STRESS SENSOR
THERMAL SENSOR
MOTION DETECTOR
SWITCH
MECHANICAL
ACCELEROMETER
UV
TEMP. (AMBIANT)
PRESSURE
LIGHT
HUMIDITY
TOXINS
DISTANCE TRAVELED
VITAL SIGNS
SPEED
LOCATION
CALORIES CONSUMED
TEMP.

FIG. 5

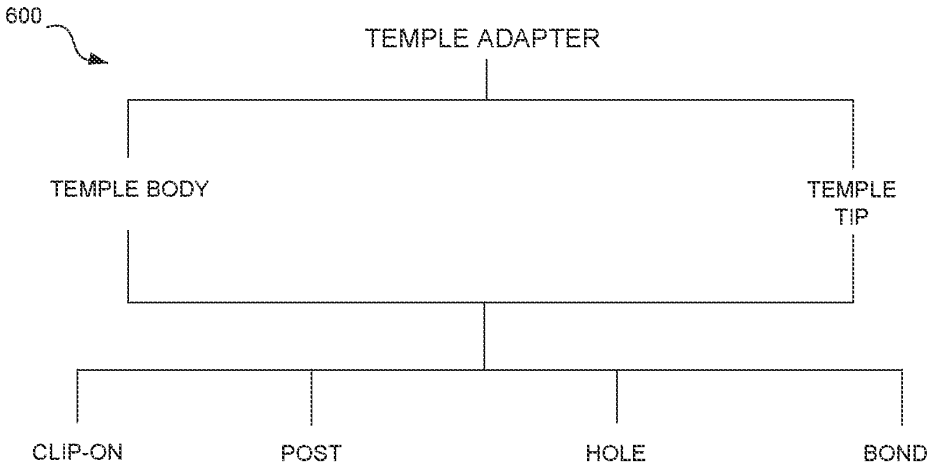

600
TEMPLE ADAPTER
TEMPLE BODY
TEMPLE TIP
CLIP-ON
POST
HOLE
BOND

FIG. 6

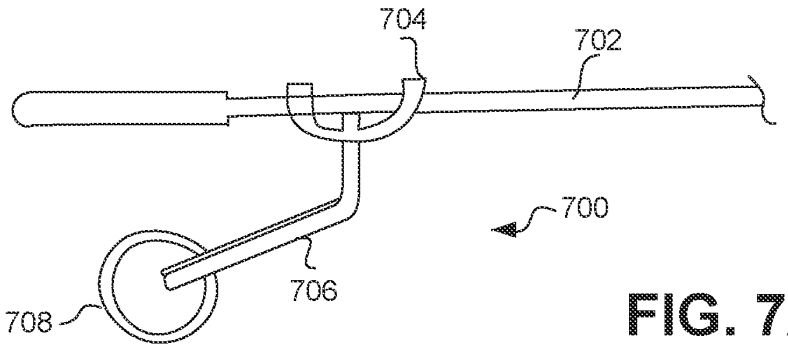


FIG. 7A

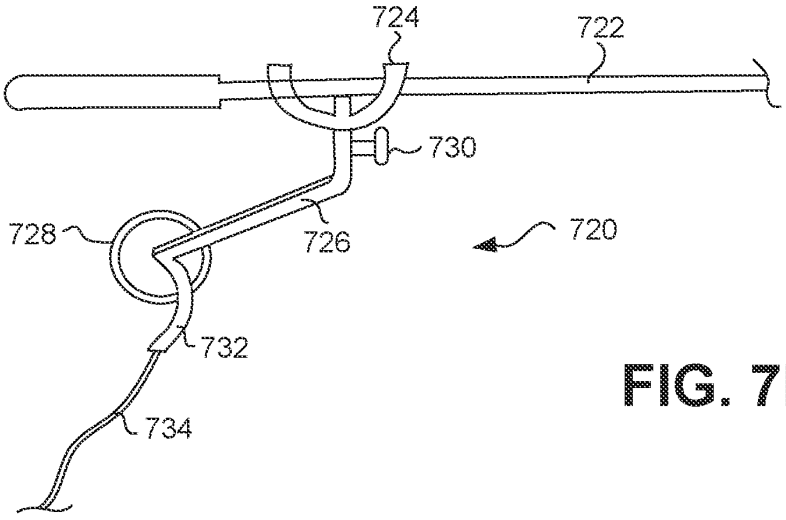


FIG. 7B

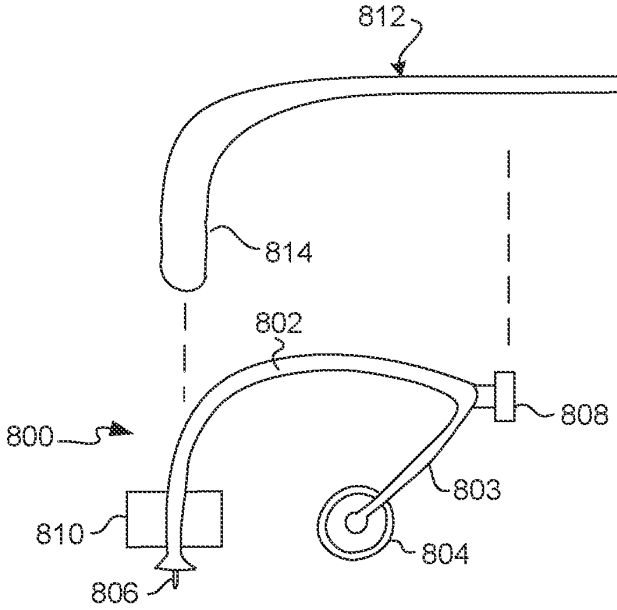


FIG. 8A

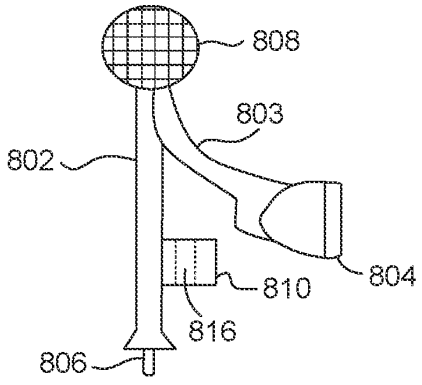


FIG. 8B

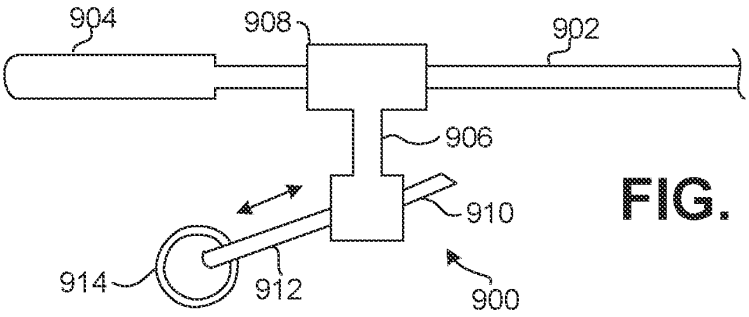


FIG. 9A

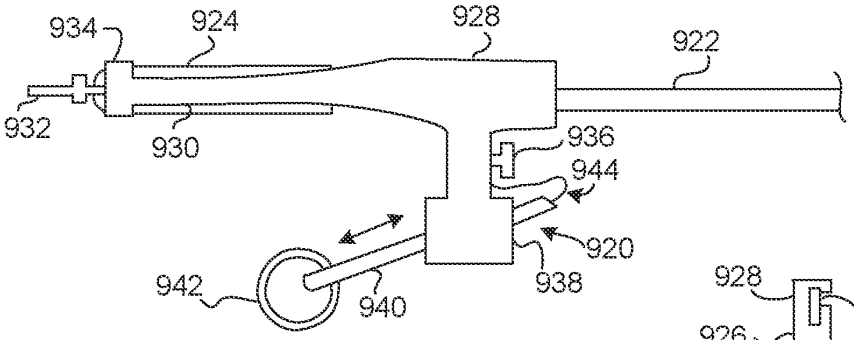


FIG. 9B

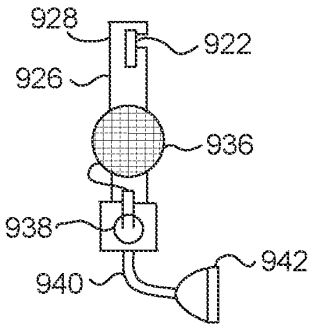


FIG. 9C

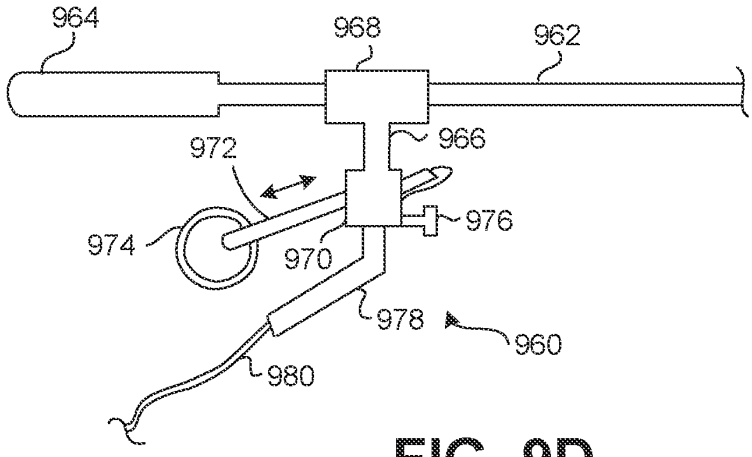


FIG. 9D

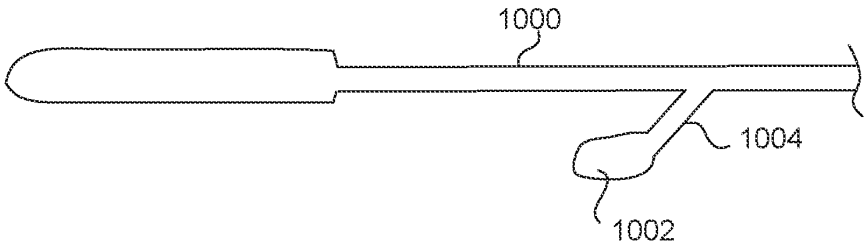


FIG. 10A

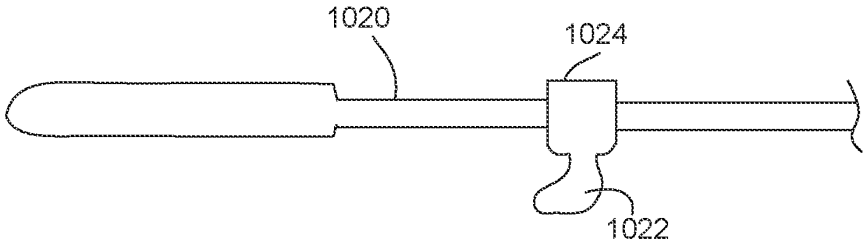


FIG. 10B

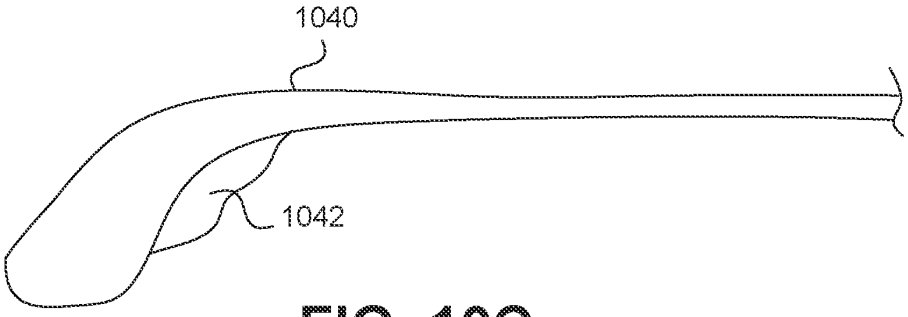


FIG. 10C

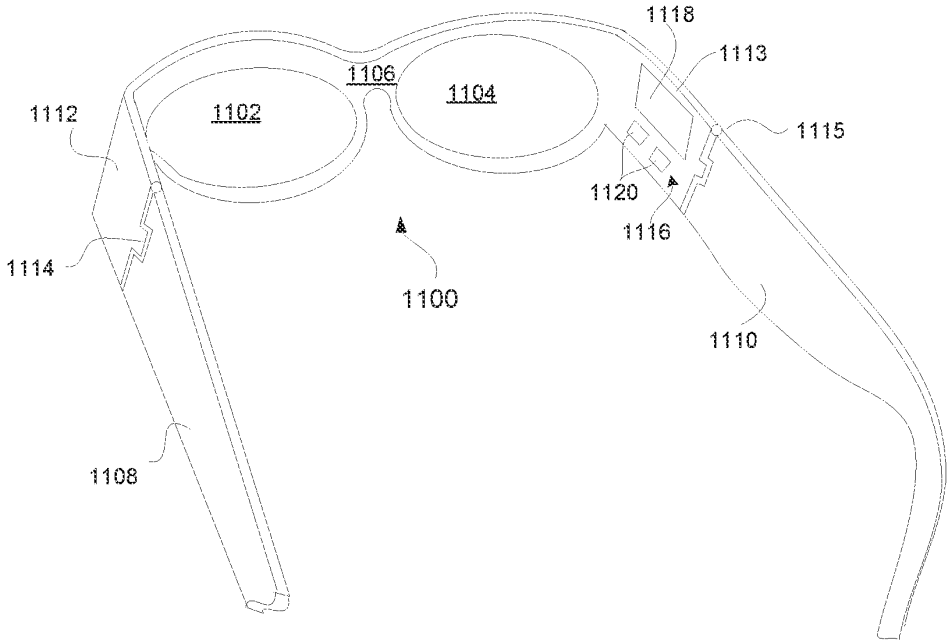

1118
1113
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1108

FIG. 11A

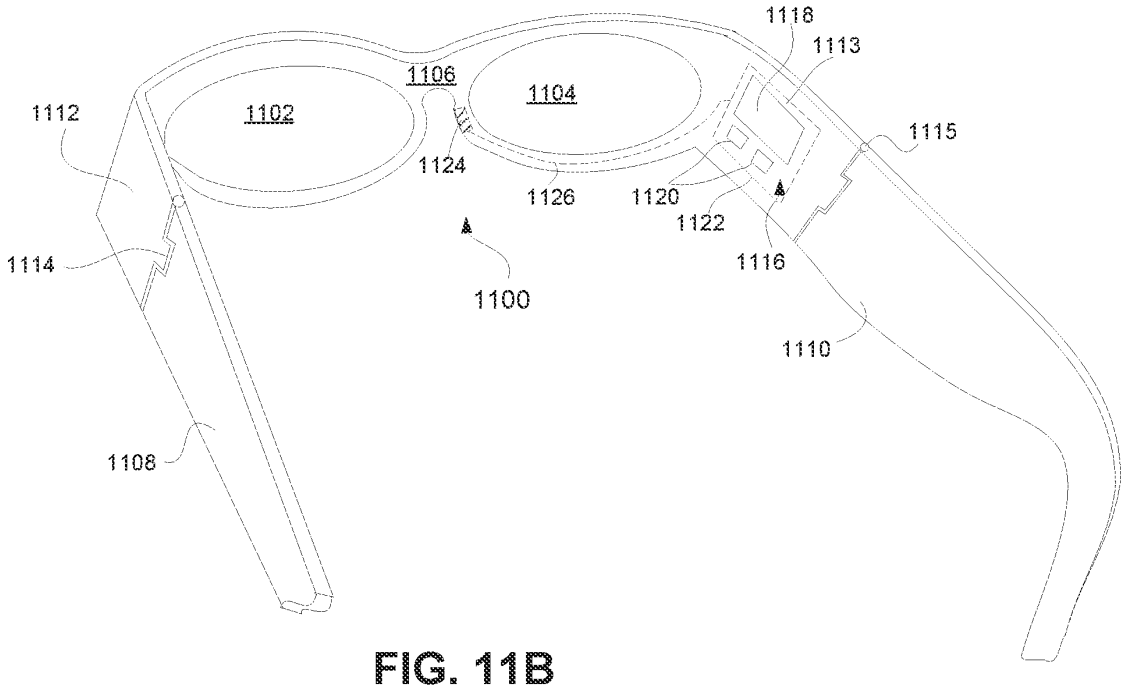

1118
1113
1106
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1112
1102
1115
1124
1126
1120
1122
1116
1114
1100
1110
1108

FIG. 11B

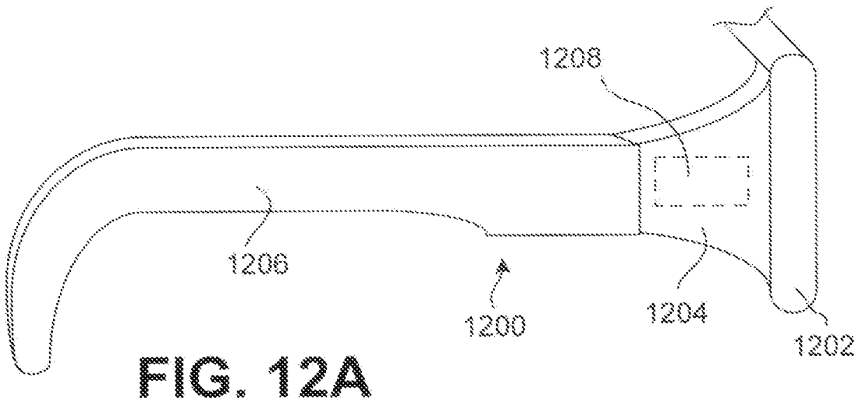


FIG. 12A

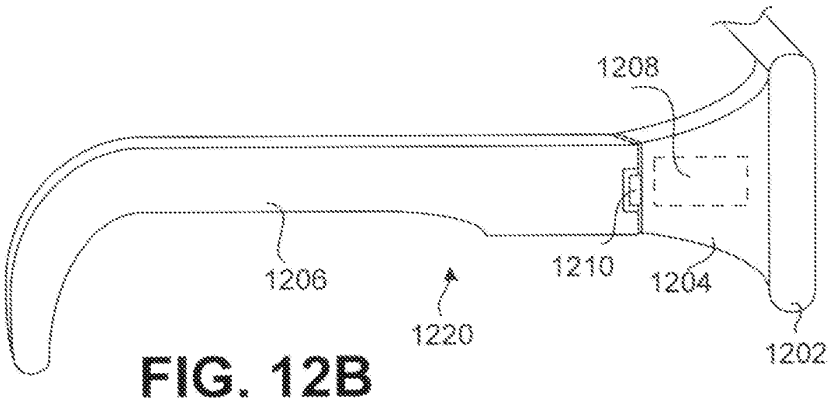


FIG. 12B

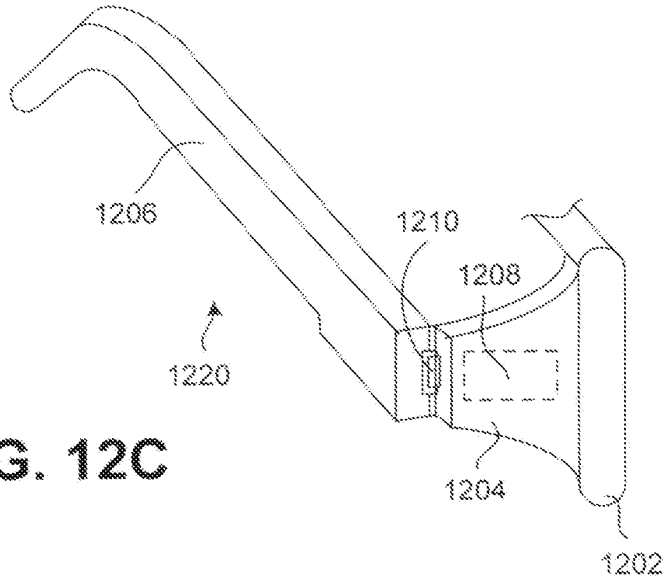


FIG. 12C

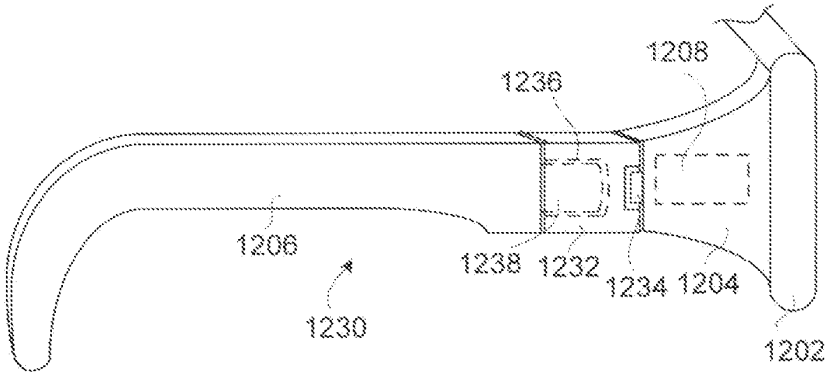


FIG. 12D

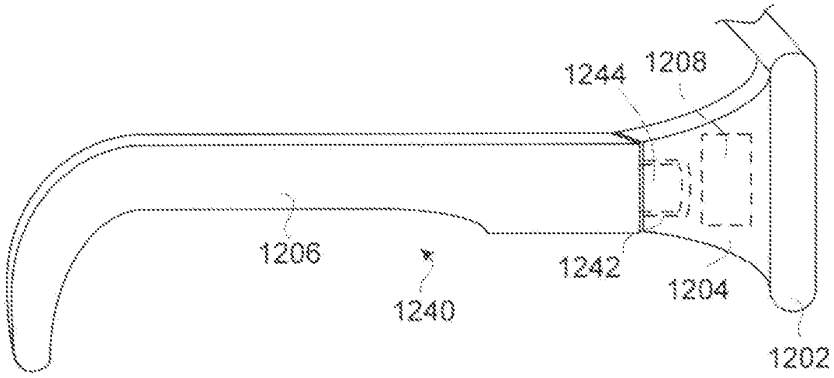


FIG. 12E

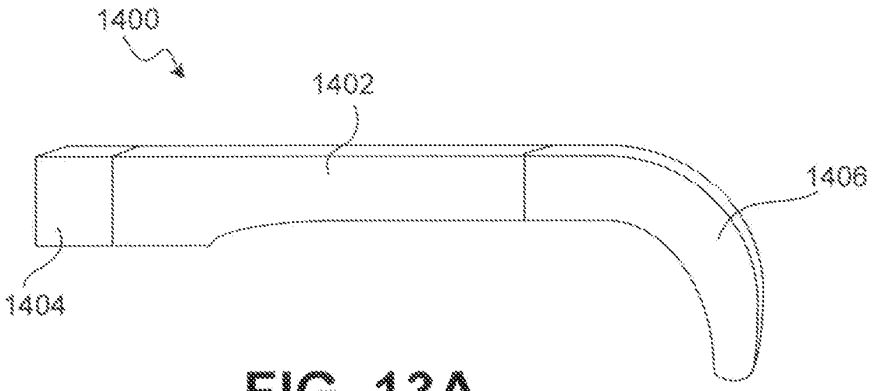


FIG. 13A

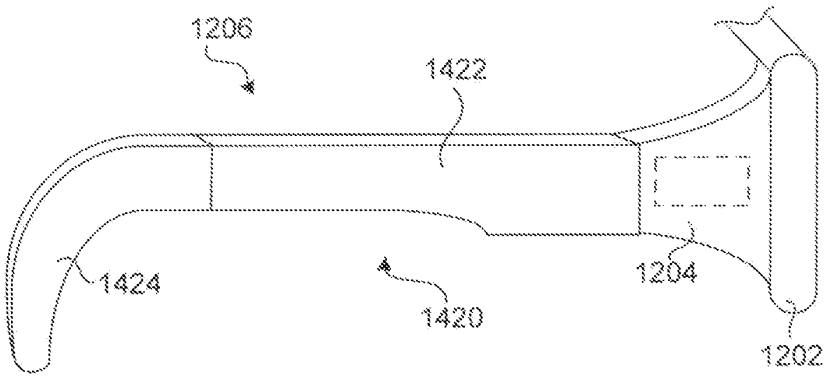


FIG. 13B

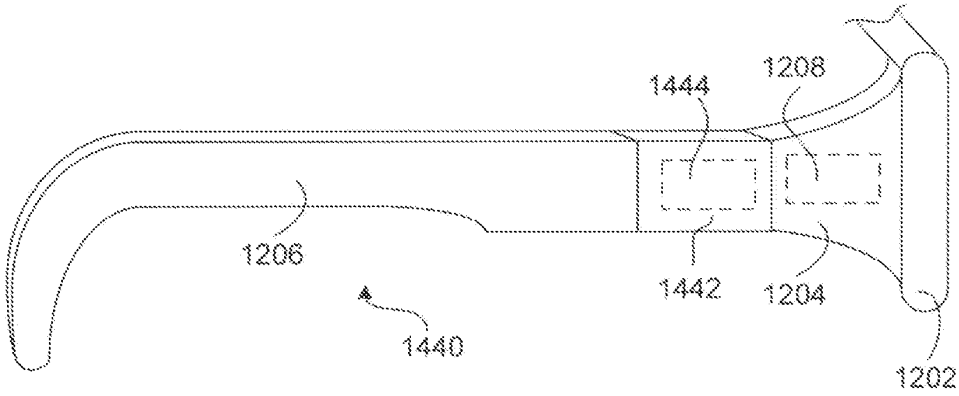


FIG. 13C

Doc code : PET.OP.AGE
Description : Petition to make special based on Age/Health

PTO/SB/130 (07-09)

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number

PETITION TO MAKE SPECIAL BASED ON AGE FOR ADVANCEMENT OF EXAMINATION UNDER 37 CFR 1.102(c)(1)

Application Information

Application Number	18375893	Confirmation Number	4776	Filing Date	
Attorney Docket Number (optional)	IPVCP003X1C4X1C1	Art Unit		Examiner	
First Named Inventor	Thomas A. Howell				
Title of Invention	SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC APPARATUS				

Attention: Office of Petitions

An application may be made special for advancement of examination upon filing of a petition showing that the applicant is 65 years of age, or more. No fee is required with such a petition. See 37 CFR 1.102(c)(1) and MPEP 708.02 (II).

APPLICANT HEREBY PETITIONS TO MAKE SPECIAL FOR ADVANCEMENT OF EXAMINATION IN THIS APPLICATION UNDER 37 CFR 1.102(c)(1) and MPEP 708.02 (II) ON THE BASIS OF THE APPLICANT'S AGE.

A grantable petition requires one of the following items:
(1) Statement by one named inventor in the application that he/she is 65 years of age, or more; or
(2) Certification by a registered attorney/agent having evidence such as a birth certificate, passport, driver's license, etc. showing one named inventor in the application is 65 years of age, or more.

Name of Inventor who is 65 years of age, or older

Given Name	Middle Name	Family Name	Suffix
Peter	P.	Tong	

A signature of the applicant or representative is required in accordance with 37 CFR 1.33 and 10.18.
Please see 37 CFR 1.4(d) for the format of the signature.

Select (1) or (2) :

○ (1) I am an inventor in this application and I am 65 years of age, or more.

◉ (2) I am an attorney or agent registered to practice before the Patent and Trademark Office, and I certify that I am in possession of evidence, and will retain such in the application file record, showing that the inventor listed above is 65 years of age, or more.

Signature	/C. Douglass Thomas/		
Name	C. Douglass Thomas	Registration Number	32947

EFSWeb 1.0.18

PTO/SB/130 (07-09)
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Fr eedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about indivi duals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

In re Application of
Thomas A. Howell

Application No. 18375893

Filed:

Attorney Docket No. IPVCP003X1C4X1C1

:
:
:DECISION ON PETITION TO MAKE SPECIAL
:UNDER 37 CFR 1.102(c)(1)
:

This is a decision on the electronic petition under 37 CFR 1.102 (c)(1), filed 05-OCT-2023 to make the above-identified application special based on applicant's age as set forth in MPEP § 708.02, Section II.

The petition is **GRANTED**.

A grantable petition to make an application special under 37 CFR 1.102(c)(1), MPEP § 708.02, Section II : Applicant's Age must include a statement by applicant or a registered practitioner having evidence that applicant is at least 65 years of age. No fee is required.

Accordingly, the above-identified application has been accorded "special" status and will be taken up for action by the examiner upon the completion of all pre-examination processing.

Telephone inquiries concerning this electronic decision should be directed to the Electronic Business Center at 866-217-9197.

All other inquiries concerning either the examination or status of the application should be directed to the Technology Center.

Electronic Acknowledgement Receipt

EFS ID:	48679863
Application Number:	18375893
International Application Number:	
Confirmation Number:	4776
Title of Invention:	SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC APPARATUS
First Named Inventor/Applicant Name:	Thomas A. Howell
Customer Number:	34071
Filer:	Peter P. Tong/Angela Nijim
Filer Authorized By:	Peter P. Tong
Attorney Docket Number:	IPVCP003X1C4X1C1
Receipt Date:	05-OCT-2023
Filing Date:	
Time Stamp:	11:33:14
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	ePetition Request Form	petition-request.pdf	44920 4d819b131732bc1792095704c1e54be3eb b01a8b	no	2
Warnings:					

Information:	
Total Files Size (in bytes):	44920

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Form 1449 (Modified)	Atty. Docket No.	IPVCP003X1C4X1C1
	Application No.:	18/375,893
Information Disclosure Statement By Applicant	Applicant	HOWELL et al.
	Filing Date	October 2, 2023
	Group	Not Yet Assigned
(Use Several Sheets if Necessary)		Page 1 of 11

U.S. Patent Documents

Examiner Initial	No.	Patent No.	Date	Patentee	Class	Sub-class	Filing Date
	1.						
	2.						

Foreign Documents

							Translation	
Init.		Document No.	Date	Country	Class	Subclass	Yes	No
		CA 2 487 391	Dec-03	Canada				
		CN 88203065	Nov-88	China			X abstract	
		CN 89214222.7	Mar-90	China			X abstract	
		CN 90208199.3	Nov-90	China			X abstract	
		DE 10123226 A1	Nov-02	Germany			X	
		EP 1027626 B1	Mar-16	Europe				
		EP 1134491 A2	Sep-01	Europe				
		EP 2290433 B1	Apr-16	Europe				
		FR 2530039 A1	Jan-84	France			X abstract	
		GB 1467982	Mar-77	Great Britain				
		JP 02-181722	Jul-90	Japan			X abstract	
		JP 09-017204	Jan-97	Japan			X	
		JP 10-161072	Jun-98	Japan			X	
		JP 2000-039595	Feb-00	Japan			X	
		JP 2002 341059 A	Nov-02	Japan			X	
		JP 2002 02511706 A	Apr-02	Japan			X	
		JP 2005-151292	Jun-05	Japan			X abstract	
		JP 2005-167902	Jun-05	Japan			X	
		JP 58-113912	Jul-83	Japan			X	
		JP-58-113914	Jul-83	Japan			X abstract	
		KR 2002-0044416 A	Jun-02	Korea			X	
		TW 484711	Jun-01	Taiwan			X abstract	

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		WO 97/12205 A1	Apr-97	WIPO				
		WO 01/06298 A1	Jan-01	WIPO				
		WO 01/24576 A1	Apr-01	WIPO				
		WO 02/06881 A2	Jan-02	WIPO				
		WO 03/069394 A1	Aug-03	WIPO			X abstract	
		WO 03/100368 A1	Dec-03	WIPO				
		WO 03/100503 A2	Dec-03	WIPO				
		WO 04/012477 A2	Feb-04	WIPO				
		WO 04/025554 A1	Mar-04	WIPO				
		WO 99/50706 A1	Oct-99	WIPO				

Other Documents (Including Author, Title, Date, Pertinent Pages, etc.)

	A	Notice of Allowance for U.S. Patent Application No. 11/183,269, dated December 10, 2010.
	B	Office Action for U.S. Patent Application No. 11/183,269, dated May 25, 2010.
	C	Final Office Action for U.S. Patent Application No. 11/183,269, dated February 17, 2010.
	D	Office Action for U.S. Patent Application No. 11/183,269, dated June 23, 2009.
	E	Office Action for U.S. Patent Application No. 11/183,269, dated December 4, 2008.
	F	Final Office Action for U.S. Patent Application No. 11/183,269, dated June 5, 2008.
	G	Office Action for U.S. Patent Application No. 11/183,269, dated October 18, 2007.
	H	Restriction Requirement for U.S. Patent Application No. 11/183,269, dated June 25, 2007.
	I	Office Action for U.S. Patent Application No. 13/085,402, dated April 19, 2012.
	J	Notice of Allowance for U.S. Patent Application No. 13/085,402, dated August 2, 2012.
	K	Notice of Allowance for U.S. Patent Application No. 13/085,402, dated November 13, 2012.
	L	Notice of Allowance for U.S. Patent Application No. 13/085,402, dated February 20, 2013.
	M	Notice of Allowance for U.S. Patent Application No. 13/085,402, dated June 14, 2013.
	N	Office Action for U.S. Patent Application No. 13/955,336, dated December 5, 2013.
	O	Notice of Allowance for U.S. Patent Application No. 13/955,336, dated April 28, 2014.
	P	Notice of Allowance for U.S. Patent Application No. 13/955,336, dated August 18, 2014.
	Q	Notice of Allowance for U.S. Patent Application No. 13/955,336, dated October 7, 2014.
	R	Notice of Allowance for U.S. Patent Application No. 13/955,336, dated November 3, 2014.
	S	Office Action for U.S. Patent Application No. 14/557,409, dated June 11, 2015.
	T	Notice of Allowance for U.S. Patent Application No 14/557,409, dated January 14, 2016.

Examiner	Date Considered

Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Form 1449 (Modified) Information Disclosure Statement By Applicant (Use Several Sheets if Necessary)	Atty. Docket No.	IPVCP003X1C4X1C1
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	Filing Date	October 2, 2023
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	U	Notice of Allowance for U.S. Patent Application No. 14/557,409, dated April 28, 2016.
	V	Notice of Allowance for U.S. Patent Application No. 14/557,409, dated August 8, 2016.
	W	Notice of Allowance for U.S. Patent Application No. 14/557,409, dated November 4, 2016.
	X	Corrected Notice of Allowance for U.S. Patent Application No. 14/557,409, dated December 12, 2016.
	Y	Office Action for U.S. Patent Application No. 15/375,423, dated March 27, 2017.
	Z	Notice of Allowance for U.S. Patent Application No. 15/375,423, dated July 5, 2017.
	AA	Notice of Allowance for U.S. Patent Application No. 15/375,423, dated October 31, 2017.
	AB	Notice of Allowance for U.S. Patent Application No. 15/375,423, dated March 23, 2018.
	AC	Notice of Allowance for U.S. Patent Application No. 15/375,423, dated July 13, 2018.
	AD	Office Action for U.S. Patent Application No. 16/049,120, dated February 28, 2020.
	AE	Notice of Allowance for U.S. Patent Application No. 16/049,120, dated June 3, 2020.
	AF	Notice of Allowance for U.S. Patent Application No. 16/049,120, dated September 21, 2020.
	AG	Notice of Allowance for U.S. Patent Application No. 16/049,120, dated February 23, 2021.
	AH	Notice of Allowance for U.S. Patent Application No. 16/049,120, dated June 3, 2021.
	AI	Notice of Allowance for U.S. Patent Application No. 16/049,120, dated September 20, 2021.
	AJ	Notice of Allowance for U.S. Patent Application No. 16/574,254, dated April 16, 2021.
	AK	Notice of Allowance for U.S. Patent Application No. 16/574,254, dated August 9, 2021.
	AL	Office Action for U.S. Patent Application No. 16/821,810, dated February 2, 2022.
	AM	Notice of Allowance for U.S. Patent Application No. 16/821,810, dated April 6, 2022.
	AN	Notice of Allowance for U.S. Patent Application No. 16/821,810, dated October 19, 2022.
	AO	Office Action for U.S. Patent Application No. 17/484,080, dated January 21, 2022.
	AP	Notice of Allowance for U.S. Patent Application No. 17/484,080, dated May 31, 2022.
	AQ	Notice of Allowance for U.S. Patent Application No. 17/484,080, dated September 13, 2022.
	AR	Notice of Allowance for U.S. Patent Application No. 17/484,080, dated January 31, 2023.
	AS	Notice of Allowance for U.S. Patent Application No. 17/484,080, dated June 1, 2023.
	AT	Office Action for U.S. Patent Application No. 17/949,029, dated November 23, 2022.
	AU	Notice of Allowance for U.S. Patent Application No. 17/949,029, dated March 1, 2023.
	AV	Notice of Allowance for U.S. Patent Application No. 17/949,029, dated July 3, 2023.
	AW	Office Action for U.S. Patent Application No. 17/873,104, dated October 6, 2022.
	AX	Office Action for U.S. Patent Application No. 17/873,104, dated November 4, 2022.
	AY	Notice of Allowance for U.S. Patent Application No. 17/873,104, dated December 16, 2022.

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	AZ	Notice of Allowance for U.S. Patent Application No. 17/873,104, dated March 22, 2023.
	BA	Restriction Requirement for U.S. Patent Application No. 11/580,222, dated June 18, 2008.
	BB	Office Action for U.S. Patent Application No. 11/580,222, dated September 12, 2008.
	BC	Office Action for U.S. Patent Application No. 11/580,222, dated January 28, 2009.
	BD	Notice of Allowance for U.S. Patent Application No. 11/580,222, dated April 20, 2009.
	BE	U.S. Patent Application No. 12/462,286, filed July 31, 2009.
	BF	Restriction Requirement for U.S. Patent Application No. 12/462,286, dated September 17, 2010.
	BG	Office Action for U.S. Patent Application No. 12/462,286, dated January 13, 2011.
	BH	Notice of Allowance for U.S. Patent Application No. 12/462,286, dated June 24, 2011.
	BI	Notice of Allowance for U.S. Patent Application No. 12/462,286, dated November 22, 2011.
	BJ	Office Action for U.S. Patent Application No. 13/367,346, dated May 15, 2013.
	BK	Notice of Allowance for U.S. Patent Application No. 13/367,346, dated October 10, 2013.
	BL	Office Action for U.S. Patent Application No. 13/367,346, dated January 28, 2014.
	BM	Notice of Allowance for U.S. Patent Application No. 13/367,346, dated August 15, 2014.
	BN	Notice of Allowance for U.S. Patent Application No. 13/367,346, dated March 19, 2015.
	BO	Office Action ffor U.S. Patent Application No. 14/715,501, dated September 23, 2015.
	BP	Office Action for U.S. Patent Application No. 14/715,501, dated March 25, 2016.
	BQ	Office Action for U.S. Patent Application No. 14/715,501, dated October 17, 2016.
	BR	Office Action for U.S. Patent Application No. 14/715,501, dated July 20, 2017.
	BS	Office Action for U.S. Patent Application No. 14/715,501, dated January 8, 2018.
	BT	Notice of Allowance for U.S. Patent Application No. 14/715,501, dated May 9, 2018.
	BU	Notice of Allowance for U.S. Patent Application No. 14/715,501, dated September 11, 2018.
	BV	Office Action for U.S. Patent Application No. 16/127,957, dated June 4, 2020.
	BW	Office Action for U.S. Patent Application No. 16/127,957, dated September 30, 2020.
	BX	Notice of Allowance for U.S. Patent Application No. 16/127,957, dated December 21, 2020.
	BY	Notice of Allowance for U.S. Patent Application No. 17/395,509, dated May 6, 2022.
	BZ	Notice of Allowance for U.S. Patent Application No. 17/395,509, dated September 9, 2022.
	CA	Notice of Allowance for U.S. Patent Application No. 17/395,509, dated December 19, 2022.
	CB	Notice of Allowance for U.S. Patent Application No. 17/395,509, dated April 26, 2023.
	CC	Notice of Allowance for U.S. Patent Application No. 17/737,866, dated September 16, 2022.

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	CD	Notice of Allowance for U.S. Patent Application No. 17/737,866, dated January 17, 2023.
	CE	Notice of Allowance for U.S. Patent Application No. 17/737,866, dated May 15, 2023.
	CF	Notice of Allowance for U.S. Patent Application No. 16/182,969, dated January 28, 2022.
	CG	Office Action for U.S. Patent Application No. 16/182,969, dated June 24, 2020.
	CH	Notice of Allowance for U.S. Patent Application No. 16/182,969, dated October 14, 2020.
	CI	Notice of Allowance for U.S. Patent Application No. 16/182,969, dated September 1, 2021.
	CJ	Office Action for U.S. Patent Application No. 16/182,969, dated January 24, 2023.
	CK	Notice of Allowance for U.S. Patent Application No. 16/182,969, dated June 30, 2023.
	CL	U.S. Patent Application No. 12/806,312, filed August 10, 2010.
	CM	Office Action for U.S. Patent Application No. 12/806,312, dated April 20, 2012.
	CN	Office Action for U.S. Patent Application No. 12/806,312, dated September 25, 2012.
	CO	Notice of Allowance for U.S. Patent Application No. 12/806,312, dated December 14, 2012.
	CP	Notice of Allowance for U.S. Patent Application No. 12/806,312, dated March 29, 2013.
	CQ	U.S. Patent Application No. 13/831,512, filed March 14, 2013.
	CR	Office Action for U.S. Patent Application No. 13/831,512, dated June 4, 2013.
	CS	Office Action for U.S. Patent Application No. 13/831,512, dated February 24, 2014.
	CT	Office Action for U.S. Patent Application No. 13/831,512, dated July 2, 2014.
	CU	Office Action for U.S. Patent Application No. 13/831,512, dated January 21, 2015.
	CV	Office Action for U.S. Patent Application No. 13/831,512, dated May 29, 2015.
	CW	Office Action for U.S. Patent Application No. 13/831,512, dated February 24, 2016.
	CX	Notice of Allowance for U.S. Patent Application No. 13/831,512, dated August 1, 2016.
	CY	Notice of Allowance for U.S. Patent Application No. 13/831,512, dated October 25, 2016.
	CZ	Notice of Allowance for U.S. Patent Application No. 13/831,512, dated January 30, 2017.
	DA	Notice of Allowance for U.S. Patent Application No. 13/831,512, dated February 21, 2017.
	DB	Office Action for U.S. Patent Application No. 15/396,428, dated February 16, 2018.
	DC	Office Action for U.S. Patent Application No. 15/396,428, dated June 21, 2018.
	DD	Office Action for U.S. Patent Application No. 15/409,723, dated April 23, 2018.
	DE	Office Action for U.S. Patent Application No. 15/409,723, dated October 31, 2018.
	DF	Notice of Allowance for U.S. Patent Application No. 11/183,256, dated January 13, 2009.
	DG	Office Action for U.S. Patent Application No. 11/183,256, dated September 12, 2008.
	DH	Notice of Allowance for U.S. Patent Application No. 11/183,256, dated July 8, 2008.
	DI	Office Action for U.S. Patent Application No. 11/183,256, dated January 25, 2008.

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	DJ	Restriction Requirement for U.S. Patent Application No. 11/183,256, dated October 17, 2007.
	DK	Restriction Requirement for U.S. Patent Application No. 11/183,256, dated June 28, 2007.
	DL	Notice of Allowance for U.S. Patent Application No. 11/546,685, dated February 17, 2010.
	DM	Notice of Allowance for U.S. Patent Application No. 11/546,685, dated September 18, 2009.
	DN	Office Action for U.S. Patent Application No. 11/546,685, dated March 5, 2009.
	DO	Restriction Requirement for U.S. Patent Application No. 11/546,685, dated January 27, 2009.
	DP	US Patent Application No. 12/803,732, filed July 1, 2010.
	DQ	Notice of Allowance for U.S. Patent Application No. 12/803,732, dated September 1, 2011.
	DR	Notice of Allowance for U.S. Patent Application No. 12/803,732, dated November 15, 2011.
	DS	Notice of Allowance for U.S. Patent Application No. 12/803,732, dated January 30, 2012.
	DT	Notice of Allowance for U.S. Patent Application No. 12/803,732, dated April 17, 2012.
	DU	Notice of Allowance for U.S. Patent Application No. 12/803,732, dated July 5, 2012.
	DV	Notice of Allowance for U.S. Patent Application No. 12/803,732, dated October 19, 2012.
	DW	Notice of Allowance for U.S. Patent Application No. 12/803,732, dated February 13, 2013.
	DX	Office Action for U.S. Patent Application No. 13/291,020, dated June 4, 2012.
	DY	Office Action for U.S. Patent Application No. 13/291,020, dated April 23, 2012.
	DZ	Notice of Allowance for U.S. Patent Application No. 13/291,020, dated August 2, 2012.
	EA	Notice of Allowance for U.S. Patent Application No. 13/291,020, dated November 2, 2012.
	EB	Notice of Allowance for U.S. Patent Application No. 13/291,020, dated February 11, 2013.
	EC	U.S. Patent Application No. 13/831,419, filed March 14, 2013.
	ED	Office Action for U.S. Patent Application No. 13/831,419, dated April 27, 2015.
	EE	Office Action for U.S. Patent Application No. 13/831,419, dated August 12, 2015.
	EF	Notice of Allowance for U.S. Patent Application No. 13/831,419, dated January 28, 2016.
	EG	Office Action for U.S. Patent Application No. 13/831,419, dated April 28, 2016.
	EH	Office Action for U.S. Patent Application No. 13/831,419, dated November 17, 2016.
	EI	Office Action for U.S. Patent Application No. 13/831,419, dated February 1, 2017.
	EJ	Notice of Allowance for U.S. Patent Application No. 13/831,419, dated June 6, 2017.
	EK	Office Action for U.S. Patent Application No. 13/831,419, dated October 20, 2017.
	EL	Office Action for U.S. Patent Application No. 13/831,419, dated June 8, 2018.
	EM	U.S. Patent Application No. 13/831,445, filed March 14, 2013.
	EN	Office Action for U.S. Patent Application No. 13/831,445, dated February 20, 2015.

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	EO	Notice of Allowance for U.S. Patent Application No. 13/831,445, dated October 21, 2016.
	EP	Notice of Allowance for U.S. Patent Application No. 13/831,445, dated January 9, 2017.
	EQ	Corrected Notice of Allowance for U.S. Patent Application No. 13/831,445, dated January 23, 2017.
	ER	Notice of Allowance for U.S. Patent Application No. 13/831,445, dated April 25, 2017.
	ES	Office Action for U.S. Patent Application No. 13/831,445, dated February 6, 2018.
	ET	Notice of Allowance for U.S. Patent Application No. 13/831,445, dated August 8, 2018.
	EU	Office Action for U.S. Patent Application No. 16/429,181, dated September 30, 2020.
	EV	Notice of Allowance for U.S. Patent Application No. 16/429,181, dated February 1, 2021.
	EW	Notice of Allowance for U.S. Patent Application No. 16/429,181, dated June 17, 2021.
	EX	Notice of Allowance for U.S. Patent Application No. 16/429,181, dated August 19, 2021.
	EY	Notice of Allowance for U.S. Patent Application No. 16/429,181, dated October 4, 2021.
	EZ	Office Action for U.S. Patent Application No. 16/429,181, dated February 9, 2022.
	FA	Notice of Allowance for U.S. Patent Application No. 16/429,181, dated August 10, 2022.
	FB	Office Action for U.S. Patent Application No. 16/424,018, dated June 10, 2020.
	FC	Notice of Allowance for U.S. Patent Application No. 16/424,018, dated October 20, 2020.
	FD	Notice of Allowance for U.S. Patent Application No. 16/424,018, dated March 8, 2021.
	FE	Office Action for U.S. Patent Application No. 16/424,018, dated May 13, 2021.
	FF	Office Action for U.S. Patent Application No. 16/424,018, dated September 3, 2021.
	FG	Notice of Allowance for U.S. Patent Application No. 16/424,018, dated November 2, 2021
	FH	Office Action for U.S. Patent Application No. 16/424,018, dated January 24, 2022.
	FI	Notice of Allowance for U.S. Patent Application No. 16/424,018, dated June 10, 2022.
	FJ	Office Action for U.S. Patent Application No. 16/424,018, dated September 6, 2022.
	FK	Office Action for U.S. Patent Application No. 16/424,018, dated November 25, 2022.
	FL	Notice of Allowance for U.S. Patent Application No. 16/424,018, dated February 21, 2023.
	FM	Notice of Allowance for U.S. Patent Application No. 17/942,347, dated April 19, 2023.
	FN	Notice of Allowance for U.S. Patent Application No 17/942,347, dated July 3, 2023.
	FO	Notice of Allowance for U.S. Patent Application No. 17/942,347, dated August 14, 2023.
	FP	Notice of Allowance for U.S. Patent Application No.17/964,853, dated March 8, 2023.
	FQ	Office Action for U.S. Patent Application No. 18/129,660, dated May 19, 2023.
	FR	Office Action for U.S. Patent Application No. 18/129,660, dated July 7, 2023.
	FS	"±1.5g Dual Axis Micromachined Accelerometer", Freescale Semiconductor, Inc., Motorola Semiconductor Technical Data, MMA6260Q, June 2004, pp. 1-7.
	FT	"APA Announces Shipment of the SunUV™ Personal UV Monitor", Press Release, November 7, 2003, pp. 1-3.

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	FU	"Camera Specs Take Candid Snaps", BBC News, 18 September 2003, pp. 1-3.
	FV	"Cardo Wireless Attaching Clips and Wearing Headset", Cardo Systems, Inc., http://www.cardowireless.com/clips.php, downloaded Nov. 27, 2004, pp. 1-3.
	FW	"Environmental Health Criteria 14: Ultraviolet Radiation", International Programme on Chemical Safety, World Health Organization Geneva, 1979 http://www.ichem.org., pp.1-102.
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Examiner	Date Considered

Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Form 1449 (Modified) Information Disclosure Statement By Applicant (Use Several Sheets if Necessary)	Atty. Docket No.	IPVCP003X1C4X1C1
	Application No.:	18/375,893
	Applicant	HOWELL et al.
	Filing Date	October 2, 2023
	Group	Not Yet Assigned
		Page 9 of 11

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Examiner	Date Considered

Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Form 1449 (Modified) **Information Disclosure Statement By Applicant** (Use Several Sheets if Necessary)	Atty. Docket No.	IPVCP003X1C4X1C1
	Application No.:	18/375,893
	Applicant	HOWELL et al.
	Filing Date	October 2, 2023
	Group	Not Yet Assigned
		Page 10 of 11

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Examiner	Date Considered

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Form 1449 (Modified) Information Disclosure Statement By Applicant (Use Several Sheets if Necessary)	Atty. Docket No.	IPVCP003X1C4X1C1
	Application No.:	18/375,893
	Applicant	HOWELL et al.
	Filing Date	October 2, 2023
	Group	Not Yet Assigned
		Page 11 of 11

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Examiner	Date Considered

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Electronic Acknowledgement Receipt

EFS ID:	48679903
Application Number:	18375893
International Application Number:	
Confirmation Number:	4776
Title of Invention:	SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC APPARATUS
First Named Inventor/Applicant Name:	Thomas A. Howell
Customer Number:	34071
Filer:	Peter P. Tong/Angela Nijim
Filer Authorized By:	Peter P. Tong
Attorney Docket Number:	IPVCP003X1C4X1C1
Receipt Date:	05-OCT-2023
Filing Date:	
Time Stamp:	11:35:50
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	IPVCP003X1C4X1C1_IDSTrans_10-23.pdf	20886 1721a5b5454f4b7fb0f89c7642a2cb7559cf2542	no	2

Warnings:

Information:					
2	Information Disclosure Statement (IDS) Form (SB08)	IPVCP003X1C4X1C1_1449_10-23.pdf	94782 4ab38ccf92b0ed831c51acbc3d29b92c4542addd	no	11
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Information:					
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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: HOWELL et al.	Attorney Docket No.: IPVCP003X1C4X1C1
Application No.: 18/375,893	Examiner: Not Yet Assigned
Filed: October 2, 2023	Group: Not Yet Assigned
Title: SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC APPARATUS	

INFORMATION DISCLOSURE STATEMENT
37 CFR §§1.56 AND 1.97(b)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

The references listed in the attached PTO Form 1449 may be material to examination of the above-identified patent application. Applicants submit the list of these references in compliance with their duty of disclosure pursuant to 37 CFR §§1.56 and 1.97. The Examiner is requested to make these references of official record in this application. The above-identified application is a Continuation of prior application U.S. Patent Application No. 16/182,969. This prior application is being relied upon for an earlier filing date under 35 U.S.C. § 120. Because the listed references (to the extent that copies are required) were either cited by the PTO, or submitted to the PTO in the prior application, under 37 CFR § 1.98(d) Applicants submit that copies need not be provided.

This Information Disclosure Statement is not to be construed as a representation that a search has been made, that additional information material

to the examination of this application does not exist, or that these references indeed constitute prior art.

This Information Disclosure Statement is: (i) filed within three (3) months of the filing date of the above-referenced application, (ii) believed to be filed before the mailing date of a first Office Action on the merits, or (iii) believed to be filed before the mailing of a first Office Action after the filing of a Request for Continued Examination under §1.114.

Accordingly, it is believed that no fees are due in connection with the filing of this Information Disclosure Statement. However, if it is determined that any fees are due, the Commissioner is hereby authorized to charge such fees to Deposit Account 50-3874 (Order No. IPVCP003X1C4X1C1).

Respectfully submitted,

/C. Douglass Thomas/

C. Douglass Thomas
Registration No. 32,947

4010 Moorpark Avenue
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Form 1449 (Modified)	Atty. Docket No.	IPVCP003X1C4X1C1
	Application No.:	18/375,893
Information Disclosure Statement By Applicant	Applicant	HOWELL et al.
	Filing Date	October 2, 2023
	Group	Not Yet Assigned
(Use Several Sheets if Necessary)		Page 1 of 1

U.S. Patent Documents

Examiner Initial	No.	Patent No.	Date	Patentee	Class	Sub-class	Filing Date
	1.	2002/0146097 A1	Oct-02	Vuori			
	2.	2019/0117121 A1	Apr-19	Kutina et al.			
	3.	2019/0187492 A1	Jun-19	Howell et al.			
	4.	2021/0364827 A9	Nov-21	Howell et al.			
	5.	2021/0399691 A1	Dec-21	SAMINATHAN et al.			
	6.	2022/0260859 A1	Aug-22	Howell et al.			
	7.	2023/0273464 A1	Aug-23	Howell et al.			
	8.	11,762,224 B2	Sep-23	Howell et al.			
	9.						
	10.						

Foreign Documents

Init.		Document No.	Date	Country	Class	Subclass	Translation Yes	Translation No

Other Documents (Including Author, Title, Date, Pertinent Pages, etc.)

	A	Office Action for U.S. Patent Application No. 17/964,853, dated September 15, 2023.
	B	Notice of Allowance for U.S. Patent Application No. 18/129,660, dated August 24, 2023.
	C	Office Action for U.S. Patent Application No. 18/224,793, dated September 7, 2023.
	D	Notice of Allowance for U.S. Patent Application No. 18/224,793, dated October 2, 2023.
	E	
	F	
	G	

Examiner	Date Considered

Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Electronic Acknowledgement Receipt

EFS ID:	48684245
Application Number:	18375893
International Application Number:	
Confirmation Number:	4776
Title of Invention:	SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC APPARATUS
First Named Inventor/Applicant Name:	Thomas A. Howell
Customer Number:	34071
Filer:	Peter P. Tong/Angela Nijim
Filer Authorized By:	Peter P. Tong
Attorney Docket Number:	IPVCP003X1C4X1C1
Receipt Date:	06-OCT-2023
Filing Date:	
Time Stamp:	14:34:46
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	IPVCP003X1C4X1C1_IDSTrans_2_10-23.pdf	19863 6aee2e6f454f9d152a43990e46d5c700b94c778e	no	2
Warnings:					

Information:					
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: HOWELL et al.	Attorney Docket No.: IPVCP003X1C4X1C1
Application No.: 18/375,893	Examiner: NOT YET ASSIGNED
Filed: October 2, 2023	Group: NOT YET ASSIGNED
Title: SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC SERVICES	

INFORMATION DISCLOSURE STATEMENT
37 CFR §§1.56 AND 1.97(b)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

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Respectfully submitted,

/C. Douglass Thomas/

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UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
18/375,893	10/02/2023		4620	IPVCP003X1C4X1C1	48	3

CONFIRMATION NO. 4776

34071
IPVENTURE, INC.
4010 Moorpark Avenue
Suite 211
San Jose, CA 95117

FILING RECEIPT



Date Mailed: 10/23/2023

Receipt is acknowledged of this non-provisional utility patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF FIRST INVENTOR, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection.

Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please submit a written request for a corrected Filing Receipt, including a properly marked-up ADS showing the changes with strike-through for deletions and underlining for additions. If you received a "Notice to File Missing Parts" or other Notice requiring a response for this application, please submit any request for correction to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections provided that the request is grantable.

Inventor(s)

Thomas A. Howell, San Jose, CA;
David Chao, Saratoga, CA;
C. Douglass Thomas, Saratoga, CA;
Peter P. Tong, Mountain View, CA;

Applicant(s)

IngenioSpec, LLC, San Jose, CA;

Power of Attorney: The patent practitioners associated with Customer Number 34071

Domestic Priority data as claimed by applicant

This application is a CON of 16/182,969 11/07/2018
which is a CON of 16/127,957 09/11/2018 PAT 11,086,147
which is a CON of 14/715,501 05/18/2015 PAT 10,330,956
which is a CON of 13/367,346 02/06/2012 PAT 9,033,493
which is a CON of 12/462,286 07/31/2009 PAT 8,109,629
which is a CON of 11/580,222 10/11/2006 PAT 7,581,833
which claims benefit of 60/725,999 10/11/2005
and claims benefit of 60/725,896 10/11/2005
and claims benefit of 60/787,850 04/01/2006
and claims benefit of 60/846,150 09/20/2006
and said 16/182,969 11/07/2018 is a CON of 16/049,120 07/30/2018 PAT 11,243,416
which is a CON of 15/375,423 12/12/2016 PAT 10,061,144
which is a CON of 14/557,409 12/01/2014 PAT 9,547,184

which is a CON of 13/955,336 07/31/2013 PAT 8,905,542
which is a CON of 13/085,402 04/12/2011 PAT 8,500,271
and said 16/182,969 11/07/2018 is a CON of 15/409,723 01/19/2017 ABN
which is a CON of 13/831,512 03/14/2013 PAT 9,690,121
which is a CON of 12/806,312 08/10/2010 PAT 8,465,151
which is a CIP of 12/462,286 07/31/2009 PAT 8,109,629
and is a CIP of 12/317,043 12/18/2008 PAT 7,771,046
which is a CON of 12/214,435 06/19/2008 PAT 7,481,531
which is a CON of 11/891,411 08/09/2007 PAT 7,401,918

Foreign Applications for which priority is claimed (You may be eligible to benefit from the Patent Prosecution Highway program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 10/17/2023
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 18/375,893**
Projected Publication Date: 02/01/2024
Non-Publication Request: No
Early Publication Request: No
Title

SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC APPARATUS

Preliminary Class

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ

in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

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No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 18/375,893

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	320
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	700
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	800
TOTAL CLAIMS (37 CFR 1.16(i))	48 minus 20 =	* 28			OR	x 100 =	2800
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*				x =	0
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	4620

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)		RATE($)	ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

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Under Secretary of Commerce for Intellectual Property and
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Kathi Vidal

Kathi Vidal
Under Secretary of Commerce for Intellectual Property and
Director of the United States Patent and Trademark Office

Derrick Brent
Deputy Under Secretary of Commerce for Intellectual Property and
Deputy Director of the United States Patent and Trademark Office

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/375,893	10/02/2023	Thomas A. Howell	IPVCP003X1C4X1C1	4776

34071 7590 11/14/2023

IPVENTURE, INC.
4010 Moorpark Avenue
Suite 211
San Jose, CA 95117

EXAMINER	
LEI, JIE	

ART UNIT	PAPER NUMBER
2872	

MAIL DATE	DELIVERY MODE
11/14/2023	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 18/375,893	Applicant(s) Howell et al.	
	Examiner JIE LEI	Art Unit 2872	AIA (FITF) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 2 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☑ Responsive to communication(s) filed on 10/2/2023.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL.** 2b) ☐ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☑ Claim(s) 1-48 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☐ Claim(s) _____ is/are rejected.

8) ☐ Claim(s) _____ is/are objected to.

9) ☑ Claim(s) 1-48 are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

DETAILED ACTION

1. The present application is being examined under the pre-AIA first to invent provisions.

Election/Restrictions

2. Any response to this restriction requirement, applicant is required to elect a single invention/specie to which the claims must be restricted.

3. This application contains claims directed to the following patentably distinct species.

Specie 1, an embodiment a system, comprising a head-worn structure, at least one speaker, a touch sensitive surface, a rechargeable battery, electronic circuitry, wireless communication circuitry, at least one conductive element, and a charging apparatus, including claims 1-18.

Specie 2, an embodiment a system, comprising, comprising a head-worn structure, at least one speaker, a first microphone, a second microphone, a rechargeable battery, electronic circuitry, wireless communication circuitry, at least one conductive element, and a charging apparatus, including claims 19-42.

Specie 3, an embodiment a system, comprising, comprising a head-worn structure, at least one speaker, a motion detector, a first microphone, a second microphone, a touch sensitive surface, a rechargeable battery, electronic circuitry,

wireless communication circuitry, at least one conductive element, and a charging apparatus, including claims 43-48.

4. The species are independent or distinct because the claims to the different species recite the mutually exclusive characteristics of such species. In addition, these species are not obvious variants of each other based on the current record.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species, or a single grouping of patentably indistinct species, for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable.

There is a search and/or examination burden for the patentably distinct species as set forth above because at least the following reason(s) apply: the species or groupings of patentably indistinct species require a different field of search (e.g., searching different classes /subclasses or electronic resources, or employing different search strategies or search queries).

5. A telephone call was not made to applicant's attorney due to the complexity of description in the restriction requirement.

6. **Applicant is advised that the reply to this requirement to be complete must include (i) an election of a species to be examined** even though the requirement may be traversed (37 CFR 1.143) **and (ii) identification of the claims encompassing**

the elected species or grouping of patentably indistinct species, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

The election may be made with or without traverse. To preserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the election of species requirement, the election shall be treated as an election without traverse. Traversal must be presented at the time of election in order to be considered timely. Failure to timely traverse the requirement will result in the loss of right to petition under 37 CFR 1.144. If claims are added after the election, applicant must indicate which of these claims are readable on the elected species or grouping of patentably indistinct species.

Should applicant traverse on the ground that the species, or groupings of patentably indistinct species from which election is required, are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing them to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the species unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103 or pre-AIA 35 U.S.C. 103(a) of the other species.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which depend from or otherwise require all the limitations of an allowable generic claim as provided by 37 CFR 1.141.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

7. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Jie Lei whose telephone number is (571) 272 7231. The examiner can normally be reached on Mon.-Thurs. 8:00 am to 5:30 pm. If attempts to reach the examiner by the telephone are unsuccessful, the examiner's supervisor, Thomas Pham can be reached on (571) 272 3689.The Fax number for the organization where this application is assigned is (571) 273 8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published application may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business

Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Services Representative or access to the automated information system, call 800-786-9199(In USA or Canada) or 571-272-1000.

/JIE LEI/
Primary Examiner, Art Unit 2872

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/375,893	Howell et al.
	Examiner	Art Unit
	JIE LEI	2872

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

CLAIMS

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	11/07/2023								
	1	÷								
	2	÷								
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	39	÷								
	40	÷								
	41	÷								
	42	÷								

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/375,893	Howell et al.
	Examiner	**Art Unit**
	JIE LEI	2872

CLAIM		DATE								
Final	Original	11/07/2023								
	43	÷								
	44	÷								
	45	÷								
	46	÷								
	47	÷								
	48	÷								

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 18/375,893	Filing Date 10/02/2023	☐ To be Mailed

ENTITY: ☑ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A		N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*		x $100 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $480 =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT	12/05/2023	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 55	Minus	** 48	= 7		x $100 =	700
	Independent (37 CFR 1.16(h))	* 4	Minus	*** 3	= 1		x $480 =	480
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	1180

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	LIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/DAMALI AYANA BERRY/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: HOWELL et al.	Attorney Docket No.: IPVCP003X1C4X1C1
Application No.: 18/375,893	Examiner: LEI, JIE
Filed: October 2, 2023	Group: 2872
Title: SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC SERVICES	

INFORMATION DISCLOSURE STATEMENT
37 CFR §§1.56 AND 1.97(b)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

The references listed in the attached PTO Form 1449, copies of which are attached, may be material to examination of the above-identified patent application. Applicants submit these references in compliance with their duty of disclosure pursuant to 37 CFR §§1.56 and 1.97. The Examiner is requested to make these references of official record in this application.

This Information Disclosure Statement is not to be construed as a representation that a search has been made, that additional information material to the examination of this application does not exist, or that these references indeed constitute prior art.

This Information Disclosure Statement is: (i) filed within three (3) months of the filing date of the above-referenced application, (ii) believed to be filed before the mailing date of a first Office Action on the merits, or (iii) believed to be filed before the mailing of a first Office Action after the filing of a Request for Continued Examination under §1.114.

Accordingly, it is believed that no fees are due in connection with the filing of this Information Disclosure Statement. However, if it is determined that any fees are due, the Commissioner is hereby authorized to charge such fees to Deposit Account 50-3874 (Order No. IPVCP003X1C4X1C1).

Respectfully submitted,

/C. Douglass Thomas/

C. Douglass Thomas
Registration No. 32,947

4010 Moorpark Avenue
Suite 211
San Jose, CA 95117

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: HOWELL et al.

Attorney Docket No.: IPVCP003X1C4X1C1

Application No.: 18/375,893

Examiner: LEI, JIE

Filed: October 2, 2023d

Group: 2872

Title: SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC SERVICES

PRELIMINARY AMENDMENT TRANSMITTAL

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Transmitted herewith is a Preliminary Amendment in the above-identified application.

The fee has been calculated as shown below.

	Claims After Amendment		Highest Previously Paid For	Present Extra	Small Entity Rate Fee	Large Entity Rate Fee
Total Claims	55	MINUS	48	07	x 40 =	x 100 = 700
Independent Claims	4	MINUS	3	01	x 192 =	x 480 = 480
Multiple Dependent Claim Present and Fee Not Previously Paid					$	$
				Total	$0.00	$1180.00

☐ Applicant(s) hereby petition for a _____- month extension(s) of time to respond to the aforementioned Office Action.

☒ Applicant(s) believe that no (additional) Extension of Time is required; however, if it is determined that such an extension is required, Applicant(s) hereby petition that such an extension be granted and authorize the Commissioner to charge the required fees for an Extension of Time under 37 CFR 1.136 to Deposit Account No. 50-3874 (Order No. IPVCP003X1C4X1C1).

☒ Any fees due are being paid electronically herewith.

☒ Please charge any additional fees required to facilitate filing the enclosed response, to Deposit Account No. 50-3874 (Order No. IPVCP003X1C4X1C1).

Respectfully submitted,

/C. Douglass Thomas/

C. Douglass Thomas
Reg. No. 32,947

Form 1449 (Modified)	Atty. Docket No.	IPVCP003X1C4X1C1
	Application No.:	18/375,893
Information Disclosure Statement By Applicant	Applicant	HOWELL et al.
	Filing Date	October 2, 2023
	Group	2872
(Use Several Sheets if Necessary)		Page 1 of 2

U.S. Patent Documents

Examiner Initial	No.	Patent No.	Date	Patentee	Class	Sub-class	Filing Date
	1.	2003/0045283 A1	Mar-03	Hagadoorn			
	2.	2005/0090295 A1	Apr-05	Ali et al.			
	3.	2017/0289323 A1	Oct-17	Gelvin et al.			
	4.	2023/0359266 A1	Nov-23	Howell et al.			
	5.	5,790,311	Aug-98	Togino			
	6.	7,430,299 B2	Sep-08	Armstrong et al.			
	7.	7,787,647 B2	Aug-10	Hagen et al.			
	8.	8,009,849 B2	Aug-11	Enzmann			
	9.	8,175,886 B2	May-12	Odinak			
	10.	8,251,875 B2	Aug-12	Ellis et al.			
	11.	8,571,241 B2	Oct-13	Larsen			
	12.	8,620,208 B2	Dec-13	Slotznick			
	13.	8,626,246 B2	Jan-14	Shostak			
	14.	9,183,351 B2	Nov-15	Shusterman			
	15.	9,369,814 B2	Jun-16	Victorian et al.			
	16.	11,480,802 B1	Oct-22	Tombelli			
	17.	11,803,069 B2	Oct-23	Howell et al.			
	18.	11,829,518 B2	Nov-23	Howell et al.			

Foreign Documents

							Translation	
Init.		Document No.	Date	Country	Class	Subclass	Yes	No

Other Documents (Including Author, Title, Date, Pertinent Pages, etc.)

	A	Notice of Allowance for U.S. Patent Application No. 17/949,029, dated October 30, 2023.
	B	Office Action for U.S. Patent Application No. 18/144,557, dated August 23, 2023.
	C	Office Action for U.S. Patent Application No. 18/144,557, dated November 24, 2023.

Examiner	Date Considered

Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Form 1449 (Modified) **Information Disclosure Statement By Applicant** (Use Several Sheets if Necessary)	Atty. Docket No.	IPVCP003X1C4X1C1
	Application No.:	18/375,893
	Applicant	HOWELL et al.
	Filing Date	October 2, 2023
	Group	2872
		Page 2 of 2

	D	Notice of Allowance for U.S. Patent Application No. 18/238,467, dated November 21, 2023.
	E	Notice of Allowance for U.S. Patent Application No. 16/182,969, dated Octber 25, 2023.

Examiner	Date Considered

Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/375,893	12/05/2023 02:48:38 PM Z ET	IPVCP003X1C4X1C1

Title of Invention

SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC APPARATUS

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	4776	FILED BY	Angela Nijim
PATENT CENTER #	63482863	AUTHORIZED BY	Peter Tong
CUSTOMER #	34071	FILING DATE	10/02/2023
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	Thomas A. Howell

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
CARD / 6200	E2023B5E50226313	Angela Nijim

PRE-AUTHORIZED ACCOUNT	PRE-AUTHORIZED CATEGORY
503874	37 CFR 1.21 (Miscellaneous fees and charges)

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
1202	EACH CLAIM IN EXCESS OF 20	100.00	7	700.00
1201	EACH INDEPENDENT CLAIM IN EXCESS OF THREE	480.00	1	480.00
			TOTAL AMOUNT:	$1,180.00

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: HOWELL et al.	Attorney Docket No.: IPVCP003X1C4X1C1
Application No.: 18/375,893	Examiner: LEI, JIE
Filed: October 2, 2023	Group: 2872
Title: SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC APPARATUS	

RESPONSE TO ELECTION/RESTRICTION REQUIREMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the Office Action mailed November 14, 2023, which imposed restriction requirements, Applicant provisionally elects Species II (claims 19-42) with traverse. However, for efficient examination and conservation of resources, it is respectfully submitted that claims 1-18 of Species I and claims 43-48 of Species III also be examined in this application. It is noted that claim 21 can serve as a linking claim between Species I and Species II, and claim 1 of Species I can serve as a linking claim between Species I and Species III.

Respectfully submitted,

/C. Douglass Thomas/

C. Douglass Thomas
Reg. No. 32, 947

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/375,893	**12/05/2023 02:48:38 PM Z ET**	**IPVCP003X1C4X1C1**

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PATENT CENTER #	63482863	FILING DATE	10/02/2023
CUSTOMER #	34071	FIRST NAMED INVENTOR	Thomas A. Howell
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Peter Tong

Documents

TOTAL DOCUMENTS: 6

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
IPVCP003X1C4X1C1_ResponsetoRestrictionReq_AsFiled_12-23.pdf	1	Response to Election / Restriction Filed	15 KB
IPVCP003X1C4X1C1_Request_Corrected_OFR_wAttachments_12-23.pdf	3	Request for Corrected Filing Receipt	178 KB
IPVCP003X1C4X1C1_IDSTrans_12-23.pdf	2	Letter specifying the conditions for filing under 37 CFR 1.97	19 KB
IPVCP003X1C4X1C1_1449_12-23.pdf	2	Information Disclosure Statement (IDS) Form (SB08)	26 KB

Warning: This is not a USPTO supplied IDS fillable form. Data in the form cannot be automatically loaded to other USPTO systems.

IPVCP003X1C4X1C1_PrelAmdTrans_12-23.pdf	1	Transmittal Letter	17 KB
IPVCP003X1C4X1C1_PrelAmd_AsFiled_12-23.pdf	17	Preliminary Amendment	83 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
IPVCP003X1C4X1C1_ResponsetoRestrictionReq_AsFiled_12-23.pdf	92DD55641B53F410E4DCE3F47D15CBC2119CF4FE5EE52211F1C639AFB6DA758A8AE9DE1471F75CAA94F41B81BB25DA781D5C58D57CD2974D765ABDA3B6C6F46A
IPVCP003X1C4X1C1_Request_Corrected_OFR_wAttachments_12-23.pdf	C3FD83B79981B8881134A32CBEDAAC3EA139150E10E4E4684FD66866A1BA0BAFF5B3A12C94861D8A05AE7CEE0C0AD9FFD9D0154833ADF879B935BC9921CBC1A7
IPVCP003X1C4X1C1_IDSTrans_12-23.pdf	73E986013EF50183338 1708E9D9F264A448DA1C072A4F5154CE51018322F02342606063CD647BCFDC9924CF0D113F7E9867F440A04ADF54062F308672A76F0B3
IPVCP003X1C4X1C1_1449_12-23.pdf	90B93BC0E36A10DC29EB8671E994E24A8C2017A781E7E28453B5737D8FAF276A5F9D972BD004900D34ABE6F0146F67CA7198EF76E42143DD1E52102F1FE57DED
IPVCP003X1C4X1C1_PrelAmdTrans_12-23.pdf	F127AA62B03211E8E55034E541719CA94CF9BC573E77F27888F52F5FE33ACEB9D87CAF2259539C0E7D064851EC5764C0DCBBF809EC6609475E35998F2210B159
IPVCP003X1C4X1C1_PrelAmd_AsFiled_12-23.pdf	A52FB24BC7FCCE4F0D3685221AF3AD51573DF14EB41081D2683C8A9702F87C34939C332DB3E4F99C543A0B7113A3D3F539F2940348013986 6FCB8F515D0DEEF4

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized

by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: HOWELL et al.	Attorney Docket No.: IPVCP003X1C4X1C1
Application No.: 18/375,893	Examiner: LEI, JIE
Filed: October 2, 2023	Group: 2872
Title: SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC APPARATUS	

REQUEST FOR CORRECTED OFFICIAL FILING RECEIPT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Applicants hereby request a Corrected Official Filing Receipt for the above-referenced patent application. Although, the Web-ADS was correct as originally filed on October 2, 2023, the Official Filing Receipt is missing some continuity information. Enclosed is an annotated copy of page 2 of the Filing Receipt indicating the missing information. This information can be found on page 6 of the originally filed Web-ADS. Since this request is being made within 4 months of filing, no petition is required. Please process and issue a corrected Official Filing Receipt.

Respectfully submitted,

/C. Douglass Thomas/

C. Douglass Thomas
Registration No. 32,947

4010 Moorpark Avenue
Suite 211
San Jose, CA 95117

which is a CON of 13/955,336 07/31/2013 PAT 8,905,542
which is a CON of 13/085,402 04/12/2011 PAT 8,500,271
and said 16/182,969 11/07/2018 is a CON of 15/409,723 01/19/2017 ABN
which is a CON of 13/831,512 03/14/2013 PAT 9,690,121
which is a CON of 12/806,312 08/10/2010 PAT 8,465,151
which is a CIP of 12/462,286 07/31/2009 PAT 8,109,629
and said 12/806,312 and is a CIP of 12/317,043 12/18/2008 PAT 7,771,046 which is a CON of 11/680,222 10/11/2006 PAT 7,581,833
which is a CON of 12/214,435 06/19/2008 PAT 7,481,531
which is a CON of 11/891,411 08/09/2007 PAT 7,401,918

Foreign Applications for which priority is claimed (You may be eligible to benefit from the Patent Prosecution Highway program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 10/17/2023
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 18/375,893**
Projected Publication Date: 02/01/2024
Non-Publication Request: No
Early Publication Request: No
Title

SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC APPARATUS

Preliminary Class

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ

COPY

PTO/AIA/14 (08-15)
Approved for use through 04/30/2017. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	IPVCP003X1C4X1C1
	Application Number	
Title of Invention	SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC APPARATUS	

Prior Application Status	Abandoned		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
16182969	Continuation of	15409723	2017-01-19

Prior Application Status	Patented			Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
15409723	Continuation of	13831512	2013-03-14	9690121	2017-06-27

Prior Application Status	Patented			Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
13831512	Continuation of	12806312	2010-08-10	8465151	2013-06-18

Prior Application Status	Patented			Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
12806312	Continuation in part of	12462286	2009-07-31	8109629	2012-02-07

Prior Application Status	Patented			Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
12462286	Continuation of	11580222	2006-10-11	7581833	2009-09-01

Prior Application Status	Patented			Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
12806312	Continuation in part of	12317043	2008-12-18	7771046	2010-08-10

Prior Application Status	Patented			Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
12317043	Continuation of	12214435	2008-06-19	7481531	2009-01-27

Prior Application Status	Patented			Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
12214435	Continuation of	11891411	2007-08-09	7401918	2008-07-22

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: HOWELL et al.	Attorney Docket No.: IPVCP003X1C4X1C1
Application No.: 18/375,893	Examiner: LEI, JIE
Filed: October 2, 2023	Group: 2872
Title: SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC SERVICES	

PRELIMINARY AMENDMENT

Mail Stop _____
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Prior to an Office Action on the merits, please amend the above-identified as follows:

Amendments to the Claims are reflected in the listing of claims which begin on page 2 of this paper.

Remarks/Arguments begin on page 17 of this paper.

Amendments to the Claims:

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Original) A system, comprising:

a head-worn personal electronic apparatus, including at least:

a head-worn structure configured to be worn by a user;

at least one speaker at least partially internal to the head-worn structure, the at least one speaker being configured to be worn proximate to an ear of the user when the head-worn structure is being worn by the user;

a touch sensitive surface at least partially contained within the head-worn structure and configured to sense a touch input associated with the user;

a rechargeable battery contained within the head-worn structure;

electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery, and the electronic circuitry being electrically connected to the touch sensitive surface;

wireless communication circuitry at least partially contained within the head-worn structure, the wireless communication circuitry being electrically connected to at least the rechargeable battery; and

at least one conductive element at least partially included within the head-worn structure, the at least one conductive element being at least partially exposed to enable interconnection therewith, the at least one conductive element being electrically connected to at least the rechargeable battery; and

a charging apparatus having a charging connector,

wherein on placement of the head-worn personal electronic apparatus in the charging apparatus, electrical connection results from the at least one conductive element connecting with the charging connector, and thereby the rechargeable battery of the head-worn personal electronic apparatus is able to be recharged while the head-worn personal electronic apparatus is placed in the charging apparatus.

2. (Original) A system as recited in claim 1, wherein the sensed touch input by the touch sensitive surface operates to at least alter operation of the head-worn personal electronic apparatus.

3. (Original) A system as recited in claim 2, wherein head-worn personal electronic apparatus is configured to support voice calls to the user, and

wherein the at least one operation of the head-worn personal electronic apparatus being altered concerns at least accepting or declining a voice call to the user.

4. (Original) A system as recited in claim 2, wherein head-worn personal electronic apparatus is configured to support audio output to the user, and

wherein the at least one operation of the head-worn personal electronic apparatus being altered concerns control of the audio output being provided to the user.

5. (Original) A system as recited in claim 2, wherein the head-worn personal electronic apparatus is configured to distinguish at least a direction of the user input with respect to the touch sensitive surface.

6. (Original) A system as recited in claim 2, wherein the head-worn personal electronic apparatus is configured to detect at least a sliding of a finger action with respect to the touch sensitive surface.

7. (Original) A system as recited in claim 2, wherein the head-worn personal electronic apparatus is configured to facilitate determination at least whether the user input pertains to a forward sliding action or a backward sliding action with respect to the touch sensitive surface.

8. (Original) A system as recited in claim 1, wherein the head-worn structure comprises:

a physical condition sensor at least partially contained within the head-worn structure and configured to acquire data pertaining to a physical condition of the user, the

physical condition sensor being provided at least partially internal to the head-worn structure.

9. (Original) A system as recited in claim 8, wherein the acquired data by the physical condition sensor includes at least data pertaining to or dependent on heart beats of the user.

10. (Original) A system as recited in claim 1, wherein the head-worn personal electronic apparatus comprises:

at least one magnetic element at least partially internal to the head-worn structure and configured to support a magnetic force that facilitates an electrical connection.

11. (Original) A system as recited in claim 1, wherein the head-worn personal electronic apparatus comprises:

a microphone at least partially internal to the head-worn structure,

wherein the head-worn personal electronic device is configured to receive a voice input via the microphone, determine a requested operation from the voice input using voice recognition, and control an operation by the head-worn personable electronic device based on the requested operation.

12. (Original) A system as recited in claim 1, wherein the head-worn structure comprises:

a radiation sensor, operatively connected to the rechargeable battery, at least partially contained within the head-worn structure and configured to sense radiation.

13. (Original) A system as recited in claim 1, wherein the head-worn personal electronic apparatus comprises:

a sensor at least partially contained within the head-worn structure and configured to sense data indicative of whether the head-worn personal electronic apparatus is being worn by the user.

14. (Original) A system as recited in claim 13, wherein the sensor is electrically connected to the electronic circuitry, and wherein the electronic circuitry contained within the head-worn structure of the head-worn personal electronic apparatus is configured to at least alter operation of the head-worn personal electronic apparatus based at least in part on the sensed data from the sensor.

15. (Original) A system as recited in claim 14, wherein head-worn personal electronic apparatus is configured to support audio output to the user, and

wherein the operation of the head-worn personal electronic apparatus being altered concerns control of the audio output being provided to the user.

16. (Currently Amended) A system as recited in claim 14, wherein head-worn personal electronic apparatus is configured to support a low power operational mode ~~audio output to the user~~, and

wherein the operation of the head-worn personal electronic apparatus being altered concerns operation of the head-worn personal electronic apparatus in the low power operational mode ~~a lower power operation~~.

17. (Original) A system as recited in claim 1, wherein the head-worn personal electronic apparatus comprises:

a Hall effect detector at least partially contained within the head-worn structure and configured to capture data associated with a magnetic characteristic, the Hall effect detector being operatively connected to the electronic circuitry.

18. (Original) A system as recited in claim 1, wherein the head-worn personal electronic apparatus comprises:

a bone conducting element at least partially contained within the head-worn structure and configured to operate in accordance with acoustic characteristics, the bone conducting element being operatively connected to the electronic circuitry.

19. (Original) A system, comprising:

a head-worn personal electronic apparatus, including at least:

a head-worn structure configured to be worn by a user;

at least one speaker at least partially internal to the head-worn structure, the at least one speaker being configured to be worn proximate to an ear of the user when the head-worn structure is being worn by the user;

a first microphone at least partially contained within the head-worn structure, the first microphone being positioned to pick up at least audio input from at least the user;

a second microphone at least partially contained within the head-worn structure, the second microphone being positioned to pick up at least environmental audio input associated with an environment around the head-worn personal electronic apparatus;

a rechargeable battery contained within the head-worn structure;

electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery;

wireless communication circuitry at least partially contained within the head-worn structure, the wireless communication circuitry being electrically connected to at least the rechargeable battery; and

at least one conductive element at least partially included within the head-worn structure, the at least one conductive element being at least partially exposed to enable interconnection therewith, the at least one conductive element being electrically connected to at least the rechargeable battery; and

a charging apparatus having a charging connector,

wherein on placement of the head-worn personal electronic apparatus in the charging apparatus, electrical connection results from the at least one conductive element connecting with the charging connector, and thereby the rechargeable battery of the head-worn personal electronic apparatus is able to be recharged while the head-worn personal electronic apparatus is placed in the charging apparatus.

20. (Original) A system as recited in claim 19, wherein the electronic circuitry is configured to process the audio input from at least the user via the first microphone to

remove at least a portion of the environmental audio input associated with the environment picked up via the second microphone.

21. (Original) A system as recited in claim 20, wherein the head-worn personal electronic apparatus comprises:

a touch sensitive surface at least partially contained within the head-worn structure and configured to sense a touch input associated with the user, wherein the sensed touch input operating to at least alter operation of the head-worn electronic personal audio apparatus.

22. (Original) A system as recited in claim 21, wherein head-worn electronic personal audio apparatus is configured to support audio output to the user, and

wherein the at least one operation of the head-worn electronic personal audio apparatus being altered concerns control of the audio output being provided to the user.

23. (Original) A system as recited in claim 21, wherein the head-worn electronic personal audio apparatus comprises:

a Hall effect detector at least partially contained within the head-worn structure and configured to capture data associated with a magnetic characteristic.

24. (Original) A system as recited in claim 19, wherein the head-worn personal electronic apparatus comprises:

a sensor at least partially contained within the head-worn structure and configured to capture data,

wherein the electronic circuitry provided within the head-worn structure and electrically connected to the sensor, the electronic circuitry configured to process at least the data captured by the sensor.

25. (Original) A system as recited in claim 24, wherein the electronic circuitry is configured to determine whether the head-worn structure is being worn by a user based on at least the processed sensor data.

26. (Original) A system as recited in claim 19, wherein the head-worn personal electronic apparatus comprises:

wherein the head-worn personal electronic device is configured to receive a voice input via the first microphone, determine a requested operation from the voice input using voice recognition, and control an operation by the head-worn personal electronic device based on the requested operation.

27. (Original) A system as recited in claim 19, wherein the head-worn structure comprises:

a radiation sensor, operatively connected to the rechargeable battery, at least partially contained within the head-worn structure and configured to sense radiation.

28. (Original) A system as recited in claim 19, wherein the head-worn personal electronic apparatus comprises:

a sensor at least partially contained within the head-worn structure and configured to sense data indicative of whether the head-worn personal electronic apparatus is being worn by the user.

29. (Original) A system as recited in claim 28, wherein the head-worn personal electronic apparatus is configured to at least alter operation of the head-worn personal electronic apparatus based at least in part on the sensed data from the sensor.

30. (Original) A system as recited in claim 29, wherein head-worn personal electronic apparatus is configured to support audio output to the user, and

wherein the operation of the head-worn personal electronic apparatus being altered concerns control of the audio output being provided to the user.

31. (Original) A system as recited in claim 19, wherein the head-worn personal electronic apparatus comprises:

a user input device supported by the head-worn structure, the user input device being configured to receive a user input, the user input device is based on at least capacitive effect, wherein the user input being received induces at least a capacitive change to produce at least an electrical response.

32. (Original) A system as recited in claim 31, wherein the user input device is configured to distinguish at least a direction of the user input with respect to the user input device.

33. (Original) A system as recited in claim 31, wherein the electronic circuitry is electrically connected to the user input device to receive user input data from the user input device, and wherein the head-worn personal electronic apparatus is configured to detect at least a sliding of a finger action with respect to the user input device using at least the electronic circuitry and the user input data.

34. (Original) A system as recited in claim 31, wherein the electronic circuitry is electrically connected to the user input device to receive user input data from the user input device, and wherein the head-worn personal electronic apparatus is configured to distinguish at least whether the user input pertains to a forward sliding action or a backward sliding action with respect to the user input device using at least the electronic circuitry and the user input data.

35. (Original) A system as recited in claim 19, wherein the head-worn personal electronic apparatus:

a radiation emitter at least partially contained within the head-worn structure and configured to at least direct radiation towards the user when at least the head-worn structure of the head-worn personal electronic apparatus is being worn; and

a radiation detector at least partially contained within the head-worn structure and configured to detect radiation reflected back from the user when at least the head-worn structure of the head-worn personal electronic apparatus is being worn.

36. (Original) A system as recited in claim 35, wherein the radiation detector is operatively connected to the electronic circuitry, and wherein electronic circuitry within the head-worn structure is configured to facilitate determining whether the head-worn structure of the head-worn personal electronic apparatus is being worn by the user based on at least the detected radiation.

37. (Original) A system as recited in claim 36, wherein the detected radiation is at least infrared radiation.

38. (Original) A system as recited in claim 19, wherein the head-worn electronic personal audio apparatus comprises:

a Hall effect detector at least partially in the head-worn structure and configured to capture data associated with a magnetic characteristic.

39. (Original) A system as recited in claim 19, wherein the head-worn personal electronic apparatus comprises:

a bone conducting element at least partially contained within the head-worn structure and configured to operate based on signals associated with sound, the bone conducting element being operatively connected to the electronic circuitry.

40. (Original) A system as recited in claim 19, wherein the head-worn personal electronic apparatus comprises:

a radiation detector configured to capture radiation data,

wherein the electronic circuitry is electrically connected to the radiation detector, the electronic circuitry configured to process at least the radiation data captured by the radiation detector, and

wherein the electronic circuitry is configured to determine whether the head-worn personal electronic apparatus is being worn by a user based on at least the processed radiation data.

41. (Original) A system as recited in claim 40, wherein the radiation detector comprises a photodetector.

42. (Original) A system as recited in claim 19, wherein the conductive element is a conductive pad.

43. (Original) A system, comprising:

a head-worn personal electronic apparatus, including at least:

a head-worn structure configured to be worn by a user;

at least one speaker at least partially internal to the head-worn structure, the at least one speaker being configured to be worn proximate to an ear of the user when the head-worn structure is being worn by the user;

a motion detector at least partially contained within the head-worn structure and configured to provide motion data pertaining to the head-worn personal electronic apparatus;

a first microphone at least partially contained within the head-worn structure, the first microphone being positioned to pick up at least audio input from at least the user;

a second microphone at least partially contained within the head-worn structure, the second microphone being positioned to pick up at least environmental audio input associated with an environment around the head-worn personal electronic apparatus;

a touch sensitive surface at least partially contained within the head-worn structure and configured to sense a touch input associated with the user, wherein the sensed touch input operating to at least alter operation of the head-worn electronic personal audio apparatus.

a rechargeable battery contained within the head-worn structure;

electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery;

wireless communication circuitry at least partially contained within the head-worn structure, the wireless communication circuitry being electrically connected to at least the rechargeable battery; and

at least one conductive element at least partially included within the head-worn structure, the at least one conductive element being at least partially exposed to enable interconnection therewith, the at least one conductive element being electrically connected to at least the rechargeable battery; and

a charging apparatus having a charging connector,

wherein on placement of the head-worn personal electronic apparatus in the charging apparatus, electrical connection results from the at least one conductive element connecting with the charging connector, and thereby the rechargeable battery of the head-worn personal electronic apparatus is able to be recharged while the head-worn personal electronic apparatus is placed in the charging apparatus.

44. (Currently Amended) A system as recited in claim 43, wherein the head-worn personal electronic apparatus comprises:

wherein the electronic circuitry is configured to process the audio input from at least the user via the first microphone to remove at least a portion of the environmental audio input associated with the environment picked up via the second microphone, and

wherein the head-worn personal electronic device is configured to receive a voice input via the first microphone, determine a requested operation from the voice input using voice recognition, and control an operation by the head-worn personal electronic device based on the requested operation~~,~~

~~wherein head-worn electronic personal audio apparatus is configured to support audio output to the user, and~~

~~wherein the at least one operation of the head-worn electronic personal audio apparatus being altered concerns control of the audio output being provided to the user~~.

45. (Currently Amended) A system as recited in claim 44, wherein the head-worn personal electronic apparatus comprises:

at least one magnetic element at least partially internal to the head-worn structure and configured to support a magnetic force that facilitates an electrical connection. [[;]]

46. (Original) A system as recited in claim 44, wherein the head-worn personal electronic apparatus comprises:

a sensor at least partially contained within the head-worn structure and configured to sense data indicative of whether the head-worn personal electronic apparatus is being worn by the user,

wherein the head-worn personal electronic apparatus is configured to at least alter operation of the head-worn personal electronic apparatus based at least in part on the sensed data from the sensor.

47. (Original) A system as recited in claim 46, wherein head-worn personal electronic apparatus is configured to support audio output to the user, and

wherein the operation of the head-worn personal electronic apparatus being altered concerns control of the audio output being provided to the user.

48. (Currently Amended) A system as recited in claim 46, wherein head-worn personal electronic apparatus is configured to support a low power operational mode ~~audio output to the user~~, and

wherein the operation of the head-worn personal electronic apparatus being altered concerns operation of the head-worn personal electronic apparatus in the low power operational mode ~~a lower power operation~~.

49. (New) A system, comprising:

a head-worn personal electronic apparatus, including at least:

a head-worn structure configured to be worn by a user;

at least one speaker at least partially internal to the head-worn structure, the at least one speaker being configured to be worn proximate to an ear of the user when the head-worn structure is being worn by the user;

a motion detector at least partially contained within the head-worn structure and configured to provide motion data pertaining to the head-worn personal electronic apparatus;

a first microphone at least partially contained within the head-worn structure, the first microphone being positioned to pick up at least audio input from at least the user;

a second microphone at least partially contained within the head-worn structure, the second microphone being positioned to pick up at least environmental audio input associated with an environment around the head-worn personal electronic apparatus;

a rechargeable battery contained within the head-worn structure;

electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery;

wireless communication circuitry at least partially contained within the head-worn structure, the wireless communication circuitry being electrically connected to at least the rechargeable battery;

a radiation emitter at least partially contained within the head-worn structure and configured to at least direct radiation towards the user when at least the head-worn structure of the head-worn personal electronic apparatus is being worn;

a radiation detector at least partially contained within the head-worn structure and configured to detect radiation reflected back from the user when at least the head-worn structure of the head-worn personal electronic apparatus is being worn; and

at least one conductive element at least partially included within the head-worn structure, the at least one conductive element being at least partially exposed to enable interconnection therewith, the at least one conductive element being electrically connected to at least the rechargeable battery; and

a charging apparatus having a charging connector,

wherein on placement of the head-worn personal electronic apparatus in the charging apparatus, electrical connection results from the at least one conductive element connecting with the charging connector, and thereby the rechargeable battery of the head-worn personal electronic apparatus is able to be recharged while the head-worn personal electronic apparatus is placed in the charging apparatus.

50. (New) A system as recited in claim 49,

wherein the radiation detector is operatively connected to the electronic circuitry, and wherein electronic circuitry within the head-worn structure is configured to facilitate determining whether the head-worn structure of the head-worn personal electronic apparatus is being worn by the user based on at least the detected radiation, and

wherein the detected radiation is at least infrared radiation.

51. (New) A system as recited in claim 50, wherein the head-worn personal electronic apparatus comprises:

at least one magnetic element at least partially internal to the head-worn structure and configured to support a magnetic force that facilitates an electrical connection.

52. (New) A system as recited in claim 51, wherein the head-worn personal electronic apparatus comprises:

wherein the electronic circuitry is configured to process the audio input from at least the user via the first microphone to remove at least a portion of the environmental audio input associated with the environment picked up via the second microphone, and

wherein the head-worn personal electronic device is configured to receive a voice input via the first microphone, determine a requested operation from the voice input using voice recognition, and control an operation by the head-worn personal electronic device based on the requested operation.

53. (New) A system as recited in claim 51, wherein the head-worn personal electronic apparatus is configured to at least alter operation of the head-worn personal electronic apparatus based at least in part on the determination of whether the head-worn structure of the head-worn personal electronic apparatus is being worn by the user based on at least the detected radiation.

54. (New) A system as recited in claim 53, wherein head-worn personal electronic apparatus is configured to support audio output to the user, and

wherein the operation of the head-worn personal electronic apparatus being altered concerns control of the audio output being provided to the user.

55. (New) A system as recited in claim 53, wherein head-worn personal electronic apparatus is configured to support a low power operational mode, and

wherein the operation of the head-worn personal electronic apparatus being altered concerns operation of the head-worn personal electronic apparatus in the low power operational mode.

REMARKS

Claims 16, 44, 45 and 48 have been amended to further clarify the subject matter regarded as the invention. In addition, new claims 49-55 have been added to the application. Claims 1-55 are now pending.

Please enter this Amendment prior to examination on the merits.

Respectfully submitted,

/C. Douglass Thomas/

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Reg. No. 32,947

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
18/375,893	10/02/2023	2872	5800	IPVCP003X1C4X1C1	48	3

CONFIRMATION NO. 4776

REPLACEMENT FILING RECEIPT

34071
IPVENTURE, INC.
4010 Moorpark Avenue
Suite 211
San Jose, CA 95117

Date Mailed: 12/07/2023

Receipt is acknowledged of this non-provisional utility patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF FIRST INVENTOR, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection.

Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please submit a written request for a corrected Filing Receipt, including a properly marked-up ADS showing the changes with strike-through for deletions and underlining for additions. If you received a "Notice to File Missing Parts" or other Notice requiring a response for this application, please submit any request for correction to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections provided that the request is grantable.

Inventor(s)

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Applicant(s)

IngenioSpec, LLC, San Jose, CA;

Power of Attorney: The patent practitioners associated with Customer Number 34071

Domestic Priority data as claimed by applicant

This application is a CON of 16/182,969 11/07/2018
which is a CON of 16/127,957 09/11/2018 PAT 11,086,147
which is a CON of 14/715,501 05/18/2015 PAT 10,330,956
which is a CON of 13/367,346 02/06/2012 PAT 9,033,493
which is a CON of 12/462,286 07/31/2009 PAT 8,109,629
which is a CON of 11/580,222 10/11/2006 PAT 7,581,833
which claims benefit of 60/725,999 10/11/2005
and claims benefit of 60/725,896 10/11/2005
and claims benefit of 60/787,850 04/01/2006
and claims benefit of 60/846,150 09/20/2006
and said 16/182,969 11/07/2018 is a CON of 16/049,120 07/30/2018 PAT 11,243,416
which is a CON of 15/375,423 12/12/2016 PAT 10,061,144
which is a CON of 14/557,409 12/01/2014 PAT 9,547,184

which is a CON of 13/955,336 07/31/2013 PAT 8,905,542
which is a CON of 13/085,402 04/12/2011 PAT 8,500,271
and said 16/182,969 11/07/2018 is a CON of 15/409,723 01/19/2017 ABN
which is a CON of 13/831,512 03/14/2013 PAT 9,690,121
which is a CON of 12/806,312 08/10/2010 PAT 8,465,151
which is a CIP of 12/462,286 07/31/2009 PAT 8,109,629
which is a CON of 11/580,222 10/11/2006 PAT 7,581,833
and said 12/806,312 08/10/2010 is a CIP of 12/317,043 12/18/2008 PAT 7,771,046
which is a CON of 12/214,435 06/19/2008 PAT 7,481,531
which is a CON of 11/891,411 08/09/2007 PAT 7,401,918

Foreign Applications for which priority is claimed (You may be eligible to benefit from the Patent Prosecution Highway program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 10/17/2023

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 18/375,893**

Projected Publication Date: 02/01/2024

Non-Publication Request: No

Early Publication Request: No

Title

SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC APPARATUS

Preliminary Class

351

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

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Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/375,893	10/02/2023	Thomas A. Howell	IPVCP003X1C4X1C1	4776

34071 7590 12/14/2023

IPVENTURE, INC.
4010 Moorpark Avenue
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EXAMINER	
LEI, JIE	

ART UNIT	PAPER NUMBER
2872	

MAIL DATE	DELIVERY MODE
12/14/2023	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 18/375,893	Applicant(s) Howell et al.	
	Examiner JIE LEI	Art Unit 2872	AIA (FITF) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☑ Responsive to communication(s) filed on 12/5/2023.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL.** 2b) ☑ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☑ Claim(s) 19-42 is/are pending in the application.

5a) Of the above claim(s) 1-18 and 43-55 is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 19-42 is/are rejected.

8) ☐ Claim(s) _____ is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☑ The drawing(s) filed on 10/2/2023 is/are: a)☐ accepted or b)☑ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☑ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date 12/5/2023,10/6/2023,10/5/2023,10/2/2023.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

DETAILED ACTION

1. The present application is being examined under the pre-AIA first to invent provisions. This office action is in response to the amendment filed 12/5/2023.

Information Disclosure Statement

2. The information disclosure statements (IDS) submitted on 12/5/2023, 10/6/2023, 10/5/2023 and 10/2/2023 are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statements have been considered by the examiner.

Election/Restrictions

3. Applicant's election of specie 2 (claims 19-42) with traverse in the reply filed on 12/5/2023 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)). Claims 1-18 (specie 1) and 43-48 (specie 3) are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Applicants point out that claim 21 can serve as a linking claim. However, claim 21 is not supported in instant specification disclosure, please see 112(a) rejections below.

Newly submitted claims 49-55 are directed to an invention which citation is similar to that of specie 3. Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original

presentation for prosecution on the merits. Accordingly, new claims 49-55 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Specification

Drawings

4. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Therefore, the following must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Claim 19 -- the second microphone being positioned to pick up at least environmental audio input associated with an environment around the head-worn personal electronic apparatus;

Claim 21 -- a touch sensitive surface at least partially contained within the head-worn structure and configured to sense a touch input associated with the user;

Claim 31 -- the user input device is based on at least capacitive effect;

Claim 35 -- a radiation emitter at least partially contained within the head-worn structure and configured to at least direct radiation towards the user.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended

replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

5. The following is a quotation of 35 U.S.C. 112(a):

> (a) IN GENERAL.—The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor or joint inventor of carrying out the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), first paragraph:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 19-42 are rejected under 35 U.S.C. 112(a) or 35 U.S.C. 112 (pre-AIA), first paragraph, as failing to comply with the written description requirement. The claim

contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor or a joint inventor, or for pre-AIA the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding claim 19, claim 19 comprises limitation/term of "a second microphone at least partially contained within the head-worn structure, the second microphone being positioned to pick up at least environmental audio input associated with an environment around the head-worn personal electronic apparatus" (line 9-12), which are not described/defined in the specification disclosure. The claimed limitation/term do not have corresponding parts specified in the specification disclosure. Instant disclosure teaches a microphone on the head-worn structure and being positioned to pick up audio input from a user, but nowhere teaches a microphone on the head-worn structure and being positioned to pick up environmental audio around the head-worn structure.

Claims 20-42 are rejected as containing the deficiencies of claim 19 through their dependency from claim 19.

Regarding claim 21, claim 21 comprises limitation/term of "a touch sensitive surface at least partially contained within the head-worn structure and configured to sense a touch input associated with the user" (line 3-4), which are not described/defined in the specification disclosure. The claimed limitation/term do not have corresponding

parts specified in the specification disclosure. Nowhere in instant specification disclosure teaches "touch sensitive" or "touch sensitive surface".

Claims 22-23 are rejected as containing the deficiencies of claim 21 through their dependency from claim 21.

Regarding claim 31, claim 31 comprises limitation/term of "the user input device is based on at least capacitive effect," (line 4-5), which are not described/defined in the specification disclosure. The claimed limitation/term do not have corresponding parts specified in the specification disclosure. Nowhere in instant specification disclosure teaches "capacitive effect".

Claims 32-34 are rejected as containing the deficiencies of claim 31 through their dependency from claim 31.

Regarding claim 35, claim 35 comprises limitation/term of "a radiation emitter at least partially contained within the head-worn structure and configured to at least direct radiation towards the user" (line 3-4), which are not described/defined in the specification disclosure. The claimed limitation/term do not have corresponding parts specified in the specification disclosure. Nowhere in instant specification disclosure teaches "radiation emitter".

Claims 36-37 are rejected as containing the deficiencies of claim 35 through their dependency from claim 35.

Claim Rejections - 35 USC § 112

7. The following is a quotation of 35 U.S.C. 112(b):

> (b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.
>
> The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:
> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 19-42 are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention.

Regarding claim 19, the term of "a second microphone at least partially contained within the head-worn structure, the second microphone being positioned to pick up at least environmental audio input associated with an environment around the head-worn personal electronic apparatus" (line 9-12) is vague and renders the claims indefinite. As instant specification disclosure does not teach this limitation term (see above), how to set up a microphone on the head-worn structure and how to pick up environmental audio input become undefined.

Claims 20-42 are rejected as containing the deficiencies of claim 19 through their dependency from claim 19.

Regarding claim 21, the term of "a touch sensitive surface at least partially contained within the head-worn structure and configured to sense a touch input

associated with the user" (line 3-4) is vague and renders the claims indefinite. As instant specification disclosure does not teach "touch sensitive" or "touch sensitive surface" (see above), how to set up and operate the touch sensitive surface becomes undefined.

Claims 22-23 are rejected as containing the deficiencies of claim 21 through their dependency from claim 21.

Regarding claim 31, the term of "the user input device is based on at least capacitive effect," (line 4-5) is vague and renders the claims indefinite. As instant specification disclosure does not teach "capacitive effect" (see above), how to set up and operate the user input device becomes undefined.

Claims 32-34 are rejected as containing the deficiencies of claim 31 through their dependency from claim 31.

Regarding claim 35, the term of "a radiation emitter at least partially contained within the head-worn structure and configured to at least direct radiation towards the user" (line 3-4) is vague and renders the claims indefinite. As instant specification disclosure does not teach "radiation emitter" (see above), how to set up and operate the radiation emitter becomes undefined.

Claims 36-37 are rejected as containing the deficiencies of claim 35 through their dependency from claim 35.

Therefore proper amendments are required in order to clarify the scopes of the claims and overcome the rejections.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102 of this title, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 19-20, 24-30 and 38-42 are rejected under 35 U.S.C. 103 as being unpatentable over Spitzer (US 6349001) in the view of Kallman et al (US 5835185).

Regarding Claim 19, Spitzer teaches a system (abstract; fig. 1), comprising:

a head-worn personal electronic apparatus (fig. 1), including at least:

a head-worn structure configured to be worn by a user (fig. 1);

at least one speaker at least partially internal to the head-worn structure, the at least one speaker being configured to be worn proximate to an ear of the user when the head-worn structure is being worn by the user (fig. 1, 108-audio; fig. 21, lower figure, audio outputs (--speakers), fixed to both temples; col. 9, line 49-52, The integration of microphones, speakers, camera and display within or upon the eyeglass frames makes possible a wide range of communication and recording devices, in addition to computer input and output devices);

a first microphone at least partially contained within the head-worn structure, the first microphone being positioned to pick up at least audio input from at least the user (fig. 1, 106- microphone; col. 8, line 1-5, a directional air conduction audio microphone may be used by placing it at the bottom of the eyeglass frame oriented so as to preferentially detect the sound of the user's speech);

a second microphone at least partially contained within the head-worn structure, the second microphone being positioned to pick up at least environmental audio input associated with an environment around the head-worn personal electronic apparatus (fig. 21, upper figure, microphones, fixed to both temples; col. 8, line 1-15, A plurality of microphones may be used in order to make possible the implementation of noise reduction techniques using analog or digital signal processing. For certain applications, it is desirable to sense ambient sound instead of or in addition to the user's speech. For the particular application of assisting the hearing impaired, the microphone would be so oriented so that sound corning from the area in front of the user is preferentially detected);

a battery contained within the head-worn structure (fig. 1, 112- internal batteries);

electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the battery (fig. 1, 110- internal electronics and position sensors; col. 4, line 11-23, an eyeglass interface system 100; the eyeglass system is mounted a display assembly 102; a camera assembly 104; an audio output subsystem 108, an audio input subsystem 106 such as a microphone, an

interconnection subsystem 110, and a power subsystem 112, such as internal batteries);

wireless communication circuitry at least partially contained within the head- worn structure, the wireless communication circuitry being electrically connected to at least the battery (fig. 15, 849; col. 8, line 41-44, integrated circuits 849 may be formed within the temple 800; col. 12, line 41-55, wherein the integrated circuits include a cellular telephone transceiver (--wireless communication); fig. 17C, 960,980, 925-battery; col. 9, line 6-25, The subsystems described above are connected to remote electronics either by wire as noted above, or by infrared link, radio frequency methods; comprises an RF link in which signals are transmitted and received by antenna 980. These signals are passed to and from transceiver circuit 960, which is in communication with the 1/0 data stream).

But Spitzer does not specifically disclose that wherein a rechargeable battery and wherein at least one conductive element at least partially included within the head-worn structure, the at least one conductive element being at least partially exposed to enable interconnection therewith, the at least one conductive element being electrically connected to at least the rechargeable battery; and a charging apparatus having a charging connector, wherein on placement of the head-worn personal electronic apparatus in the charging apparatus, electrical connection results from the at least one conductive element connecting with the charging connector, and thereby the rechargeable battery of the head- worn personal electronic apparatus is able to be

recharged while the head-worn personal electronic apparatus is placed in the charging apparatus.

However, Kallman teaches an eyewear system (abstract; fig. 4), wherein,

a rechargeable battery contained within the head-worn structure (fig. 4, 16, 18 -- batteries; col. 19, line 53-57, CHARGER circuit, produces up to approximately 1.0 rnA of charging current at 2.2-2.4 V (adjusted by setting potentiometer K1) at contacts 116, 118 and is capable of recharging fully depleted lead acid batteries 16, 18 of eyewear 38');

at least one conductive element at least partially included within the head-worn structure, the at least one conductive element being at least partially exposed to enable interconnection therewith, the at least one conductive element being electrically connected to at least the rechargeable battery (fig. 1, 10, 16, 18, and wires connecting 10, 12, 16, 18; -- Power supply system 10 contained within the frame, batteries 16, 18 contained within temples, see above; fig. 4, 106, 108; col. 17, line 24-29, bridge 84 preferably is provided with dual external electrical contacts 106, 108 for the series-connected dual lead-acid cell, or other suitable rechargeable-cell, batteries of one of the disclosed battery subsystems, for external charging by a battery charging eyewear case now to be described); and

a charging apparatus having a charging connector (fig. 5, 124-charge, 116, 118--electrical contacts; col. 17, line 58-62, Operatively connected to electrical contacts 116, 118 and preferably located within eyewear case 110 is an external battery CHARGER circuit 124 packaged in any suitable form, as by a discrete or integrated circuit (IC) devices interconnected as by use of a PCB powered by a battery B1),

wherein on placement of the head-worn personal electronic apparatus in the charging apparatus (fig. 5, 110-eyewear case, 124-charger), electrical connection results from the at least one conductive element connecting with the charging connector, and thereby the rechargeable battery of the head- worn personal electronic apparatus is able to be recharged while the head-worn personal electronic apparatus is placed in the charging apparatus (fig. 5, 112, 114, 116, 118, 122, 124; col. 17, line 29-65; FIG. 5 is an isometric view of an eyewear case 110 that securely and protectively cradles and covers eyewear 38' (wherein it will be appreciated that eyewear 38', not shown for the sake of simplicity and clarity, may be identical with eyewear 38 described and illustrated above as being powered by dual lead acid batteries) while charging its batteries; eyewear 38' is grippingly engaged adjacent its bridge 84 such that its dual batteries, e.g. dual lead acid batteries 16, 18 are charged; structure indicated at 112 includes mechanical bridge-gripping structure 114 and a pair of electrical contacts or regions 116, 118 configured for matingly electrically engaging corresponding battery circuit contacts or regions 106, 108 of eyewear 38'; Operatively connected to electrical contacts 116, 118 and preferably located within eyewear case 110 is an external battery CHARGER circuit 124 packaged in any suitable form, as by a discrete or integrated circuit (IC) devices interconnected as by use of a PCB powered by a battery B1).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention to modify the eyewear of Spitzer by the eyewear system of Kallman for the purpose of extending useful battery life, reducing battery replacement cost and minimizing frame and temple size (col. 2, line 63—col. 3, line 5)

Regarding Claim 20, Spitzer - Kallman combination teaches a system as recited in claim 19, wherein the electronic circuitry is configured to process the audio input from at least the user via the first microphone to remove at least a portion of the environmental audio input associated with the environment picked up via the second microphone (fig. 1, 110; fig. 15, 849; col. 8, line 1-16, .Alternatively a directional air conduction audio microphone may be used by placing it at the bottom of the eyeglass frame oriented so as to preferentially detect the sound of the user's speech. A plurality of microphones may be used in order to make possible the implementation of noise reduction techniques using analog or digital signal processing. For certain applications, it is desirable to sense ambient sound instead of or in addition to the user's speech. In that case, an air conduction microphone similar to ones used in hearing aids may be used in any convenient place along the eyeglass frame. For the particular application of assisting the hearing impaired, the microphone would be so oriented so that sound corning from the area in front of the user is preferentially detected, in alignment with the camera direction if one is used. Alternatively, an external microphone may be used for this application, as disclosed in Spitzer).

Regarding Claim 24, Spitzer - Kallman combination teaches a system as recited in claim 19, wherein the head-worn personal electronic apparatus comprises:

a sensor at least partially contained within the head-worn structure and configured to capture data (fig. 1, 110- internal electronics and position sensors; fig. 20, 1001, as disclosed in Spitzer),

wherein the electronic circuitry provided within the head-worn structure and electrically connected to the sensor, the electronic circuitry configured to process at least the data captured by the sensor (col. 9, line 65-67, the internal circuitry of the plug-in module 1001 may be permanently mounted within the eyeglass frame 1003; col. 10, line 61-67, A head tracking position sensor can be used to stabilize the image. In such a device, the recording device (for example, tape recorder, recordable digital video disk system, recordable compact disk system) are located in module 1001, as disclosed in Spitzer).

Regarding Claim 25, Spitzer - Kallman combination teaches a system as recited in claim 24, wherein the electronic circuitry is configured to determine whether the head-worn structure is being worn by a user based on at least the processed sensor data (col. 11, line 35-41, In this way the magnetic sensors can determine the user's head position; Many other types of sensors may be used for the head tracking system, including miniature gyroscopic or other inertial sensors, ultrasonic sensors, and even systems that use images from the camera system to detect bead movement, as disclosed in Spitzer).

Regarding Claim 26, Spitzer - Kallman combination teaches a system as recited in claim 19, wherein the head-worn personal electronic apparatus comprises:

wherein the head-worn personal electronic device is configured to receive a voice input via the first microphone, determine a requested operation from the voice input using voice recognition, and control an operation by the head-worn personal electronic device based on the requested operation (col. 2, line 25-27, the microphone may also provide voice activated commands to the system; col, 10, line 9-21, A keypad is unnecessary if voice recognition is employed. In such a case, the user speaks the command normally input by keypad, such as the number to dial, the send command, and so forth. The display within the interface module shows the number to be called for verification, just as the display on a cell phone would show the number, and after the appropriate send command is spoken, the call is placed. The user speaks and listens through the audio capability of the eyeglass system, as disclosed in Spitzer).

Regarding Claim 27, Spitzer - Kallman combination teaches a system as recited in claim 19, wherein the head-worn structure comprises:

a radiation sensor, operatively connected to the rechargeable battery, at least partially contained within the head-worn structure and configured to sense radiation (fig. 2, 210-camera; col. 9, line 45-48, if the camera is provided with an IR sensor, the detection of the signal may be made directly at the camera sensor 510, as disclosed in Spitzer).

Regarding Claim 28, Spitzer - Kallman combination teaches a system as recited in claim 19, wherein the head-worn personal electronic apparatus comprises:

a sensor at least partially contained within the head-worn structure (fig. 2, 210-camera; col. 9, line 45-48, if the camera is provided with an IR sensor, the detection of the signal may be made directly at the camera sensor 510, as disclosed in Spitzer), and configured to sense data indicative of whether the head-worn personal electronic apparatus is being worn by the user (col. 11, line 35-41, In this way the magnetic sensors can determine the user's head position; Many other types of sensors may be used for the head tracking system, including miniature gyroscopic or other inertial sensors, ultrasonic sensors, and even systems that use images from the camera system to detect bead movement, as disclosed in Spitzer).

Regarding Claim 29, Spitzer - Kallman combination teaches a system as recited in claim 28, wherein the head-worn personal electronic apparatus is configured to at least alter operation of the head-worn personal electronic apparatus based at least in part on the sensed data from the sensor (col. 2, line 25-27, the microphone may also provide voice activated commands to the system; col. 10, line 55-67, The camera and microphone within the glasses allow the system to perform many of the functions of a camcorder or still camera…., as disclosed in Spitzer).

Regarding Claim 30, Spitzer - Kallman combination teaches a system as recited in claim 29, wherein head-worn personal electronic apparatus is configured to support

audio output to the user (fig. 1, 108-audio; fig. 21, lower figure, audio outputs, as disclosed in Spitzer), and

wherein the operation of the head-worn personal electronic apparatus being altered concerns control of the audio output being provided to the user (col. 8, line 1-16, A plurality of microphones may be used in order to make possible the implementation of noise reduction techniques using analog or digital signal processing; col. 11, line 42-52, used for video conferencing; the user receives information in audio and video form through the system interface so (display and audio subsystems) and transmits information from the system interface, as disclosed in Spitzer).

.

Regarding Claim 38, Spitzer - Kallman combination teaches a system as recited in claim 19, wherein the head-worn electronic personal audio apparatus comprises:

a Hall effect detector at least partially in the head-worn structure and configured to capture data associated with a magnetic characteristic (col. 11, line 29-36, The magnetic sensor may be based on the Hall effect; An alternative is to position magnetic sensors within module 1001; col. 9, line 65-67, the internal circuitry of the plug-in module 1001 may be permanently mounted within the eyeglass frame 1003, as disclosed in Spitzer).

Regarding Claim 39, Spitzer - Kallman combination teaches a system as recited in claim 19, wherein the head-worn personal electronic apparatus comprises:

a bone conducting element at least partially contained within the head-worn structure and configured to operate based on signals associated with sound, the bone

conducting element being operatively connected to the electronic circuitry (fig. 11, 810; col. 7, line 44-66, As shown in FIG. 11, a bone conductivity transducer 810 serving as the speaker may be mounted to the temple 800 of an eyeglass frame so as to be in contact with the skull at a point approximately centered over the ear; One or more bone conduction microphones may be mounted within the eyeglass frame, as disclosed in Spitzer).

Regarding Claim 40, Spitzer - Kallman combination teaches a system as recited in claim 19, wherein the head-worn personal electronic apparatus comprises:

a radiation detector configured to capture radiation data (fig. 2, 210-camera; col. 9, line 45-48, if the camera is provided with an IR sensor, the detection of the signal may be made directly at the camera sensor 510, as disclosed in Spitzer),

wherein the electronic circuitry is electrically connected to the radiation detector, the electronic circuitry configured to process at least the radiation data captured by the radiation detector (fig. 2, 210, 230; col. 4, line 63-65, A cable 230 may supply the signal generated by the camera to external electronics, or may connect to circuitry within the eyeglass temple, as disclosed in Spitzer), and

wherein the electronic circuitry is configured to determine whether the head-worn personal electronic apparatus is being worn by a user based on at least the processed radiation data (col. 11, line 35-41, In this way the magnetic sensors can determine the user's head position; Many other types of sensors may be used for the head tracking system, including miniature gyroscopic or other inertial sensors, ultrasonic sensors, and

even systems that use images from the camera system to detect bead movement, as disclosed in Spitzer).

Regarding Claim 41, Spitzer - Kallman combination teaches a system as recited in claim 40, wherein the radiation detector comprises a photodetector (fig. 2, 210-camera; col. 9, line 45-48, if the camera is provided with an IR sensor, the detection of the signal may be made directly at the camera sensor 510, as disclosed in Spitzer).

Regarding Claim 42, Spitzer - Kallman combination teaches a system as recited in claim 19, wherein the conductive element is a conductive pad (fig. 4, 84, 106, 108, as disclosed in Kallman).

Examiner's Note

11. Regarding the references, the Examiner cites particular figures, paragraphs, columns and line numbers in the reference(s), as applied to the claims above. Although the particular citations are representative teachings and are applied to specific limitations within the claims, other passages, internally cited references, and figures may also apply. In preparing a response, it is respectfully requested that the Applicant fully consider the references, in their entirety, as potentially disclosing or teaching all or part of the claimed invention, as well as fully consider the context of the passage as taught by the reference(s) or as disclosed by the Examiner.

Conclusion

12. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Jie Lei whose telephone number is (571) 272 7231. The examiner can normally be reached on Mon.-Thurs. 8:00 am to 5:30 pm.

13. If attempts to reach the examiner by the telephone are unsuccessful, the examiner's supervisor, Thomas Pham can be reached on (571) 272 3689.The Fax number for the organization where this application is assigned is (571) 273 8300.

14. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published application may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Services Representative or access to the automated information system, call 800-786-9199(In USA or Canada) or 571-272-1000.

/JIE LEI/
Primary Examiner, Art Unit 2872

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/375,893	Howell et al.
	Examiner	Art Unit
	JIE LEI	2872

CPC - Searched*		
Symbol	**Date**	**Examiner**
G02C 1/00, 11/10, 11/06, 5/001, 5/02, 5/14, 5/22, 5/143, 5/146, 2200/08	12/12/2023	JL
G02B 27/01, 27/017, 27/0176; G02J 7/0045	12/12/2023	JL

CPC Combination Sets - Searched*		
Symbol	**Date**	**Examiner**

US Classification - Searched*			
Class	**Subclass**	**Date**	**Examiner**
351	158, 41, 111, 121, 123, 124	12/12/2023	JL
359	13, 629-633	12/12/2023	JL
381	381, 327, 328, 370, 380	12/12/2023	JL

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

/JIE LEI/ Primary Examiner, Art Unit 2872	

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Search Notes		
Search Notes	**Date**	**Examiner**
G02C 1/00, 11/10, 11/06, 5/001, 5/02, 5/14, 5/22, 5/143, 5/146, 2200/08 class and text search	12/12/2023	JL
G02B 27/01, 27/017, 27/0176; G02J 7/0045 class and text search	12/12/2023	JL
351/158, 41, 111, 121, 123, 124 class and text search	12/12/2023	JL
359/13, 629-633 class and text search	12/12/2023	JL
381/381, 327, 328, 370, 380 class and text search	12/12/2023	JL
Inventor name search	12/12/2023	JL
NPL and foreign search (google scholar, google patent, globaldossier and Dialog search)	12/12/2023	JL
PE2E text search	12/12/2023	JL
Similarity search	12/12/2023	JL

Interference Search			
US Class/CPC Symbol	**US Subclass/CPC Group**	**Date**	**Examiner**
	USPGPUB, USPAT	12/12/2023	JL

/JIE LEI/ Primary Examiner, Art Unit 2872	

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
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	JIE LEI	2872

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

CLAIMS

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	11/07/2023	12/12/2023							
	1	÷	N							
	2	÷	N							
	3	÷	N							
	4	÷	N							
	5	÷	N							
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	39	÷	✓							
	40	÷	✓							
	41	÷	✓							
	42	÷	✓							

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
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CLAIM		DATE								
Final	Original	11/07/2023	12/12/2023							
	43	÷	N							
	44	÷	N							
	45	÷	N							
	46	÷	N							
	47	÷	N							
	48	÷	N							
	49		N							
	50		N							
	51		N							
	52		N							
	53		N							
	54		N							
	55		N							

Web Search History

date, time	web site	search string
12/11/2023 3:21:59 PM	Google Images	smart glasses
12/11/2023 3:21:59 PM	Google	smart glasses
12/11/2023 3:22:18 PM	Google Images	Smart glasses with display
12/11/2023 3:22:18 PM	Google	Smart glasses with display
12/11/2023 3:22:27 PM	Google Images	Smart glasses with camera
12/11/2023 3:22:27 PM	Google	Smart glasses with camera
12/11/2023 3:22:55 PM	Google Images	VR glasses
12/11/2023 3:22:55 PM	Google	VR glasses
12/11/2023 3:23:14 PM	Google Images	Best VR headset
12/11/2023 3:23:14 PM	Google	Best VR headset
12/11/2023 3:23:46 PM	Google Images	AR glasses
12/11/2023 3:23:46 PM	Google	AR glasses
12/11/2023 3:24:00 PM	Google Images	Best AR glasses
12/11/2023 3:24:00 PM	Google	Best AR glasses
12/11/2023 3:24:15 PM	Google Images	Nreal AR glasses
12/11/2023 3:24:15 PM	Google	Nreal AR glasses
12/11/2023 3:24:42 PM	Google Images	electronic smart glasses
12/11/2023 3:24:42 PM	Google	electronic smart glasses
12/11/2023 3:24:55 PM	Google Images	Electronic smart glasses reviews

date, time	web site	search string
12/11/2023 3:24:55 PM	Google	Electronic smart glasses reviews
12/11/2023 3:26:13 PM	Google Scholar	(temple) (electrical components) (eyewear) (eyeglasses) (electrical)
12/11/2023 3:26:13 PM	Google Patents	Search Term 1 (temple) (electrical components) (eyewear) (eyeglasses) (electrical) Before Priority Date: priority:20030415
12/11/2023 3:26:15 PM	Google Patents	Search Term 1 (temple) Search Term 2 (electrical components) Search Term 3 (eyewear) Search Term 4 (eyeglasses) Search Term 5 (electrical) Before Priority Date: priority:20030415
12/11/2023 3:26:17 PM	Google Scholar	temple electrical components eyewear eyeglasses electrical
12/11/2023 3:26:17 PM	Google Patents	Search Term 1 temple Search Term 2 electrical components Search Term 3 eyewear Search Term 4 eyeglasses Search Term 5 electrical Before Priority Date: priority:20030415
12/11/2023 3:26:39 PM	Google Scholar	(battery) (eyewear) (lens) (frame) (batteries)
12/11/2023 3:26:39 PM	Google Patents	Search Term 1 (battery) (eyewear) (lens) (frame) (batteries) Before Priority Date: priority:19930910

date, time	web site	search string
12/11/2023 3:26:55 PM	Google Scholar	(light) (eye) (pupil) (optical fibers) (array)
12/11/2023 3:26:55 PM	Google Patents	Search Term 1 (light) (eye) (pupil) (optical fibers) (array) Before Priority Date: priority:19950615
12/11/2023 3:26:57 PM	Google Scholar	light eye pupil optical fibers array
12/11/2023 3:26:57 PM	Google Patents	Search Term 1 light Search Term 2 eye Search Term 3 pupil Search Term 4 optical fibers Search Term 5 array Before Priority Date: priority:19950615
12/11/2023 3:27:05 PM	Google Scholar	(electro) (lens) (active) (optical lens) (controller)
12/11/2023 3:27:05 PM	Google Patents	Search Term 1 (electro) (lens) (active) (optical lens) (controller) Before Priority Date: priority:20000623
12/11/2023 3:27:06 PM	Google Scholar	electro lens active optical lens controller
12/11/2023 3:27:06 PM	Google Patents	Search Term 1 electro Search Term 2 lens Search Term 3 active Search Term 4 optical lens Search Term 5 controller Before Priority Date: priority:20000623

date, time	web site	search string
12/11/2023 3:27:12 PM	Google Scholar	(eyeglass) (bracket) (spectacles) (spectacle) (combined)
12/11/2023 3:27:12 PM	Google Patents	Search Term 1 (eyeglass) (bracket) (spectacles) (spectacle) (combined) Before Priority Date: priority:18850623
12/11/2023 3:27:14 PM	Google Scholar	eyeglass bracket spectacles spectacle combined
12/11/2023 3:27:14 PM	Google Patents	Search Term 1 eyeglass Search Term 2 bracket Search Term 3 spectacles Search Term 4 spectacle Search Term 5 combined Before Priority Date: priority:18850623
12/11/2023 3:27:20 PM	Google Scholar	(globes) (globe) (lighting device) (facially) (annular)
12/11/2023 3:27:20 PM	Google Patents	Search Term 1 (globes) (globe) (lighting device) (facially) (annular) Before Priority Date: priority:18990707
12/11/2023 3:27:21 PM	Google Scholar	globes globe lighting device facially annular
12/11/2023 3:27:21 PM	Google Patents	Search Term 1 globes Search Term 2 globe Search Term 3 lighting device Search Term 4 facially Search Term 5 annular Before Priority Date: priority:18990707

date, time	web site	search string
12/11/2023 3:27:27 PM	Google Scholar	(lamp) (frame) (spectacle) (socket) (opening)
12/11/2023 3:27:27 PM	Google Patents	Search Term 1 (lamp) (frame) (spectacle) (socket) (opening) Before Priority Date: priority:19160412
12/11/2023 3:27:29 PM	Google Scholar	lamp frame spectacle socket opening
12/11/2023 3:27:29 PM	Google Patents	Search Term 1 lamp Search Term 2 frame Search Term 3 spectacle Search Term 4 socket Search Term 5 opening Before Priority Date: priority:19160412
12/11/2023 3:27:36 PM	Google Scholar	(fuse) (insert) (plug) (slots) (contact)
12/11/2023 3:27:37 PM	Google Scholar	fuse insert plug slots contact
12/11/2023 3:27:37 PM	Google Patents	Search Term 1 fuse Search Term 2 insert Search Term 3 plug Search Term 4 slots Search Term 5 contact Before Priority Date: priority:19310529
12/11/2023 3:27:45 PM	Google Scholar	(head) (bone) (receiver) (hearing) (contact surface)

date, time	web site	search string
12/11/2023 3:27:45 PM	Google Patents	Search Term 1 (head) (bone) (receiver) (hearing) (contact surface) Before Priority Date: priority:19330718
12/11/2023 3:27:46 PM	Google Scholar	head bone receiver hearing contact surface
12/11/2023 3:27:46 PM	Google Patents	Search Term 1 head Search Term 2 bone Search Term 3 receiver Search Term 4 hearing Search Term 5 contact surface Before Priority Date: priority:19330718
12/11/2023 3:34:48 PM	Google Scholar	(light) (spectacle frame) (battery) (bulb) (frame)
12/11/2023 3:34:48 PM	Google Patents	Search Term 1 (light) (spectacle frame) (battery) (bulb) (frame) Before Priority Date: priority:19490323
12/11/2023 3:34:49 PM	Google Scholar	light spectacle frame battery bulb frame
12/11/2023 3:34:49 PM	Google Patents	Search Term 1 light Search Term 2 spectacle frame Search Term 3 battery Search Term 4 bulb Search Term 5 frame Before Priority Date: priority:19490323
12/11/2023 3:35:03 PM	Google Scholar	(radiation) (crystal) (impedance) (spectral ranges) (exciter)

date, time	web site	search string
12/11/2023 3:35:03 PM	Google Patents	Search Term 1 (radiation) (crystal) (impedance) (spectral ranges) (exciter) Before Priority Date: priority:19531013
12/11/2023 3:35:04 PM	Google Scholar	radiation crystal impedance spectral ranges exciter
12/11/2023 3:35:04 PM	Google Patents	Search Term 1 radiation Search Term 2 crystal Search Term 3 impedance Search Term 4 spectral ranges Search Term 5 exciter Before Priority Date: priority:19531013
12/11/2023 3:35:11 PM	Google Scholar	(earphone) (seating) (hearing) (aid) (automatic self)
12/11/2023 3:35:11 PM	Google Patents	Search Term 1 (earphone) (seating) (hearing) (aid) (automatic self) Before Priority Date: priority:19541018
12/11/2023 3:35:12 PM	Google Scholar	earphone seating hearing aid automatic self
12/11/2023 3:35:12 PM	Google Patents	Search Term 1 earphone Search Term 2 seating Search Term 3 hearing Search Term 4 aid Search Term 5 automatic self Before Priority Date: priority:19541018
12/11/2023 3:35:20 PM	Google Scholar	(mount) (temple) (temples) (hinge) (ophthalmic)

date, time	web site	search string
12/11/2023 3:35:20 PM	Google Patents	Search Term 1 (mount) (temple) (temples) (hinge) (ophthalmic) Before Priority Date: priority:19550804
12/11/2023 3:35:21 PM	Google Scholar	mount temple temples hinge ophthalmic
12/11/2023 3:35:21 PM	Google Patents	Search Term 1 mount Search Term 2 temple Search Term 3 temples Search Term 4 hinge Search Term 5 ophthalmic Before Priority Date: priority:19550804
12/11/2023 3:35:27 PM	Google Scholar	(hearing aid) (ear) (frame) (spectacles) (parts)
12/11/2023 3:35:27 PM	Google Patents	Search Term 1 (hearing aid) (ear) (frame) (spectacles) (parts) Before Priority Date: priority:19530316
12/11/2023 3:35:29 PM	Google Scholar	hearing aid ear frame spectacles parts
12/11/2023 3:35:29 PM	Google Patents	Search Term 1 hearing aid Search Term 2 ear Search Term 3 frame Search Term 4 spectacles Search Term 5 parts Before Priority Date: priority:19530316
12/11/2023 3:35:44 PM	Google Scholar	(hearing aid) (temple) (temples) (microphone) (housing)

date, time	web site	search string
12/11/2023 3:35:44 PM	Google Patents	Search Term 1 (hearing aid) (temple) (temples) (microphone) (housing) Before Priority Date: priority:19570225
12/11/2023 3:35:46 PM	Google Scholar	hearing aid temple temples microphone housing
12/11/2023 3:35:46 PM	Google Patents	Search Term 1 hearing aid Search Term 2 temple Search Term 3 temples Search Term 4 microphone Search Term 5 housing Before Priority Date: priority:19570225
12/11/2023 3:35:55 PM	Google Scholar	(lamp) (recess) (frame) (recesses) (spectacles)
12/11/2023 3:35:55 PM	Google Patents	Search Term 1 (lamp) (recess) (frame) (recesses) (spectacles) Before Priority Date: priority:19570412
12/11/2023 3:35:56 PM	Google Scholar	lamp recess frame recesses spectacles
12/11/2023 3:35:56 PM	Google Patents	Search Term 1 lamp Search Term 2 recess Search Term 3 frame Search Term 4 recesses Search Term 5 spectacles Before Priority Date: priority:19570412
12/11/2023 3:36:55 PM	Google	smart glasses battery+

date, time	web site	search string
12/11/2023 3:37:02 PM	Google Images	smart glasses battery
12/11/2023 3:37:02 PM	Google	smart glasses battery
12/11/2023 3:37:29 PM	Google Images	Smart glasses battery replacement
12/11/2023 3:37:29 PM	Google	Smart glasses battery replacement
12/11/2023 3:37:58 PM	Google Images	google glasses charging
12/11/2023 3:37:58 PM	Google	google glasses charging
12/11/2023 3:38:55 PM	Google Images	google glass charger
12/11/2023 3:38:55 PM	Google	google glass charger
12/11/2023 3:56:58 PM	Google Scholar	(optical device) (lens) (illuminated optical) (frame) (bulbs)
12/11/2023 3:56:58 PM	Google Patents	Search Term 1 (optical device) (lens) (illuminated optical) (frame) (bulbs) Before Priority Date: priority:19590508
12/11/2023 3:57:00 PM	Google Scholar	optical device lens illuminated optical frame bulbs
12/11/2023 3:57:00 PM	Google Patents	Search Term 1 optical device Search Term 2 lens Search Term 3 illuminated optical Search Term 4 frame Search Term 5 bulbs Before Priority Date: priority:19590508
12/11/2023 3:57:06 PM	Google Scholar	(output) (integrator) (sunburn) (switch) (solar radiation)

date, time	web site	search string
12/11/2023 3:57:06 PM	Google Patents	Search Term 1 (output) (integrator) (sunburn) (switch) (solar radiation) Before Priority Date: priority:19690804
12/11/2023 3:57:07 PM	Google Scholar	output integrator sunburn switch solar radiation
12/11/2023 3:57:07 PM	Google Patents	Search Term 1 output Search Term 2 integrator Search Term 3 sunburn Search Term 4 switch Search Term 5 solar radiation Before Priority Date: priority:19690804
12/11/2023 3:57:14 PM	Google Scholar	(spectacles) (ultraviolet) (pair) (bodies) (wearer)
12/11/2023 3:57:14 PM	Google Patents	Search Term 1 (spectacles) (ultraviolet) (pair) (bodies) (wearer) Before Priority Date: priority:19691217
12/11/2023 3:57:15 PM	Google Scholar	spectacles ultraviolet pair bodies wearer
12/11/2023 3:57:15 PM	Google Patents	Search Term 1 spectacles Search Term 2 ultraviolet Search Term 3 pair Search Term 4 bodies Search Term 5 wearer Before Priority Date: priority:19691217
12/11/2023 3:57:22 PM	Google Scholar	(temple) (tip) (electrical) (members) (engageable)

date, time	web site	search string
12/11/2023 3:57:22 PM	Google Patents	Search Term 1 (temple) (tip) (electrical) (members) (engageable) Before Priority Date: priority:19710318
12/11/2023 3:57:23 PM	Google Scholar	temple tip electrical members engageable
12/11/2023 3:57:23 PM	Google Patents	Search Term 1 temple Search Term 2 tip Search Term 3 electrical Search Term 4 members Search Term 5 engageable Before Priority Date: priority:19710318
12/11/2023 3:57:30 PM	Google Scholar	(polarization direction) (images) (stereoscopic display) (vibration) (light)
12/11/2023 3:57:30 PM	Google Patents	Search Term 1 (polarization direction) (images) (stereoscopic display) (vibration) (light) Before Priority Date: priority:19730511
12/11/2023 3:57:32 PM	Google Scholar	polarization direction images stereoscopic display vibration light
12/11/2023 3:57:32 PM	Google Patents	Search Term 1 polarization direction Search Term 2 images Search Term 3 stereoscopic display Search Term 4 vibration Search Term 5 light Before Priority Date: priority:19730511
12/11/2023 3:57:37 PM	Google Scholar	(clip) (contacts) (frame) (reading aid) (pair)

date, time	web site	search string
12/11/2023 3:57:37 PM	Google Patents	Search Term 1 (clip) (contacts) (frame) (reading aid) (pair) Before Priority Date: priority:19740430
12/11/2023 3:57:40 PM	Google Scholar	clip contacts frame reading aid pair
12/11/2023 3:57:40 PM	Google Patents	Search Term 1 clip Search Term 2 contacts Search Term 3 frame Search Term 4 reading aid Search Term 5 pair Before Priority Date: priority:19740430
12/11/2023 3:57:46 PM	Google Scholar	(signal) (patrons) (audio) (output signal) (frequency)
12/11/2023 3:57:46 PM	Google Patents	Search Term 1 (signal) (patrons) (audio) (output signal) (frequency) Before Priority Date: priority:19780410
12/11/2023 3:57:48 PM	Google Scholar	signal patrons audio output signal frequency
12/11/2023 3:57:48 PM	Google Patents	Search Term 1 signal Search Term 2 patrons Search Term 3 audio Search Term 4 output signal Search Term 5 frequency Before Priority Date: priority:19780410
12/11/2023 3:58:00 PM	Google Scholar	(matrix) (led) (sequentially) (clock signal) (pair)

date, time	web site	search string
12/11/2023 3:58:00 PM	Google Patents	Search Term 1 (matrix) (led) (sequentially) (clock signal) (pair) Before Priority Date: priority:19781027
12/11/2023 3:58:01 PM	Google Scholar	matrix led sequentially clock signal pair
12/11/2023 3:58:01 PM	Google Patents	Search Term 1 matrix Search Term 2 led Search Term 3 sequentially Search Term 4 clock signal Search Term 5 pair Before Priority Date: priority:19781027
12/11/2023 4:14:46 PM	Google Scholar	(cell) (subject) (ultraviolet light) (ultraviolet) (predetermined value)
12/11/2023 4:14:46 PM	Google Patents	Search Term 1 (cell) (subject) (ultraviolet light) (ultraviolet) (predetermined value) Before Priority Date: priority:19781030
12/11/2023 4:14:47 PM	Google Scholar	cell subject ultraviolet light ultraviolet predetermined value
12/11/2023 4:14:47 PM	Google Patents	Search Term 1 cell Search Term 2 subject Search Term 3 ultraviolet light Search Term 4 ultraviolet Search Term 5 predetermined value Before Priority Date: priority:19781030
12/11/2023 4:15:11 PM	Google Scholar	(radiation) (exposure) (color) (unit) (temperature)

date, time	web site	search string
12/11/2023 4:15:11 PM	Google Patents	Search Term 1 (radiation) (exposure) (color) (unit) (temperature) Before Priority Date: priority:19790511
12/11/2023 4:15:12 PM	Google Scholar	radiation exposure color unit temperature
12/11/2023 4:15:12 PM	Google Patents	Search Term 1 radiation Search Term 2 exposure Search Term 3 color Search Term 4 unit Search Term 5 temperature Before Priority Date: priority:19790511
12/11/2023 4:15:19 PM	Google Scholar	(frame) (light emitting) (eyeglasses) (pair) (switch)
12/11/2023 4:15:19 PM	Google Patents	Search Term 1 (frame) (light emitting) (eyeglasses) (pair) (switch) Before Priority Date: priority:19791129
12/11/2023 4:15:20 PM	Google Scholar	frame light emitting eyeglasses pair switch
12/11/2023 4:15:20 PM	Google Patents	Search Term 1 frame Search Term 2 light emitting Search Term 3 eyeglasses Search Term 4 pair Search Term 5 switch Before Priority Date: priority:19791129
12/11/2023 4:15:26 PM	Google Scholar	(clothing) (speaker) (article) (enclosure) (pin)

date, time	web site	search string
12/11/2023 4:15:26 PM	Google Patents	Search Term 1 (clothing) (speaker) (article) (enclosure) (pin) Before Priority Date: priority:19800505
12/11/2023 4:15:27 PM	Google Scholar	clothing speaker article enclosure pin
12/11/2023 4:15:27 PM	Google Patents	Search Term 1 clothing Search Term 2 speaker Search Term 3 article Search Term 4 enclosure Search Term 5 pin Before Priority Date: priority:19800505
12/11/2023 4:15:37 PM	Google Scholar	(display) (glasses) (display device) (frame) (integrated circuit)
12/11/2023 4:15:37 PM	Google Patents	Search Term 1 (display) (glasses) (display device) (frame) (integrated circuit) Before Priority Date: priority:19811226
12/11/2023 4:15:38 PM	Google Scholar	display glasses display device frame integrated circuit
12/11/2023 4:15:38 PM	Google Patents	Search Term 1 display Search Term 2 glasses Search Term 3 display device Search Term 4 frame Search Term 5 integrated circuit Before Priority Date: priority:19811226
12/11/2023 4:15:43 PM	Google Scholar	(display) (circuit) (frame) (glasses) (earphone)

date, time	web site	search string
12/11/2023 4:15:45 PM	Google Scholar	display circuit frame glasses earphone
12/11/2023 4:15:45 PM	Google Patents	Search Term 1 display Search Term 2 circuit Search Term 3 frame Search Term 4 glasses Search Term 5 earphone Before Priority Date: priority:19811226
12/11/2023 4:15:51 PM	Google Scholar	(insecticide) (lighting equipment) (lamp) (utility) (scope)
12/11/2023 4:15:51 PM	Google Patents	Search Term 1 (insecticide) (lighting equipment) (lamp) (utility) (scope) Before Priority Date: priority:19820128
12/11/2023 4:15:52 PM	Google Scholar	insecticide lighting equipment lamp utility scope
12/11/2023 4:15:52 PM	Google Patents	Search Term 1 insecticide Search Term 2 lighting equipment Search Term 3 lamp Search Term 4 utility Search Term 5 scope Before Priority Date: priority:19820128
12/11/2023 4:16:00 PM	Google Scholar	(tape) (indicator mark) (indicator) (abstract) (bisects)
12/11/2023 4:16:00 PM	Google Patents	Search Term 1 (tape) (indicator mark) (indicator) (abstract) (bisects) Before Priority Date: priority:19820129

date, time	web site	search string
12/11/2023 4:16:01 PM	Google Scholar	tape indicator mark indicator abstract bisects
12/11/2023 4:16:01 PM	Google Patents	Search Term 1 tape Search Term 2 indicator mark Search Term 3 indicator Search Term 4 abstract Search Term 5 bisects Before Priority Date: priority:19820129
12/11/2023 4:16:08 PM	Google Scholar	(cell) (photodetector) (protective glasses) (generator) (glasses according)
12/11/2023 4:16:08 PM	Google Patents	Search Term 1 (cell) (photodetector) (protective glasses) (generator) (glasses according) Before Priority Date: priority:19820706
12/11/2023 4:16:09 PM	Google Scholar	cell photodetector protective glasses generator glasses according
12/11/2023 4:16:09 PM	Google Patents	Search Term 1 cell Search Term 2 photodetector Search Term 3 protective glasses Search Term 4 generator Search Term 5 glasses according Before Priority Date: priority:19820706
12/11/2023 4:26:47 PM	Google Scholar	(alarm) (microprocessor) (value) (output signal) (photocell)
12/11/2023 4:26:48 PM	Google Scholar	alarm microprocessor value output signal photocell

date, time	web site	search string
12/11/2023 4:26:48 PM	Google Patents	Search Term 1 alarm Search Term 2 microprocessor Search Term 3 value Search Term 4 output signal Search Term 5 photocell Before Priority Date: priority:19830519
12/11/2023 4:26:53 PM	Google Scholar	(housing) (photocell) (key) (value) (user)
12/11/2023 4:26:53 PM	Google Patents	Search Term 1 (housing) (photocell) (key) (value) (user) Before Priority Date: priority:19830519
12/11/2023 4:26:55 PM	Google Scholar	housing photocell key value user
12/11/2023 4:26:55 PM	Google Patents	Search Term 1 housing Search Term 2 photocell Search Term 3 key Search Term 4 value Search Term 5 user Before Priority Date: priority:19830519
12/11/2023 4:27:00 PM	Google Scholar	(timer) (sports) (electronic) (recited) (timing function)
12/11/2023 4:27:01 PM	Google Scholar	timer sports electronic recited timing function

date, time	web site	search string
12/11/2023 4:27:01 PM	Google Patents	Search Term 1 timer Search Term 2 sports Search Term 3 electronic Search Term 4 recited Search Term 5 timing function Before Priority Date: priority:19831121
12/11/2023 4:27:08 PM	Google Scholar	(eyeglasses) (improve natural) (natural hearing) (hearing) (improve)
12/11/2023 4:27:08 PM	Google Patents	Search Term 1 (eyeglasses) (improve natural) (natural hearing) (hearing) (improve) Before Priority Date: priority:19840322
12/11/2023 4:27:09 PM	Google Scholar	eyeglasses improve natural natural hearing hearing improve
12/11/2023 4:27:09 PM	Google Patents	Search Term 1 eyeglasses Search Term 2 improve natural Search Term 3 natural hearing Search Term 4 hearing Search Term 5 improve Before Priority Date: priority:19840322
12/11/2023 4:27:18 PM	Google Scholar	(stress) (individual) (eyeglasses) (alarms) (alarm)
12/11/2023 4:27:18 PM	Google Patents	Search Term 1 (stress) (individual) (eyeglasses) (alarms) (alarm) Before Priority Date: priority:19841212
12/11/2023 4:27:20 PM	Google Scholar	stress individual eyeglasses alarms alarm

date, time	web site	search string
12/11/2023 4:27:20 PM	Google Patents	Search Term 1 stress Search Term 2 individual Search Term 3 eyeglasses Search Term 4 alarms Search Term 5 alarm Before Priority Date: priority:19841212
12/11/2023 4:27:26 PM	Google Scholar	(tubing) (transducer) (sound) (housing) (section)
12/11/2023 4:27:26 PM	Google Patents	Search Term 1 (tubing) (transducer) (sound) (housing) (section) Before Priority Date: priority:19850611
12/11/2023 4:27:27 PM	Google Scholar	tubing transducer sound housing section
12/11/2023 4:27:27 PM	Google Patents	Search Term 1 tubing Search Term 2 transducer Search Term 3 sound Search Term 4 housing Search Term 5 section Before Priority Date: priority:19850611
12/11/2023 4:27:34 PM	Google Scholar	(locating) (hearing) (microphone) (impaired person) (microphone arrangement)
12/11/2023 4:27:34 PM	Google Patents	Search Term 1 (locating) (hearing) (microphone) (impaired person) (microphone arrangement) Before Priority Date: priority:19851016
12/11/2023 4:27:35 PM	Google Scholar	locating hearing microphone impaired person microphone arrangement

date, time	web site	search string
12/11/2023 4:27:35 PM	Google Patents	Search Term 1 locating Search Term 2 hearing Search Term 3 microphone Search Term 4 impaired person Search Term 5 microphone arrangement Before Priority Date: priority:19851016
12/11/2023 4:27:42 PM	Google Scholar	(dosimeter) (radiation) (function) (signal) (magnitude)
12/11/2023 4:27:42 PM	Google Patents	Search Term 1 (dosimeter) (radiation) (function) (signal) (magnitude) Before Priority Date: priority:19851126
12/11/2023 4:27:44 PM	Google Scholar	dosimeter radiation function signal magnitude
12/11/2023 4:27:44 PM	Google Patents	Search Term 1 dosimeter Search Term 2 radiation Search Term 3 function Search Term 4 signal Search Term 5 magnitude Before Priority Date: priority:19851126
12/11/2023 4:40:30 PM	Google Scholar	(speedometer) (sportsman) (reflector) (speed) (waves)
12/11/2023 4:40:30 PM	Google Patents	Search Term 1 (speedometer) (sportsman) (reflector) (speed) (waves) Before Priority Date: priority:19860925
12/11/2023 4:40:31 PM	Google Scholar	speedometer sportsman reflector speed waves

date, time	web site	search string
12/11/2023 4:40:31 PM	Google Patents	Search Term 1 speedometer Search Term 2 sportsman Search Term 3 reflector Search Term 4 speed Search Term 5 waves Before Priority Date: priority:19860925
12/11/2023 4:40:37 PM	Google Scholar	(region) (glasses) (narrow) (transmissivity) (prescription)
12/11/2023 4:40:37 PM	Google Patents	Search Term 1 (region) (glasses) (narrow) (transmissivity) (prescription) Before Priority Date: priority:19870330
12/11/2023 4:40:38 PM	Google Scholar	region glasses narrow transmissivity prescription
12/11/2023 4:40:38 PM	Google Patents	Search Term 1 region Search Term 2 glasses Search Term 3 narrow Search Term 4 transmissivity Search Term 5 prescription Before Priority Date: priority:19870330
12/11/2023 4:40:44 PM	Google Scholar	(spectacles) (display) (time) (sunglasses) (light emitting)
12/11/2023 4:40:44 PM	Google Patents	Search Term 1 (spectacles) (display) (time) (sunglasses) (light emitting) Before Priority Date: priority:19870701
12/11/2023 4:40:45 PM	Google Scholar	spectacles display time sunglasses light emitting

date, time	web site	search string
12/11/2023 4:40:45 PM	Google Patents	Search Term 1 spectacles Search Term 2 display Search Term 3 time Search Term 4 sunglasses Search Term 5 light emitting Before Priority Date: priority:19870701
12/11/2023 4:40:51 PM	Google Scholar	(set forth) (apparatus set) (lens) (wearer) (display)
12/11/2023 4:40:51 PM	Google Patents	Search Term 1 (set forth) (apparatus set) (lens) (wearer) (display) Before Priority Date: priority:19870706
12/11/2023 4:40:53 PM	Google Scholar	set forth apparatus set lens wearer display
12/11/2023 4:40:53 PM	Google Patents	Search Term 1 set forth Search Term 2 apparatus set Search Term 3 lens Search Term 4 wearer Search Term 5 display Before Priority Date: priority:19870706
12/11/2023 4:41:00 PM	Google Scholar	(temples) (frame) (radio) (loud speakers) (speakers)
12/11/2023 4:41:00 PM	Google Patents	Search Term 1 (temples) (frame) (radio) (loud speakers) (speakers) Before Priority Date: priority:19871120
12/11/2023 4:41:01 PM	Google Scholar	temples frame radio loud speakers speakers

date, time	web site	search string
12/11/2023 4:41:01 PM	Google Patents	Search Term 1 temples Search Term 2 frame Search Term 3 radio Search Term 4 loud speakers Search Term 5 speakers Before Priority Date: priority:19871120
12/11/2023 4:41:08 PM	Google Scholar	(dioxane) (cyanophenyl) (lens) (optical) (pentylcyclohexyl)
12/11/2023 4:41:08 PM	Google Patents	Search Term 1 (dioxane) (cyanophenyl) (lens) (optical) (pentylcyclohexyl) Before Priority Date: priority:19880119
12/11/2023 4:41:10 PM	Google Scholar	dioxane cyanophenyl lens optical pentylcyclohexyl
12/11/2023 4:41:10 PM	Google Patents	Search Term 1 dioxane Search Term 2 cyanophenyl Search Term 3 lens Search Term 4 optical Search Term 5 pentylcyclohexyl Before Priority Date: priority:19880119
12/11/2023 4:41:23 PM	Google Scholar	(power supply) (supply means) (remote power) (spectacle) (illuminating)
12/11/2023 4:41:23 PM	Google Patents	Search Term 1 (power supply) (supply means) (remote power) (spectacle) (illuminating) Before Priority Date: priority:19880119
12/11/2023 4:41:25 PM	Google Scholar	power supply supply means remote power spectacle illuminating

date, time	web site	search string
12/11/2023 4:41:25 PM	Google Patents	Search Term 1 power supply Search Term 2 supply means Search Term 3 remote power Search Term 4 spectacle Search Term 5 illuminating Before Priority Date: priority:19880119
12/11/2023 4:41:33 PM	Google Scholar	(spectacles) (glasses) (leg) (spectacle) (illumination)
12/11/2023 4:41:33 PM	Google Patents	Search Term 1 (spectacles) (glasses) (leg) (spectacle) (illumination) Before Priority Date: priority:19880204
12/11/2023 4:41:34 PM	Google Scholar	spectacles glasses leg spectacle illumination
12/11/2023 4:41:34 PM	Google Patents	Search Term 1 spectacles Search Term 2 glasses Search Term 3 leg Search Term 4 spectacle Search Term 5 illumination Before Priority Date: priority:19880204
12/11/2023 5:00:24 PM	Google Scholar	(eye) (eyeglass) (attachment rail) (application module) (application)
12/11/2023 5:00:24 PM	Google Patents	Search Term 1 (eye) (eyeglass) (attachment rail) (application module) (application) Before Priority Date: priority:20120106
12/11/2023 5:00:25 PM	Google Scholar	eye eyeglass attachment rail application module application

date, time	web site	search string
12/11/2023 5:00:25 PM	Google Patents	Search Term 1 eye Search Term 2 eyeglass Search Term 3 attachment rail Search Term 4 application module Search Term 5 application Before Priority Date: priority:20120106
12/11/2023 5:00:30 PM	Google Scholar	(eye) (image) (point) (real) (computing device)
12/11/2023 5:00:32 PM	Google Scholar	eye image point real computing device
12/11/2023 5:00:32 PM	Google Patents	Search Term 1 eye Search Term 2 image Search Term 3 point Search Term 4 real Search Term 5 computing device Before Priority Date: priority:20120106
12/11/2023 5:00:37 PM	Google Scholar	(interest) (image) (control signal) (wearable computing) (determining)
12/11/2023 5:00:37 PM	Google Patents	Search Term 1 (interest) (image) (control signal) (wearable computing) (determining) Before Priority Date: priority:20120109
12/11/2023 5:00:39 PM	Google Scholar	interest image control signal wearable computing determining

date, time	web site	search string
12/11/2023 5:00:39 PM	Google Patents	Search Term 1 interest Search Term 2 image Search Term 3 control signal Search Term 4 wearable computing Search Term 5 determining Before Priority Date: priority:20120109
12/11/2023 5:00:46 PM	Google Scholar	(eyeglasses) (receiver) (locator device) (item) (locator)
12/11/2023 5:00:46 PM	Google Patents	Search Term 1 (eyeglasses) (receiver) (locator device) (item) (locator) Before Priority Date: priority:20111206
12/11/2023 5:00:48 PM	Google Scholar	eyeglasses receiver locator device item locator
12/11/2023 5:00:48 PM	Google Patents	Search Term 1 eyeglasses Search Term 2 receiver Search Term 3 locator device Search Term 4 item Search Term 5 locator Before Priority Date: priority:20111206
12/11/2023 5:00:56 PM	Google Scholar	(determined) (magnetic field) (gesture) (perturbation) (hwm)
12/11/2023 5:00:56 PM	Google Patents	Search Term 1 (determined) (magnetic field) (gesture) (perturbation) (hwm) Before Priority Date: priority:20120104
12/11/2023 5:00:57 PM	Google Scholar	determined magnetic field gesture perturbation hwm

date, time	web site	search string
12/11/2023 5:00:57 PM	Google Patents	Search Term 1 determined Search Term 2 magnetic field Search Term 3 gesture Search Term 4 perturbation Search Term 5 hwm Before Priority Date: priority:20120104
12/11/2023 5:01:05 PM	Google Scholar	(hmd) (optical flow) (vehicle) (user) (computing device)
12/11/2023 5:01:05 PM	Google Patents	Search Term 1 (hmd) (optical flow) (vehicle) (user) (computing device) Before Priority Date: priority:20120106
12/11/2023 5:01:06 PM	Google Scholar	hmd optical flow vehicle user computing device
12/11/2023 5:01:06 PM	Google Patents	Search Term 1 hmd Search Term 2 optical flow Search Term 3 vehicle Search Term 4 user Search Term 5 computing device Before Priority Date: priority:20120106
12/11/2023 5:01:14 PM	Google Scholar	(movement) (wearable computing) (computing system) (vehicle) (movements)
12/11/2023 5:01:14 PM	Google Patents	Search Term 1 (movement) (wearable computing) (computing system) (vehicle) (movements) Before Priority Date: priority:20120106
12/11/2023 5:01:15 PM	Google Scholar	movement wearable computing computing system vehicle movements

date, time	web site	search string
12/11/2023 5:01:15 PM	Google Patents	Search Term 1 movement Search Term 2 wearable computing Search Term 3 computing system Search Term 4 vehicle Search Term 5 movements Before Priority Date: priority:20120106
12/11/2023 5:01:23 PM	Google Scholar	(bis) (benzyl) (polymer) (flask) (polymeric material)
12/11/2023 5:01:23 PM	Google Patents	Search Term 1 (bis) (benzyl) (polymer) (flask) (polymeric material) Before Priority Date: priority:20111115
12/11/2023 5:01:25 PM	Google Scholar	bis benzyl polymer flask polymeric material
12/11/2023 5:01:25 PM	Google Patents	Search Term 1 bis Search Term 2 benzyl Search Term 3 polymer Search Term 4 flask Search Term 5 polymeric material Before Priority Date: priority:20111115
12/11/2023 5:12:05 PM	Google Scholar	(viewing) (head) (time) (sequence) (viewing state)
12/11/2023 5:12:05 PM	Google Patents	Search Term 1 (viewing) (head) (time) (sequence) (viewing state) Before Priority Date: priority:20120321
12/11/2023 5:12:06 PM	Google Scholar	viewing head time sequence viewing state

date, time	web site	search string
12/11/2023 5:12:06 PM	Google Patents	Search Term 1 viewing Search Term 2 head Search Term 3 time Search Term 4 sequence Search Term 5 viewing state Before Priority Date: priority:20120321
12/11/2023 5:12:12 PM	Google Scholar	(head) (computing device) (mountable computing) (capacitance) (state)
12/11/2023 5:12:12 PM	Google Patents	Search Term 1 (head) (computing device) (mountable computing) (capacitance) (state) Before Priority Date: priority:20120321
12/11/2023 5:12:13 PM	Google Scholar	head computing device mountable computing capacitance state
12/11/2023 5:12:13 PM	Google Patents	Search Term 1 head Search Term 2 computing device Search Term 3 mountable computing Search Term 4 capacitance Search Term 5 state Before Priority Date: priority:20120321
12/11/2023 5:12:20 PM	Google Scholar	(hmd) (context) (media content) (display) (user)
12/11/2023 5:12:21 PM	Google Scholar	hmd context media content display user

date, time	web site	search string
12/11/2023 5:12:21 PM	Google Patents	Search Term 1 hmd Search Term 2 context Search Term 3 media content Search Term 4 display Search Term 5 user Before Priority Date: priority:20120323
12/11/2023 5:12:28 PM	Google Scholar	(eye) (light) (light intensity) (intensity level) (determining)
12/11/2023 5:12:28 PM	Google Patents	Search Term 1 (eye) (light) (light intensity) (intensity level) (determining) Before Priority Date: priority:20120402
12/11/2023 5:12:29 PM	Google Scholar	eye light light intensity intensity level determining
12/11/2023 5:12:29 PM	Google Patents	Search Term 1 eye Search Term 2 light Search Term 3 light intensity Search Term 4 intensity level Search Term 5 determining Before Priority Date: priority:20120402
12/11/2023 5:12:43 PM	Google Scholar	(capsules) (electronic device) (distal end) (mountable section) (section)
12/11/2023 5:12:43 PM	Google Patents	Search Term 1 (capsules) (electronic device) (distal end) (mountable section) (section) Before Priority Date: priority:20120622
12/11/2023 5:12:44 PM	Google Scholar	capsules electronic device distal end mountable section section

date, time	web site	search string
12/11/2023 5:12:44 PM	Google Patents	Search Term 1 capsules Search Term 2 electronic device Search Term 3 distal end Search Term 4 mountable section Search Term 5 section Before Priority Date: priority:20120622
12/11/2023 5:12:50 PM	Google Scholar	(head) (wearer) (support structure) (vibration) (vibration transducer)
12/11/2023 5:12:50 PM	Google Patents	Search Term 1 (head) (wearer) (support structure) (vibration) (vibration transducer) Before Priority Date: priority:20120828
12/11/2023 5:12:51 PM	Google Scholar	head wearer support structure vibration vibration transducer
12/11/2023 5:12:51 PM	Google Patents	Search Term 1 head Search Term 2 wearer Search Term 3 support structure Search Term 4 vibration Search Term 5 vibration transducer Before Priority Date: priority:20120828
12/11/2023 5:12:57 PM	Google Scholar	(unit) (buffer) (main body) (mounted display) (head mounted)
12/11/2023 5:12:57 PM	Google Patents	Search Term 1 (unit) (buffer) (main body) (mounted display) (head mounted) Before Priority Date: priority:20120831

date, time	web site	search string
12/11/2023 5:12:58 PM	Google Scholar	unit buffer main body mounted display head mounted
12/11/2023 5:12:58 PM	Google Patents	Search Term 1 unit Search Term 2 buffer Search Term 3 main body Search Term 4 mounted display Search Term 5 head mounted Before Priority Date: priority:20120831
12/11/2023 5:13:04 PM	Google Scholar	(poly) (conducting polymer) (electrode) (electrochromic device) (electrolyte)
12/11/2023 5:13:04 PM	Google Patents	Search Term 1 (poly) (conducting polymer) (electrode) (electrochromic device) (electrolyte) Before Priority Date: priority:20130315
12/11/2023 5:13:06 PM	Google Scholar	poly conducting polymer electrode electrochromic device electrolyte
12/11/2023 5:13:06 PM	Google Patents	Search Term 1 poly Search Term 2 conducting polymer Search Term 3 electrode Search Term 4 electrochromic device Search Term 5 electrolyte Before Priority Date: priority:20130315
12/11/2023 5:26:49 PM	Google Scholar	(pen) (hwc) (virtual line) (user) (presented)
12/11/2023 5:26:49 PM	Google Patents	Search Term 1 (pen) (hwc) (virtual line) (user) (presented) Before Priority Date: priority:20140117

date, time	web site	search string
12/11/2023 5:26:51 PM	Google Scholar	pen hwc virtual line user presented
12/11/2023 5:26:51 PM	Google Patents	Search Term 1 pen Search Term 2 hwc Search Term 3 virtual line Search Term 4 user Search Term 5 presented Before Priority Date: priority:20140117
12/11/2023 5:26:57 PM	Google Scholar	(light) (eye) (hwc) (wearer) (user)
12/11/2023 5:26:57 PM	Google Patents	Search Term 1 (light) (eye) (hwc) (wearer) (user) Before Priority Date: priority:20140609
12/11/2023 5:26:59 PM	Google Scholar	light eye hwc wearer user
12/11/2023 5:26:59 PM	Google Patents	Search Term 1 light Search Term 2 eye Search Term 3 hwc Search Term 4 wearer Search Term 5 user Before Priority Date: priority:20140609
12/11/2023 5:27:06 PM	Google Scholar	(light) (eye) (hwc) (content) (wearer)
12/11/2023 5:27:06 PM	Google Patents	Search Term 1 (light) (eye) (hwc) (content) (wearer) Before Priority Date: priority:20140609

date, time	web site	search string
12/11/2023 5:27:07 PM	Google Scholar	light eye hwc content wearer
12/11/2023 5:27:07 PM	Google Patents	Search Term 1 light Search Term 2 eye Search Term 3 hwc Search Term 4 content Search Term 5 wearer Before Priority Date: priority:20140609
12/11/2023 5:27:15 PM	Google Scholar	(light) (eye) (hwc) (image) (user)
12/11/2023 5:27:15 PM	Google Patents	Search Term 1 (light) (eye) (hwc) (image) (user) Before Priority Date: priority:20140812
12/11/2023 5:27:17 PM	Google Scholar	light eye hwc image user
12/11/2023 5:27:17 PM	Google Patents	Search Term 1 light Search Term 2 eye Search Term 3 hwc Search Term 4 image Search Term 5 user Before Priority Date: priority:20140812
12/11/2023 5:27:34 PM	Google Scholar	(user) (dose) (time) (threshold) (presenting)
12/11/2023 5:27:34 PM	Google Patents	Search Term 1 (user) (dose) (time) (threshold) (presenting) Before Priority Date: priority:20131002

date, time	web site	search string
12/11/2023 5:27:36 PM	Google Scholar	user dose time threshold presenting
12/11/2023 5:27:36 PM	Google Patents	Search Term 1 user Search Term 2 dose Search Term 3 time Search Term 4 threshold Search Term 5 presenting Before Priority Date: priority:20131002
12/11/2023 5:27:42 PM	Google Scholar	(housing) (interconnect) (hinge assembly) (conductive) (hinge)
12/11/2023 5:27:42 PM	Google Patents	Search Term 1 (housing) (interconnect) (hinge assembly) (conductive) (hinge) Before Priority Date: priority:20131227
12/11/2023 5:27:43 PM	Google Scholar	housing interconnect hinge assembly conductive hinge
12/11/2023 5:27:43 PM	Google Patents	Search Term 1 housing Search Term 2 interconnect Search Term 3 hinge assembly Search Term 4 conductive Search Term 5 hinge Before Priority Date: priority:20131227
12/11/2023 5:27:54 PM	Google Scholar	(pen) (hwc) (housing) (user) (user interface)
12/11/2023 5:27:54 PM	Google Patents	Search Term 1 (pen) (hwc) (housing) (user) (user interface) Before Priority Date: priority:20140617

date, time	web site	search string
12/11/2023 5:27:56 PM	Google Scholar	pen hwc housing user user interface
12/11/2023 5:27:56 PM	Google Patents	Search Term 1 pen Search Term 2 hwc Search Term 3 housing Search Term 4 user Search Term 5 user interface Before Priority Date: priority:20140617
12/11/2023 5:38:25 PM	Google Scholar	(light) (hwc) (micro) (illustrates) (user)
12/11/2023 5:38:26 PM	Google Scholar	light hwc micro illustrates user
12/11/2023 5:38:26 PM	Google Patents	Search Term 1 light Search Term 2 hwc Search Term 3 micro Search Term 4 illustrates Search Term 5 user Before Priority Date: priority:20140211
12/11/2023 5:38:32 PM	Google Scholar	(light) (eye) (image) (hwc) (wearer)
12/11/2023 5:38:32 PM	Google Patents	Search Term 1 (light) (eye) (image) (hwc) (wearer) Before Priority Date: priority:20140211
12/11/2023 5:38:34 PM	Google Scholar	light eye image hwc wearer

date, time	web site	search string
12/11/2023 5:38:34 PM	Google Patents	Search Term 1 light Search Term 2 eye Search Term 3 image Search Term 4 hwc Search Term 5 wearer Before Priority Date: priority:20140211
12/11/2023 5:38:41 PM	Google Scholar	(frame structure) (mobile device) (electronic components) (heat) (thermal)
12/11/2023 5:38:41 PM	Google Patents	Search Term 1 (frame structure) (mobile device) (electronic components) (heat) (thermal) Before Priority Date: priority:20140228
12/11/2023 5:38:42 PM	Google Scholar	frame structure mobile device electronic components heat thermal
12/11/2023 5:38:42 PM	Google Patents	Search Term 1 frame structure Search Term 2 mobile device Search Term 3 electronic components Search Term 4 heat Search Term 5 thermal Before Priority Date: priority:20140228
12/11/2023 5:38:49 PM	Google Scholar	(light) (eye) (hwc) (user) (wearer)
12/11/2023 5:38:49 PM	Google Patents	Search Term 1 (light) (eye) (hwc) (user) (wearer) Before Priority Date: priority:20140328
12/11/2023 5:38:51 PM	Google Scholar	light eye hwc user wearer

date, time	web site	search string
12/11/2023 5:38:51 PM	Google Patents	Search Term 1 light Search Term 2 eye Search Term 3 hwc Search Term 4 user Search Term 5 wearer Before Priority Date: priority:20140328
12/11/2023 5:39:02 PM	Google Scholar	(clip) (temple) (eyewear) (protective eyewear) (accessory)
12/11/2023 5:39:02 PM	Google Patents	Search Term 1 (clip) (temple) (eyewear) (protective eyewear) (accessory) Before Priority Date: priority:20140415
12/11/2023 5:39:03 PM	Google Scholar	clip temple eyewear protective eyewear accessory
12/11/2023 5:39:03 PM	Google Patents	Search Term 1 clip Search Term 2 temple Search Term 3 eyewear Search Term 4 protective eyewear Search Term 5 accessory Before Priority Date: priority:20140415
12/11/2023 5:39:10 PM	Google Scholar	(head) (worn computer) (speaker) (user) (computer)
12/11/2023 5:39:10 PM	Google Patents	Search Term 1 (head) (worn computer) (speaker) (user) (computer) Before Priority Date: priority:20140425
12/11/2023 5:39:11 PM	Google Scholar	head worn computer speaker user computer

date, time	web site	search string
12/11/2023 5:39:11 PM	Google Patents	Search Term 1 head Search Term 2 worn computer Search Term 3 speaker Search Term 4 user Search Term 5 computer Before Priority Date: priority:20140425
12/11/2023 5:39:18 PM	Google Scholar	(speaker) (language) (user) (head) (hwc)
12/11/2023 5:39:19 PM	Google Scholar	speaker language user head hwc
12/11/2023 5:39:19 PM	Google Patents	Search Term 1 speaker Search Term 2 language Search Term 3 user Search Term 4 head Search Term 5 hwc Before Priority Date: priority:20140425
12/11/2023 5:39:28 PM	Google Scholar	(light) (content) (eye) (hwc) (physical location)
12/11/2023 5:39:28 PM	Google Patents	Search Term 1 (light) (content) (eye) (hwc) (physical location) Before Priority Date: priority:20140609
12/11/2023 5:39:29 PM	Google Scholar	light content eye hwc physical location

date, time	web site	search string
12/11/2023 5:39:29 PM	Google Patents	Search Term 1 light Search Term 2 content Search Term 3 eye Search Term 4 hwc Search Term 5 physical location Before Priority Date: priority:20140609
12/11/2023 5:46:51 PM	Google Scholar	(eyewear assembly) (interchangeable) (interchangeable eyewear) (assembly) (elevation view)
12/11/2023 5:46:51 PM	Google Patents	Search Term 1 (eyewear assembly) (interchangeable) (interchangeable eyewear) (assembly) (elevation view) Before Priority Date: priority:20140627
12/11/2023 5:46:53 PM	Google Scholar	eyewear assembly interchangeable interchangeable eyewear assembly elevation view
12/11/2023 5:46:53 PM	Google Patents	Search Term 1 eyewear assembly Search Term 2 interchangeable Search Term 3 interchangeable eyewear Search Term 4 assembly Search Term 5 elevation view Before Priority Date: priority:20140627
12/11/2023 5:46:59 PM	Google Scholar	(electronic device) (temple) (camera) (guide) (groove)
12/11/2023 5:46:59 PM	Google Patents	Search Term 1 (electronic device) (temple) (camera) (guide) (groove) Before Priority Date: priority:20140803
12/11/2023 5:47:00 PM	Google Scholar	electronic device temple camera guide groove

date, time	web site	search string
12/11/2023 5:47:00 PM	Google Patents	Search Term 1 electronic device Search Term 2 temple Search Term 3 camera Search Term 4 guide Search Term 5 groove Before Priority Date: priority:20140803
12/11/2023 5:47:07 PM	Google Scholar	(function) (module) (electronic component) (component comprises) (apparel)
12/11/2023 5:47:08 PM	Google Scholar	function module electronic component component comprises apparel
12/11/2023 5:47:08 PM	Google Patents	Search Term 1 function Search Term 2 module Search Term 3 electronic component Search Term 4 component comprises Search Term 5 apparel Before Priority Date: priority:20140919
12/11/2023 5:47:17 PM	Google Scholar	(light) (eye) (image) (hwc) (user)
12/11/2023 5:47:17 PM	Google Patents	Search Term 1 (light) (eye) (image) (hwc) (user) Before Priority Date: priority:20141203
12/11/2023 5:47:18 PM	Google Scholar	light eye image hwc user

date, time	web site	search string
12/11/2023 5:47:18 PM	Google Patents	Search Term 1 light Search Term 2 eye Search Term 3 image Search Term 4 hwc Search Term 5 user Before Priority Date: priority:20141203
12/11/2023 5:48:21 PM	Google Scholar	(image) (camera) (base module) (camera according) (shooting)
12/11/2023 5:48:22 PM	Google Scholar	image camera base module camera according shooting
12/11/2023 5:48:22 PM	Google Patents	Search Term 1 image Search Term 2 camera Search Term 3 base module Search Term 4 camera according Search Term 5 shooting Before Priority Date: priority:20141223
12/11/2023 5:48:29 PM	Google Scholar	(computer glasses) (glasses) (computer) (view) (ornamental design)
12/11/2023 5:48:29 PM	Google Patents	Search Term 1 (computer glasses) (glasses) (computer) (view) (ornamental design) Before Priority Date: priority:20141231
12/11/2023 5:48:30 PM	Google Scholar	computer glasses glasses computer view ornamental design

date, time	web site	search string
12/11/2023 5:48:30 PM	Google Patents	Search Term 1 computer glasses Search Term 2 glasses Search Term 3 computer Search Term 4 view Search Term 5 ornamental design Before Priority Date: priority:20141231
12/11/2023 5:48:36 PM	Google Scholar	(magnetic field) (winter sports) (time) (magnet) (sports athlete)
12/11/2023 5:48:36 PM	Google Patents	Search Term 1 (magnetic field) (winter sports) (time) (magnet) (sports athlete) Before Priority Date: priority:20150130
12/11/2023 5:48:37 PM	Google Scholar	magnetic field winter sports time magnet sports athlete
12/11/2023 5:48:37 PM	Google Patents	Search Term 1 magnetic field Search Term 2 winter sports Search Term 3 time Search Term 4 magnet Search Term 5 sports athlete Before Priority Date: priority:20150130
12/11/2023 5:48:45 PM	Google Scholar	(light) (image) (eye) (hwc) (user)
12/11/2023 5:48:45 PM	Google Patents	Search Term 1 (light) (image) (eye) (hwc) (user) Before Priority Date: priority:20150217
12/11/2023 5:48:46 PM	Google Scholar	light image eye hwc user

date, time	web site	search string
12/11/2023 5:48:46 PM	Google Patents	Search Term 1 light Search Term 2 image Search Term 3 eye Search Term 4 hwc Search Term 5 user Before Priority Date: priority:20150217
12/11/2023 5:48:52 PM	Google Scholar	(connector) (temple) (frame) (eyewear) (electronics)
12/11/2023 5:48:52 PM	Google Patents	Search Term 1 (connector) (temple) (frame) (eyewear) (electronics) Before Priority Date: priority:20150415
12/11/2023 5:48:54 PM	Google Scholar	connector temple frame eyewear electronics
12/11/2023 5:48:54 PM	Google Patents	Search Term 1 connector Search Term 2 temple Search Term 3 frame Search Term 4 eyewear Search Term 5 electronics Before Priority Date: priority:20150415
12/11/2023 5:49:01 PM	Google Scholar	(temple) (frame) (connector) (electronics) (wearable device)
12/11/2023 5:49:01 PM	Google Patents	Search Term 1 (temple) (frame) (connector) (electronics) (wearable device) Before Priority Date: priority:20150415
12/11/2023 5:49:03 PM	Google Scholar	temple frame connector electronics wearable device

date, time	web site	search string
12/11/2023 5:49:03 PM	Google Patents	Search Term 1 temple Search Term 2 frame Search Term 3 connector Search Term 4 electronics Search Term 5 wearable device Before Priority Date: priority:20150415

Web Search History

date, time	web site	search string
12/12/2023 7:45:20 AM	Google Scholar	(eyeglass) (interface system) (camera) (audio) (integrated circuits)
12/12/2023 7:45:20 AM	Google Patents	Search Term 1 (eyeglass) (interface system) (camera) (audio) (integrated circuits) Before Priority Date: priority:19971030
12/12/2023 7:45:22 AM	Google Scholar	eyeglass interface system camera audio integrated circuits
12/12/2023 7:45:22 AM	Google Patents	Search Term 1 eyeglass Search Term 2 interface system Search Term 3 camera Search Term 4 audio Search Term 5 integrated circuits Before Priority Date: priority:19971030
12/12/2023 7:45:51 AM	Google Scholar	(prism) (telescopes) (relating) (block) (systems suitable)
12/12/2023 7:45:51 AM	Google Patents	Search Term 1 (prism) (telescopes) (relating) (block) (systems suitable) Before Priority Date: priority:19280124
12/12/2023 7:45:53 AM	Google Scholar	prism telescopes relating block systems suitable

date, time	web site	search string
12/12/2023 7:45:53 AM	Google Patents	Search Term 1 prism Search Term 2 telescopes Search Term 3 relating Search Term 4 block Search Term 5 systems suitable Before Priority Date: priority:19280124
12/12/2023 7:46:01 AM	Google Scholar	(viewfinder) (mirror) (block means) (intermediate block) (light rays)
12/12/2023 7:46:01 AM	Google Patents	Search Term 1 (viewfinder) (mirror) (block means) (intermediate block) (light rays) Before Priority Date: priority:19601102
12/12/2023 7:46:02 AM	Google Scholar	viewfinder mirror block means intermediate block light rays
12/12/2023 7:46:02 AM	Google Patents	Search Term 1 viewfinder Search Term 2 mirror Search Term 3 block means Search Term 4 intermediate block Search Term 5 light rays Before Priority Date: priority:19601102
12/12/2023 7:46:11 AM	Google Scholar	(aircraft) (landing) (mirror) (spherical) (pilot)
12/12/2023 7:46:11 AM	Google Patents	Search Term 1 (aircraft) (landing) (mirror) (spherical) (pilot) Before Priority Date: priority:19611005
12/12/2023 7:46:12 AM	Google Scholar	aircraft landing mirror spherical pilot

date, time	web site	search string
12/12/2023 7:46:12 AM	Google Patents	Search Term 1 aircraft Search Term 2 landing Search Term 3 mirror Search Term 4 spherical Search Term 5 pilot Before Priority Date: priority:19611005
12/12/2023 7:46:18 AM	Google Scholar	(viewer) (vehicle) (windshield) (housing) (vehicles)
12/12/2023 7:46:18 AM	Google Patents	Search Term 1 (viewer) (vehicle) (windshield) (housing) (vehicles) Before Priority Date: priority:19640210
12/12/2023 7:46:19 AM	Google Scholar	viewer vehicle windshield housing vehicles
12/12/2023 7:46:19 AM	Google Patents	Search Term 1 viewer Search Term 2 vehicle Search Term 3 windshield Search Term 4 housing Search Term 5 vehicles Before Priority Date: priority:19640210
12/12/2023 7:46:29 AM	Google Scholar	(reticle) (target) (sight) (mirror) (semi)
12/12/2023 7:46:29 AM	Google Patents	Search Term 1 (reticle) (target) (sight) (mirror) (semi) Before Priority Date: priority:19650412
12/12/2023 7:46:30 AM	Google Scholar	reticle target sight mirror semi

date, time	web site	search string
12/12/2023 7:46:30 AM	Google Patents	Search Term 1 reticle Search Term 2 target Search Term 3 sight Search Term 4 mirror Search Term 5 semi Before Priority Date: priority:19650412
12/12/2023 7:46:36 AM	Google Scholar	(housing) (camera head) (mirror) (elevation) (turret)
12/12/2023 7:46:36 AM	Google Patents	Search Term 1 (housing) (camera head) (mirror) (elevation) (turret) Before Priority Date: priority:19690604
12/12/2023 7:46:38 AM	Google Scholar	housing camera head mirror elevation turret
12/12/2023 7:46:38 AM	Google Patents	Search Term 1 housing Search Term 2 camera head Search Term 3 mirror Search Term 4 elevation Search Term 5 turret Before Priority Date: priority:19690604
12/12/2023 8:03:59 AM	Google Patents	Search Term 1 (~patent/DE2205325A1)
12/12/2023 8:04:01 AM	Google Patents	Search Term 1 ~patent/DE2205325A1
12/12/2023 8:04:12 AM	Google Scholar	(visor) (focal point) (light emitting) (emitting means) (helmet)

date, time	web site	search string
12/12/2023 8:04:12 AM	Google Patents	Search Term 1 (visor) (focal point) (light emitting) (emitting means) (helmet) Before Priority Date: priority:19720628
12/12/2023 8:04:13 AM	Google Scholar	visor focal point light emitting emitting means helmet
12/12/2023 8:04:13 AM	Google Patents	Search Term 1 visor Search Term 2 focal point Search Term 3 light emitting Search Term 4 emitting means Search Term 5 helmet Before Priority Date: priority:19720628
12/12/2023 8:04:20 AM	Google Scholar	(light) (image) (lens) (source) (focal plane)
12/12/2023 8:04:20 AM	Google Patents	Search Term 1 (light) (image) (lens) (source) (focal plane) Before Priority Date: priority:19730430
12/12/2023 8:04:21 AM	Google Scholar	light image lens source focal plane
12/12/2023 8:04:21 AM	Google Patents	Search Term 1 light Search Term 2 image Search Term 3 lens Search Term 4 source Search Term 5 focal plane Before Priority Date: priority:19730430
12/12/2023 8:04:28 AM	Google Scholar	(holographic lens) (lens) (holographic) (axial) (tilted)

date, time	web site	search string
12/12/2023 8:04:28 AM	Google Patents	Search Term 1 (holographic lens) (lens) (holographic) (axial) (tilted) Before Priority Date: priority:19750123
12/12/2023 8:04:30 AM	Google Scholar	holographic lens lens holographic axial tilted
12/12/2023 8:04:30 AM	Google Patents	Search Term 1 holographic lens Search Term 2 lens Search Term 3 holographic Search Term 4 axial Search Term 5 tilted Before Priority Date: priority:19750123
12/12/2023 8:04:47 AM	Google Scholar	(documentation) (information) (documentation data) (data) (real information)
12/12/2023 8:04:48 AM	Google Scholar	documentation information documentation data data real information
12/12/2023 8:04:48 AM	Google Patents	Search Term 1 documentation Search Term 2 information Search Term 3 documentation data Search Term 4 data Search Term 5 real information Before Priority Date: priority:19990325
12/12/2023 8:04:57 AM	Google Scholar	(data) (operating) (acquisition means) (designed) (observation)
12/12/2023 8:04:57 AM	Google Patents	Search Term 1 (data) (operating) (acquisition means) (designed) (observation) Before Priority Date: priority:19990302

date, time	web site	search string
12/12/2023 8:04:58 AM	Google Scholar	data operating acquisition means designed observation
12/12/2023 8:04:58 AM	Google Patents	Search Term 1 data Search Term 2 operating Search Term 3 acquisition means Search Term 4 designed Search Term 5 observation Before Priority Date: priority:19990302
12/12/2023 8:05:07 AM	Google Scholar	(arm) (phone) (user) (image) (phone body)
12/12/2023 8:05:07 AM	Google Patents	Search Term 1 (arm) (phone) (user) (image) (phone body) Before Priority Date: priority:20001110
12/12/2023 8:05:09 AM	Google Scholar	arm phone user image phone body
12/12/2023 8:05:09 AM	Google Patents	Search Term 1 arm Search Term 2 phone Search Term 3 user Search Term 4 image Search Term 5 phone body Before Priority Date: priority:20001110
12/12/2023 8:05:16 AM	Google Scholar	(language) (learning) (virtual world) (studying) (education)
12/12/2023 8:05:16 AM	Google Patents	Search Term 1 (language) (learning) (virtual world) (studying) (education) Before Priority Date: priority:20020511

date, time	web site	search string
12/12/2023 8:05:17 AM	Google Scholar	language learning virtual world studying education
12/12/2023 8:05:17 AM	Google Patents	Search Term 1 language Search Term 2 learning Search Term 3 virtual world Search Term 4 studying Search Term 5 education Before Priority Date: priority:20020511
12/12/2023 8:13:39 AM	Google Scholar	(image capture) (remote device) (image data) (images) (user)
12/12/2023 8:13:41 AM	Google Scholar	image capture remote device image data images user
12/12/2023 8:13:41 AM	Google Patents	Search Term 1 image capture Search Term 2 remote device Search Term 3 image data Search Term 4 images Search Term 5 user Before Priority Date: priority:20010727
12/12/2023 8:13:51 AM	Google Scholar	(multidimensional) (video) (receptors) (video data) (audio)
12/12/2023 8:13:51 AM	Google Patents	Search Term 1 (multidimensional) (video) (receptors) (video data) (audio) Before Priority Date: priority:19980127
12/12/2023 8:13:53 AM	Google Scholar	multidimensional video receptors video data audio

date, time	web site	search string
12/12/2023 8:13:53 AM	Google Patents	Search Term 1 multidimensional Search Term 2 video Search Term 3 receptors Search Term 4 video data Search Term 5 audio Before Priority Date: priority:19980127
12/12/2023 8:13:59 AM	Google Scholar	(reader) (keyboard) (indicia) (monitor) (light)
12/12/2023 8:13:59 AM	Google Patents	Search Term 1 (reader) (keyboard) (indicia) (monitor) (light) Before Priority Date: priority:19981110
12/12/2023 8:14:01 AM	Google Scholar	reader keyboard indicia monitor light
12/12/2023 8:14:01 AM	Google Patents	Search Term 1 reader Search Term 2 keyboard Search Term 3 indicia Search Term 4 monitor Search Term 5 light Before Priority Date: priority:19981110
12/12/2023 8:14:08 AM	Google Scholar	(wearer) (eyewear) (speaker) (microphone) (unit)
12/12/2023 8:14:08 AM	Google Patents	Search Term 1 (wearer) (eyewear) (speaker) (microphone) (unit) Before Priority Date: priority:20011006
12/12/2023 8:14:09 AM	Google Scholar	wearer eyewear speaker microphone unit

date, time	web site	search string
12/12/2023 8:14:09 AM	Google Patents	Search Term 1 wearer Search Term 2 eyewear Search Term 3 speaker Search Term 4 microphone Search Term 5 unit Before Priority Date: priority:20011006
12/12/2023 8:14:16 AM	Google Scholar	(support) (display) (support member) (user) (ear)
12/12/2023 8:14:16 AM	Google Patents	Search Term 1 (support) (display) (support member) (user) (ear) Before Priority Date: priority:20010907
12/12/2023 8:14:17 AM	Google Scholar	support display support member user ear
12/12/2023 8:14:17 AM	Google Patents	Search Term 1 support Search Term 2 display Search Term 3 support member Search Term 4 user Search Term 5 ear Before Priority Date: priority:20010907
12/12/2023 8:14:33 AM	Google Scholar	(values) (speaker) (listener) (location) (speech)
12/12/2023 8:14:33 AM	Google Patents	Search Term 1 (values) (speaker) (listener) (location) (speech) Before Priority Date: priority:20001127
12/12/2023 8:14:34 AM	Google Scholar	values speaker listener location speech

date, time	web site	search string
12/12/2023 8:14:34 AM	Google Patents	Search Term 1 values Search Term 2 speaker Search Term 3 listener Search Term 4 location Search Term 5 speech Before Priority Date: priority:20001127
12/12/2023 8:49:24 AM	Google Scholar	(audio) (video) (wearer) (pick) (mounting means)
12/12/2023 8:49:25 AM	Google Scholar	audio video wearer pick mounting means
12/12/2023 8:49:25 AM	Google Patents	Search Term 1 audio Search Term 2 video Search Term 3 wearer Search Term 4 pick Search Term 5 mounting means Before Priority Date: priority:20020403
12/12/2023 8:49:31 AM	Google Scholar	(eyewear according) (eyewear) (front frame) (sidepiece) (display)
12/12/2023 8:49:31 AM	Google Patents	Search Term 1 (eyewear according) (eyewear) (front frame) (sidepiece) (display) Before Priority Date: priority:20020524
12/12/2023 8:49:32 AM	Google Scholar	eyewear according eyewear front frame sidepiece display

date, time	web site	search string
12/12/2023 8:49:32 AM	Google Patents	Search Term 1 eyewear according Search Term 2 eyewear Search Term 3 front frame Search Term 4 sidepiece Search Term 5 display Before Priority Date: priority:20020524
12/12/2023 8:49:38 AM	Google Scholar	(tracking) (augmented reality) (frame acquisition) (video) (computer)
12/12/2023 8:49:38 AM	Google Patents	Search Term 1 (tracking) (augmented reality) (frame acquisition) (video) (computer) Before Priority Date: priority:20011220
12/12/2023 8:49:39 AM	Google Scholar	tracking augmented reality frame acquisition video computer
12/12/2023 8:49:39 AM	Google Patents	Search Term 1 tracking Search Term 2 augmented reality Search Term 3 frame acquisition Search Term 4 video Search Term 5 computer Before Priority Date: priority:20011220
12/12/2023 8:49:46 AM	Google Scholar	(speaker) (eyewear) (wearer) (earstem)
12/12/2023 8:49:46 AM	Google Patents	Search Term 1 (speaker) (eyewear) (wearer) (earstem) Assignee(s) [microphone] Before Priority Date: priority:20011006

date, time	web site	search string
12/12/2023 8:49:54 AM	Google Scholar	(speaker) (eyewear) (microphone) (wearer) (earstem)
12/12/2023 8:49:54 AM	Google Patents	Search Term 1 (speaker) Search Term 2 (eyewear) Search Term 3 (microphone) Search Term 4 (wearer) Search Term 5 (earstem) Before Priority Date: priority:20011006
12/12/2023 8:49:55 AM	Google Scholar	speaker eyewear microphone wearer earstem
12/12/2023 8:49:55 AM	Google Patents	Search Term 1 speaker Search Term 2 eyewear Search Term 3 microphone Search Term 4 wearer Search Term 5 earstem Before Priority Date: priority:20011006
12/12/2023 8:50:10 AM	Google Scholar	(information) (user) (telescope) (electronic) (visual)
12/12/2023 8:50:10 AM	Google Patents	Search Term 1 (information) (user) (telescope) (electronic) (visual) Before Priority Date: priority:20021210
12/12/2023 8:50:11 AM	Google Scholar	information user telescope electronic visual

date, time	web site	search string
12/12/2023 8:50:11 AM	Google Patents	Search Term 1 information Search Term 2 user Search Term 3 telescope Search Term 4 electronic Search Term 5 visual Before Priority Date: priority:20021210
12/12/2023 8:50:19 AM	Google Scholar	(audio interface) (wearer) (signal) (audio) (support)
12/12/2023 8:50:19 AM	Google Patents	Search Term 1 (audio interface) (wearer) (signal) (audio) (support) Before Priority Date: priority:20020726
12/12/2023 8:50:21 AM	Google Scholar	audio interface wearer signal audio support
12/12/2023 8:50:21 AM	Google Patents	Search Term 1 audio interface Search Term 2 wearer Search Term 3 signal Search Term 4 audio Search Term 5 support Before Priority Date: priority:20020726
12/12/2023 8:50:27 AM	Google Scholar	(mounting) (user) (chassis) (virtual) (images)
12/12/2023 8:50:27 AM	Google Patents	Search Term 1 (mounting) (user) (chassis) (virtual) (images) Before Priority Date: priority:20030103
12/12/2023 8:50:29 AM	Google Scholar	mounting user chassis virtual images

date, time	web site	search string
12/12/2023 8:50:29 AM	Google Patents	Search Term 1 mounting Search Term 2 user Search Term 3 chassis Search Term 4 virtual Search Term 5 images Before Priority Date: priority:20030103
12/12/2023 9:29:11 AM	Google Scholar	(support) (wearer) (eyeglass) (frame) (audio)
12/12/2023 9:29:11 AM	Google Patents	Search Term 1 (support) (wearer) (eyeglass) (frame) (audio) Before Priority Date: priority:20000602
12/12/2023 9:29:13 AM	Google Scholar	support wearer eyeglass frame audio
12/12/2023 9:29:13 AM	Google Patents	Search Term 1 support Search Term 2 wearer Search Term 3 eyeglass Search Term 4 frame Search Term 5 audio Before Priority Date: priority:20000602
12/12/2023 9:29:21 AM	Google Scholar	(golfer) (image) (training aid) (golf training) (light)
12/12/2023 9:29:21 AM	Google Patents	Search Term 1 (golfer) (image) (training aid) (golf training) (light) Before Priority Date: priority:20010327
12/12/2023 9:29:22 AM	Google Scholar	golfer image training aid golf training light

date, time	web site	search string
12/12/2023 9:29:22 AM	Google Patents	Search Term 1 golfer Search Term 2 image Search Term 3 training aid Search Term 4 golf training Search Term 5 light Before Priority Date: priority:20010327
12/12/2023 9:29:28 AM	Google Scholar	(user) (virtual image) (spectacles) (display) (mounting)
12/12/2023 9:29:28 AM	Google Patents	Search Term 1 (user) (virtual image) (spectacles) (display) (mounting) Before Priority Date: priority:20021210
12/12/2023 9:29:30 AM	Google Scholar	user virtual image spectacles display mounting
12/12/2023 9:29:30 AM	Google Patents	Search Term 1 user Search Term 2 virtual image Search Term 3 spectacles Search Term 4 display Search Term 5 mounting Before Priority Date: priority:20021210
12/12/2023 9:29:37 AM	Google Scholar	(location) (audiovisual) (processor) (communication) (user)
12/12/2023 9:29:37 AM	Google Patents	Search Term 1 (location) (audiovisual) (processor) (communication) (user) Before Priority Date: priority:20021127
12/12/2023 9:29:38 AM	Google Scholar	location audiovisual processor communication user

date, time	web site	search string
12/12/2023 9:29:38 AM	Google Patents	Search Term 1 location Search Term 2 audiovisual Search Term 3 processor Search Term 4 communication Search Term 5 user Before Priority Date: priority:20021127
12/12/2023 9:29:50 AM	Google Scholar	(viewing system) (binocular viewing) (optical) (assembly) (optical pipe)
12/12/2023 9:29:50 AM	Google Patents	Search Term 1 (viewing system) (binocular viewing) (optical) (assembly) (optical pipe) Before Priority Date: priority:20030425
12/12/2023 9:29:51 AM	Google Scholar	viewing system binocular viewing optical assembly optical pipe
12/12/2023 9:29:51 AM	Google Patents	Search Term 1 viewing system Search Term 2 binocular viewing Search Term 3 optical Search Term 4 assembly Search Term 5 optical pipe Before Priority Date: priority:20030425
12/12/2023 9:29:58 AM	Google Scholar	(user) (arrangement according) (vehicle) (head) (information)
12/12/2023 9:29:58 AM	Google Patents	Search Term 1 (user) (arrangement according) (vehicle) (head) (information) Before Priority Date: priority:20030829

date, time	web site	search string
12/12/2023 9:29:59 AM	Google Scholar	user arrangement according vehicle head information
12/12/2023 9:29:59 AM	Google Patents	Search Term 1 user Search Term 2 arrangement according Search Term 3 vehicle Search Term 4 head Search Term 5 information Before Priority Date: priority:20030829
12/12/2023 9:30:29 AM	Google Scholar	(cord) (eyeglass) (tethered) (electrical) (recited)
12/12/2023 9:30:29 AM	Google Patents	Search Term 1 (cord) (eyeglass) (tethered) (electrical) (recited) Before Priority Date: priority:20030415
12/12/2023 9:30:31 AM	Google Scholar	cord eyeglass tethered electrical recited
12/12/2023 9:30:31 AM	Google Patents	Search Term 1 cord Search Term 2 eyeglass Search Term 3 tethered Search Term 4 electrical Search Term 5 recited Before Priority Date: priority:20030415
12/12/2023 9:30:39 AM	Google Scholar	(video) (audio) (stream) (camera) (participant)
12/12/2023 9:30:39 AM	Google Patents	Search Term 1 (video) (audio) (stream) (camera) (participant) Before Priority Date: priority:20030724

date, time	web site	search string
12/12/2023 9:30:40 AM	Google Scholar	video audio stream camera participant
12/12/2023 9:30:40 AM	Google Patents	Search Term 1 video Search Term 2 audio Search Term 3 stream Search Term 4 camera Search Term 5 participant Before Priority Date: priority:20030724
12/12/2023 9:45:23 AM	Google Scholar	(eyeglasses) (wireless) (arms) (wireless communication) (frame)
12/12/2023 9:45:23 AM	Google Patents	Search Term 1 (eyeglasses) (wireless) (arms) (wireless communication) (frame) Before Priority Date: priority:20030415
12/12/2023 9:45:25 AM	Google Scholar	eyeglasses wireless arms wireless communication frame
12/12/2023 9:45:25 AM	Google Patents	Search Term 1 eyeglasses Search Term 2 wireless Search Term 3 arms Search Term 4 wireless communication Search Term 5 frame Before Priority Date: priority:20030415
12/12/2023 9:45:31 AM	Google Scholar	(head mounted) (mounted display) (signals) (unit) (display device)

date, time	web site	search string
12/12/2023 9:45:31 AM	Google Patents	Search Term 1 (head mounted) (mounted display) (signals) (unit) (display device) Before Priority Date: priority:20040909
12/12/2023 9:45:33 AM	Google Scholar	head mounted mounted display signals unit display device
12/12/2023 9:45:33 AM	Google Patents	Search Term 1 head mounted Search Term 2 mounted display Search Term 3 signals Search Term 4 unit Search Term 5 display device Before Priority Date: priority:20040909
12/12/2023 9:45:40 AM	Google Scholar	(coupled) (microphone) (speaker) (eyeglasses) (frame)
12/12/2023 9:45:40 AM	Google Patents	Search Term 1 (coupled) (microphone) (speaker) (eyeglasses) (frame) Before Priority Date: priority:20010621
12/12/2023 9:45:41 AM	Google Scholar	coupled microphone speaker eyeglasses frame
12/12/2023 9:45:41 AM	Google Patents	Search Term 1 coupled Search Term 2 microphone Search Term 3 speaker Search Term 4 eyeglasses Search Term 5 frame Before Priority Date: priority:20010621
12/12/2023 9:45:47 AM	Google Scholar	(camera) (cable) (wiring harness) (communication system) (power)

date, time	web site	search string
12/12/2023 9:45:47 AM	Google Patents	Search Term 1 (camera) (cable) (wiring harness) (communication system) (power) Before Priority Date: priority:20040309
12/12/2023 9:45:49 AM	Google Scholar	camera cable wiring harness communication system power
12/12/2023 9:45:49 AM	Google Patents	Search Term 1 camera Search Term 2 cable Search Term 3 wiring harness Search Term 4 communication system Search Term 5 power Before Priority Date: priority:20040309
12/12/2023 9:45:57 AM	Google Scholar	(display) (information) (user) (gaze) (control)
12/12/2023 9:45:57 AM	Google Patents	Search Term 1 (display) (information) (user) (gaze) (control) Before Priority Date: priority:20041001
12/12/2023 9:45:59 AM	Google Scholar	display information user gaze control
12/12/2023 9:45:59 AM	Google Patents	Search Term 1 display Search Term 2 information Search Term 3 user Search Term 4 gaze Search Term 5 control Before Priority Date: priority:20041001
12/12/2023 9:46:07 AM	Google Scholar	(eye) (audio circuitry) (ear) (arm) (compartment)

date, time	web site	search string
12/12/2023 9:46:07 AM	Google Patents	Search Term 1 (eye) (audio circuitry) (ear) (arm) (compartment) Before Priority Date: priority:20041013
12/12/2023 9:46:09 AM	Google Scholar	eye audio circuitry ear arm compartment
12/12/2023 9:46:09 AM	Google Patents	Search Term 1 eye Search Term 2 audio circuitry Search Term 3 ear Search Term 4 arm Search Term 5 compartment Before Priority Date: priority:20041013
12/12/2023 9:46:15 AM	Google Scholar	(module) (user) (visualisation) (eye) (images)
12/12/2023 9:46:15 AM	Google Patents	Search Term 1 (module) (user) (visualisation) (eye) (images) Before Priority Date: priority:20041029
12/12/2023 9:46:17 AM	Google Scholar	module user visualisation eye images
12/12/2023 9:46:17 AM	Google Patents	Search Term 1 module Search Term 2 user Search Term 3 visualisation Search Term 4 eye Search Term 5 images Before Priority Date: priority:20041029
12/12/2023 9:46:23 AM	Google Scholar	(user) (data) (biometric authentication) (eyewear) (biometric)

date, time	web site	search string
12/12/2023 9:46:23 AM	Google Patents	Search Term 1 (user) (data) (biometric authentication) (eyewear) (biometric) Before Priority Date: priority:20041129
12/12/2023 9:46:24 AM	Google Scholar	user data biometric authentication eyewear biometric
12/12/2023 9:46:24 AM	Google Patents	Search Term 1 user Search Term 2 data Search Term 3 biometric authentication Search Term 4 eyewear Search Term 5 biometric Before Priority Date: priority:20041129
12/12/2023 9:46:30 AM	Google Scholar	(user) (signals) (accelerometer) (nose) (input)
12/12/2023 9:46:30 AM	Google Patents	Search Term 1 (user) (signals) (accelerometer) (nose) (input) Before Priority Date: priority:20041229
12/12/2023 9:46:31 AM	Google Scholar	user signals accelerometer nose input
12/12/2023 9:46:31 AM	Google Patents	Search Term 1 user Search Term 2 signals Search Term 3 accelerometer Search Term 4 nose Search Term 5 input Before Priority Date: priority:20041229
12/12/2023 9:46:38 AM	Google Scholar	(image) (distance) (optical element) (display) (subject)

date, time	web site	search string
12/12/2023 9:46:38 AM	Google Patents	Search Term 1 (image) (distance) (optical element) (display) (subject) Before Priority Date: priority:20040206
12/12/2023 9:46:40 AM	Google Scholar	image distance optical element display subject
12/12/2023 9:46:40 AM	Google Patents	Search Term 1 image Search Term 2 distance Search Term 3 optical element Search Term 4 display Search Term 5 subject Before Priority Date: priority:20040206
12/12/2023 9:46:48 AM	Google Scholar	(optical device) (substrate) (light waves) (reflecting surfaces) (optical)
12/12/2023 9:46:48 AM	Google Patents	Search Term 1 (optical device) (substrate) (light waves) (reflecting surfaces) (optical) Before Priority Date: priority:20050210
12/12/2023 9:46:49 AM	Google Scholar	optical device substrate light waves reflecting surfaces optical
12/12/2023 9:46:49 AM	Google Patents	Search Term 1 optical device Search Term 2 substrate Search Term 3 light waves Search Term 4 reflecting surfaces Search Term 5 optical Before Priority Date: priority:20050210

IP Office	Application	Applicant	Title	Application Date	Priority Number	Publication Number	Publication Date
US	10822218			04/12/2004	US 60527565 US 60462591 US 10822218 US 60509831	US 20060003803 A1 US 7792562 B2	01/05/2006 09/07/2010
US	10964011			10/12/2004	US 60527565 US 60583169 US 60509831 US 10964011 US 60562798 US 60618107 US 60462591 US 60605191 US 60592045	US 20050078274 A1 US 7192136 B2	04/14/2005 03/20/2007
US	11006343			12/07/2004	US 11006343 US 60527565	US 20050124324 A1 US 7116976 B2	06/09/2005 10/03/2006
US	11078857			03/11/2005	US 60647826 US 60583169 US 60562798 US 60620238 US 60618107 US 60605191 US 11078857 US 60592045 US 60647836	US 20050230596 A1	10/20/2005
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CN	200520016479			04/14/2005	US 60562798	CN 2859575 Y	01/17/2007

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US	11183269			07/15/2005	US 60647826 US 60527565 US 60583169 US 11183269 US 60509631 US 10964011 US 60562798 US 60620238 US 60618107 US 60605191 US 60592045 US 60647836	US 20050264752 A1 US 7922321 B2	12/01/2005 04/12/2011
US	11183263			07/15/2005	US 60647826 US 60527565 US 60583169 US 60509631 US 10964011 US 60562798 US 60620238 US 60618107 US 60605191 US 11183263 US 60592045 US 60647836	US 20060001827 A1 US 7380938 B2	01/05/2006 06/03/2008
US	11183256			07/15/2005	US 60647826 US 60527565 US 60583169 US 60509631 US 10964011 US 60562798 US 60620238 US 60618107 US 60605191 US 11183256 US 60592045 US 60647836	US 20060023158 A1 US 7500747 B2	02/02/2006 03/10/2009
US	11183262			07/15/2005	US 60647826 US 60527565 US 60583169 US 60509631 US 10964011 US 60562798 US 11183262 US 60620238 US 60618107 US 60605191 US 60592045 US 60647836	US 20050248717 A1 US 7760895 B2	11/10/2005 07/20/2010
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IP Office	Application	Applicant	Title	Application Date	Priority Number	Publication Number	Publication Date
US	11183276			07/15/2005	US 60647826 US 60527565 US 60583169 US 11183276 US 60509631 US 10964011 US 60562798 US 60620238 US 60618107 US 60605191 US 60592045 US 60647836	US 20050248718 A1 US 7255437 B2	11/10/2005 08/14/2007
US	PCT/US06/22015			06/07/2006	US 60689686	WO 2006135614 A2 WO 2006135614 A3 WO 2006135614 A8 WO 2006135614 A9	12/21/2006 03/22/2007 07/10/2008 12/11/2008
CN	200680027964			06/07/2006	US 60689686	CN 101297191 A	10/29/2008
US	11452115			06/12/2006	US 11452115 US 60689686 US 11006343 US 60527565	US 20060259565 A1 US 7729688 B2	11/16/2006 06/01/2010
US	11497651			08/02/2006	US 11006343 US 60527565 US 11497651	US 20060276210 A1 US 7376434 B2	12/07/2006 05/20/2008
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US	11580222			10/11/2006	US 60583169 US 60725896 US 11183256 US 60787850 US 60846150 US 10964011 US 60725999 US 60527565 US 60509631 US 60562798 US 60620238 US 11580222 US 60618107 US 60605191 US 60592045 US 60647836	US 20070046887 A1 US 7581833 B2	03/01/2007 09/01/2009
US	11546685			10/11/2006	US 60583169 US 60725896 US 11546685 US 60787850 US 60846150 US 10964011 US 60725999 US 11183256 US 60647826 US 60527565 US 60509631 US 60562798 US 60620238 US 60618107 US 60605191 US 60592045 US 60647836	US 20070030442 A1 US 7806525 B2	02/08/2007 10/05/2010
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	Application No.:	18/375,893
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Init.		Document No.	Date	Country	Class	Subclass	Translation Yes	Translation No

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	269.	5,510,961	Apr-96	Peng			
	270.	5,513,384	Apr-96	Brennan et al.			
	271.	5,519,781	May-96	Kurkurudza			
	272.	5,533,130	Jul-96	Staton			
	273.	5,541,641	Jul-96	Shimada			
	274.	5,581,090	Dec-96	Goudjil			
	275.	5,585,871	Dec.-96	Linden			
	276.	5,589,398	Dec-96	Krause et al.			
	277.	5,590,417	Dec-96	Rydbeck			
	278.	5,606,743	Feb-97	Vogt et al.			
	279.	5,608,808	Mar-97	da Silva			
	280.	5,634,201	May-97	Mooring			
	281.	5,671,035	Sep-97	Barnes			
	282.	5,686,727	Nov-97	Reenstra et al.			
	283.	5,694,475	Dec-97	Boyden			
	284.	5,715,323	Feb-98	Walker			
	285.	5,737,436	Apr-98	Boyden et al.			
	286.	5,777,715	Jul-98	Kruegle et al.			
	287.	5,818,381	Oct-98	Williams			
	288.	5,819,183	Oct-98	Voroba et al.			
	289.	5,835,185	Nov-98	Kallman et al.			
	290.	5,900,720	May-99	Kallman et al.			
	291.	5,903,395	May-99	Rallison et al.			
	292.	5,923,398	Jul-99	Goldman			
	293.	5,941,837	Aug-99	Amano et al.			
	294.	5,946,071	Aug-99	Feldman			
	295.	5,949,516	Sep-99	McCurdy			
	296.	5,966,746	Oct-99	Reedy et al.			
	297.	5,980,037	Nov-99	Conway			
	298.	5,988,812	Nov-99	Wingate			

Examiner	Date Considered

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Form 1449 (Modified)	Atty. Docket No.	IPVCP003X1C4X1C1
	Application No.:	Not Yet Assigned
Information Disclosure Statement By Applicant	Applicant	HOWELL et al.
	Filing Date	Filed Herewith
	Group	Not Yet Assigned
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	299.	5,991,085	Nov-99	Rallison et al.			
	300.	5,992,996	Nov-99	Sawyer			
	301.	5,995,592	Nov-99	Shirai et al.			
	302.	6,091,546	Jul-00	Spitzer			
	303.	6,010,216	Jan-00	Jesiek			
	304.	6,013,919	Jan-00	Schneider et al.			
	305.	6,028,627	Feb-00	Helmsderfer			
	306.	6,046,455	Apr-00	Ribi et al.			
	307.	6,060,321	May-00	Hovorka			
	308.	6,061,580	May-00	Altschul et al.			
	309.	6,091,546	Jul-00	Spitzer			
	310.	6,091,832	Jul-00	Shurman et al.			
	311.	6,115,177	Sep-00	Vossler			
	312.	6,132,681	Oct-00	Faran et al.			
	313.	6,145,983	Nov-00	Schiffer			
	314.	6,154,552	Nov-00	Koroljow et al.			
	315.	6,176,576 B1	Jan-01	Green et al.			
	316.	6,225,897 B1	May-01	Doyle et al.			
	317.	6,231,181 B1	May-01	Swab			
	318.	6,236,969 B1	May-01	Ruppert et al.			
	319.	6,243,578 B1	Jun-01	Koike			
	320.	6,259,367 B1	Jul-01	Klein			
	321.	6,270,466 B1	Aug-01	Weinstein et al.			
	322.	6,292,213 B1	Sep-01	Jones			
	323.	6,292,685 B1	Sep-01	Pompei			
	324.	6,301,050 B1	Oct-01	DeLeon			
	325.	6,301,367 B1	Oct-01	Boyden et al.			
	326.	6,307,526 B1	Oct-01	Mann			
	327.	6,311,155 B1	Oct-01	Vaudrey et al.			
	328.	6,343,858 B1	Feb-02	Zelman			

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	329.	6,346,929 B1	Feb-02	Fukushima et al.			
	330.	6,349,001 B1	Feb-02	Spitzer			
	331.	6,349,422 B1	Feb-02	Schleger et al.			
	332.	6,409,335 B1	Jun-02	Lipawsky			
	333.	6,409,338 B1	Jun-02	Jewell			
	334.	6,426,719 B1	Jul-02	Nagareda et al.			
	335.	6,431,705 B1	Aug-02	Linden			
	336.	6,474,816 B2	Nov-02	Butler et al.			
	337.	6,478,736 B1	Nov-02	Mault			
	338.	6,506,142 B2	Jan-03	Itoh et al.			
	339.	6,511,175 B2	Jan-03	Hay et al.			
	340.	6,513,532 B2	Feb-03	Mault et al.			
	341.	6,517,203 B1	Feb-03	Blum et al.			
	342.	6,539,336 B1	Mar-03	Vock et al.			
	343.	6,542,081 B2	Apr-03	Torch			
	344.	6,546,101 B1	Apr-03	Murray et al.			
	345.	6,554,763 B1	Apr-03	Amano et al.			
	346.	6,582,075 B1	Jun-03	Swab et al.			
	347.	6,619,799 B1	Sep-03	Blum et al.			
	348.	6,629,076 B1	Sep-03	Haken			
	349.	6,678,381 B1	Jan-04	Manabe			
	350.	6,717,737 B1	Apr-04	Haglund			
	351.	6,729,726 B2	May-04	Miller et al.			
	352.	6,736,759 B1	May-04	Stubbs et al.			
	353.	6,764,194 B1	Jul-04	Cooper			
	354.	6,769,767 B2	Aug-04	Swab et al.			
	355.	6,771,423 B2	Aug-04	Geist			
	356.	6,788,309 B1	Sep-04	Swan et al.			
	357.	6,792,401 B1	Sep-04	Nigro et al.			
	358.	6,816,314 B2	Nov-04	Shimizu et al.			

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	Filing Date	Filed Herewith
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	359.	6,824,265 B1	Nov-04	Harper			
	360.	6,857,741 B2	Feb-05	Blum et al.			
	361.	6,871,951 B2	Mar-05	Blum et al.			
	362.	6,879,930 B2	Apr-05	Sinclair et al.			
	363.	6,912,386 B1	Jun-05	Himberg et al.			
	364.	6,929,365 B2	Aug-05	Swab et al.			
	365.	6,932,090 B1	Aug-05	Reschke et al.			
	366.	6,947,219 B1	Sep-05	Ou			
	367.	7,004,582 B2	Feb-06	Jannard et al.			
	368.	7,013,009 B2	Mar-06	Warren			
	369.	7,023,594 B2	Apr-06	Blum et al.			
	370.	7,030,902 B2	Apr-06	Jacobs			
	371.	7,031,667 B2	Apr-06	Horiguchi			
	372.	7,033,025 B2	Apr-06	Winterbotham			
	373.	7,059,717 B2	Jun-06	Bloch			
	374.	7,073,905 B2	Jul-06	Da Pra'			
	375.	7,079,876 B2	Jul-06	Levy			
	376.	7,123,215 B2	Oct-06	Nakada			
	377.	7,192,136 B2	Mar-07	Howell et al.			
	378.	7,255,437 B2	Aug-07	Howell et al.			
	379.	7,265,358 B2	Sep-07	Fontaine			
	380.	7,274,292 B2	Sep-07	Velhal et al.			
	381.	7,289,767 B2	Oct-07	Lai			
	382.	7,312,699 B2	Dec-07	Chornenky			
	383.	7,331,666 B2	Feb-08	Swab et al.			
	384.	7,376,238 B1	May-08	Rivas et al.			
	385.	7,380,936 B2	Jun-08	Howell et al.			
	386.	7,401,918 B2	Jul-08	Howell et al.			
	387.	7,405,801 B2	Jul-08	Jacobs			
	388.	7,429,965 B2	Sep-08	Weiner			

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Information Disclosure Statement By Applicant	Applicant	HOWELL et al.
	Filing Date	Filed Herewith
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	389.	7,438,409 B2	Oct-08	Jordan			
	390.	7,438,410 B1	Oct-08	Howell et al.			
	391.	7,445,332 B2	Nov-08	Jannard et al.			
	392.	7,481,531 B2	Jan-09	Howell et al.			
	393.	7,500,746 B2	Mar-09	Howell et al.			
	394.	7,500,747 B2	Mar-09	Howell et al.			
	395.	7,512,414 B2	Mar-09	Jannard et al.			
	396.	7,517,083 B2	Apr-09	Blum et al.			
	397.	7,527,374 B2	May-09	Chou			
	398.	7,543,934 B2	Jun-09	Howell et al.			
	399.	7,581,833 B2	Sep-09	Howell et al.			
	400.	7,621,634 B2	Nov-09	Howell et al.			
	401.	7,648,236 B1	Jan-10	Dobson			
	402.	7,677,723 B2	Mar-10	Howell et al.			
	403.	7,760,898 B2	Jul-10	Howell et al.			
	404.	7,771,046 B2	Aug-10	Howell et al.			
	405.	7,792,552 B2	Sep-10	Thomas et al.			
	406.	7,801,570 B2	Sep-10	Cheung et al.			
	407.	7,806,525 B2	Oct-10	Howell et al.			
	408.	7,922,321 B2	Apr-11	Howell et al.			
	409.	7,976,159 B2	Jul-11	Jacobs et al.			
	410.	8,109,629 B2	Feb-12	Howell et al.			
	411.	8,142,015 B2	Mar-12	Paolino			
	412.	8,174,569 B2	May-12	Tanijiri et al.			
	413.	8,337,013 B2	Dec-12	Howell et al.			
	414.	8,430,507 B2	Apr-13	Howell et al.			
	415.	8,434,863 B2	May-13	Howell et al.			
	416.	8,465,151 B2	Jun-13	Howell et al.			
	417.	8,485,661 B2	Jul-13	Yoo et al.			
	418.	8,500,271 B2	Aug-13	Howell et al.			

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Information Disclosure Statement By Applicant	Applicant	HOWELL et al.
	Filing Date	Filed Herewith
	Group	Not Yet Assigned
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	419.	8,582,789 B2	Nov-13	Cheung et al.			
	420.	8,770,742 B2	Jul-14	Howell et al.			
	421.	8,849,185 B2	Sep-14	Cheung et al.			
	422.	8,905,542 B2	Dec-14	Howell et al.			
	423.	9,033,493 B2	May-15	Howell et al.			
	424.	9,244,292 B2	Jan-16	Swab et al.			
	425.	9,400,390 B2	Jul-16	Osterhout et al.			
	426.	9,405,135 B2	Aug-16	Sweis et al.			
	427.	9,488,520 B2	Nov-16	Howell et al.			
	428.	9,547,184 B2	Jan-17	Howell et al.			
	429.	9,690,121 B2	Jun-17	Howell et al.			
	430.	9,922,236 B2	Mar-18	Moore et al.			
	431.	10,042,186 B2	Aug-18	Chao et al.			
	432.	10,060,790 B2	Aug-18	Howell et al.			
	433.	10,061,144 B2	Aug-18	Howell et al.			
	434.	10,310,296 B2	Jun-19	Howell et al.			
	435.	10,345,625 B2	Jul-19	Howell et al.			
	436.	10,359,311 B2	Jul-19	Howell et al.			
	437.	10,515,623 B1	Dec-19	Grizzel			
	438.	10,539,459 B2	Jan-20	Howell et al.			
	439.	10,624,790 B2	Apr-20	Chao et al.			
	440.	10,571,715 B2	Feb-20	Rizzo, III et al.			
	441.	10,777,048 B2	Sep-20	Howell et al.			
	442.	10,802,582 B1	Oct-20	Clements			
	443.	10,964,190 B2	Mar-21	Peyrard			
	444.	11,042,045 B2	Jun-21	Chao et al.			
	445.	11,069,358 B1	Jul-21	Harper			
	446.	11,086,147 B2	Aug-21	Howell et al.			
	447.	11,204,512 B2	Dec-21	Howell et al.			
	448.	11,243,416 B2	Feb-22	Howell et al.			

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	449.	11,326,941 B2	May-22	Howell et al.				
	450.	11,513,371 B2	Nov-22	Howell et al.				
	451.	11,536,988 B2	Dec-22	Howell et al.				
	452.	11,630,331 B2	Apr-23	Howell et al.				
	453.	11,644,361 B2	May-23	Howell et al.				
	454.	11,644,693 B2	May-23	Howell et al.				
	455.	11,721,183 B2	Aug-23	Howell et al.				
	456.	11,733,549 B2	Aug-23	Howell et al.				
	457.	DES. 369,167	Apr-96	Hanson et al.				

Foreign Documents

							Translation	
Init.		Document No.	Date	Country	Class	Subclass	Yes	No

Other Documents (Including Author, Title, Date, Pertinent Pages, etc.)

	A	
	B	
	C	

Examiner	Date Considered
/JIE LEI/	12/11/2023

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Bibliographic Data

Application No: 18/375,893

Foreign Priority claimed: ○ Yes ◉ No

35 USC 119 (a-d) conditions met: ☐ Yes ☑ No ☐ Met After Allowance

Verified and Acknowledged: /JIE LEI/ (Examiner's Signature) | (Initials)

Title: SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC APPARATUS

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
10/02/2023	351	2872	IPVCP003X1C4X1C1
RULE			

APPLICANTS

IngenioSpec, LLC,

INVENTORS

Thomas A. Howell, San Jose, CA, UNITED STATES

David Chao, Saratoga, CA, UNITED STATES

C. Douglass Thomas, Saratoga, CA, UNITED STATES

Peter P. Tong, Mountain View, CA, UNITED STATES

CONTINUING DATA

This application is a CON of 16182969 11/07/2018

16182969 is a CON of 16127957 09/11/2018 PAT 11086147

16182969 is a CON of 16049120 07/30/2018 PAT 11243416

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11580222 has PRO of 60725999 10/11/2005

FOREIGN APPLICATIONS

IF REQUIRED, FOREIGN LICENSE GRANTED**

10/17/2023

STATE OR COUNTRY

UNITED STATES

ADDRESS

IPVENTURE, INC.
4010 Moorpark Avenue
Suite 211
San Jose, CA 95117
UNITED STATES

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PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1	4	"18375893"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:12 PM
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			HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L10	4	"83901364".fmid.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; JPO)	OR	ON	ON	2023/12/11 03:33 PM
L11	5	"16821810"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM
L12	17	"46304853".fmid.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; JPO)	OR	ON	ON	2023/12/11 03:33 PM
L13	45	(Artificial Intelligence) Similar to: 16/182,969 with 0 CPC	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY,	OR	ON	ON	2023/12/11 03:33 PM

		Selections and 0 Text Selections Text: (US-10330956-B2 OR US-11086147-B2 OR US-9690121-B2 OR US-20090296044-A1 OR US-20210364828-A1 OR US-9033493-B2 OR US-20170131575-A1 OR US-20190033623-A1 OR US-20210364827-A9 OR US-20190187492-A1 OR US-8109629-B2 OR US-20120133885-A1 OR US-20150253590-A1 OR US-20100309426-A1 OR US-20220260859-A1 OR US-8465151-B2 OR US-20130201440-A1 OR US-20170146829-A1 OR CN-113330355-A OR KR-20210110726-A OR EP-3914960-A1 OR WO-2020154047-A1 OR US-20200233238-A1 OR US-20190113774-A1 OR US-11156855-B2 OR EP-3455670-A1 OR WO-2017196294-A1 OR US-20220113562-A1 OR US-7581833-B2 OR US-20070046887-A1 OR CN-113454521-A OR US-8905542-B2 OR US-11204512-B2 OR KR-20210127221-A OR EP-3928149-A1 OR WO-2020172138-A1 OR US-20200271961-A1 OR CA-3103299-A1 OR US-20210191159-A1 OR DE-102020102281-A1 OR CH-718397-A2 OR KR-102077483-B1 OR TW-M583054-U OR KR-20070077875-A OR KR-100819659-B1 OR US-9720260-B2 OR US-20170255029-A1 OR WO-2014201213-A1 OR KR-20220042606-A OR	CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN))				

		GB-834268-A).did.					
L14	44	(Artificial Intelligence) Similar to: 16/182,969 with 0 CPC Selections and 2 Text Selections Text: (US-9690121-B2 OR US-11204512-B2 OR US-20170131575-A1 OR US-8905542-B2 OR US-10330956-B2 OR US-11086147-B2 OR US-11536988-B2 OR US-20200012127-A1 OR US-20080151179-A1 OR US-7621634-B2 OR US-10444544-B2 OR US-20180252946-A1 OR US-20170255029-A1 OR US-7438410-B1 OR US-10345625-B2 OR EP-3341785-B1 OR US-9547184-B2 OR US-10061144-B2 OR US-20100309426-A1 OR JP-6475289-B2 OR US-9033493-B2 OR US-8500271-B2 OR EP-3377934-B1 OR US-20220011604-A1 OR US-20210364827-A9 OR US-20190187492-A1 OR WO-2009092054-A2 OR JP-2017194712-A OR US-20110139163-A1 OR US-20140207033-A1 OR US-7922321-B2 OR US-10031345-B2 OR AU-2016373687-B2 OR CA-3008656-A1 OR US-20170168316-A1 OR EP-3377934-A1 OR WO-2017105647-A1 OR AU-2016373687-A1 OR US-20220260859-A1 OR US-11243416-B2 OR JP-2017194711-A OR US-20190033623-A1 OR US-20200041813-A1 OR US-11199724-B2 OR WO-2017106385-A3 OR KR-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN))	OR	ON	ON	2023/12/11 03:33 PM

		20210110726-A OR US-20210364828-A1 OR US-20220099996-A1 OR US-9482880-B1 OR WO-2017048484-A1).did.					
L15	48	(Artificial Intelligence) Similar to: 16/182,969 with 0 CPC Selections and 3 Text Selections Text: (US-9690121-B2 OR US-11204512-B2 OR US-8905542-B2 OR US-10330956-B2 OR US-20170131575-A1 OR US-11086147-B2 OR US-11536988-B2 OR US-20080151179-A1 OR US-8500271-B2 OR US-20200012127-A1 OR US-7438410-B1 OR US-7621634-B2 OR US-10345625-B2 OR US-9033493-B2 OR US-7922321-B2 OR US-9547184-B2 OR US-20100309426-A1 OR US-20210364827-A9 OR US-20190187492-A1 OR US-20220011604-A1 OR JP-6475289-B2 OR US-20210364828-A1 OR US-10061144-B2 OR US-10444544-B2 OR US-20180252946-A1 OR US-20170255029-A1 OR EP-3341785-B1 OR US-20190033623-A1 OR JP-2017194712-A OR JP-2017194711-A OR US-20220260859-A1 OR US-20090296044-A1 OR KR-20210110726-A OR EP-3377934-B1 OR US-11243416-B2 OR US-8465151-B2 OR US-20130201440-A1 OR US-8337013-B2 OR US-10168551-B2 OR JP-6571136-B2 OR US-10670889-B1 OR US-20200241329-A1 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN))	OR	ON	ON	2023/12/11 03:33 PM

		US-20150253590-A1 OR US-20120133885-A1 OR US-7581833-B2 OR US-20170075141-A1 OR US-20160246075-A9 OR US-20140268008-A1 OR US-10031345-B2 OR AU-2016373687-B2).did.					
L16	45	(Artificial Intelligence) Similar to: 16/182,969 with 2 CPC Selections and 3 Text Selections Text: (US-9690121-B2 OR US-10330956-B2 OR US-20170131575-A1 OR US-11086147-B2 OR US-11204512-B2 OR US-20220260859-A1 OR US-7581833-B2 OR US-8905542-B2 OR US-20070046887-A1 OR US-9033493-B2 OR US-20220011604-A1 OR US-20100309426-A1 OR JP-6475289-B2 OR US-20210364827-A9 OR US-20190187492-A1 OR US-20210364828-A1 OR WO-0003287-A1 OR CA-2275057-C OR GB-2336692-A OR US-20190033623-A1 OR FR-2906900-A1 OR US-6176576-B1 OR JP-2017194712-A OR JP-2017194711-A OR CA-2275057-A1 OR GB-2343263-A OR US-20090296044-A1 OR US-4251302-A OR US-8465151-B2 OR CA-2045119-A1 OR US-10168551-B2 OR US-20130201440-A1 OR US-20200041813-A1 OR US-11199724-B2 OR JP-6571136-B2 OR US-20170075141-A1 OR US-20220099996-A1 OR US-20120133885-A1 OR US-20150253590-A1	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN))	OR	ON	ON	2023/12/11 03:33 PM

		OR US-10222633-B2 OR WO-2021262097-A1 OR US-20170031181-A1 OR CN-114174900-A OR FR-2957157-A1 OR WO-2017106385-A3 OR US-5042933-A OR US-20170146829-A1 OR GB-2079972-A OR JP-S56501775-A OR US-20180074341-A1).did.					
L17	46	(Artificial Intelligence) Similar to: 16/182,969 with 2 CPC Selections and 3 Text Selections Text: (US-11204512-B2 OR US-9690121-B2 OR US-8905542-B2 OR US-10330956-B2 OR US-20170131575-A1 OR US-11086147-B2 OR US-11536988-B2 OR US-8500271-B2 OR US-20200012127-A1 OR US-9547184-B2 OR US-10061144-B2 OR AU-2016201503-B2 OR US-10114235-B2 OR US-9033493-B2 OR US-7922321-B2 OR US-20180231804-A1 OR US-10156739-B2 OR CN-106940484-B OR US-20210364827-A9 OR US-20190187492-A1 OR US-20210364828-A1 OR US-20100309426-A1 OR BR-112014016460-A8 OR BR-112014016460-A2 OR AU-2013207265-B2 OR US-11243416-B2 OR US-20190033623-A1 OR US-11487138-B2 OR US-20200218093-A1 OR US-20150378180-A1 OR US-10598960-B2 OR US-20090296044-A1 OR AU-2013207265-A1 OR WO-2013103985-A2	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN))	OR	ON	ON	2023/12/11 03:33 PM

		OR EP-2800993-A2 OR US-20130215374-A1 OR KR-102276220-B1 OR WO-2013103985-A3 OR US-8465151-B2 OR US-20130201440-A1 OR KR-20220003143-A OR US-20150253590-A1 OR US-20120133885-A1 OR KR-102347056-B1 OR US-20170146829-A1 OR US-8109629-B2 OR US-20170090219-A1 OR US-20180335650-A1 OR WO-2014163794-A2 OR US-20140270316-A1).did.					
L18	47	(Artificial Intelligence) Similar to: 16/182,969 with 2 CPC Selections and 3 Text Selections Text: (US-9690121-B2 OR US-10330956-B2 OR US-11086147-B2 OR US-20170131575-A1 OR US-11204512-B2 OR US-20190187492-A1 OR US-20210364827-A9 OR US-20210364828-A1 OR US-9033493-B2 OR US-20190033623-A1 OR US-20090296044-A1 OR US-20120133885-A1 OR US-20150253590-A1 OR US-8905542-B2 OR US-8109629-B2 OR US-20100309426-A1 OR KR-20210110726-A OR US-20220260859-A1 OR US-20170255029-A1 OR EP-3914960-A1 OR WO-2020154047-A1 OR US-20200233238-A1 OR US-20130201440-A1 OR US-8465151-B2 OR US-20170146829-A1 OR US-11536988-B2 OR EP-3686654-A1 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN))	OR	ON	ON	2023/12/11 03:33 PM

		US-20210389605-A1 OR US-20080151179-A1 OR CN-111033361-A OR US-8500271-B2 OR US-20200012127-A1 OR JP-6475289-B2 OR US-7438410-B1 OR JP-WO2019059220-A1 OR JP-2017194711-A OR US-10423011-B2 OR EP-1707028-A1 OR WO-2005067343-A1 OR JP-6896086-B2 OR JP-2017194712-A OR CN-113330355-A OR US-10168551-B2 OR WO-2019059220-A1 OR US-20090060231-A1 OR CN-113078715-A OR KR-20210080253-A OR US-7621634-B2 OR JP-6571136-B2 OR US-10345625-B2).did.					
L19	20223	((("HOWELL") near3 ("Thomas")) OR (("CHAO") near3 ("David")) OR (("THOMAS") near3 ("C")) OR (("TONG") near3 ("Peter"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2023/12/11 03:33 PM
L20	42965	((("HOWELL") near3 ("Thomas")) OR (("CHAO") near3 ("David")) OR (("THOMAS") near3 ("C")) OR (("TONG") near3 ("Peter"))).INV.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM
L21	300	((("HOWELL") near3 ("Thomas")) OR (("CHAO") near3 ("David")) OR (("THOMAS") near3 ("C")) OR (("TONG") near3 ("Peter"))).INV. AND frame AND (arm OR temple) AND sensor AND battery	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO,	OR	ON	ON	2023/12/11 03:33 PM

			NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L22	296	((("HOWELL") near3 ("Thomas")) OR (("CHAO") near3 ("David")) OR (("THOMAS") near3 ("C")) OR (("TONG") near3 ("Peter"))).INV. AND frame AND (arm OR temple) AND sensor AND batter$4 AND control$4 AND connect$4	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM
L23	195	((("HOWELL") near3 ("Thomas")) OR (("CHAO") near3 ("David")) OR (("THOMAS") near3 ("C")) OR (("TONG") near3 ("Peter"))).INV. AND frame AND (arm OR temple) AND sensor AND batter$4 AND control$4 AND connect$4 AND charg$4 AND electric$4	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM
L24	176	((("HOWELL") near3 ("Thomas")) OR (("CHAO") near3 ("David")) OR (("THOMAS") near3 ("C")) OR (("TONG") near3 ("Peter"))).INV. AND frame AND (arm OR temple) AND sensor AND batter$4 AND control$4 AND connect$4 AND charg$4 AND electric$4 AND wireless AND communicat$4	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM
L25	50912	(eyewear OR spectale OR eyeglass$4 OR glass$4) AND frame	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY,	OR	ON	ON	2023/12/11 03:33 PM

		AND (arm OR temple) AND sensor AND batter$4 AND control$4 AND connect$4 AND charg$4 AND electric$4 AND wireless AND communicat$4	CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L26	33912	(eyewear OR spectale OR eyeglass$4 OR glass$4) AND frame AND (arm OR temple) AND sensor AND (batter$4 WITH charg$4) AND control$4 AND connect$4 AND electric$4 AND wireless AND communicat$4	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM
L27	31655	(eyewear OR spectale OR eyeglass$4 OR glass$4) AND frame AND (arm OR temple) AND sensor AND (batter$4 WITH charg$4) AND control$4 AND connect$4 AND electric$4 AND (wireless WITH communicat$4)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM
L28	24323	(eyewear OR spectale OR eyeglass$4 OR glass$4) AND frame AND (arm OR temple) AND sensor AND (batter$4 WITH charg$4) AND control$4 AND connect$4 AND electric$4 AND (wireless WITH communicat$4) AND position AND open$4	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK,	OR	ON	ON	2023/12/11 03:33 PM

		AND clos$4	TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L29	20131	(eyewear OR spectale OR eyeglass$4 OR glass$4) AND frame AND (arm OR temple) AND sensor AND (batter$4 WITH charg$4) AND control$4 AND connect$4 AND electric$4 AND (wireless WITH communicat$4) AND position AND open$4 AND clos$4 AND circuit$4	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM
L30	6749	(eyewear OR spectale OR eyeglass$4 OR glass$4) AND frame AND (arm OR temple) AND sensor AND (batter$4 WITH charg$4) AND control$4 AND connect$4 AND electric$4 AND (wireless WITH communicat$4) AND position AND open$4 AND clos$4 AND circuit$4 AND (within WITH frame)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM
L31	2943	(eyewear OR spectale OR eyeglass$4 OR glass$4) AND frame AND (arm OR temple) AND sensor AND (batter$4 WITH charg$4) AND control$4 AND connect$4 AND electric$4 AND (wireless WITH communicat$4) AND position AND open$4 AND clos$4 AND circuit$4 AND (within WITH frame) AND hing$4	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM
L32	2424	(eyewear OR spectale OR eyeglass$4 OR glass$4) AND frame AND (arm OR temple) AND sensor AND	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA,	OR	ON	ON	2023/12/11 03:33 PM

		(batter$4 WITH charg$4) AND control$4 AND connect$4 AND electric$4 AND (wireless WITH communicat$4) AND position AND open$4 AND clos$4 AND circuit$4 AND (within WITH frame) AND hing$4 AND conduct$4	EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L33	2310	(eyewear OR spectale OR eyeglass$4 OR glass$4) AND frame AND (arm OR temple) AND sensor AND (batter$4 WITH charg$4) AND control$4 AND connect$4 AND electric$4 AND (wireless WITH communicat$4) AND position AND open$4 AND clos$4 AND circuit$4 AND (within WITH frame) AND hing$4 AND conduct$4 AND coupl$4	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM
L34	1453	(eyewear OR spectale OR eyeglass$4 OR glass$4) AND frame AND (arm OR temple) AND sensor AND (batter$4 WITH charg$4) AND control$4 AND connect$4 AND electric$4 AND (wireless WITH communicat$4) AND position AND open$4 AND clos$4 AND circuit$4 AND (within WITH frame) AND hing$4 AND conduct$4 AND coupl$4 AND lens$4	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM
L35	1439	(eyewear OR spectale OR eyeglass$4 OR glass$4) AND frame AND (arm OR temple) AND sensor AND (batter$4 WITH charg$4) AND control$4 AND connect$4 AND electric$4 AND (wireless WITH communicat$4) AND	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO,	OR	ON	ON	2023/12/11 03:33 PM

		position AND open$4 AND clos$4 AND circuit$4 AND (within WITH frame) AND hing$4 AND conduct$4 AND coupl$4 AND lens$4 AND indicat$4	RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L36	1174	(eyewear OR spectale OR eyeglass$4 OR glass$4) AND frame AND (arm OR temple) AND sensor AND (batter$4 WITH charg$4) AND control$4 AND connect$4 AND electric$4 AND (wireless WITH communicat$4) AND position AND open$4 AND clos$4 AND circuit$4 AND (within WITH frame) AND hing$4 AND conduct$4 AND coupl$4 AND lens$4 AND indicat$4 AND embed$4	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM
L37	999	(eyewear OR spectale OR eyeglass$4 OR glass$4) AND frame AND (arm OR temple) AND sensor AND (batter$4 WITH charg$4) AND control$4 AND connect$4 AND electric$4 AND (wireless WITH communicat$4) AND position AND open$4 AND clos$4 AND circuit$4 AND (within WITH frame) AND hing$4 AND conduct$4 AND coupl$4 AND lens$4 AND indicat$4 AND embed$4 AND antenna	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM
L38	23	(eyewear OR spectale OR eyeglass$4 OR glass$4) AND frame AND (arm OR temple) AND sensor AND (batter$4 WITH charg$4) AND control$4 AND connect$4 AND electric$4 AND (wireless WITH communicat$4) AND	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO,	OR	ON	ON	2023/12/11 03:33 PM

		position AND open$4 AND clos$4 AND circuit$4 AND (within WITH frame) AND hing$4 AND conduct$4 AND coupl$4 AND lens$4 AND indicat$4 AND embed$4 AND antenna AND endpiece	RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L39	999	(eyewear OR spectale OR eyeglass$4 OR glass$4) AND frame AND (arm OR temple) AND sensor AND (batter$4 WITH charg$4) AND control$4 AND connect$4 AND electric$4 AND (wireless WITH communicat$4) AND position AND open$4 AND clos$4 AND circuit$4 AND (within WITH frame) AND hing$4 AND conduct$4 AND coupl$4 AND lens$4 AND indicat$4 AND embed$4 AND antenna AND side AND view	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM
L40	836	(eyewear OR spectale OR eyeglass$4 OR glass$4) AND frame AND (arm OR temple) AND sensor AND (batter$4 WITH charg$4) AND control$4 AND connect$4 AND electric$4 AND (wireless WITH communicat$4) AND position AND open$4 AND clos$4 AND circuit$4 AND (within WITH frame) AND hing$4 AND conduct$4 AND coupl$4 AND lens$4 AND indicat$4 AND embed$4 AND antenna AND side AND view AND audio AND microphone	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM
L41	544	(eyewear OR spectale OR eyeglass$4 OR glass$4) AND frame AND (arm OR temple) AND sensor AND	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA,	OR	ON	ON	2023/12/11 03:33 PM

		(batter$4 WITH charg$4) AND control$4 AND connect$4 AND electric$4 AND (wireless WITH communicat$4) AND position AND open$4 AND clos$4 AND circuit$4 AND (within WITH frame) AND hing$4 AND conduct$4 AND coupl$4 AND lens$4 AND indicat$4 AND embed$4 AND antenna AND side AND view AND audio AND microphone AND diode AND output	EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L42	520	(eyewear OR spectale OR eyeglass$4 OR glass$4) AND frame AND (arm OR temple) AND sensor AND (batter$4 WITH charg$4) AND control$4 AND connect$4 AND electric$4 AND (wireless WITH communicat$4) AND position AND open$4 AND clos$4 AND circuit$4 AND (within WITH frame) AND hing$4 AND conduct$4 AND coupl$4 AND lens$4 AND indicat$4 AND embed$4 AND antenna AND side AND view AND audio AND microphone AND diode AND output AND front AND section	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM
L43	464	(eyewear OR spectale OR eyeglass$4 OR glass$4) AND frame AND (arm OR temple) AND sensor AND (batter$4 WITH charg$4) AND control$4 AND connect$4 AND electric$4 AND (wireless WITH communicat$4) AND position AND open$4 AND clos$4 AND circuit$4 AND (within WITH frame) AND	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT;	OR	ON	ON	2023/12/11 03:33 PM

		hing$4 AND conduct$4 AND coupl$4 AND lens$4 AND indicat$4 AND embed$4 AND antenna AND side AND view AND audio AND microphone AND diode AND output AND front AND section AND information AND place AND expos$4	IBM_TDB)				
L44	319	(eyewear OR spectale OR eyeglass$4 OR glass$4) AND frame AND (arm OR temple) AND sensor AND (batter$4 WITH charg$4) AND control$4 AND connect$4 AND electric$4 AND (wireless WITH communicat$4) AND position AND open$4 AND clos$4 AND circuit$4 AND (within WITH frame) AND hing$4 AND conduct$4 AND coupl$4 AND lens$4 AND indicat$4 AND embed$4 AND antenna AND side AND view AND audio AND microphone AND diode AND output AND front AND section AND information AND place AND expos$4 AND pin	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM
L45	317	(eyewear OR spectale OR eyeglass$4 OR glass$4) AND frame AND (arm OR temple) AND sensor AND (batter$4 WITH charg$4) AND control$4 AND connect$4 AND electric$4 AND (wireless WITH communicat$4) AND position AND open$4 AND clos$4 AND circuit$4 AND (within WITH frame) AND hing$4 AND conduct$4 AND coupl$4 AND lens$4 AND indicat$4 AND embed$4 AND antenna AND side AND	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM

		view AND audio AND microphone AND diode AND output AND front AND section AND information AND place AND expos$4 AND pin AND pad					
L46	0	(eyewear OR spectale OR eyeglass$4 OR glass$4) AND frame AND (arm OR temple) AND sensor AND (batter$4 WITH charg$4) AND control$4 AND connect$4 AND electric$4 AND (wireless WITH communicat$4) AND position AND open$4 AND clos$4 AND circuit$4 AND (within WITH frame) AND hing$4 AND conduct$4 AND coupl$4 AND lens$4 AND indicat$4 AND embed$4 AND antenna AND side AND view AND audio AND microphone AND diode AND output AND front AND section AND information AND place AND expos$4 AND pin AND pad AND endpiece	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM
L47	32	((("HOWELL") near3 ("Thomas")) OR (("CHAO") near3 ("David")) OR (("THOMAS") near3 ("C")) OR (("TONG") near3 ("Peter"))).INV. AND (eyewear OR spectale OR eyeglass$4 OR glass$4) AND frame AND (arm OR temple) AND sensor AND (batter$4 WITH charg$4) AND control$4 AND connect$4 AND electric$4 AND (wireless WITH communicat$4) AND position AND open$4 AND clos$4 AND circuit$4 AND (within	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM

		WITH frame) AND hing$4 AND conduct$4 AND coupl$4 AND lens$4 AND indicat$4 AND embed$4 AND antenna AND side AND view AND audio AND microphone AND diode AND output AND front AND section AND information AND place AND expos$4					
L48	3433	L1 AND ((G02B2027/0178 OR G02B27/017 OR G02B27/0172 OR G02B2027/014 OR G02B2027/0138 OR G02B27/0093 OR G02B2027/0187 OR G02B27/0176 OR G02B2027/0118 OR G02B27/0101 OR G02B2027/0134 OR G02B27/01 OR G02B2027/0174 OR G02B27/0179 OR G02B2027/012 OR G02B6/005 OR G02B2027/0141 OR G02B6/00 OR G02B6/0076 OR G02B27/0081 OR G02B2027/0132 OR G02B2027/0123 OR G02B6/0016 OR G02B2027/011 OR G02B2027/0156 OR G02B6/0023 OR G02B27/30 OR G02B2027/0125 OR G02B27/144 OR G02B6/0036 OR G02B6/34 OR G02B6/0038 OR G02B2027/0127 OR G02B7/285 OR G02B27/283 OR G02B3/0081 OR G02B27/1086 OR G02B5/3025 OR G02B7/28 OR G02B5/1857 OR G02B6/0088 OR G02B5/1866 OR G02B6/0068 OR G02B27/0018 OR G02B6/0035 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM

		G02B7/008 OR G02B5/1871 OR G02B2027/0112 OR G02B2027/0114 OR G02B2027/0147 OR G02B2027/0159 OR G02B5/1823 OR G02B6/003 OR G02B6/29325 OR G02B2027/0154 OR G02B27/0149 OR G02B3/14 OR G02B6/0001 OR G02B6/006 OR G02B6/0028 OR G02B6/0018 OR G02B2027/015 OR G02B2027/0181 OR G02B27/022 OR G02B6/0065 OR G02B2027/0169 OR G02B27/028 OR G02B5/208 OR G02B6/002 OR G02B19/0061 OR G02B2027/013 OR G02B7/09 OR G02B27/02 OR G02B2027/0161 OR G02B26/10 OR G02B6/0031 OR G02B6/0053 OR G02B27/4272 OR G02B19/0042 OR G02B26/0833 OR G02B19/0052 OR G02B6/009 OR G02B2027/0152 OR G02B27/0103 OR G02B27/20 OR G02B13/001 OR G02B13/06 OR G02B2027/0163 OR G02B5/005 OR G02B26/001 OR G02B27/64 OR G02B5/30 OR G02B7/02 OR G02B7/021 OR G02B7/102 OR G02B27/646 OR G02B5/32 OR G02B6/001 OR G02B6/0055 OR G02B13/0045 OR G02B27/0006 OR G02B6/0006 OR G02B13/14 OR					

		G02B5/3016 OR G02B5/18 OR G02B5/20 OR G02B6/0011 OR G02B7/08 OR G02B2027/0107 OR G02B27/0972 OR G02B27/4205 OR G02B3/0056 OR G02B30/24 OR G02B6/0078 OR G02B6/0085 OR G02B2027/0116 OR G02B2027/0158 OR G02B2027/0185 OR G02B2027/0198 OR G02B27/0944 OR G02B27/0955 OR G02B7/12 OR G02B2027/0143 OR G02B2027/0167 OR G02B26/00 OR G02B27/0977 OR G02B30/00 OR G02B30/34 OR G02B5/201 OR G02B7/04 OR G02B9/62 OR G02B5/0263 OR G02B6/0051 OR G02B6/0075 OR G02B6/42 OR G02B13/00 OR G02B3/0006 OR G02B6/0045 OR G02B6/02085 OR G02B9/60 OR G02B13/004 OR G02B27/0189 OR G02B27/0905 OR G02B3/08 OR G02B30/27 OR G02B30/30 OR G02B13/0015 OR G02B15/14 OR G02B2027/0136 OR G02B25/004 OR G02B26/101 OR G02B6/2848 OR G02B9/34 OR G02B13/009 OR G02B15/142 OR G02B23/125 OR G02B26/0875 OR G02B27/00 OR G02B27/0075 OR G02B27/14 OR G02B27/425 OR					

		G02B3/0075 OR G02B30/36 OR G02B6/0008 OR G02B6/0015 OR G02B6/0025 OR G02B7/003 OR G02B7/182 OR G02B7/38 OR G02B19/0028 OR G02B2027/0196 OR G02B26/02 OR G02B26/105 OR G02B27/48 OR G02B5/205 OR G02B6/0033 OR G02B7/006 OR G02B7/025 OR G02B9/16 OR G02B13/18 OR G02B23/2484 OR G02B27/0961 OR G02B27/106 OR G02B27/146 OR G02B27/40 OR G02B27/4233 OR G02B27/4288 OR G02B3/0043 OR G02B3/10 OR G02B30/26 OR G02B30/33 OR G02B5/003 OR G02B5/0294 OR G02B5/23 OR G02B6/0083 OR G02B6/0086 OR G02B6/32 OR G02B9/10).cpc.)					
L49	1197	L1 AND ((G02C11/10 OR G02C7/101 OR G02C7/083 OR G02C11/06 OR G02C7/04 OR G02C7/06 OR G02C7/08 OR G02C7/02 OR G02C2202/20 OR G02C5/146 OR G02C2202/16 OR G02C2202/18 OR G02C2202/22 OR G02C5/14 OR G02C11/00 OR G02C7/061 OR G02C7/102 OR G02C7/022 OR G02C5/16 OR G02C2202/12 OR G02C7/049 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM

		G02C7/066 OR G02C3/003 OR G02C2200/08 OR G02C5/143 OR G02C11/04 OR G02C7/16 OR G02C5/02 OR G02C7/086 OR G02C5/001 OR G02C9/00 OR G02C7/10 OR G02C7/088 OR G02C5/22 OR G02C7/041 OR G02C5/12 OR G02C2202/24 OR G02C9/02 OR G02C5/008 OR G02C5/10 OR G02C2202/10 OR G02C5/2209 OR G02C2200/02 OR G02C7/081 OR G02C7/104 OR G02C7/085 OR G02C1/00 OR G02C7/12 OR G02C9/04 OR G02C7/14 OR G02C1/10 OR G02C2200/26 OR G02C3/006 OR G02C5/006 OR G02C7/107).cpc.)					
L50	1691	L4 AND ((G02B2027/0178 OR G02B27/017 OR G02B2027/014 OR G02B27/0172 OR G02B2027/0138 OR G02B27/0176 OR G02B27/0093 OR G02B2027/0187 OR G02B2027/0118 OR G02B27/0101 OR G02B2027/012 OR G02B6/0076 OR G02B6/005 OR G02B2027/0174 OR G02B6/00 OR G02B27/30 OR G02B6/0016 OR G02B6/0036 OR G02B2027/0156 OR G02B2027/0125 OR G02B27/01 OR G02B6/0023 OR G02B6/0038 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM

		G02B27/283 OR G02B2027/011 OR G02B2027/0132 OR G02B2027/0134 OR G02B27/0081 OR G02B7/008 OR G02B27/0179 OR G02B27/1086 OR G02B5/1857 OR G02B5/1866 OR G02B2027/0114 OR G02B27/0018 OR G02B5/1823 OR G02B5/1871 OR G02B5/3025 OR G02B6/0035 OR G02B6/0088 OR G02B6/29325 OR G02B6/34 OR G02B6/0068 OR G02B6/003 OR G02B6/0001 OR G02B6/006 OR G02B6/0028 OR G02B6/0018 OR G02B27/022 OR G02B2027/0169 OR G02B2027/0141 OR G02B3/14 OR G02B6/002 OR G02B2027/0159 OR G02B27/028 OR G02B2027/0123 OR G02B2027/0154 OR G02B6/0053 OR G02B6/0065 OR G02B19/0061 OR G02B19/0042 OR G02B19/0052 OR G02B2027/0127 OR G02B27/144 OR G02B6/0031 OR G02B6/009 OR G02B27/0149 OR G02B5/208 OR G02B7/09 OR G02B27/02 OR G02B27/64 OR G02B2027/0147 OR G02B6/001 OR G02B26/001 OR G02B26/10 OR G02B2027/013 OR G02B2027/0161 OR G02B6/0078 OR G02B6/0085 OR G02B2027/0167 OR G02B27/0006 OR					

		G02B27/646 OR G02B6/0011 OR G02B7/021 OR G02B2027/0112 OR G02B2027/015 OR G02B5/005 OR G02B5/201 OR G02B6/0075 OR G02B2027/0158 OR G02B2027/0163 OR G02B5/0263 OR G02B5/30 OR G02B6/0045 OR G02B6/0051 OR G02B6/0055 OR G02B2027/0152 OR G02B27/20 OR G02B6/0006 OR G02B6/42 OR G02B7/102 OR G02B26/00 OR G02B7/02 OR G02B13/009 OR G02B26/0833 OR G02B27/14 OR G02B3/0075 OR G02B5/20 OR G02B6/0025 OR G02B7/08 OR G02B7/38 OR G02B2027/0136 OR G02B27/48 OR G02B5/205 OR G02B7/003 OR G02B7/025 OR G02B13/001 OR G02B15/142 OR G02B2027/0143 OR G02B27/00 OR G02B27/0103 OR G02B27/106 OR G02B27/146 OR G02B27/4272 OR G02B3/10 OR G02B30/34 OR G02B5/0294 OR G02B6/0015 OR G02B6/0083 OR G02B6/0086 OR G02B6/32 OR G02B7/12 OR G02B13/0045 OR G02B26/0875 OR G02B3/08 OR G02B6/0021 OR G02B7/006 OR G02B7/182 OR G02B15/00 OR					

		G02B17/08 OR G02B2003/0093 OR G02B2027/0116 OR G02B25/02 OR G02B26/06 OR G02B26/0841 OR G02B27/08 OR G02B27/0972 OR G02B3/0006 OR G02B30/36 OR G02B5/18 OR G02B7/023 OR G02B7/026 OR G02B7/028 OR G02B9/62 OR G02B13/06 OR G02B13/14 OR G02B2027/0107 OR G02B2027/0181 OR G02B2027/0185 OR G02B2027/0196 OR G02B21/0012 OR G02B26/02 OR G02B27/0012 OR G02B27/0075 OR G02B27/04 OR G02B27/0955 OR G02B3/005 OR G02B3/0087 OR G02B30/27 OR G02B30/30 OR G02B5/122 OR G02B5/3016 OR G02B7/1827).cpc.)					
L51	658	L4 AND ((G02C11/10 OR G02C11/06 OR G02C7/101 OR G02C5/16 OR G02C7/083 OR G02C3/003 OR G02C7/04 OR G02C5/146 OR G02C5/14 OR G02C5/143 OR G02C11/00 OR G02C7/06 OR G02C2200/08 OR G02C7/16 OR G02C5/001 OR G02C5/02 OR G02C7/02 OR G02C5/12 OR G02C5/22 OR G02C9/00 OR G02C2200/02 OR G02C7/10 OR G02C7/086 OR G02C7/08 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM

		G02C1/00 OR G02C11/04 OR G02C5/008 OR G02C9/04 OR G02C5/10 OR G02C2202/10 OR G02C5/2209 OR G02C2200/26 OR G02C9/02 OR G02C1/10 OR G02C3/006 OR G02C5/2263 OR G02C7/104 OR G02C2200/28 OR G02C5/006 OR G02C5/2227 OR G02C7/041 OR G02C7/081).cpc.)					
L52	472	L6 AND ((G02B2027/0178 OR G02B27/017 OR G02B27/0172 OR G02B2027/014 OR G02B27/0176 OR G02B27/0093 OR G02B2027/0138 OR G02B6/0076 OR G02B2027/0118 OR G02B6/005 OR G02B27/0101 OR G02B6/0036 OR G02B6/0016 OR G02B2027/0174 OR G02B6/0038 OR G02B7/008 OR G02B2027/012 OR G02B27/0081 OR G02B2027/0114 OR G02B2027/0125 OR G02B27/0018 OR G02B27/1086 OR G02B27/283 OR G02B27/30 OR G02B5/1823 OR G02B5/1857 OR G02B5/1866 OR G02B5/1871 OR G02B5/3025 OR G02B6/0023 OR G02B6/0035 OR G02B6/29325 OR G02B6/34 OR G02B2027/0156 OR G02B2027/0132 OR G02B2027/0187 OR G02B6/0068 OR G02B6/0018 OR G02B6/0028 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM

		G02B6/006 OR G02B6/003 OR G02B6/0088 OR G02B2027/011 OR G02B2027/0169 OR G02B27/0179 OR G02B27/022 OR G02B27/028 OR G02B6/002 OR G02B6/0065 OR G02B27/0149 OR G02B6/0053 OR G02B6/0078 OR G02B6/0085 OR G02B6/0031 OR G02B6/009 OR G02B2027/0159 OR G02B6/0011 OR G02B6/0075 OR G02B2027/0134 OR G02B5/30 OR G02B5/0263 OR G02B3/14 OR G02B2027/0112 OR G02B2027/0158 OR G02B26/00 OR G02B3/08 OR G02B2027/0161 OR G02B2027/0123 OR G02B2027/013 OR G02B2027/0143 OR G02B2027/0147 OR G02B2027/0116 OR G02B2027/0127 OR G02B2027/0167 OR G02B27/0103 OR G02B27/04 OR G02B27/40 OR G02B3/0006 OR G02B3/005 OR G02B5/18 OR G02B6/0051 OR G02B6/0055 OR G02B6/0083 OR G02B6/12009 OR G02B2027/0152 OR G02B2027/0154 OR G02B2027/0163 OR G02B2207/113 OR G02B2207/115 OR G02B26/004 OR G02B27/0075 OR G02B27/01 OR G02B27/18 OR G02B27/281 OR G02B27/4272 OR G02B5/23 OR G02B5/3058 OR					

		G02B6/0045 OR G02B6/0056 OR G02B6/12019 OR G02B6/42 OR G02B2003/0093 OR G02B2027/0141 OR G02B2027/015 OR G02B26/10 OR G02B27/02 OR G02B27/64 OR G02B3/0081 OR G02B3/10 OR G02B30/00 OR G02B30/34 OR G02B5/04 OR G02B5/1842 OR G02B5/28 OR G02B6/00 OR G02B6/001 OR G02B7/38).cpc.)					
L53	389	L6 AND ((G02C11/10 OR G02C11/06 OR G02C5/16 OR G02C3/003 OR G02C7/101 OR G02C5/143 OR G02C5/146 OR G02C7/083 OR G02C5/14 OR G02C2200/08 OR G02C7/16 OR G02C11/00 OR G02C5/001 OR G02C7/06 OR G02C5/22 OR G02C5/02 OR G02C7/02 OR G02C1/00 OR G02C5/12 OR G02C2200/02 OR G02C9/00 OR G02C5/2209 OR G02C5/008 OR G02C7/086 OR G02C11/04 OR G02C5/10 OR G02C7/10 OR G02C9/04 OR G02C2200/26 OR G02C7/08 OR G02C2200/28 OR G02C5/006 OR G02C5/2227 OR G02C9/02 OR G02C7/104 OR G02C1/08 OR G02C1/10 OR G02C11/08 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM

		G02C2200/22 OR G02C5/2236 OR G02C5/2263 OR G02C5/2272 OR G02C7/081 OR G02C11/02 OR G02C5/2218).cpc.)					
L54	368	L13 AND ((G02B2027/0178 OR G02B27/017 OR G02B27/0172 OR G02B2027/014 OR G02B27/0176 OR G02B27/0093 OR G02B2027/0138 OR G02B2027/0118 OR G02B6/0076 OR G02B6/005 OR G02B6/0016 OR G02B6/0036 OR G02B6/0038 OR G02B7/008 OR G02B2027/012 OR G02B2027/0174 OR G02B27/0081 OR G02B2027/0114 OR G02B2027/0125 OR G02B27/0018 OR G02B27/1086 OR G02B27/283 OR G02B27/30 OR G02B5/1823 OR G02B5/1857 OR G02B5/1866 OR G02B5/1871 OR G02B5/3025 OR G02B6/0023 OR G02B6/0035 OR G02B6/29325 OR G02B6/34 OR G02B2027/0156 OR G02B2027/0132 OR G02B27/0101 OR G02B2027/0187 OR G02B2027/0169 OR G02B27/022 OR G02B27/028 OR G02B2027/011 OR G02B27/0179 OR G02B6/0018 OR G02B6/0028 OR G02B6/003 OR G02B6/006 OR G02B6/0068 OR G02B6/0088 OR G02B6/0053 OR G02B6/0011 OR G02B6/002 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM

		G02B6/0065 OR G02B6/0031 OR G02B6/0075 OR G02B6/0078 OR G02B6/0085 OR G02B6/009 OR G02B5/30 OR G02B2027/0134 OR G02B5/0263 OR G02B3/14 OR G02B27/0149 OR G02B2027/0112 OR G02B26/00 OR G02B2027/0123 OR G02B2027/013 OR G02B2027/0143 OR G02B2027/0147 OR G02B2027/0159 OR G02B2027/0116 OR G02B2027/0127 OR G02B2027/0161 OR G02B27/0103 OR G02B27/40 OR G02B3/0006 OR G02B3/005 OR G02B5/18 OR G02B6/12009 OR G02B2027/0154 OR G02B2027/0163 OR G02B2207/113 OR G02B2207/115 OR G02B26/004 OR G02B27/0075 OR G02B27/4272 OR G02B5/23 OR G02B5/3058 OR G02B6/0045 OR G02B6/0056 OR G02B6/12019 OR G02B2003/0093 OR G02B2027/0141 OR G02B2027/015 OR G02B2027/0152 OR G02B2027/0167 OR G02B26/10 OR G02B27/01 OR G02B27/02 OR G02B27/04 OR G02B3/0081 OR G02B3/10 OR G02B30/34 OR G02B5/04 OR G02B5/1842 OR G02B5/28 OR G02B6/00 OR G02B6/001).cpc.)					
L55	301	L13 AND ((G02C11/10 OR G02C11/06 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP,	OR	ON	ON	2023/12/11 03:33 PM

		G02C5/16 OR G02C5/143 OR G02C3/003 OR G02C5/14 OR G02C7/101 OR G02C5/146 OR G02C7/083 OR G02C2200/08 OR G02C5/001 OR G02C5/22 OR G02C7/02 OR G02C1/00 OR G02C5/02 OR G02C5/12 OR G02C9/00 OR G02C7/06 OR G02C7/16 OR G02C11/00 OR G02C5/008 OR G02C5/2209 OR G02C2200/02 OR G02C5/10 OR G02C7/10 OR G02C7/08 OR G02C7/086 OR G02C2200/26 OR G02C5/006 OR G02C9/02 OR G02C9/04 OR G02C1/10 OR G02C11/08 OR G02C5/2236 OR G02C5/2263 OR G02C5/2272 OR G02C7/081 OR G02C11/02 OR G02C2200/28 OR G02C5/2218 OR G02C5/2227).cpc.)	AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L56	308	L17 AND ((G02B2027/0178 OR G02B27/017 OR G02B27/0172 OR G02B2027/014 OR G02B27/0093 OR G02B27/0176 OR G02B2027/0118 OR G02B2027/0138 OR G02B6/0076 OR G02B6/0016 OR G02B6/0036 OR G02B6/005 OR G02B6/0038 OR G02B7/008 OR G02B2027/012 OR G02B2027/0174 OR G02B2027/0114 OR G02B2027/0125 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM

		G02B27/0018 OR G02B27/0081 OR G02B27/1086 OR G02B27/283 OR G02B27/30 OR G02B5/1823 OR G02B5/1857 OR G02B5/1866 OR G02B5/1871 OR G02B5/3025 OR G02B6/0023 OR G02B6/0035 OR G02B6/29325 OR G02B6/34 OR G02B2027/0132 OR G02B2027/0156 OR G02B27/0101 OR G02B2027/0169 OR G02B27/022 OR G02B27/028 OR G02B2027/0187 OR G02B2027/011 OR G02B27/0179 OR G02B6/0018 OR G02B6/0028 OR G02B6/003 OR G02B6/006 OR G02B6/0068 OR G02B6/0088 OR G02B6/0011 OR G02B6/0031 OR G02B6/0075 OR G02B6/0078 OR G02B6/0085 OR G02B6/009 OR G02B5/30 OR G02B6/0053 OR G02B2027/0134 OR G02B27/0149 OR G02B3/14 OR G02B6/002 OR G02B6/0065 OR G02B2027/0112 OR G02B26/00 OR G02B2027/013 OR G02B2027/0147 OR G02B2027/0123 OR G02B2027/0127 OR G02B2027/0161 OR G02B27/0103 OR G02B27/40 OR G02B3/0006 OR G02B5/18 OR G02B6/12009 OR G02B2027/0154 OR G02B2207/113 OR G02B2207/115 OR G02B27/0075 OR					

		G02B5/23 OR G02B5/3058 OR G02B6/0045 OR G02B6/0056 OR G02B6/12019 OR G02B2027/0141 OR G02B2027/015 OR G02B2027/0152 OR G02B2027/0167 OR G02B26/10 OR G02B27/04 OR G02B30/34 OR G02B5/04 OR G02B5/1842 OR G02B5/28 OR G02B6/00).cpc.)					
L57	247	L17 AND ((G02C11/10 OR G02C11/06 OR G02C5/16 OR G02C3/003 OR G02C5/143 OR G02C5/146 OR G02C5/14 OR G02C2200/08 OR G02C7/101 OR G02C7/083 OR G02C5/001 OR G02C1/00 OR G02C7/06 OR G02C7/16 OR G02C11/00 OR G02C7/08 OR G02C7/086 OR G02C5/2209 OR G02C9/00 OR G02C1/10 OR G02C5/2236 OR G02C7/081 OR G02C11/02 OR G02C5/2218).cpc.)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM
L58	124	L21 AND ((G02B27/017 OR G02B2027/0178 OR G02B27/0093 OR G02B2027/014 OR G02B27/0172 OR G02B2027/0187 OR G02B2027/0118 OR G02B6/0018 OR G02B6/0028 OR G02B6/003 OR G02B6/006 OR G02B6/0068 OR G02B6/0076 OR G02B6/0088 OR G02B2027/0138 OR G02B6/0011 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM

		G02B6/0016 OR G02B6/0031 OR G02B6/0036 OR G02B6/0075 OR G02B6/0078 OR G02B6/0085 OR G02B6/009 OR G02B27/0176 OR G02B5/30 OR G02B6/0053 OR G02B27/0101 OR G02B6/002 OR G02B6/005 OR G02B6/0065 OR G02B2027/0112 OR G02B2027/0147 OR G02B2027/0127 OR G02B2027/0132 OR G02B27/0149 OR G02B5/18 OR G02B6/12009 OR G02B2027/011 OR G02B2027/0123 OR G02B2027/0134 OR G02B2207/113 OR G02B2207/115 OR G02B27/0075 OR G02B5/23 OR G02B5/3058 OR G02B6/0038 OR G02B6/0045 OR G02B6/0056 OR G02B6/12019 OR G02B7/008 OR G02B2027/012 OR G02B2027/0141 OR G02B2027/0167 OR G02B5/04 OR G02B5/1842 OR G02B5/28 OR G02B6/00).cpc.)					
L59	47	L21 AND ((G02C11/10 OR G02C5/143 OR G02C5/001 OR G02C5/14 OR G02C11/06 OR G02C7/086 OR G02C7/08 OR G02C9/00 OR G02C11/00 OR G02C2200/08 OR G02C5/146).cpc.)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM

L60	175	L1 AND ((351/158 OR 351/41 OR 351/159.39 OR 351/159.03 OR 351/121 OR 351/159.01 OR 351/159.42 OR 351/246 OR 351/124 OR 351/210 OR 351/216 OR 351/111 OR 351/113 OR 351/159.41 OR 351/159.46 OR 351/116 OR 351/159.4 OR 351/159.44 OR 351/159.75 OR 351/222 OR 351/228 OR 351/114 OR 351/119 OR 351/131 OR 351/159.08 OR 351/159.6 OR 351/159.78 OR 351/204 OR 351/205 OR 351/233 OR 351/47 OR 351/110 OR 351/118 OR 351/125 OR 351/132 OR 351/133 OR 351/135 OR 351/136 OR 351/153 OR 351/156 OR 351/157 OR 351/159.02 OR 351/159.1 OR 351/159.31 OR 351/159.56 OR 351/159.62 OR 351/159.68 OR 351/159.71 OR 351/159.73 OR 351/159.74 OR 351/206 OR 351/209 OR 351/211 OR 351/219 OR 351/239 OR 351/51 OR 351/57 OR 351/74).ccls.)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM
L61	56	L1 AND ((359/630 OR 359/13 OR 359/633 OR 359/838 OR 359/265 OR 359/267 OR 359/275 OR 359/631 OR 359/269 OR 359/273 OR 359/567 OR 359/632 OR 359/14 OR 359/197.1 OR 359/214.1 OR 359/223.1 OR 359/244 OR 359/245 OR 359/247 OR 359/256 OR 359/266 OR 359/291 OR 359/296 OR 359/358 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM

		359/466 OR 359/554 OR 359/627 OR 359/844 OR 359/846 OR 359/851 OR 359/866 OR 359/871 OR 359/872 OR 359/886).ccls.)					
L62	88	L4 AND ((351/158 OR 351/41 OR 351/111 OR 351/121 OR 351/124 OR 351/113 OR 351/114 OR 351/159.39 OR 351/159.78 OR 351/116 OR 351/119 OR 351/125 OR 351/132 OR 351/133 OR 351/156 OR 351/157 OR 351/159.01 OR 351/159.56 OR 351/159.75 OR 351/204 OR 351/205 OR 351/206 OR 351/210 OR 351/219 OR 351/246 OR 351/47 OR 351/51 OR 351/74).ccls.)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM
L63	30	L4 AND ((359/630 OR 359/13 OR 359/838 OR 359/267 OR 359/633 OR 359/197.1 OR 359/223.1 OR 359/245 OR 359/247 OR 359/265 OR 359/273 OR 359/275 OR 359/291 OR 359/358 OR 359/554 OR 359/567 OR 359/627 OR 359/631 OR 359/632 OR 359/844 OR 359/846 OR 359/871 OR 359/872 OR 359/886).ccls.)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM
L64	71	L6 AND ((351/158 OR 351/41 OR 351/111 OR 351/121 OR 351/113 OR 351/114 OR 351/124 OR 351/159.39 OR 351/116 OR 351/119 OR 351/125 OR 351/132 OR 351/133 OR 351/156 OR 351/157 OR 351/159.75 OR 351/159.78 OR 351/47 OR 351/74).ccls.)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT;	OR	ON	ON	2023/12/11 03:33 PM

			IBM_TDB)				
L65	11	L6 AND ((359/630 OR 359/13 OR 359/358 OR 359/554 OR 359/567 OR 359/632 OR 359/886).ccls.)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM
L66	4719	351/158,41,111.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM
L67	1918	351/121,123,124.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM
L68	994	359/13.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV,	OR	ON	ON	2023/12/11 03:33 PM

			MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L69	7622	359/629-633.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM
L70	3402	381/381,327,328.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM
L71	3460	381/370,380.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM
L72	789	g02c1/00.cpc.	(US-PGPUB; USPAT;	OR	ON	ON	2023/12/11

			USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				03:33 PM
L73	16424	g02c11/10.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM
L74	2896	g02c11/06.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM
L75	3099	g02c5/001.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO,	OR	ON	ON	2023/12/11 03:33 PM

			NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L76	3949	g02c5/02.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM
L77	4712	g02c5/14.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM
L78	5034	g02c5/22.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM
L79	4635	g02c5/143.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY,	OR	ON	ON	2023/12/11 03:33 PM

			CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L80	4888	g02c5/146.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM
L81	5935	g02c2200/08.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM
L82	34429	g02b27/01.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK,	OR	ON	ON	2023/12/11 03:33 PM

			TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L83	68456	g02b27/017.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM
L84	26298	g02b27/0176.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM
L85	33028	h02j7/0045.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:33 PM
L93	45	(Artificial Intelligence) Similar to: 16/182,969 with 0 CPC Selections and 0 Text Selections	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA,	OR	ON	ON	2023/12/11 03:33 PM

		Text: (US-11086147-B2 OR US-10330956-B2 OR US-20210364828-A1 OR US-9033493-B2 OR US-20190033623-A1 OR US-20090296044-A1 OR US-9690121-B2 OR US-8109629-B2 OR US-20220260859-A1 OR US-20170131575-A1 OR US-20190187492-A1 OR US-20210364827-A9 OR US-20120133885-A1 OR US-20150253590-A1 OR US-20100309426-A1 OR US-8465151-B2 OR US-20130201440-A1 OR US-20170146829-A1 OR US-11204512-B2 OR CN-113330355-A OR KR-20210110726-A OR EP-3914960-A1 OR WO-2020154047-A1 OR US-20200233238-A1 OR US-20190113774-A1 OR US-11156855-B2 OR EP-3455670-A1 OR WO-2017196294-A1 OR US-11668958-B2 OR US-20220113562-A1 OR US-7581833-B2 OR US-8905542-B2 OR US-20070046887-A1 OR CN-113454521-A OR KR-20210127221-A OR EP-3928149-A1 OR WO-2020172138-A1 OR US-20200271961-A1 OR CA-3103299-A1 OR US-20210191159-A1 OR US-20230204985-A1 OR DE-102020102281-A1 OR KR-102077483-B1 OR CH-718397-A2 OR TW-M583054-U OR FR-3126050-A3 OR CH-718869-A2 OR AT-525342-B1 OR AU-2022201400-A1 OR CA-3149165-A1).did.	EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN))				
L94	45	(Artificial Intelligence)	(US-PGPUB; USPAT;	OR	ON	ON	2023/12/11

		Similar to: 16/182,969 with 0 CPC Selections and 6 Text Selections Text: (US-11204512-B2 OR US-11086147-B2 OR US-9690121-B2 OR US-8905542-B2 OR MX-PA99011222-A OR US-10330956-B2 OR US-20220260859-A1 OR US-10777048-B2 OR US-11536988-B2 OR US-20170131575-A1 OR US-10310296-B2 OR US-11721183-B2 OR US-20130329183-A1 OR EP-3377934-B1 OR US-8500271-B2 OR US-20170168316-A1 OR US-10031345-B2 OR AU-2016373687-A1 OR CA-3008656-A1 OR AU-2016373687-B2 OR WO-2017105647-A1 OR US-20080151179-A1 OR US-10345625-B2 OR KR-20150040032-A OR CN-218547168-U OR US-20230026477-A1 OR US-9547184-B2 OR US-20230054967-A1 OR US-11330165-B2 OR US-20190318589-A1 OR US-9033493-B2 OR KR-102240087-B1 OR US-10444544-B2 OR US-20180252946-A1 OR US-20220011604-A1 OR US-20200012127-A1 OR US-7192136-B2 OR US-7621634-B2 OR US-7438410-B1 OR EP-3519892-B1 OR EP-3519892-A1 OR WO-2018064195-A1 OR US-20180091729-A1 OR US-11470936-B2 OR US-20210298440-A1 OR US-20050078274-A1 OR US-7922321-B2 OR US-10708488-B2 OR EP-3341785-B1 OR	USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN))				03:33 PM

		US-20220417418-A1).did.					
L95	44	(Artificial Intelligence) Similar to: 16/182,969 with 2 CPC Selections and 6 Text Selections Text: (US-11086147-B2 OR US-10330956-B2 OR US-9690121-B2 OR US-11204512-B2 OR US-20220260859-A1 OR US-8905542-B2 OR US-9033493-B2 OR US-20210364828-A1 OR US-20090296044-A1 OR US-20170131575-A1 OR US-20190033623-A1 OR US-20210364827-A9 OR US-20190187492-A1 OR US-8109629-B2 OR MX-PA99011222-A OR US-20120133885-A1 OR US-20150253590-A1 OR CN-111538173-B OR CN-111538173-A OR US-10777048-B2 OR US-20100309426-A1 OR WO-2022231768-A1 OR US-11536988-B2 OR US-8465151-B2 OR US-20170255029-A1 OR WO-2018058130-A1 OR EP-3515232-A1 OR US-20180090958-A1 OR KR-20190054144-A OR EP-3539285-A1 OR US-20170146829-A1 OR CN-114545635-A OR KR-20210110726-A OR US-20130201440-A1 OR EP-3914960-A1 OR WO-2020154047-A1 OR US-20200233238-A1 OR KR-20210080253-A OR KR-20230003284-A OR WO-2021227975-A1 OR CA-3103299-A1 OR US-20210191159-A1 OR CN-113009715-A OR EP-4152079-A1 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN))	OR	ON	ON	2023/12/11 03:33 PM

		US-20230054967-A1 OR JP-2023524838-A OR CN-113467103-A OR JP-2022517538-A OR DE-102020102281-A1 OR US-20230060657-A1).did.					
L96	45	(Artificial Intelligence) Similar to: 16/182,969 with 5 CPC Selections and 6 Text Selections Text: (US-11086147-B2 OR US-9690121-B2 OR US-10330956-B2 OR US-20220260859-A1 OR US-20170131575-A1 OR US-9033493-B2 OR US-11204512-B2 OR US-20210364828-A1 OR US-20100309426-A1 OR US-20090296044-A1 OR US-8465151-B2 OR US-20190033623-A1 OR US-20210364827-A9 OR US-20190187492-A1 OR US-8109629-B2 OR US-20170146829-A1 OR US-20130201440-A1 OR US-20120133885-A1 OR US-20150253590-A1 OR US-20190113774-A1 OR US-11156855-B2 OR EP-3455670-A1 OR WO-2017196294-A1 OR US-11668958-B2 OR US-20220113562-A1 OR CN-113454521-A OR KR-20210127221-A OR EP-3928149-A1 OR WO-2020172138-A1 OR US-20200271961-A1 OR US-8905542-B2 OR CN-113330355-A OR US-7581833-B2 OR US-20070046887-A1 OR KR-20210110726-A OR EP-3914960-A1 OR WO-2020154047-A1 OR US-20200233238-A1 OR KR-102077483-B1 OR TW-M583054-U	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN))	OR	ON	ON	2023/12/11 03:33 PM

		OR CH-718397-A2 OR KR-102006414-B1 OR US-9720260-B2 OR KR-20200063030-A OR US-9081212-B1 OR US-20220390766-A1 OR WO-2014201213-A1 OR CH-718397-B1 OR US-20180011344-A1 OR US-20150286074-A1).did.					
L97	45	(Artificial Intelligence) Similar to: 16/182,969 with 7 CPC Selections and 6 Text Selections Text: (US-11086147-B2 OR US-10330956-B2 OR US-9690121-B2 OR US-9033493-B2 OR US-20210364828-A1 OR US-20220260859-A1 OR US-20090296044-A1 OR US-20170131575-A1 OR US-20190033623-A1 OR US-20190187492-A1 OR US-20210364827-A9 OR US-8109629-B2 OR US-20120133885-A1 OR US-20150253590-A1 OR US-20100309426-A1 OR US-8465151-B2 OR US-20170146829-A1 OR US-20130201440-A1 OR CN-113330355-A OR KR-20210110726-A OR WO-2020154047-A1 OR EP-3914960-A1 OR US-20200233238-A1 OR US-11204512-B2 OR US-20190113774-A1 OR US-11156855-B2 OR EP-3455670-A1 OR WO-2017196294-A1 OR US-11668958-B2 OR US-20220113562-A1 OR CN-113454521-A OR CA-3103299-A1 OR US-20210191159-A1 OR KR-20210127221-A OR EP-3928149-A1 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN))	OR	ON	ON	2023/12/11 03:33 PM

		WO-2020172138-A1 OR US-20200271961-A1 OR DE-102020102281-A1 OR US-20230204985-A1 OR US-7581833-B2 OR US-20070046887-A1 OR US-8905542-B2 OR KR-102077483-B1 OR TW-M583054-U OR CH-718869-A2 OR AT-525342-B1 OR FR-3126050-A3 OR CH-718397-A2 OR AU-2022201400-A1 OR CA-3149165-A1).did.					
L784	62085	(G02C11/10 OR G02C5/143 OR G02C5/146 OR G02C11/06 OR H02J7/0045 OR G02C2200/08).cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:45 PM
L785	869	784 AND 27	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:48 PM
L786	625	784 AND 29	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO,	OR	ON	ON	2023/12/11 03:48 PM

			MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L787	434	784 AND 30	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:48 PM
L790	237	784 AND 40	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:48 PM
L791	82	784 AND 42	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:48 PM
L793	22	784 AND 38	(US-PGPUB; USPAT; USOCR; FIT (AU, AP,	OR	ON	ON	2023/12/11 03:49 PM

			AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L794	336	(US-10042186-$ | US-10139966-$ | US-10152141-$ | US-10191279-$ | US-10215568-$ | US-10254856-$ | US-10310296-$ | US-10338400-$ | US-10341787-$ | US-10345625-$ | US-10359459-$ | US-10448867-$ | US-10466491-$ | US-10469916-$ | US-10481417-$ | US-10515623-$ | US-10534203-$ | US-10539459-$ | US-10613355-$ | US-10617342-$ | US-10624790-$ | US-10649220-$ | US-10663740-$ | US-10684478-$ | US-10684687-$ | US-10722128-$ | US-10739253-$ | US-10761566-$ | US-10777048-$ | US-10802582-$ | US-10824253-$ | US-10853589-$ | US-10908421-$ | US-10964190-$ | US-10993515-$ | US-10997943-$ | US-11003246-$ | US-11042045-$ | US-11061252-$ | US-11064282-$ | US-11069358-$ | US-11086147-$ | US-11103122-$ | US-11204512-$ | US-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:58 PM

		11243416-$ | US- 11300857-$ | US- 11340466-$ | US- 11487110-$ | US- 11495207-$ | US- 11513371-$ | US- 11558538-$ | US- 11604367-$ | US- 11630331-$ | US- 11644693-$ | US- 11669163-$ | US- 11709376-$ | US- 11733549-$ | US- 11737666-$ | US- 11762224-$ | US- 11796833-$ | US- 11829518-$ | US- 1255265-$ | US- 1917745-$ | US- 20020021407-$ | US- 20020081982-$ | US- 20020090103-$ | US- 20020098877-$ | US- 20020140899-$ | US- 20030022690-$ | US- 20030032449-$ | US- 20030226978-$ | US- 20040096078-$ | US- 20040114770-$ | US- 20050230596-$ | US- 20050248719-$ | US- 20050278446-$ | US- 20060034478-$ | US- 20070186330-$ | US- 20070248238-$ | US- 20070270663-$ | US- 20070271116-$ | US- 20080129953-$ | US- 20080144854-$ | US- 20090156128-$ | US- 20100045928-$ | US- 20100149073-$ | US- 20120105740-$ | US- 20120113235-$ | US- 20120176580-$ | US- 20130072828-$ | US- 20130143519-$ | US- 20140064536-$ | US- 20140176902-$ | US- 20140198293-$ | US- 20140259271-$ | US- 20150205135-$ | US- 20150206173-$ | US- 20150241964-$ | US- 20150293379-$ | US- 20150338677-$ | US- 20160019715-$ | US- 20160187651-$ | US-					

		20160239985-$ | US- 20170131575-$ | US- 20170255029-$ | US- 20200029140-$ | US- 20200124468-$ | US- 20210000347-$ | US- 20210259621-$ | US- 20210263319-$ | US- 20210379425-$ | US- 20220008763-$ | US- 20220034542-$ | US- 20220054092-$ | US- 20230033660-$ | US- 20230057654-$ | US- 2249572-$ | US- 2638532-$ | US- 2794085-$ | US- 2818511-$ | US- 2830132-$ | US- 2874230-$ | US- 2904670-$ | US- 3060308-$ | US- 3104290-$ | US- 3119903-$ | US- 3597054-$ | US- 3710115-$ | US- 3858001-$ | US- 3883701-$ | US- 4165487-$ | US- 4254451-$ | US- 4283127-$ | US- 4322585-$ | US- 4348664-$ | US- 4389217-$ | US- 4526473-$ | US- 4535244-$ | US- 4608492-$ | US- 46259103-$ | US- 4683587-$ | US- 4751691-$ | US- 4757714-$ | US- 4806011-$ | US- 4822160-$ | US- 4822161-$ | US- 4851686-$ | US- 4856086-$ | US- 4859047-$ | US- 4882769-$ | US- 4962469-$ | US- 4967268-$ | US- 4985632-$ | US- 5008548-$ | US- 5015086-$ | US- 5020150-$ | US- 5026151-$ | US- 5064410-$ | US- 5093576-$ | US- 50963103-$ | US-				

		5144344-$ | US- 5151600-$ | US- 5161250-$ | US- 5172256-$ | US- 5264877-$ | US- 52756503-$ | US- 5306917-$ | US- 5353378-$ | US- 5359444-$ | US- 5367345-$ | US- 5379464-$ | US- 5382986-$ | US- 5394005-$ | US- 5452026-$ | US- 5452480-$ | US- 5455637-$ | US- 5455640-$).DID.					
L795	365	(US-5457751-$ | US- 5463428-$ | US- 5475798-$ | US- 5500532-$ | US- 5510961-$ | US- 5513384-$ | US- 5519781-$ | US- 5533130-$ | US- 5581090-$ | US- 5585871-$ | US- 56279804-$ | US- 5634201-$ | US- 5671035-$ | US- 5686727-$ | US- 5694475-$ | US- 5715323-$ | US- 5777715-$ | US- 5819183-$ | US- 58316904-$ | US- 5835185-$ | US- 5900720-$ | US- 5903395-$ | US- 59204504-$ | US- 5923398-$ | US- 5941837-$ | US- 5946071-$ | US- 5949516-$ | US- 5963294-$ | US- 5966746-$ | US- 5988812-$ | US- 5991085-$ | US- 5992996-$ | US- 6010216-$ | US- 6013919-$ | US- 6023372-$ | US- 6028627-$ | US- 6046455-$ | US- 60519104-$ | US- 6060321-$ | US- 6061580-$ | US- 6091832-$ | US-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:58 PM

		6115177-$ | US- 6132681-$ | US- 6132881-$ | US- 6154552-$ | US- 6176576-$ | US- 61810704-$ | US- 6199550-$ | US- 62023804-$ | US- 6225897-$ | US- 6231181-$ | US- 6236969-$ | US- 6259367-$ | US- 6270466-$ | US- 6292213-$ | US- 6292685-$ | US- 6301050-$ | US- 6301367-$ | US- 6311155-$ | US- 6343858-$ | US- 6409335-$ | US- 6409338-$ | US- 6431705-$ | US- 6474816-$ | US- 64782605-$ | US- 64783605-$ | US- 6511175-$ | US- 6513532-$ | US- 6517203-$ | US- 6539336-$ | US- 6542081-$ | US- 6546101-$ | US- 6554444-$ | US- 6582075-$ | US- 6612695-$ | US- 6619799-$ | US- 6629076-$ | US- 6686843-$ | US- 6717737-$ | US- 6729726-$ | US- 6736759-$ | US- 6764194-$ | US- 6769767-$ | US- 6771423-$ | US- 6788309-$ | US- 6792401-$ | US- 6798391-$ | US- 6824265-$ | US- 6840908-$ | US- 6853303-$ | US- 6857741-$ | US- 6876947-$ | US- 6879930-$ | US- 6899585-$ | US- 6912386-$ | US- 6932090-$ | US- 6944474-$ | US- 6947219-$ | US- 6974226-$ | US-					

		7013009-$ | US- 7023594-$ | US- 7030902-$ | US- 7033025-$ | US- 7044615-$ | US- 7048370-$ | US- 7059717-$ | US- 7079876-$ | US- 7095455-$ | US- 7150526-$ | US- 7192136-$ | US- 7255437-$ | US- 72589605-$ | US- 72599905-$ | US- 7265358-$ | US- 7274292-$ | US- 7278734-$ | US- 7289767-$ | US- 7312699-$ | US- 7313246-$ | US- 7319780-$ | US- 7376238-$ | US- 7380936-$ | US- 7388962-$ | US- 7392880-$ | US- 7405801-$ | US- 7431450-$ | US- 7438409-$ | US- 7438410-$ | US- 7449622-$ | US- 7452067-$ | US- 7500746-$ | US- 7500747-$ | US- 7521623-$ | US- 7543934-$ | US- 7543938-$ | US- 7547101-$ | US- 7564981-$ | US- 7581833-$ | US- 7604348-$ | US- 7643895-$ | US- 7648236-$ | US- 7677723-$ | US- 7760898-$ | US- 7792552-$ | US- 7798638-$ | US- 7806525-$ | US- 78785006-$ | US- 7922321-$ | US- 8044879-$ | US- 8073984-$ | US- 8109629-$ | US- 8142015-$ | US- 8182084-$ | US- 8184067-$ | US- 8243973-$ | US- 8337013-$ | US- 8421851-$ | US-					

		84615006-$ | US-8465151-$ | US-8482488-$ | US-8485661-$ | US-8508851-$ | US-8558759-$ | US-8593795-$ | US-8668334-$ | US-8678581-$ | US-8684900-$ | US-8766747-$ | US-8767306-$ | US-8778022-$ | US-8818466-$ | US-8823740-$ | US-8838708-$ | US-8884845-$ | US-8893010-$ | US-8907867-$ | US-8915588-$ | US-8918197-$ | US-8941560-$ | US-8952869-$ | US-8957835-$ | US-9024843-$ | US-9116545-$ | US-9128522-$ | US-9137309-$ | US-9141194-$ | US-9201512-$ | US-9207515-$ | US-9210991-$ | US-9229233-$ | US-9230501-$ | US-9256071-$ | US-9256253-$ | US-9264803-$ | US-9298007-$).DID.					
L796	338	(IP-0920081021-$ | IP-0920100720-$ | RF-1220040317-$ | DA-1419941122-$ | DA-1419960502-$ | IP-1520090310-$ | QR-1820030624-$ | QR-2320010515-$ | QR-3020040803-$ | AT-383428-$ | AU-2001261787-$ | AU-2002353793-$ | CA-2059597-$ | CA-2310114-$ | CA-2426681-$ | CA-2603077-$ | CA-3103521-$ | CH-037719-$ | CN-101815962-$ | CN-104160325-$ | CN-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 03:58 PM

		108014002-$ | CN- 109565516-$ | CN- 1279463-$ | CN- 2054169-$ | CN- 2066151-$ | CN- 216145034-$ | CN- 88203065-$ | DE- 10103922-$ | DE- 10123226-$ | DE- 10205579-$ | DE- 10222375-$ | DE- 3818389-$ | DE- 4338811-$ | DE- 8529458-$ | EP- 1830221-$ | EP- 2439580-$ | EP- 3258308-$ | EP- 3264162-$ | EP- 3299870-$ | EP- 3740152-$ | ES- 2530421-$ | ES- 2637799-$ | FR- 2530039-$ | FR- 2697921-$ | FR- 2706103-$ | FR- 3028980-$ | FR- 3051656-$ | GB- 1467982-$ | GB- 2291551-$ | GB- 2369754-$ | GB- 2393076-$ | GB- 2495697-$ | GB- 2561854-$ | IT- 1298975-$ | IT- 1397295-$ | JP- 2000039595-$ | JP- 2001183735-$ | JP- 2002341059-$ | JP- 2002515197-$ | JP- 2003033328-$ | JP- 2004513669-$ | JP- 2005151292-$ | JP- 2005167902-$ | JP- 2005534269-$ | JP- 2010231119-$ | JP- 2012078588-$ | JP- 2014049934-$ | JP- 2017183827-$ | JP- 2799002-$ | JP- 3000621-$ | JP- 3048964-$ | JP- 3455182-$ | JP- 3532537-$ | JP- 3794986-$ | JP- 3988632-$ | JP- 4096376-$ | JP- 4239317-$ | JP- 4371268-$ | JP-					

		4470301-$ | JP-4496354-$ | JP-4510993-$ | JP-4887907-$ | JP-5017989-$ | JP-5458080-$ | JP-6032940-$ | JP-6332880-$ | JP-7037818-$ | JP-7330920-$ | KR-100420024-$ | KR-101044199-$ | KR-101090667-$ | KR-101420560-$ | KR-101940638-$ | KR-20020044416-$ | KR-20180016552-$ | KR-20180084394-$ | NL-1021485-$ | PL-181650-$ | RU-2017124378-$ | TW-484711-$ | TW-572286-$ | WO-1996013136-$ | WO-1998035263-$ | WO-1999023524-$ | WO-2001006298-$ | WO-2002006881-$ | WO-2005036921-$ | WO-2005043224-$ | WO-2008076774-$ | WO-2010062479-$ | WO-2010141514-$ | WO-2010150260-$ | WO-2011137034-$ | WO-2013084240-$ | WO-2014149631-$ | WO-2014201213-$ | WO-2016022499-$ | WO-2016044612-$ | WO-2017035384-$ | WO-2018089533-$ | WO-2019159141-$ | WO-2019178557-$).DID.				
L797	358	(US-5036311-$ | US-5050150-$ | US-5064410-$ | US-5093576-$ | US-50963103-$ | US-5148023-$ | US-5151600-$ | US-5161250-$ | US-5172256-$ | US-5264877-$ | US-52756503-$ | US-5306917-$ | US-5353378-$ | US-5359370-$ | US-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO;	OR	ON	ON	2023/12/11 04:00 PM

		5359444-$ | US- 5367345-$ | US- 5379464-$ | US- 5382986-$ | US- 5394005-$ | US- 5452026-$ | US- 5452480-$ | US- 5455637-$ | US- 5455640-$ | US- 5457751-$ | US- 5463428-$ | US- 5500532-$ | US- 5510961-$ | US- 5513384-$ | US- 5533130-$ | US- 5581090-$ | US- 5585871-$ | US- 5589398-$ | US- 5590417-$ | US- 5608808-$ | US- 56279804-$ | US- 5634201-$ | US- 5671035-$ | US- 5686727-$ | US- 5694475-$ | US- 5715323-$ | US- 5737436-$ | US- 58316904-$ | US- 5835185-$ | US- 5900720-$ | US- 5903395-$ | US- 59204504-$ | US- 5923398-$ | US- 5941837-$ | US- 5946071-$ | US- 5949516-$ | US- 5963294-$ | US- 5966746-$ | US- 5980037-$ | US- 5988812-$ | US- 5991085-$ | US- 5992996-$ | US- 5995592-$ | US- 6010216-$ | US- 6013919-$ | US- 6028627-$ | US- 6046455-$ | US- 60519104-$ | US- 6060321-$ | US- 6061580-$ | US- 6091546-$ | US- 6091832-$ | US- 6115177-$ | US- 6132681-$ | US- 6132881-$ | US- 6154552-$ | US- 6176576-$ | US- 61810704-$ | US-	JPO; DERWENT; IBM_TDB)				

		62023804-$ | US- 6225897-$ | US- 6231181-$ | US- 6236969-$ | US- 6243578-$ | US- 6259367-$ | US- 6270466-$ | US- 6292213-$ | US- 6292685-$ | US- 6301367-$ | US- 6307526-$ | US- 6343858-$ | US- 6409335-$ | US- 6409338-$ | US- 6426719-$ | US- 6431705-$ | US- 6474816-$ | US- 64782605-$ | US- 64783605-$ | US- 6478736-$ | US- 6506142-$ | US- 6511175-$ | US- 6513532-$ | US- 6517203-$ | US- 6539336-$ | US- 6542081-$ | US- 6546101-$ | US- 6554763-$ | US- 6582075-$ | US- 6619799-$ | US- 6629076-$ | US- 6736759-$ | US- 6764194-$ | US- 6788309-$ | US- 6792401-$ | US- 6824265-$ | US- 6857741-$ | US- 6879930-$ | US- 6912386-$ | US- 6932090-$ | US- 6947219-$ | US- 7013009-$ | US- 7023594-$ | US- 7030902-$ | US- 7031667-$ | US- 7033025-$ | US- 7059717-$ | US- 7079876-$ | US- 7192136-$ | US- 7255437-$ | US- 72589605-$ | US- 72599905-$ | US- 7274292-$ | US- 7278734-$ | US- 7289767-$ | US- 7312699-$ | US- 7319780-$ | US- 7376238-$ | US-					

		7405801-$ | US- 7429965-$ | US- 7431450-$ | US- 7438409-$ | US- 7438410-$ | US- 7452067-$ | US- 7500746-$ | US- 7527374-$ | US- 7543938-$ | US- 7547101-$ | US- 7581833-$ | US- 7604348-$ | US- 7648236-$ | US- 7740353-$ | US- 7792552-$ | US- 7798638-$ | US- 7806525-$ | US- 78785006-$ | US- 8109629-$ | US- 8142015-$ | US- 8243973-$ | US- 8384617-$ | US- 8421851-$ | US- 84615006-$ | US- 8485661-$ | US- 8508851-$ | US- 8558759-$ | US- 8593795-$ | US- 8668334-$ | US- 8678581-$ | US- 8766747-$ | US- 8767306-$ | US- 8770742-$ | US- 8823740-$ | US- 8838708-$ | US- 8884845-$ | US- 8892232-$ | US- 8907867-$ | US- 8915588-$ | US- 8934015-$ | US- 8941560-$ | US- 8952869-$ | US- 8957835-$ | US- 9024843-$ | US- 9033493-$ | US- 9116545-$ | US- 9122083-$ | US- 9124796-$ | US- 9128522-$ | US- 9137309-$ | US- 9141194-$ | US- 9201512-$ | US- 9207515-$ | US- 9210991-$ | US- 9229233-$ | US- 9230501-$ | US- 9256071-$ | US- 9264803-$ | US-					

		9274395-$ | US-9298007-$ | US-9299194-$ | US-9360889-$ | US-9400390-$ | US-9401540-$ | US-9405135-$).DID.					
L798	328	(US-20121030-$ | US-20121220-$ | US-10042186-$ | US-10139966-$ | US-10152141-$ | US-10191279-$ | US-10215568-$ | US-10222617-$ | US-10241351-$ | US-10254856-$ | US-10306036-$ | US-10310296-$ | US-10341787-$ | US-10345625-$ | US-10359459-$ | US-10466491-$ | US-10469916-$ | US-10481417-$ | US-10488668-$ | US-10527490-$ | US-10613355-$ | US-10617342-$ | US-10624790-$ | US-10649220-$ | US-10663740-$ | US-10684478-$ | US-10684687-$ | US-10722128-$ | US-10739253-$ | US-10777048-$ | US-10824253-$ | US-10853589-$ | US-10863060-$ | US-10876886-$ | US-10908421-$ | US-10993515-$ | US-10997943-$ | US-11003246-$ | US-11061252-$ | US-11064282-$ | US-11086147-$ | US-11103122-$ | US-11243416-$ | US-11300857-$ | US-11487110-$ | US-11495207-$ | US-11513371-$ | US-11558538-$ | US-11604367-$ | US-11630331-$ | US-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 04:00 PM

		1255265-$ | US- 1917745-$ | US- 20010005230-$ | US- 20020017997-$ | US- 20020021407-$ | US- 20020081982-$ | US- 20020084990-$ | US- 20020089639-$ | US- 20020090103-$ | US- 20020098877-$ | US- 20020109600-$ | US- 20020140899-$ | US- 20030018274-$ | US- 20030022690-$ | US- 20030032449-$ | US- 20030062046-$ | US- 20030067585-$ | US- 20030068057-$ | US- 20030083591-$ | US- 20030226978-$ | US- 20040000733-$ | US- 20040063378-$ | US- 20040096078-$ | US- 20040100384-$ | US- 20040128737-$ | US- 20040150986-$ | US- 20040160573-$ | US- 20050067580-$ | US- 20050213026-$ | US- 20050230596-$ | US- 20050248717-$ | US- 20050248719-$ | US- 20050264752-$ | US- 20060001827-$ | US- 20060003803-$ | US- 20060023158-$ | US- 20060034478-$ | US- 20060107822-$ | US- 20060132382-$ | US- 20070030442-$ | US- 20070046887-$ | US- 20070098192-$ | US- 20070109491-$ | US- 20070186330-$ | US- 20070208531-$ | US- 20070270663-$ | US- 20070271065-$ | US- 20070271116-$ | US- 20070271387-$ | US- 20080062338-$ | US- 20080068559-$ | US- 20080144854-$ | US- 20080218684-$ | US- 20080282392-$ | US- 20090156128-$ | US- 20100309426-$ | US- 20110102734-$ | US- 20110187990-$ | US-					

		20120113235-$ | US- 20120176580-$ | US- 20130072828-$ | US- 20130143519-$ | US- 20130342981-$ | US- 20140064536-$ | US- 20140176902-$ | US- 20140198293-$ | US- 20140259271-$ | US- 20140313033-$ | US- 20150091781-$ | US- 20150185765-$ | US- 20150205135-$ | US- 20150293379-$ | US- 20160019715-$ | US- 20160187651-$ | US- 20160239985-$ | US- 20170146829-$ | US- 20170255029-$ | US- 20200029140-$ | US- 20210263319-$ | US- 20220260859-$ | US- 20220357599-$ | US- 2249572-$ | US- 2638532-$ | US- 2794085-$ | US- 2818511-$ | US- 2830132-$ | US- 2874230-$ | US- 2904670-$ | US- 3060308-$ | US- 3597054-$ | US- 3710115-$ | US- 3858001-$ | US- 3883701-$ | US- 4165487-$ | US- 4254451-$ | US- 4283127-$ | US- 4322585-$ | US- 4348664-$ | US- 4389217-$ | US- 4526473-$ | US- 4535244-$ | US- 4608492-$ | US- 4683587-$ | US- 4751691-$ | US- 4757714-$ | US- 4773095-$ | US- 4806011-$ | US- 4822160-$ | US- 4822161-$ | US- 4851686-$ | US- 4856086-$ | US- 4859047-$ | US- 4882769-$ | US- 4942629-$ | US- 4962469-$ | US- 4967268-$ | US-					

		4985632-$ | US-5008548-$ | US-5015086-$ | US-5020150-$ | US-5026151-$).DID.					
L799	359	(LG-0220141104-$ | LG-0220220816-$ | IP-0920100720-$ | LG-1220150521-$ | DA-1419941122-$ | YU-1520050120-$ | QR-1820030624-$ | DP-2320110726-$ | MR-2620090827-$ | LG-2620140902-$ | LG-2820140703-$ | SR-2920060504-$ | QR-3020040803-$ | AU-2002255568-$ | AU-3150200-$ | CA-2252786-$ | CA-2307877-$ | CA-2576010-$ | CN-100416340-$ | CN-101770073-$ | CN-103033952-$ | CN-103217791-$ | CN-103584833-$ | CN-103646587-$ | CN-103905763-$ | CN-104090383-$ | CN-104616435-$ | CN-104796669-$ | CN-105262497-$ | CN-106104364-$ | CN-106687858-$ | CN-107966821-$ | CN-113196139-$ | DE-10041085-$ | DE-10063089-$ | DE-10106650-$ | DE-19921739-$ | DE-2205325-$ | DE-3623206-$ | DE-4436528-$ | EP-0724743-$ | EP-1169663-$ | EP-1196807-$ | EP-1643401-$ | EP-1874527-$ | EP-2315066-$ | EP-2963479-$ | EP-2992382-$ | EP-3128362-$ | EP-3196643-$ | EP-3308216-$ | EP-3637419-$ | EP-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; JPO)	OR	ON	ON	2023/12/11 04:00 PM

		3686610-$ | EP- 3749172-$ | ES- 2387782-$ | ES- 2542804-$ | ES- 2612266-$ | FR- 2775894-$ | FR- 2848304-$ | FR- 2877737-$ | FR- 2907559-$ | FR- 2954090-$ | GB- 0414113-$ | GB- 0512038-$ | GB- 0704971-$ | GB- 0812753-$ | GB- 201103200-$ | GB- 2405049-$ | GB- 2513018-$ | GB- 2528867-$ | GB- 301672-$ | GB- 9721506-$ | JP- 2002023098-$ | JP- 2002282220-$ | JP- 2003169822-$ | JP- 2005124143-$ | JP- 2005276139-$ | JP- 2005352024-$ | JP- 2006071707-$ | JP- 2006071726-$ | JP- 2006071770-$ | JP- 2006145988-$ | JP- 2006267887-$ | JP- 2008067219-$ | JP- 2008124885-$ | JP- 2008310275-$ | JP- 2011138141-$ | JP- 2012058530-$ | JP- 2012159681-$ | JP- 2012249097-$ | JP- 2013255012-$ | JP- 2014049934-$ | JP- 2015132821-$ | JP- 2017183857-$ | JP- 2021189379-$ | JP- 3000621-$ | JP- 3111430-$ | JP- 3151770-$ | JP- 3245478-$ | JP- 3310325-$ | JP- 3632271-$ | JP- 4073533-$ | JP- 4367663-$ | JP- 4506795-$ | JP- 4727188-$ | JP- 4961914-$ | JP- 4961984-$ | JP- 5023663-$ | JP- 5092357-$ | JP- 5119636-$ | JP-					

		5228305-$ | JP-5295714-$ | JP-5360115-$ | JP-5363555-$ | JP-5748939-$ | JP-5812666-$ | JP-5891705-$ | JP-6021582-$ | JP-6499154-$ | KR-100584344-$ | KR-100609421-$ | KR-100707294-$ | KR-101231026-$ | KR-101253348-$ | KR-101290994-$ | KR-101871660-$ | KR-102422782-$ | KR-20020067443-$ | KR-20150084603-$ | KR-20170112898-$ | KR-20180009932-$ | KR-20180037909-$ | KR-20190100105-$ | KR-20220140289-$ | RU-2404531-$ | RU-2593391-$ | RU-2607640-$ | SE-524821-$ | SG-193669-$ | WO-1997034182-$ | WO-2000079327-$ | WO-2000079329-$ | WO-2003083875-$ | WO-2003100503-$ | WO-2006001254-$ | WO-2006045843-$ | WO-2006085308-$ | WO-2006085310-$ | WO-2006102368-$ | WO-2006128648-$ | WO-2007079633-$ | WO-2007110551-$ | WO-2008017051-$ | WO-2008096719-$ | WO-2008149172-$ | WO-2009012470-$ | WO-2009094646-$ | WO-2011100284-$ | WO-2011159205-$ | WO-2013013158-$ | WO-2013019893-$ | WO-2013052274-$ | WO-2013098376-$ | WO-2013101313-$ | WO-2014035622-$ | WO-2014160500-$ | WO-2015072633-$ | WO-2015110859-$ | WO-2015143018-$ |					

		WO-2016090066-$ | WO-2017051079-$ | WO-2017058733-$ | WO-2017144934-$ | WO-2017145382-$ | WO-2017171157-$ | WO-2017222497-$).DID.					
L800	1656	794 795 796 797 798 799	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 04:00 PM
L801	91	800 AND 27	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 04:01 PM
L802	75	800 AND 29	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 04:01 PM
L804	43	800 AND 40	(US-PGPUB; USPAT;	OR	ON	ON	2023/12/11

			USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				04:01 PM
L806	12	800 AND 38	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 04:01 PM
L807	20536	66 67 68 69 70 71	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 04:17 PM
L808	127	807 AND 27	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO,	OR	ON	ON	2023/12/11 04:17 PM

			NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L809	79	807 AND 30	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 04:17 PM
L811	51	807 AND 40	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 04:18 PM
L812	21	807 AND 44	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 04:18 PM
L813	12	807 AND 38	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY,	OR	ON	ON	2023/12/11 04:18 PM

			CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L814	185512	72 73 74 75 76 77 78 79 80 81 82 83 84 85	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 04:42 PM
L815	2416	814 AND 27	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 04:42 PM
L816	755	814 AND 30	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH,	OR	ON	ON	2023/12/11 04:43 PM

			TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L817	382	814 AND 40	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 04:43 PM
L819	127	814 AND 44	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 04:43 PM
L820	22	814 AND 38	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 04:43 PM
L821	44	(Artificial Intelligence) Similar to: 18/375,893 with 0 CPC Selections and 0 Text Selections	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA,	OR	ON	ON	2023/12/11 04:49 PM

		Text: (US-20210364828-A1 OR US-10330956-B2 OR US-20210364827-A9 OR US-20190187492-A1 OR US-11733549-B2 OR US-20170131575-A1 OR US-11086147-B2 OR US-9690121-B2 OR US-20090296044-A1 OR US-20130201440-A1 OR US-20120133885-A1 OR US-20150253590-A1 OR US-20100309426-A1 OR US-8465151-B2 OR CN-113330355-A OR US-20220260859-A1 OR CN-113454521-A OR US-11668958-B2 OR US-20220113562-A1 OR EP-3914960-A1 OR KR-20210110726-A OR WO-2017196294-A1 OR EP-3455670-A1 OR WO-2023192316-A1 OR KR-20210127221-A OR EP-3928149-A1 OR WO-2020172138-A1 OR US-20200271961-A1 OR KR-102077483-B1 OR US-20230204985-A1 OR TW-M583054-U OR US-7581833-B2 OR KR-102006414-B1 OR CA-3149165-A1 OR GB-2609686-A OR NL-2031025-A OR KR-20230000350-U OR CH-718869-A2 OR AT-525342-B1 OR US-20210318558-A1 OR US-11604367-B2 OR CA-3103299-A1 OR US-20210191159-A1 OR DE-102020102281-A1 OR KR-20200135137-A OR JP-3237752-U OR CH-718397-B1 OR US-20180011344-A1 OR US-10288908-B2 OR US-20230040338-A1).did.	EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO))				

L822	44	(Artificial Intelligence) Similar to: 18/375,893 with 0 CPC Selections and 5 Text Selections Text: (US-11204512-B2 OR US-9761068-B2 OR US-20040086141-A1 OR US-11326941-B2 OR WO-2020060596-A1 OR US-20200088999-A1 OR CN-210136443-U OR KR-102400383-B1 OR US-20160349520-A1 OR US-7677723-B2 OR US-20220394371-A1 OR US-11644361-B2 OR WO-2021086537-A1 OR US-10191289-B2 OR EP-4052478-A1 OR WO-2021086538-A1 OR US-20180227679-A1 OR US-20180227684-A1 OR EP-3358812-A1 OR US-10674290-B2 OR US-10986451-B2 OR EP-3358812-B1 OR EP-3577911-A1 OR US-20160100237-A1 OR CN-111936953-A OR US-11762224-B2 OR US-10575579-B2 OR CN-111936953-B OR US-20220353624-A1 OR US-20140292636-A1 OR US-6473630-B1 OR US-11630331-B2 OR KR-20080031206-A OR CN-115735179-A OR EP-4074067-A1 OR WO-2021262318-A1 OR KR-20190027934-A OR EP-3776144-B1 OR US-20180335650-A1 OR US-20170090219-A1 OR US-10345625-B2 OR NL-1027023-C2 OR EP-3065027-B1 OR US-10359311-B2 OR WO-2023049877-A1 OR US-9075249-B2 OR EP-2805201-B1 OR WO-2013109874-A1 OR EP-2805201-A1 OR	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO))	OR	ON	ON	2023/12/11 04:51 PM

		US-20130188080-A1).did.					
L823	44	(Artificial Intelligence) Similar to: 18/375,893 with 3 CPC Selections and 5 Text Selections Text: (CN-113454521-A OR CN-113330355-A OR US-20200271961-A1 OR EP-3928149-A1 OR WO-2020172138-A1 OR KR-20210127221-A OR EP-3914960-A1 OR WO-2020154047-A1 OR US-20200233238-A1 OR KR-20210110726-A OR US-11762224-B2 OR US-9033493-B2 OR US-20210364828-A1 OR US-8109629-B2 OR US-20170131575-A1 OR US-10330956-B2 OR US-20190187492-A1 OR US-20210364827-A9 OR US-9690121-B2 OR US-20130201440-A1 OR US-11086147-B2 OR US-20090296044-A1 OR US-20150253590-A1 OR US-20120133885-A1 OR US-20170146829-A1 OR US-11733549-B2 OR US-20100309426-A1 OR US-8465151-B2 OR US-20150286074-A1 OR KR-20200135137-A OR CN-205691887-U OR TW-M583054-U OR US-20230204985-A1 OR US-9989771-B2 OR US-11668958-B2 OR US-20220113562-A1 OR US-10288908-B2 OR KR-102006414-B1 OR US-20180011344-A1 OR US-11156855-B2 OR EP-3469418-A1 OR WO-2017215953-A1 OR EP-3258308-A1 OR JP-2017147520-A OR US-11500227-B2	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO))	OR	ON	ON	2023/12/11 04:52 PM

		OR WO-2023192316-A1 OR EP-4057051-A1 OR EP-3455670-A1 OR WO-2017196294-A1 OR US-20220244576-A1).did.					
L824	44	(Artificial Intelligence) Similar to: 18/375,893 with 6 CPC Selections and 5 Text Selections Text: (US-11762224-B2 OR US-9033493-B2 OR US-20210364828-A1 OR US-10330956-B2 OR US-8109629-B2 OR US-20190187492-A1 OR US-20210364827-A9 OR US-20170131575-A1 OR US-11086147-B2 OR US-11733549-B2 OR US-9690121-B2 OR US-20090296044-A1 OR US-20130201440-A1 OR US-20120133885-A1 OR US-20150253590-A1 OR US-20170146829-A1 OR US-20100309426-A1 OR US-8465151-B2 OR CN-113330355-A OR US-20220260859-A1 OR US-11156855-B2 OR CN-113454521-A OR WO-2020154047-A1 OR EP-3914960-A1 OR US-20200233238-A1 OR KR-20210110726-A OR US-11668958-B2 OR US-20220113562-A1 OR WO-2017196294-A1 OR EP-3455670-A1 OR US-20190113774-A1 OR WO-2023192316-A1 OR KR-20210127221-A OR KR-102077483-B1 OR EP-3928149-A1 OR WO-2020172138-A1 OR US-20200271961-A1 OR US-20230204985-A1 OR TW-M583054-U OR	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO))	OR	ON	ON	2023/12/11 04:53 PM

		US-7581833-B2 OR KR-102006414-B1 OR FR-3126050-A3 OR AU-2022201400-A1 OR CA-3149165-A1 OR GB-2609686-A OR NL-2031025-A OR KR-20230000350-U OR CH-718869-A2 OR AT-525342-B1 OR AT-525342-A1).did.					
L825	45	(Artificial Intelligence) Similar to: 18/375,893 with 0 CPC Selections and 2 Text Selections Text: (US-11204512-B2 OR US-9761068-B2 OR US-20040086141-A1 OR US-11326941-B2 OR WO-2020060596-A1 OR US-20200088999-A1 OR CN-210136443-U OR US-20160349520-A1 OR KR-102400383-B1 OR US-11644361-B2 OR US-20220394371-A1 OR US-7677723-B2 OR WO-2021086537-A1 OR EP-4052478-A1 OR WO-2021086538-A1 OR US-10191289-B2 OR EP-3358861-A1 OR US-20180227679-A1 OR EP-3358812-A1 OR US-20180227684-A1 OR US-10674290-B2 OR EP-3358812-B1 OR US-20160100237-A1 OR BR-202014016356-U2 OR US-11762224-B2 OR CN-111936953-A OR US-10575579-B2 OR US-20220353624-A1 OR EP-3358861-B1 OR CN-111936953-B OR US-6473630-B1 OR US-20100315329-A1 OR CN-115735179-A OR US-11630331-B2 OR WO-2021262318-A1 OR EP-4074067-A1 OR EP-3776144-B1 OR US-10359311-B2 OR	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO))	OR	ON	ON	2023/12/11 04:54 PM

		US-20170090219-A1 OR US-20180335650-A1 OR NL-1027023-C2 OR WO-2023049877-A1 OR JP-2019537144-A OR US-9075249-B2 OR WO-2013109874-A1 OR US-20130188080-A1 OR AU-2013209578-A1 OR EP-2805201-A1 OR EP-2805201-B1 OR US-11668958-B2).did.					
L826	44	(Artificial Intelligence) Similar to: 18/375,893 with 3 CPC Selections and 2 Text Selections Text: (CN-113454521-A OR CN-113330355-A OR EP-3928149-A1 OR WO-2020172138-A1 OR KR-20210127221-A OR US-11762224-B2 OR WO-2020154047-A1 OR EP-3914960-A1 OR US-20200233238-A1 OR KR-20210110726-A OR US-9033493-B2 OR US-20210364828-A1 OR US-8109629-B2 OR US-20170131575-A1 OR US-20210364827-A9 OR US-20190187492-A1 OR US-10330956-B2 OR US-9690121-B2 OR US-20130201440-A1 OR US-20150253590-A1 OR US-20120133885-A1 OR US-11086147-B2 OR US-20090296044-A1 OR US-20170146829-A1 OR US-11733549-B2 OR US-8465151-B2 OR US-20150286074-A1 OR KR-20200135137-A OR CN-205691887-U OR US-11668958-B2 OR US-20220113562-A1 OR TW-M583054-U OR US-20230204985-A1 OR US-11156855-B2	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO))	OR	ON	ON	2023/12/11 04:54 PM

		OR US-9989771-B2 OR US-10288908-B2 OR US-20180011344-A1 OR KR-102006414-B1 OR WO-2017215953-A1 OR EP-3469418-A1 OR EP-3258308-A1 OR US-9720260-B2 OR US-11500227-B2 OR WO-2014201213-A1 OR WO-2023192316-A1 OR EP-4057051-A1 OR EP-3455670-A1 OR WO-2017196294-A1 OR CH-718397-A2 OR US-20220244576-A1).did.					
L827	44	(Artificial Intelligence) Similar to: 18/375,893 with 6 CPC Selections and 2 Text Selections Text: (US-11762224-B2 OR US-9033493-B2 OR US-20210364828-A1 OR US-10330956-B2 OR US-8109629-B2 OR US-20190187492-A1 OR US-20210364827-A9 OR US-20170131575-A1 OR US-11733549-B2 OR US-11086147-B2 OR US-9690121-B2 OR US-20130201440-A1 OR US-20120133885-A1 OR US-20150253590-A1 OR US-20090296044-A1 OR US-20170146829-A1 OR US-20100309426-A1 OR US-8465151-B2 OR CN-113330355-A OR US-20220260859-A1 OR US-11156855-B2 OR CN-113454521-A OR EP-3914960-A1 OR WO-2020154047-A1 OR US-20200233238-A1 OR KR-20210110726-A OR US-11668958-B2 OR US-20220113562-A1 OR EP-3455670-A1 OR WO-2017196294-A1	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO))	OR	ON	ON	2023/12/11 04:54 PM

		OR US-20190113774-A1 OR WO-2023192316-A1 OR KR-102077483-B1 OR KR-20210127221-A OR EP-3928149-A1 OR WO-2020172138-A1 OR US-20200271961-A1 OR US-20230204985-A1 OR TW-M583054-U OR US-7581833-B2 OR KR-102006414-B1 OR FR-3126050-A3 OR AU-2022201400-A1 OR CA-3149165-A1 OR GB-2609686-A OR NL-2031025-A OR KR-20230000350-U OR CH-718869-A2 OR AT-525342-B1 OR AT-525342-A1).did.					
L828	44	(Artificial Intelligence) Similar to: 18/375,893 with 6 CPC Selections and 4 Text Selections --- Text: (US-11762224-B2 OR US-9033493-B2 OR US-20210364828-A1 OR US-10330956-B2 OR US-8109629-B2 OR US-20190187492-A1 OR US-20210364827-A9 OR US-20170131575-A1 OR US-11086147-B2 OR US-11733549-B2 OR US-9690121-B2 OR US-20090296044-A1 OR US-20130201440-A1 OR US-20120133885-A1 OR US-20150253590-A1 OR US-20170146829-A1 OR US-8465151-B2 OR CN-113330355-A OR US-20220260859-A1 OR US-11156855-B2 OR CN-113454521-A OR EP-3914960-A1 OR WO-2020154047-A1 OR US-20200233238-A1 OR KR-20210110726-A OR US-11668958-B2 OR	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO))	OR	ON	ON	2023/12/11 04:59 PM

		US-20220113562-A1 OR WO-2017196294-A1 OR EP-3455670-A1 OR US-20190113774-A1 OR WO-2023192316-A1 OR KR-20210127221-A OR KR-102077483-B1 OR EP-3928149-A1 OR WO-2020172138-A1 OR US-20230204985-A1 OR TW-M583054-U OR US-7581833-B2 OR KR-102006414-B1 OR FR-3126050-A3 OR AU-2022201400-A1 OR CA-3149165-A1 OR GB-2609686-A OR NL-2031025-A OR KR-20230000350-U OR CH-718869-A2 OR AT-525342-B1 OR CH-718397-A2 OR US-20210318558-A1 OR EP-4057051-A1).did.				
L829	579	"6349001"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 05:13 PM
L830	117	"5835185"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 05:13 PM

L831	116	"6301050"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 05:13 PM
L832	84	"6678381"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 05:13 PM
L833	147	"5777715"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 05:13 PM
L834	74	"5819183"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO,	OR	ON	ON	2023/12/11 05:13 PM

			MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L843	212	(US-0000347-$ | US-0004325-$ | US-0005069-$ | US-0008763-$ | US-0011603-$ | US-0017634-$ | US-0026146-$ | US-0033622-$ | US-0033660-$ | US-0036103-$ | US-0044416-$ | US-0045928-$ | US-0054092-$ | US-0057654-$ | US-0064746-$ | US-0089545-$ | US-0091200-$ | US-0098874-$ | US-0101411-$ | US-0104864-$ | US-0105445-$ | US-0114770-$ | US-0122208-$ | US-0136414-$ | US-0172691-$ | US-0178743-$ | US-0189548-$ | US-0211574-$ | US-0226838-$ | US-02511706-$ | US-0277123-$ | US-0283894-$ | US-0291667-$ | US-0292333-$ | US-0335792-$ | US-0338677-$ | US-0357599-$ | US-0369402-$ | US-0378493-$ | US-0379425-$ | US-0415388-$ | US-10515623-$ | US-10571715-$ | US-10802582-$ | US-10964190-$ | US-11069358-$ | US-11204512-$ | US-11243416-$ | US-11326941-$ | US-11513371-$ | US-11536988-$ | US-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 05:20 PM

		11630331-$ | US- 11644361-$ | US- 11644693-$ | US- 20020136414-$ | US- 20030064746-$ | US- 20030091200-$ | US- 20040005069-$ | US- 20040104864-$ | US- 20040114770-$ | US- 20050036103-$ | US- 20060291667-$ | US- 20070189548-$ | US- 20070211574-$ | US- 20080089545-$ | US- 20100045928-$ | US- 20100105445-$ | US- 20110292333-$ | US- 20120101411-$ | US- 20120283894-$ | US- 20130172691-$ | US- 20140226838-$ | US- 20150277123-$ | US- 20150338677-$ | US- 20160098874-$ | US- 20180122208-$ | US- 20190004325-$ | US- 20190033622-$ | US- 20190369402-$ | US- 20190378493-$ | US- 20210000347-$ | US- 20210026146-$ | US- 20210379425-$ | US- 20220008763-$ | US- 20220011603-$ | US- 20220054092-$ | US- 20220178743-$ | US- 20220335792-$ | US- 20220357599-$ | US- 20220415388-$ | US- 20230017634-$ | US- 20230033660-$ | US- 20230057654-$ | US- 3104290-$ | US- 3119903-$ | US- 5144344-$ | US- 5475798-$ | US- 5519781-$ | US- 5777715-$ | US- 5819183-$ | US- 6301050-$ | US- 6311155-$ | US- 6346929-$ | US- 6678381-$ | US- 6717737-$ | US- 6771423-$ | US- 7801570-$ | US- 8582789-$ | US- 8849185-$).DID.					

L844	208	(IP-0920081021-$ | RF-1220040325-$ | DA-1419941122-$ | DA-1419970304-$ | IP-1520090310-$ | QR-1820030624-$ | QR-2320010515-$ | DA-2420050929-$ | AT-383428-$ | CA-2059597-$ | CA-2603077-$ | CA-2667671-$ | CH-037719-$ | CN-101815962-$ | CN-2054169-$ | CN-2066151-$ | CN-216145034-$ | CN-88203065-$ | DE-10103922-$ | DE-10123226-$ | DE-10222375-$ | EP-1134491-$ | EP-1196807-$ | EP-1830221-$ | EP-1908304-$ | EP-2439580-$ | EP-3258308-$ | EP-3264162-$ | EP-3299870-$ | EP-3893043-$ | ES-2530421-$ | FR-2530039-$ | FR-3028980-$ | GB-1467982-$ | GB-2291551-$ | GB-2476064-$ | GB-2495697-$ | GB-2561854-$ | IT-1298975-$ | IT-1397295-$ | JP-2000039595-$ | JP-2002341059-$ | JP-2005151292-$ | JP-2010231119-$ | JP-2012078588-$ | JP-2014049934-$ | JP-2017183827-$ | JP-2019522391-$ | JP-3000621-$ | JP-3532537-$ | JP-3794986-$ | JP-3988632-$ | JP-4470301-$ | JP-4496354-$ | JP-4887907-$ | JP-5436678-$ | JP-5458080-$ | JP-6032940-$ | JP-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 05:20 PM

		6332880-$ | JP-7037818-$ | KR-100420024-$ | KR-101044199-$ | KR-101124852-$ | KR-101940638-$ | TW-484711-$ | TW-572286-$ | WO-1997012205-$ | WO-2002006881-$ | WO-2003069394-$ | WO-2003100368-$ | WO-2004012477-$ | WO-2004025554-$ | WO-2007070508-$ | WO-2010062479-$ | WO-2011137034-$ | WO-2016044612-$ | WO-2019178557-$ | WO-2020006275-$).DID.					
L845	341	(US-20080090679-$ | US-20080119207-$ | US-20080147488-$ | US-20080151179-$ | US-20080218684-$ | US-20080273165-$ | US-20080291277-$ | US-20090059159-$ | US-20090059381-$ | US-20090086159-$ | US-20090091838-$ | US-20090109395-$ | US-20090122161-$ | US-20090122414-$ | US-20090154293-$ | US-20090202096-$ | US-20090213323-$ | US-20090226022-$ | US-20090237355-$ | US-20090251660-$ | US-20090251661-$ | US-20090268032-$ | US-20100026970-$ | US-20100103249-$ | US-20100103516-$ | US-20100110368-$ | US-20100149073-$ | US-20100165287-$ | US-20100277563-$ | US-20100309426-$ | US-20110055027-$ | US-20110077548-$ | US-20110080289-$ | US-20110084900-$ | US-20110139163-$ | US-20110169932-$ | US-20110170723-$ | US-20110193963-$ |	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 05:20 PM

		US-20110194029-$ | US-20110213664-$ | US-20110214082-$ | US-20110221658-$ | US-20110248905-$ | US-20120188501-$ | US-20120194549-$ | US-20120194550-$ | US-20120224070-$ | US-20120262557-$ | US-20120281961-$ | US-20130131985-$ | US-20130141313-$ | US-20130150004-$ | US-20130169513-$ | US-20130201285-$ | US-20130249776-$ | US-20130342806-$ | US-20140063054-$ | US-20140152530-$ | US-20140164282-$ | US-20140184724-$ | US-20140253867-$ | US-20140270316-$ | US-20140291396-$ | US-20140347736-$ | US-20150177521-$ | US-20150187357-$ | US-20150219899-$ | US-20150234192-$ | US-20150261995-$ | US-20150323990-$ | US-20160004306-$ | US-20160103322-$ | US-20160210834-$ | US-20160248994-$ | US-20160259996-$ | US-20170053576-$ | US-20170099479-$ | US-20180130371-$ | US-20180131847-$ | US-20180336382-$ | US-20220163806-$ | US-20220299792-$ | US-2339173-$ | US-3192826-$ | US-3216308-$ | US-3229580-$ | US-3524710-$ | US-3610825-$ | US-3787109-$ | US-3885095-$ | US-3915548-$ | US-3923370-$ | US-3936605-$ | US-3940204-$ | US-4052073-$ | US-4082432-$ | US-						

		4195915-$ | US- 4218111-$ | US- 4447128-$ | US- 4516157-$ | US- 4550984-$ | US- 4621283-$ | US- 4649434-$ | US- 4664475-$ | US- 4665385-$ | US- 4722601-$ | US- 4751691-$ | US- 4753514-$ | US- 4799765-$ | US- 4806001-$ | US- 4806011-$ | US- 4818048-$ | US- 4826287-$ | US- 4852988-$ | US- 4853306-$ | US- 4867551-$ | US- 4869575-$ | US- 4884137-$ | US- 4961626-$ | US- 4968117-$ | US- 4973132-$ | US- 4973139-$ | US- 4988183-$ | US- 5003300-$ | US- 5013134-$ | US- 5028119-$ | US- 5044709-$ | US- 5050962-$ | US- 5053755-$ | US- 5129716-$ | US- 5138470-$ | US- 5162828-$ | US- 5212471-$ | US- 5214425-$ | US- 5231379-$ | US- 5281957-$ | US- 5281960-$ | US- 5309169-$ | US- 5320538-$ | US- 5325386-$ | US- 5334991-$ | US- 5348477-$ | US- 5359669-$ | US- 5367345-$ | US- 5369415-$ | US- 5381267-$ | US- 5384654-$ | US- 5392158-$ | US- 5416876-$ | US- 5446507-$ | US- 5455591-$ | US- 5459612-$ | US- 5469185-$ | US- 5491510-$ | US-					

		5495576-$ | US- 5506728-$ | US- 5519410-$ | US- 5537253-$ | US- 5539578-$ | US- 5576887-$ | US- 5579148-$ | US- 5583590-$ | US- 5585871-$ | US- 5589846-$ | US- 5596451-$ | US- 5606743-$ | US- 5610765-$ | US- 5626410-$ | US- 5629790-$ | US- 5648789-$ | US- 5653751-$ | US- 5654827-$ | US- 5654828-$ | US- 5671037-$).DID.					
L846	340	(US-10042186-$ | US- 10139966-$ | US- 10152141-$ | US- 10191279-$ | US- 10215568-$ | US- 10254856-$ | US- 10310296-$ | US- 10345625-$ | US- 10359459-$ | US- 10448867-$ | US- 10466491-$ | US- 10469916-$ | US- 10481417-$ | US- 10527491-$ | US- 10613355-$ | US- 10617342-$ | US- 10624790-$ | US- 10649220-$ | US- 10663740-$ | US- 10684478-$ | US- 10684687-$ | US- 10722128-$ | US- 10739253-$ | US- 10761566-$ | US- 10777048-$ | US- 10824253-$ | US- 10853589-$ | US- 10863060-$ | US- 10908421-$ | US- 10997943-$ | US- 11003246-$ | US- 11061252-$ | US- 11064282-$ | US- 11086147-$ | US- 11103122-$ | US- 11163156-$ | US- 11219287-$ | US- 11243416-$ | US-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 05:20 PM

		11300857-$ | US- 11326941-$ | US- 11487110-$ | US- 11495207-$ | US- 11513371-$ | US- 11536988-$ | US- 1255265-$ | US- 1917745-$ | US- 20020021407-$ | US- 20020057440-$ | US- 20020081982-$ | US- 20020090103-$ | US- 20020098877-$ | US- 20030022690-$ | US- 20030032449-$ | US- 20030226978-$ | US- 20040096078-$ | US- 20050230596-$ | US- 20050248719-$ | US- 20060034478-$ | US- 20070186330-$ | US- 20070270663-$ | US- 20070271116-$ | US- 20080144854-$ | US- 20090156128-$ | US- 20100296045-$ | US- 20120105740-$ | US- 20120113235-$ | US- 20120176580-$ | US- 20130072828-$ | US- 20130143519-$ | US- 20140064536-$ | US- 20140176902-$ | US- 20140198293-$ | US- 20140259271-$ | US- 20150205135-$ | US- 20150206173-$ | US- 20150293379-$ | US- 20160019715-$ | US- 20160187651-$ | US- 20160239985-$ | US- 20170131575-$ | US- 20170255029-$ | US- 20190278110-$ | US- 20200029140-$ | US- 20210263319-$ | US- 20210263343-$ | US- 20220260859-$ | US- 2249572-$ | US- 2638532-$ | US- 2794085-$ | US- 2818511-$ | US- 2830132-$ | US- 2874230-$ | US- 2904670-$ | US- 3060308-$ | US- 3597054-$ | US- 3710115-$ | US-					

		3858001-$ | US- 3883701-$ | US- 4165487-$ | US- 4254451-$ | US- 4283127-$ | US- 4322585-$ | US- 4348664-$ | US- 4389217-$ | US- 4526473-$ | US- 4535244-$ | US- 4608492-$ | US- 46259103-$ | US- 4683587-$ | US- 4751691-$ | US- 4757714-$ | US- 4806011-$ | US- 4822160-$ | US- 4822161-$ | US- 4851686-$ | US- 4856086-$ | US- 4859047-$ | US- 4882769-$ | US- 4962469-$ | US- 4967268-$ | US- 4985632-$ | US- 5008548-$ | US- 5015086-$ | US- 5020150-$ | US- 5026151-$ | US- 5064410-$ | US- 5093576-$ | US- 50963103-$ | US- 5151600-$ | US- 5161250-$ | US- 5172256-$ | US- 5264877-$ | US- 52756503-$ | US- 5306917-$ | US- 5353378-$ | US- 5359444-$ | US- 5367345-$ | US- 5379464-$ | US- 5382986-$ | US- 5394005-$ | US- 5452026-$ | US- 5452480-$ | US- 5455637-$ | US- 5455640-$ | US- 5457751-$ | US- 5463428-$ | US- 5500532-$ | US- 5510961-$ | US- 5513384-$ | US- 5533130-$ | US- 5581090-$ | US- 5585871-$ | US- 56279804-$ | US- 5634201-$ | US-					

		5671035-$ | US- 5686727-$ | US- 5694475-$ | US- 5715323-$ | US- 58316904-$ | US- 5835185-$ | US- 5900720-$ | US- 5903395-$ | US- 59204504-$ | US- 5923398-$ | US- 5946071-$ | US- 5949516-$ | US- 5963294-$ | US- 5966746-$ | US- 5988812-$ | US- 5991085-$ | US- 5992996-$ | US- 6010216-$ | US- 6013919-$ | US- 6028627-$ | US- 6046455-$ | US- 60519104-$ | US- 6060321-$ | US- 6061580-$ | US- 6091832-$ | US- 6115177-$ | US- 6132681-$ | US- 6132881-$).DID.					
L847	329	(US-6154552-$ | US- 6176576-$ | US- 61810704-$ | US- 6199550-$ | US- 62023804-$ | US- 6225897-$ | US- 6231181-$ | US- 6236969-$ | US- 6259367-$ | US- 6270466-$ | US- 6292213-$ | US- 6292685-$ | US- 6301367-$ | US- 6343858-$ | US- 6409335-$ | US- 6409338-$ | US- 6431705-$ | US- 6474816-$ | US- 64782605-$ | US- 64783605-$ | US- 6511175-$ | US- 6513532-$ | US- 6517203-$ | US- 6539336-$ | US- 6542081-$ | US- 6546101-$ | US- 6554444-$ | US- 6582075-$ | US- 6619799-$ | US- 6629076-$ | US-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 05:20 PM

		6686843-$ | US- 6729726-$ | US- 6736759-$ | US- 6764194-$ | US- 6769767-$ | US- 6788309-$ | US- 6792401-$ | US- 6798391-$ | US- 6824265-$ | US- 6840908-$ | US- 6853303-$ | US- 6857741-$ | US- 6871951-$ | US- 6876947-$ | US- 6879930-$ | US- 6899585-$ | US- 6912386-$ | US- 6932090-$ | US- 6947219-$ | US- 6974226-$ | US- 7013009-$ | US- 7023594-$ | US- 7030902-$ | US- 7033025-$ | US- 7044615-$ | US- 7048370-$ | US- 7059717-$ | US- 7079876-$ | US- 7150526-$ | US- 7187960-$ | US- 7192136-$ | US- 7255437-$ | US- 72589605-$ | US- 72599905-$ | US- 7265358-$ | US- 7274292-$ | US- 7278734-$ | US- 7289767-$ | US- 7312699-$ | US- 7313246-$ | US- 7319780-$ | US- 7376238-$ | US- 7380936-$ | US- 7405801-$ | US- 7431450-$ | US- 7438409-$ | US- 7438410-$ | US- 7449622-$ | US- 7452067-$ | US- 7500746-$ | US- 7500747-$ | US- 7521623-$ | US- 7543934-$ | US- 7543938-$ | US- 7547101-$ | US- 7581833-$ | US- 7604348-$ | US- 7643895-$ | US-					

		7648236-$ | US- 7677723-$ | US- 7740353-$ | US- 7760898-$ | US- 7792552-$ | US- 7798638-$ | US- 7806525-$ | US- 78785006-$ | US- 7922321-$ | US- 8073984-$ | US- 8109629-$ | US- 8142015-$ | US- 8184067-$ | US- 8243973-$ | US- 8337013-$ | US- 8421851-$ | US- 84615006-$ | US- 8465151-$ | US- 8482488-$ | US- 8485661-$ | US- 8508851-$ | US- 8558759-$ | US- 8593795-$ | US- 8668334-$ | US- 8678581-$ | US- 8766747-$ | US- 8767306-$ | US- 8778022-$ | US- 8823740-$ | US- 8838708-$ | US- 8884845-$ | US- 8893010-$ | US- 8907867-$ | US- 8918197-$ | US- 8931896-$ | US- 8941560-$ | US- 8952869-$ | US- 8957835-$ | US- 9024843-$ | US- 9116545-$ | US- 9128522-$ | US- 9137309-$ | US- 9141194-$ | US- 9201512-$ | US- 9207515-$ | US- 9210991-$ | US- 9229233-$ | US- 9230501-$ | US- 9256071-$ | US- 9256253-$ | US- 9264803-$ | US- 9298007-$ | US- 9299194-$ | US- 9360889-$ | US- 9400390-$ | US- 9401540-$ | US- 9405135-$ | US- 9423870-$ | US-					

		9482880-$ | US-9482882-$ | US-9482883-$ | US-9494800-$ | US-9529199-$ | US-9532714-$ | US-9575321-$ | US-9594246-$ | US-9632059-$ | US-9635222-$ | US-9651784-$ | US-9651787-$ | US-9684172-$ | US-9684374-$ | US-9726904-$ | US-9746686-$ | US-9753288-$ | US-9766463-$ | US-9766479-$ | US-9798458-$ | US-9800990-$ | US-9810906-$ | US-9811153-$ | US-9829707-$ | US-9836122-$ | US-9841599-$ | US-9851567-$ | US-9874936-$ | US-9880052-$ | US-9910298-$ | US-9939934-$ | US-9952664-$ | US-9965681-$).DID.					
L848	291	(IP-0920081021-$ | IP-0920100720-$ | RF-1220040317-$ | DA-1419941122-$ | DA-1419960502-$ | IP-1520090310-$ | QR-1820030624-$ | QR-2320010515-$ | QR-3020040803-$ | AT-383428-$ | AU-2001269883-$ | AU-2002243370-$ | CA-2059597-$ | CA-2307877-$ | CA-2310114-$ | CA-2667671-$ | CA-2852711-$ | CA-3018763-$ | CH-037719-$ | CN-102972037-$ | CN-104793338-$ | CN-106687858-$ | CN-107077173-$ | CN-2054169-$ | CN-205691887-$ | CN-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 05:21 PM

		2066151-$ | CN- 216145034-$ | CN- 88203065-$ | DE- 10103922-$ | DE- 10123226-$ | DE- 10205579-$ | DE- 10222375-$ | DE- 3818389-$ | DE- 4338811-$ | DE- 69810855-$ | DE- 8529458-$ | EP- 1196807-$ | EP- 1265524-$ | EP- 1547434-$ | EP- 1830221-$ | EP- 1908304-$ | EP- 2439580-$ | EP- 3258308-$ | EP- 3264162-$ | EP- 3299870-$ | EP- 3308216-$ | EP- 3867610-$ | ES- 2530421-$ | FR- 2530039-$ | FR- 2697921-$ | FR- 2706103-$ | FR- 3028980-$ | GB- 1467982-$ | GB- 2291551-$ | GB- 2369754-$ | GB- 2393076-$ | GB- 2495697-$ | GB- 2561854-$ | IT- 1298975-$ | IT- 1397295-$ | JP- 2000039595-$ | JP- 2001183735-$ | JP- 2002341059-$ | JP- 2003033328-$ | JP- 2005151292-$ | JP- 2010231119-$ | JP- 2012078588-$ | JP- 2014049934-$ | JP- 2017183827-$ | JP- 2799002-$ | JP- 3000621-$ | JP- 3048964-$ | JP- 3532537-$ | JP- 3794986-$ | JP- 3988632-$ | JP- 4096376-$ | JP- 4239317-$ | JP- 4470301-$ | JP- 4496354-$ | JP- 4510993-$ | JP- 4887907-$ | JP- 5458080-$ | JP- 6032940-$ | JP-					

		6332880-$ | JP-7037818-$ | KR-100420024-$ | KR-101940638-$ | NL-1021485-$ | PL-181650-$ | TW-200819817-$ | TW-484711-$ | TW-572286-$ | WO-1996013136-$ | WO-1997011574-$ | WO-1997022295-$ | WO-2005043224-$ | WO-2006118555-$ | WO-2007070508-$ | WO-2010062479-$ | WO-2013084240-$ | WO-2014149631-$ | WO-2017075405-$ | WO-2020006271-$).DID.					
L849	384	(US-5673139-$ | US-5682173-$ | US-5699194-$ | US-5717479-$ | US-5719588-$ | US-5744788-$ | US-5751493-$ | US-5808589-$ | US-5815197-$ | US-5815326-$ | US-5886822-$ | US-5943171-$ | US-5973845-$ | US-5991103-$ | US-6005720-$ | US-6023372-$ | US-6081304-$ | US-6091546-$ | US-6169789-$ | US-6204974-$ | US-6301050-$ | US-6349001-$ | US-6417969-$ | US-6442018-$ | US-6443097-$ | US-6523006-$ | US-6523753-$ | US-6582075-$ | US-6619799-$ | US-6629076-$ | US-6639706-$ | US-6724354-$ | US-6729726-$ | US-6736759-$ | US-6769767-$ | US-6784833-$ | US-6966647-$ | US-6975991-$ | US-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 05:21 PM

		7008074-$ | US- 7013009-$ | US- 7079876-$ | US- 7095573-$ | US- 7126558-$ | US- 7158296-$ | US- 7199951-$ | US- 7248232-$ | US- 7255437-$ | US- 7321785-$ | US- 7380936-$ | US- 7410254-$ | US- 7488294-$ | US- 7500747-$ | US- 7505793-$ | US- 7536150-$ | US- 7581833-$ | US- 7631968-$ | US- 7648236-$ | US- 7760898-$ | US- 7773767-$ | US- 7791593-$ | US- 7810750-$ | US- 7824052-$ | US- 7855743-$ | US- 7873243-$ | US- 7885419-$ | US- 7922321-$ | US- 7987070-$ | US- 8109629-$ | US- 8128422-$ | US- 8160287-$ | US- 8188880-$ | US- 8189263-$ | US- 8203502-$ | US- 8223088-$ | US- 8294994-$ | US- 8316319-$ | US- 8340476-$ | US- 8376548-$ | US- 8386261-$ | US- 8405489-$ | US- 8411214-$ | US- 8417185-$ | US- 8438659-$ | US- 8467133-$ | US- 8471967-$ | US- 8472119-$ | US- 8472120-$ | US- 8477425-$ | US- 8482859-$ | US- 8488246-$ | US- 8503087-$ | US- 8508851-$ | US- 8531355-$ | US- 8554307-$ | US- 8576143-$ | US- 8582209-$ | US-					

		8588448-$ | US- 8593795-$ | US- 8605009-$ | US- 8640959-$ | US- 8641621-$ | US- 8659397-$ | US- 8666212-$ | US- 8690776-$ | US- 8699842-$ | US- 8743464-$ | US- 8744113-$ | US- 8749886-$ | US- 8760762-$ | US- 8760765-$ | US- 8767305-$ | US- 8767306-$ | US- 8773599-$ | US- 8778022-$ | US- 8786686-$ | US- 8798292-$ | US- 8817379-$ | US- 8823603-$ | US- 8823636-$ | US- 8823740-$ | US- 8830329-$ | US- 8848289-$ | US- 8867131-$ | US- 8867139-$ | US- 8873148-$ | US- 8878750-$ | US- 8885877-$ | US- 8890946-$ | US- 8911087-$ | US- 8929589-$ | US- 8941560-$ | US- 8956396-$ | US- 8964298-$ | US- 8966656-$ | US- 8976085-$ | US- 8988519-$ | US- 9001030-$ | US- 9013793-$ | US- 9069115-$ | US- 9087471-$ | US- 9091851-$ | US- 9097890-$ | US- 9097891-$ | US- 9116337-$ | US- 9116545-$ | US- 9128281-$ | US- 9129295-$ | US- 9129429-$ | US- 9134534-$ | US- 9151953-$ | US- 9153074-$ | US- 9182596-$ | US- 9194995-$ | US- 9217868-$ | US-					

		9223134-$ | US- 9229227-$ | US- 9239415-$ | US- 9256071-$ | US- 9277334-$ | US- 9285589-$ | US- 9285591-$ | US- 9285592-$ | US- 9286726-$ | US- 9329388-$ | US- 9341843-$ | US- 9366862-$ | US- 9366869-$ | US- 9377627-$ | US- 9389422-$ | US- 9395544-$ | US- 9405135-$ | US- 9429759-$ | US- 9436009-$ | US- 9438984-$ | US- 9459455-$ | US- 9470907-$ | US- 9482882-$ | US- 9482883-$ | US- 9488833-$ | US- 9519092-$ | US- 9544675-$ | US- 9578307-$ | US- 9586318-$ | US- 9592404-$ | US- 9606612-$ | US- 9606992-$ | US- 9629774-$ | US- 9635222-$ | US- 9665901-$ | US- 9675319-$ | US- 9677901-$ | US- 9720258-$ | US- 9720260-$ | US- 9726904-$ | US- 9729767-$ | US- 9759917-$).DID.				
L850	340	(US-10012505-$ | US- 10013138-$ | US- 10013889-$ | US- 10015577-$ | US- 10018530-$ | US- 10024667-$ | US- 10024678-$ | US- 10024679-$ | US- 10024680-$ | US- 10037708-$ | US- 10039445-$ | US- 10042186-$ | US- 10061352-$ | US- 10063958-$ | US- 10067341-$ | US- 10073264-$ | US-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 05:21 PM

		10089684-$ | US- 10095034-$ | US- 10095036-$ | US- 10095833-$ | US- 10129395-$ | US- 10133070-$ | US- 10133074-$ | US- 10146054-$ | US- 10162180-$ | US- 10172760-$ | US- 10178378-$ | US- 10180572-$ | US- 10188467-$ | US- 10192133-$ | US- 10192361-$ | US- 10219944-$ | US- 10222617-$ | US- 10248856-$ | US- 10261321-$ | US- 10275642-$ | US- 10278778-$ | US- 10288881-$ | US- 10302835-$ | US- 10306389-$ | US- 10310296-$ | US- 10314559-$ | US- 10338390-$ | US- 10338400-$ | US- 10339952-$ | US- 10341787-$ | US- 10345625-$ | US- 10348965-$ | US- 10360907-$ | US- 10423760-$ | US- 10424405-$ | US- 10432851-$ | US- 10437031-$ | US- 10453264-$ | US- 10466487-$ | US- 10481319-$ | US- 10481417-$ | US- 10490102-$ | US- 10506220-$ | US- 10507346-$ | US- 10520731-$ | US- 10520732-$ | US- 10521669-$ | US- 10539787-$ | US- 10545347-$ | US- 10547814-$ | US- 10551544-$ | US- 10561519-$ | US- 10624790-$ | US- 10634912-$ | US- 10634921-$ | US- 10646283-$ | US- 10650594-$ | US- 10742965-$ | US-					

		10747301-$ | US- 10764571-$ | US- 10777048-$ | US- 10782527-$ | US- 10809528-$ | US- 10859834-$ | US- 10860100-$ | US- 10884246-$ | US- 10895679-$ | US- 10965931-$ | US- 10976575-$ | US- 11009711-$ | US- 11054648-$ | US- 11119353-$ | US- 11137609-$ | US- 11153472-$ | US- 11153555-$ | US- 11163161-$ | US- 11181974-$ | US- 11207150-$ | US- 11219287-$ | US- 11243434-$ | US- 11259879-$ | US- 11262587-$ | US- 11294427-$ | US- 11300857-$ | US- 11378802-$ | US- 11382699-$ | US- 11382700-$ | US- 11402668-$ | US- 11415802-$ | US- 11415812-$ | US- 11448816-$ | US- 11464578-$ | US- 11464581-$ | US- 11484365-$ | US- 11500143-$ | US- 11510750-$ | US- 11513371-$ | US- 11523092-$ | US- 11526003-$ | US- 11533961-$ | US- 11536988-$ | US- 20020049566-$ | US- 20020049775-$ | US- 20020058531-$ | US- 20030020950-$ | US- 20030068057-$ | US- 20030090439-$ | US- 20030090787-$ | US- 20030227542-$ | US- 20040096078-$ | US- 20040108981-$ | US- 20040156012-$ | US- 20040156114-$ | US- 20040160573-$ | US- 20040171432-$ | US- 20040178970-$ | US-					

		20040201695-$ | US-20040205256-$ | US-20040212776-$ | US-20040238732-$ | US-20050012683-$ | US-20050046953-$ | US-20050078274-$ | US-20050110943-$ | US-20050184866-$ | US-20050201585-$ | US-20050230596-$ | US-20050248719-$ | US-20050254135-$ | US-20060003803-$ | US-20060052146-$ | US-20060055786-$ | US-20060093178-$ | US-20060109350-$ | US-20060115130-$ | US-20060140422-$ | US-20060152618-$ | US-20060192306-$ | US-20060212430-$ | US-20060236120-$ | US-20060236121-$ | US-20060238550-$ | US-20060238877-$ | US-20070030442-$ | US-20070049351-$ | US-20070064097-$ | US-20070064888-$ | US-20070064894-$ | US-20070067885-$ | US-20070081646-$ | US-20070109491-$ | US-20070204014-$ | US-20080024391-$ | US-20080064326-$ | US-20080068559-$ | US-20080082363-$ | US-20080084362-$).DID.				
L851	2137	843 844 845 846 847 848 849 850	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 05:22 PM

L852	129	851 AND 27	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 05:22 PM
L853	92	851 AND 30	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 05:22 PM
L854	72	851 AND 40	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 05:22 PM
L855	41	851 AND 44	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO,	OR	ON	ON	2023/12/11 05:22 PM

			MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L856	7	851 AND 38	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 05:23 PM
L864	18	(16/182969 | 16/424018 | 16/429181 | 16/821810 | 17/395509 | 17/484080 | 17/737866 | 17/873104 | 17/942347 | 17/949029 | 17/964853).APP.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 05:25 PM
L865	12	(AT-20220034542-$ | EP-1027626-$ | EP-2290433-$ | KR-20020044416-$ | WO-200124576-$).DID.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 05:25 PM
L866	75	(US-9299194-$ | US-9360889-$ | US-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP,	OR	ON	ON	2023/12/11 05:40 PM

		9400390-$ | US- 9401540-$ | US- 9405135-$ | US- 9423870-$ | US- 9460732-$ | US- 9482880-$ | US- 9482882-$ | US- 9482883-$ | US- 9494800-$ | US- 9501880-$ | US- 9508269-$ | US- 9538915-$ | US- 9575321-$ | US- 9594246-$ | US- 9632059-$ | US- 9635222-$ | US- 9651784-$ | US- 9651787-$ | US- 9684172-$ | US- 9684374-$ | US- 9726904-$ | US- 9746676-$ | US- 9746686-$ | US- 9753288-$ | US- 9766463-$ | US- 9766479-$ | US- 9798458-$ | US- 9800990-$ | US- 9810906-$ | US- 9829707-$ | US- 9836122-$ | US- 9841599-$ | US- 9851567-$ | US- 9874936-$ | US- 9880052-$ | US- 9910298-$ | US- 9922236-$ | US- 9939934-$ | US- 9952664-$ | US- 9965681-$).DID.	AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L867	74	(US-9423870-$ | US-9451068-$ | US-9482880-$ | US-9482882-$ | US-9482883-$ | US-9494800-$ | US-9494807-$ | US-9532714-$ | US-9575321-$ | US-9594246-$ | US-9619201-$ | US-9628707-$ | US-9632059-$ | US-9635222-$ | US-9649052-$ | US-9651784-$ | US-9651787-$ | US-9684172-$ | US-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 05:40 PM

		9684374-$ | US-9720258-$ | US-9720260-$ | US-9726904-$ | US-9740280-$ | US-9746676-$ | US-9746686-$ | US-9753288-$ | US-9766463-$ | US-9766479-$ | US-9798458-$ | US-9800990-$ | US-9810906-$ | US-9811152-$ | US-9823494-$ | US-9829707-$ | US-9836122-$ | US-9841599-$ | US-9880052-$ | US-9910298-$ | US-9939934-$ | US-9952664-$ | US-9965681-$).DID.					
L868	127	(US-10042186-$ | US-10222617-$ | US-10345625-$ | US-10613355-$ | US-10624790-$ | US-10777048-$ | US-11061252-$ | US-11513371-$ | US-11536988-$ | US-20040160572-$ | US-20090097688-$ | US-20090296044-$ | US-20100177277-$ | US-20100265456-$ | US-20110080556-$ | US-20110102734-$ | US-20110109873-$ | US-20120002159-$ | US-20130010256-$ | US-20160109729-$ | US-20170068117-$ | US-20190126060-$ | US-3042548-$ | US-3683168-$ | US-3923384-$ | US-4447504-$ | US-4449799-$ | US-4618226-$ | US-4675259-$ | US-4756605-$ | US-4770954-$ | US-4883728-$ | US-4977899-$ | US-5007726-$ | US-5142406-$ | US-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 05:40 PM

		5455637-$ | US-5455638-$ | US-5835185-$ | US-5900720-$ | US-6099117-$ | US-6325507-$ | US-6476311-$ | US-64764696-$ | US-6552511-$ | US-7150526-$ | US-7339353-$ | US-7370963-$ | US-7461936-$ | US-8337013-$ | US-8465151-$ | US-8500271-$ | US-8770742-$ | US-8787970-$ | US-8801174-$ | US-8876285-$ | US-8905541-$ | US-8944590-$ | US-9192772-$ | US-9207515-$ | US-9274395-$ | US-9405135-$ | US-9470909-$ | US-9482880-$ | US-9619201-$ | US-9632059-$ | US-9720258-$ | US-9720260-$).DID.					
L869	69	(CA-2388872-$ | CN-1110465-$ | CN-212276134-$ | CN-217718312-$ | DE-69800345-$ | EP-2082281-$ | EP-3306380-$ | EP-3608705-$ | JP-2000162341-$ | JP-2000268883-$ | JP-2001183620-$ | JP-2002218669-$ | JP-2003017020-$ | JP-2020027271-$ | JP-6742059-$ | KR-100720019-$ | KR-101529551-$ | KR-20010078034-$ | KR-200250874-$ | KR-200262295-$ | WO-2001035159-$ | WO-2002054135-$ | WO-2009062381-$ | WO-2010010204-$ | WO-2019011925-$).DID.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 05:40 PM

L870	46	(US-9759932-$ | US-9763071-$ | US-9767160-$ | US-9782604-$ | US-9786171-$ | US-9804400-$ | US-9811752-$ | US-9814425-$ | US-9843743-$ | US-9864211-$ | US-9897811-$ | US-9897886-$ | US-9898039-$ | US-9901406-$ | US-9915545-$ | US-9915823-$ | US-9922236-$ | US-9946074-$ | US-9949700-$ | US-9958275-$ | US-9972216-$ | US-9976901-$ | US-9980054-$).DID.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 05:40 PM
L871	18	(US-0017635-$ | US-0063763-$ | US-0415338-$ | US-11721183-$ | US-11733549-$ | US-2725462-$ | US-20030063763-$ | US-20220415338-$ | US-20230017635-$).DID.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 05:40 PM
L872	11	(WO-2019013821-$ | WO-2019154509-$ | WO-2020244358-$ | WO-2022145647-$).DID.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 05:40 PM
L873	378	864 865 866 867 868 869 870 871 872	(US-PGPUB; USPAT; USOCR; FIT (AU, AP,	OR	ON	ON	2023/12/11 05:41 PM

			AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L874	41	873 AND 27	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 05:41 PM
L876	27	873 AND 40	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 05:42 PM
L877	15	873 AND 44	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO,	OR	ON	ON	2023/12/11 05:42 PM

			RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L878	8	873 AND 38	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 05:42 PM
L879	27	873 AND 40	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 05:45 PM
L880	27	873 AND 40	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 05:46 PM
L881	27	873 AND 40	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU,	OR	ON	ON	2023/12/11 05:46 PM

			CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L882	15	873 AND 44	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 05:46 PM
L883	8	873 AND 38	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/11 05:46 PM
L884	27	873 AND 40	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA,	OR	ON	ON	2023/12/11 05:47 PM

			VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L885	69	"2011106798"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/12 07:48 AM
L886	117	"20120075168"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/12 07:48 AM
L887	56	"20120194420"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/12 07:48 AM
L888	45	"20120194419"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB,	OR	ON	ON	2023/12/12 07:48 AM

			HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L889	30	"20120206322"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/12 07:48 AM
L890	22	"20040000733"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/12 08:06 AM
L891	24	"20050201585"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT;	OR	ON	ON	2023/12/12 08:06 AM

			IBM_TDB)				
L892	90	"20060023158"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/12 08:06 AM
L893	31	"20070030442"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/12 08:06 AM
L894	32	(Artificial Intelligence) More like doc: US-20190187492-A1 Text: (US-20090296044-A1 OR US-20120133885-A1 OR US-20210364827-A9 OR US-20100309426-A1 OR US-20210364828-A1 OR US-20170146829-A1 OR US-20170131575-A1 OR US-20150253590-A1 OR US-20130201440-A1 OR US-20190033623-A1 OR US-20220260859-A1 OR US-20070046887-A1 OR US-8109629-B2 OR US-8465151-B2 OR US-7581833-B2 OR US-11733549-B2 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/12 08:21 AM

		US-9033493-B2 OR US-9690121-B2 OR US-11086147-B2 OR US-10330956-B2).did.					
L895	37	(Artificial Intelligence) More like doc: US-20200218094-A1 Text: (US-20220357599-A1 OR US-20230017635-A1 OR US-20220011603-A1 OR US-20230273464-A1 OR US-20200012127-A1 OR US-20050264752-A1 OR US-7500747-B2 OR US-7922321-B2 OR US-20230033660-A1 OR US-20230057654-A1 OR US-20110187990-A1 OR US-20230236444-A1 OR US-8500271-B2 OR US-8905542-B2 OR US-10310296-B2 OR US-11536988-B2 OR US-20130308089-A1 OR US-20180335650-A1 OR US-20170090219-A1 OR US-20150085245-A1).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/12 08:21 AM
L897	35	(Artificial Intelligence) More like doc: US-20220357599-A1 Text: (US-20230017635-A1 OR US-20230273464-A1 OR US-20200218094-A1 OR US-20220011603-A1 OR US-7500747-B2 OR US-20230033660-A1 OR US-11644693-B2 OR US-20230057654-A1 OR US-20230236444-A1 OR US-11536988-B2 OR US-20190285913-A1 OR US-20120050668-A1 OR US-20190278110-A1 OR US-20220260859-A1 OR US-20140268008-A1 OR US-20160246075-A9 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/12 08:21 AM

		US-11513371-B2 OR US-11204512-B2 OR US-11733549-B2 OR US-8430507-B2).did.					
L898	37	(Artificial Intelligence) More like doc: US-6349001-B1 Text: (CA-2307877-C OR EP-1027627-A1 OR EP-1027627-A4 OR WO-9923524-A1 OR US-6091546-A OR JP-2001522063-A OR EP-1027627-B1 OR AU-2007205168-A1 OR CA-2636159-A1 OR AU-2007205168-B2 OR CA-2174510-A1 OR CA-2636159-C OR BR-PI0706349-A2 OR KR-20180037887-A OR US-20040108981-A1 OR CN-1529831-A OR CN-100365470-C OR TW-200409945-A OR CN-103033952-A OR CA-2377742-A1).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/12 08:22 AM
L899	38	(Artificial Intelligence) More like doc: US-5835185-A Text: (US-5455638-A OR US-5455637-A OR US-5900720-A OR US-20080100792-A1 OR WO-2008057199-A2 OR CA-2667671-A1 OR US-20090201460-A1 OR WO-2008057200-A2 OR EP-2082281-A2 OR US-20080106694-A1 OR WO-2008057198-A2 OR WO-2008054654-A2 OR US-20080129953-A1 OR US-20210149216-A1 OR WO-2019011925-A1 OR EP-3652584-A1 OR EP-3608705-A1 OR TW-200837421-A OR CN-110892314-A OR WO-2008057200-A3).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/12 08:22 AM
L900	10	"20160085076"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP,	OR	ON	ON	2023/12/12 08:51 AM

			AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L901	13	"20140268013"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/12 08:51 AM
L902	17	"20140268008"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/12 08:51 AM
L903	202	"20130278631"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO,	OR	ON	ON	2023/12/12 08:51 AM

			RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L904	19	"20110221657"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/12 08:51 AM
L905	43	"8849185"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/12 09:31 AM
L906	28	"8582789"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/12 09:31 AM
L907	184	"8109629"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU,	OR	ON	ON	2023/12/12 09:31 AM

			CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L908	541	"8964298"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/12 09:31 AM
L909	418	"8467133"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/12 09:31 AM
L910	40	"10802582"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA,	OR	ON	ON	2023/12/12 09:47 AM

			VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L911	55	"10515623"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/12 09:47 AM
L912	8	"11762224"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; JPO)	OR	ON	ON	2023/12/12 09:47 AM

PE2E SEARCH - Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
N1	13385	((("HOWELL") near3 ("Thomas")) OR (("CHAO") near3 ("David")) OR (("THOMAS") near3 ("C")) OR (("TONG") near3 ("Peter"))).INV.	(US-PGPUB; USPAT)	OR	ON	ON	2023/12/11 03:33 PM
N2	210	((("HOWELL") near3 ("Thomas")) OR (("CHAO") near3 ("David")) OR (("THOMAS") near3 ("C")) OR (("TONG") near3 ("Peter"))).INV. AND frame AND (arm OR temple) AND sensor AND battery	(US-PGPUB; USPAT)	OR	ON	ON	2023/12/11 03:33 PM
N3	210	((("HOWELL") near3	(US-PGPUB; USPAT)	OR	ON	ON	2023/12/11

		("Thomas")) OR (("CHAO") near3 ("David")) OR (("THOMAS") near3 ("C")) OR (("TONG") near3 ("Peter"))).INV. AND frame AND (arm OR temple) AND sensor AND batter$4 AND control$4 AND connect$4					03:33 PM
N4	143	((("HOWELL") near3 ("Thomas")) OR (("CHAO") near3 ("David")) OR (("THOMAS") near3 ("C")) OR (("TONG") near3 ("Peter"))).INV. AND frame AND (arm OR temple) AND sensor AND batter$4 AND control$4 AND connect$4 AND charg$4 AND electric$4	(US-PGPUB; USPAT)	OR	ON	ON	2023/12/11 03:33 PM
N5	129	((("HOWELL") near3 ("Thomas")) OR (("CHAO") near3 ("David")) OR (("THOMAS") near3 ("C")) OR (("TONG") near3 ("Peter"))).INV. AND frame AND (arm OR temple) AND sensor AND batter$4 AND control$4 AND connect$4 AND charg$4 AND electric$4 AND wireless AND communicat$4	(US-PGPUB; USPAT)	OR	ON	ON	2023/12/11 03:33 PM
N6	32	((("HOWELL") near3 ("Thomas")) OR (("CHAO") near3 ("David")) OR (("THOMAS") near3 ("C")) OR (("TONG") near3 ("Peter"))).INV. AND (eyewear OR spectale OR eyeglass$4 OR glass$4) AND frame AND (arm OR temple) AND sensor AND (batter$4 WITH charg$4) AND control$4 AND connect$4 AND electric$4 AND (wireless WITH	(US-PGPUB; USPAT)	OR	ON	ON	2023/12/11 03:33 PM

		communicat$4) AND position AND open$4 AND clos$4 AND circuit$4 AND (within WITH frame) AND hing$4 AND conduct$4 AND coupl$4 AND lens$4 AND indicat$4 AND embed$4 AND antenna AND side AND view AND audio AND microphone AND diode AND output AND front AND section AND information AND place AND expos$4					
N146	5484	((eyewear OR spectale OR eyeglass$4 OR glass$4) AND frame AND (arm OR temple)).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2023/12/11 03:44 PM
N147	687	((eyewear OR spectale OR eyeglass$4 OR glass$4) AND frame AND (arm OR temple) AND sensor).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2023/12/11 03:44 PM
N148	140	((eyewear OR spectale OR eyeglass$4 OR glass$4) AND frame AND (arm OR temple) AND sensor AND (batter$4)).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2023/12/11 03:44 PM
N149	51	((eyewear OR spectale OR eyeglass$4 OR glass$4) AND frame AND (arm OR temple) AND sensor AND (batter$4 WITH charg$4)).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2023/12/11 04:19 PM
N150	28	((eyewear OR spectale OR eyeglass$4 OR glass$4) AND frame AND (arm OR temple) AND sensor AND (batter$4 WITH charg$4) AND connect$4 AND electric$4).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2023/12/11 04:19 PM
N151	21	((eyewear OR spectale OR eyeglass$4 OR glass$4) AND frame AND (arm OR temple) AND sensor AND (batter$4 WITH charg$4) AND control$4 AND connect$4 AND	(US-PGPUB; USPAT)	OR	ON	ON	2023/12/11 04:19 PM

		electric$4).clm.					
N152	11	((eyewear OR spectale OR eyeglass$4 OR glass$4) AND frame AND (arm OR temple) AND sensor AND (batter$4 WITH charg$4) AND control$4 AND connect$4 AND electric$4 AND wireless).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2023/12/11 05:11 PM
N153	10	((eyewear OR spectale OR eyeglass$4 OR glass$4) AND frame AND (arm OR temple) AND sensor AND (batter$4 WITH charg$4) AND control$4 AND connect$4 AND electric$4 AND wireless AND communicat$4).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2023/12/11 05:11 PM
N154	2	((eyewear OR spectale OR eyeglass$4 OR glass$4) AND frame AND (arm OR temple) AND sensor AND (batter$4 WITH charg$4) AND control$4 AND connect$4 AND electric$4 AND (wireless WITH communicat$4) AND position AND open$4 AND clos$4).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2023/12/11 05:11 PM
N155	2	((eyewear OR spectale OR eyeglass$4 OR glass$4) AND frame AND (arm OR temple) AND sensor AND (batter$4 WITH charg$4) AND control$4 AND connect$4 AND electric$4 AND (wireless WITH communicat$4) AND position AND open$4 AND clos$4 AND circuit$4).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2023/12/12 07:47 AM
N156	2	((eyewear OR spectale OR eyeglass$4 OR glass$4) AND frame AND (arm OR temple) AND sensor AND (batter$4 WITH charg$4) AND control$4	(US-PGPUB; USPAT)	OR	ON	ON	2023/12/12 07:47 AM

		AND connect$4 AND electric$4 AND (wireless WITH communicat$4) AND position AND open$4 AND clos$4 AND circuit$4 AND (within WITH frame)).clm.					
N157	0	((eyewear OR spectale OR eyeglass$4 OR glass$4) AND frame AND (arm OR temple) AND sensor AND (batter$4 WITH charg$4) AND control$4 AND connect$4 AND electric$4 AND (wireless WITH communicat$4) AND position AND open$4 AND clos$4 AND circuit$4 AND (within WITH frame) AND hing$4 AND conduct$4).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2023/12/12 07:47 AM
N158	0	((eyewear OR spectale OR eyeglass$4 OR glass$4) AND frame AND (arm OR temple) AND sensor AND (batter$4 WITH charg$4) AND control$4 AND connect$4 AND electric$4 AND (wireless WITH communicat$4) AND position AND open$4 AND clos$4 AND circuit$4 AND (within WITH frame) AND hing$4 AND conduct$4 AND coupl$4).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2023/12/12 08:22 AM
N159	0	((eyewear OR spectale OR eyeglass$4 OR glass$4) AND frame AND (arm OR temple) AND sensor AND (batter$4 WITH charg$4) AND control$4 AND connect$4 AND electric$4 AND (wireless WITH communicat$4) AND position AND open$4 AND clos$4 AND circuit$4 AND (within WITH frame) AND	(US-PGPUB; USPAT)	OR	ON	ON	2023/12/12 08:22 AM

		hing$4 AND conduct$4 AND coupl$4 AND lens$4 AND indicat$4).clm.					
N160	0	((eyewear OR spectale OR eyeglass$4 OR glass$4) AND frame AND (arm OR temple) AND sensor AND (batter$4 WITH charg$4) AND control$4 AND connect$4 AND electric$4 AND (wireless WITH communicat$4) AND position AND open$4 AND clos$4 AND circuit$4 AND (within WITH frame) AND hing$4 AND conduct$4 AND coupl$4 AND lens$4 AND indicat$4 AND embed$4 AND antenna AND side AND view AND audio AND microphone).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2023/12/12 08:22 AM
N161	0	((eyewear OR spectale OR eyeglass$4 OR glass$4) AND frame AND (arm OR temple) AND sensor AND (batter$4 WITH charg$4) AND control$4 AND connect$4 AND electric$4 AND (wireless WITH communicat$4) AND position AND open$4 AND clos$4 AND circuit$4 AND (within WITH frame) AND hing$4 AND conduct$4 AND coupl$4 AND lens$4 AND indicat$4 AND embed$4 AND antenna AND side AND view AND audio AND microphone AND diode AND output AND front AND section).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2023/12/12 09:31 AM
N162	0	((eyewear OR spectale OR eyeglass$4 OR glass$4) AND frame AND (arm OR temple) AND sensor AND (batter$4 WITH charg$4) AND control$4	(US-PGPUB; USPAT)	OR	ON	ON	2023/12/12 09:31 AM

		AND connect$4 AND electric$4 AND (wireless WITH communicat$4) AND position AND open$4 AND clos$4 AND circuit$4 AND (within WITH frame) AND hing$4 AND conduct$4 AND coupl$4 AND lens$4 AND indicat$4 AND embed$4 AND antenna AND side AND view AND audio AND microphone AND diode AND output AND front AND section AND information AND place AND expos$4).clm.					
N163	0	((eyewear OR spectale OR eyeglass$4 OR glass$4) AND frame AND (arm OR temple) AND sensor AND (batter$4 WITH charg$4) AND control$4 AND connect$4 AND electric$4 AND (wireless WITH communicat$4) AND position AND open$4 AND clos$4 AND circuit$4 AND (within WITH frame) AND hing$4 AND conduct$4 AND coupl$4 AND lens$4 AND indicat$4 AND embed$4 AND antenna AND side AND view AND audio AND microphone AND diode AND output AND front AND section AND information AND place AND expos$4 AND pin AND pad).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2023/12/12 09:31 AM

PE2E SEARCH - Search History (Similarity Search)

Ref #	Sort and Retrieval Information	Text Selections	CPC Selections
L821	Sort results by: Similarity to Application # 18/375,893 Retrieve results by: Application # 18/375,893	No selections	No selections
L822	Sort results by: Similarity to	(Abstract) Techniques for	No selections

	Application # 18/375,893 Retrieve results by: Application # 18/375,893	providing eyewear or other head-worn personal electronic apparatus with electrical components are disclosed. The electrical components can provide electrical technology to eyewear or other head-worn personal electronic apparatus without having to substantially compromise aesthetic design principles. The electrical components can be partially or completely internal to eyewear or other head-worn personal electronic apparatus. The electrical components can operate independently or together with other electrical components provided elsewhere. Apparatus for presenting after-market electrical components are also disclosed. (Claims) a head-worn personal electronic apparatus, including at least: a head-worn structure configured to be worn by a user; at least one speaker at least partially internal to the head-worn structure, the at least one speaker being configured to be worn proximate to an ear of the user when the head-worn structure is being worn by the user; a touch sensitive surface at least partially contained within the head-worn structure and configured to sense a touch input associated with the user; a rechargeable battery contained within the head-worn structure; electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery, and the electronic circuitry being	

		electrically connected to the touch sensitive surface; wireless communication circuitry at least partially contained within the head-worn structure, the wireless communication circuitry being electrically connected to at least the rechargeable battery; and at least one conductive element at least partially included within the head-worn structure, the at least one conductive element being at least partially exposed to enable interconnection therewith, the at least one conductive element being electrically connected to at least the rechargeable battery; and a charging apparatus having a charging connector, wherein on placement of the head-worn personal electronic apparatus in the charging apparatus, electrical connection results from the at least one conductive element connecting with the charging connector, and thereby the rechargeable battery of the head- worn personal electronic apparatus is able to be recharged while the head-worn personal electronic apparatus is placed in the charging apparatus. 1. (Original) A system, comprising: (Claims) 19. (Original) A system, comprising: a head-worn structure configured to be worn by a user; at least one speaker at least partially internal to the head-worn structure, the at least one speaker being configured	

		to be worn proximate to an ear of the user when the head-worn structure is being worn by the user; a first microphone at least partially contained within the head-worn structure, the first microphone being positioned to pick up at least audio input from at least the user; a second microphone at least partially contained within the head-worn structure, the second microphone being positioned to pick up at least environmental audio input associated with an environment around the head-worn personal electronic apparatus; a rechargeable battery contained within the head-worn structure; electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery; wireless communication circuitry at least partially contained within the head-worn structure, the wireless communication circuitry being electrically connected to at least the rechargeable battery; and at least one conductive element at least partially included within the head-worn structure, the at least one conductive element being at least partially exposed to enable interconnection therewith, the at least one conductive element being electrically connected to at least the rechargeable battery; and wherein on placement of the head-worn personal electronic	

		apparatus in the charging apparatus, electrical connection results from the at least one conductive element connecting with the charging connector, and thereby the rechargeable battery of the head- worn personal electronic apparatus is able to be recharged while the head-worn personal electronic apparatus is placed in the charging apparatus. a charging apparatus having a charging connector, (Claims) 43. (Original) A system, comprising: wireless communication circuitry at least partially contained within the head-worn structure, the wireless communication circuitry being electrically connected to at least the rechargeable battery; and at least one conductive element at least partially included within the head-worn structure, the at least one conductive element being at least partially exposed to enable interconnection therewith, the at least one conductive element being electrically connected to at least the rechargeable battery; and wherein on placement of the head-worn personal electronic apparatus in the charging apparatus, electrical connection results from the at least one conductive element connecting with the charging connector, and thereby the rechargeable battery of the head- worn personal electronic apparatus is able to be recharged while the head-worn personal electronic apparatus is placed in the charging apparatus.	

		a charging apparatus having a charging connector, wherein the electronic circuitry is configured to process the audio input from at least the user via the first microphone to remove at least a portion of the environmental audio input associated with the environment picked up via the second microphone, and wherein the head-worn personal electronic device is configured to receive a voice input via the first microphone, determine a requested operation from the voice input using voice recognition, and control an operation by the head-worn personal electronic device based on the requested operatio (Claims) 49. (New) A system, comprising: at least one speaker at least partially internal to the head-worn structure, the at least one speaker being configured to be worn proximate to an ear of the user when the head-worn structure is being worn by the user; a motion detector at least partially contained within the head-worn structure and configured to provide motion data pertaining to the head-worn personal electronic apparatus; a first microphone at least partially contained within the head-worn structure, the first microphone being positioned to pick up at least audio input from at least the user; a second microphone at least partially contained within the head-worn structure, the second microphone being positioned to pick up at least environmental audio input	

		associated with an environment around the head-worn personal electronic apparatus; a rechargeable battery contained within the head-worn structure; electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery; wireless communication circuitry at least partially contained within the head-worn structure, the wireless communication circuitry being electrically connected to at least the rechargeable battery; a radiation emitter at least partially contained within the head-worn structure and configured to at least direct radiation towards the user when at least the head-worn structure of the head-worn personal electronic apparatus is being worn; a radiation detector at least partially contained within the head-worn structure and configured to detect radiation reflected back from the user when at least the head- worn structure of the head-worn personal electronic apparatus is being worn; and at least one conductive element at least partially included within the head-worn structure, the at least one conductive element being at least partially exposed to enable interconnection therewith, the at least one conductive element being electrically connected to at least the rechargeable battery; and wherein on placement of the	

		head-worn personal electronic apparatus in the charging apparatus, electrical connection results from the at least one conductive element connecting with the charging connector, and thereby the rechargeable battery of the head- worn personal electronic apparatus is able to be recharged while the head-worn personal electronic apparatus is placed in the charging apparatus. a charging apparatus having a charging connector,	
L823	Sort results by: Similarity to Application # 18/375,893 Retrieve results by: Application # 18/375,893	(Abstract) Techniques for providing eyewear or other head-worn personal electronic apparatus with electrical components are disclosed. The electrical components can provide electrical technology to eyewear or other head-worn personal electronic apparatus without having to substantially compromise aesthetic design principles. The electrical components can be partially or completely internal to eyewear or other head-worn personal electronic apparatus. The electrical components can operate independently or together with other electrical components provided elsewhere. Apparatus for presenting after-market electrical components are also disclosed. (Claims) a head-worn personal electronic apparatus, including at least: a head-worn structure configured to be worn by a user; at least one speaker at least partially internal to the head-worn structure, the at least one speaker being configured to be worn proximate to an ear of the user when the head-worn structure is being worn by the user;	(G02C2200/08) Modular frames, easily exchangeable frame parts and lenses (G02C11/10) Electronic devices other than hearing aids (G02C5/146) Side-members having special front end

		a touch sensitive surface at least partially contained within the head-worn structure and configured to sense a touch input associated with the user; a rechargeable battery contained within the head-worn structure; electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery, and the electronic circuitry being electrically connected to the touch sensitive surface; wireless communication circuitry at least partially contained within the head-worn structure, the wireless communication circuitry being electrically connected to at least the rechargeable battery; and at least one conductive element at least partially included within the head-worn structure, the at least one conductive element being at least partially exposed to enable interconnection therewith, the at least one conductive element being electrically connected to at least the rechargeable battery; and a charging apparatus having a charging connector, wherein on placement of the head-worn personal electronic apparatus in the charging apparatus, electrical connection results from the at least one conductive element connecting with the charging connector, and thereby the rechargeable battery of the head- worn personal electronic apparatus is able to be recharged while the head-	

		worn personal electronic apparatus is placed in the charging apparatus. 1. (Original) A system, comprising: (Claims) 19. (Original) A system, comprising: a head-worn structure configured to be worn by a user; at least one speaker at least partially internal to the head-worn structure, the at least one speaker being configured to be worn proximate to an ear of the user when the head-worn structure is being worn by the user; a first microphone at least partially contained within the head-worn structure, the first microphone being positioned to pick up at least audio input from at least the user; a second microphone at least partially contained within the head-worn structure, the second microphone being positioned to pick up at least environmental audio input associated with an environment around the head-worn personal electronic apparatus; a rechargeable battery contained within the head-worn structure; electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery; wireless communication circuitry at least partially contained within the head-worn structure, the wireless communication circuitry being electrically connected to at	

		least the rechargeable battery; and at least one conductive element at least partially included within the head-worn structure, the at least one conductive element being at least partially exposed to enable interconnection therewith, the at least one conductive element being electrically connected to at least the rechargeable battery; and wherein on placement of the head-worn personal electronic apparatus in the charging apparatus, electrical connection results from the at least one conductive element connecting with the charging connector, and thereby the rechargeable battery of the head- worn personal electronic apparatus is able to be recharged while the head-worn personal electronic apparatus is placed in the charging apparatus. a charging apparatus having a charging connector, (Claims) 43. (Original) A system, comprising: wireless communication circuitry at least partially contained within the head-worn structure, the wireless communication circuitry being electrically connected to at least the rechargeable battery; and at least one conductive element at least partially included within the head-worn structure, the at least one conductive element being at least partially exposed to enable interconnection therewith, the at least one conductive element being electrically connected to at least the rechargeable battery;	

		and wherein on placement of the head-worn personal electronic apparatus in the charging apparatus, electrical connection results from the at least one conductive element connecting with the charging connector, and thereby the rechargeable battery of the head- worn personal electronic apparatus is able to be recharged while the head-worn personal electronic apparatus is placed in the charging apparatus. a charging apparatus having a charging connector, wherein the electronic circuitry is configured to process the audio input from at least the user via the first microphone to remove at least a portion of the environmental audio input associated with the environment picked up via the second microphone, and wherein the head-worn personal electronic device is configured to receive a voice input via the first microphone, determine a requested operation from the voice input using voice recognition, and control an operation by the head-worn personal electronic device based on the requested operatio (Claims) 49. (New) A system, comprising: at least one speaker at least partially internal to the head-worn structure, the at least one speaker being configured to be worn proximate to an ear of the user when the head-worn structure is being worn by the user; a motion detector at least partially contained within the head-worn structure and	

		configured to provide motion data pertaining to the head-worn personal electronic apparatus; a first microphone at least partially contained within the head-worn structure, the first microphone being positioned to pick up at least audio input from at least the user; a second microphone at least partially contained within the head-worn structure, the second microphone being positioned to pick up at least environmental audio input associated with an environment around the head-worn personal electronic apparatus; a rechargeable battery contained within the head-worn structure; electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery; wireless communication circuitry at least partially contained within the head-worn structure, the wireless communication circuitry being electrically connected to at least the rechargeable battery; a radiation emitter at least partially contained within the head-worn structure and configured to at least direct radiation towards the user when at least the head-worn structure of the head-worn personal electronic apparatus is being worn; a radiation detector at least partially contained within the head-worn structure and configured to detect radiation reflected back from the user when at least the head- worn	

		structure of the head-worn personal electronic apparatus is being worn; and at least one conductive element at least partially included within the head-worn structure, the at least one conductive element being at least partially exposed to enable interconnection therewith, the at least one conductive element being electrically connected to at least the rechargeable battery; and wherein on placement of the head-worn personal electronic apparatus in the charging apparatus, electrical connection results from the at least one conductive element connecting with the charging connector, and thereby the rechargeable battery of the head- worn personal electronic apparatus is able to be recharged while the head-worn personal electronic apparatus is placed in the charging apparatus. a charging apparatus having a charging connector,	
L824	Sort results by: Similarity to Application # 18/375,893 Retrieve results by: Application # 18/375,893	(Abstract) Techniques for providing eyewear or other head-worn personal electronic apparatus with electrical components are disclosed. The electrical components can provide electrical technology to eyewear or other head-worn personal electronic apparatus without having to substantially compromise aesthetic design principles. The electrical components can be partially or completely internal to eyewear or other head-worn personal electronic apparatus. The electrical components can operate independently or together with other electrical components provided elsewhere. Apparatus for presenting after-market electrical components	(G02C2200/08) Modular frames, easily exchangeable frame parts and lenses (G02C11/10) Electronic devices other than hearing aids (G02C5/146) Side-members having special front end (G02C5/143) Side-members having special ear pieces (G02C11/06) Hearing aids (H02J7/0045) Circuit arrangements for charging or depolarising batteries or for supplying loads from batteries characterised by the mechanical construction concerning the insertion or the connection of the batteries

		are also disclosed. (Claims) a head-worn personal electronic apparatus, including at least: a head-worn structure configured to be worn by a user; at least one speaker at least partially internal to the head-worn structure, the at least one speaker being configured to be worn proximate to an ear of the user when the head-worn structure is being worn by the user; a touch sensitive surface at least partially contained within the head-worn structure and configured to sense a touch input associated with the user; a rechargeable battery contained within the head-worn structure; electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery, and the electronic circuitry being electrically connected to the touch sensitive surface; wireless communication circuitry at least partially contained within the head-worn structure, the wireless communication circuitry being electrically connected to at least the rechargeable battery; and at least one conductive element at least partially included within the head-worn structure, the at least one conductive element being at least partially exposed to enable interconnection therewith, the at least one conductive element being electrically connected to at	

		least the rechargeable battery; and a charging apparatus having a charging connector, wherein on placement of the head-worn personal electronic apparatus in the charging apparatus, electrical connection results from the at least one conductive element connecting with the charging connector, and thereby the rechargeable battery of the head- worn personal electronic apparatus is able to be recharged while the head-worn personal electronic apparatus is placed in the charging apparatus. 1. (Original) A system, comprising: (Claims) 19. (Original) A system, comprising: a head-worn structure configured to be worn by a user; at least one speaker at least partially internal to the head-worn structure, the at least one speaker being configured to be worn proximate to an ear of the user when the head-worn structure is being worn by the user; a first microphone at least partially contained within the head-worn structure, the first microphone being positioned to pick up at least audio input from at least the user; a second microphone at least partially contained within the head-worn structure, the second microphone being positioned to pick up at least environmental audio input associated with an environment around the head-worn personal electronic apparatus;	

		a rechargeable battery contained within the head-worn structure; electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery; wireless communication circuitry at least partially contained within the head-worn structure, the wireless communication circuitry being electrically connected to at least the rechargeable battery; and at least one conductive element at least partially included within the head-worn structure, the at least one conductive element being at least partially exposed to enable interconnection therewith, the at least one conductive element being electrically connected to at least the rechargeable battery; and wherein on placement of the head-worn personal electronic apparatus in the charging apparatus, electrical connection results from the at least one conductive element connecting with the charging connector, and thereby the rechargeable battery of the head- worn personal electronic apparatus is able to be recharged while the head-worn personal electronic apparatus is placed in the charging apparatus. a charging apparatus having a charging connector, (Claims) 43. (Original) A system, comprising: wireless communication circuitry at least partially	

		contained within the head-worn structure, the wireless communication circuitry being electrically connected to at least the rechargeable battery; and at least one conductive element at least partially included within the head-worn structure, the at least one conductive element being at least partially exposed to enable interconnection therewith, the at least one conductive element being electrically connected to at least the rechargeable battery; and wherein on placement of the head-worn personal electronic apparatus in the charging apparatus, electrical connection results from the at least one conductive element connecting with the charging connector, and thereby the rechargeable battery of the head- worn personal electronic apparatus is able to be recharged while the head-worn personal electronic apparatus is placed in the charging apparatus. a charging apparatus having a charging connector, wherein the electronic circuitry is configured to process the audio input from at least the user via the first microphone to remove at least a portion of the environmental audio input associated with the environment picked up via the second microphone, and wherein the head-worn personal electronic device is configured to receive a voice input via the first microphone, determine a requested operation from the voice input using voice recognition, and control an operation by the head-worn personal electronic	

		device based on the requested operatio (Claims) 49. (New) A system, comprising: at least one speaker at least partially internal to the head-worn structure, the at least one speaker being configured to be worn proximate to an ear of the user when the head-worn structure is being worn by the user; a motion detector at least partially contained within the head-worn structure and configured to provide motion data pertaining to the head-worn personal electronic apparatus; a first microphone at least partially contained within the head-worn structure, the first microphone being positioned to pick up at least audio input from at least the user; a second microphone at least partially contained within the head-worn structure, the second microphone being positioned to pick up at least environmental audio input associated with an environment around the head-worn personal electronic apparatus; a rechargeable battery contained within the head-worn structure; electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery; wireless communication circuitry at least partially contained within the head-worn structure, the wireless communication circuitry being electrically connected to at	

		least the rechargeable battery; a radiation emitter at least partially contained within the head-worn structure and configured to at least direct radiation towards the user when at least the head-worn structure of the head-worn personal electronic apparatus is being worn; a radiation detector at least partially contained within the head-worn structure and configured to detect radiation reflected back from the user when at least the head- worn structure of the head-worn personal electronic apparatus is being worn; and at least one conductive element at least partially included within the head-worn structure, the at least one conductive element being at least partially exposed to enable interconnection therewith, the at least one conductive element being electrically connected to at least the rechargeable battery; and wherein on placement of the head-worn personal electronic apparatus in the charging apparatus, electrical connection results from the at least one conductive element connecting with the charging connector, and thereby the rechargeable battery of the head- worn personal electronic apparatus is able to be recharged while the head-worn personal electronic apparatus is placed in the charging apparatus. a charging apparatus having a charging connector,	
L825	Sort results by: Similarity to Application # 18/375,893 Retrieve results by: Application # 18/375,893	(Abstract) Techniques for providing eyewear or other head-worn personal electronic apparatus with electrical components are disclosed.	No selections

		The electrical components can provide electrical technology to eyewear or other head-worn personal electronic apparatus without having to substantially compromise aesthetic design principles. The electrical components can be partially or completely internal to eyewear or other head-worn personal electronic apparatus. The electrical components can operate independently or together with other electrical components provided elsewhere. Apparatus for presenting after-market electrical components are also disclosed. (Claims) 19. (Original) A system, comprising: a head-worn structure configured to be worn by a user; at least one speaker at least partially internal to the head-worn structure, the at least one speaker being configured to be worn proximate to an ear of the user when the head-worn structure is being worn by the user; a first microphone at least partially contained within the head-worn structure, the first microphone being positioned to pick up at least audio input from at least the user; a second microphone at least partially contained within the head-worn structure, the second microphone being positioned to pick up at least environmental audio input associated with an environment around the head-worn personal electronic apparatus; a rechargeable battery contained within the head-worn structure;	

		electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery; wireless communication circuitry at least partially contained within the head-worn structure, the wireless communication circuitry being electrically connected to at least the rechargeable battery; and at least one conductive element at least partially included within the head-worn structure, the at least one conductive element being at least partially exposed to enable interconnection therewith, the at least one conductive element being electrically connected to at least the rechargeable battery; and wherein on placement of the head-worn personal electronic apparatus in the charging apparatus, electrical connection results from the at least one conductive element connecting with the charging connector, and thereby the rechargeable battery of the head- worn personal electronic apparatus is able to be recharged while the head-worn personal electronic apparatus is placed in the charging apparatus. a charging apparatus having a charging connector,	
L826	Sort results by: Similarity to Application # 18/375,893 Retrieve results by: Application # 18/375,893	(Abstract) Techniques for providing eyewear or other head-worn personal electronic apparatus with electrical components are disclosed. The electrical components can provide electrical technology to eyewear or other head-worn personal electronic apparatus without having to substantially compromise	(G02C11/10) Electronic devices other than hearing aids (G02C5/146) Side-members having special front end (G02C2200/08) Modular frames, easily exchangeable frame parts and lenses

		aesthetic design principles. The electrical components can be partially or completely internal to eyewear or other head-worn personal electronic apparatus. The electrical components can operate independently or together with other electrical components provided elsewhere. Apparatus for presenting after-market electrical components are also disclosed. (Claims) 19. (Original) A system, comprising: a head-worn structure configured to be worn by a user; at least one speaker at least partially internal to the head-worn structure, the at least one speaker being configured to be worn proximate to an ear of the user when the head-worn structure is being worn by the user; a first microphone at least partially contained within the head-worn structure, the first microphone being positioned to pick up at least audio input from at least the user; a second microphone at least partially contained within the head-worn structure, the second microphone being positioned to pick up at least environmental audio input associated with an environment around the head-worn personal electronic apparatus; a rechargeable battery contained within the head-worn structure; electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery;	

		wireless communication circuitry at least partially contained within the head-worn structure, the wireless communication circuitry being electrically connected to at least the rechargeable battery; and at least one conductive element at least partially included within the head-worn structure, the at least one conductive element being at least partially exposed to enable interconnection therewith, the at least one conductive element being electrically connected to at least the rechargeable battery; and wherein on placement of the head-worn personal electronic apparatus in the charging apparatus, electrical connection results from the at least one conductive element connecting with the charging connector, and thereby the rechargeable battery of the head- worn personal electronic apparatus is able to be recharged while the head-worn personal electronic apparatus is placed in the charging apparatus. a charging apparatus having a charging connector,	
L827	Sort results by: Similarity to Application # 18/375,893 Retrieve results by: Application # 18/375,893	(Abstract) Techniques for providing eyewear or other head-worn personal electronic apparatus with electrical components are disclosed. The electrical components can provide electrical technology to eyewear or other head-worn personal electronic apparatus without having to substantially compromise aesthetic design principles. The electrical components can be partially or completely internal to eyewear or other head-worn personal electronic apparatus. The electrical	(G02C11/10) Electronic devices other than hearing aids (G02C5/146) Side-members having special front end (G02C2200/08) Modular frames, easily exchangeable frame parts and lenses (G02C5/143) Side-members having special ear pieces (G02C11/06) Hearing aids (H02J7/0045) Circuit arrangements for charging or depolarising batteries or for supplying loads from batteries characterised

		components can operate independently or together with other electrical components provided elsewhere. Apparatus for presenting after-market electrical components are also disclosed. (Claims) 19. (Original) A system, comprising: a head-worn structure configured to be worn by a user; at least one speaker at least partially internal to the head-worn structure, the at least one speaker being configured to be worn proximate to an ear of the user when the head-worn structure is being worn by the user; a first microphone at least partially contained within the head-worn structure, the first microphone being positioned to pick up at least audio input from at least the user; a second microphone at least partially contained within the head-worn structure, the second microphone being positioned to pick up at least environmental audio input associated with an environment around the head-worn personal electronic apparatus; a rechargeable battery contained within the head-worn structure; electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery; wireless communication circuitry at least partially contained within the head-worn structure, the wireless communication circuitry being	by the mechanical construction concerning the insertion or the connection of the batteries

		electrically connected to at least the rechargeable battery; and at least one conductive element at least partially included within the head-worn structure, the at least one conductive element being at least partially exposed to enable interconnection therewith, the at least one conductive element being electrically connected to at least the rechargeable battery; and wherein on placement of the head-worn personal electronic apparatus in the charging apparatus, electrical connection results from the at least one conductive element connecting with the charging connector, and thereby the rechargeable battery of the head- worn personal electronic apparatus is able to be recharged while the head-worn personal electronic apparatus is placed in the charging apparatus. a charging apparatus having a charging connector,	
L828	Sort results by: Similarity to Application # 18/375,893 Retrieve results by: Application # 18/375,893	(Abstract) Techniques for providing eyewear or other head-worn personal electronic apparatus with electrical components are disclosed. The electrical components can provide electrical technology to eyewear or other head-worn personal electronic apparatus without having to substantially compromise aesthetic design principles. The electrical components can be partially or completely internal to eyewear or other head-worn personal electronic apparatus. The electrical components can operate independently or together with other electrical components provided elsewhere. Apparatus for presenting after-	(G02C11/10) Electronic devices other than hearing aids (G02C5/146) Side-members having special front end (G02C2200/08) Modular frames, easily exchangeable frame parts and lenses (G02C5/143) Side-members having special ear pieces (G02C11/06) Hearing aids (H02J7/0045) Circuit arrangements for charging or depolarising batteries or for supplying loads from batteries characterised by the mechanical construction concerning the insertion or the connection of the batteries

		market electrical components are also disclosed. (Claims) 19. (Original) A system, comprising: a head-worn structure configured to be worn by a user; at least one speaker at least partially internal to the head-worn structure, the at least one speaker being configured to be worn proximate to an ear of the user when the head-worn structure is being worn by the user; a first microphone at least partially contained within the head-worn structure, the first microphone being positioned to pick up at least audio input from at least the user; a second microphone at least partially contained within the head-worn structure, the second microphone being positioned to pick up at least environmental audio input associated with an environment around the head-worn personal electronic apparatus; a rechargeable battery contained within the head-worn structure; electronic circuitry contained within the head-worn structure, the electronic circuitry being electrically connected to at least the rechargeable battery; wireless communication circuitry at least partially contained within the head-worn structure, the wireless communication circuitry being electrically connected to at least the rechargeable battery; and at least one conductive	

		element at least partially included within the head-worn structure, the at least one conductive element being at least partially exposed to enable interconnection therewith, the at least one conductive element being electrically connected to at least the rechargeable battery; and wherein on placement of the head-worn personal electronic apparatus in the charging apparatus, electrical connection results from the at least one conductive element connecting with the charging connector, and thereby the rechargeable battery of the head- worn personal electronic apparatus is able to be recharged while the head-worn personal electronic apparatus is placed in the charging apparatus. a charging apparatus having a charging connector, (Claims) 31. (Original) A system as recited in claim 19, wherein the head-worn personal electronic apparatus comprises: a userinput device supported by the head-worn structure, the user input device being configured to receive a user input, the user input device is based on at least capacitive effect, wherein the user input being received induces at least a capacitive change to produce at least an electrical response. (Claims) a touch sensitive surface at least partially contained within the head-worn structure and configured to sense a touch input associated with the user;	

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Examiner Initial	No.	Patent No.	Date	Patentee	Class	Sub-class	Filing Date
	1.						
	2.						

Foreign Documents

							Translation	
Init.		Document No.	Date	Country	Class	Subclass	Yes	No
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		CN 88203065	Nov-88	China			X abstract	
		CN 89214222.7	Mar-90	China			X abstract	
		CN 90208199.3	Nov-90	China			X abstract	
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	A	Notice of Allowance for U.S. Patent Application No. 11/183,269, dated December 10, 2010.
	B	Office Action for U.S. Patent Application No. 11/183,269, dated May 25, 2010.
	C	Final Office Action for U.S. Patent Application No. 11/183,269, dated February 17, 2010.
	D	Office Action for U.S. Patent Application No. 11/183,269, dated June 23, 2009.
	E	Office Action for U.S. Patent Application No. 11/183,269, dated December 4, 2008.
	F	Final Office Action for U.S. Patent Application No. 11/183,269, dated June 5, 2008.
	G	Office Action for U.S. Patent Application No. 11/183,269, dated October 18, 2007.
	H	Restriction Requirement for U.S. Patent Application No. 11/183,269, dated June 25, 2007.
	I	Office Action for U.S. Patent Application No. 13/085,402, dated April 19, 2012.
	J	Notice of Allowance for U.S. Patent Application No. 13/085,402, dated August 2, 2012.
	K	Notice of Allowance for U.S. Patent Application No. 13/085,402, dated November 13, 2012.
	L	Notice of Allowance for U.S. Patent Application No. 13/085,402, dated February 20, 2013.
	M	Notice of Allowance for U.S. Patent Application No. 13/085,402, dated June 14, 2013.
	N	Office Action for U.S. Patent Application No. 13/955,336, dated December 5, 2013.
	O	Notice of Allowance for U.S. Patent Application No. 13/955,336, dated April 28, 2014.
	P	Notice of Allowance for U.S. Patent Application No. 13/955,336, dated August 18, 2014.
	Q	Notice of Allowance for U.S. Patent Application No. 13/955,336, dated October 7, 2014.
	R	Notice of Allowance for U.S. Patent Application No. 13/955,336, dated November 3, 2014.
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	T	Notice of Allowance for U.S. Patent Application No 14/557,409, dated January 14, 2016.

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	U	Notice of Allowance for U.S. Patent Application No. 14/557,409, dated April 28, 2016.
	V	Notice of Allowance for U.S. Patent Application No. 14/557,409, dated August 8, 2016.
	W	Notice of Allowance for U.S. Patent Application No. 14/557,409, dated November 4, 2016.
	X	Corrected Notice of Allowance for U.S. Patent Application No. 14/557,409, dated December 12, 2016.
	Y	Office Action for U.S. Patent Application No. 15/375,423, dated March 27, 2017.
	Z	Notice of Allowance for U.S. Patent Application No. 15/375,423, dated July 5, 2017.
	AA	Notice of Allowance for U.S. Patent Application No. 15/375,423, dated October 31, 2017.
	AB	Notice of Allowance for U.S. Patent Application No. 15/375,423, dated March 23, 2018.
	AC	Notice of Allowance for U.S. Patent Application No. 15/375,423, dated July 13, 2018.
	AD	Office Action for U.S. Patent Application No. 16/049,120, dated February 28, 2020.
	AE	Notice of Allowance for U.S. Patent Application No. 16/049,120, dated June 3, 2020.
	AF	Notice of Allowance for U.S. Patent Application No. 16/049,120, dated September 21, 2020.
	AG	Notice of Allowance for U.S. Patent Application No. 16/049,120, dated February 23, 2021.
	AH	Notice of Allowance for U.S. Patent Application No. 16/049,120, dated June 3, 2021.
	AI	Notice of Allowance for U.S. Patent Application No. 16/049,120, dated September 20, 2021.
	AJ	Notice of Allowance for U.S. Patent Application No. 16/574,254, dated April 16, 2021.
	AK	Notice of Allowance for U.S. Patent Application No. 16/574,254, dated August 9, 2021.
	AL	Office Action for U.S. Patent Application No. 16/821,810, dated February 2, 2022.
	AM	Notice of Allowance for U.S. Patent Application No. 16/821,810, dated April 6, 2022.
	AN	Notice of Allowance for U.S. Patent Application No. 16/821,810, dated October 19, 2022.
	AO	Office Action for U.S. Patent Application No. 17/484,080, dated January 21, 2022.
	AP	Notice of Allowance for U.S. Patent Application No. 17/484,080, dated May 31, 2022.
	AQ	Notice of Allowance for U.S. Patent Application No. 17/484,080, dated September 13, 2022.
	AR	Notice of Allowance for U.S. Patent Application No. 17/484,080, dated January 31, 2023.
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	AV	Notice of Allowance for U.S. Patent Application No. 17/949,029, dated July 3, 2023.
	AW	Office Action for U.S. Patent Application No. 17/873,104, dated October 6, 2022.
	AX	Office Action for U.S. Patent Application No. 17/873,104, dated November 4, 2022.
	AY	Notice of Allowance for U.S. Patent Application No. 17/873,104, dated December 16, 2022.

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	AZ	Notice of Allowance for U.S. Patent Application No. 17/873,104, dated March 22, 2023.
	BA	Restriction Requirement for U.S. Patent Application No. 11/580,222, dated June 18, 2008.
	BB	Office Action for U.S. Patent Application No. 11/580,222, dated September 12, 2008.
	BC	Office Action for U.S. Patent Application No. 11/580,222, dated January 28, 2009.
	BD	Notice of Allowance for U.S. Patent Application No. 11/580,222, dated April 20, 2009.
	BE	U.S. Patent Application No. 12/462,286, filed July 31, 2009.
	BF	Restriction Requirement for U.S. Patent Application No. 12/462,286, dated September 17, 2010.
	BG	Office Action for U.S. Patent Application No. 12/462,286, dated January 13, 2011.
	BH	Notice of Allowance for U.S. Patent Application No. 12/462,286, dated June 24, 2011.
	BI	Notice of Allowance for U.S. Patent Application No. 12/462,286, dated November 22, 2011.
	BJ	Office Action for U.S. Patent Application No. 13/367,346, dated May 15, 2013.
	BK	Notice of Allowance for U.S. Patent Application No. 13/367,346, dated October 10, 2013.
	BL	Office Action for U.S. Patent Application No. 13/367,346, dated January 28, 2014.
	BM	Notice of Allowance for U.S. Patent Application No. 13/367,346, dated August 15, 2014.
	BN	Notice of Allowance for U.S. Patent Application No. 13/367,346, dated March 19, 2015.
	BO	Office Action ffor U.S. Patent Application No. 14/715,501, dated September 23, 2015.
	BP	Office Action for U.S. Patent Application No. 14/715,501, dated March 25, 2016.
	BQ	Office Action for U.S. Patent Application No. 14/715,501, dated October 17, 2016.
	BR	Office Action for U.S. Patent Application No. 14/715,501, dated July 20, 2017.
	BS	Office Action for U.S. Patent Application No. 14/715,501, dated January 8, 2018.
	BT	Notice of Allowance for U.S. Patent Application No. 14/715,501, dated May 9, 2018.
	BU	Notice of Allowance for U.S. Patent Application No. 14/715,501, dated September 11, 2018.
	BV	Office Action for U.S. Patent Application No. 16/127,957, dated June 4, 2020.
	BW	Office Action for U.S. Patent Application No. 16/127,957, dated September 30, 2020.
	BX	Notice of Allowance for U.S. Patent Application No. 16/127,957, dated December 21, 2020.
	BY	Notice of Allowance for U.S. Patent Application No. 17/395,509, dated May 6, 2022.
	BZ	Notice of Allowance for U.S. Patent Application No. 17/395,509, dated September 9, 2022.
	CA	Notice of Allowance for U.S. Patent Application No. 17/395,509, dated December 19, 2022.
	CB	Notice of Allowance for U.S. Patent Application No. 17/395,509, dated April 26, 2023.
	CC	Notice of Allowance for U.S. Patent Application No. 17/737,866, dated September 16, 2022.

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	CD	Notice of Allowance for U.S. Patent Application No. 17/737,866, dated January 17, 2023.
	CE	Notice of Allowance for U.S. Patent Application No. 17/737,866, dated May 15, 2023.
	CF	Notice of Allowance for U.S. Patent Application No. 16/182,969, dated January 28, 2022.
	CG	Office Action for U.S. Patent Application No. 16/182,969, dated June 24, 2020.
	CH	Notice of Allowance for U.S. Patent Application No. 16/182,969, dated October 14, 2020.
	CI	Notice of Allowance for U.S. Patent Application No. 16/182,969, dated September 1, 2021.
	CJ	Office Action for U.S. Patent Application No. 16/182,969, dated January 24, 2023.
	CK	Notice of Allowance for U.S. Patent Application No. 16/182,969, dated June 30, 2023.
	CL	U.S. Patent Application No. 12/806,312, filed August 10, 2010.
	CM	Office Action for U.S. Patent Application No. 12/806,312, dated April 20, 2012.
	CN	Office Action for U.S. Patent Application No. 12/806,312, dated September 25, 2012.
	CO	Notice of Allowance for U.S. Patent Application No. 12/806,312, dated December 14, 2012.
	CP	Notice of Allowance for U.S. Patent Application No. 12/806,312, dated March 29, 2013.
	CQ	U.S. Patent Application No. 13/831,512, filed March 14, 2013.
	CR	Office Action for U.S. Patent Application No. 13/831,512, dated June 4, 2013.
	CS	Office Action for U.S. Patent Application No. 13/831,512, dated February 24, 2014.
	CT	Office Action for U.S. Patent Application No. 13/831,512, dated July 2, 2014.
	CU	Office Action for U.S. Patent Application No. 13/831,512, dated January 21, 2015.
	CV	Office Action for U.S. Patent Application No. 13/831,512, dated May 29, 2015.
	CW	Office Action for U.S. Patent Application No. 13/831,512, dated February 24, 2016.
	CX	Notice of Allowance for U.S. Patent Application No. 13/831,512, dated August 1, 2016.
	CY	Notice of Allowance for U.S. Patent Application No. 13/831,512, dated October 25, 2016.
	CZ	Notice of Allowance for U.S. Patent Application No. 13/831,512, dated January 30, 2017.
	DA	Notice of Allowance for U.S. Patent Application No. 13/831,512, dated February 21, 2017.
	DB	Office Action for U.S. Patent Application No. 15/396,428, dated February 16, 2018.
	DC	Office Action for U.S. Patent Application No. 15/396,428, dated June 21, 2018.
	DD	Office Action for U.S. Patent Application No. 15/409,723, dated April 23, 2018.
	DE	Office Action for U.S. Patent Application No. 15/409,723, dated October 31, 2018.
	DF	Notice of Allowance for U.S. Patent Application No. 11/183,256, dated January 13, 2009.
	DG	Office Action for U.S. Patent Application No. 11/183,256, dated September 12, 2008.
	DH	Notice of Allowance for U.S. Patent Application No. 11/183,256, dated July 8, 2008.
	DI	Office Action for U.S. Patent Application No. 11/183,256, dated January 25, 2008.

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	DJ	Restriction Requirement for U.S. Patent Application No. 11/183,256, dated October 17, 2007.
	DK	Restriction Requirement for U.S. Patent Application No. 11/183,256, dated June 28, 2007.
	DL	Notice of Allowance for U.S. Patent Application No. 11/546,685, dated February 17, 2010.
	DM	Notice of Allowance for U.S. Patent Application No. 11/546,685, dated September 18, 2009.
	DN	Office Action for U.S. Patent Application No. 11/546,685, dated March 5, 2009.
	DO	Restriction Requirement for U.S. Patent Application No. 11/546,685, dated January 27, 2009.
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	DQ	Notice of Allowance for U.S. Patent Application No. 12/803,732, dated September 1, 2011.
	DR	Notice of Allowance for U.S. Patent Application No. 12/803,732, dated November 15, 2011.
	DS	Notice of Allowance for U.S. Patent Application No. 12/803,732, dated January 30, 2012.
	DT	Notice of Allowance for U.S. Patent Application No. 12/803,732, dated April 17, 2012.
	DU	Notice of Allowance for U.S. Patent Application No. 12/803,732, dated July 5, 2012.
	DV	Notice of Allowance for U.S. Patent Application No. 12/803,732, dated October 19, 2012.
	DW	Notice of Allowance for U.S. Patent Application No. 12/803,732, dated February 13, 2013.
	DX	Office Action for U.S. Patent Application No. 13/291,020, dated June 4, 2012.
	DY	Office Action for U.S. Patent Application No. 13/291,020, dated April 23, 2012.
	DZ	Notice of Allowance for U.S. Patent Application No. 13/291,020, dated August 2, 2012.
	EA	Notice of Allowance for U.S. Patent Application No. 13/291,020, dated November 2, 2012.
	EB	Notice of Allowance for U.S. Patent Application No. 13/291,020, dated February 11, 2013.
	EC	U.S. Patent Application No. 13/831,419, filed March 14, 2013.
	ED	Office Action for U.S. Patent Application No. 13/831,419, dated April 27, 2015.
	EE	Office Action for U.S. Patent Application No. 13/831,419, dated August 12, 2015.
	EF	Notice of Allowance for U.S. Patent Application No. 13/831,419, dated January 28, 2016.
	EG	Office Action for U.S. Patent Application No. 13/831,419, dated April 28, 2016.
	EH	Office Action for U.S. Patent Application No. 13/831,419, dated November 17, 2016.
	EI	Office Action for U.S. Patent Application No. 13/831,419, dated February 1, 2017.
	EJ	Notice of Allowance for U.S. Patent Application No. 13/831,419, dated June 6, 2017.
	EK	Office Action for U.S. Patent Application No. 13/831,419, dated October 20, 2017.
	EL	Office Action for U.S. Patent Application No. 13/831,419, dated June 8, 2018.
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	EN	Office Action for U.S. Patent Application No. 13/831,445, dated February 20, 2015.

Examiner	Date Considered

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Form 1449 (Modified)	Atty. Docket No.	IPVCP003X1C4X1C1
	Application No.:	18/375,893
Information Disclosure	Applicant	HOWELL et al.
Statement By Applicant	Filing Date	October 2, 2023
	Group	Not Yet Assigned
(Use Several Sheets if Necessary)		Page 7 of 11

	EO	Notice of Allowance for U.S. Patent Application No. 13/831,445, dated October 21, 2016.
	EP	Notice of Allowance for U.S. Patent Application No. 13/831,445, dated January 9, 2017.
	EQ	Corrected Notice of Allowance for U.S. Patent Application No. 13/831,445, dated January 23, 2017.
	ER	Notice of Allowance for U.S. Patent Application No. 13/831,445, dated April 25, 2017.
	ES	Office Action for U.S. Patent Application No. 13/831,445, dated February 6, 2018.
	ET	Notice of Allowance for U.S. Patent Application No. 13/831,445, dated August 8, 2018.
	EU	Office Action for U.S. Patent Application No. 16/429,181, dated September 30, 2020.
	EV	Notice of Allowance for U.S. Patent Application No. 16/429,181, dated February 1, 2021.
	EW	Notice of Allowance for U.S. Patent Application No. 16/429,181, dated June 17, 2021.
	EX	Notice of Allowance for U.S. Patent Application No. 16/429,181, dated August 19, 2021.
	EY	Notice of Allowance for U.S. Patent Application No. 16/429,181, dated October 4, 2021.
	EZ	Office Action for U.S. Patent Application No. 16/429,181, dated February 9, 2022.
	FA	Notice of Allowance for U.S. Patent Application No. 16/429,181, dated August 10, 2022.
	FB	Office Action for U.S. Patent Application No. 16/424,018, dated June 10, 2020.
	FC	Notice of Allowance for U.S. Patent Application No. 16/424,018, dated October 20, 2020.
	FD	Notice of Allowance for U.S. Patent Application No. 16/424,018, dated March 8, 2021.
	FE	Office Action for U.S. Patent Application No. 16/424,018, dated May 13, 2021.
	FF	Office Action for U.S. Patent Application No. 16/424,018, dated September 3, 2021.
	FG	Notice of Allowance for U.S. Patent Application No. 16/424,018, dated November 2, 2021
	FH	Office Action for U.S. Patent Application No. 16/424,018, dated January 24, 2022.
	FI	Notice of Allowance for U.S. Patent Application No. 16/424,018, dated June 10, 2022.
	FJ	Office Action for U.S. Patent Application No. 16/424,018, dated September 6, 2022.
	FK	Office Action for U.S. Patent Application No. 16/424,018, dated November 25, 2022.
	FL	Notice of Allowance for U.S. Patent Application No. 16/424,018, dated February 21, 2023.
	FM	Notice of Allowance for U.S. Patent Application No. 17/942,347, dated April 19, 2023.
	FN	Notice of Allowance for U.S. Patent Application No 17/942,347, dated July 3, 2023.
	FO	Notice of Allowance for U.S. Patent Application No. 17/942,347, dated August 14, 2023.
	FP	Notice of Allowance for U.S. Patent Application No.17/964,853, dated March 8, 2023.
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Examiner /JIE LEI/	Date Considered 12/11/2023

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	10.						

Foreign Documents

Init.		Document No.	Date	Country	Class	Subclass	Translation Yes	Translation No

Other Documents (Including Author, Title, Date, Pertinent Pages, etc.)

	A	Office Action for U.S. Patent Application No. 17/964,853, dated September 15, 2023.
	B	Notice of Allowance for U.S. Patent Application No. 18/129,660, dated August 24, 2023.
	C	Office Action for U.S. Patent Application No. 18/224,793, dated September 7, 2023.
	D	Notice of Allowance for U.S. Patent Application No. 18/224,793, dated October 2, 2023.
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
18/375,893	10/02/2023	Thomas A. Howell	IPVCP003X1C4X1C1

CONFIRMATION NO. 4776

34071
IPVENTURE, INC.
4010 Moorpark Avenue
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PUBLICATION NOTICE

OC000000067780808

Date Mailed: 02/01/2024

Title:SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC APPARATUS

Publication No.US-2024-0036361-A1
Publication Date:02/01/2024

NOTICE OF PUBLICATION OF APPLICATION

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CONFIRMATION NO. 4776

34071
IPVENTURE, INC.
4010 Moorpark Avenue
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Date Mailed: 02/09/2024

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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 18/375,893	Filing Date 10/02/2023	☐ To be Mailed

ENTITY: ☑ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A		N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*		x $100 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $480 =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT	02/13/2024	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 59	Minus	** 55	= 4		x $100 =	400
	Independent (37 CFR 1.16(h))	* 5	Minus	*** 4	= 1		x $480 =	480
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	880

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	Supervisory Patent Examiner
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/KARA E CRESTWELL/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/375,893	**02/13/2024 07:53:59 PM Z ET**	**IPVCP003X1C4X1C1**

Title of Invention

SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC APPARATUS

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	4776	FILED BY	Angela Nijim
PATENT CENTER #	64301195	FILING DATE	10/02/2023
CUSTOMER #	34071	FIRST NAMED INVENTOR	Thomas A. Howell
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Peter Tong

Documents

TOTAL DOCUMENTS: 7

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
IPVCP003X1C4X1C1_AmdA Trans_2-24.pdf	1	Transmittal Letter	16 KB
IPVCP003X1C4X1C1_Amd_ A_AsFiled_1-24-AsFiled.pdf	26	Amendment/Request for Reconsideration-After Non-Final Rejection	126 KB
IPVCP003X1C4X1C1_NewD rawings_CUTE.pdf	8	Drawings-only black and white line drawings	70 KB
IPVCP003X1C4X1C1_Sub_ Spec_Trans_wMark-Up_2-24.pdf	77	Miscellaneous Incoming Letter	396 KB
IPVCP003X1C4X1C1-SubstituteSpecification-Mark-up-Clean_DOCX-	75	Application body structured text document	64 KB

APP.TEXT.docx

Warning: Bookmarks were found and have been removed. At least one claim appears to not end with a period. Please review and revise if necessary.

IPVCP003X1C4X1C1-SubstituteSpecification-Mark-up-Clean.pdf	75	Auxiliary PDF of Application	370 KB
IPVCP003X1C4X1C1_Trans NewDrawings_2-24.pdf	1	Transmittal Letter accompanying New/Additional Drawings	16 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
IPVCP003X1C4X1C1_AmdATrans_2-24.pdf	D12CCEF888038E69FAC1A0E0E2C82710054CE501871AB015C939407DD096FE99C639AEF39C9BFC7337E4C4F5F023063615842B1C99D2F2CF17AF58C79696E89E
IPVCP003X1C4X1C1_Amd_A_AsFiled_1-24-AsFiled.pdf	1F5E1D56DF9A9AE1A6B45D6211C9FB45ABFAA3E064BB2E30BC20C90C8157BF738DBEFBD0840E0913CE548D6173D9D6A7CB1FE14BC34CD50E7E642D41903E3D79
IPVCP003X1C4X1C1_NewDrawings_CUTE.pdf	9CF4DD9C8E4A749A4E30C67812EA6650ABA403446F91A99D474A20F27E9A59533CEAD80D98B140F43FEA09DF521BD3266E77C223CCAC1A742E99DAC4C473F9BC
IPVCP003X1C4X1C1_Sub_Spec_Trans_wMark-Up_2-24.pdf	A5BB721ADF9650F00BF43C1E9FD891F29C763F6CB0E27814B51726A768C39F4810583F2308619A6491E25BF7E61A8FAD99B38FE35CF61879E725639F0BE11651
IPVCP003X1C4X1C1-SubstituteSpecification-Mark-up-Clean_DOCX-APP.TEXT.docx	F686F793420FA48ECEA2724E1547446FB1817B22875E925350C89C1A7E84E180AE569155C2566EE3224907AF7FBE6AB33031CE954B5155137E0F85C1532C0715
IPVCP003X1C4X1C1-SubstituteSpecification-Mark-up-Clean.pdf	869EF4A74A1CA3E224DF84C9DFEFF484477A2CFC7941A41086E17249F01F1D104D6A166E45C16A162B9A1EE726D0EBDE65ACCC677F1F19AC7F17A4868DA88589
IPVCP003X1C4X1C1_TransNewDrawings_2-24.pdf	7C68A99A2B2501E3E430C907DD9F95B14969B13D974255EE8BD3D8423683EA4DC14AE8E88E89F833DD0165A26C1687FA7BECFD6B2C7B5ABF2BE590625E7FEF86

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: HOWELL et al.	Attorney Docket No.: IPVCP003X1C4X1C1
Application No.: 18/375,893	Examiner: LEI, JIE
Filed: October 2, 2023	Group: 2872
Title: SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC SERVICES	

TRANSMITTAL OF ADDITIONAL DRAWINGS

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Applicant hereby submits Additional Drawings, namely, Figures 14 – 19C (8 Sheets), for entry into the above-referenced patent application. These 8 Sheets of Additional Drawings being submitted herewith are to be added to the above-referenced patent application. These added New Figures 14-19C are directly from drawings provided in prior applications that are incorporated by reference into the present application, see, e.g., U.S. Patent Application No. 11/183,276, FIG. 7; and U.S. Patent Application No. 11/283,283, FIGs. 3-7C, and thus should not be considered by the Examiner as presenting new matter.

Should the Examiner have any questions concerning this submission, a call to the undersigned would be appreciated.

Respectfully submitted,

/C. Douglass Thomas/

C. Douglass Thomas
Registration No. 32,947

4010 Moorpark Avenue
Suite 211
San Jose, CA 95117

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/375,893	**02/13/2024 07:53:59 PM Z ET**	**IPVCP003X1C4X1C1**

Title of Invention

SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC APPARATUS

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	4776	FILED BY	Angela Nijim
PATENT CENTER #	64301195	AUTHORIZED BY	Peter Tong
CUSTOMER #	34071	FILING DATE	10/02/2023
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	Thomas A. Howell

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
CARD / 6200	**E20242CJ58075022**	**Angela Nijim**

PRE-AUTHORIZED ACCOUNT	PRE-AUTHORIZED CATEGORY
503874	**37 CFR 1.21 (Miscellaneous fees and charges)**

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
1202	EACH CLAIM IN EXCESS OF 20	100.00	4	400.00
1201	EACH INDEPENDENT CLAIM IN EXCESS OF THREE	480.00	1	480.00
			TOTAL AMOUNT:	**$880.00**

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d)

and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT

In re application of: HOWELL et al.	Attorney Docket No.: IPVCP003X1C4X1C1
Application No.: 18/375,893	Examiner: LEI, JIE
Filed: October 7, 2023	Group: 2872
Title: SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC DEVICES	

SUBMISSION OF SUBSTITUTE SPECIFICATION

Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

Enclosed is a Substitute Specification for the originally filed specification in this application. This Substitute Specification is being voluntarily submitted, in order to facilitate the processing of the application. Also enclosed is a marked-up copy of the Substitute Specification showing the matter being added to and/or the matter being deleted from the specification. As to newly added paragraphs [00197]-[00255], this content was provided in prior applications that are incorporated by reference into the present application. As examples of where the content is found in the prior applications, see e.g., the following table:

Current Application	**Priority Application**
[00197]	10/964,011 - [0075]
[00198]	11/183,256 - [0168]
[00199]-[00202]	11/183,262 - [0134], [0135]. [0120], [0121]
[00203]	11/183,256 - [0183]
[00204]	11/183,269 – [0116]
[00205]-[00221]	11/183,276 – [0088]. [0077]-[0092]
[00222]-[00250]	11/183,283 – [0067]-[0095]
[00251]	11/183,276 – [0086]

[00252]	11/183,256-[0122]
[00253]-[00254]	11/183,262 – [0117], [0142]
[00255]	11/183,283 – [0070]

Provided below is a statement as required by 37 CFR §1.125, that the Substitute Specification transmitted herewith contains no new matter.

STATEMENT THAT THE SUBSTITUTE SPECIFICATION CONTAINS NO NEW MATTER (37 CFR §1.125)

I hereby state that the accompanying Substitute Specification contains no new matter over that contained in the above-identified application originally filed. I further state that the changes made are the same as indicated in the interlineated Substitute Specification also accompanying this statement.

It is submitted, therefore, that the Substitute Specification should be accepted by the Examiner and entered into the file. If there are any questions regarding this matter, the Examiner is respectfully requested to telephone the undersigned.

Respectfully submitted,

/C. Douglass Thomas/

C. Douglass Thomas
Reg. No.32,947

4010 Moorpark Avenue
Suite 211
San Jose, CA 95117
650-903-9200, x103

SYSTEM FOR CHARGING EMBEDDED BATTERY IN WIRELESS HEAD-WORN PERSONAL ELECTRONIC APPARATUS

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation of U.S. Patent Application No. 16/182,969, filed November 7, 2018, and entitled "EYEWEAR HOUSING FOR CHARGING EMBEDDED BATTERY IN EYEWEAR FRAME" which is incorporated herein by reference, which in turn is a continuation of U.S. Patent Application No. 16/127,957, now U.S. Patent No. 11,086,147, filed September 11, 2018, and entitled "EYEWEAR SUPPORTING ELECTRICAL COMPONENTS AND APPARATUS THEREFOR" which is incorporated herein by reference, which in turn is a continuation of U.S. Patent Application No. 14/715,501, now U.S. Patent No. 10,330,956, filed May 18, 2015, and entitled "EYEWEAR SUPPORTING ELECTRICAL COMPONENTS AND APPARATUS THEREFOR" which is incorporated herein by reference, which in turn is a continuation of U.S. Patent Application No. 13/367,346, filed February 6, 2012, now U.S. Patent No. 9,033,493, and entitled "EYEWEAR SUPPORTING ELECTRICAL COMPONENTS AND APPARATUS THEREFOR" which is incorporated herein by reference, which in turn is a continuation of U.S. Patent Application No. 12/462,286, filed July 31, 2009, now U.S. Patent No. 8,109,629, and entitled "EYEWEAR SUPPORTING ELECTRICAL COMPONENTS AND APPARATUS THEREFOR" which is incorporated herein by reference, which in turn is a continuation of U.S. Patent Application No. 11/580,222, filed October 11, 2006, now U.S. Patent No. 7,581,833, and entitled "EYEWEAR SUPPORTING AFTER-MARKET ELECTRICAL COMPONENTS" which is hereby incorporated herein by reference.

[0002] This application and U.S. Patent Application No. 11/580,222 references U.S. Patent Application No. 11/183,269, filed July 15, 2005, now U.S. Patent No. 7,922,321, and entitled "EYEGLASSES SUPPORTING AFTER MARKET ELECTRICAL COMPONENTS," which is hereby incorporated herein by reference,

which references U.S. Patent Application No. 10/964,011, filed October 12, 2004, now U.S. Patent No. 7,192,136, and entitled "TETHERED ELECTRICAL COMPONENTS FOR EYEGLASSES" which is hereby incorporated herein by reference, which in turn references each of: (i) U.S. Provisional Patent Application No. 60/509,631, filed October 9, 2003, and entitled "TETHERED ELECTRICAL COMPONENTS FOR EYEGLASSES," which is hereby incorporated herein by reference; (ii) U.S. Provisional Patent Application No. 60/527,565, filed December 8, 2003, and entitled "ADAPTABLE COMMUNICATION TECHNIQUES FOR ELECTRONIC DEVICES," which is hereby incorporated herein by reference; (iii) U.S. Provisional Patent Application No. 60/562,798, filed April 15, 2004, entitled "EYEWEAR WITH ULTRAVIOLET DETECTION SYSTEM," and which is hereby incorporated herein by reference; (iv) U.S. Provisional Patent Application No. 60/583,169, filed June 26, 2004, entitled "ELECTRICAL COMPONENTS FOR USE WITH EYEWEAR, AND METHODS THEREFOR," and which is hereby incorporated herein by reference; (v) U.S. Provisional Patent Application No. 60/592,045, filed July 28, 2004, entitled "EYEGLASSES WITH A CLOCK OR OTHER ELECTRICAL COMPONENT," and which is hereby incorporated herein by reference; and (vi) U.S. Provisional Patent Application No. 60/605,191, filed August 28, 2004, entitled "ELECTRICAL COMPONENTS FOR USE WITH EYEWEAR, AND METHODS THEREFOR," and which is hereby incorporated herein by reference.

[0003] This application and U.S. Patent Application No. 11/580,222 also claim priority to each of: (i) U.S. Provisional Patent Application No. 60/725,999, filed October 11, 2005, and entitled "EYEWEAR SUPPORTING AFTER-MARKET ELECTRICAL COMPONENTS," which is hereby incorporated herein by reference; (ii) U.S. Provisional Patent Application No. 60/725,896, filed October 11, 2005, and entitled "EYEGLASSES WITH ELECTRICAL COMPONENTS," which is hereby incorporated herein by reference; (iii) U.S. Provisional Patent Application No. 60/787,850, filed April 1, 2006, and entitled "EYEGLASSES WITH A HEART RATE MONITOR," which is hereby incorporated herein by reference; and (iv) U.S. Provisional Patent Application No. 60/846,150, filed September 20, 2006, and

entitled "EYEGLASSES WITH ACTIVITY MONITORING," which is hereby incorporated herein by reference.

[0004] This application, by way of U.S. Patent Application No. 16/182,969, is a continuation of U.S. Patent Application No. 16/049,120, filed July 30, 2018, and entitled "EYEWEAR SUPPORTING EMBEDDED ELECTRONIC COMPONENTS," which is hereby incorporated herein by reference, which in turn is a continuation of U.S. Patent Application No. 15/375,423, filed December 12, 2016, and entitled "EYEWEAR SUPPORTING EMBEDDED ELECTRONIC COMPONENTS," which is hereby incorporated herein by reference, which in turn is a continuation of U.S. Patent Application No. 14/557,409, filed December 1, 2014, and entitled "EYEWEAR SUPPORTING EMBEDDED ELECTRONIC COMPONENTS," now U.S. Patent No. 9,547,184, which is hereby incorporated herein by reference, which in turn is a continuation of U.S. Patent Application No. 13/955,336, filed July 31, 2013, and entitled "EYEWEAR SUPPORTING BONE CONDUCTING SPEAKER," now U.S. Patent No. 8,905,542, which is hereby incorporated herein by reference, which in turn is a continuation of U.S. Patent Application No 13/085,402, filed April 12, 2011, and entitled "EYEWEAR SUPPORTING AFTER-MARKET ELECTRICAL COMPONENTS," now U.S. Patent No. 8,500,271, which is hereby incorporated herein by reference, which in turn references U.S. Patent Application No. 11/183,269, filed July 15, 2005, and entitled "EYEWEAR SUPPORTING AFTER-MARKET ELECTRICAL COMPONENTS," now U.S. Patent No. 7,922,321, which is hereby incorporated herein by reference, which in turn references U.S. Patent Application No. 10/964,011, filed October 12, 2004, and entitled "TETHERED ELECTRICAL COMPONENTS FOR EYEGLASSES," now U.S. Patent No. 7,192,136, which in turn references each of: (i) U.S. Provisional Patent Application No. 60/509,631, filed October 9, 2003, and entitled "TETHERED ELECTRICAL COMPONENTS FOR EYEGLASSES," which is hereby incorporated herein by reference; (ii) U.S. Provisional Patent Application No. 60/527,565, filed December 8, 2003, and entitled "ADAPTABLE COMMUNICATION TECHNIQUES FOR ELECTRONIC DEVICES," which is hereby incorporated herein by reference; (iii) U.S. Provisional

Patent Application No. 60/562,798, filed April 15, 2004, entitled "EYEWEAR WITH ULTRAVIOLET DETECTION SYSTEM," which is hereby incorporated herein by reference; (iv) U.S. Provisional Patent Application No. 60/583,169, filed June 26, 2004, entitled "ELECTRICAL COMPONENTS FOR USE WITH EYEWEAR, AND METHODS THEREFOR," which is hereby incorporated herein by reference; and (v) U.S. Provisional Patent Application No. 60/592,045, filed July 28, 2004, entitled "EYEGLASSES WITH A CLOCK OR OTHER ELECTRICAL COMPONENT," which is hereby incorporated herein by reference; and (vi) U.S. Provisional Patent Application No. 60/605,191, filed August 28, 2004, entitled "ELECTRICAL COMPONENTS FOR USE WITH EYEWEAR, AND METHODS THEREFOR," which is hereby incorporated herein by reference.

[0005] This application, by way of U.S. Patent Application No. 11/183,269, also references each of: (i) U.S. Provisional Patent Application No. 60/592,045, filed July 28, 2004, entitled "EYEGLASSES WITH A CLOCK OR OTHER ELECTRICAL COMPONENT," which is hereby incorporated herein by reference; (ii) U.S. Provisional Patent Application No. 60/605,191, filed August 28, 2004, entitled "ELECTRICAL COMPONENTS FOR USE WITH EYEWEAR, AND METHODS THEREFOR," which is hereby incorporated herein by reference; (iii) U.S. Provisional Patent Application No. 60/618,107, filed October 12, 2004, and entitled "TETHERED ELECTRICAL COMPONENTS FOR EYEGLASSES," which is hereby incorporated herein by reference; (iv) U.S. Provisional Patent Application No. 60/620,238, filed October 18, 2004, entitled "EYEGLASSES WITH HEARING ENHANCED AND OTHER AUDIO SIGNAL-GENERATING CAPABILITIES," which is hereby incorporated herein by reference; (v) U.S. Provisional Patent Application No. 60/647,836, filed January 31, 2005, and entitled "EYEGLASSES WITH HEART RATE MONITOR," which is hereby incorporated herein by reference; and (vi) U.S. Provisional Patent Application No. 60/647,826, filed January 31, 2005, and entitled "EYEWEAR WITH ELECTRICAL COMPONENTS," which is hereby incorporated herein by reference.

[0006] This application, by way of U.S. Patent Application No. 16/182,969, is a continuation of U.S. Patent Application No. 15/409,723, filed January 19, 2017,

and entitled "EYEWEAR HOUSING FOR CHARGING EMBEDDED BATTERY IN EYEWEAR FRAME" which is hereby incorporated herein by reference, which in turn is a continuation of U.S. Patent Application No. 13/831,512, filed March 14, 2013, and entitled "EYEWEAR SUPPORTING AFTER-MARKET ELECTRICAL COMPONENTS" which is hereby incorporated herein by reference, which in turn is a continuation of U.S. Patent Application No. 12/806,312, filed August 10, 2010, and entitled "EYEWEAR WITH MULTI-PART TEMPLE FOR SUPPORTING ONE OR MORE ELECTRICAL COMPONENTS" (now U.S. Patent No. 8,465,151) which is hereby incorporated herein by reference, which in turn is a continuation-in-part of U.S. Patent Application No. 12/462,286, filed July 31, 2009, and entitled "EYEWEAR SUPPORTING ELECTRICAL COMPONENTS AND APPARATUS THEREFOR" (now U.S. Patent No. 8,109,629) which is hereby incorporated herein by reference, which in turn is a continuation of U.S. Patent Application No. 11/580,222, filed October 11, 2006, and entitled "EYEWEAR SUPPORTING AFTER-MARKET ELECTRICAL COMPONENTS" (now U.S. Patent No. 7,581,833) which is hereby incorporated herein by reference.

[0007] This application, by way of U.S. Patent Application No. 10/964,011, also references each of: (i) U.S. Provisional Patent Application No. 60/509,631, filed October 9, 2003, and entitled "TETHERED ELECTRICAL COMPONENTS FOR EYEGLASSES," which is hereby incorporated herein by reference; (ii) U.S. Provisional Patent Application No. 60/527,565, filed December 8, 2003, and entitled "ADAPTABLE COMMUNICATION TECHNIQUES FOR ELECTRONIC DEVICES," which is hereby incorporated herein by reference; (iii) U.S. Provisional Patent Application No. 60/562,798, filed April 15, 2004, entitled "EYEWEAR WITH ULTRAVIOLET DETECTION SYSTEM," and which is hereby incorporated herein by reference; (iv) U.S. Provisional Patent Application No. 60/583,169, filed June 26, 2004, entitled "ELECTRICAL COMPONENTS FOR USE WITH EYEWEAR, AND METHODS THEREFOR," and which is hereby incorporated herein by reference; (v) U.S. Provisional Patent Application No. 60/592,045, filed July 28, 2004, entitled "EYEGLASSES WITH A CLOCK OR OTHER ELECTRICAL COMPONENT," and which is hereby incorporated herein by reference; and (vi)

U.S. Provisional Patent Application No. 60/605,191, filed August 28, 2004, entitled "ELECTRICAL COMPONENTS FOR USE WITH EYEWEAR, AND METHODS THEREFOR," and which is hereby incorporated herein by reference.

[0008] This application via U.S. Patent Application No. 12/806,312 is also a continuation-in-part of U.S. Patent Application No. 12/317,043, filed December 18, 2008, and entitled "EYEGLASSES WITH MONITORING CAPABILITY," (now U.S. Patent No. 7,771,046) which is hereby incorporated herein by reference, which in turn is a continuation of U.S. Patent Application No. 12/214,435, filed June 19, 2008, and entitled "EYEGLASSES WITH USER MONITORING," (now U.S. Patent No. 7,481,531), which is hereby incorporated herein by reference, which in turn is a continuation of U.S. Patent Application No. 11/891,411, filed August 9, 2007, and entitled "EYEGLASSES WITH ACTIVITY MONITORING" (now U.S. Patent No. 7,401,918), which is hereby incorporated herein by reference, which in turn references U.S. Patent Application No. 11/183,276, filed July 15, 2005, and entitled "EYEGLASSES WITH ACTIVITY MONITORING" (now U.S. Patent No. 7,255,437), which is hereby incorporated herein by reference, which in turn references U.S. Patent Application No. 10/964,011, filed October 12, 2004, and entitled "TETHERED ELECTRICAL COMPONENTS FOR EYEGLASSES" (now U.S. Patent No. 7,192,136), which is hereby incorporated herein by reference.

[0009] This application via U.S. Patent Application No. 11/183,276 also references each of: (i) U.S. Provisional Patent Application No. 60/592,045, filed July 28, 2004, entitled "EYEGLASSES WITH A CLOCK OR OTHER ELECTRICAL COMPONENT," and which is hereby incorporated herein by reference; (ii) U.S. Provisional Patent Application No. 60/605,191, filed August 28, 2004, entitled "ELECTRICAL COMPONENTS FOR USE WITH EYEWEAR, AND METHODS THEREFOR," and which is hereby incorporated herein by reference; (iii) U.S. Provisional Patent Application No. 60/618,107, filed October 12, 2004, and entitled "TETHERED ELECTRICAL COMPONENTS FOR EYEGLASSES," which is hereby incorporated herein by reference; (iv) U.S. Provisional Patent Application No. 60/620,238, filed October 18, 2004, entitled "EYEGLASSES WITH HEARING ENHANCED AND OTHER AUDIO SIGNAL-GENERATING CAPABILITIES," and

which is hereby incorporated herein by reference; (v) U.S. Provisional Patent Application No. 60/647,836, filed January 31, 2005, and entitled "EYEGLASSES WITH HEART RATE MONITOR," which is hereby incorporated herein by reference; and (vi) U.S. Provisional Patent Application No. 60/647,826, filed January 31, 2005, and entitled "EYEWEAR WITH ELECTRICAL COMPONENTS," which is hereby incorporated herein by reference.

[0010] This application via U.S. Patent Application No. 12/806,312 also references U.S. Patent Application No. 10/822,218, filed April 12, 2004, and entitled "EYEGLASSESS FOR WIRELESS COMMUNCIATIONS," (now U.S. Patent No. 7,792,552, which is hereby incorporated herein by reference, which in turn references each of: (i) U.S. Provisional Patent Application No. 60/462,591, filed April 15, 2003, and entitled "EYEGLASSES FOR WIRELESS COMMUNICATION," which is hereby incorporated herein by reference; (ii) U.S. Provisional Patent Application No. 60/509,631, filed October 9, 2003, and entitled "TETHERED ELECTRICAL COMPONENTS FOR EYEGLASSES," which is hereby incorporated herein by reference; and (iii) U.S. Provisional Patent Application No. 60/527,565, filed December 8, 2003, and entitled "ADAPTABLE COMMUNICATION TECHNIQUES FOR ELECTRONIC DEVICES," which is hereby incorporated herein by reference.

[0011] In addition, this application is related to each of: (i) U.S. Patent Application 10/822,218, filed April 12, 2004, and entitled "EYEGLASSES FOR WIRELESS COMMUNICATIONS," which is hereby incorporated herein by reference; (ii) U.S. Patent Application No. 10/964,011, filed October 12, 2004, and entitled "TETHERED ELECTRICAL COMPONENTS FOR EYEGLASSES," which is hereby incorporated herein by reference; (iii) U.S. Patent Application No. 11/006,343, filed December 7, 2004, and entitled "ADAPTABLE COMMUNICATION TECHNIQUES FOR ELECTRONIC DEVICES," (now U.S. Patent No. 7,116,976) which is hereby incorporated herein by reference; (iv) U.S. Patent Application No. 11/078,855, filed March 11, 2005, and entitled "EYEWEAR WITH RADIATION DETECTION SYSTEM," (now U.S. Patent No. 7,500,746) which is hereby incorporated herein by reference; (v) U.S. Patent Application No.

11/078,857, filed March 11, 2005, and entitled "RADIATION MONITORING SYSTEM," which is hereby incorporated herein by reference; (vi) U.S. Patent Application No. 11/183,283, filed July 15, 2005, and entitled "EVENT EYEGLASSES," which is hereby incorporated herein by reference; (vii) U.S. Patent Application No. 11/183,262, filed July 15, 2005, and entitled "EYEGLASSES WITH HEARING ENHANCED AND OTHER AUDIO SIGNAL-GENERATING CAPABILITIES," (now U.S. Patent No. 7,760,898) which is hereby incorporated herein by reference; (viii) U.S. Patent Application No. 11/183,256, filed July 15, 2005, and entitled "EYEGLASSES WITH ELECTRICAL COMPONENTS," (now U.S. Patent No. 7,500,747) which is hereby incorporated herein by reference; (ix) U.S. Patent Application No. 11/183,263, filed July 15, 2005, and entitled "EYEGLASSES WITH A CLOCK OR OTHER ELECTRICAL COMPONENT," (now U.S. Patent No. 7,380,936) which is hereby incorporated herein by reference; (x) U.S. Patent Application No. 11/183,276, filed July 15, 2005, and entitled "EYEGLASSES WITH ACTIVITY MONITORING," now U.S. Patent No. 7,255,437) which is hereby incorporated herein by reference; and (xi) U.S. Patent Application No. 11/546,685, filed October 11, 2006, and entitled "EYEGLASSES HAVING A CAMERA", (now U.S. Patent No. 7,806,525) which is hereby incorporated herein by reference.

BACKGROUND OF THE INVENTION

[0012] Traditionally, eyeglasses have not contained or made any use of electrical components. In recent years, attempts to include electrical components within eyeglasses have had limited success. Even incorporating a small electrical component, such as a microphone, into an eyeglass frame may not be a simple task because, for example, of the necessary electrical connections with the electrical component. Clearly, larger scale electrical components would be more difficult to be provided in or attached to eyeglass frames. Many eyeglass frames tend to be very compact and lightweight and thus may not have a lot of space for electrical components. Moreover, since eyeglass frames are often fashionable items whose designs are important, there are substantial design tradeoffs involved with providing or attaching electrical components to eyeglass frames.

[0013] Even if electrical components are provided in an eyeglass frame, the ability to alter or change electrical components is problematic. Conventionally, once an eyeglass frame is manufactured, electrical components embedded in the eyeglass frame may not be removed, nor can addition electrical components be added into the eyeglass frame. Attachment of electrical components to eyeglass frames has not proven to be reliable, design friendly or commercially successful. Hence, there is a need for improved approaches to facilitate modifications or alterations to electrical components used with eyeglasses.

[0014] Typically, to participate in wireless communications, a user holds a mobile phone (e.g., wireless or a cellular phone) against his ear to hear an audio communication received in a wireless manner. The user usually also speaks towards a microphone embedded in the mobile phone to participate in the audio communication, again in a wireless manner. More recently, to facilitate hands-free operation of mobile phones, head-sets have been produced and utilized. Typically, a headset clips over or into an ear of the user to provide a speaker and a microphone in proximity to the ear and the mouth, respectively, of the user. Traditionally, the head-set was connected to the mobile phone by a cord (i.e., wire). In recent times, head-sets have been developed to operate in a wireless manner, without the need of a cord connected to the mobile phone. For example, one

popular type of wireless head-set uses Bluetooth wireless transmissions to communicate between the head-set and the corresponding mobile phone.

[0015] Mobile phones often support both voice calls and text messaging. When the user does not make use of a head-set, the user often holds the mobile phone against their ear when participating in a voice call. One problem this presents is that the user is not able to see the screen of the mobile phone. As a result, the user has difficultly interacting with the keypad or screen of the mobile phone when the mobile phone is held against the user's head. Alternatively, when the user of a mobile phone makes use of a head-set, the user can receive and participate in voice calls in a hands-free manner. Unfortunately, however, the user would need to view a screen of the mobile phone to participate in text messaging.

[0016] Accordingly, there is a need for improved wireless communication techniques for users of mobile communication devices.

SUMMARY

[0017] Generally speaking, the invention pertains to techniques for providing eyewear or other head-worn personal electronic apparatus with electrical components. The electrical components can provide electrical technology to eyewear (e.g., eyeglasses) or other head-worn personal electronic apparatus without having to substantially compromise aesthetic design principles of the eyewear. The electrical components can operate independently or together with other electrical components provided elsewhere. Apparatus can also be provided to present after-market electrical components.

[0018] The electrical components can support signal capturing, signal processing, signal transmission, signal display, signal storage and/or power provision. The signals can be, for example, analog or digital signals. The electrical components can, for example, be used to provide audio output and/or audio pick-up. The electrical components may include and/or control one or more sensors to monitor and/or signal the conditions of a user of the eyewear. The electrical components may also include and/or control one or more operation indicators to signal operational status of at least some other electrical components. In addition, the electrical components can be or pertain to a circuit board or module, which includes a plurality of electrical components.

[0019] The invention can be implemented in numerous ways, including a method, system, device, apparatus, and a computer readable medium. Several embodiments of the invention are discussed below.

[0020] Other aspects and advantages of the invention will become apparent from the following detailed description taken in conjunction with the accompanying drawings which illustrate, by way of example, the principles of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021] The invention will be readily understood by the following detailed description in conjunction with the accompanying drawings, wherein like reference numerals designate like structural elements, and in which:

[0022] FIG. 1 is a perspective view of a pair of glasses according to one embodiment of the invention.

[0023] FIG. 2 illustrates a diagram of a number of different embodiments of temple arrangements according to the invention.

[0024] FIG. 3A is a diagram of a temple arrangement according to one embodiment of the invention.

[0025] FIG. 3B is a diagram of a temple cover that at least partially covers a temple (e.g., temple and/or temple tip) according to one embodiment of the invention.

[0026] FIG. 3C is a diagram of a fit-over temple that at least partially fits over a temple (e.g., temple and/or temple tip) according to one embodiment of the invention.

[0027] FIG. 3D and 3E are diagrams of a temple arrangement according to another embodiment of the invention.

[0028] FIGs. 3F-3H are diagrams of exemplary multi-part temples according to different embodiments of the invention.

[0029] FIGs. 3I-3K are diagrams of exemplary rearward portions of multi-part temples according to several embodiments of the invention.

[0030] FIGs. 3L-3O are diagrams of exemplary forward portions of multi-part temples according to several embodiments of the invention.

[0031] FIG. 3P is a diagram of an eyewear products display apparatus according to one embodiment of the invention.

[0032] FIG. 4 shows examples of different electrical components according to the invention.

[0033] FIG. 5 is a chart that depicts examples of sensors suitable for use according to the invention.

[0034] FIG. 6 illustrates a diagram of a number of different embodiments of temple adapters according to the invention.

[0035] FIG. 7A is a diagram of a temple adapter according to one embodiment of the invention.

[0036] FIG. 7B is a diagram of a temple adapter according to another embodiment of the invention.

[0037] FIGs. 8A and 8B are diagrams of a temple adapter according to another embodiment of the invention.

[0038] FIG. 9A is a diagram of a temple adapter according to one embodiment of the invention.

[0039] FIGs. 9B and 9C are diagrams of a temple adapter according to another embodiment of the invention.

[0040] FIG. 9D is a diagram of a temple adapter according to still another embodiment of the invention.

[0041] FIGs. 10A-10C are diagrams of a temple having a bone conducting element according to still other embodiments of the invention.

[0042] FIG. 11A illustrates a pair of glasses according to one embodiment of the invention.

[0043] FIG. 11B illustrates a pair of glasses according to another embodiment of the invention.

[0044] FIGs. 12A-12E illustrate a side view of eyeglass frames having an extended temples according to several embodiment of the invention.

[0045] FIG. 13A illustrates a temple having multiple parts according to one embodiment of the invention.

[0046] FIG. 13B illustrates a portion of an eyeglass frame according to one embodiment of the invention.

[0047] FIG. 13C illustrates a portion of an eyeglass frame according to another embodiment of the invention.

[0048] FIG. 14 is a chart that depicts examples of auxiliary sensors that can be utilized with the eyewear.

[0049] FIG. 15 shows some electrical components of a player according to an embodiment of the invention.

[0050] FIG. 16 illustrates a number of forces activating a switch according to a number of embodiments of the invention.

[0051] FIG. 17 illustrates a number of mechanical forces activating a switch according to a number of embodiments of the invention.

[0052] FIG. 18 shows a Hall-effect detector at a joint of a pair of glasses according to an embodiment of the invention.

[0053] FIGs. 19A-19C illustrate different embodiments of a quadrature sensor according to the invention.

DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS OF THE INVENTION

[0054] The invention pertains to techniques for providing eyewear or other head-worn personal electronic apparatus with electrical components. The electrical components can provide electrical technology to eyewear (e.g., eyeglasses) or other head-worn personal electronic apparatus without having to substantially compromise aesthetic design principles of the eyewear. The electrical components can operate independently or together with other electrical components provided elsewhere. Apparatus can also be provided to present after-market electrical components.

[0055] One aspect of the invention relates to temple arrangements for use with eyeglasses. According to this aspect, a temple arrangement includes one or more electrical components. The one or more electrical components are attached to or at least partially embedded in the temple arrangement.

[0056] Another aspect of the invention relates to a temple adapter for use with eyeglasses. According to this aspect, a temple adapter includes one or more electrical components that are able to be mechanically (and optionally electrically) coupled to a temple (including a temple tip) of the eyeglasses.

[0057] Still another aspect of the invention relates to one or more swappable temple portions for a pair of glasses. In one aspect, a temple has a forward portion and a rearward portion which can removably couple to one another. In one embodiment, different rearward portions can be used with the same forward portion. In other words, the different rearward portions can be swapped with one another. In one implementation, the different rearward portions can offer different electrical components/functionalities to the pair of glasses. For example, the different rearward portions can provide different electrical components/functionalities such as: battery/power, wireless communication, radio, headset, GPS, pedometer, sun sensor, hearing enhancement, image/video capturing, etc. In another embodiment, different forward portions can be used with the same rearward portion.

[0058] The electrical components can support signal capturing, signal processing, signal transmission, signal display, signal storage and/or power provision. The signals can be, for example, analog or digital signals. The electrical components can, for example, be used to provide audio output and/or audio pick-up. The electrical components may include and/or control one or more sensors to monitor and/or signal the conditions of a user of the eyewear. The electrical components may also include and/or control one or more operation indicators to signal operational status of at least some other electrical components. In addition, the electrical components can be or pertain to a circuit board or module, which includes a plurality of electrical components.

[0059] Embodiments of different aspects of the invention are discussed below with reference to FIGs. 1 – 13C. However, those skilled in the art will readily appreciate that the detailed description given herein with respect to these figures is for explanatory purposes as the invention extends beyond these limited embodiments.

[0060] FIG. 1 is a perspective view of a pair of glasses 100 according to one embodiment of the invention. The glasses 100 include a frame and a pair of lenses 102. The frame has lens holders 104 that hold the lenses 102 in position. The frame also has a bridge 106. The glasses 100 further include a pair of temples (or arms) 108. The temples 108 are considered part of the frame. As shown in FIG. 1, each of the temples 108 is coupled to one of the lens holders 104 by a hinge 109. In one embodiment, the temples 108 can be removed from the frame (e.g., at the hinge 109).

[0061] In addition, temple arrangements 110 are attached to the temples 108. Here, one or both of the temples 108 can include a temple arrangement 110. A temple arrangement 110 can include one or more electrical components 112. In one embodiment, the temple arrangements 110 can be considered separate parts that can be attached to respective temples 108. Once attached, the temple arrangements 110 can be considered part of, or an extension to, the temples 108.

[0062] By having one or more electrical components 112 in one or more of the temple arrangements 110, electrical capabilities can be provided to the glasses 100 without burdensome impact to the design of other parts of the frames. Moreover, by providing electrical components in one or more of the temple arrangements 112, electrical capabilities can be added to eyeglasses in an after-market manner. Still further, by replacing temple arrangements, a user could alter the electrical capabilities of his eyeglasses.

[0063] In one embodiment, the glasses 100 do not have any other embedded electrical components, such as within the frame, except those in one or both of the temple arrangements 112. In another embodiment, the glasses 100 include one or more other electrical components embedded or attached to the frame of the glasses 100 and the components are electrically coupled to the one or more electrical components 112 in one or both of the temple arrangements 110.

[0064] In different embodiments, the glasses 100 can be, for example, a pair of sunglasses, fit-over glasses, prescription glasses, reading glasses, or safety glasses.

[0065] FIG. 2 illustrates a diagram of a number of different embodiments of temple arrangements 200 according to the invention. A temple arrangement 200 can be a temple tip, a temple fit-over, or a temple cover. In one embodiment, a temple tip is a structure that attaches to a rearward portion of a temple. In one embodiment, a temple tip can pertain to an enclosure that grabs onto a rearward portion of a temple. A temple tip is particularly common for wire frame eyeglass where the temple tip attaches to the rearward end of the temple and provides a surface suitable for positioning proximate to the user's ear. For example, FIG. 1 illustrates the temple arrangement 112 implemented as a temple tip.

[0066] In one embodiment, a temple tip is removable from its corresponding temple so that it can be replaced. The temple tip can be originally provided with the purchase of a pair of eyeglasses. Alternatively, the temple tip can be a replacement part that can be purchased separately and subsequently mounted onto a rearward portion of a temple of a pair of eyeglasses after removing any

original temple tip. In another embodiment, a temple tip is permanently held onto the corresponding temple, for example, by an adhesive (e.g., epoxy, glue, etc.).

[0067] In one embodiment, a temple fit-over fits over at least a portion of the rearward end of a temple. If the rearward end of the temple has a temple tip, at least a portion of the temple tip can be fitted over by the temple fit-over. In one embodiment, a temple cover slides over and at least partially covers a portion of the rearward end of a temple. If the rearward end of the temple has a temple tip, at least a portion of the temple tip can be covered by the temple cover.

[0068] A temple cover is typically made of a material that is more flexible than a temple fit-over. For example, a temple cover can be made of a fabric or other materials, such as a sock or sleeve; while a temple fit-over can be made of plastic.

[0069] A temple arrangement 200 can be made of the same or different materials than the temple or other parts of the frame of the pair of eyeglasses. To illustrate, a pair of glasses with a metal frame can have non-metallic temple tips. A temple arrangement 200 can be of a color that is the same as, or similar to, or different from, that of the temple.

[0070] A temple arrangement 200 can be held onto a temple by frictional force. For example, if the temple arrangement 200 is a temple fit-over, it can be held onto an existing temple or temple tip by frictional force. Here, the temple fit-over is often removable. In another embodiment, the temple arrangement 200 can be permanently held onto its corresponding temple or temple tip. For example, the temple arrangement can be permanently held onto the corresponding temple or temple tip, for example, by an adhesive (e.g., epoxy, glue, etc.).

[0071] Depending on applications, a temple arrangement can be of different shapes. The shape can depend on the type of glasses. For example, a temple arrangement for fit-over glasses can be bigger than a temple arrangement for prescription glasses. The shape of the temple arrangement can also depend on applications for the electronic component(s) that are fully or partially embedded in

the temple arrangement. Of course, aesthetic reasons can also influence shape (e.g., design, size, style) of a temple arrangement.

[0072] In one embodiment, the temple arrangement is a structure that has at least one electrical component attached thereto or at least partially embedded therein. In another embodiment, all of the electrical components to be provided with the temple arrangement are at least partially embedded in the temple arrangement.

[0073] FIG. 3A is a diagram of a portion 300 of a pair of eyeglasses according to one embodiment of the invention. The portion 300 includes a temple 302 that is associated with a pair of eyeglasses. Over the end of the temple 302 that is opposite the associated lens holder, a temple tip 304 is provided. The temple tip 304 can, for example, be held to the temple 302 by frictional forces and/or adhesive. The temple tip 304 includes at least one electrical component 306 that is at least partially embedded therein. A wide range of functionalities can be provided by the at least one electrical component 306. The temple tip 304 can be considered separate from or part of the temple 302. For example, when the temple tip 304 is not attached to the temple 302, the temple tip 304 is considered a separate part. As another example, when the temple tip 304 is attached to the temple 302, the temple tip 304 can be considered separate from or part of the temple 302.

[0074] The temple tip 304 can be manufactured and delivered to resellers or retailers and thereafter sold attached to eyeglasses. Alternatively, the temple tip 304 can be separately provided as an optional replacement temple tip for an original temple tip. Hence, after or during purchasing a pair of eyeglasses, upgrade of the eyeglasses can be had by replacing an existing temple tip with a replacement temple tip. The colors and shapes of the temple tip 304 can vary widely. In the after-manufacturing environment, the reseller or retailer can be provided with a range of different colors and shapes so that a user can receive a replacement temple tip that reasonably matches the color and shape of the temple or that provides an altered appearance as desired by the user.

[0075] A number of embodiments have been described regarding one or more electrical components at least partially embedded in a pair of glasses. In one embodiment, one or more electrical components are at least partially embedded in a temple tip of a pair of glasses. Temple tips are relatively common for wire or metal frames which have wire or metal temples. The pair of glasses has a first and a second lens holders for receiving lenses. Each of the lens holders has a first side and a second side. The pair of glasses has a bridge element that couples the first side of the first lens holder to the second side of the second lens holder. The pair of glasses also includes a first temple and a second temple. The first temple is pivotally secured to the second side of the first lens holder through a joint, while the second temple is pivotally secured to the first side of the second lens holder through another joint. A temple typically has two ends, a first end and a second end. The first end can be the end that is pivotally secured to a lens holder through a joint, and the second end can be the other end of the temple. It is not uncommon that a temple includes a main body and an enclosure that grabs onto the main body of the temple. The second end is typically where the enclosure grabs onto the main body. The enclosure can be made of a different material than the main body of the temple. In one embodiment, such an enclosure is a temple tip, and there is an electrical component, partially or fully, embedded in the temple tip. There can also be a connector at the temple tip. In another embodiment, the temple tip can include a female connector. In still another embodiment, as a temple tip grabs onto the main body of the temple, a connector at the temple tip (such as a female connector) can make electrical contact with another connector (such as a male connector) at the main body of the temple. Typically, particularly before a pair of glasses has been extensively worn, the temple tip can be removed and re-inserted back on to the main body of the temple without much difficulty. Such a temple tip can be an after-market component, with different temple tips having different electrical components to serve different functions.

[0076] Besides a temple tip such as illustrated in FIG. 3A, a temple tip can also be effectively modified by a fit-over temple or temple cover.

[0077] FIG. 3B is a diagram of a temple cover 320 that at least partially covers a temple (e.g., temple and/or temple tip) according to one embodiment of the invention. As an example, the temple cover 320 can be made of a fabric or other material, such as a sock or sleeve, that slides over and at least partially covers a temple or a temple tip. The temple cover 320 can include at least one electrical component 322 that is either attached thereto or at least partially embedded therein. The temple cover 320 can also include an opening 324 so as to receive a temple or a temple tip. In one embodiment, the temple cover 320 is placed over a substantial portion of a temple tip, and the opening 324 can extend to a far end 326 so as to receive all or a substantial part of the temple tip. The temple cover 320 can, for example, be held to a temple or a temple tip by frictional forces and/or adhesive.

[0078] FIG. 3C is a diagram of a fit-over temple 340 that at least partially fits over a temple (e.g., temple and/or temple tip) according to one embodiment of the invention. For example, the fit-over temple 340 can at least partially fit-over a temple tip. The fit-over temple 340 includes at least one electrical component 342 that is either attached thereto or at least partially embedded therein. The fit-over temple 340 can also include an opening 344 so as to receive a temple or a temple tip. The depth and/or width of the opening 344 within the fit-over temple 340 can vary depending on the extent to which it is being fit over a temple or a temple tip. The fit-over temple 340 can, for example, be held to a temple or temple tip by frictional forces and/or adhesive. As an example, the fit-over temple 340 can be plastic or other material. The colors and shapes of the fit-over temple 340 can have a lot of variations.

[0079] A wide range of functionalities can be provided by the at least one electrical component (e.g., electrical component 322 and 342). In the after-manufacturing environment, the reseller or retailer can be provided with a range of different colors and shapes so that a user can receive a replacement temple cover or fit-over temple that reasonably matches the color and shape of the temple or that provides an altered appearance as desired by the user.

[0080] FIG. 3D and 3E are diagrams of a temple arrangement 360 according to another embodiment of the invention. FIG. 3D is a side view of the temple arrangement 360, and FIG. 3E is a front view of the temple arrangement 360. In this embodiment, the temple arrangement 360 is a temple tip that can be attached to a temple (e.g., temple body) of a pair of eyeglasses. The temple arrangement 360 includes a speaker housing 362 allowing a speaker 364 to be at least partially embedded within the temple arrangement 360. An audio sound output by the speaker 364 is coupled to an ear plug 366 by way of the speaker housing 362 and a tube 368. Typically, the tube 368 is a flexible tube, such as a flexible plastic tube. A user of the eyeglasses having the temple arrangement 360 can place the ear plug 366 within her ear to facilitate coupling of the audio sound from the speaker 364 to the ear. The tube 368 can have a disconnection region 370 whereby at least a section of the tube 368 and the attached ear plug 366 can be removed from the temple arrangement 360, such as when audio output is not being listened to. The tube 368 and/or the speaker housing 362 can also be capable of rotating with respect to the temple arrangement 360 to facilitate ease of use. Still further, the temple arrangement 360 can include a connector 372, such as a male audio connector (e.g., 2.5 mm, stereo mini-phone connector). The connector 372 provides a means to electrically connect an external audio source to the speaker 364 within the temple arrangement 360. For example, at least one wire (not shown) that is internal to the temple arrangement 360 can be used to electrically connect the speaker 364 to the connector 372.

[0081] In one embodiment, an electrical component is a component of an electrical circuit or system, and the electrical circuit or system is for performing at least a desired, intended or predetermined function.

[0082] In one embodiment, a temple tip, fit-over temple or temple cover according to the invention can further include a connector or cable to facilitate electrical connection with the at least one electrical component that is either attached to a temple or a temple tip or at least partially embedded therein.

[0083] Still another aspect of the invention relates to one or more swappable temple portions for a pair of glasses. According to this aspect, a temple has a forward portion and a rearward portion which can removably couple to one another. In one embodiment, different rearward portions can be used with the same forward portion. In other words, the different rearward portions can be swapped with one another. In one implementation, the different rearward portions can offer different electrical components/functionalities to the pair of glasses. For example, the different rearward portions can provide different electrical components/functionalities such as: battery/power, wireless communication, radio, headset, GPS, pedometer, sun sensor, hearing enhancement, image/video capturing, etc. In another embodiment, different forward portions can be used with the same rearward portion.

[0084] In one embodiment, only one of the temples of an eyeglass frame has swappable part(s). In another embodiment, both of the temples of an eyeglass frame have swappable part(s). Regardless, viewed in one way, each of the swappable parts at a temple can be viewed as a removable peripheral device to the eyeglass frame.

[0085] In one embodiment, a temple is a multi-part temple. The multi-part temple includes at least a forward (or first) part and a rearward (or second) part. The forward part is typically integral with or coupled to an eyeglass frame (such as at the lens holder or hinge region of an eyeglass frame). The rearward part removably connects with the forward part. The removable connection allows the rearward part to be removed for any of a variety of reasons. For example, the rearward part can be removed to: (1) connect a different rearward part; (2) connect to a peripheral bus (e.g., for data download); or (3) charge a battery (e.g., located in forward or rearward part).

[0086] The removable connection between the forward and rearward parts of the multi-part temple physically attaches and secures the rearward part to the forward part by way of at least a mechanical connection. The mechanical

connection can be provided in a variety of ways, such as through use of one or more connectors, snaps, detents, bayonets, etc.

[0087] In addition, the removable connection between the forward and the rearward parts of the multi-part temple can provide (or facilitate) an electrical connection between the forward and rearward parts. In one embodiment, the forward part of the temple (or some other part of the eyeglass frame) includes one or more electrical components, and the rearward part includes one or more electrical components. In such case, the electrical connection serves to electrically connect one or more of the electrical components of the forward part (or other part of the eyeglass frame) with one or more of the electrical components of the rearward part. For example, the forward part of the temple can include one or more electronic components (e.g., integrated circuit) that are electrically connected to one or more electronic components in the rearward part.

[0088] However, in the event that all needed electrical components are within the rearward part of the multi-part temple, electrical connection between the forward part and the rearward part may not be needed. Accordingly, in some embodiments, no electrical components will be needed in the forward part; instead, all the needed electrical components will be provided in the rearward part.

[0089] Various embodiments of eyewear can utilize the multi-part temples to provided electrical components to eyeglass frames in a convenient and user-friendly manner. As one example, consider an eyeglass frame that supports a camera. The electrical components can include an image sensor, a memory, a microcontroller, and a battery. One or more of these electrical components can be in the forward part (or other part of the eyeglass frame) and the remaining one or more electrical components can be in the rearward part. For example, the image sensor and the microcontroller can be in the forward part and the battery and the memory can be in the rearward part. Additionally, if the camera makes use of a display (e.g., LCD), the display could be in either the forward part or the rearward part. The eyeglass frame might also include other electrical components for additional functionality. Examples of additional functionality include: global

positioning system, antenna, user interface (e.g., buttons, switches, etc), display, microphone, earphone, etc. In another example, all of the electrical components supporting the camera functionality can be provided in the rearward part of the multi-part temple.

[0090] In one embodiment, the electrical components provided in the forward part are able to be shared with different rearward parts. In other words, different rearward parts can be swapped. For example, a different rearward part can be connected to the forward part to provide the eyeglass frame with different functionality. Examples of some of the different functionality that can be provided in this matter include: radio receiver (e.g., satellite radio), media player, pedometer, wireless communication, sun monitor, hearing enhancement, global positioning, etc. In a first example, in the case of a radio receiver, the forward part can include a display, while the rearward part can include a tuner, a rechargeable battery, an amplifier, and earphones or earphone connectors. In a second example, in the case of a media player, the forward part can include a display, while the rearward part can include a media player module, a memory, a rechargeable battery, a switch and earphones or earphone connectors. In a third example, in the case of a pedometer, the forward part can include a display, while the rearward part can include an accelerometer, a rechargeable battery, a memory and a microcontroller. In a fourth example, in the case of a wireless communication device, the forward part can include a display, while the rearward part can include a battery, an antenna, a wireless module, earphones or earphone connectors, and a user interface. The user interface, for example, can include buttons, which, for example, can facilitate user input with respect to on/off, volume, and accept or decline call. In this case, information displayed can include battery status, device status, caller ID, etc. In these four examples, the forward part includes a display and thus the forward part can be used (i.e., shared) with any of the different rearward parts to thereby provide different functionality to the eyeglass frames. Hence, by swapping one of these different rearward parts, the same pair of eyeglasses can provide different functionality.

[0091] A multi-part temple can be manufactured and delivered to resellers or retailers and thereafter sold attached to eyeglasses. Alternatively, a rearward part can be separately provided as a separate part or as an optional rearward part that can be swapped with an original rearward part. Hence, after or during purchasing a pair of eyeglasses, alteration, upgrade or conversion of the eyeglasses can be had by swapping in another rearward part. The electrical components or functions supported by the rearward part can vary widely. The colors and shapes of the rearward parts also can vary widely. For example, in the retailing or after manufacturing environment, the reseller or retailer can be provided with a range of different colors and shapes so that a user can receive a rearward part that reasonably matches the color and shape of the multi-part temple or that provides an altered appearance as desired by the user.

[0092] FIG. 3F is a diagram of a multi-part temple 1300 according to one embodiment of the invention. The multi-part temple 1300 has a forward part 1302 and a rearward part 1304. The rearward part 1304 is removably connected to the forward part 1302 such that the rearward part 1304 is removable. Once removed, the same rearward part or a different rearward part can be later connected to the forward part 1302. Alternatively, a cable can be connected to the forward part 1302 when the rearward part 1304 is removed. The cable can facilitate data transfer, battery charging, etc, depending on the electrical components in the forward part 1302.

[0093] FIG. 3G is a diagram of a multi-part temple 1310 according to one embodiment of the invention. The multi-part temple 1310 can represent the multi-part temple 1300 shown in FIG. 1 in one embodiment. In FIG. 3G, a forward part 1312 and a rearward part 1314 are shown disconnected. The forward part 1312 has a mechanical element 1316 and the rearward part 1314 has a corresponding opening 1318. Once connected together, the mechanical element 1316 of the forward part 1312 is inserted into the opening 1318, thereby mechanically coupling the rearward part 1314 to the forward part 1312. Once mechanically coupled the rearward part 1314 is secured to the forward part 1312, but remains removable.

[0094] FIG. 3H is a diagram of a multi-part temple 1320 according to one embodiment of the invention. The multi-part temple 1320 can represent the multi-part temple 1300 shown in FIG. 1 in one embodiment. In FIG. 3H, a forward part 1322 and a rearward part 1324 are shown disconnected. The forward part 1322 has a connector 1326 and the rearward part 1324 has a corresponding connector 1328 embedded therein. Once connected together, the connector 1326 of the forward part 1322 is inserted into the corresponding connector 1328, thereby mechanically coupling the rearward part 1324 to the forward part 1322. Once mechanically coupled the rearward part 1324 is secured to the forward part 1322, but remains removable. Additionally, the connection of the connector 1326 and the corresponding connector 1328 can also provide an electrical connection. An electrical connection would serve to enable electrical components in the forward part 1322 (or other parts of an eyeglass frame) to electrically connect to electrical components in the rearward part 1324. For example, the electrical connection can provide electrical connections for one or more electrical wires. An example of one suitable type of connector is a USB connector which can provide mechanical and electrical connection.

[0095] As noted above, a rearward part of a multi-part temple can include one or more electrical components. FIG. 3I is a diagram of a rearward part 1330 of a multi-part temple according to one embodiment of the invention. The rearward part 1330 has a body 1332 with electrical circuitry 1334 internal to the body 1332. As one example, the electrical circuitry 1334 can pertain to data storage (e.g., memory). In such an example, the rearward part 1330 can be considered a memory stick or a memory card. As other examples, the electrical circuitry 1334 can pertain to a battery/power source, a sun sensor, a pedometer, a media player, a wireless module, etc.

[0096] FIG. 3J is a diagram of a rearward part 1340 of a multi-part temple according to another embodiment of the invention. The rearward part 1340 has a body 1342 with an ear bud 1344 and an ear bud arm 1346 extending therefrom. In addition, the body 1342 includes at least one conductor 1347 and electrical circuitry 1348 internal to the body 1342. The at least one conductor 1347 can

electrically connect the electrical circuitry 1348 with the ear bud 1344, where the at least one conductor 1347 extends through the ear bud arm 1346 to the ear bud 1344. Optionally, the body 1342 can further include an antenna 1349 internal to the body 1342. In the case where the electrical circuitry 1348 includes a wireless receiver (e.g., Bluetooth, XM, FM), the antenna 1349 can enhance reception. As an example, the electrical circuitry 1348, can be a wireless module for wireless communications or a receiver for XM or FM signals. Additionally or alternatively, the electrical circuitry 1348 can, for example, pertain to one or more of a data storage device, battery/power source, a sun sensor, a pedometer, a media player, etc.

[0097] FIG. 3K is a diagram of a rearward part 1350 of a multi-part temple according to another embodiment of the invention. The rearward part 1330 has a body 1352 with a printed circuit board 1354 internal to the body 1352. A display device 1356 (e.g., LCD) can be provided on the body 1352. In one example, the display device 1356 can be mounted to the circuit board 1354 and exposed through an opening in the body 1352 so as to be visible by a user of the eyeglasses using the multi-part temple. Optionally, at least a portion of the printed circuit board 1354 can conform to the shape of the body 1352. The ability to conform, even partially, allows the printed circuit board 1354 to yield greater surface area within a temple, which tends to be small and stylized. The integrated circuit board 1354 can have one or more electronic components (e.g., integrated circuits) mounted thereon.

[0098] FIGs. 3L – 3O are diagrams of representative forward parts for multi-part temples according to different embodiments of the invention. FIG. 3L is a diagram of an exemplary forward part 1360 having a mechanical element 1362 that includes one or more detents 1364. When a rearward part is connected to the forward part 1360, the mechanical element 1362 is inserted into an opening (e.g., opening 1318) and held securely in place by mechanical forces facilitated by the mechanical element 1362 and the detents 1364. This can be accomplished through different methods, such as with corresponding protruding portions in the

opening that can, for example, be aligned with the detents 1364. For example, the protruding portions can snap into place or biased by springs (e.g., spring–loaded).

[0099] FIG. 3M is a diagram of an exemplary forward part 1370 having a mechanical element 1372 that includes one or more protrusions 1374. When a rearward part is connected to the forward part 1370, the mechanical element 1372 is inserted into an opening (e.g., opening 1318) and held securely in place by mechanical forces facilitated by the mechanical element 1372 and the protrusions 1374. In one embodiment, the protrusions 1374 are spring-loaded to facilitate connection with the opening.

[00100] FIG. 3N is a diagram of an exemplary forward part 1380 having a mechanical element 1382 that includes one or more bayonet structures 1384. To connect a rearward part to the forward part 1380, the mechanical element 1382 is inserted into an opening (e.g., opening 1318) that has groves (in the direction substantially parallel to the axis of the mechanical element 1382) for receiving the bayonet structures 1384. The rearward part can be connected with the forward part 1380 when the groves within the opening of the rearward part are aligned with the bayonet structures 1384. Once the mechanical element 1382 is so inserted, the rearward part can be rotated with respect to the forward part 1380. The rotation causes the bayonet structures 1384 to no longer be aligned with the grooves. As a result, the rearward part is mechanically secured to the forward part 1380 (and thus the eyeglass frame) in a bayonet like manner.

[00101] In one embodiment, a connector is used to removably couple the rearward portion to the forward portion of a multi-part temple. For example, the connector can be standard connector. One example of a suitable connector is a Universal Serial Bus (USB) connector.

[00102] FIG. 3O is a diagram of an exemplary forward part 1390 having an electrical connector 1392. The connector 1392 facilitates mechanical and/or electrical connections between the forward part 1390 and a rearward part. When a rearward part is connected to the forward part 1390, the connector 1392 is inserted into an opening (e.g., opening 1328) and held securely in place by

mechanical forces. There can be additional mechanical connecting mechanisms to further secure the connection.

[00103] In one embodiment, the opening receiving the connector 1392 can include a corresponding (i.e., counterpart) connector. When the connector 1392 is connected with the corresponding connector within the opening, the rearward part is physically secured to the forward part 1390. For example, mechanical forces can hold the connector 1392 and the corresponding connector in a connected position. In addition, when the connector 1392 and the corresponding counterpart connector are coupled together, one or more electrical connections are facilitated. For example, each connector can be coupled to one or more electrical wires at the other connector so that wires from one part are able to be connected to corresponding wires on the other part. As a result, electrical component(s) in the rearward part are able to be electrically connected with electrical component(s) in the forward part 1390 (or elsewhere in the eyeglass frame). In one implementation, the connectors pertain to or resemble a Universal Serial Bus (USB) type connector.

[00104] In another embodiment, the opening receiving the connector 1392 does include a corresponding counterpart connector. In this embodiment, mechanical forces can hold the connector 1392 within the opening. Also, in this embodiment, electrical connections are not facilitated.

[00105] Although FIGs. 3G-3N pertain to connections having a male connector at the forward part and a female connector at the rearward part, it should be understood that alternatively the male connector can be at the rearward part and the female connector can be at the forward part.

[00106] Also, although FIGs. 3G-3N pertain to connections showing only one elongated portion (like a male connector) to be received by an opening (like a female connector), in other embodiments, there can be more than one elongated portion to be received by more than one opening. Also, the connections can be formed on the sides (i.e., outer surface), instead of by having elongated portions and openings positioned in the middle of (i.e., internal to) the forward and rearward parts. For example, there can be two prongs, one on the top surface and one on

the bottom surface of a forward part. Each prong can be received by a counterpart detent in a rearward part, such as the prong on the top surface of the forward part to be received by a detent on the top surface of the rearward part.

[00107] In a number of embodiments, the forward part of the multi-part temple is substantially smaller than the rearward part. For example, in FIG. 3F, the forward part 1302 is substantially smaller than the rearward part 1304. In one embodiment, a forward part is large enough to house a connection mechanism used to couple with a rearward part and not too much larger. In another embodiment, a forward part and a rearward part are about the same size. In still another embodiment, a forward part is larger than a rearward part.

[00108] In one embodiment, neither the forward part nor the rearward part of a multi-part temple contains any electrical components. In such case, the rearward part can still be removable from the forward part. Such an embodiment enables a user to swap one (which can be substantially all of the temple) or both the rearward portions of both temples, with another rearward portion(s), such as for aesthetic, configuration or design reasons.

[00109] In one implementation, a connector is used to removably couple the rearward portion to the forward portion of the multi-part temple. For example, the connector can be a Universal Serial Bus (USB) connector.

[00110] In one embodiment, a forward part can be part of or integral with a corresponding region of a lens holder. In such case, there need not be any hinges for coupling the temples to the lens holders.

[00111] As noted above, connectors can be use to removably attach a temple to an eyeglass frame (e.g., lens holder) or to removably attach different portion(s) of a temple. These connectors can be provided for one or both temples of the eyeglass frames. With such temples being easily removable by users without the need for any special skill or tools, the temple parts can be interchangeable and can be separately sold or leased.

[00112] Further, to display various eyewear products, such as in a retail environment, an eyewear products display apparatus (e.g., stand) can include corresponding connectors or connector structures so that (i) separate temples (ii) separate parts of temples and/or (iii) eyeglass frames without temples can be connected to the eyewear products display apparatus for display. For example, if the eyewear products (e.g., frames, temples, etc.) use connectors, then the eyewear products display apparatus can support those same connectors (e.g., USB connectors) or compatible structures. This eyewear products display apparatus opens up new ways to organize and present eyewear products at retail stores. It also allows users to separately select a base eyewear frame and temples to be used therewith. The temples and the frames can be displayed detached from one another, such that a user can separately select and try different temples with frames.

[00113] FIG. 3P is a diagram of an eyewear products display apparatus 1400 according to one embodiment of the invention. The apparatus 1400 has a first region 1404 of first type connectors (or compatible protrusions) integral with the apparatus 1400. A plurality of eyeglass frames having second type connectors can be attached and displayed on the apparatus 1400 by connecting one or two of the second type connector of the eyeglass frames to those of the first type connectors of the first region of the apparatus 1400.

[00114] The apparatus 1400 also can include a second region 1402 of second type connectors (or compatible openings) integral with the apparatus 1400. A plurality of removable temples (and/or removable temple parts) having first type connectors can be attached and displayed on the apparatus 1400 by connecting the first type connectors of the removable temples (and/or removable temple parts) to those of the second type connectors (or compatible openings) in the second region 1402 of the apparatus 1400.

[00115] In one embodiment, the first type connectors are male connectors and the second type connectors are corresponding female connectors which provide a secure mechanical connection. In one embodiment, the first type

connectors and/or the second type connectors provided integral with the apparatus 1400 are not electrical connectors but compatible structures (e.g., protrusions and openings) such that a secure mechanical connect can be had.

[00116] In one embodiment, the orientation of at least some of the connectors in the apparatus 1400 is substantially horizontal. In other words, for example, when a rearward part of a temple is inserted into such a connector in the apparatus 1400, the rearward part is substantially perpendicular to the surface of the apparatus 1400 as shown. In another embodiment, the orientation of at least some of the connectors in the apparatus 1400 is substantially facing upward or downward in a vertical manner. In other words, for example, when a rearward part of a temple is inserted into such a connector in the apparatus 1400, the rearward part is substantially parallel to the surface of the apparatus 1400 as shown. In yet another embodiment, the orientation is at an acute angle relative to the surface of the apparatus 1400 as shown. In other words, for example, when a rearward part of a temple is inserted into a connector in the apparatus 1400, the rearward part is at an acute angle relative to the surface of the apparatus 1440 as shown. The connectors in the apparatus 1400 can also be rotatable or movable, such as between different positions and/or angles.

[00117] Although FIG. 3P only depicts one side of the eyewear products display apparatus 1400, the apparatus can have other like sides. For example, the apparatus 1400 can be a one, two, three or four sided apparatus.

[00118] In still another embodiment, at least one connector of the apparatus 1400 is connected to at least one electrical component in the apparatus 1400. For example, when a selected temple part is connected to the connector, the at least one electrical component in the apparatus 1400 is electrically connected to an electrical component in the temple part, and together can perform an electrical operation.

[00119] In yet another embodiment, at least one connector of the apparatus 1400 is connected to another connector of the apparatus 1400. This allows electrical connection between the different eyewear parts connected to the

apparatus 1400. For example, when a selected temple part is connected to the connector and an eyeglass frame is connected to the other connector, an electrical component within the eyeglass frame is electrically connected to an electrical component in the temple part, and together can perform an electrical operation.

[00120] FIG. 4 shows examples of different electrical components according to the present invention. Different embodiments of temple arrangements, temple adapters or temple parts according to the invention can use one or more of these different electrical components.

[00121] In one embodiment, the electrical component is an electrical connector. The connector can be a male connector or a female connector. Examples of different types of connectors have previously been described in the related patent applications, which have been incorporated by reference.

[00122] In one embodiment, the embedded electrical component is an electrical switch, such as one or more of those previously described in the related patent applications, which have been incorporated by reference.

[00123] In one embodiment, one electrical component can be a power source. The power source can be a battery, a solar cell or other type of power source.

[00124] In one embodiment, one electrical component can include a circuit board. The circuit board can be a rigid or a flexible circuit board.

[00125] In one embodiment, one electrical component can be an indicator. The indicator can be audio, visual, or physical (e.g., vibration). For example, the indicator can signal an event or condition to a user of the glasses.

[00126] In one embodiment, one electrical component can be a display, such as an LCD display.

[00127] In one embodiment, one electrical component can be a speaker. The speaker can provide an audio output for the benefit of the wearer of the glasses. The speaker can directly transmit sound to a user, such as a speaker mounted on an exterior surface of an eyeglass frame, or partially or fully embedded in an

eyeglass frame, or a bone conducting type of speaker. Alternatively, the speaker can indirectly transmit sound to a user, such as through the use of a tube to deliver audio output proximate to a user's ear.

[00128] In one embodiment, one electrical component can be a controller. The controller can, for example, be a microprocessor.

[00129] In one embodiment, one electrical component can be a memory device. The memory device can be non-volatile memory, such as FLASH memory. The data stored in the memory device can be user data or data provided by other electrical components.

[00130] In one embodiment, one electrical component is a frequency receiver or a frequency transmitter. They can be in the radio frequency range.

[00131] In one embodiment, one electrical component can be a sensor. The sensor can be a temperature sensor. The temperature sensor can be used to sense the temperature of the wearer. In one embodiment, such a temperature sensor is in a temple tip. In measuring the temperature, the user can further press the temple tip towards his head to ensure better connection. One can also put the temple under one's tongue to measure body temperature.

[00132] In other different embodiments, one electrical component can be a motion detector, a speed sensor, a rate of ascent (or descent) detector, a pressure detector, or a detector for radiation, such as an ultraviolet (UV) detector.

[00133] In one embodiment, one electrical component is a radio frequency identification (RFID) tag. A RFID tag typically includes a memory chip and a radio antenna. The memory chip usually has a small storage capacity and thus does not include a large amount of information. A portion of such information can provide identifying information for the glasses. The memory chip may only have a few kilobytes, sufficient to encode information, such as a serial number, where and when the product (such as eyeglasses) was manufactured, and other relevant information.

[00134] The RFID tags can come in a number of configurations. For example, an active tag uses a battery-powered transponder to constantly emit signals which can carry information programmed into the memory chip. Active tags are more applicable to situations where readers are not close to the tags. A semi-passive tag likewise has a battery, but may not be activated until it receives a signal from a reader. They are more applicable to situations that do not need continuous connection and accessing. A passive tag has no battery; its antenna extracts power from a reader's radio wave signal to transmit the identifying information. Passive tags are typically relatively inexpensive, but may have to be within a few feet of a reader to extract power. The electrical component can be a passive RFID tag, or some other type of tag.

[00135] In one embodiment, one electrical component can be for locating the corresponding glasses. For example, the electrical component can produce a beeping tone when it receives a specific radio signal. A handheld device (such as a key chain accessory, can generate the specific radio signal (e.g., when a button is pushed). Through the beeping tone, one can locate the glasses.

[00136] As noted above, in one embodiment, the electrical component can be a sensor. More generally, a pair of glasses can include one or more sensors that can be used individually or in combination. FIG. 5 is a chart 500 that depicts examples of sensors suitable for use in or attached to the glasses.

[00137] In one embodiment, the sensor is a "being worn" sensor. The "being worn" sensor indicates whether the glasses are being worn by its user. The "being worn" operation can be performed using, for example, a thermal sensor, a motion detector, a stress sensor or a switch.

[00138] In one embodiment, a motion detector is used as a "being worn" sensor. A threshold can be set, such that if the amount of motion exceeds the threshold, the glasses are assumed to be worn. The motion detector can, for example, be achieved by a mechanical mechanism or an accelerometer.

[00139] In another embodiment, the "being worn" sensor includes two thermal sensors. One sensor can be at approximately the middle of a temple, such

as in a region that touches the head of the user wearing the glasses. The other sensor can be at one end of the temple, the end that is close to its hinge. If the temperature differential between the two sensors is beyond a certain preset value, the glasses would be assumed to be worn. The differential is presumed to be caused by a person wearing the pair of glasses.

[00140] In yet another embodiment, the "being worn" sensor includes a stress sensor at the hinge of the temple. The assumption is that when the eyewear is worn, the hinge is typically slightly stretched because typically, the width of the head of the user is slightly wider than the width between the temples when the two temples are in the extended positions. If the value of the stress sensor is beyond a certain preset value, the glasses would be assumed to be worn.

[00141] In a further embodiment, the "being worn" sensor can be a switch. For example, at the hinge between a temple and its corresponding lens holder, there is a switch. When that temple is in its extended position, i.e., fully extended outwards, the switch is turned on. The switch can be a pin-type switch. When the temple is fully extended outwards, the pin is pressed. When both temples are fully extended outwards, in one embodiment, the glasses would be assumed to be worn by the user.

[00142] In one embodiment, another type of sensor is an environmental sensor. The environmental sensor can sense environmental conditions, such as one or more of radiation (e.g., ultraviolet radiation or light), temperature (e.g., ambient temperature), pressure, humidity and toxins (e.g., chemicals, etc.).

[00143] In another embodiment, another type of sensor is a condition sensor. The condition sensor can sense the conditions of the user of the glasses. Examples of condition sensors include sensing one or more of distance traveled, location, speed, calories consumed, temperature and vital signs associated with the user of the glasses. The distance traveled could represent the horizontal distance traveled or the vertical distance (i.e., elevation) traveled. The speed can be the rate of movement along the horizontal distance traveled and/or the vertical

distance. In yet another embodiment, the condition sensor can indirectly sense emotional conditions of the user of the glasses.

[00144] The sensors can be provided in a redundant or fault-tolerant manner. For example, sensors can come in pairs in the glasses. When one malfunctions, the other one will take over its operation. In another embodiment, the sensor information can be processed in a differential manner to examine changes to the sensor information. The differential can be based on time. The sensors can be powered by a battery, solar energy, or kinetic energy. For reduced power consumption, the sensors can remain in a low-power state unless data is being acquired by the sensors. In yet another embodiment, two or more of the sensors can communicate with one another (wired or wirelessly) to exchange data or control information.

[00145] FIG. 6 illustrates a diagram of a number of different embodiments of temple adapters 600 according to the invention. The temple adapters 600 serve to adapt a temple (i.e., a temple body or temple tip) of a pair of eyeglasses to provide for at least one electrical component. In one embodiment, a temple adapter can clip onto a temple body or a temple tip. In another embodiment, a temple adapter can mount to a post provided on a temple body or a temple tip. In still another embodiment, a temple adapter can mount to a hole provided in a temple body or a temple tip. In yet another embodiment, a temple adapter can be bonded (or adhered) to a temple body or a temple tip.

[00146] The temple adapter is particularly well suited to adapt a pair of eyeglasses with communication components, such as a speaker and/or a microphone. As an example, a standard pair of eyeglasses can be transformed into an operational headset by attaching a temple adapter to a temple body or temple tip of the pair of eyeglasses, wherein the temple adapter includes at least one speaker and at least one microphone.

[00147] The temple adapter can be rigid or malleable. The benefit of being malleable is that the particular geometric arrangement/assembly of the temple adapter can be altered by its user for better user comfort or operation.

[00148] In one embodiment, the temple adapter is a structure that has at least one electrical component attached thereto or at least partially embedded therein. In another embodiment, all of the electrical components to be provided with the temple adapter are at least partially embedded in the temple adapter.

[00149] FIG. 7A is a diagram of a temple adapter 700 according to one embodiment of the invention. The temple adapter 700 attaches to a temple 702 (including any temple tip using a clip 704. The clip 704 can use force, such as an interference fit force or spring-induced force, to attach the temple adapter 700 to the temple 702. Besides the clip 704, the temple adapter 700 includes an angled arm 706 and an ear bud 708. The angled arm 706 can be malleable. When a pair of eyeglasses associated with the temple 702 is being worn by a user, the ear bud 708 can be placed in or near the user's ear canal. The ear bud 708 contains a speaker and receives electrical signals via a wire, such wire can be provided internal or external to the temple adapter 700 and can originate at the temple 702 or external to the temple 702.

[00150] FIG. 7B is a diagram of a temple adapter 720 according to another embodiment of the invention. The temple adapter 720 attaches to a temple 722 (including any temple tip) using a clip 724. The clip 724 can use force, such as an interference fit force or spring-induced force, to hold the temple adapter 720 to the temple 722. Besides the clip 724, the temple adapter 720 includes an angled arm 726, an ear bud 728, a microphone 730, an extension arm 732 and a cord 734. In this embodiment, the cord 734 includes a wire that connects to the speaker within the ear bud 728 and another wire that connects to the microphone 730. There can be one or more conductors inside a given wire. For example, a wire might have one conductor serving as a signal line and another conductor serving as ground. Such wires can be provided internal to the extension arm 732 and the angled arm 726. The arm 732 can serve to guide the cord 734 away from the user's ear or rearward. The angled arm 726 can be malleable. The placement or position of the microphone 730 can vary with implementation. As shown in FIG. 7B, the microphone 730 is directed forward to a user's front when a pair of eyeglasses associated with the temple 722 are being worn. Alternatively, the microphone 730

could be directed outward away from the user's head when the pair of eyeglasses are being worn. When a pair of eyeglasses associated with the temple 722 is being worn by a user, the ear bud 728 can be placed in or near the user's ear canal. The ear bud 728 contains a speaker and receives electrical signals via a wire of the cord 734. The cord 734 can have another end (not shown) with a connector for coupling with an audio output device (e.g., radio, MP3 player) or a communication device (e.g., mobile phone).

[00151] FIGs. 8A and 8B are diagrams of a temple adapter 800 according to another embodiment of the invention. FIG. 8A is a side view of the temple adapter 800, and FIG. 8B is a front view of the temple adapter 800. The temple adapter 800 has a support body 802 which has a support arm 803. An ear bud 804 is attached to an end of the support arm 803. A connector 806, such as a male audio connector, is attached to one end of the support body 802. A microphone 808 can be optionally provided and attached to the support body 802 or the support arm 803. Additionally, an elastic member 810 can be provided to facilitate attachment of the support body 802 to a temple 812 of a pair of eyeglasses. The temple 812 can have a tip region 814, which can be referred to as a temple tip. When the temple adapter 800 is attached to the tip region 814 of the temple 812, the tip region 814 is placed in or through an opening 816 in the elastic member 810, as shown, for example, in FIG. 8B. The temple adapter 800 is thereby held in place relative to the tip region 814. Additionally, although not shown, the support body 802 would carry a first internal wire from the connector 806 to the microphone 808, and the support body 802 and the support arm 803 would carry a second internal wire from the connector 806 to the ear bud 804.

[00152] FIG. 9A is a diagram of a temple adapter 900 according to another embodiment of the invention. In FIG. 9A, a side-view of the temple adapter 900 is depicted. The temple adapter 900 attaches to a temple 902 of a pair of eyeglasses. The temple 902 can have a tip region 904, which can be referred to as a temple tip. The temple adapter 900 has a support member 906. A first end 908 of the support member 906 couples to the temple 902 of a pair of eyeglasses. In one embodiment, the first end 908 serves to attach the temple adapter 900 to the

temple 902. For example, the first end 908 can provide a clip, clamp, post, or hole to provide or assist with the attachment. As another example, the first end 908 can alternatively or additionally use an adhesive, bonding or fastener (e.g., hook and loop system, such as Velcro) to provide or assist with the attachment. A second end 910 of the support member 906 provides an opening through which an arm 912 extends. One end of the arm 912 has an ear bud 914 attached thereto. The arm 912 can be angled and/or malleable. When a pair of eyeglasses associated with the temple 902 is being worn by a user, the ear bud 914 can be placed in or near the user's ear canal. The ear bud 914 contains a speaker and receives electrical signals via a wire, such wire can be provided internal or external to the temple adapter 900 and can originate at the temple 902 or external to the temple 902.

[00153] FIGs. 9B and 9C are diagrams of a temple adapter 920 according to still another embodiment of the invention. FIG. 9B is a side view of the temple adapter 920, and FIG. 9C is a front view of the temple adapter 920. The temple adapter 920 attaches to a temple 922 of a pair of eyeglasses. The temple 922 can have a tip region 924, which can be referred to as a temple tip. The temple adapter 920 has a support member 926. A first end 928 of the support member 926 couples to the temple 922 of a pair of eyeglasses. In one embodiment, the first end 928 serves to attach the temple adapter 920 to the temple 922. For example, the first end 928 can provide a clip, clamp, post, or hole to provide or assist with the attachment. As another example, the first end 928 can alternatively or additionally use an adhesive, bonding or fastener (e.g., hook and loop system, e.g., Velcro) to provide or assist with the attachment. The first end 928 also has a bracket 930 having a connector 932 at one end, and an elastic member 934 for coupling about the tip region 924. The connector 932, such as a male audio connector, is attached to one end of the bracket 930. A microphone 936 can be optionally provided and, for example, attached to the support body 926.

[00154] A second end 938 of the support member 926 provides an opening through which an arm 940 extends. One end of the arm 940 has an ear bud 942 attached thereto. The arm 940 can be angled and/or malleable. The arm 940 is

also re-positionable within the opening at the second end 938 so as to permit user adjustment. When a pair of eyeglasses associated with the temple 922 is being worn by a user, the ear bud 942 can be placed in or near the user's ear canal. The ear bud 942 contains a speaker and receives electrical signals via a wire, such wire can be provided internal or external to the temple adapter 920 and can originate at the temple 902 or external to the temple 902. In this embodiment, a wire 944 is shown as passing through the arm 940 to provide signals to the speaker within the ear bud 942. More particularly, in one embodiment, although not shown in FIGs. 9B and 9C, a first wire would connect the speaker within the ear bud 942 to the connector 932 (e.g., wire 944), and a second wire would connect the microphone 936 to the connector 932. Such wires can be internal or external, or partially internal and partially external, to the temple adapter 920.

[00155] FIG. 9D is a diagram of a temple adapter 960 according to still another embodiment of the invention. In FIG. 9D, a side-view of the temple adapter 960 is depicted. The temple adapter 960 attaches to a temple 962 of a pair of eyeglasses. The temple 962 can have a tip region 964, which can be referred to as a temple tip. The temple adapter 900 has a support member 966. A first end 968 of the support member 966 couples to the temple 962 of a pair of eyeglasses. In one embodiment, the first end 968 serves to attach the temple adapter 960 to the temple 962. For example, the first end 968 can provide a clip, clamp, post, or hole to provide or assist with the attachment. As another example, the first end 968 can alternatively or additionally use an adhesive, bonding or fastener (e.g., hook and loop system, e.g., Velcro) to provide or assist with the attachment. A second end 970 of the support member 906 provides an opening through which an arm 972 extends. One end of the arm 972 has an ear bud 974 attached thereto. The arm 972 can be angled and/or malleable. When a pair of eyeglasses associated with the temple 962 is being worn by a user, the ear bud 974 can be placed in or near the user's ear canal. The ear bud 974 contains a speaker and receives electrical signals via a wire, such wire can be provided internal or external to the temple adapter 960 and can originate at the temple 962 or external to the temple 962. Further, the temple adapter 960 can include a microphone 976. In this

embodiment, the microphone 976 is attached to the support member 966. In addition, an arm 978 is used to support an end of a cable 980 that is coupled to the arm 978. The cable 980 can include at least one wire for the microphone 976 and one wire for the speaker within the ear bud 974.

[00156] To the extent that any of the embodiments of the temple adapters discussed above use a microphone, a tube can be optionally attached to the microphone to facilitate voice pick-up of the user. One end of the tube can be placed over the microphone, and the other end of the tube is then positioned closer to the user's mouth than is the microphone. With a temple adapter on both temples, each providing a microphone and speaker to a pair of eyeglasses, only one temple adapter would typically make use of such a tube. Alternatively, the tube and the microphone could be replaced by a boom microphone.

[00157] FIG. 10A-10C are diagrams of a temple having a bone conducting element according to still other embodiments of the invention. The bone conducting elements can replace a traditional speaker to provide audio output to a user. Although not shown, electrical signals would be internally or externally supplied to the bone conducting element.

[00158] FIG. 10A illustrates a temple 1000 for a pair of eyeglasses. The temple 1000 includes a bone conducting element 1002 that can provide audio sound to a user by coupling vibrations to at least one bone of the user's face. The bone conducting element 1002 is held relative to the temple 1000 by an arm 1004. Hence, in this embodiment, the temple 1000, the arm 1004 and the bone conducting element 1002 can all be integrally formed.

[00159] FIG. 10B illustrates a temple 1020 for a pair of eyeglasses. The temple 1020 includes a bone conducting element 1022 that can provide audio sound to a user by coupling vibrations to at least one bone of the user's face. The bone conducting element 1022 is held relative to the temple 1020 by a support 1024 that removably attaches to the temple 1020.

[00160] FIG. 10C illustrates a temple 1040 for a pair of eyeglasses. The temple 1040 includes a bone conducting element 1042 that can provide audio

sound to a user by coupling vibrations to at least one bone of the user's head. In this embodiment, the bone conducting element 1042 is positioned in the vicinity of the user's ear, such as behind the user's ear. The placement of the bone conducting element 1042 in this embodiment can reduce impact to the design of the eyeglasses.

[00161] In one embodiment, the electrical components associated with a temple arrangement, a temple adapter or a removable temple part is for enhancing the hearing of the person wearing the corresponding pair of glasses. There can be at least a microphone and a speaker in a temple arrangement, a temple adapter or removable temple part. The microphone can be close to an ear of the user when the glasses are worn by the user, and can be a directional microphone. The microphones can be a microphone in a temple adapter, such as the microphone 730 in FIG. 7B, 808 in FIG. 8A, 936 in FIG. 9B, or 976 in FIG. 9D. The microphones can be in a temple arrangement. The microphone in a temple arrangement can be attached to a temple tip, a temple fit-over or a temple cover. The microphones can be positioned to be in front of the user's ears so that the microphones will not be affected by the shadowing effect of the ears. The speaker can be inserted into the ear, as in some of the speakers previously described.

[00162] In another embodiment, there are two sets of microphones and speakers, such as in two temple arrangements, temple adapters or removable temple part. In the vicinity of each ear, there is a temple arrangement, temple adapter or removable temple part with its corresponding microphone and speaker. The microphones again can be directional, one pointing generally outwards in a position close to the left ear, and one pointing generally outwards in a position close to the right ear. Alternatively, the microphones can point forward.

[00163] The microphone and the speaker close to an ear do not have to be in very close proximity to each other, as in many hearing aids existing nowadays. They can be spaced apart by, such as, one to several inches, with the microphone being directional and pointing to the front and to either the left or the right of the user, and with the speaker pointing toward or inserted into the corresponding ear

of the user. Such a distance apart can significantly reduce feedback effect of existing hearing aids. Another advantage of such a hearing enhancement device is that users may not need to be fitted into ears with ear molds. In any case, additional details on hearing enhancement are further described in the related applications that have been incorporated herein by reference, such as U.S. Provisional Patent Application No. 60/620,238, filed October 18, 2004, and entitled "EYEGLASSES WITH HEARING ENHANCED AND OTHER AUDIO SIGNAL-GENERATING CAPABILITIES."

[00164] The various embodiments of the invention noted above, whether temple arrangement, temple adapter or removable temple part, can have a cable or cord attached or attachable thereto. The cable or cord has one or more conductors. The cable or cord can serve to provide electrical signals to or receive electrical signals from the temple arrangement, the temple adapter or removable temple part. In one embodiment, one end of a cable or cord attaches to a temple arrangement, temple adapter or removable temple part (either permanently or via a connector) and the other end of the cable or cord attaches (either permanently or via a connector) to an electronic device. As an example, the electronic device can be an audio output device (e.g., audio player) or a communication device (e.g., mobile telephone). In a first example, the cable or cord could provide a male audio (stereo) connector at one end, and a pair of female audio connectors at the opposite end, each being for use with a different temple. In a second example, the cable or cord could provide a set of connectors, such as a male mini-phone connector (2.5 mm) and a male audio (stereo) connector, at one end, and one or a pair of female phone connectors at the opposite end.

[00165] In one embodiment, the cable or cord can also have a switch coupled thereto so as to permit a user to switch modes. For example, if the temple arrangement, temple adapter or removable temple part provides a speaker and microphone to a pair of eyeglasses, a switch on a cable or cord that connects the temple arrangement or temple adapter to an electronic device could provide different switch positions for different electronic devices or different functional modes of operation of a single electronic device. As an example, if the electronic

device is (or operates as) an audio player, a first switch position could be used. Alternatively, if the electronic device is (or operates as) a mobile telephone, a second switch position could be used. Additional discussion of suitable cables and cords is provided in the related applications that have been incorporated herein by reference.

[00166] Electrical components can form an electronic module. The electronic module can provide radiation monitoring, wireless communication, enhanced hearing, etc. A radiation monitoring system can be partially or fully contained in a temple arrangement, temple adapter or removable temple part associated with a temple of a pair of glasses. Typically, the temple arrangement or temple adapter can be removable from the temple. The removable temple part is obviously removable from a corresponding remaining temple part.

[00167] In another embodiment, an electronic component in a temple arrangement, temple adapter or removable temple part interacts with another electronic component in another part (e.g., frame) of the glasses or in a device tethered to the glasses. For example, a temple of a pair of glasses holds one portion of an electronic circuit. That portion can include generic parts, such as a battery, that are applicable to different applications. Another portion of the electronic circuit is in a temple arrangement, temple adapter or removable temple part. This portion can be application specific, such as an electronic clock without a battery, or a temperature sensor.

[00168] In yet another embodiment, the electrical components can provide audio player capabilities. In such an embodiment, the electrical components can include audio file storage, an audio player and a battery. The electrical components may or may not include wireless communication circuitry.

[00169] Further, in an alternative embodiment, the output of an operation indicator can be audio. The audio output can be from one or more speakers associated with the frame of the eyeglasses. Such audio output can signal the user using natural language, voice synthesis, pre-recorded messages, etc.

[00170] In another embodiment, the electrical components can include a memory module. The memory module provides non-volatile data storage. For example, the memory module can be a portable (or removable) memory device (e.g., memory card). The memory module can, for example, store sensor information (which can be over an extended period of time). Such memory module can be remotely interrogated using wireless communication circuitry, or can be accessed through a wired connection with a tethered device.

[00171] In one embodiment, the electrical connection(s) can alternatively be used to allow information stored in the electrical components to be accessed or queried by a device. For example, when the electrical components include a memory module, the memory module can be accessed to read data (e.g., status information) stored therein.

[00172] As previously noted, the electrical components associated with a temple arrangement, a temple adapter and/or removable temple part can pertain to radiation monitoring circuitry. In such case, the electrical components within the temple arrangement, temple adapter or removable temple part alone or together with eyeglass electrical components can implement a radiation monitoring system. The radiation being monitored can, for example, pertain to one or more of UV, infrared and gamma radiation. In one embodiment, sunlight is considered as a type of radiation. In any case, additional details on radiation monitoring are further described in the related applications that have been incorporated herein by reference.

[00173] Also, the electrical components can pertain to health or fitness monitoring circuitry. In such case, the electrical components within the temple arrangement, the temple adapter removable temple part alone or together with eyeglass electrical components can implement a health or fitness monitoring system. Additional details on health or fitness monitoring are further described in the related applications that have been incorporated herein by reference.

[00174] In yet another embodiment, an electronic component in a temple arrangement, a temple adapter or removable temple part of a frame of eyeglasses

interacts with an electronic component of an apparatus tethered to the eyeglasses to perform an operation. For example, a temple arrangement, a temple adapter removable temple part of a pair of eyeglasses holds one portion of an electronic system, and a tethered apparatus that tethers to the pair of eyeglasses includes another portion of the electronic system.

[00175] Still further, the invention can provide a new approach to marketing accessories, namely, electrical accessories, for eyewear. According to one method for providing temple arrangements, temple adapters and/or removable temple part for use with a pair of glasses, the method can initially provide a plurality of temple arrangements, temple adapters and/or removable temple part for a customer. This enables the customer to browse and select at least one temple arrangement, temple adapter or removable temple part. Each of the temple arrangements, temple adapters or removable temple part can have one or more electrical components at least partially embedded therein, with different temple arrangements, temple adapters or removable temple parts providing different electrical capabilities. Once a temple arrangement, temple adapter or removable temple part has been selected, the selected temple arrangement, temple adapter or removable temple part can be coupled to one of the corresponding temples of the eyewear (e.g., a pair of glasses). In the case where the selected temple arrangement is a temple tip, the selected temple tip is inserted onto (e.g., slid over) an end of the corresponding temple (after removing any previously installed temple tip if there was one). In the case where the selected temple adapter is to be coupled, the selected temple adapter can be attached to the corresponding temple. In the case where the selected removable temple part is to be coupled, the selected removable temple part can be attached to a remaining part (e.g., forward part) of the corresponding temple. Thereafter, the customer can make use of the eyewear with its associated electrical capabilities provided by the temple arrangement, temple adapters or removable temple part.

[00176] In one embodiment, once a temple arrangement, a temple adapter and/or removable temple part is provided to a customer, the customer can test the electrical capabilities of the pair of glasses. If the customer does not like the current

selected temple arrangement, temple adapter or removable temple part, the customer can repeat the process by selecting and testing another temple arrangement, temple adapter or removable temple part. Before providing the eyewear with the temple arrangement, temple adapter or removable temple part, the customer can be required to pay a purchase (or rental) price for at least the temple arrangement, temple adapter or removable temple part. Thereafter, the customer can be permitted to return and replace the temple arrangement, temple adapter or removable temple part with another temple arrangement, temple adapter or removable temple part. Such returns or replacements can be available only for a limited period of time following their purchase.

[00177] Yet still another aspect of the invention relates to eyewear having an extended endpiece so as to facilitate placement of one or more electrical components at the extended endpiece. In one embodiment, a conventional pair of glasses has two endpieces, one on its left and the other on its right side of the frame. For example, the left endpiece is the region of the frame approximately between the left hinge (or joint) and the left lens holder of the frame. Similarly, the right endpiece is the region of the frame approximately between the right hinge (or joint) and the right lens holder of the frame.

[00178] The one or more electrical components at an extended endpiece can operate independently or together with other electrical components provided elsewhere. For example, other electrical components can be provided in other regions of the frame for the eyewear. In another example, the other electrical components can be located in a bridge area of the frame for the eyewear. In such an example, given that the endpiece is extended, the one or more electrical components can be placed at the endpiece and thereby communicate with other electrical components in a front area (e.g., lens holder region or bridge region) or the other endpiece (which can also be extended) without having to communicate through a hinge or connector.

[00179] FIG. 11A illustrates a pair of glasses 1100 according to one embodiment of the invention. The pair of glasses 1100 includes a first lens holder

1102 and a second lens holder 1104. The lens holders 1102 and 1104 are capable of receiving lenses. The lenses can be prescription lenses or non-prescription lenses. The first lens holder 1102 has a first side and a second side. The second lens holder 1104 has a first side and a second side. The pair of glasses 1100 also has a bridge 1106 in between the first lens holder 1102 and the second lens holder 1104. The bridge 1106 is coupled to the second side of the first lens holder 1102 and the first side of the second lens holder 1104. The lens holders 1102 and 1104 and the bridge 1106 can be separate pieces or a single integral piece. The glasses 1100 can also be referred to as eyeglasses.

[00180] The pair of glasses 1100 also includes a first extended endpiece 1112 and a second extended endpiece 1113. In addition, the pair of glasses 1100 includes a pair of temples, namely, a first temple 1108 and a second temple 1110. The first extended endpiece 1112 connects to the first temple 1108 via a joint (or hinge) 1114. The second extended endpiece 1113 connects to the second temple 1110 via a joint (or hinge) 1115. In one embodiment, the extended endpieces 1112 and 1113 are larger as compared to conventional endpieces. As a result, the respective joints (or hinges) 1114 and 1115 are set back from the respective lens holders 1102 and 1104. For example, in one embodiment, the hinge 1115 is set back from the lens holder 1104 by about 1 to 5 centimeters. One advantage of utilizing enlarged (or extended) endpieces 1112 and 1113 as illustrated in FIG. 11A is that electrical components 1116 are able to be comfortably provided in the extended endpieces 1112 and 1113. Moreover, another advantage is that the electrical components 1116 within the extended endpiece 1113 can electrically couple to other electrical components provided within the forward portion or front area of the frame without having to electrically connect through a joint or hinge. As illustrated in FIG. 11A, the extended endpiece 1113 provides electrical components 1116 with at least a portion at an inner surface of the extended endpiece 1113. The electrical components 1116, in this example, include a display 1118 and a plurality of switches 1120 (e.g., buttons). As an example, the electrical components 1116 can, for example, implement an electrical system (e.g., pedometer system, UV monitoring system, or other physical condition monitoring

system, etc.). In the embodiment of the glasses 1100 illustrated in FIG. 11A, the electrical components 1116 are provided in the extended endpiece 1113.

[00181] FIG. 11B illustrates the pair of glasses 1100 according to another embodiment of the invention. More particularly, FIG. 11B illustrates the pair of glasses 1100 illustrated in FIG. 11A where the electrical components 1116 are provided as a module 1122 embedded internal to the extended endpiece 1113. The module 1122 includes a plurality of interconnected electrical components, including the display 1118 and the switches 1120. In addition, the glasses 1100 further include a separate electrical component 1124. As illustrated in FIG. 11B, the separate electrical component 1124 can be provided at the bridge 1106. Still further, a conductive element (e.g., a wire) that electrically connects the module 1122 with the separate electrical component 1124 can be provided internal to the eyeglass frame, such as internal to the lens holder of 1104. The nature of the separate electrical component 1124 can vary depending upon application. In the case in which the module 1122 pertains to a pedometer or health system, the separate electrical component 1124 can pertain to a sensor used to measure the heart rate of the user of the glasses 1100. For additional details on a sensor utilized in this context, see U.S. Provisional Patent Application No. 60/787,850, filed April 1, 2006, and entitled "EYEGLASSES WITH HEART RATE MONITOR," which is hereby incorporated herein by reference. Although not illustrated in FIG. 11B, the extended end piece 1113 can also include a cavity (or opening) and a cover or a door. The module 1122 can be inserted or removed from the cavity by way of the cover or door.

[00182] FIGs. 12A-12E illustrate a side view of eyeglass frames having an extended temples according to several embodiment of the invention. In FIG. 12A, a side view of an eyeglass frame 1200 includes a lens holder (or a region immediately proximate to a lens holder) 1202, an extended endpiece 1204 and a temple 1206. The extended endpiece 1204 includes one or more electrical components 1208 partially or completely internal to the extended endpiece 1204. In this embodiment, the manner by which the temple 1206 connects to the extended endpiece 1204 is not depicted. Hence, the temple 1206 can be integral

with the extended endpiece 1200, can be permanently coupled to the extended endpiece 1204, or can be removably or pivotally coupled to the extended endpiece 1204.

[00183] The side view of an eyeglass frame 1220 illustrated in FIG. 12B is similar to the eyeglass frame 1200 illustrated in FIG. 12A. However, in this embodiment, the temple 1206 is coupled to the extended endpiece 1204 by way of a joint (or hinge) 1210. FIG. 12C illustrates the eyeglass frame 1220 with the temple 1206 being substantially closed with respect to the eyeglass frame 1220. As noted in FIG. 12C, the temple 1206 can rotate (or pivot) with respect to the extended endpiece 1204 by way of the joint (or hinge) 1210. In this embodiment, the temple 1206 is able to be rotated (or pivoted) as in conventional eyewear such that (i) the temples can be closed or folded inwards towards the lens holders when not being worn, which can facilitate storage or (ii) the temples can be extended to an open position or extended outwards away from the lens holders, so that the eyeglasses can be worn. While retaining the traditional notion of the folding temples, the eyeglass frame 1220 causes the joint 1210 to be set back from the lens holder 1202 so that the endpiece is extended, which can facilitate including or storing one or more electoral components within the endpiece.

[00184] The side view of an eyeglass frame 1230 illustrated in FIG. 12D is similar to the eyeglass frame 1200 illustrated in FIG. 12A. However, in this embodiment, the temple 1206 is coupled to the extended endpiece 1204 by a linking temple piece 1232. The linking temple piece 1232 couples to the extended endpiece 1204 by way of a joint (or hinge) 1234. The joint 1234 allows the linking temple piece 1232 to rotate (or pivot) with respect to the extended endpiece 1204. In addition, the linking temple piece 1232 includes a connector 1236 that is capable of receiving a corresponding connector 1238 associated with the temple 1206. In this embodiment, the temple 1206 couples to the linking temple piece 1232 using the connectors 1236 and 1238 which provide physical connection (and optionally also electrical connection). The linking temple piece 1232 in turn can couple to the extended endpiece 1204 by way of the joint (or hinge) 1234. The temple 1206 is

thus easily removable from the linking temple piece 1232 of the eyeglass frame 1230.

[00185] The side view of an eyeglass frame 1240 illustrated in FIG. 12E is similar to the eyeglass frame 1200 illustrated in FIG. 12A. However, in this embodiment, the extended endpiece 1204 includes a first connector 1242, and the temple 1206 includes a corresponding connector 1244. Here, the temple 1206 can be removably connected to the extended endpiece 1204 by way of the connectors 1242 and 1244.

[00186] According to still another embodiment of the invention, temples for eyeglass frames can be not only removable but also piecewise replaceable. In other words, an entire temple can be removed and replaced with respect to an eyeglass frame. In another implementation, a portion of a temple can be removed and replaced with another portion. Allowing temples of eyeglass frames to be removed and replaced facilitates incorporating different electronic modules that are internal to, integral with, or at least partially embedded in the temples (or temple portions) to the changed. Also, the different temple portions can have different design appearances that allow the design of the eyeglasses, namely the temples, to be altered as desired by a user. In other words, the temples or temple portions can be swappable.

[00187] FIG. 13A illustrates a temple 1400 having multiple parts according to one embodiment of the invention. The temple 1400 includes a temple base 1402 that couples to a forward portion 1404 of an eyeglass frame. The forward portion 1404 can, for example, pertain to an endpiece or a portion in the vicinity of a hinge (or joint) of a temple. In addition, the temple 1400 includes a temple tip 1406 (or rearward portion). One end of the temple base 1402 can connect to the forward portion 1404 and the other end of the temple base can connect to the temple tip (or rearward portion) 1406. In one embodiment, the temple base 1402 and the temple tip 1406 of an eyeglass frame can be replaced (individually or in combination) with other temple bases and temple tips. For example, the temple base 1402 and/or the temple tip 1406 could be removed and replaced with another

temple base and/or temple tip having a different functional capability or a different ornamental appearance.

[00188] FIG. 13B illustrates a portion of an eyeglass frame 1420 according to one embodiment of the invention. The portion of the eyeglass frame 1420 is similar to a portion of the eyeglass frames 1200 illustrated in FIG. 12A. One difference is that the temple 1206 now explicitly illustrates a temple base 1422 and a temple tip 1424. The temple base 1422 and the temple tip 1424 can be removed and replaced (individually or in combination) with respect to the eyeglass frame, such as the extended endpiece 1204.

[00189] FIG. 13C illustrates a portion of an eyeglass frame 1340 according to another embodiment of the invention. The portion of the eyeglass frame 1440 is similar to a portion of the eyeglass frame 1200 illustrated in FIG. 12A. However, in FIG. 13C, the portion of the eyeglass frame 1440 includes a temple insert 1442. The temple insert 1442 can include one or more electrical components 1444 internal to, integral with, or at least partially embedded in the temple insert 1442. As illustrated in FIG. 13C, the temple insert 1442 can be provided between the extended endpiece 1204 and the temple 1206 or the rearward portion of the temple. Although not shown in FIG. 13C, the connection between the temple insert 1442 and the extended endpiece 1204 or the temple 1206 can be through use of a joint (or hinge) or by way of connectors as discussed above. In this embodiment, the temple insert 1442 can provide electrical components that can interact with the electrical components 1208 within the extended endpiece 1204 or elsewhere within the eyeglass frame. Hence, a user can optionally include the temple insert 1442 between the temple 1206 and the extended endpiece 1204 to provide additional functionality to the eyeglasses. In one embodiment, when the additional functionalities are not desired, the temple insert 1442 can be removed from the temple configuration, or the one or more electrical components 1444 can be removed from the temple insert 1442.

[00190] Another feature of the wireless eyeglasses that may be provided is one or more electrical connections on the frame of the wireless eyeglasses so as

to facilitate electrical connection with a battery charger. For example, when the power source for the wireless eyeglasses is a rechargeable battery, the ability to charge the battery without removing the battery from the frame (e.g., arm) of the wireless eyeglasses is advantageous. Hence, in one embodiment, the frame of the eyeglasses includes at least one connector or conductive element (e.g., terminal, pin, pad, trace, etc.) so that the electrical coupling between the rechargeable battery and the charger can be achieved. In this regard, the electrical connector or conductive element is provided on the frame of the eyeglasses and electrically connected to the battery. The placement of the electrical connector or conductive element on the frame serves to allow the wireless eyeglasses to be simply placed within a charger and consequently have the electrical connector or conductive element be in electrical contact with a counterpart or corresponding electrical connector or conductive element of the charger.

[00191] In one embodiment, the charger can be considered a docking station, upon which the wireless eyeglasses are docked so that the battery within the wireless eyeglasses is able to be charged. Hence, the frame of the wireless eyeglasses can likewise include an electrical connector or conductive element that facilitates electrical connection to the docking station when docked.

[00192] Power (e.g., external power source) can be coupled to the glasses through a connector. In one embodiment, the power source is embedded inside or inserted into the glasses. Different types of power sources are applicable. For example, the power source can be a battery, a fuel cell, a solar cell, or a re-chargeable battery. The rechargeable battery can be charged through a connector at the glasses.

[00193] In an earlier application, namely, U.S. Provisional Patent Application No. 60/509,631, filed October 9, 2003, and entitled "TETHERED ELECTRICAL COMPONENTS FOR EYEGLASSES," which has been incorporated herein by reference, there can be a base connected to the glasses through a cord. The cord can be just a piece of flexible conductor encapsulated by a flexible insulator. Typically, a cord includes a number of electrical wires or conductors. There can be one or more electrical components in the base, and there can also be one or more

electrical components in the cord. The different types of connectors previously described can be located in the base. In one embodiment, a power source is an electrical component in the base tethered to a pair of glasses. In another embodiment, the glasses are tethered to a base that has a connector. The connector is connected to and draws power from an external electronic device. In this embodiment, electrical components in the glasses draw power from the external electronic devices.

[00194] In yet another embodiment, the power sources are in a base or portable device connected to the glasses through a wire connection, and the power sources can be rechargeable.

[00195] An arm for a frame of a pair of eyeglasses according to one embodiment can further include additional eyeglass electrical components, such as a light source. The light source can, for example, be a Light Emitting Diode (LED). The light source can provide ornamental lighting to the frame or can serve as an indicator light.

[00196] As explained, in a number of embodiments, the glasses include a switch, which typically is at least partially embedded in the glasses.

[00197] Sensor processing can receive sensor information from a sensor. The sensor information is typically associated with the user of the eyeglasses. There can be different types of sensors. The sensors can be considered either eyeglass electrical components or tethered electrical components. For example, the sensor can be a temperature sensor configured to sense the temperature of the user. The sensor can be a humidity sensor configured to sense how much the user has been perspiring. The sensor can sense whether at least one of the user's eyes is open or not. The sensor can sense if the user is crying. The sensor can sense the direction the user is looking. In a general sense, the sensor information can, for example, pertain to physical and/or emotional conditions of the user.

[00198] In another embodiment, another type of sensor is a condition sensor. The condition sensor can sense the conditions of the user of the glasses. Examples of physical sensors include sensing one or more of distance traveled,

location, speed, calories consumed, temperature and vital signs associated with the user of the glasses. The distance traveled could represent the horizontal distance traveled or the vertical distance (i.e. elevation) traveled. The speed can be the rate of movement along the horizontal distance traveled and/or the vertical distance. In yet another embodiment, the condition sensor can sense the emotional conditions of the user of the glasses.

[00199] One advantage of cell phones is that you can make calls anywhere you can get a signal. However, one disadvantage is that you might be making a call in a noisy environment. In one embodiment, the glasses also include electrical components for noise cancellation. Such noise cancellation functionalities can be activated during a phone conversation.

[00200] In one approach, noise cancellation is achieved through a first and a second directional microphones. The first one points at the user's mouth, and the second one points away. For example, the first one can be at one of the hinges, whose directionality favors sound arriving from the user. There can also be a tube from the first microphone to or towards the mouth of the user, to guide the sound from the mouth to the microphone. The second microphone can be in the vicinity of the other hinge, whose directionality favors sound arriving in front of or outside of the user. Signals received from the second microphone are subtracted from signals received from the first microphone before the audio signals are further processed for transmission as the message from the user.

[00201] In yet another embodiment of power management, the amplification of the glasses on at least a range of frequencies depends on the ambient power level, or the noise level of the environment of the glasses. One approach to measure the noise level is to measure the average SPL at gaps of the audio signals. For example, a person asks the user the following question, "Have you left your heart in San Francisco?" Typically, there are gaps between every two words or between sentences or phrases. The glasses measure, for example, the root mean square ("rms") value of the power in each of the gaps, and can calculate another average among all of the rms values to determine the noise level. In one

embodiment, the glasses increase the amplification so as to ensure that the average power of the output audio signals by its speaker(s) is higher than the noise level by a certain degree. For example, the average SPL of the output audio signals from the glasses is 20 dB above the noise level.

[00202] In another embodiment, if the average power level of the environment or the ambient noise level is higher than a preset threshold value, signal amplification is reduced. This average power level can include all the audio signals received by, such as the microphone(s) of the glasses. The rationale is that if the environment is very noisy, it would be difficult for the user to hear the audio signals from the other person anyway. As a result, the glasses should not keep on amplifying the audio signals independent of the environment. To illustrate, if the average power level of the environment is more than 75 dB, hearing enhancement amplification is reduced, such as to 0 dB.

[00203] A number of embodiments have been described involving a speaker in an eyemask or a night cap. In one embodiment, the audio output from the speaker can serve to cancel the environmental sounds in the vicinity of the user. For example, if the user is on an airplane, the surrounding environmental sound has a relatively high level of white noise. This white noise can be detected by a pickup device and cancelled by noise cancellation circuitry provided within the eyemask or night cap. Namely, the audio output from the speaker serves to cancel the white noise of the user's environment. In another embodiment, the electrical component embedded or partially embedded is not a speaker, but can be a sensor, which can sense a physiological function of the user.

[00204] Electrical components within the temple arrangement or temple adapter alone or together with eyeglass electrical components can implement a radiation monitoring system. The radiation being monitored can, for example, pertain to one or more of UV, infrared and gamma radiation. In one embodiment, sunlight is considered as a type of radiation. In any case, additional details on radiation monitoring are further described in the related applications that have been incorporated herein by reference.

[00205] Eyewear can include one or more auxiliary sensors. One another type of auxiliary sensor is a physical sensor. The physical sensor can sense physical conditions of the user of the glasses. Examples of physical sensors include sensing one or more of location, temperature, alertness, and vital signs (e.g., heart rate, blood pressure, etc.) associated with the user of the glasses. Still other physical sensors can sense emotions of the user. For example, the physical sensor could sense whether the user is calm, excited, happy, sad, angry, etc. In one embodiment, the physical sensor can also more generally sense user activity level. As an example, the user activity level can be used to provide a lifestyle indication. For example, a lifestyle indication might show that the user was active today or, alternatively, lazy today. Such a lifestyle indication can be displayed as a text or graphic symbol to let the user or others aware of the activity level.

[00206] The activity monitoring system can also include one or more switches with the eyewear. The switches can, for example, facilitate user input or control with respect to the activity monitoring system. For example, the switches can provide one or more of on/off, reset, on, on (and reset), and calibration. The activity monitoring system can also provide a user with an indication of whether the system is currently on or off, such as by a graphical image on a display device or by a LED. The one or more switches can also be used to change operational settings, such as threshold levels, output type, user preferences, user physical characteristics (e.g., stride, weight), operational mode, or activation/deactivation of auxiliary sensors, if any.

[00207] The activity monitoring system can have a “being-worn” switch. In one embodiment, the “being-worn” switch enables the activity monitoring system to automatically determine when to monitor activity and when not to monitor activity. In particular, the activity can be monitored when an eyeglass frame having the activity monitoring system is “being-worn” and not when the eyeglass frame is not “being-worn.” The “being-worn” switch can be positioned in the temple portion with the other components of the activity monitoring system. In one embodiment, the activity monitoring system is provided, as a module as noted above, and which further includes a switch. The switch can, for example, be a “being worn” switch.

By having the switch integral with the module, the manufacture and assembly of the end-product having the activity monitoring system can be simplified. As examples, the "being-worn" switch can be an optical, magnetic or mechanical switching device.

[00208] The "being-worn" switch can make use of the situation that the temples are in an open position when the eyeglass frame is being worn, and in a closed position when not being worn. In one embodiment, the "being-worn" switch can be positioned at a temple proximate to a region that couples the temple to its corresponding lens holder. For example, the activity monitoring system (e.g., module) can be provided within the temple region near the end of the temple so that the "being worn" switch is adjacent the lens portion of the eyeglass frame.

[00209] The "being worn" switch can also be used by a user to signal the activity monitoring system to provide its output at an output device, such as a display device. For example, when the "being worn" switch is initially closed (i.e., being worn), the activity monitoring system can output its text or graphical output to the display device. Typically, the displayed output would be displayed only for a limited period of time (e.g., 10 seconds). Such an approach is typically more power efficient, yet permits the user to obtain the output information when desired. Alternatively, another switch (e.g., dedicated output switch) could be used to cause the output to be displayed for a limited period of time or while the switch is depressed.

[00210] In one embodiment, the eyewear (such as one including the activity monitoring system) can further include one or more auxiliary sensors. FIG. 14 is a chart 1500 that depicts examples of auxiliary sensors that can be utilized with the eyewear.

[00211] The chart 1500 indicates that one type of auxiliary sensor is a "being worn" sensor. The "being worn" sensor would indicate whether the glasses are being worn by its user. The "being worn" sensing mechanism can be performed using, for example, a thermal sensor, a motion detector, a stress sensor or a switch.

[00212] In one embodiment, a motion detector is used as a "being worn" sensor. A threshold can be set, such that if the amount of motion detected exceeds the threshold, the eyewear is assumed to be worn. The motion detector can, for example, be achieved by a mechanical means or an accelerometer.

[00213] In another embodiment, the "being worn" sensor includes one or more thermal sensors. In the case where two sensors are used, one sensor can be at approximately the middle of a temple, such as in a region that would receive heat from the head of the user wearing the glasses, and the other sensor can be positioned at the end of the same temple close to the hinge. If the temperature differential between the two sensors is beyond a certain preset value, the eyewear would be assumed to be worn.

[00214] In yet another embodiment, the "being worn" sensor includes a stress sensor at the hinge of the temple. The assumption is that when the eyewear is worn, the hinge is typically slightly stretched because typically the width of the head of the user can be slightly wider than the width between the temples when the two temples are in the extended positions. If the value of the stress sensor is beyond a certain preset value, the glasses would be assumed to be worn.

[00215] In still yet another embodiment, the "being worn" sensor can be implemented as a switch. For example, the switch can utilize optical, magnetic or mechanical means. In one embodiment, the switch can be positioned at the temple of the eyewear, such as a forward end of the temple proximate to a corresponding lens holder. Different embodiments of such sensors is also described in U.S. Provisional Patent Application No. 60/583,169, filed June 26, 2004, entitled "ELECTRICAL COMPONENTS FOR USE WITH EYEWEAR, AND METHODS THEREFOR," which has been incorporated herein by reference, see, e.g., section entitled "EYEGLASSES WITH USER INPUT CAPABILITY."

[00216] Another type of auxiliary sensor is an environmental sensor. The environmental sensor can sense environmental conditions, such as one or more of temperature (e.g., ambient temperature), pressure, humidity and toxins (e.g., chemicals, radiation, etc.).

[00217] Still another type of auxiliary sensor is a physical sensor. The physical sensor can sense physical conditions of the user of the glasses. Examples of physical sensors include sensing one or more of location, temperature, alertness, and vital signs (e.g., heart rate, blood pressure, etc.) associated with the user of the glasses. Still other physical sensors can sense emotions of the user. For example, the physical sensor could sense whether the user is calm, excited, happy, sad, angry, etc. In one embodiment, the physical sensor can also more generally sense user activity level. As an example, the user activity level can be used to provide a lifestyle indication. For example, a lifestyle indication might show that the user was active today or, alternatively, lazy today. Such a lifestyle indication can be displayed as a text or graphic symbol to let the user or others aware of the activity level.

[00218] In one embodiment, one particular type of physical sensor is a heart-beat sensor. The heart-beat sensor measures the heart beat of the wearer of the eyewear. One implementation for the heart-beat sensor utilizes an infrared emitter and an infrared detector as components. The infrared emitter can be an infrared LED and the infrared detector can be an infrared photodiode (or a non-infrared photodiode with a separate infrared filter). The components can be located at a temple of the eyewear, with both the emitter and the detector facing the user when the eyewear is worn. In operation, the infrared emitter shines infrared radiation towards the user, and the detector captures the infrared signals reflected back by the skin of the user. The magnitude of the reflected signals depends on the amount of blood flowing below the skin, which, in turn, depends on (i.e., fluctuates with) the heart beat. The rate of emission by the emitter and reception by the detector can be modulated (e.g., amplitude modulate) in a frequency range much higher than the heart beat, such as three Kilohertz. And the signals from the detector can be low-pass filtered before they are measured to identify the heart beat of the user. For example, the low-pass filter can have a cutoff frequency at about 1 Hertz (Hz).

[00219] It should be understood that the sensors might rely on more than one measured criteria. The one or more measured criteria might be used to determine

the sensor output. The determination of the sensor output can involve estimation or prediction.

[00220] The auxiliary sensors can be provided in a redundant or fault-tolerant manner. For example, sensors can be provided in pairs. When one sensor of a pair malfunctions, the other one can replace it. In another embodiment, any of the auxiliary sensor information can be processed in a differential manner to examine changes to the auxiliary sensor information. The auxiliary sensors can by powered by a battery, solar energy, or kinetic energy. For reduced power consumption, the auxiliary sensors can remain in a low-power state unless data is being acquired by the auxiliary sensors. In yet another embodiment, two or more of the auxiliary sensors can communicate with one another (wired or wirelessly) to exchange data or control information.

[00221] In general, the auxiliary sensors can be fully or partially embedded in the eyewear or a base tethered to the eyewear. Alternatively, one or more of the auxiliary sensors can be separate from the eyewear, or any base tethered thereto, and wirelessly communicate with the eyewear or base.

[00222] FIG. 15 shows some of the electrical components for a player 1600 in a glasses according to an embodiment of the invention. The player includes a speaker 1602, a data bus 1604 to facilitate data transfer among, for example, a processor 1606, a storage device 1608, and a coder/decoder (CODEC) 1610. The processor 1606, which can be a microprocessor or controller, controls the operation of the player 1600. The storage device 1608 stores the information, which can be different types of appropriately-formatted media data. In one example, the information is digitally encoded audio signals. The storage device 1608 can include a number of separate storage elements. For example, the device can be a flash memory device, or a minidisk device, and a cache, which can improve the access time and reduce power consumption of the storage device 1608. The storage device 1608 typically also includes a Read-Only Memory (ROM), which stores programs, utilities or processes to be executed in a non-volatile manner. The player 1600 can also include a RAM, such as for the cache.

[00223] Once a piece of information is selected to be played, the processor 1606 would supply the piece of information to the CODEC 1610, which decompresses the media data and produces analog output signals for the speaker 1602. In one embodiment, the bus 1604 is also coupled to an input/output device 1612, which would allow information to be downloaded from an instrument to the glasses.

[00224] There are different approaches to identify a piece of information to be played. In one embodiment, different pieces of information in the storage device 1608 can be categorized, and the categorization can be hierarchical, with multiple levels in the hierarchy. To illustrate, assume that there are three levels. The top level can be the name of the football team; the second level can be the names of the players on the team, and the third level can be scoring statistics or other attributes of the players. The entries, such as the name of the players, can be abbreviated. There can be a control knob or switch to allow the user to scroll down entries in a level. By pushing the knob, the user selects an entry, which can lead the user to the next level. There can be an entry for moving up a level also. In one embodiment, once an entry is selected, the identity of that entry will be announced. For example, a selected entry is about the statistics of Joe Smith. Once that entry is selected, the speaker will state, "Joe Smith statistics." If that is the one the user wants, the user can signal his preference by, for example, pushing a switch.

[00225] In another embodiment, the information can be searched. The search can be based on one or more key words. As an example, the information is related to songs. A user can search by the name of the song, the name of the artists or music genre. Entry for the search term can be through voice recognition applications in the glasses. Based on the term verbalized by the user, a song will be selected. The glasses can ask the user if that is the song the user has selected. If the response is positive, the song will be played. If not, the glasses will ask the user to verbalize the term again. In another embodiment, entering the search terms is through the key pad of a portable device, wired or wirelessly, coupled to

the glasses. Additional descriptions regarding having a portable device linked to a pair of glasses are further discussed below.

[00226] With the speaker relatively close to at least one ear of the user, the volume of the speaker does not have to be very high. In one embodiment, the volume of the speaker is limited, such as the maximum sound level is not more than 60 dB. If the glasses are powered by a battery, limiting the volume of the speaker would extend the lifetime of the battery. Such a limit can also reduce the chance of the speaker generating audio signals that might disturb people in the vicinity of the user. This, in turn, helps to provide information to the user in a relatively private manner.

[00227] In one embodiment, the glasses are powered by a battery. To extend its lifetime, the glasses include a timer. For example, if the glasses have a radio, after the radio is turned on for a preset amount of time, the timer will turn the radio off automatically. In another embodiment, the glasses include a speaker and the timer would turn the speaker off after the speaker has been turned on for a preset amount of time. The preset time can be determined by the timer.

[00228] In another embodiment, the glasses are powered by other types of sources, such as a solar cell or a fuel cell. Such other type of sources can be at one of temples of the glasses.

[00229] As explained, in a number of embodiments, the glasses include a switch, which typically is at least partially embedded in the glasses. For example, the switch can be used to turn the speaker on, or to tune the frequency of a radio. If the glasses have two speakers, such as one on each of the temples, there can be two switches, one on each temple to control the corresponding speaker. The two speakers can be for generating stereo audio signals for the user. There can also be one control switch for both speakers.

[00230] The switch in the glasses can have different attributes. It can be activated by different type of forces, including mechanical, radiation, magnetic, electrical, and temperature. The switch can also be activated remotely by a remote device. The switch can be based on one or more detectors. The switch can have

different degrees or ranges of control, such as binary, multiple discrete steps or incremental control. The switch can be placed at different position on the glasses, such as on the side or top surface of a temple or at a joint. The control can take perception into consideration, such as based on texture, height and lateral position of multiple switches.

[00231] FIG. 16 illustrates a number of forces 1650 activating the switch according to different embodiments of the invention. They can be based on, for example, mechanical 1652, radiation 1654, magnetic 1656, electrical 1658, and temperature 1660.

[00232] FIG. 17 illustrates a number of mechanical forces 1652 activating the switch according to different embodiments of the invention. The mechanical switch or sensor can be a conductive-elastomer switch 1702, a membrane switch 1704, a dome switch 1706, a relatively simple wire switch 1708, and a roller switch 1710, such as a switch including a wheel. Another type of mechanical force can be based on stress 1711, such as a switch based on piezoelectric force or a piezoelectric device.

[00233] In yet another embodiment, the mechanical switch is made so that the electrical circuitry in the glasses can be activated but not deactivated by the user. In other words, once activated, the switch is designed not to be deactivated by the user, and the circuit will remain on till the power source inside the glasses is depleted. One approach to implement such a switch is based on a piece of insulating material 1716 between a terminal of, for example, a battery and its contact with the circuit embedded in the glasses. When the battery is installed, at least one of its terminals is separated from its circuit contact. There can be a thin, flexible, insulating material, 1716, such as a ribbon, positioned between the terminal and the contact. Though the circuit is embedded in the glasses, the insulating material 1716 extends outwardly from inside the glasses through a hole, such as a small hole, in the side wall of, for example, a temple of the glasses. In one embodiment, the hole or slot is located above or below the terminal and the contact, or the hole is not directly inline with the terminal and the contact. By pulling