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Application Number: 18519802 Document Date: 11/27/2023

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Form Revision Date: March 1, 2019

PTO/AIA/96 (08-12)
Approved for use through 01/31/2013. OMB 0651-0031
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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: Filed Herewith

Titled: HEAD-WORN DEVICE WITH CONNECTION REGION

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 021438, Frame 0402, 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 032263, Frame 0874, 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
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4. From: Smart iGlasses, LLC To: IngenioSpec, LLC

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5. From: _____ To: _____

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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.

/Peter P. Tong/	November 27, 2023
Signature	Date
Peter P. Tong	35757
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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: HOWELL et al.	Attorney Docket No.: IPVCP006X1C10D1C1
Application No.: Not Yet Assigned	Examiner: Not Yet Assigned
Filed: Herewith	Group: Not Yet Assigned
Title: HEAD-WORN DEVICE WITH CONNECTION REGION	

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. 18/224,793. 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. IPVCP006X1C10D1C1).

Respectfully submitted,

/Peter P. Tong/

Peter P. Tong
Registration No. 35,757

4010 Moorpark Avenue
Suite 211
San Jose, CA 95117

Form 1449 (Modified)	Atty. Docket No.	IPVCP006X1C10D1C1
	Application No.:	Not Yet Assigned
Information Disclosure Statement By Applicant	Applicant	HOWELL et al.
	Filing Date	Filed Herewith
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	1.	2001/0005230 A1	Jun-01	Ishikawa			
	2.	2001/0028309 A1	Oct-01	Torch			
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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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	148.	2015/0338677 A1	Nov-15	Block				
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	165.	2019/0117121 A1	Apr-19	Kutina et al.				
	166.	2019/0187492 A1	Jun-19	Howell et al.				
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	173.	2019/0378493 A1	Dec-19	KIM et al.			
	174.	2019/0387351 A1	Dec-19	Lyren et al.			
	175.	2020/0012127 A1	Jan-20	Howell et al.			
	176.	2020/0218094 A1	Jul-20	Howell et al.			
	177.	2020/0364992 A1	Nov-20	Howell et al.			
	178.	2021/0000347 A1	Jan-21	Stump			
	179.	2021/0026146 A1	Jan-21	Harder et al.			
	180.	2021/0271116 A1	Sep-21	Chao et al.			
	181.	2021/0364827 A9	Nov-21	Howell et al.			
	182.	2021/0364828 A1	Nov-21	Howell et al.			
	183.	2021/0379425 A1	Dec-21	Tran			
	184.	2021/0399691 A1	Dec-21	SAMINATHAN et al.			
	185.	2022/0008763 A1	Jan-22	SALEH et al.			
	186.	2022/0011603 A1	Jan-22	Howell et al.			
	187.	2022/0034542 A1	Feb-22	Peters et al.			
	188.	2022/0054092 A1	Feb-22	Howell et al.			
	189.	2022/0178743 A1	Jun-22	Howell et al.			
	190.	2022/0260859 A1	Aug-22	Howell et al.			
	191.	2022/0335792 A1	Oct-22	Howell et al.			
	192.	2022/0357599 A1	Nov-22	Howell et al.			
	193.	2022/0415338 A1	Dec-22	Howell et al.			
	194.	2023/0017635 A1	Jan-23	Howell et al.			
	195.	2023/0033660 A1	Feb-23	Howell et al.			
	196.	2023/0057654 A1	Feb-23	Howell et al.			
	197.	2023/0236444 A1	Jul-23	Howell et al.			
	198.	2023/0273464 A1	Aug-23	Howell et al.			
	199.	2023/0359266 A1	Nov-23	Howell et al.			
	200.	320,558	Jun-1885	Hull			
	201.	669,949	Mar-1901	Underwood			

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	202.	1,255,265	Feb-1918	Zachara			
	203.	1,917,745	Jul-33	Weiss			
	204.	2,249,572	Jul-41	Lieber			
	205.	2,638,532	May-53	Brady			
	206.	2,725,462	Nov-55	Vorgang			
	207.	2,794,085	May-57	De Angelis			
	208.	2,818,511	Dec-57	Ullery et al.			
	209.	2,830,132	Apr-58	Borg			
	210.	2,874,230	Feb-59	Carlson			
	211.	2,904,670	Sep-59	Calmes			
	212.	3,060,308	Oct-62	Fortuna			
	213.	3,104,290	Sep-63	Rosemond et al.			
	214.	3,119,903	Jan-64	Rosemond et al.			
	215.	3,597,054	Aug-71	Winter			
	216.	3,710,115	Jan-73	Jubb			
	217.	3,858,001	Dec-74	Bonne			
	218.	3,883,701	May-75	Delorenzo			
	219.	4,165,487	Aug-79	Corderman			
	220.	4,254,451	Mar-81	Cochran, Jr.			
	221.	4,283,127	Aug-81	Rosenwinkel et al.			
	222.	4,322,585	Mar-82	Liautaud			
	223.	4,348,664	Sep-82	Boschetti et al.			
	224.	4,389,217	Jun-83	Baughman et al.			
	225.	4,526,473	Jul-85	Zahn, III			
	226.	4,535,244	Aug-85	Burnham			
	227.	4,608,492	Aug-86	Burnham			
	228.	4,683,587	Jul-87	Silverman			
	229.	4,751,691	Jun-88	Perera			
	230.	4,757,714	Jul-88	Purdy et al.			

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	231.	4,773,095	Sep-88	Zwicker et al.			
	232.	4,806,011	Feb-89	Bettinger			
	233.	4,822,160	April-89	Tsai			
	234.	4,822,161	Apr-89	Jimmy			
	235.	4,851,686	Jul-89	Pearson			
	236.	4,856,086	Aug-89	McCullough			
	237.	4,859,047	Aug-89	Badewitz			
	238.	4,882,769	Nov-89	Gallimore			
	239.	4,904,078	Feb-90	Gorike			
	240.	4,942,629	Jul-90	Stadlmann			
	241.	4,962,469	Oct-90	Ono et al.			
	242.	4,967,268	Oct-90	Lipton et al.			
	243.	4,985,632	Jan-91	Bianco et al.			
	244.	5,008,548	Apr-91	Gat			
	245.	5,015,086	May-91	Okaue et al.			
	246.	5,020,150	May-91	Shannon			
	247.	5,026,151	Jun-91	Waltuck et al.			
	248.	5,036,311	Jul-91	Moran et al.			
	249.	5,050,150	Sep-91	Ikeda			
	250.	5,064,410	Nov-91	Frenkel et al.			
	251.	5,093,576	Mar-92	Edmond et al.			
	252.	5,106,179	Apr-92	Kamaya et al.			
	253.	5,144,344	Sep-92	Takahashi et al.			
	254.	5,148,023	Sep-92	Hayashi et al.			
	255.	5,151,600	Sep-92	Black			
	256.	5,161,250	Nov-92	Ianna et al			
	257.	5,172,256	Dec-92	Sethofer et al.			
	258.	5,264,877	Nov-93	Hussey			
	259.	5,306,917	Apr-94	Black et al.			

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	260.	5,353,378	Oct-94	Hoffman et al.				
	261.	5,359,370	Oct-94	Mugnier				
	262.	5,359,444	Oct-94	Piosenka et al.				
	263.	5,367,345	Nov-94	da Silva				
	264.	5,379,464	Jan-95	Schleger et al.				
	265.	5,382,986	Jan-95	Black et al.				
	266.	5,394,005	Feb-95	Brown et al.				
	267.	5,452,026	Sep-95	Marcy, III				
	268.	5,452,480	Sep-95	Ryden				
	269.	5,455,637	Oct-95	Kallman et al.				
	270.	5,455,640	Oct-95	Gertsikov				
	271.	5,457,751	Oct-95	Such				
	272.	5,463,428	Oct-95	Lipton et al.				
	273.	5,475,798	Dec-95	Handlos				
	274.	5,500,532	Mar-96	Kozicki				
	275.	5,510,961	Apr-96	Peng				
	276.	5,513,384	Apr-96	Brennan et al.				
	277.	5,519,781	May-96	Kurkurudza				
	278.	5,533,130	Jul-96	Staton				
	279.	5,541,641	Jul-96	Shimada				
	280.	5,581,090	Dec-96	Goudjil				
	281.	5,585,871	Dec.-96	Linden				
	282.	5,589,398	Dec-96	Krause et al.				
	283.	5,590,417	Dec-96	Rydbeck				
	284.	5,606,743	Feb-97	Vogt et al.				
	285.	5,608,808	Mar-97	da Silva				
	286.	5,634,201	May-97	Mooring				
	287.	5,671,035	Sep-97	Barnes				
	288.	5,686,727	Nov-97	Reenstra et al.				

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	289.	5,694,475	Dec-97	Boyden			
	290.	5,715,323	Feb-98	Walker			
	291.	5,737,436	Apr-98	Boyden et al.			
	292.	5,777,715	Jul-98	Kruegle et al.			
	293.	5,818,381	Oct-98	Williams			
	294.	5,819,183	Oct-98	Voroba et al.			
	295.	5,835,185	Nov-98	Kallman et al.			
	296.	5,900,720	May-99	Kallman et al.			
	297.	5,903,395	May-99	Rallison et al.			
	298.	5,923,398	Jul-99	Goldman			
	299.	5,941,837	Aug-99	Amano et al.			
	300.	5,946,071	Aug-99	Feldman			
	301.	5,949,516	Sep-99	McCurdy			
	302.	5,966,746	Oct-99	Reedy et al.			
	303.	5,980,037	Nov-99	Conway			
	304.	5,988,812	Nov-99	Wingate			
	305.	5,991,085	Nov-99	Rallison et al.			
	306.	5,992,996	Nov-99	Sawyer			
	307.	5,995,592	Nov-99	Shirai et al.			
	308.	6,091,546	Jul-00	Spitzer			
	309.	6,010,216	Jan-00	Jesiek			
	310.	6,013,919	Jan-00	Schneider et al.			
	311.	6,028,627	Feb-00	Helmsderfer			
	312.	6,046,455	Apr-00	Ribi et al.			
	313.	6,060,321	May-00	Hovorka			
	314.	6,061,580	May-00	Altschul et al.			
	315.	6,091,546	Jul-00	Spitzer			
	316.	6,091,832	Jul-00	Shurman et al.			
	317.	6,115,177	Sep-00	Vossler			

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	318.	6,132,681	Oct-00	Faran et al.			
	319.	6,145,983	Nov-00	Schiffer			
	320.	6,154,552	Nov-00	Koroljow et al.			
	321.	6,176,576 B1	Jan-01	Green et al.			
	322.	6,225,897 B1	May-01	Doyle et al.			
	323.	6,231,181 B1	May-01	Swab			
	324.	6,236,969 B1	May-01	Ruppert et al.			
	325.	6,243,578 B1	Jun-01	Koike			
	326.	6,259,367 B1	Jul-01	Klein			
	327.	6,270,466 B1	Aug-01	Weinstein et al.			
	328.	6,292,213 B1	Sep-01	Jones			
	329.	6,292,685 B1	Sep-01	Pompei			
	330.	6,301,050 B1	Oct-01	DeLeon			
	331.	6,301,367 B1	Oct-01	Boyden et al.			
	332.	6,307,526 B1	Oct-01	Mann			
	333.	6,311,155 B1	Oct-01	Vaudrey et al.			
	334.	6,343,858 B1	Feb-02	Zelman			
	335.	6,346,929 B1	Feb-02	Fukushima et al.			
	336.	6,349,001 B1	Feb-02	Spitzer			
	337.	6,349,422 B1	Feb-02	Schleger et al.			
	338.	6,409,335 B1	Jun-02	Lipawsky			
	339.	6,409,338 B1	Jun-02	Jewell			
	340.	6,426,719 B1	Jul-02	Nagareda et al.			
	341.	6,431,705 B1	Aug-02	Linden			
	342.	6,474,816 B2	Nov-02	Butler et al.			
	343.	6,478,736 B1	Nov-02	Mault			
	344.	6,506,142 B2	Jan-03	Itoh et al.			
	345.	6,511,175 B2	Jan-03	Hay et al.			
	346.	6,513,532 B2	Feb-03	Mault et al.			

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	347.	6,517,203 B1	Feb-03	Blum et al.			
	348.	6,539,336 B1	Mar-03	Vock et al.			
	349.	6,542,081 B2	Apr-03	Torch			
	350.	6,546,101 B1	Apr-03	Murray et al.			
	351.	6,554,763 B1	Apr-03	Amano et al.			
	352.	6,582,075 B1	Jun-03	Swab et al.			
	353.	6,619,799 B1	Sep-03	Blum et al.			
	354.	6,629,076 B1	Sep-03	Haken			
	355.	6,678,381 B1	Jan-04	Manabe			
	356.	6,717,737 B1	Apr-04	Haglund			
	357.	6,729,726 B2	May-04	Miller et al.			
	358.	6,736,759 B1	May-04	Stubbs et al.			
	359.	6,764,194 B1	Jul-04	Cooper			
	360.	6,769,767 B2	Aug-04	Swab et al.			
	361.	6,771,423 B2	Aug-04	Geist			
	362.	6,788,309 B1	Sep-04	Swan et al.			
	363.	6,792,401 B1	Sep-04	Nigro et al.			
	364.	6,816,314 B2	Nov-04	Shimizu et al.			
	365.	6,824,265 B1	Nov-04	Harper			
	366.	6,857,741 B2	Feb-05	Blum et al.			
	367.	6,871,951 B2	Mar-05	Blum et al.			
	368.	6,879,930 B2	Apr-05	Sinclair et al.			
	369.	6,912,386 B1	Jun-05	Himberg et al.			
	370.	6,929,365 B2	Aug-05	Swab et al.			
	371.	6,932,090 B1	Aug-05	Reschke et al.			
	372.	6,947,219 B1	Sep-05	Ou			
	373.	7,004,582 B2	Feb-06	Jannard et al.			
	374.	7,013,009 B2	Mar-06	Warren			
	375.	7,023,594 B2	Apr-06	Blum et al.			

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	376.	7,030,902 B2	Apr-06	Jacobs			
	377.	7,031,667 B2	Apr-06	Horiguchi			
	378.	7,033,025 B2	Apr-06	Winterbotham			
	379.	7,059,717 B2	Jun-06	Bloch			
	380.	7,073,905 B2	Jul-06	Da Pra'			
	381.	7,079,876 B2	Jul-06	Levy			
	382.	7,123,215 B2	Oct-06	Nakada			
	383.	7,192,136 B2	Mar-07	Howell et al.			
	384.	7,255,437 B2	Aug-07	Howell et al.			
	385.	7,265,358 B2	Sep-07	Fontaine			
	386.	7,274,292 B2	Sep-07	Velhal et al.			
	387.	7,289,767 B2	Oct-07	Lai			
	388.	7,312,699 B2	Dec-07	Chornenky			
	389.	7,331,666 B2	Feb-08	Swab et al.			
	390.	7,376,238 B1	May-08	Rivas et al.			
	391.	7,380,936 B2	Jun-08	Howell et al.			
	392.	7,401,918 B2	Jul-08	Howell et al.			
	393.	7,405,801 B2	Jul-08	Jacobs			
	394.	7,429,965 B2	Sep-08	Weiner			
	395.	7,438,409 B2	Oct-08	Jordan			
	396.	7,438,410 B1	Oct-08	Howell et al.			
	397.	7,445,332 B2	Nov-08	Jannard et al.			
	398.	7,481,531 B2	Jan-09	Howell et al.			
	399.	7,500,746 B2	Mar-09	Howell et al.			
	400.	7,500,747 B2	Mar-09	Howell et al.			
	401.	7,512,414 B2	Mar-09	Jannard et al.			
	402.	7,517,083 B2	Apr-09	Blum et al.			
	403.	7,527,374 B2	May-09	Chou			
	404.	7,543,934 B2	Jun-09	Howell et al.			

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	405.	7,581,833 B2	Sep-09	Howell et al.			
	406.	7,621,634 B2	Nov-09	Howell et al.			
	407.	7,648,236 B1	Jan-10	Dobson			
	408.	7,677,723 B2	Mar-10	Howell et al.			
	409.	7,760,898 B2	Jul-10	Howell et al.			
	410.	7,771,046 B2	Aug-10	Howell et al.			
	411.	7,792,552 B2	Sep-10	Thomas et al.			
	412.	7,801,570 B2	Sep-10	Cheung et al.			
	413.	7,806,525 B2	Oct-10	Howell et al.			
	414.	7,922,321 B2	Apr-11	Howell et al.			
	415.	7,976,159 B2	Jul-11	Jacobs et al.			
	416.	8,109,629 B2	Feb-12	Howell et al.			
	417.	8,142,015 B2	Mar-12	Paolino			
	418.	8,174,569 B2	May-12	Tanijiri et al.			
	419.	8,337,013 B2	Dec-12	Howell et al.			
	420.	8,430,507 B2	Apr-13	Howell et al.			
	421.	8,434,863 B2	May-13	Howell et al.			
	422.	8,465,151 B2	Jun-13	Howell et al.			
	423.	8,485,661 B2	Jul-13	Yoo et al.			
	424.	8,500,271 B2	Aug-13	Howell et al.			
	425.	8,582,789 B2	Nov-13	Cheung et al.			
	426.	8,770,742 B2	Jul-14	Howell et al.			
	427.	8,849,185 B2	Sep-14	Cheung et al.			
	428.	8,905,542 B2	Dec-14	Howell et al.			
	429.	9,033,493 B2	May-15	Howell et al.			
	430.	9,244,292 B2	Jan-16	Swab et al.			
	431.	9,400,390 B2	Jul-16	Osterhout et al.			
	432.	9,405,135 B2	Aug-16	Sweis et al.			
	433.	9,488,520 B2	Nov-16	Howell et al.			

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	434.	9,547,184 B2	Jan-17	Howell et al.				
	435.	9,690,121 B2	Jun-17	Howell et al.				
	436.	9,922,236 B2	Mar-18	Moore et al.				
	437.	10,042,186 B2	Aug-18	Chao et al.				
	438.	10,060,790 B2	Aug-18	Howell et al.				
	439.	10,061,144 B2	Aug-18	Howell et al.				
	440.	10,310,296 B2	Jun-19	Howell et al.				
	441.	10,345,625 B2	Jul-19	Howell et al.				
	442.	10,359,311 B2	Jul-19	Howell et al.				
	443.	10,515,623 B1	Dec-19	Grizzel				
	444.	10,539,459 B2	Jan-20	Howell et al.				
	445.	10,624,790 B2	Apr-20	Chao et al.				
	446.	10,571,715 B2	Feb-20	Rizzo, III et al.				
	447.	10,777,048 B2	Sep-20	Howell et al.				
	448.	10,802,582 B1	Oct-20	Clements				
	449.	10,964,190 B2	Mar-21	Peyrard				
	450.	11,042,045 B2	Jun-21	Chao et al.				
	451.	11,069,358 B1	Jul-21	Harper				
	452.	11,086,147 B2	Aug-21	Howell et al.				
	453.	11,204,512 B2	Dec-21	Howell et al.				
	454.	11,243,416 B2	Feb-22	Howell et al.				
	455.	11,326,941 B2	May-22	Howell et al.				
	456.	11,513,371 B2	Nov-22	Howell et al.				
	457.	11,536,988 B2	Dec-22	Howell et al.				
	458.	11,630,331 B2	Apr-23	Howell et al.				
	459.	11,644,361 B2	May-23	Howell et al.				
	460.	11,644,693 B2	May-23	Howell et al.				
	461.	11,721,183 B2	Aug-23	Howell et al.				
	462.	11,733,549 B2	Aug-23	Howell et al.				

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	463.	11,762,224 B2	Sep-23	Howell et al.			
	464.	11,829,518 B2	Nov-23	Howell et al.			
	465.	DES. 369,167	Apr-96	Hanson et al.			

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APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
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Title of Invention

HEAD-WORN DEVICE WITH CONNECTION REGION

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	3510	FILED BY	Angela Nijim
PATENT CENTER #	63337701	FILING DATE	-
CUSTOMER #	34071	FIRST NAMED INVENTOR	Thomas A. Howell
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Peter Tong

Documents

TOTAL DOCUMENTS: 11

DOCUMENT		PAGES	DESCRIPTION	SIZE (KB)
generatedADS63337701.pdf		9	Application Data Sheet	227 KB
IPVCP006X1C10D1C1-Application_AsFiled.pdf		80	-	398 KB
IPVCP006X1C10D1C1-Application_AsFiled-SPEC.pdf	(1-75)	75	Specification	376 KB
IPVCP006X1C10D1C1-Application_AsFiled-CLM.pdf	(76-79)	4	Claims	23 KB
IPVCP006X1C10D1C1-	(80-80)	1	Abstract	12 KB

Application_AsFiled-ABST.pdf			
IPVCP006X1C10D1C1-DecFromParent-CUTE.pdf	4	Oath or Declaration filed	4062 KB
IPVCP006X1C10D1C1_AllFigs.pdf	42	Drawings-only black and white line drawings	1906 KB
IPVCP006X1C10D1C1_IDSTrans.pdf	2	Transmittal Letter	20 KB
IPVCP006X1C10D1C1_1449.pdf	17	Information Disclosure Statement (IDS) Form (SB08)	144 KB

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IPVCP006X1C10D1C1_PoA.pdf	2	Power of Attorney	475 KB
IPVCP006X1C10D1C1-Statement373c.pdf	3	Assignee showing of ownership per 37 CFR 3.73	119 KB
IPVCP006X1C10D1C1_AppTrans.pdf	2	Transmittal of New Application	278 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
generatedADS63337701.pdf	82AC319CAC58144F7C4D2FD55AAD32CB9B3C6C661D29343AD7E2B42E9398EC89649BFE0E177411B1863BE2FE73FE773D3FB56A6757C8ED5418E8A99E91F059D1
IPVCP006X1C10D1C1-Application_AsFiled.pdf	EE161AD0D0B3BBD1C6BF11DD1C189112266C7C85B709655D98A8EFD647EF11BAE1A13BF7591ED3A2F703A56CB5F863F7F0FA00831D20532D20458652330A861D

IPVCP006X1C10D1C1-Application_AsFiled-SPEC.pdf	0235A2A1FDE390A3B73C993725CC2E331622933C272383046EFC23A1D39790C90AE3634796F1D515FFDC0E26DF48147BEA9C2B3B0489CE96C6162DD863EDDE5A
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IPVCP006X1C10D1C1_PoA.pdf	0F47A41298B0831D0D839B770830F6D560428161F8741DD03E3F6600DEE4CA23AB9E4A60DDE397BA65331C35A7BC0498311B669852F07AC58FA4AF69CA18A35E
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IPVCP006X1C10D1C1_AppTrans.pdf	636DAD10F69F7A666B6912326E20AB22F5C9D62349ACEB1DE40ED127881D99682BE6926CAF727D63F05ADC465F4D2C28140167D28B752D62FC90D3B22116F0E1

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PTO/AIA/80 (07-17)
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Name Peter P. Tong	Telephone 650-903-9200, x102
Title Member	

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HEAD-WORN DEVICE WITH CONNECTION REGION

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation of U.S. Patent Application No. 18/224,793, now U.S. Patent No. 11,829,518, and entitled "HEAD-WORN DEVICE WITH CONNECTION REGION," which is hereby incorporated herein by reference, which is a divisional of U.S. Patent Application No. 18/129,660, filed March 31, 2023, now U.S. Patent No. 11,803,069, and entitled "EYEWEAR WITH CONNECTION REGION," which is hereby incorporated herein by reference, which is a continuation of U.S. Patent Application No. 16/424,018, filed May 28, 2019, now U.S. Patent No. 11,630,331, and entitled "EYEWEAR WITH TOUCH-SENSITIVE INPUT SURFACE," which is hereby incorporated herein by reference, which is a continuation of U.S. Patent Application No. 13/831,419, filed March 14, 2013, now U.S. Patent No. 10,345,625, and entitled "EYEWEAR WITH TOUCH-SENSITIVE INPUT SURFACE," which is hereby incorporated herein by reference, which is a continuation of U.S. Patent Application No. 13/291,020, filed November 7, 2011, now U.S. Patent No. 8,430,507, and entitled "EYEWEAR WITH TOUCH-SENSITIVE INPUT SURFACE" which is hereby incorporated herein by reference, which is a continuation of U.S. Patent Application No. 12/803,732, filed July 1, 2010, now U.S. Patent No. 8,434,863, and entitled "EYEGLASSES WITH A PRINTED CIRCUIT BOARD" which is hereby incorporated herein by reference, which is a continuation of U.S. Patent Application No. 11/546,685, filed October 11, 2006, now U.S. Patent No. 7,806,525, and entitled "EYEGLASSES HAVING A CAMERA" which is hereby incorporated herein by reference, which is a continuation-in-part of U.S. Patent Application No. 11/183,256, filed July 15, 2005, now U.S. Patent No. 7,500,747, and entitled "EYEGLASSES WITH ELECTRICAL COMPONENTS," which is hereby incorporated herein by reference, which claims priority to 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; and (ii) U.S. Provisional Patent Application No. 60/605,191, filed August 28, 2004, entitled

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"ELECTRICAL COMPONENTS FOR USE WITH EYEWEAR, AND METHODS THEREFOR," and which is hereby incorporated herein by reference.

[0002] U.S. Patent Application No. 11/183,256 also claims priority to each of: (i) 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; (ii) 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; (iii) 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 (iv) 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.

[0003] U. S. Patent Application 11/546,685 also claims priority to each of: (i) 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; (ii) 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; (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 is related to 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 references to 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.

[0005] 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 now U.S. Patent No. 7,192,136, 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 now U.S. Patent No. 7,116,976, and entitled "ADAPTABLE COMMUNICATION TECHNIQUES FOR ELECTRONIC DEVICES," which is hereby incorporated herein by reference; (iv) U.S. Patent Application No. 11/078,855, filed March 11, 2005 now U. S. Patent No. 7,500,746, and entitled "EYEWEAR WITH RADIATION DETECTION SYSTEM," 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. 11/183,269, filed July 15, 2005 now U.S. Patent No. 7,380,936, and entitled "EYEWEAR SUPPORTING AFTER-MARKET ELECTRICAL COMPONENTS," which is hereby incorporated herein by reference; (vii) U.S. Patent Application No. 11/183,283, filed July 15, 2005, and entitled "EVENT EYEGLASSES," which is hereby incorporated herein by reference; (viii) U.S. Patent Application No. 11/183,262, filed July 15, 2005, and entitled "EYEGLASSES WITH HEARING ENHANCED AND OTHER AUDIO SIGNAL-

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GENERATING CAPABILITIES," which is hereby incorporated herein by reference; (ix) U.S. Patent Application No. 11/183,263, filed July 15, 2005 now U.S. Patent No. 7,380,936, and entitled "EYEGLASSES WITH A CLOCK OR OTHER ELECTRICAL COMPONENT," which is hereby incorporated herein by reference; (x) U.S. Patent Application No. 11/183,276, filed July 15, 2005 now U.S. Patent No. 7,255,437, and entitled "EYEGLASSES WITH ACTIVITY MONITORING," which is hereby incorporated herein by reference; and (xi) U.S. Patent Application No. 11,580,222, filed October 11, 2006 now U.S. Patent No. 7,581,833, and entitled "EYEGLASSES SUPPORTING AFTER MARKET ELECTRICAL COMPONENTS", which is hereby incorporated herein by reference.

BACKGROUND OF THE INVENTION

[0006] Many of us have experienced the inconvenience of trying to listen to a piece of music from a portable device in an outdoor environment, particularly in cold weather. First, we remove the device from inside our jacket. Then, we take off our gloves to find the right song, connect the device to a headset, and put on the headset. After we have finished listening, we go through the process again to put the device back into our jacket. To a certain degree, we are somewhat used to such procedures. However, to look at this objectively, going through the multi-step process just to listen to a piece of music is cumbersome. Such inconvenient procedures are not limited to hearing music. For example, it may not be much easier for us to use the cell phones or cameras and the like.

[0007] It should be apparent from the foregoing that there is still a need to increase the ease of handling electronic devices.

[0008] Also, 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

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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.

[0009] 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.

[00010] Accordingly, there is a need for improved wireless communication techniques for users of mobile communication devices.

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SUMMARY OF THE INVENTION

[00011] The present invention provides a pair of glasses with one or more embedded or partially embedded electrical components. In a number of the embodiments of the invention, with one or more electrical components in the glasses, the electrical components are much easier to operate. For example, you do not have to take an electronic device out from your pocket to use it. The electronic device may already be in your glasses, and you just have to turn it on.

[00012] In one embodiment, an eyewear for a user includes an eyewear frame; a first switch at the frame, the first switch having at least two operational states, and the operational states of the switch being configured to be changed by a user touching a surface of the frame, without moving any mechanical part at least partially exposed to the outside of the frame; and a first electrical component in the frame configured to be electrically coupled to the first switch to perform a function.

[00013] In another embodiment, an eyewear for a user includes an eyewear frame, electrical circuitry at least partially in the eyewear frame, and a touch sensitive input surface on the eyewear frame configured to provide an input to the electrical circuitry to perform a function via touching the touch sensitive input surface.

[00014] In yet another embodiment, an eyewear includes a switch with at least two operational states. The operational states of the switch can be configured to be changed by sliding a finger across a touch sensitive input surface of the frame, without moving any mechanical part at least partially exposed to the outside of the frame. The embodiment could also include an electrical component in the frame configured to be electrically coupled to the switch to perform a function.

[00015] In one embodiment, an eyewear frame for a user includes at least a front portion with two side portions; two speakers, one in each side portion; a connection region at one side portion, with an electrical connector having two conductive pads to connect to corresponding conductive contacts of a counterpart connector; a rechargeable battery; a microphone in the frame; and wireless communication circuitry in the frame. The connection region can be provided at an inside surface of one of the side portions. The eyewear frame can also include a

touch-sensitive input surface on the eyewear frame configured to provide an input to the frame to perform a function.

[00016] In one embodiment, a headset includes an electrical connector having a conductive pad to connect to a corresponding conductive contact of a counterpart connector. The headset can also include a touch-sensitive input surface.

[00017] Other aspects and advantages of the present invention will become apparent from the following detailed description, which, when taken in conjunction with the accompanying drawings, illustrates by way of example the principles of the invention.

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BRIEF DESCRIPTION OF THE DRAWINGS

[00018] FIG. 1 shows one embodiment of the invention with a speaker in one of the temples of the glasses.

[00019] FIG. 2 shows a tube extending from a speaker at a temple of the glasses to guide sound to one of the ears of the user according to one embodiment of the invention.

[00020] FIG. 3 shows a retractable tube extending from a speaker at a temple of the glasses according to one embodiment of the invention.

[00021] FIG. 4 shows a funnel at the output of a speaker in the glasses according to one embodiment of the invention.

[00022] FIG. 5 shows a male connector at the end of a temple according to one embodiment of the invention.

[00023] FIGS. 6A-6B illustrate a process to make a non-standard female plug couple to a male connector at a pair of glasses according to one embodiment of the invention.

[00024] FIG. 7 illustrates another non-standard connector, applicable to clamp onto a temple of a pair of glasses according to an embodiment of the invention.

[00025] FIGS. 8A-8E shows different embodiments of standard connectors located at different positions on the temple of a pair of glasses according to the invention.

[00026] FIGs. 8F-8H are diagrams pertaining to providing a removable electronic device with an eyeglass frame according to one embodiment of the invention.

[00027] FIG. 8I is a diagram of a temple of an eyeglass frame according to another embodiment of the invention.

[00028] FIG. 9 shows some of the electrical components for a MP3 player according to an embodiment of the invention.

[00029] FIG. 10 shows an embodiment of the invention where a user is wearing a pair of glasses with electrical components, tethered to a base, which is connected to a portable device.

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[00030] FIGS. 11A-11B show different embodiments of the present invention illustrating some of the electrical components for wireless connections to a pair of glasses.

[00031] FIG. 12 shows a process for a personalized radio according to one embodiment of the present invention.

[00032] FIG. 13 shows a number of attributes of control knobs according to different embodiments of the present invention.

[00033] FIG. 14 shows some of the electrical components for capturing images with a pair of glasses according to an embodiment of the present invention.

[00034] FIG. 15 shows an operation of taking actions based on images captured with a pair of glasses with wireless transceiver capability according to one embodiment of the invention.

[00035] FIG. 16 shows an operation to provide messages to a user based on images captured by a pair of glasses according to an embodiment of the present invention.

[00036] FIG. 17A is a chart that depicts examples of sensors in a pair of glasses according to different embodiments of the present invention.

[00037] FIG. 17B is a diagram of a temple arrangement according to one embodiment of the invention.

[00038] FIG. 17C is a diagram of a cover that at least partially covers a temple according to one embodiment of the invention.

[00039] FIG. 17D is a diagram of a fit-over temple that at least partially fits over a temple according to one embodiment of the invention.

[00040] FIG. 18 shows an embodiment including an eye mask according to the invention.

[00041] FIG. 19 shows an embodiment including a night cap according to the invention.

[00042] FIG. 20A is a diagram illustrating a temple having a slot for receiving a removable electronic device according to one embodiment of the invention

[00043] FIG. 20B is a diagram illustrating the temple having a recessed lower portion according to another embodiment of the invention.

[00044] FIGs. 21A and 21B are diagrams illustrating a pair of glasses having a camera coupled thereto, according to one embodiment.

[00045] FIG. 22 is a diagram of a pair of glasses having a camera according to one embodiment of the invention.

[00046] FIG. 23A is a diagram of a pair of glasses having a camera according to one embodiment of the invention.

[00047] FIG. 23B is a diagram of the pair of glasses according to another embodiment.

[00048] FIG. 24 is a side view of a pair of eyeglasses according to another embodiment of the invention.

[00049] FIG. 25 shows one embodiment of the invention with a speaker in one of the temples of a pair of glasses.

[00050] Fig. 26 shows a number of attributes regarding a number of applications of glasses according to different embodiments of the invention.

[00051] FIG. 27 shows some electrical components of a player according to an embodiment of the invention.

[00052] Fig. 28 illustrates a number of forces activating a switch according to a number of embodiments of the invention.

[00053] Fig. 29 illustrates a number of mechanical forces activating a switch according to a number of embodiments of the invention.

[00054] FIG. 30 shows a Hall-effect detector at a joint of a pair of glasses according to an embodiment of the invention.

[00055] FIGs. 31A-31C illustrate different embodiments of a quadrature sensor according to the invention.

[00056] Same numerals in Figures 1-31 are assigned to similar elements in all the figures. Embodiments of the invention are discussed below with reference to Figures 1-31. 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.

DETAILED DESCRIPTION OF THE INVENTION

[00057] A number of embodiments according to the present invention regarding glasses with one or more electrical components attached, partially embedded or fully embedded are described. Many of them are applicable to different types of glasses, such as sunglasses, auxiliary frames, fit-over glasses, prescription glasses, safety glasses, swim masks, and goggles, such as ski goggles. In a number of embodiments, the frames of the glasses have more surface area than frames with minimal structure. For example, the temple regions of the glasses can have a tapered profile. They are wider or broader when they are closer to the lens holders. Then they get narrower. In one embodiment, a wider or broader temple implies that the temple spans across a wider or broader area longitudinally down from the top of the head of the user. FIG. 1 shows an example of such an embodiment.

[00058] FIG. 1 shows one embodiment 100 of the invention where there is a speaker 102 at least partially embedded in one of the temples 104 of the glasses 106. The speaker 102 is closer to one end of the temple 104 than the other end. The end of the temple that the speaker 102 is closer to is the end that is in the vicinity of the lens holder or the hinge of the glasses 106, instead of the end 108 that is free. The speaker can be partially embedded in the glasses. For example, the mouth of the speaker, where sometimes there can be small holes on a cover, can be exposed.

[00059] In the embodiment shown in FIG. 1, the speaker 102 outputs audio signals in the direction towards the user. In another embodiment, the speaker 102 outputs audio signals in the direction away from the user. For example, the mouth of the speaker 102 can be facing outwards away from the user.

[00060] There are different approaches to embed an electrical component into a pair of glasses. For example, the glasses can be made of plastic (e.g., plastic frames). One way to produce such frames is to first assemble electrical components onto a circuit board. The circuit board can be shaped to fit, for example, the temple of the glasses. The circuit board is placed into a mold. Then, hot, molten plastic is injected around the circuit board to form the temple piece of

the glasses. To reduce weight, the wall of the glasses can be made relatively thin through injection molding techniques.

[00061] In another embodiment, the glasses have metallic frames. For example, the frames can be made of Titanium, which is a relatively light metal. Also, Titanium is relatively non-conductive and strong, and is quite immune to corrosion. Further, Titanium can be anodized or heat colored.

[00062] For glasses with metallic frames, to prevent circuits from being shorted or to reduce leakage current, one embodiment provides an insulating layer between the electrical components or circuit board and the metallic frames. One example of an insulting layer is a tape to encapsulate the electrical components. The tape is non-conducting so as to provide insulation and, to a certain degree, can also provide mechanical stiffness. One way to make such temples is to have two sheets of the metal die-stamped to form the two halves, or the two faces of the temple piece. A circuit board is made to fit into the space between the faces. Then, two die-cut pieces of insulator material (e.g., dielectric tape) can cover the top and the bottom surfaces of the circuit board. The board is then sandwiched between the faces to form the temple. In one example, the dielectric tape can be double-sided sticky tape, with one side sticking to the circuit board, and the other side sticking to the temple. An adhesive can be used to glue the two faces of the temple piece together.

[00063] In yet another embodiment, the frames are made of hard rubber. The frames can be manufactured in an approach similar to injection molding techniques, with circuit boards inserted into the mold along with the rubber at the time of molding.

[00064] Different types of speakers can be used, such as, standard, fixed-magnet/moving coil speakers; speakers with fixed-coil and a steel diaphragm; piezo-electric speakers; and electrostatic speakers.

[00065] In one embodiment, the glasses further include a tube, such as a plastic tube, extending from a speaker. The tube serves to guide sound generated by the speaker to one of the ears of the user. FIG. 2 shows an embodiment where

a tube 150 is located on the outside of a temple 152. In another embodiment, the tube can be on the inside of a temple.

[00066] In one embodiment, the tube 150 can be rotated, such as from behind the temple 152 (if the tube is on the inside of the temple) to being downward at an angle towards one of the ears of the user, such as the position shown in FIG. 2. To increase flexibility, the tube can be attached to a rotating disk 154, which allows rotation about the speaker.

[00067] In another embodiment, the tube is malleable. This allows the tube to be placed in different positions.

[00068] In one embodiment, the length of the tube is adjustable. FIG. 3 shows such an embodiment 200 of a pair of glasses with a retractable tube 202. In the figure, the tube is shown to be in its extended position.

[00069] To further enhance sound coupling, in one approach, there is a plug 156 at the end of the tube for inserting into an ear of the user. The plug can be an ear bud. The plug can provide a cushion, foam rubber or other materials. Such materials give comfort and/or enhance sound coupling to the ear canal.

[00070] In another approach, there is a funnel at the output of the speaker. FIG. 4 shows the cross section of such a funnel from a speaker at a temple region of the glasses. As shown in FIG. 4, the speaker 254 sits on a speaker frame 252, and the speaker 254 is electrically connected to a circuit board 256. As sound is generated from the speaker 254, the sound propagates to a tube 258 through a structure 260 in the shape of a funnel. Such a structure helps guide the sound to the tube (i.e., improved sound coupling). Also, FIG. 4 shows the tube, which can be the tube 150 shown in FIG. 2, mounted onto the temple region of the glasses with a circular lip 262. Such a lip 262 allows the tube 258 to rotate relative to the glasses. In the embodiment shown in FIG. 4, the speaker 254 is fully embedded in the glasses.

[00071] As an alternative to or in conjunction with the tube, the glasses can include a channel to likewise guide sound generated by the speaker to one of the ears of the user. For example, the channel can be formed within a temple. The temple also has an opening to output the sound towards the user's ear.

[00072] FIG. 1 shows one speaker at one of the temples. There can be more than one speaker at each temple. In one embodiment, there can also be at least one speaker at each temple. The two speakers can generate stereo effects.

[00073] In another embodiment, the glasses can provide four or more speakers to give a high fidelity sound or a surround sound effect. For example, each temple can include one speaker in front of the user's ear, and one speaker behind the user's ear. The different speakers can generate different portions or sections of the sound. Further, if a base (discussed below) or portable electronic device is coupled to the glasses, the base or portable electronic device can contain another speaker, such as a base or woofer speaker. Such embodiments enable the glasses to provide a personal high-fidelity sound or a surround-sound environment.

[00074] Electrical signals can be coupled to an electrical component, such as a speaker, in a pair of glasses through a number of mechanisms. In one embodiment, there is an electrical connector at least partially embedded in the glasses. In other words, at least a portion of the connector is inside the glasses. The connector is electrically coupled to the speaker (or other electrical component) by, for example, a conductor. The conductor can be on a printed-circuit board. In one embodiment, the conductor is also embedded in the glasses.

[00075] Regarding connectors, FIG. 5 shows one embodiment where the connector is not a standard connector. The end 108 of the temple 104 of the glasses 106 shown in FIG. 1 has a similar connector. In FIG. 5, the connector is a male plug or a male connector 300 at the end of a temple 302 of a pair of glasses. The connector 300 is connected to the speaker through, for example, one or more wires embedded in the temple. Electrical signals external to the glasses can then be coupled to the speaker (or other electrical component) through the plug.

[00076] As shown in FIG. 5, the free end of the temple 302 can have a relatively flat cross section. There can be one or more electrically-conductive contacts, such as 304 and 306, on one or both of the flat surfaces of the temple. In FIG. 5, four contacts are shown on one surface of the temple. The contacts, 304 and 306, can be metal pads or bumps.

[00077] In one embodiment, a non-standard connector can be made using printed-circuit board technologies. First, a printed-circuit board with printed conductors connected to metal contact bumps is produced. Then plastic is overmolded around the printed-circuit board, with the mold designed to shut off around the bumps or pads. The overmolded plastic can serve as the temple, and the pads would be left exposed. Thus, portions of the printed circuit board are covered by plastic, and areas with the bumps or pads are exposed for connection. These pads serve as the connectors for the glasses.

[00078] Regarding printed-circuit boards, there can be one or more circuit boards in the glasses. For example, there can be a circuit board in one of the temples of the glasses. Or, the circuits can be divided into two circuit boards, one in each temple of the glasses. The circuit boards can carry additional electrical components to be described below.

[00079] In one embodiment, the circuit boards are rigid. In another embodiment, the circuit boards are made of flexible materials, such as a polyimide sheet, like Kapton®. In one embodiment, the circuit board is configured or adapts to the shape of the temple in which it resides.

[00080] As shown in FIG. 5, the end of the temple 302 serves as a male connector (plug) 300. The non-standard male connector 300 can be received by a non-standard female connector (plug) 310. Typically, the female connector 310 makes electrical and physical connection through grabbing around the male plug. The female connector 310 can be connected to a cable 312.

[00081] FIGS. 6A-6B illustrate a process to make the non-standard female plug 310. First, an electrical wire 354 is attached to a small sheet or piece of metal 356. FIG. 6A shows a number of such wires, with a number of the metal sheets or pieces crimped to a hard PVC 358. The figure shows the back side of the crimped board with the wires and with a number of holes, such as 360. Then the frame is overmolded with a soft PVC. FIG. 6B shows a cross section of the overmolded frame 362 with the soft PVC. As shown in the figure, a number of the metal sheets, such as 364 and 366, are exposed. They are the metal contacts in the female connector 310. Instead of the above approach, alternatively, a wire can be

attached to a sheet of metal by putting the wire between the metal and the plastic as the metal is crimped onto a plastic. When the temple (i.e., male connector 300) is inserted into the female plug, the soft PVC material stretches slightly, providing a spring-force to keep the contacts connected.

[00082] The hard PVC can have a hardness of over 80 durometer, while the soft PVC can have a hardness of less than 50 durometer. The hard PVC can be replaced by other materials, such as Polypropylene or cloth. The soft PVC can be replaced by Silicone, or a thermo-plastic elastomer, such as Kraton®.

[00083] Referring to both FIG. 5 and FIG. 6B, when the male connector 300 is inserted into the slot 314 of the female connector 310, the metal pads, 304 and 306, will get in contact, or mate, with the metal sheets, 364 and 366.

[00084] In one embodiment, as long as the male connector 300 is pushed all the way into the female connector 310, the pads are aligned correctly to the sheets for electrical connections. In another embodiment, there is an alignment mechanism to guide the position of the temple relative to the female connector so as to ensure the conductive sheets to be in contact with the conductive pads. For example, there can be a registration location to indicate that the male connector is at the appropriate position relative to the female connector. There can be an alignment extension, which can be a partial sphere, close to the end of the temple 302, such as between the pads 304 and 306, at 316. And, there can be a corresponding alignment notch at the female connector 310. When the extension is received or caught by the notch, the male connector 300 is in the appropriate position relative to the female connector 310. In other words, the alignment is proper, and the pads and the sheets are in contact.

[00085] FIG. 5 shows the non-standard male connector 300 at one end of a temple of a pair of glasses. In yet another embodiment, a non-standard connector can be at another location. FIG. 7 shows another example of a non-standard connector 400. The connector 400 includes one or more conductive pads, 412 and 414, on the top side of a temple 402. The connector 400 is designed to receive another connector 406 that grabs onto the side of the temple 402. There can be an indentation 404 on the temple 402 to receive the other connector 406. The other

connector 406 can include a top 420 and a bottom 416 clip. There are a number of conductive pads or sheets inside the other connector 406. The indentation 404 provides an alignment to indicate where the top clip 420 of the other connector 406 should grab onto the temple 402 for connection. At that position, the conductive pads at the temple will be in contact with the conductive pads or sheets at the other connector 406. There can also be another indentation 418 at the temple 402 to receive the bottom clip 416. This can further enhance the alignment process and to secure the connection.

[00086] In FIG. 7, the other connector 406 is coupled to one end of a cord and a plug 408, which can be inserted into a portable device 410, can be connected to another end of the cord. The portable device, for example, can be a cell phone. This type of non-standard clip-type connector could be easily applied to the temple with one hand, for example, while the user is driving a car.

[00087] A number of non-standard connectors have been described. In another embodiment, the contacts are based on standard connectors, which can be off-the-shelf connectors. FIGS. 8A-8E show a number of examples of such connectors.

[00088] In one embodiment, the standard connector is a standard cylindrical plug located at the end of a temple. From a different perspective, the temple molds around the end of the plug. FIG. 8A shows one such embodiment. The plug 450 can be a standard audio connector or a 3-wire or three terminal plug, such as a 3.5 mm male stereo mini-phone plug. The 3 wires for such a plug are typically one for ground, the other two applicable for two signals, such as for creating stereo effects. FIG. 8A also shows the three wires, 452, 454 and 456, inside the temple, extended from the plug 450. These wires are for connection to electrical components of the glasses.

[00089] In one embodiment, the cylindrical plug 450 shown in FIG. 8A can be protected, encapsulated or shrouded. Or, at least a portion of the plug is protected, encapsulated or shrouded. Such protection can, for example, be for aesthetic reasons, or to prevent the plug from scratching the face of the user when

the user is putting on the pair of glasses. In FIG. 8A, the plug 450 is partially embedded in a temple.

[00090] Instead of a three terminal plug, other types of standard cylindrical plugs applicable to different embodiments of the present invention include a serial connector with 3 pins, typically one for ground, one for transmitting data (Tx) and the third for receiving data (Rx); or (b) a 2-wire connector, one served as ground, the other for carrying, such as power and modulated signals.

[00091] In yet another embodiment, instead of a cylindrical plug, the standard connector at the end of a temple of a pair of glasses is a USB or a FIREWIRE connector.

[00092] A number of embodiments have been described where the standard connector(s) at the glasses are male connectors. In yet another embodiment, the standard connector(s) in the glasses are female connectors. For example, there can be a 3.5 mm female stereo mini-phone plug at the end of a temple of a pair of glasses. At least a portion of the female connector can be protected, encapsulated or shrouded. For example, the female connector can be recessed within the end of a temple.

[00093] FIGS. 8B-8E show different examples of standard connectors located or partially embedded not at the end of a temple of a pair of glasses, but, for example, on the side of the temple, such as on the inside surface or the outside surface of a temple. FIG. 8B shows a 0.10" header plug 460, commonly known as a MOLEX connector, on such a surface. FIG. 8C shows a female mini-phone plug 465 on such a surface. FIG. 8D shows a card connector 470 to receive a card 472, such as a removable media card (e.g., memory card). There can be a cover 474 to secure and/or protect the media card 472 in place after it is inserted into the card connector 470. FIG. 8E shows a female USB connector 480 on the inside surface of a temple 482 to receive a male USB connector 484.

[00094] FIGs. 8F-8H are diagrams pertaining to providing a removable electronic device with an eyeglass frame according to one embodiment of the invention. FIG. 8F illustrates a temple 490 that includes a connector 492. The connector 492 includes an opening 494. A removable electronic device can be

coupled to the temple 490 using the connector 492. More particularly, FIG. 8G illustrates a removable electronic device 496 that includes an electronic device housing 498 and a connector 499. As an example, the removable electronic device 496 can be a memory storage device, sometimes referred to as a memory card. FIG. 8H illustrates the removable electronic device 496 coupled to the temple 490. The removable electronic device 496 is coupled to one side of the temple 490, such side can be either an inside or outside surface of the eyeglass frame. When the removable electronic device 496 is coupled to the temple 490, the connector 499 of the removable electronic device 496 is inserted into the opening 494 of the connector 492. Physical forces between the connector 499 and the connector 492 operate to secure the removable electronic device 496 to the temple 490, yet permit the removable electronic device 496 to be removable therefrom.

[00095] In one embodiment, the connector 492 is not electrically connected to any electronic circuitry within the temple 490 or other parts of the eyeglass frame. In other words, the connector 492 provides a convenient means by which removable electronic devices can be coupled to the eyeglass frame. In another embodiment, the connector 492 can be coupled to electrical circuitry within the temple 490 or elsewhere within the eyeglass frame. Such an embodiment allows the electronic components within the removable electronic device 496 to be utilized with the electrical circuitry within the temple 490 or elsewhere within the eyeglass frame. For example, the removable electronic device 496 can provide data storage and/or other software modules to be utilized by or to utilize the other electrical circuitry within the temple 490 or elsewhere within the eyeglass frame. In any case, by attaching the removable electronic device 496 to the temple 490 (and thus the eyeglass frame), the removable electronic device 496 is able to be conveniently carried by the user of the eyeglass frame. In one implementation, the eyeglass frame, which includes the connector 492, becomes a docking station for the removable electronic device 496. As such, a variety of different removable electronic devices can be interconnected with the eyeglass frame, as desired. For example, the eyeglass frame can thus support different function or operations depending on the removable electronic device that is attached. For example, the

eyeglass frame might operate as a camera, data storage device, FM radio, MP3 player, mobile telephone, pedometer, hearing enhancer, sun sensor, time piece, etc.

[00096] In one embodiment, the removable electronic device 496 can align itself with the orientation of the temple 490, such as shown in FIG. 8H. In FIG. 8G, the electronic device housing 498 can be said to have an elongated housing. The configuration (e.g., shape) and/or color of the removable electronic device 496 can also be designed to conform or complement the design of the temple 490. In one embodiment, the temple 490 might also have a recessed region to allow the portable electronic device to be less visually perceptible when attached to the temple 490 or to provide a more consistent contour of the temple 490.

[00097] In one embodiment, the connector 499 is a male connector, and the connector 492 is a female connector or a similarly sized structure. In one implementation the connector 499 is a peripheral bus connector, such as a Universal Serial Bus (USB) connector. In such cases, the connector 492 can also be a peripheral bus connector (either electrically functional or non-functional as noted above).

[00098] Although the embodiment illustrated in FIGs. 8F-8H utilize connectors, namely, electrical connectors, the removable electronic device 496 could be attached to the temple in other ways. For example, other means to provide physical forces to hold the removable electronic device 496 in place can be used.

[00099] FIG. 8I is a diagram of a temple of an eyeglass frame according to another embodiment of the invention. In this embodiment, the temple 490' includes an opening 491 through which a cable 493 extends outward. The cable 493 has an electrical connector 495 connected at its end. The electrical connector 495 is electrically connected to electrical circuits within the temple 490' or elsewhere within the eyeglass frame such as by way of one or more wires contained within the cable 493. In one implementation, the length of the cable 493 is about one to four inches. The temple 490' shown in FIG. 8I also includes a receptacle 497. The receptacle 497 is affixed to or integral with the temple 490 to receive the electrical

connector 495. Typically, the receptacle 497 provides a holding mechanism for the electrical connector 495 when not been utilized. When the electrical connector 495 is being utilized, the electrical connector 495 is removed from the receptacle 497 and coupled to a corresponding counterpart connector of another electrical device. The cord 493 can provide ease-of-use so that the electrical connector 495 can be maneuvered to couple to the counterpart connector. In one embodiment, the temple 490' can provide a recess for receiving the entire cable 493, with the outer surface of the receptacle 497 being substantially flush to the surface of the temple 490. So when the connector 495 is not in use, the connector 495 can be in the receptacle 497, with the cable 493 in the recess. In one embodiment, when the cable 493 is in the recess and the connector 495 inside the receptacle 497, the cable 493 has substantially no slack. Also, in another embodiment, the cable 493 can be retractable into the opening 491. In the embodiment shown in FIG. 8I, the electrical connector 495 is a male connector, and the receptacle 497 is a female connector or a similarly sized structure.

[000100] A number of standard and non-standard connectors have been described. Other types of connectors can also be used. In one embodiment, there is a connector adapter, which serves to transform such other type of connectors to a different interface. For example, an adapter can be a cord with one type of connector at one end and a different type of connector at the other end.

[000101] In one or more of the above embodiments, the glasses can access audio signals from another device through a connector at the glasses. The another device can be a multimedia asset players or a radio.

[000102] In one embodiment of the invention, the glasses have a storage medium (i.e., memory). The memory can be on a printed-circuit board and, for example, store 256 MBs or more. The memory can be a built-in or removable flash memory. The memory can be coupled to a device external to the glasses through one or more connectors at the glasses. As an example, a 256 MB flash memory is in one of the temples of a pair of glasses, and there is a USB connector at the free end of that temple to couple to an external device.

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[000103] With the embedded storage medium, the glasses can upload information in the memory to or download information into the memory from an external device, such as a computer. A user can plug the glasses into the computer through a connector, either directly, or indirectly, with, for example, an intermediate wire in between. The user can store files in the glasses. Such an embodiment should reduce the chances of the user losing the files because the user has to lose the glasses as well.

[000104] In yet another embodiment of the invention, a pair of glasses includes a multimedia asset player, such as a MP3 player. FIG. 9 shows some of the electrical components for a MP3 player 500 according to an embodiment of the invention. The player 500 includes a speaker 502 and a data bus 512, which facilitates data transfer among, for example, a processor 506, a storage device 510, and a coder/decoder (CODEC) 504. The processor 506, which can be a microprocessor or controller, controls the operation of the player 500. The storage device 510 stores the multimedia assets, such as MP3 files, or other types of media data that are appropriately formatted. In one example, the MP3 files are digitally encoded songs or other types of audio signals. The storage device 510 can include a number of separate storage elements. For example, the device 510 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. The storage device 510 typically also includes a Read-Only Memory (ROM), which stores programs, utilities or processes to be executed in a non-volatile manner. The player 500 can also include a RAM, such as for the cache.

[000105] Once a media asset, such as a song, is selected to be played, the processor 506 would supply the asset to the CODEC 504, which decompresses the asset and produces analog output signals for the speaker 502. In one embodiment, the bus 512 is also coupled to an input/output device 508, which would allow a user to upload songs in the glasses to an external instrument, such as a computer, or download songs from the instrument to the glasses.

[000106] There are different approaches to select a song. In one embodiment, the songs or the media assets can be categorized in the MP3 player, and the

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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 singer; the second level can be the time period when the asset was produced, and the third level can be the names of the songs. The entries, such as the name of the singer, can be abbreviated. There can be a small display and a control knob to allow a user to scroll down entries in a level. By pushing the knob, the user selects an entry, which can lead the user to a lower level. There can be an entry for moving up a level also. In another embodiment, the display is a touch-screen display, allowing entries to be entered directly on the display. In yet another embodiment, entries can be selected based on voice recognition.

[000107] A number of embodiments have been described with the glasses having a connector. In one embodiment, the glasses can have more than one connector. For example, a pair of glasses with two connectors also has a speaker. One connector is, for example, at a broad side of a temple, as in FIG. 8D. The connector can be for coupling to multimedia assets of a MP3 player. Another connector is, for example, at the end of a temple, as in FIG. 8A. That connector can couple power to the glasses. The speaker can play the multimedia assets accessed from one connector, based on power from another connector.

[000108] As described, 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.

[000109] 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.

[000110] FIG. 10 shows an embodiment where a user 550 is wearing a pair of glasses 552, which include electrical components. There are also tethered electrical components in a base 554, which is connected to the glasses 552 through a cord 556. In addition, there is a wire 558 connected to a connector at the base 554 to a portable electronic device 560. The portable device 560 can be (a) a multimedia device, such as a MP3 player/recorder or a minidisk players, (b) a wireless communication device, such as a cell phone, or (c) a personal digital assistant, or other types of portable devices with computing and/or entertaining and/or communication capabilities.

[000111] Note that instead of connecting to the portable electronic device 560 through the base 554, in another embodiment, the glasses 552 directly connect to the portable device 560 through a cord.

[000112] In one embodiment, there is an attachment device 562, such as a pin or clip. The attachment device attaches at least a part of the glasses to the user's clothing. The attachment device 562 can serve to attach the cord 556 and/or the wire 558 and/or the base 554 to the user's clothing. The attachment can also be through other mechanisms, such as Velcro.

[000113] In a number of embodiments, the speaker described is assumed to emit audio signals. In one embodiment, the speaker emits ultrasonic signals. The glasses can be used, for example, as an insect repellant by transmitting ultrasound to repel insects, such as mosquitoes. In this embodiment, the one or more speakers broadcast the ultrasonic signals away from the user. In other words, the speakers face outwards, not inwards towards the user. In this embodiment, the glasses, which can include a base, also has a power source to provide power to

the speaker. There can also be a control knob to turn the one or more speakers on/off on the glasses. There will be additional discussions on the control knob below.

[000114] In another embodiment, the glasses generating ultrasonic signals can be used to produce audio signals that are more directional. For example, two ultrasonic signals are generated by a speaker in the glasses, with their difference frequencies being the audio signals. The audio signals generated based on mixing the two ultrasonic signals can be much more directional than audio signals directly generated from the speaker.

[000115] Referring back to FIG. 1, in one embodiment, the glasses include a microphone 110. The microphone 110 can be at the end of a temple 104 close to a lens holder 112. Or, the microphone 110 can be in the lens holder 112, located directly adjacent to the temple 104. In yet another embodiment, there can be a small protrusion extending down from the temple to house the microphone.

[000116] With glasses having a microphone, one can use the glasses to record voices into, for example, a storage medium. The storage medium can be in the glasses, or can be in a base or a portable device attached to the glasses.

[000117] Different types of microphones can be used. For example, they can be electret microphones, crystal microphones, resistance microphones, piezoelectric microphones or moving-coil microphones.

[000118] In one embodiment, the glasses with a microphone also include a speaker that can generate directional sound. A user can speak into the microphone and his message can be transmitted from the glasses in a more directional manner.

[000119] In another embodiment, the glasses also include a notification electrical component to provide a notification to the user wearing the glasses. The notification can be to notify, alert or display information to the user. There can be a display located at the inside 114 of the lens holder, or at the vicinity of the junction 116 or the hinge of a lens holder and its corresponding temple facing the user. Or, there can be a display at the inside surface of a temple, or at other locations on the glasses. The display can be one or more light emitting diodes. To alert the

user, one or more diodes can blink. The blinking can be of a specific sequence. Instead of diodes, the display can be a liquid crystal display. The display can provide indications or information to the user. For example, a number or a variable-height bar can be shown. Other than visual indications, the notification or alert can be audio, like a beeper.

[000120] In one embodiment, the notification electrical component is for selecting a multimedia asset in a multimedia asset player in a pair of glasses for the multimedia to play. The multimedia asset player can be a MP3 player.

[000121] A number of embodiments of the present invention have been described where electrical signals are transmitted to or from a pair of glasses through a physical connection. In one embodiment, electrical signals are wirelessly coupled to a pair of glasses. The coupling can be short range or long range. The coupling can be directly to the glasses, or to a base connected to a pair of glasses. The glasses with wireless coupling capabilities can be used to couple to a Bluetooth network, the Internet, a WiFi network, a WiMax network, a cell-phone network or other types of networks. The coupling can also be through a point-to-point link, such as an infrared link.

[000122] FIGS. 11A-11B show examples of some of the electrical components in or tethered to a pair of glasses for wireless connections, according to embodiments of the present invention. In FIG. 11A, a high frequency or RF antenna 602 wirelessly captures high frequency or RF signals for RF transceiver circuits 604. If the transceiver circuits are for a conventional superheterodyne system, the transceiver circuits 604 mix the RF signals down to IF signals. Then the IF signals are processed by baseband circuits. Digital outputs from the baseband circuits are coupled to a processor 608 for analysis and synthesis.

[000123] Outputs from the processor 608 are fed to a D-to-A converter 610 to generate audio signals for a speaker 612. Similarly, audio analog signals from a microphone 614 can be fed to an A-to-D converter 616 to generate digital low frequency signals for the processor 608 and then to the RF transceiver circuits 604. The low frequency signals are up-converted by the RF transceiver circuits 604 and wirelessly transmitted by the antenna 602.

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[000124] In another embodiment, digital conversion is moved closer to the antenna. For example, instead of mixing RF into IF signals, the RF transceiver circuits 604 directly perform digital conversion from the RF signals.

[000125] Typically, high frequency filters are used at the front end of the RF transceiver circuits 604 for the RF signals. In one embodiment, to save space, FBAR (film bulk acoustic resonator) duplexer is employed. A set of piezoelectric filters can be used to separate incoming and outgoing signals. For cell phone operation, such filters can enable a user to hear and speak simultaneously. A number of these electronic devices can be on a circuit board in the glasses. Or, some of the devices are in the glasses, while other in the base tethered to the glasses.

[000126] FIG. 11B shows another example of some of the electrical components in or tethered to a pair of glasses for wireless connections according to the present invention. In this embodiment, there does not need to have digital data. A speaker 620 and a microphone 622 are connected to an analog interface circuit 624, which is coupled to a RF transceiver circuit 626 and an antenna 628. For the speaker application, the transceiver circuit 626 mixes the RF signals down into IF signals, which are converted by the analog interface circuit 624 into analog signals for the speaker 620. Similarly, for the microphone application, its analog signals are converted into the IF signals by the analog interface circuit 624 to be up converted by the transceiver circuit 626 into RF signals for the antenna 628. These types of circuitry are suitable for, such as, simple radios, analog cell phones, CB radios, walkee-talkees, police radios or intercom systems.

[000127] In one embodiment, most of the electrical components are not in the glasses. The pair of glasses includes an antenna to capture the wireless signals, and a connector. The wireless signals captured are transmitted through the connector to electrical circuits external to the glasses.

[000128] A number of processors have been described. The processors can use different types of operating systems. In one embodiment, Symbian Operating Systems are used. In another embodiment, operating systems, such as TinyOS,

are used. The operating system could be programmed in C++ and then compiled into machine codes.

[000129] For privacy protection, signals can be encrypted before transmission. Encryption can take significant computation power, and may generate a fair amount of heat. In one embodiment, encryption capabilities are located in a base tethered to the glasses. There can be a fan inside the base. The fan can be turned on during encryption. In another embodiment, the fan is activated during other high capacity uses for heat dissipation purposes.

[000130] In yet another embodiment, there is a fan in the glasses. The fan is located at a temple of the glasses, in the region close to its lens holder. The fan is used to cool the wearer of the glasses.

[000131] In one embodiment, a pair of glasses has access to voice recognition software. The software can be embedded in (a) the glasses, (b) a base tethered to the glasses, (c) a portable device wired or wirelessly coupled to the glasses or to the base, or (d) a computing system wired or wirelessly coupled to the glasses. Or, the software or firmware can be in more than one of the above devices.

[000132] Glasses that can couple to signals wirelessly can be used in different applications. For example, the glasses can be a cell phone wireless head set, such as a Bluetooth cordless headset. Such short-distance wireless technologies allow the headset to connect to the user's cell phone without a wire. This would allow the user to drive, eat or perform other functions without getting tangled in a pesky wire.

[000133] In one embodiment, the cell phone is a VOIP (voice over Internet protocol) phone.

[000134] In one embodiment, for the glasses operating as a cell phone head set, the head set includes active noise cancellation mechanism. For example, the glasses include two microphones. One microphone is for capturing the voice of the user. But the microphone captures ambient noise also. It can be embedded in a protrusion extending from the end of the temple close to a lens holder, towards the mouth of the user, as the microphone 110 in FIG. 1. Another microphone can be located at the top of one of the lens holders pointing away from the mouth of the

user. This microphone is for capturing ambient noise. As a first order approximation, outputs from the two microphones could be subtracted from each other to provide voice signals with noise reduced.

[000135] In yet another embodiment, the glasses with wireless coupling capabilities also have a multimedia asset player, such as a MP3 player. The glasses can be used to receive music directly in digital format over, for example, a data-capable network of a mobile operator. The music can be received, for example, at a speed of 16 Kbits per second, providing sound quality close to compact disc. If the music is transmitted in a compressed manner, such as in a MP3 format, then the music data can be received at a much lower speed. In one embodiment, the glasses also have a microphone and can serve as a cellular phone or a wireless headset of a cellular phone.

[000136] In yet another embodiment, the glasses can serve as a radio, again through electrical components in or tethered to the glasses. In this embodiment, the glasses can include a tuner with one or more control knobs. The knobs can be used to select channels and to set the volume.

[000137] In one embodiment, a pair of glasses allows personalization by including a preference indicator. The indicator allows a user to provide his preference, such as on whatever is being output by the glasses. In one example, the glasses also has a radio having a speaker and with electrical components for wireless connection. In this example, the indicator can be used by the user to provide his preference regarding whatever is being played by the radio at that time. This preference can be wirelessly transmitted from the glasses to a third party. To illustrate, when the user is listening to a piece of music, the user can indicate he likes the piece of music by pressing a control knob on the glasses. This piece of preference information is then transmitted and received by a service provider, which is then informed of the user's preference. Instead of a control knob, in another embodiment, the preference indicator is a system with a microphone and voice recognition software. The user can indicate his preference vocally.

[000138] In another example regarding the personalization process, the glasses can serve as a multimedia asset player, such as a MP3 player. The song

that the user has shown preference can be stored in a storage device, which can be in the glasses.

[000139] FIG. 12 shows a process 650 according to one embodiment of the present invention for a personalized radio.

[000140] Initially, a pair of glasses according to the present invention receives 652 a piece of music from a radio station. That piece of music is stored 654 in a buffer or a temporary storage area. This temporary storage area can be in the glasses or tethered to the glasses. The piece of music is also sent 656 to a speaker in the glasses.

[000141] Assume that the user likes the music. Based on the preference indicator, the user shows his preference. After the glasses receive 658 an indication of the user's preference, the glasses determine 660 the song corresponding to the indication. That piece of music can then be moved 662 from the buffer to a permanent storage area, such as into a flash memory. This would then allow the user to subsequently access the piece of music.

[000142] There are different ways to determine 660 the song or the content being played by the radio corresponding to the indication. For example, one rule is that when the user pushes the preference button or voices his preference, the song (or media asset or media file) that is being played is the one the user likes. Since the operating system knows what song is being played at what time, based on the rule, the song of preference is determined. Another rule is that when the user shows his preference, and there is no song being played at that instance, the song immediately preceding the break is the song of preference.

[000143] In another embodiment, the glasses can get 664 an identification for the song of preference. For example, the glasses can ask the user to provide an identification for the piece of music. This identification can be the type of music, the singer, the name of the music or other identification. In another embodiment, there can be meta data embedded, such as in the beginning part of the music (or media asset). Having such meta data embedded is not uncommon for music in digital format. The meta data can include identifications for the music. The glasses can get 664 such identification. Based on the identification, the song is categorized

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666 accordingly, such as grouped with other songs having the same identification. Such categorization process would enhance the ease of accessing the song by the user at a later time.

[000144] A number of control knobs have been described. FIG. 13 shows a number of attributes 700 regarding control knobs according to the present invention. The knobs can be of different physical structure 702. For example, a control knob can be a roller, a switch or a push-button. A control knob serving as an up/down controller can use two buttons, or a roller.

[000145] A control knob can be more intelligent 704. For example, a push-button control knob can serve different purposes depending on the duration the knob is being pushed. If a user pushes it for more than three seconds, the knob serves as an on-off toggle switch. In another example, a knob can serve multiple purposes, and the specific purpose depends on the number of times the knob is pushed.

[000146] A knob can also be programmed. A user can connect the glasses to a computer and program the knob accordingly. For example, one can program a knob such that if the knob is pushed more than three seconds, the knob would serve as an on/off switch for the glasses.

[000147] The location 706 of a control knob can vary for different applications. A control knob can be located on the glasses. A control knob can be on the top, the side or the bottom of the temple. A control knob can be located at the inside of a temple facing the user. Assume that there are a number of control knobs and all of them are on the edges of a temple, except one. By being at a position different from other control knobs, this knob can serve a specific purpose. For example, it can be an on/off control knob. In yet another embodiment, a control knob can be located in a base tethered to the glasses.

[000148] The number 708 of control knobs can vary depending on operations. For example, there is an on/off control knob and a volume up/down control knob. If the glasses are used for cell phone headset application, in one embodiment, there is also an answer/hang-up control knob. If the glasses serve as a radio, in one embodiment, there is also a tuning control knob, which can be two push

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buttons. If the glasses serve as a CD player, in one embodiment, there is a play control knob, a stop control knob, and a skip forward/backward control knob. If the glasses serve as a multimedia asset player, such as a MP3 player, in one embodiment, there is a save-this-song control knob, a skip-forward/backward-song control knob and a select-song-to-play control knob.

[000149] A number of embodiments of the present invention have been described regarding audio signals. In one embodiment, the glasses further serve as a camera.

[000150] FIG. 14 shows one embodiment of electrical components in a pair of glasses with image capturing capabilities. A processor 752 is coupled to a CCD interface chip 754 and then to a CCD chip 756. Images focused by a lens 758 are captured and collected by the CCD chip. In another embodiment, there is also be a flash controller 760 connected to the processor 752 to control a flash 762.

[000151] In one embodiment, a number of pixels of the CCD chip 756 are used as light sensors. The pixels can be used to adjust the sensitivity of the CCD chip 756 based on the amount of ambient light. For example, if the outside environment is dim, it would take a longer period of time to collect enough charges by the CCD chip 756 to re-create the image. This implies that the integration time of the CCD chip 756 should increase.

[000152] In yet another embodiment, the camera can pertain to a video camera. The capacity of the memory 753 increases so as to store the video images.

[000153] In one embodiment, the glasses do not offer adjustment on the image distance. The CCD chip 756 can be located, for example, at the focal point of the lens 758. In another embodiment, there is an image distance control knob. For example, a mechanical lever can be pre-programmed or pre-set to move the lens to one or more different positions. One position can be for close-up shots, such as objects from 2 to 4 ft, and another for scenic or vista images, such as objects greater than 6 ft.

[000154] Depending on the embodiment, electrical components of a camera can be in a pair of glasses, and/or a base tethered to the glasses, and/or a portable

device tethered to the glasses or to the base. For example, the memory 753 can be in the base tethered to the glasses.

[000155] The location of the lens 758 can vary depending on the embodiment. In one embodiment, referring to FIG. 1, one location is at the bridge of the glasses, with the lens of the camera facing forward. In this situation, what the user sees is substantially what the captured image would be. In other words, in a general sense, what the user sees is what the user gets. With such an embodiment, it is relatively easy for a user to take pictures, hands-free. In another embodiment, another location for the lens 758 are at a side portion adjacent to a lens holder, before the joint of the corresponding temple, such as at 116 in FIG. 1. Again, the lens of the camera faces forward. Some of the electrical components of the camera can be in that location, and other components in the temple 104. These components are electrically connected through one of the joints, such as with a flexible pc board. In yet another embodiment, the lens 758 can face sideways and outwards in a temple of a pair of glasses, towards the left or right side of the user.

[000156] Regarding storing the images, in one embodiment, the images are stored locally. One approach to determine which image to store is the first-in-first-out approach. Once the camera is turned on, the camera takes pictures continually in an automatic mode, such as once every few seconds. When the memory becomes full or under other pre-set or pre-programmed condition, the first picture stored will be deleted when the next picture comes in. In another embodiment, the digital content in one picture is compared to the digital content in, for example, the fifth picture further down. If the difference between the two is not more than a pre-set threshold, the four pictures in between will be deleted. One approach to determine the difference is by comparing the total charges collected by the CCD chip for the two images. If the two sets of charges do not differ by more than a certain threshold, the images in between would be deleted.

[000157] The images captured can also be stored at a remote site. For example, the glasses can upload the images to a computer, wirelessly or through a wired connection from a connector at the glasses.

[000158] FIG. 15 shows an operation 800 of taking certain actions based on images captured by a pair of glasses with a wireless transceiver, according to one embodiment of the invention. This operation can be used by a police officer on patrol. Before the officer gets out of his patrol vehicle to confront a suspect, the officer can inform the station. At that point, the camera is turned on 802.

[000159] There can be different approaches to turn on the camera. In one embodiment, an operator at the station can remind the officer to turn on the camera. Or, the operator can remotely turn on the camera. In yet another embodiment, the camera can be automatically turned on under certain condition. One such condition is that if the camera is out of the patrol vehicle, the camera is automatically turned on. With the glasses having the capability to wirelessly communicate with the patrol vehicle, one method to detect if the glasses are out of the patrol vehicle is based on the wireless signal strength of the glasses. The patrol vehicle can detect the signal strength of the wireless signals, which depends on the distance between glasses and the vehicle. A threshold can be set. If the signal strength is below the preset threshold, the glasses would be assumed to be out of the car, and the camera would be automatically turned on.

[000160] After the camera is turned on 802, the glasses start to continually take 804 pictures, such as once every few seconds. The pictures taken are automatically transmitted back 806 to the patrol vehicle in a wireless manner. In this situation, the patrol vehicle serves as a hub, which stores the pictures. Then, the hub re-transmits 808 the pictures back to the station. Note that the pictures can be compressed by standard algorithms before they are transmitted. This compression mechanism can be performed by a computer in the patrol vehicle. When the station gets the pictures, they are de-compressed before being viewed, such as by the operator. The pictures enable the operator at the station to see what the officer is confronting. This effectively allows the operator at the station to perform real-time monitoring of or for the officer. If it is a high risk situation, the operator can quickly react 810, such as by dispatching additional support for the officer. In one embodiment, the glasses can include not only a camera but also a

microphone for audio pickup, such as sounds from the officer, suspect, witness or environmental sounds (such as door opening, gun shot, etc.).

[000161] Regarding ownership of the glasses, the user can own the glasses. In one embodiment, the user leases the glasses from a provider. For example, the user leases a ski goggle with a camera. After the user turns on the camera, as the user skis, the goggle automatically takes pictures. Later, the user can return the goggle to the provider or a kiosk, where the pictures can be retrieved and/or stored. Alternatively, the goggle can include a wireless transceiver and the images could be uploaded continually or automatically to the provider or the kiosk via a wireless network. The provider or the kiosk can transmit the images to a website, such as a website associated with the user. In another embodiment, the user picks up hardcopies of the images, e.g., a CD with the images or a DVD with the video, from the provider or the kiosk.

[000162] In one embodiment, the glasses allow the user to enter his identification. This can be done, for example, through a control knob at the glasses. Such identification is then linked to the images. Based on the identification, the user can return to the provider or kiosk at a subsequent time to pick up the images previously left behind.

[000163] In yet another embodiment, the pair of glasses with a camera also has a speaker and a wireless transceiver. It can be used to remotely control or direct the user wearing the glasses. FIG. 16 shows one such operation 850 according to one embodiment.

[000164] To illustrate the operation 850, assume that the user is a paramedic helping a patient. The glasses continually take pictures 852 of objects directly in front of the paramedic, such as images around four feet away from the eyes of the paramedic. The pictures are wirelessly transmitted 854 to a remote site, such as a hospital, to be viewed by a doctor. Again, this transmission can be a two-step process. For example, pictures can be transmitted to the paramedic's ambulance, which can then re-transmit to the remote site. The first transmission from the glasses to the ambulance can be through a low-power, short-range, broadband, wireless transmission protocol. The second transmission from the ambulance to

the hospital can be through a much longer-range, higher power, broadband, wireless transmission protocol. Again, compression and de-compression techniques can be used to enhance the rate of transmission by reducing the amount of data to be transmitted.

[000165] Based on the images, the doctor sends out voice messages to the paramedic. These messages are wirelessly transmitted to and received 856 by the glasses. The speaker in the glasses outputs 858 the messages to the paramedic.

[000166] In another embodiment, the glasses also have a microphone, which allows the paramedic to communicate directly with the doctor also.

[000167] In one embodiment, the glasses can take pictures and can be a multimedia asset player. Pictures and the multimedia assets can share the same memory storage device. In this situation, the capacity for the multimedia assets and pictures can be interrelated. For example, a user can take more pictures if there are less multimedia assets, such as fewer songs in the storage device.

[000168] A number of embodiments have been described regarding electrical components in the temples of glasses. The locations selected are for illustration purposes. In other embodiments, some of the components are embedded fully or partially in other areas of the glasses, such as the lens holders or the bridges of the glasses. For example, there are glasses where there are shields at the edges of the lens holders of the glasses. These shields can wrap around, or better conform to the profile of, the face of the wearer. There can be transparent or translucent windows on these shields also. The shields are not limited to be in primary frames. They can be in, for example, fit-over glasses, auxiliary frames or safety glasses. To illustrate, in fit-over glasses, such shields can go over or cover at least a portion of the primary frames. One or more electrical components can be in such shields. In still another embodiment, one or more electrical components can be in a strap tied to the corresponding eyewear, such as a sports strap tied to the corresponding sports eyewear. For example, the one or more electrical components can be at least partially embedded in or attached to a strap. As one particular example, an audio player or wireless communication module can be at least partially embedded in or attached to the strap. The strap may also provide

electrical conductors (that are attached or internal to the strap). Such electrical conductors can be coupled to a speaker to produce audio output to the speaker, or can be coupled to a microphone to receive audio input from the microphone. The speaker and/or microphone can also be attached to or integral with the strap.

[000169] Note that in one embodiment, a pair of glasses does not have to include lenses. Also, a number of embodiments have been described with a pair of glasses tethered to a base. In one embodiment, a pair of glasses includes a base and a cord connecting the base to the glasses.

[000170] In yet another embodiment, a pair of glasses also includes a sensor. FIG. 17A is a chart 900 that depicts examples of sensors in the glasses.

[000171] 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.

[000172] 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 eyewear is assumed to be worn. The motion detector can, for example, be achieved by a mechanical means or an accelerometer.

[000173] 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 the end of the temple, close to its hinge. If the temperature differential between the two sensors is beyond a certain preset value, the eyewear would be assumed to be worn. The differential is presumed to be caused by a person wearing the pair of glasses.

[000174] 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.

[000175] 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 fully extended outwards, the switch is turned on. The switch can be a pin. 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.

[000176] In one embodiment, another type of sensor is an environmental sensor. The environmental sensor can sense environmental conditions, such as one or more of ultraviolet radiation, temperature (e.g., ambient temperature), pressure, light, humidity and toxins (e.g., chemicals, radiation, etc.).

[000177] 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.

[000178] 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 sensors can by 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 auxiliary sensors can communicate with one another (wired or wirelessly) to exchange data or control information.

[000179] 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 particularly common for wire or metal frames. 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 tip. There can also be a connector, such as the connector 300 shown in FIG. 5, at the temple tip. In another embodiment, the temple tip can include a female connector, which can be similar to the female connector 310 shown in FIG. 6B. As the temple tip grabs onto the main body of the temple, the female connector can make electrical contact with 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 a lot of difficulties. Such a temple tip can be an after-market component, with different temple tips having different electrical components to serve different functions.

[000180] FIG. 17B is a diagram of a temple arrangement 910 according to one embodiment of the invention. In this arrangement, a temple tip is not considered as a part of the temple. The temple arrangement 910 includes a temple 912 that

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is associated with a pair of eyeglasses. Over the end of the temple 912 that is opposite the associated lens holder, a temple tip 914 is provided. The temple tip 914 can be held to the temple 912 by frictional forces and/or adhesive. The temple tip 914 includes at least one electrical component 916 that is at least partially embedded therein. The temple tip 914 can be manufactured and delivered to resellers or retailers as such. Alternatively, the temple tip 914 can be separately provided as an optional replacement temple tip for an existing temple tip. Hence, as after manufacture, upgrade to the eyewear can be had through replacing the existing temple tip with the replacement temple tip. The colors and shapes of the temple tip 914 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 tip that reasonably matches the color and shape of the temple or that provides an altered appearance as desired by the user.

[000181] Besides a replacement temple tip such as illustrated in FIG. 17B, a temple tip can also be effectively modified by a fit-over temple or temple cover. FIG. 17C is a diagram of a temple cover 920 that at least partially covers a temple (e.g., temple 912) according to one embodiment of the invention. As another example, the temple cover 920 can be a fabric or other material, such as a sock or sleeve, that slides over and at least partially covers a temple tip. The temple cover 920 can include at one electrical component 922 that is either attached thereto or at least partially embedded therein. The temple cover 920 can also include an opening 924 so as to received a temple or a temple tip. The temple cover 920 can be held to a temple by frictional forces and/or adhesive. FIG. 17D is a diagram of a fit-over temple 926 that at least partially fits over a temple according to one embodiment of the invention. For example, the fit-over temple 926 can at least partial fit-over a temple tip. The fit-over temple 926 includes at one electrical component 928 that is either attached thereto or at least partially embedded therein. The fit-over temple 926 can also include an opening 930 so as to receive a temple. The fit-over temple 926 can be held to a temple by frictional forces and/or adhesive. As an example, the fit-over temple 926 can be plastic or other material. The colors and shapes of the fit-over temple 926 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 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.

[000182] In one embodiment, a 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.

[000183] In one embodiment, an electrical component is a component of an electrical circuit, and the electrical circuit is for performing at least a desired, intended or predetermined function.

[000184] A number of embodiments have been described above for an eyeglass frame, i.e., primary frame, are also applicable to an auxiliary frame. An auxiliary frame can attach to a primary frame through different techniques, such as using clips. Another technique to attach an auxiliary frame to a primary frame is by way of magnets. Examples of using magnets as an attachment technique can be found, for example, in U.S. Patent 6,012,811, entitled, "EYEGLASS FRAMES WITH MAGNETS AT BRIDGES FOR ATTACHMENT."

[000185] A number of embodiments have been described where one or more electrical components are at least partially embedded in a pair of glasses. In yet another embodiment, the one or more electrical components are at least partially embedded in an eye mask.

[000186] FIG. 18 shows one embodiment 925 where one or more electrical components are at least partially embedded in an eye mask 927. The eye mask 927 includes a piece of fabric that is opaque so that when the mask is worn, the mask wraps around the eyes to block light from entering into the eyes of the user.

[000187] The embodiment 925 includes a wrapping mechanism to hold the fabric onto the head of a user so that when the mask is worn by the user, the mechanism allows the fabric to have a relatively tight and comfortable fit over the

face of the user. In one approach the wrapping mechanism is achieved with the fabric in the shape of a band and having a certain degree of elasticity. When the mask is worn by the user, the elasticity of the fabric allows the mask to establish a relatively tight fit over the face of the user. In another example, the fabric is a long piece of material. The wrapping mechanism includes a clip or Velcro at the two ends of the piece of material to tie the two ends together. In another example, the wrapping mechanism includes two elastic pieces of elastic materials at the two ends of the fabric. To wear the mask, each elastic piece of material goes over one of the ears of the user so that the fabric establishes a relatively tight fit over the face of the user. In yet another embodiment, the mask 927 includes a notch 935 to accommodate the nose of the user. In another embodiment, there can be additional padding in the vicinity of the one or more electrical components so that if an electrical component is pressed against the user, the padding serves as a buffer or cushion.

[000188] In one embodiment, a speaker 929 can be at least partially embedded in the mask 927, and can be positioned close to and facing one of the ears of the user. The speaker 929, through an electrical connector, is electrically connected to a cable 931. The cable 931 can also have a connector 933 at its distal end. The connector 933 can be plugged into another device, such as a MP3 player or a CD player. After putting on the mask, with the connector 933 plugged into the another device, the user would be able to hear, for example, audio sounds such as music. The eyemask 925 can be applied to different areas. For example, the user can be on a plane, and would like to rest. The user can put on the eyemask 925, and plug the connector 933 into a media outlet at an armrest of her seat in the plane. Thus, the user can enjoy music while taking a rest. The embodiment 925 could also include a plurality of speakers, such as one for each of the user's ears.

[000189] In another embodiment, the eyemask 927 includes the speaker 929 and a battery that is electrically connected to the speaker 929. The battery can be in a pocket on the eyemask and can be replaceable. The battery can also be a rechargeable battery, such as a lithium-ion battery, and there is a connector at

least partially embedded in the eyemask. The connector can be used to recharge the battery.

[000190] FIG. 19 shows another embodiment 950 where one or more electrical components are at least partially embedded in a night cap 952. In one embodiment, the cap 952 is at least partially made of fabric. In another embodiment, the cap 952 is entirely made of fabric. The cap includes a wrapping mechanism. When the cap is worn, the wrapping mechanism holds the cap onto the head of the user, and allows the cap to have a relatively tight and comfortable fit over the head of the user. Again the wrapping mechanism can be an elastic band at the base 963 of the cap 952. Or, the wrapping mechanism can include clips or Velcro as previously described.

[000191] The cap can include at least one speaker 954, which is at least partially embedded in the cap 952. When the cap 952 is worn by a user, the speaker 954 is positioned close to and facing one of the ears of the user. The speaker 954 can, for example, be electrically connected through a connector to a device 962 in a pocket 960 on the cap 952. The electrical connection can be through a cable 956 external to the cap 952. The cable 956 also can have a connector 958 to be plugged into the device 962. In another embodiment, the cable 956 is embedded in the cap. The device 962 can be an asset player, such as a MP3 player, with a battery. Through the connector 958, audio signals from the device 962 can be received by the speaker 954 and heard by the user. There can be one or more additional pockets on the night cap for one or more additional electrical components. When worn, the night cap does not have to cover the eyes of the user. In yet another embodiment, when worn, the night cap further covers the eyes of the user, as shown in FIG. 19. In one embodiment, the embodiment 950 further includes padding in the vicinity of an electrical component to serve as a buffer or cushion between the user and the electrical component.

[000192] 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.

[000193] FIG. 20A is a diagram illustrating a temple 1000 having a slot for receiving a removable electronic device 1002 according to one embodiment of the invention. In one example, the removable electronic device 1002 can be a memory storage device, sometimes referred to as a memory card. As shown in FIG. 20A, the removable electronic device 1002 is inserted into the slot. Although the slot could be electrically non-functional, typically the slot provides an avenue for the removable electronic device 1002 to be physically and electrically connected to electrical circuitry within the temple 1000 or elsewhere within the eyeglass frame. FIG. 20B is a diagram illustrating the temple 1000 having a recessed lower portion 1004 according to another embodiment of the invention. The recessed lower portion 1004 facilitates the insertion and removal of the removable electronic device 1002. In either embodiment, the removable electronic device can be manually inserted and removed or can use more complicated mechanical mechanisms to assist with the insertion and removal (e.g., spring-based push and release structure).

[000194] FIGs. 21A and 21B are diagrams illustrating a pair of glasses 2100 having a camera 2101 coupled thereto, according to one embodiment. The camera includes an image sensor 2102 and a camera housing 2106 (also referred to as a camera support arm). In this embodiment, the camera 2101 is rotatably coupled to an exterior surface of a temple 2104 of the pair of glasses 2100. The camera support arm 2106 is attached to the temple 2104. The camera support arm 2106 can couple to the temple 2104 using a hinge 2108. In one implementation, the hinge 2108 can use a spring or cam mechanism so that the camera support arm 2106 is held either against the temple 2104 when not in use or held in an open or

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extended position when in use. FIG. 21A illustrates one position of the camera support arm 2106 when the camera 2101 is not in use. FIG. 21B illustrates one position of the camera support arm 2106 when the camera 2101 is in use. The presence of the camera 2101 with the pair of eyeglasses 2100 enables a wearer of the pair of eyeglasses 2100 to take pictures of what the wearer is looking at. It should be noted that other supporting circuitry such as data storage for pictures, switches, battery, and electronics for the camera 2101 can be in the temple 2104, in the camera support arm 2106, elsewhere in the pair of glasses 2100, or even tethered thereto. However, in one implementation, the camera 2101 is completely self-contained in the camera housing 2106. In one embodiment, the hinge 2108 can also serve as a switch to turn the image sensor 2102 on or off.

[000195] In one implementation, to improve overall appearance of the pair of glasses 2100, the temple 2100 can provide a recess for receiving the camera support arm 2106 when the camera is not being utilized. Such may improve the aesthetic appearance of the pair of glasses 2100.

[000196] In another implementation, the pair of glasses 2100 can further provide a viewfinder. The viewfinder can assist the user in directing the image sensor 2102 towards whenever the user desired to photograph. The viewfinder can be a separate apparatus that is extended by user action or can be a viewfinder that is visually present or presented on one of the lenses. In one example, the viewfinder can be an extendable viewer through which the user can look through to determine the field of reference of the image sensor 2102. The viewfinder can be extendible from either of the temples, such as in a telescoping, sliding or flipping action. Additionally, when the camera support arm 2106 is extended, a viewfinder can be automatically initiated. For example, indicators on one of the lens can be visually presented, such as through optical projection from one or more light sources. In another embodiment, the viewfinder can be always present, such as with indicators on one of the lens of the pair of glasses 2100. The indicators can be a few faint dots to define an area (e.g., a square) on the lens.

[000197] In one embodiment, the camera support arm (camera housing) 2106 is removably coupled to the hinge 2108. As such, the camera 2101 can be removed from or attached to the pair of glasses 2100. Indeed, the camera support arm (camera housing) 2106 can be a camera body that houses electronics for the camera 2101. In such case, the camera 2101 can operate as a camera apart from the pair of glasses 2100.

[000198] In one implementation, the camera support arm 2106 has a connector and the hinge 2108 has a counterpart connector. In one example, the connectors are peripheral bus connectors, such as USB connectors. In such case, the camera support arm 2106 can be attached and removed from the pair of glasses 2100. Such a connection via the connectors can be electrically functional or non-functional. If functional, electrical components in the pair of glasses 2100 can be electrically connected to electrical components in the camera 2101.

[000199] Still further, in one embodiment, the connector at the end of the hinge 2108 enables connection of a variety of different peripheral devices to the pair of glasses 2100. For example, the different peripheral devices (portable electronic devices) can be the camera, a memory card, or a media player. In one embodiment, electrical components integral with the pair of glasses 2100 can be shared by the different peripheral components. The hinge 2108 is not necessary in other embodiments, see FIGs. 8F-8H, where a connector is attached or integral with a temple of a pair of glasses. If desired, the camera 2101 or other peripheral devices can include in its structure a hinge or other mechanism to permit positioning the camera or other peripheral devices.

[000200] In still another embodiment, an angled or hinged adapter can be inserted between a connector attached to the pair of glasses 2100 and a connector of the camera 2101 or other peripheral devices. The adapter can be electrically functional or non-functional.

[000201] In yet in another embodiment, a pair of glasses functioning as a headset with a speaker and a microphone further includes a camera. FIG. 22 is a diagram of a pair of glasses 2200 having a camera according to one embodiment

of the invention. The glasses 2200 include a temple 2205 that has a microphone 2204, a speaker 2206 and a camera 2208 with a connector 2210. The connector 2210 is for connecting, for example, to another electronic device that provides at least one of data or information transfer capabilities or a power source for the glasses.

[000202] In one embodiment, the camera 2208 is a digital camera with an on/off switch 2212. For example, the camera 2208 is a CCD camera including a CCD controller coupled to a CCD chip to capture images, a CCD memory device and a lens.

[000203] In one embodiment, with the connector 2210 connected to another electronic device (e.g., a portable electronic device), when the switch 2212 is pushed on, the CCD chip takes a picture. The charges in the CCD chip are digitized and transmitted through the connector 2210 to the other electronic device, under the management of the controller. At least some of the charges can be temporarily stored in the CCD memory device, for example, to accommodate the differences in speed in taking pictures and sending the pictures to the portable device through the connector. In this embodiment, images can be stored at the other electronic device. In another embodiment, the glasses can include sufficient data storage capabilities to store the pictures, at least until transferred to another electronic device.

[000204] In one embodiment, the glasses do not offer focusing capability. The CCD chip can be located, for example, at the focal point of the lens. In another embodiment, there is an image distance control knob. For example, a mechanical lever can be pre-programmed or pre-set to move the lens to one or more different positions. In one implementation, there can be just two positions. One position can be for close-up shots and another for distance shots, such as close-up being about 2 ft from the lens and the distant being about 6 ft away; or close-up being about 8 inches away and distant being about 2 ft away.

[000205] FIG. 22 shows one embodiment regarding the location of the camera 2208 at the end of the temple or arm 2205 of the glasses 2200 next to the hinge.

The lens of the camera faces forward. In this situation, what the user sees is substantially what the captured image would be. In other words, in a general sense, what the user sees through the glasses is what the user gets, without the need for an additional view finder. With such an embodiment, it is relatively easy for a user to take pictures, hands-free, without the need for an additional strap for holding the camera.

[000206] The connector 2210 at the end of the glasses 2200 can be, for example, a 4-terminal connector, one for ground, one for power and the other two for transmit and receive signals. In another embodiment, the connector 2210 can be a 3-terminal connector, with the power line and one of the signal lines sharing one terminal.

[000207] Regarding the embodiment shown in FIG. 22, the speaker 2206 can be in the glasses, with a tube 2216 and an ear bud 2218, to help bring audio signals to the user. In one embodiment, the tube 2216 can be rotated at its end where it connects to the glasses. In another embodiment, the speaker 2206 can be provided at the ear bud 2218.

[000208] In one embodiment, the CCD chip with the CCD memory device and the CCD controller are on the same integrated circuit.

[000209] The embodiment shown in FIG. 22 also includes a microphone 2204. In one embodiment, the CCD memory device also stores audio signals from the microphone 2204. For example, the memory device stores a duration of time, such as the last 15 seconds, of audio signals. When the user takes a picture, a duration of time before taking the picture, such as the previous 15 seconds, audio signals can be coupled to the picture. Another duration of time after taking the picture, such as the next 10 seconds, of audio signals can also be coupled to the picture. In one embodiment, the audio picked up can include environmental sounds present at that time. The audio signals or the digitized version of the audio signals can also be transmitted to the other electronic device with the corresponding picture. In the future, if the user wants to view the picture, the audio signals can be played with the picture at the same time. As another example, the user can provide

an auditory annotation to the pictures being taken. Here, the user can leave a specific audio message to be associated with the picture. For example, the user might take a picture of his childhood home and record an audio annotation, “This is where I grew up”.

[000210] In one embodiment, a pair of glasses functions as a headset with a speaker, a microphone and a camera. The pair of glasses can be coupled to another electronic device through a connector of the glasses. Additional electrical components, such as those in the other electronic device, like a portable device, for the glasses can be incorporated in the glasses. For example, the power source can also be in the glasses and the glasses do not have to include a connector. In one embodiment, the glasses include non-volatile memory to store at least a number of pictures. In another embodiment, the glasses further include a connector to receive a memory card, such as a flash memory device. The card can be a standard memory card with a USB connector. Pictures taken can be stored in the removable memory card.

[000211] In yet another embodiment for the glasses with a camera, the glasses do not include a speaker or a microphone. The glasses include a temple that has a CCD controller coupled to a CCD chip, a CCD memory device and a lens. The temple also includes an on/off switch with a connector. The connector is for connecting, for example, to a portable device that includes at least a power source for the camera.

[000212] In still another embodiment, an auditory feedback by a speaker is provided or coupled to a pair of glasses. For example, a clicking or “snapshot” sound can be output when a picture is taken (such as when a user initiates the picture taking).

[000213] Additional disclosure on camera in glasses can be found in U.S. Provisional Application No. 60/583,169, filed on June 22, 2004, which is hereby incorporated by reference.

[000214] A number of electrical components have been described. They can be on circuit boards, which can be made of flexible materials. They can be on a substrate. They can also be integrated into one or more integrated circuits.

[000215] FIG. 23A is a diagram of a pair of glasses (i.e., eyeglass frame) 2300 having a camera according to one embodiment of the invention. The eyeglass frame 2300 illustrated in FIG. 23A includes a lens holder 2302 holding a lens 2304 and a lens holder 2306 holding a lens 2308. The eyeglass frame 2300 also includes temples 2309 and 2310. In the embodiment shown in FIG. 23A, the temple 2310 includes a camera 2312, supporting electronics 2314 and a switch (e.g., button) 2316. In one embodiment, the camera 2312 includes a CCD chip. The camera 2312 can also include a lens and buffer memory. In one embodiment, the electronics 2314 illustrated in FIG. 23A can be embedded within the temple 2310. The electronics 2314 can include at least a microcontroller (e.g., an image processor), a memory, and a battery. These electronics 2314 can support the camera 2312. The eyeglass frame 2300 can further include various other electrical components. For example, the eyeglass frame 2300 can further include one or more of: a microphone, an earphone, a removable memory, a display, a clock, and a Global Positioning System (GPS). These electrical components can be used in conjunction with the camera 2312 or separately from the camera 2312. The button 2316 enables a wearer of the eyeglass frame 2300 to turn the camera 2312 on/off and/or to cause a picture to be taken (recorded). For example, by pushing the button 2316 for more than a few seconds, the camera will be turned off. However, by pushing and releasing the button 2316, the camera takes a picture.

[000216] Still further, in the embodiment of the eyeglass frame 2300 shown in FIG. 23A, the eyeglass frame 2300 further includes a view finder 2318 and an angled surface 2320. Other embodiments of eyeglass frames need not include such features. Nevertheless, the view finder 2318 can assist a wearer (i.e., user) of the eyeglass frame 2300 in understanding the frame of the image (picture) being captured by the camera 2312. In this example, the view finder 2318 is provided on the lens 2304 in a visible, yet non-distracting manner. As shown in FIG. 23A, the view finder 2318 can be positioned such the wearer can direct the image (picture)

to be captured. For example, the wearer would orient their head (using the view finder 2318) to direct the camera 2312 towards the desired subject. Also, the angled surface 2320 allows mounting the camera 2312 in an angled manner. As a result, the direction of the camera 2312 is not straight forward but out towards the side. This facilitates the wearer in directing the camera 2312 using a single eye via the lens 2304, and more particularly via the view finder 2318 if provided. The outward angle from straight forward being utilized by the camera 2312 can vary with implementation. For example, the outward angle can be in the range of 10-70 degrees or more particularly in the range of 15-60 degrees, or more particularly in the range of 20-40 degrees from the perpendicular direction of the plane of a front surface of the eyeglass frame 2300. In one embodiment, with the camera positioned at an angle, the lens holder 2302 would not block the field of view of the camera even with the camera being positioned at a distance behind the lens holder 2302.

[000217] Although the camera 2312 is provided on the left side of the pair of glasses 2300 as shown in FIG. 23A, it should be understood that the camera could alternatively or additionally be provided on the right side of the glasses.

[000218] FIG. 23B is a diagram of a pair of glasses (i.e., eyeglass frame) 2300' according to another embodiment. In this embodiment, the eyeglass frame 2300' is similar to the eyeglass frame 2300 illustrated in FIG. 23A. However, the eyeglass frame 2300' further includes a connector 2322 and a memory card 2324. More particularly, the temple 2310 includes a region 2326 larger than the temple region shown in FIG. 23A. The larger or enlarged region can provide additional space for the connector 2322 and the memory card 2324. The memory card 2324 can be operatively connected electrically to the electronics 2314 within the temple 2310 via the connector 2322. The connector 2322 also can serve to provide a physical connection of the memory card 2324 to the eyeglass frame 2300. In one embodiment, such physical connection is removable so that the memory card 2324 can be connected to or removed from the temple 2310. Accordingly, the memory card 2324 can facilitate porting of data or information (e.g., pictures) from the eyeglass frame 2300' to another electronic device (e.g., computer). As an

example, the connector 2322 can be a USB connector or other peripheral type connector.

[000219] The eyeglass frame having a camera according to one embodiment of the invention can further include one or more sensors. For example, the one or more sensors can include one or more of a “being worn” sensor, a motion sensor, and a light sensor. These sensors can be used to influence operation of the camera provided with the eyeglass frame. For example, a “being worn” sensor can be used to determine whether the eyeglass frame is being worn by a user. If the eyeglass frame is not being worn, then the camera can be deactivated to prevent unnecessary battery consumption and/or to prevent pictures from being taken. As an example, if the camera is operated to automatically, periodically take a picture, then if the eyeglasses are not being worn, the automatic picture taking process could be stopped. In one embodiment, a motion sensor can be used in a variety of ways. A motion indication can indicate a rate of activity of the user. For example, the rate of activity could be used to avoid taking pictures during periods of high activity, such as rapid movements of the eyeglass frame (or the corresponding user), or to influence image processing, such as exposure rate. As another example, the rate of activity can be used to control the rate pictures are taken such as in the automatic picture taking example. In one embodiment, a light sensor can indicate the degree of light in the vicinity of the camera. The light indication can influence the image processing, such as exposure rate of the camera.

[000220] In one embodiment, in an automatic picture taking example, the location, time or device resources (e.g., available memory) can also be used to control the rate pictures are taken. Also, the ability of the eyeglass frame to know or acquire time and/or location information (such as the location of the eyeglass frame or the corresponding user) can enable pictures taken by the camera to be stored along with time and/or location indications.

[000221] The eyeglass frame having a camera according to one embodiment of the invention can further include a global positioning system (GPS). The information from the GPS can be used to alter configuration settings and/or

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influence operation of the camera. For example, the configuration settings can be different at night versus during daytime or can be different depending on time or location. As another example, the camera can take pictures depending on location. In one implementation, the camera can automatically take pictures dependent on a change in location. For example, after taking a picture, the camera can take a subsequent picture when the change in location exceeds a predetermined threshold.

[000222] In one embodiment, the camera utilized in the various embodiments is a digital camera, namely, a digital image capture device. The camera can be a still camera or a motion camera (i.e., video camera). The camera can be designed for manual focusing, auto-focusing, or predetermined fixed focusing. The camera can also support a wide angle or panoramic view.

[000223] FIG. 24 is a side view of a pair of eyeglasses (i.e., eyeglass frame) 2400 according to another embodiment of the invention. The eyeglasses 2400 include a lens holder 2402 for a lens 2404. The lens holder 2402 is for the left side of the eyeglasses 2400. A bridge 2406 couples the lens holder 2402 to another lens holder for the right side of the eyeglasses. In this embodiment, the lens 2404 and the lens holder 2402 extend substantially around the side and are sometimes referred to as “wrap-around” type frames. The eyeglasses 2400 include a temple having a forward temple portion 2408 and a rearward temple portion 2410. Typically, the lens holder 2402, the temple 2406, the forward temple portion 2408 and the rearward temple portion 2410 are integrally formed as a single structure. The eyeglasses 2400 also support audio output to a wearer of the eyeglasses 2400. To support audio, the eyeglasses 2400 include an ear bud 2412, which serves as a speaker, and an extension arm 2414. In this embodiment, the extension arm 2414 couples the ear bud 2412 to the forward temple portion 2408. The extension arm 2414 can be pliable so that the wearer can adjust the position of the ear bud 2412. In further support of audio, the eyeglasses 2400 couple to a cable 2416. The cable 2416 provides audio signals to the ear bud 2412 via at least one electrical conductor extending through the cable 2416 and the extension arm 2414 to the ear bud 2412. In one implementation, one end of the cable 2416 has

a connector 2418 and the other end is integral with or connected to the forward temple portion 2408. The connector 2418 can connect to a media output device, such as a portable media player (e.g., radio, MP3 player, CD player, etc.). In another implementation, the cable 2416 can have a connector, such as a plug, that connects to a jack 2420 embedded in the forward temple portion 2408, thereby allowing the cable 2416 to detach from the eyeglasses 2400. Alternatively, the cable 2416 can directly connect to the media output device without the use of the connector 2418. Optionally, the eyeglasses 2400 can also support audio input by providing a microphone with the eyeglasses 2400. In one embodiment, with a microphone, the eyeglasses 2400 serve as a headset for a phone.

[000224] Regardless of the electrical components being utilized with the eyeglass frames, it may be desirable for the eyeglass frames to be substantially balanced in weight. In the event that electrical components are attached and/or at least partially embedded in one of the temples of the eyeglass frame, the other of the temples can include other electrical components or even a counter weight so that the eyeglass frame can be substantially balanced.

[000225] Fig. 25 shows one embodiment of the present invention. The embodiment includes a pair of glasses 3010 with a first lens holder 3012 and a second lens holder 3014. Both lens holders are for receiving lenses. The first lens holder 3012 has a first side and a second side. The second lens holder 3014 also has a first side and a second side. The pair of glasses has a bridge element 3016. The bridge element is coupled to the first side of the first lens holder 3012 and the second side of the second lens holder 3014. In one embodiment, the lens holders and the bridge element are not separate pieces, but are an integral piece.

[000226] The pair of glasses 3010 also includes a first temple 3016 and a second temple 3018. The first temple 3016 is pivotally secured to the second side of the first lens holder 3012 through a joint 3020. And, the second temple 3018 is pivotally secured to the first side of the second lens holder 3014 through another joint 3022. The glasses 3010 further include a speaker 3024, a power source 3026 and a switch 3028. The speaker 3024 is powered by the power source 3026, and the switch 3028 is used to turn the speaker 3024 on and off. The pair of glasses

3010 can deliver information through the speaker 3024 to the wearer or user of the glasses 3010. In one embodiment, the information is available for a duration of time. With the speaker 3024 close to at least one of ears of the wearer of the glasses 3010, the information provided to the user can be provided in a relatively private manner.

[000227] In different embodiments, the glasses 3010 can be a pair of sunglasses, fit-over glasses, prescription glasses or other types of glasses. In a number of embodiments, the frames of the glasses have more surface area than frames with minimal structure, such as those frames with lenses connected together by wires. For example, the temples of the glasses can have a tapered profile. Each of the temples is wider or broader when it is close to its corresponding joint. In one embodiment, the temple is wider or broader by spanning across a wider or broader area longitudinally downward, creating a bigger surface in an orientation generally parallel to the side of the user's head. FIG. 25 shows an example of such an embodiment.

[000228] In another embodiment, there can be a shield at least at one edge of each of the lens holders of the glasses. These shields can wrap around, or better conform to the profile of, the face of the wearer. The shields can be opaque. There can be transparent or translucent windows on these shields. To illustrate, in fit-over sunglasses, when worn over a pair of prescription glasses, such shields can go over or cover at least a portion of the pair of prescription glasses. Note that in one embodiment, a pair of glasses does not have to include lenses.

[000229] In one embodiment, a pair of glasses is for an event. An event can be viewed from the perspective of one or more organizations sponsoring or organizing the event. These events can be, for example, a basketball game, a concert, or a trade show. These events are provided or sponsored by one or more organizations or companies. In a number of embodiments where information is available from a speaker at a pair of glasses and the glasses are for an event, the information made available from the speaker is related to the event. In such embodiments, the information can be available for only a limited duration of time and the duration is associated with the event, which can include some time (such

as buffer time) before the event and some time after the event. When the event is over, which can include any post-event buffer time, the information will generally not be available.

[000230] In another embodiment, an event can be viewed from the perspective of the person at the event. From the perspective of the person, an event can be buying a product from a store. This can be considered an event from the point of view of the person at the event. Typically, it has a beginning, it has an end, and there is a purpose or a theme. The information is available to the person when the person is at or proximate to a location associated with the event, such as a building. When the person is away from the location, the information will not be available.

[000231] In one embodiment, the duration of an event is not more than a week. In another embodiment, the duration is not more than a day. In yet another embodiment, the duration of an event is not more than a few hours, such as nine hours.

[000232] In one embodiment, there is advertising or promotional material on a pair of glasses, and the material is related to an event. The material can be on the surface area provided by temples, shields or other areas on a pair of glasses. For example, if the event is about dinosaurs in the Jurassic period provided by an organization, there can be a Brachiosaurus printed on the glasses. The organization can use the surface area on the glasses as places for advertisement of not only the event, but also the organization itself. The organization can also sell such surface area to other companies, which can provide additional promotional material on the glasses.

[000233] Referring back to FIG. 25, it shows one embodiment of the invention where there is a speaker 3024 in one of the temples 3018 of the glasses 3010.

[000234] In one embodiment, the information is available for a duration of time, which can be short. For example, the power source 3026, which can be a battery, may not have enough power to run the speaker 3024 in its full capacity for a long duration. To illustrate, the battery 3026 only has enough power to run the speaker continuously for a short duration of time, which can be less than a few hours with the speaker 3024 at its highest volume possible, when it is turned on by the switch

3028 in the glasses 3010. The battery 3026 can be encapsulated in the glasses 3010, such as in one of the temples 3018 of the glasses 3010. The battery 3026 can be a coin battery or a AAA battery, or other types of batteries. In one implementation, the glasses are designed such that the battery 3026 is not easily replaceable by the user. The battery 3026 can be inside a temple and the temple can be sealed so that the battery 3026 is typically not replaceable without breaking the temple.

[000235] Fig. 26 shows a number of attributes regarding the applications of the glasses, such as the glasses shown in Fig. 25, according to different embodiments of the invention.

[000236] In one embodiment, the information provided by the glasses can be driven by an event organized by an organization 3050. For example, the user is at a football game in a stadium. The information can be related to a star player, such as his statistics, or other interesting information regarding the team. The information can be for an event related to the event at the stadium. For example, the user is at the Stanford Stadium watching the game between the Stanford and the Berkeley football teams. However, periodic update information or other types of information, such as play-by-play information, from a game at the UCLA Stadium between UCLA and USC can be provided to the user. All four teams are vying for the PAC 10 title. The user at the Stanford Stadium, who might be an UCLA fan, can hear about how the UCLA team is performing, while watching the Stanford/Berkeley game.

[000237] In the embodiments where information is available from the glasses, the information is available hands-free. This allows the user to use both of his hands totally freely, for whatever other purposes the user prefers, including providing different gestures.

[000238] In the embodiments where information is available, such as through a radio, the information can be available almost instantaneously when the electrical components in the embodiments are activated or turned on. This can be important during high intensity games. If it takes 30 seconds to start the system before

information is available, such down time may not be available or tolerable during the games.

[000239] The user in an event may not be the audience or the observer of the event. In one embodiment, the user using a pair of glasses in the present invention not only attends the event, the person also helps to produce the event. For example, the event is a game, and the person is a coach of one of the teams playing in the game. Additional embodiments will be described where a pair of glasses is coupled to a handheld device. The glasses provide information to the coach, who can use the handheld device for a number of purposes, such as to track plays or calls.

[000240] In one embodiment, the information available at a pair of glasses can be advertising materials available during the break time of a game. The advertising materials can, for example, be from a company organizing or sponsoring the event, or from one of the teams in the event.

[000241] As another example, the event is an indoor event, such as an indoor concert.

[000242] The information can be location driven 3052, which in one embodiment can be considered as an event attended by a user when the user is at the location. For example, the user is in a store, with many products. The products can be services. As the user moves around the store, he looks at different products. In one approach, each product is designated by a number. By entering the specific number into the glasses or into a portable device coupled to the glasses, such as through a switch, information pertinent to the corresponding product will be available to the user. As another example, the user can be in an exhibit hall, a trade show or in a museum. As the user strolls in the hall, information of different exhibits is available to him. Or, the user can be walking around a botanical garden, and is given a virtual, unguided tour by the glasses of the different type of plants in the garden. When the user moves away from such locations, the information will not be available.

[000243] The user can be at places where he is alone, or he does not know anybody. He might be bored. For example, he can be in a dental office having his

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teeth cleaned. Or, he can be in a bank waiting for his turn. Different types of information can be available to him. For example, if the bank has a new home loan program, such information is available to him. Again, when the user moves away from such location, the information will not be available.

[000244] The information can be for entertaining 3054 the user. Or, the information is primarily promotional 3056 in nature. The promotion can be related to the event the user is participating, or the promotion can be related to the location, such as the company associated with the user's location.

[000245] The information can be in different languages 3058. For example, glasses with a red dot provide information in English, while glasses with a white dot provide information in Spanish. Or, there can be a switch on the glasses that allows setting the language to that preferred by the user.

[000246] The glasses can be given away 3060. They can be sold at a relatively low price 3062. Or, the glasses can be for temporarily use, such as the user can borrow, rent or lease 3064 the glasses for a short duration of time. To track such glasses after they have been rented, each pair of glasses can have an identifier, such as a bar code. The bar code can be located on the inside of the glasses, such as on the inside of a temple of the glasses. In another embodiment, each pair of glasses can also or alternatively have a RFID tag, which can be wirelessly tracked. The tag can be in a temple, such as in the vicinity of the tip of the temple, or its temple tip. A temple tip is, in general, in a region of the temple substantially furthest away from the hinge of that temple. The organization responsible for renting out the glasses can ask for the user's identity card, which can be the user's driver's license. The card is then linked to the bar code, the RFID tag or other identifier of the glasses. When the user returns the glasses, the user can reclaim the corresponding identity card.

[000247] Referring back to Fig. 25, the embodiment 3010 includes a speaker 3024 that is at least partially embedded into the glasses. There are different approaches to embed an electrical component, such as a speaker, into different types of glasses. A number of approaches are described, for example, in the various related patent application noted above.

[000248] In one embodiment, the pair of glasses 3010 shown in FIG. 25 includes a radio, and the speaker is a part of the radio. All the electronics for the radio are at least partially embedded in the glasses. For example, the electronics can be on a printed circuit board, and the board is in one of the temples of the glasses. Information is provided to the user through the radio. The radio can be an AM or a FM receiver. In one embodiment, the receiver is pretuned to the frequencies of the transmitter of the information. Or, before the glasses are distributed, the radio is set to receive signals from a specific frequency band. Also the radio may not include an external tuner or switch on the glasses for the user to tune the radio to listen to another frequency band. In another embodiment, the receiver is tunable by a switch on the glasses to one or more frequencies.

[000249] The information can be information captured by a microphone or other pickup device, and transmitted over radio frequency waves to the radio.

[000250] As to the transmitted frequencies, typically government agencies, such as the FCC in the United States, regulate the availability of frequency ranges, particularly when the power of transmission is not low. In one embodiment, the transmitted frequencies can be on either side of the standard FM radio bands. They can be within the television VHF frequency range of 50 megahertz to 150 megahertz, or 49 to 88 MHz, or 108 to 220 MHz. Selecting such frequencies can have the advantage of having receiver components more readily available and less expensive. But, the frequencies selected may vary depending on costs, performance and/or FCC or other government agency requirements.

[000251] In another embodiment, the transmitted frequencies are in the CB (Citizen Band) radio band.

[000252] In yet another embodiment, the transmitted frequencies are FM-sidebands. This would allow the use of FM sideband receivers. Using such sidebands typically would require a lease from radio stations.

[000253] In one embodiment, information is transmitted to the glasses through a Wi-Fi network, or a WiMax network.

[000254] Also, the frequencies transmitted could be based on spread spectrum techniques. In other words, though the frequencies would constantly

change, the transmitter and the receiver would be synchronized following the changing frequencies. In a number of countries, such embodiments do not require government license.

[000255] Information can typically reside within a few MHz. In one embodiment, the radio in the glasses is a narrow-band receiver, with a bandwidth of 3-6 MHz.

[000256] In yet another embodiment, the radio can receive signals from one of multiple and proximate AM modulated frequencies. For example, in a museum, information from adjacent artwork can be transmitted based on frequencies centered at the different frequencies. The radio receiver is a broader band AM receiver, which can be a receiver non-tunable by the user. Depending on proximity, the radio will adjust automatically to capture the frequency of the carrier for information regarding the particular artwork and excludes cross-talks from information regarding its immediate adjacent artworks.

[000257] Another embodiment considers the power level of the transmitted signals. If the power level of the transmitted signals is low, signals do not travel an excessive distance beyond the transmitter of the signals. For example, the low power level can be between ¼ to ½ watts. Or, the low power level is not more than 50 milliwatts. If the transmitted power level is low, it is relatively easier to meet government agencies, such as the FCC's, guidelines. Cost and complexity of the circuitry are usually also reduced. High power transmission typically requires special government approval.

[000258] In one embodiment, the transmission path between the transmitter and the receiver is primarily line of sight, and the information can be transmitted via, for example, infrared.

[000259] In yet another embodiment, there can be multiple transmitters. This can then keep transmission power low even if a large or unusually shaped area is to be covered. The corresponding radio will capture its signals from the transmitters based on proximity.

[000260] In one embodiment, the frequency of the radio cannot be tuned at the glasses by the user. The frequencies are fixed upon distribution of the glasses.

In another embodiment, the frequencies of interest can be changed. For example, there can be an EPROM in the glasses that can be programmed. Or, one can replace a chip in the glasses to adjust the frequencies. In yet another embodiment, there can be one or more switches at the glasses to change the frequencies.

[000261] A number of embodiments have been described where the glasses include a radio to receive broadcast information. In another embodiment, the information to be received is previously programmed or recorded within a memory device. The glasses include a player to play the information stored in the memory device, and the player includes a speaker. The player is at least partially embedded in the glasses. In one embodiment, the glasses can include the memory device with the recorded information.

[000262] The memory can be on a printed-circuit board and, for example, can store up to 256 MB. The memory can be a built-in or removable flash memory. In one embodiment, the glasses include one or more connectors. The memory embedded in the glasses can be coupled to a device external to the glasses through the one or more connectors. As an example, a 256 MB flash memory is in one of the temples of a pair of glasses, and there is a USB connector at, for example, the end of that temple (close to the ear) to couple to an external device or instrument.

[000263] With the storage medium embedded, the glasses can upload information in the memory to or download information into the memory from an external device, such as a computer. A user can couple the glasses into the computer through a connector, either directly or indirectly. For example, indirect coupling might use an intermediate wire between the computer and the glasses.

[000264] In yet another embodiment, the memory device is external to the glasses. The memory device is coupled to the glasses through a connector at the glasses. If such removable memories are deployed for an event, the memories can be rented out during the event. Again, such memories can be tracked based on, for example, identifiers stored in the memories, or attached to the memories.

[000265] FIG. 27 shows some of the electrical components for a player 3100 in a glasses according to an embodiment of the invention. The player includes a

speaker 3102, a data bus 3104 to facilitate data transfer among, for example, a processor 3106, a storage device 3108, and a coder/decoder (CODEC) 3110. The processor 3106, which can be a microprocessor or controller, controls the operation of the player 3100. The storage device 3108 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 3108 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 3108. The storage device 3108 typically also includes a Read-Only Memory (ROM), which stores programs, utilities or processes to be executed in a non-volatile manner. The player 3100 can also include a RAM, such as for the cache.

[000266] Once a piece of information is selected to be played, the processor 3106 would supply the piece of information to the CODEC 3110, which decompresses the media data and produces analog output signals for the speaker 3102. In one embodiment, the bus 3104 is also coupled to an input/output device 3112, which would allow information to be downloaded from an instrument to the glasses.

[000267] There are different approaches to identify a piece of information to be played. In one embodiment, different pieces of information in the storage device 3108 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

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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.

[000268] 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 will be further discussed below.

[000269] 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.

[000270] 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.

[000271] 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.

[000272] 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.

[000273] 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.

[000274] Fig. 28 illustrates a number of forces 3150 activating the switch according to different embodiments of the invention. They can be based on, for example, mechanical 3152, radiation 3154, magnetic 3156, electrical 3158, and temperature 3160.

[000275] FIG. 29 illustrates a number of mechanical forces 3152 activating the switch according to different embodiments of the invention. The mechanical switch or sensor can be a conductive-elastomer switch 3202, a membrane switch 3204, a dome switch 3206, a relatively simple wire switch 3208, and a roller switch 3210, such as a switch including a wheel. Another type of mechanical force can be based on stress 3211, such as a switch based on piezoelectric force or a piezoelectric device.

[000276] 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 3216 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, 3216, such as a ribbon, positioned between the terminal and the contact. Though the circuit is embedded in the glasses, the insulating material 3216 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 the insulating material out from the glasses, the terminal will establish electrical connection with the contact, activating the circuit and turning the speaker on.

[000277] In another embodiment of a switch based on mechanical force 3152, the mechanical force is the force that is used to insert 3218 a battery into the glasses. Once the battery is inserted, the speaker in the glasses will be activated. The speaker will remain on until the battery is removed, or until the power in the battery is drained.

[000278] The switch can also be activated by radiation 3154, or energies in a type of radiation, according to a number of embodiments of the invention. The radiation 3154 can be in the optical, or infrared or ultraviolet range. For example, the switch includes a photodiode or photo sensor in the glasses, and there is an opening above the photodiode. In one embodiment, the diode is activated by light getting to the diode through the opening. In another embodiment, the circuit is activated if the opening is covered to prevent light from getting to the diode.

[000279] The switch can be activated by magnetic forces 3156. 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. FIG. 30 shows a section of a pair of glasses 3250 with such a detector 3254. The detector 3254 is electrically connected to a printed circuit board 3255. When the temple 3252 is in its extended position, as when the glasses 3250 are ready to be worn, the detector 3254 will be directly adjacent to a magnet 3256 inside a lens holder 3258 at the corresponding joint 3260. The

magnet 3256 would activate the Hall effect detector 3254. 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.

[000280] The switch can be activated depending on electrical forces 3158. In one embodiment, the electrical force depends on capacitive effect. By changing the capacitance, the switch is turned on and off. For example, the capacitance is changed by placing one's finger over a metallic pad. In another example, by changing the amount of overlap between two metallic sheets that are not in contact, the capacitance between the two metallic sheets will change. This then changes the range of control of the switch.

[000281] In another embodiment, the electrical force 3158 is based on resistive effect. For example, the switch is made up of a slide or a rotary potentiometer. By changing the amount of coupling, the amount of resistance is changed to reflect the range of control of the switch.

[000282] In one embodiment, the switch's activation can depend on temperature 3160. For example, the switch includes a temperature sensor. When the temperature reaches a certain point, the switch is activated.

[000283] In yet another embodiment, the switch is controlled by a remote controller. For example, the glasses include an infrared detector. The remote controller can generate infrared radiation. By aiming the controller at the detector, the infrared radiation can activate the infrared detector and the switch is activated. Or, if the user moves into the vicinity of a corresponding infrared transmitter, circuits in the glasses would be activated.

[000284] The switch can include one or more previously-described sensor or detector of different types of forces. For example, the switch can use two photo sensors. One sensor is exposed to light on the outside surface of the temple and the other is exposed to light on the inside surface of the temple, such as close to the ear. Based on their differential output, the switch is activated. As another example, there are two temperature sensors in the glasses. One is located close

to a joint and the other is at the temple close to the ear. Again, the switching action depends on their differential outputs. In yet another embodiment, the glasses include more than one type of switch. There can be one type of switch, such as a mechanical switch, acting as an on/off switch, and another, such as a switch using electrical forces, as an incremental switch to change frequency.

[000285] As described, in a number of embodiments, the switch can provide different degrees or ranges of control. In one embodiment, there are two degrees of control, such as in an on/off switch. In another embodiment, there can be multiple discrete degrees, steps or positions. For example, the switch is a roller with discrete notches to indicate different discrete positions. Or, there can be two mechanical switches, placed side-by-side. Pushing one switch will increment one step, and pushing the other will decrement one step.

[000286] In yet another embodiment, the change from one degree to the next is gradual and not noticeably discrete. This can be achieved with 2 sensors arranged in quadrature. FIGs. 31A-31C show examples of different embodiments of such a switch based on two photodiodes or photo detectors.

[000287] FIG. 31A shows an embodiment 3300 with a wheel 3302 (roller) having clear strips, 3304, 3306 and 3308, alternating with black strips, 3310, 3312 and 3314, and two photodiodes, 3316 and 3318. Most of the wheel 3302 and the two diodes, after incorporated into the temple 3320, are covered by a piece of material 3322. The two diodes, 3316 and 3318, are exposed to ambient light through a clear window 3324. A part of the wheel 3302 is extended out of the temple 3320, allowing the wheel 3302 to be turned about its axis 3326. The wheel 3302 can have teeth for friction turning. As the wheel 3302 rotates about the axis 3326, based on the differential outputs from the diodes, the direction of movement of the wheel 3302—clockwise or counterclockwise—is determined. For example, if the wheel 3302 is rotated clockwise, the top diode 3316 senses light before the bottom 3318 senses light. On the other hand, if the wheel 3302 is rotated counterclockwise, the bottom diode 3318 senses light before the top 3316. Based on the signals from the two diodes, one would be able to tell if the wheel is being turned clockwise or counterclockwise. Clockwise can denote increase and

counterclockwise can denote decrease. This embodiment can be used, for example, to change frequency. By turning the wheel 3302 clockwise, the frequency of the radio goes up. And, by turning the wheel 3302 counter-clockwise, the frequency goes down. Such a wheel 3302 is also applicable for other purposes, such as controlling the volume of a speaker.

[000288] FIG. 31B shows an embodiment 3350 with a wheel 3352 having black 3354 and reflecting 3356 strips, two photodiodes, 3358 and 3360, and a LED 3362. Again, most of the wheel, the two diodes and the LED are covered by a sheet of material 3364. If a reflecting strip 3356, instead of a black strip 3354, goes over a diode, more light from the LED will be reflected back and received by the diode. If a black strip 3354 goes over a diode, output from the diode will be significantly reduced. Again based on the signals from the diodes, the direction of rotation can be determined, which, in turn, can be used to indicate incrementing or decrementing outputs.

[000289] FIG. 31C shows an embodiment 3400 again using two photodiodes, 3402 and 3404, but without a wheel. The two diodes, 3402 and 3404, are exposed to ambient light unless they are covered. In this embodiment, whether the finger 3406 or another object is moving from the first diode 3402 to the second diode 3404, or from the second diode 3404 to the first diode 3402 can be determined based on the signals from the diodes. For example, the finger 3406 sliding in a forward direction would trigger a signal from the first diode 3402 before the second diode 3404. On the other hand, sliding the finger in a backward direction would trigger a signal from the second diode before the first diode. Thus, the outputs from the two diodes can show the direction of movement of the finger. One can then, for example, assign forward movement (from the first 3402 to the second 3404) as increment, and backward movement (from the second 3402 to the first 3402) as decrement.

[000290] A switch can be placed at different location on a pair of glasses. In one embodiment, the switch is positioned on one of the side surfaces of one of the temples, such as the side that is not facing the face of the user when the glasses are worn. In another embodiment, the switch is positioned on a top surface of one

of the temples. The switch 3028 shown in FIG. 25 falls under this category. In yet another embodiment, the switch is positioned at one of the joints or hinges of the glasses. For example, there is a mechanical switch at a joint. If the corresponding temple is extended, as in the position when the glasses are worn, the switch will be pressed, which can indicate that the switch has been activated.

[000291] In one embodiment, the user can be using a switch when the glasses are worn. Depending on the position and the type of switch, the user may not be able to see the switch when he is manipulating it. In one embodiment, the design of the switch takes into consideration perception. To illustrate, there are two mechanical switches on the glasses. The top surfaces of the two switches have different texture. One switch has a smooth surface and the other has a rough surface. Pushing the rough surface implies incrementing one step and pushing the smooth surface implies decrementing one step. This type of perception design is based on tactile effect. In another example, the heights of the two switches are different. The taller switch is for one effect and the shorter is for another. In yet another embodiment, the lateral position of the two switches has significance. For example, the two mechanical switches are on the top surface or edge of a temple. By pushing the switch closer to the lens holder, the volume of the speaker in the glasses goes up; and by pushing the switch further away from the lens holder, the volume of the speaker goes down. In another example, the two switches are under the two ends of a piece of materials, such as a rocker-lever, which can be plastic. Rocking the plastic piece forward is an increment motion, and rocking the plastic piece backwards is a decrement motion.

[000292] A number of embodiments have been described where information is available only for a relatively short duration of time. In one embodiment, the information is available for a longer duration of time. For example, after the short duration of time, the battery in the glasses is drained. In order to continue on running the electronics inside the glasses to get the information, the user can replace the battery in the glasses with a new battery. In this embodiment, the glasses are designed so that the battery is replaceable by the user. Or, in another embodiment, the battery is rechargeable through a connector at the glasses.

[000293] A number of embodiments have been described regarding the glasses with a speaker for providing information to the user. In one embodiment, the glasses also include one or more light emitting diodes. The LEDs can be for entertaining purposes. For example, the information provided to the user is music. If the audio signals received are beyond a certain threshold, one or more of the LEDs will be activated. The activation of the one or more LEDs can then be synchronized to the sound of the speaker. In another example, a number of LEDs could be arranged as an array on the outside surface of one of the temples. The array could display graphics, pictures, or scrolling text. The array could also be located at other locations on the glasses, such as across the front surface or the top surface of the bridge or the lens-holders of the glasses.

[000294] One embodiment of the glasses includes a specially-designed surface texture, such as on the outside surface of a temple of the glasses. By scratching the surface texture, depending on its design, one can generate specific audio tones.

[000295] A number of embodiments have been described regarding electrical components in a temple of a pair of glasses. All of the electronic components can be self-contained inside the temple of the glasses. The components can be coupled to a printed circuit board. In other embodiments, some of the components are embedded fully or partially in other areas of the glasses, such as the lens holders or the bridge of the glasses. Or, one or more electrical components can be in a shield of the glasses.

[000296] A number of embodiments have been described regarding information available for a pair of glasses. In one embodiment, a pair of glasses also includes an information input mechanism that allows its user to input information into the glasses. Such information allows the user to provide inputs or feedbacks.

[000297] The information input mechanism can be implemented by a switch at the glasses, such as one of the switches previously described. The user input can be stored in the glasses if the glasses include memory storage electrical components. The input can be wirelessly transmitted from the glasses to a remote

device if the glasses include wireless transceiver electrical components. For example, the user is at a football game, and the referee has made a controversial call. A broadcaster at the event can instantaneously use such glasses to perform a simple polling. This can be done by the broadcaster as part of the wireless transmission of information (e.g., event information) to the wearer of the glasses. Alternatively, the broadcaster can transmit a message to the user. In one embodiment, there can be an indicator on the glasses to indicate that there is a message for the wearer of the glasses. The indicator can be a LED light flashing for a few seconds, a ringing tone that rings for a few seconds, or other types of indication at the glasses. In any case, if desired, the wearer can receive the message. The message asks the wearer to push a button (an information input mechanism) at the glasses one time, if the wearer believes the call was correct, and two times otherwise. Such input information from the glasses is then wirelessly transmitted from the glasses and received by the broadcaster. Statistics on the responses can then be automatically performed. Such statistics can be provided almost instantaneously to, for example, the referee.

[000298] In one embodiment, each pair of such glasses also includes an identifier that identifies the glasses, such as an identification number. When input information is transmitted from such a pair of glasses, such as back to the broadcaster, its identifier can also be transmitted together with the corresponding input information.

[000299] Organizers of an event or a company affiliated with or related to the event also can use the glasses to gather other information from the wearers of the glasses, such as the audience of the event. For example, the audience can be electronically polled regarding ways to improve on the services they received.

[000300] The information input mechanism can include a microphone at the glasses. The organizers again can send a message to a user of a pair of such glasses. The message can be as follows: “If you like the ways we take food orders, say yes. If not, say no.” The voice response from the user is transmitted to the organizers. Such simple yes/no responses can be automatically deciphered based

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on voice recognition mechanisms and then automatically tabulated for the organizers.

[000301] In one embodiment, not all of the electrical components in a number of the glasses previously described are in the glasses. Instead, at least one of the electrical components, such as its power source, is in a portable device, which can also be carried by the user of the glasses. In another embodiment, a pair of glasses can function as a headset and are wired or wirelessly coupled to a portable device. The portable device can provide additional areas for user input, or outputs to the user.

[000302] As an example of wireless coupling for a pair of glasses functioning as a headset, the glasses include a wireless transceiver that is based on, for example, Bluetooth, UWB, Zigbee, or other types of short-distance wireless transmission standards. Based on the transceiver, the glasses are wirelessly coupled to a corresponding portable device. Information from long distances can be received by the portable device, which can then re-transmit such information to the glasses.

[000303] As an example of wired coupling for a pair of glasses functioning as a headset, the glasses include a connector. The connector can be used to electrically connect to a portable device through, for example, a wire. In one embodiment, the connector at the glasses is a male connector and is located at the tip of one temple of the glasses, such as at the tip position 3019 of the second temple 3018, shown in FIG. 25. When the male connector is not inserted into a female connector, the male connector can be covered, such as with a cap or a cover, to protect, encapsulate or shroud the connector. In one embodiment, at least a portion of the connector is covered.

[000304] Different embodiments of glasses functioning as a headset have been described in patent application, entitled, “EYEGLASSES WITH HEARING ENHANCED AND OTHER AUDIO SIGNAL-GENERATING CAPABILITIES”, which was incorporated by reference above, and can be used with the various embodiments described herein.

[000305] A number of embodiments have been described regarding glasses with a number of structural elements. In one embodiment, the glasses can be rimless frames. The glasses can include two lenses held together by a bridge. A temple can be attached to each lens through a joint that is connected to the corresponding lens by one or more screws. For example, there can be two screws at each lens to hold onto a temple piece, which includes a joint for a corresponding temple. One or more electrical components can be fully or partially embedded in the glasses, such as in a temple of the glasses.

[000306] A number of embodiments have been described with glasses. In one embodiment, a device, which is not a pair of glasses, can provide information to a user, where the information can be directly relevant to an event attended by the user. There can also be a user input mechanism at the device to allow the user to provide user input, including user feedback. Different embodiments of electrical components previously described can be in the device. Advantageously, in one embodiment, the different embodiments of components have minimal impact on the design of the end product and no tedious wiring is required. For example, in the case in which the end product is an eyeglass frame, a temple of the eyeglass frame can have an opening, cavity or container to hold or encompass the different embodiments of components, whereby no other changes or complications to the eyeglass frames need be imposed. Other such end-products can include: hats, shoes, watches, tee-shirt, swimming-suit, key-ring, purse, beer can holder, and other consumer products.

[000307] The various 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, embodiments, implementations or features provided in the description herein.

[000308] A number of embodiments in the invention can be implemented in software, hardware or a combination of hardware and software. A number of embodiments of the invention can also be embodied as computer readable code

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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.

[000309] 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.

[000310] Also, in this specification, 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.

[000311] Other embodiments of the invention will be apparent to those skilled in the art from a consideration of this specification or practice of the invention disclosed herein. It is intended that the specification and examples be considered as exemplary only, with the true scope and spirit of the invention being indicated by the following claims.

What is claimed is:

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CLAIMS

1. A wireless wearable device configured to secure to the head of a user, with the device proximate to at least one ear of the user when the device is worn by the user, to at least help the user hear audio outputs produced by the device, the wireless wearable device comprising:

a speaker at least partially in the wireless wearable device;

an electrical connector at least partially in the wireless wearable device, wherein the electrical connector includes at least two conductive areas, wherein the at least two conductive areas are configured to removably couple to corresponding conductive contacts of a counterpart connector external to and separate from the wireless wearable device, at least via spring-force, to at least enable each of the at least two conductive areas to be electrically connected to its corresponding conductive contact;

a rechargeable battery at least partially in the wireless wearable device; and

a microphone at least partially in the wireless wearable device.

2. A wireless wearable device as recited in claim 1 comprising another microphone at least partially in the wireless wearable device configured to capture at least sound in vicinity of the wireless wearable device.

3. A wireless wearable device as recited in claim 2 comprising circuitry at least partially in the wireless wearable device configured to cancel at least a portion of the sound captured by the another microphone to produce the audio outputs.

4. A wireless wearable device as recited in claim 2, wherein at least the microphone and the another microphone are configured to receive audio inputs, with at least some noise in the audio inputs configured to be cancelled based on using at least the microphone and the another microphone.

5. A wireless wearable device as recited in claim 2, wherein the microphone is configured to be positioned closer to mouth of the user than the another microphone, when the wireless wearable device is worn by the user.

6. A wireless wearable device as recited in claim 2 comprising a storage medium at least partially in the wireless wearable device configured to store at least computer program codes for facilitating voice recognition to facilitate recognizing at least a word received at least by the microphone for an operation of the wireless wearable device.

7. A wireless wearable device as recited in claim 2 comprising wireless communication circuitry at least partially in the wireless wearable device configured for coupling to at least a Bluetooth network.

8. A wireless wearable device as recited in claim 2, wherein the wireless wearable device is configured to be worn in the at least one ear of the user.

9. A wireless wearable device as recited in claim 2 comprising a controller at least partially in the wireless wearable device configured to determine whether the wireless wearable device is being worn based on outputs from a sensor at least partially in the wireless wearable device.

10. A wireless wearable device as recited in claim 2 comprising a motion sensor at least partially in the wireless wearable device.

11. A wireless wearable device as recited in claim 2 comprising a touch-sensitive input surface on the wireless wearable device, wherein the touch-sensitive input surface is configured to generate at least an electrical signal for an operation of the wireless wearable device based on receiving at least a touch input.

12. A wireless wearable device as recited in claim 2 comprising an area configured for attachment via magnetic force.

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13. A wireless wearable device as recited in claim 12 comprising a magnet in the area.

14. A wireless wearable device as recited in claim 12 comprising a storage medium at least partially in the wireless wearable device configured to store at least computer program codes for facilitating voice recognition to facilitate recognizing at least a word received at least by the microphone for an operation of the wireless wearable device.

15. A wireless wearable device as recited in claim 14 comprising wireless communication circuitry at least partially in the wireless wearable device configured for coupling to at least a Bluetooth network.

16. A wireless wearable device as recited in claim 15, wherein the wireless wearable device is configured to be worn in the at least one ear of the user.

17. A wireless wearable device as recited in claim 16 comprising a controller at least partially in the wireless wearable device configured to determine whether the wireless wearable device is being worn based on outputs from a sensor at least partially in the wireless wearable device.

18. A wireless wearable device as recited in claim 17 comprising a motion sensor at least partially in the wireless wearable device.

19. A wireless wearable device as recited in claim 18 comprising a touch-sensitive input surface on the wireless wearable device, wherein the touch-sensitive input surface is configured to generate at least an electrical signal for an operation of the wireless wearable device based on receiving at least a touch input.

20. A wireless wearable device configured to secure to the head of a user, to at least help the user hear audio outputs produced by the device, and to be worn in an ear of the user, and the wireless wearable device comprising:

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a speaker at least partially in the wireless wearable device;

an electrical connector at least partially in the wireless wearable device, wherein the electrical connector includes at least two conductive areas, wherein the at least two conductive areas are configured to removably couple to corresponding conductive contacts of a counterpart connector external to and separate from the wireless wearable device, at least via spring-force, to at least enable each of the at least two conductive areas to be electrically connected to its corresponding conductive contact;

a rechargeable battery at least partially in the wireless wearable device;

a microphone at least partially in the wireless wearable device;

another microphone at least partially in the wireless wearable device configured to capture at least sound in vicinity of the wireless wearable device, wherein the microphone is configured to be positioned closer to mouth of the user than the another microphone, when the wireless wearable device is worn by the user;

a storage medium at least partially in the wireless wearable device configured to store at least computer program codes for facilitating voice recognition to facilitate recognizing at least a word received at least by the microphone for an operation of the wireless wearable device;

wireless communication circuitry at least partially in the wireless wearable device configured for coupling to at least a Bluetooth network; and

an area configured for attachment via magnetic force.

ABSTRACT

In one embodiment, an eyewear frame for a user includes at least a front portion with two side portions; two speakers, one in each side portion; a connection region at one side portion, with an electrical connector having two conductive pads to connect to corresponding conductive contacts of a counterpart connector; a rechargeable battery; a microphone in the frame; and wireless communication circuitry in the frame. The connection region can be provided at an inside surface of one of the side portions. The eyewear frame can also include a touch-sensitive input surface on the eyewear frame configured to provide an input to the frame to perform a function. Another embodiment includes a headset with an electrical connector having a conductive pad to connect to a corresponding conductive contact of a counterpart connector. The headset can also include a touch-sensitive input surface.

PTO/AIA/15 (10-17)
Approved for use through 11/30/2020. 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.

UTILITY PATENT APPLICATION TRANSMITTAL

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

Attorney Docket No.	IPVCP006X1C10D1C1
First Named Inventor	HOWELL et al.
Title	HEAD-WORN DEVICE WITH CONNECTION REGION
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* 80] 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* 42]
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:
      i. [ ] CD-ROM or CD-R (2 copies); or
      ii. [ ] Paper
   c. [ ] Statements verifying identity of above copies

ADDRESS TO: **Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450**

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

[✓] The address associated with Customer Number: 34071 **OR** [ ] Correspondence address below

Name					
Address					
City		State		Zip Code	
Country		Telephone		Email	

Signature	/Peter P. Tong/	Date	November 27, 2023
Name (Print/Type)	Peter P. Tong	Registration No. (Attorney/Agent)	35757

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.**

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

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.

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 #
18/519,802	**11/27/2023 03:52:05 PM Z ET**	**IPVCP006X1C10D1C1**

Title of Invention

HEAD-WORN DEVICE WITH CONNECTION REGION

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	3510	FILED BY	Angela Nijim
PATENT CENTER #	63337701	AUTHORIZED BY	Peter Tong
CUSTOMER #	34071	FILING DATE	-
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	Thomas A. Howell

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
CARD / 9649	**E2023AQF53539048**	**Angela Nijim**
PRE-AUTHORIZED ACCOUNT	**PRE-AUTHORIZED CATEGORY**	
503874	**37 CFR 1.21 (Miscellaneous fees and charges)**	

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
1111	UTILITY PATENT APPL. SEARCH FEE	700.00	1	700.00
1011	BASIC FILING FEE - UTILITY (PAPER FILING ALSO REQUIRES NON-ELECTRONIC FILING FEE UNDER 1.16(T))	320.00	1	320.00
1311	PATENT APPL. EXAMINATION FEE	800.00	1	800.00
			TOTAL AMOUNT:	**$1,820.00**

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.

Application Data Sheet 37 CFR 1.76

The Application Data Sheet is part of the provisional or non-provisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.

Inventor Information

of inventors: 4

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Application Information

Customer number	34071 -
Correspondence address	---
Title of invention	HEAD-WORN DEVICE WITH CONNECTION REGION
Attorney docket number	IPVCP006X1C10D1C1
Entity status	Regular Undiscounted
Application type	Nonprovisional Application under 35 USC 111(a)
Subject matter	Utility
Total number of drawing sheets	42
Suggested figure for publication	17A
Filing by reference	No

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Publication request	Normal eighteen-month publication

Representative Information

of representatives: 1

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).

Customer number	34071

Domestic Benefit/National Stage Information

of benefit claims: 18

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c), 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(a)(2) or CFR 1.78(a)(4), and need not otherwise be made part of the specification.

Prior app status	Pending
Application number	---
Continuity type	**Continuation of**
Prior app number	**18224793**
Filing Date	07/21/2023

Prior app status	Patented
Application number	**18224793**
Continuity type	**Division of**
Prior app number	**18129660**
Filing Date	03/31/2023
Patent number	11803069
Issue date	10/31/2023

Prior app status	Patented
Application number	**18129660**
Continuity type	**Continuation of**

Apple Inc. EX1002 Page 116

Prior app number	**16424018**
Filing Date	05/28/2019
Patent number	11630331
Issue date	04/18/2023

Prior app status	Patented
Application number	**16424018**
Continuity type	**Continuation of**
Prior app number	**13831419**
Filing Date	03/14/2013
Patent number	10345625
Issue date	07/09/2019

Prior app status	Patented
Application number	**13831419**
Continuity type	**Continuation of**
Prior app number	**13291020**
Filing Date	11/07/2011
Patent number	8430507
Issue date	04/30/2013

Prior app status	Patented
Application number	**13129020**
Continuity type	**Continuation of**
Prior app number	**12803732**
Filing Date	07/01/2010
Patent number	8434863
Issue date	05/07/2013

Prior app status	Patented
Application number	**12803732**
Continuity type	**Continuation of**
Prior app number	**11546685**
Filing Date	10/11/2006
Patent number	7806525
Issue date	10/05/2010

Prior app status	Patented
Application number	**11546685**
Continuity type	**Continuation in part of**
Prior app number	**11183256**
Filing Date	07/15/2005
Patent number	7500747
Issue date	03/10/2009

Prior app status	Expired
Application number	**11183256**
Continuity type	**Claims benefit of provisional**
Prior app number	**60592045**
Filing Date	07/25/2004
Issue date	03/10/2009

Prior app status	Expired
Application number	**11183256**
Continuity type	**Claims benefit of provisional**
Prior app number	**60605191**
Filing Date	08/28/2004
Issue date	03/10/2009

Prior app status	Expired
Application number	**11183256**
Continuity type	**Claims benefit of provisional**
Prior app number	**60618107**
Filing Date	10/12/2004
Issue date	03/10/2009

Prior app status	Expired
Application number	**11183256**
Continuity type	**Claims benefit of provisional**
Prior app number	**60620238**
Filing Date	10/18/2004
Issue date	03/10/2009

Prior app status	Expired
Application number	**11183256**
Continuity type	**Claims benefit of provisional**
Prior app number	**60647836**
Filing Date	01/31/2005
Issue date	03/10/2009

Prior app status	Expired
Application number	**11183256**
Continuity type	**Claims benefit of provisional**
Prior app number	**60647826**
Filing Date	01/31/2005
Issue date	03/10/2009

Prior app status	Expired
Application number	**11546685**
Continuity type	**Claims benefit of provisional**
Prior app number	**60725896**
Filing Date	10/11/2005
Issue date	03/10/2009

Prior app status	Expired
Application number	**11546685**
Continuity type	**Claims benefit of provisional**
Prior app number	**60725999**
Filing Date	10/11/2005
Issue date	03/10/2009

Prior app status	Expired
Application number	**11546685**
Continuity type	**Claims benefit of provisional**
Prior app number	**60787850**
Filing Date	04/01/2006
Issue date	03/10/2009

Prior app status	Expired
Application number	**11546685**
Continuity type	**Claims benefit of provisional**
Prior app number	**60846150**
Filing Date	09/20/2006

Foreign Priority Information

of foreign priority claims: 0

This section allows for the applicant to claim benefit of foreign priority and to identify any prior foreign application for which priority is not claimed. 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).

Data was not provided for this section.

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

Checking this box will cause the application to be examined under the first inventor to file provisions of the AIA.

☐ 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 2016, 2013, will be examined under the first inventor to file provisions of the AIA.

Authorization or Opt-Out of Authorization to Permit Access

When this Application Data Sheet is properly signed and filled 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:

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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 the 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.

Applicant Information

of applicants: 1

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.

1. **IngenioSpec, LLC**
4010 Moorpark Avenue, Suite 211

Applicant Organization

Apple Inc. EX1002 Page 121

San Jose, CA 95117
UNITED STATES

Phone: 650903-9200
Fax: 6509039800
Email: peter@ipventure.com

Applicant type Assignee

Assignee Information including Non-Applicant Assignee Information

of assignees: 0

An assignee-applicant identified in the "Applicant" section will appear on the patent application as an applicant.

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.

Data was not provided for this section.

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

Signature	First name	Last name	Registration #	Date
/Peter P. Tong/	Peter	Tong	35757	11/22/2023

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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 WITH TOUCH-SENSITIVE INPUT SURFACE

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 13/831,419

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.

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

Inventor: THOMAS A. HOWELL Date (Optional): 6/22/15

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.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. 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 1 minute 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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LEGAL NAME OF INVENTOR

Inventor: DAVID CHAO Date (Optional): _____

Signature: _____

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.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. 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 1 minute 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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LEGAL NAME OF INVENTOR

Inventor: PETER P. TONG Date (Optional): 6/18/2013

Signature: Peter Tong

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: C. DOUGLASS THOMAS Date (Optional): 6-17-2015

Signature: C. Douglass Thomas

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

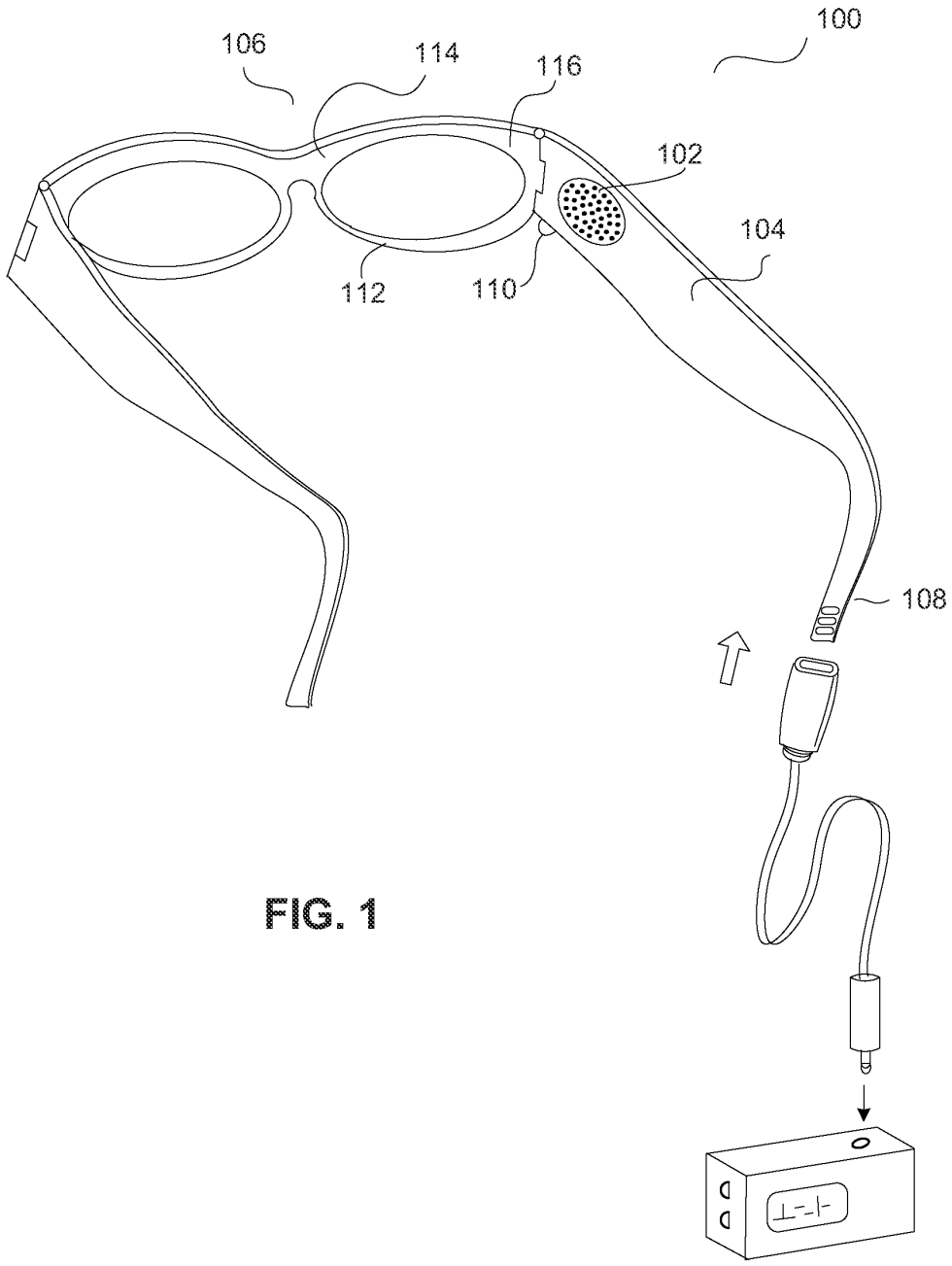


FIG. 1

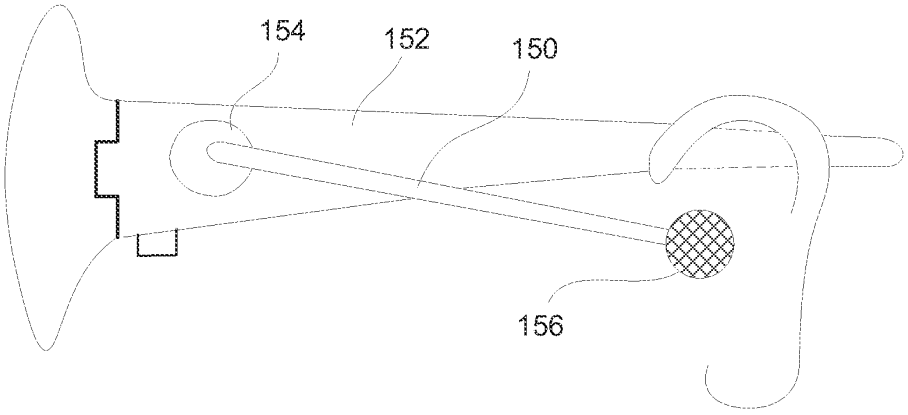


FIG. 2

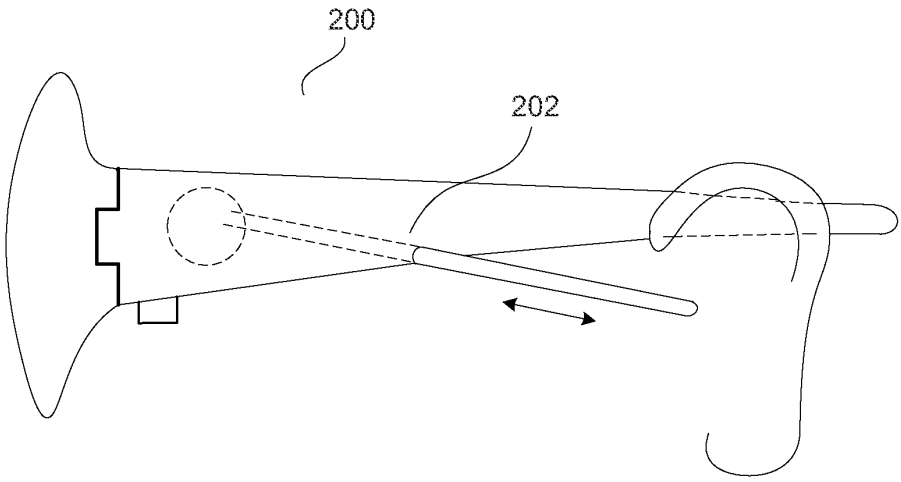


FIG. 3

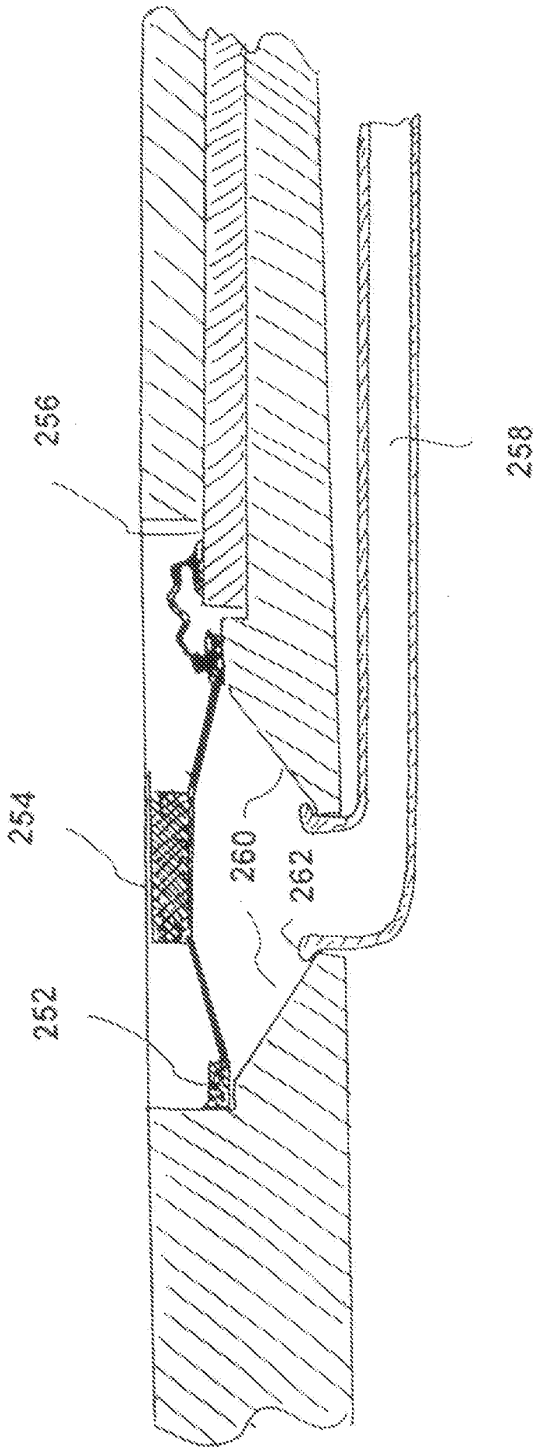


FIG. 4

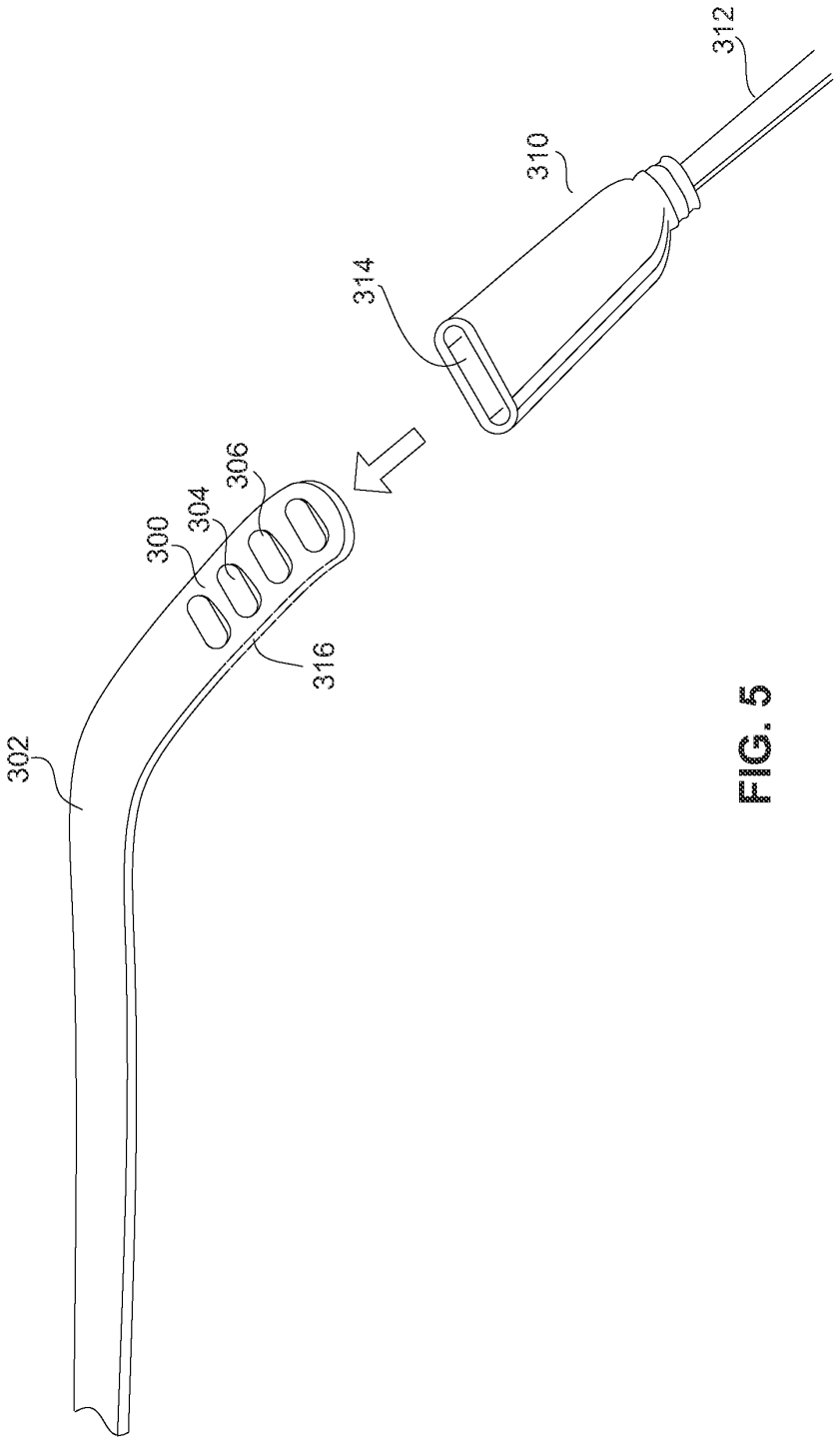


FIG. 5

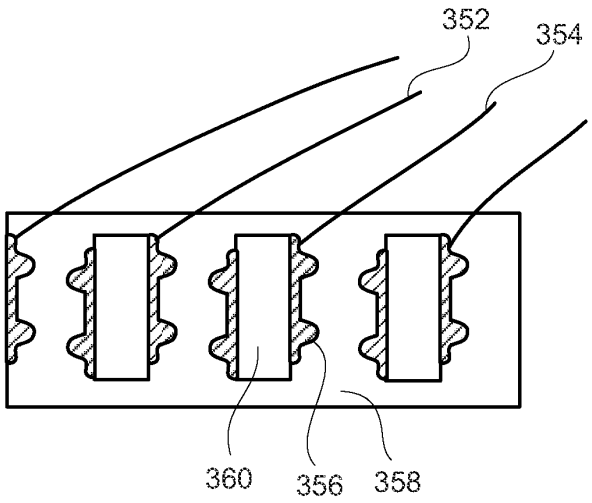


FIG. 6A

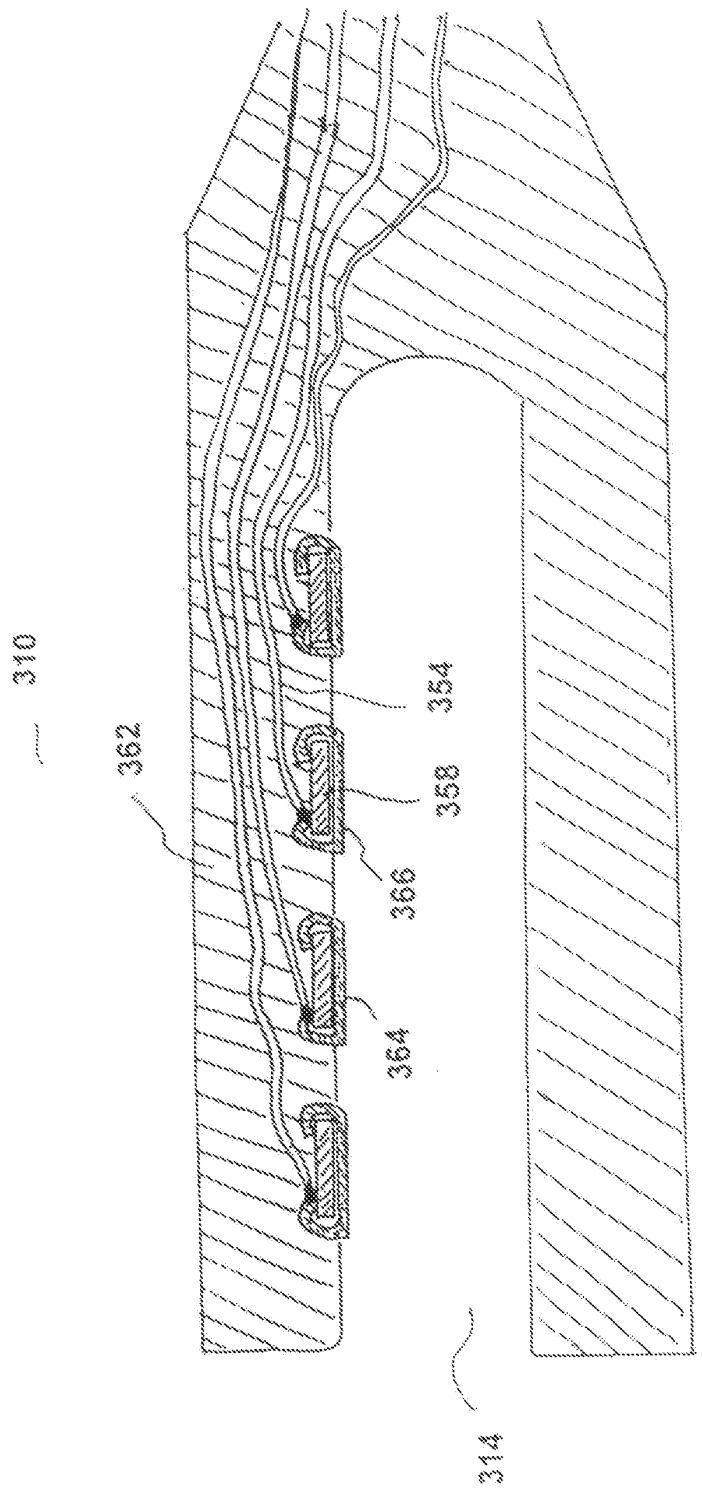


FIG. 6B

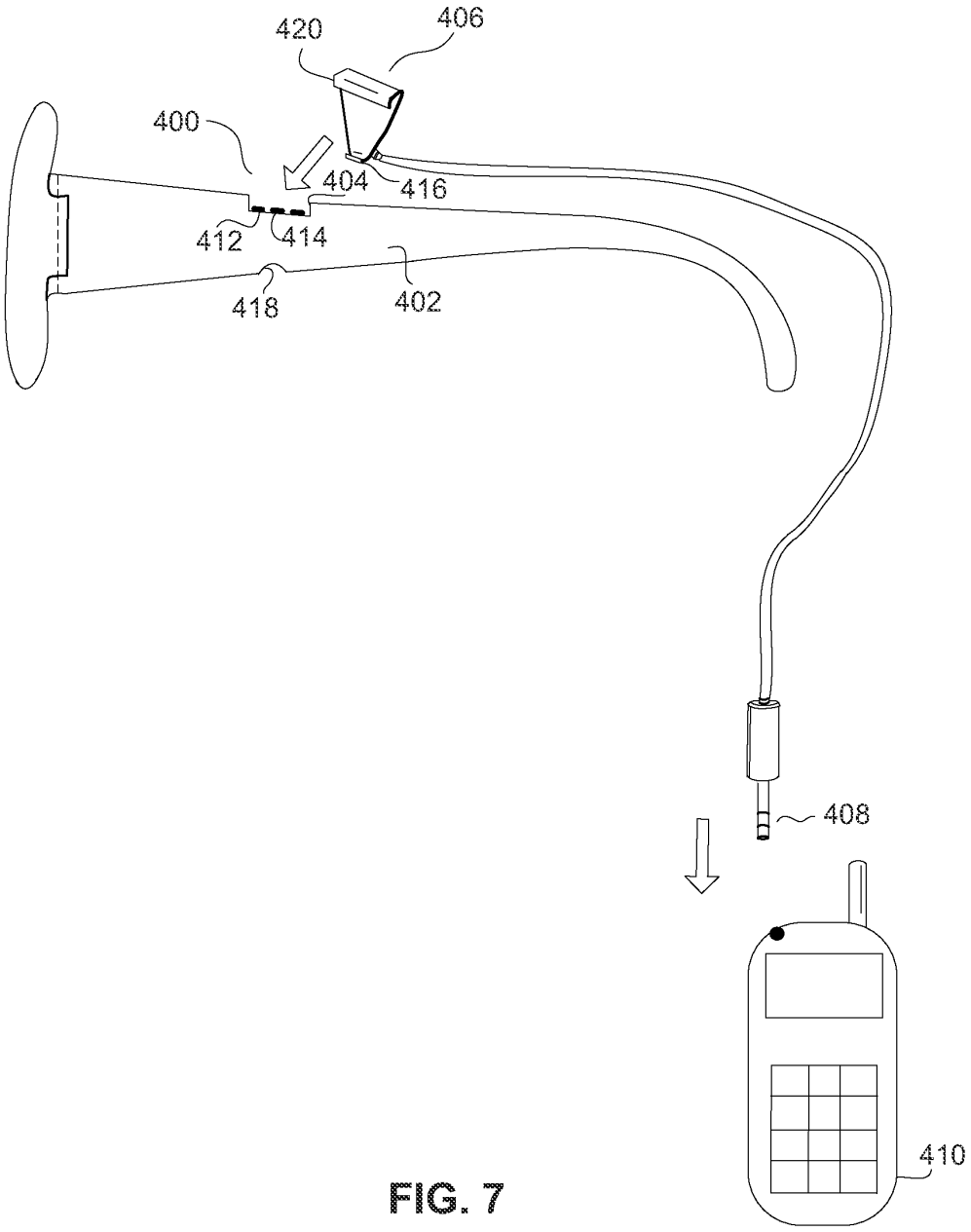


FIG. 7

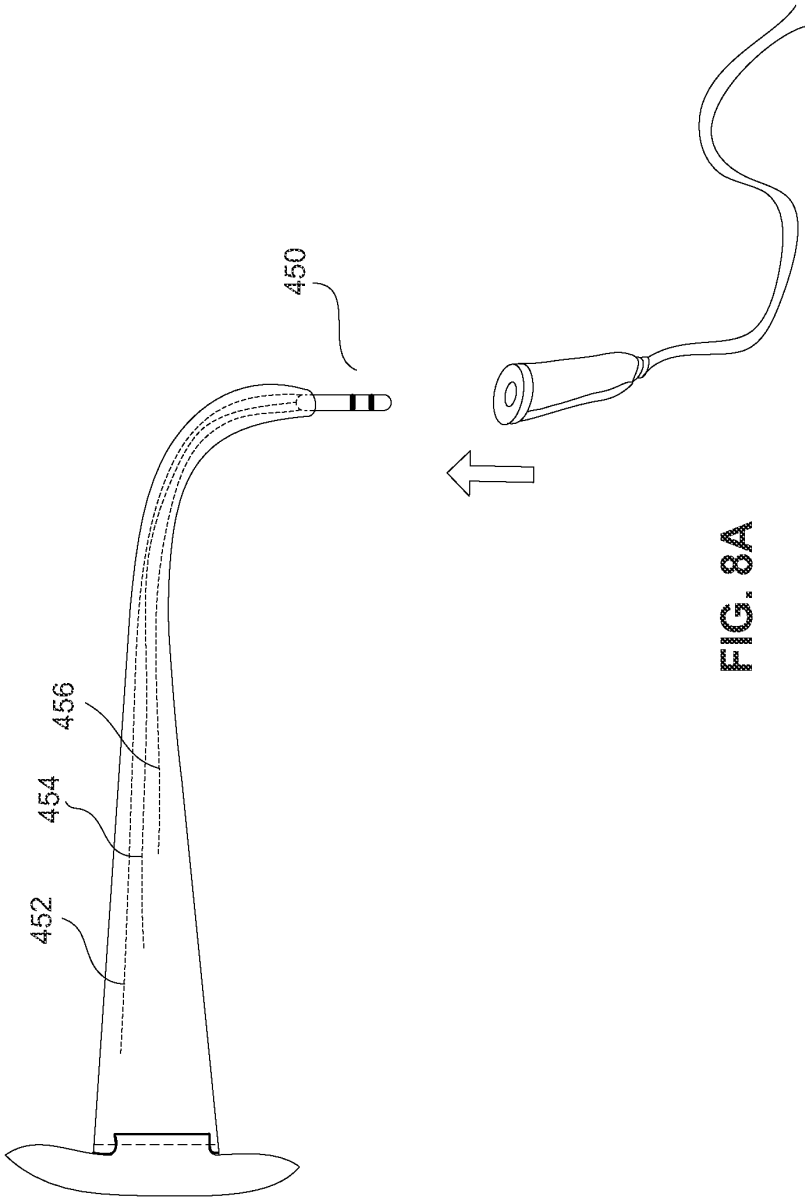


FIG. 8A

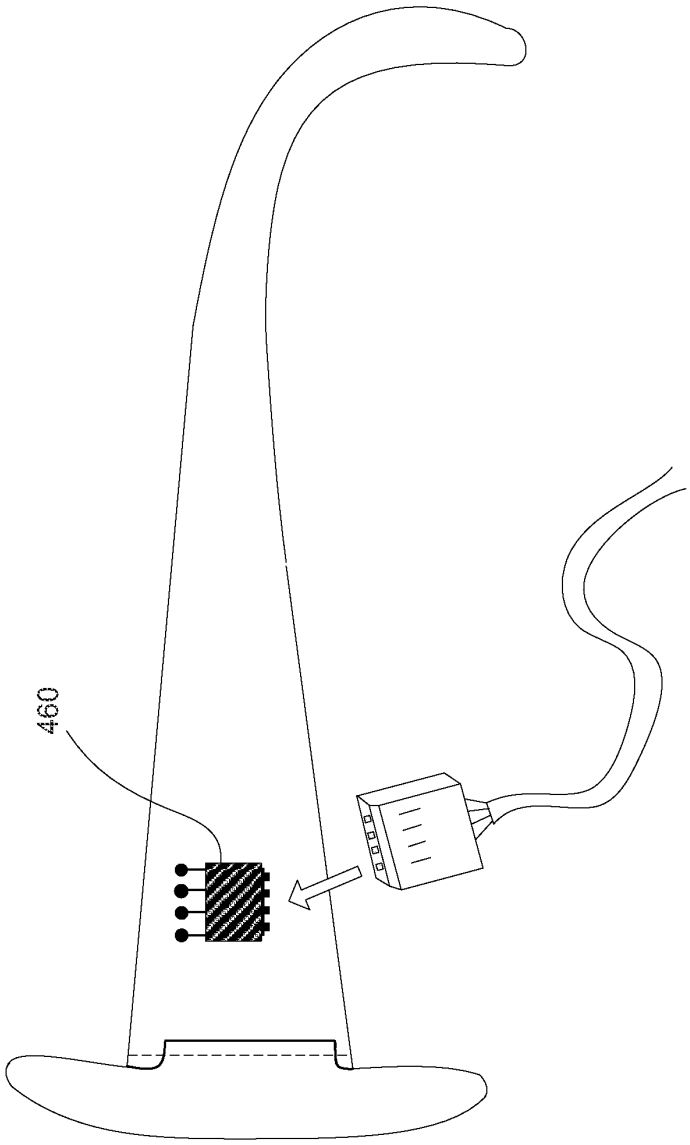


FIG. 8B

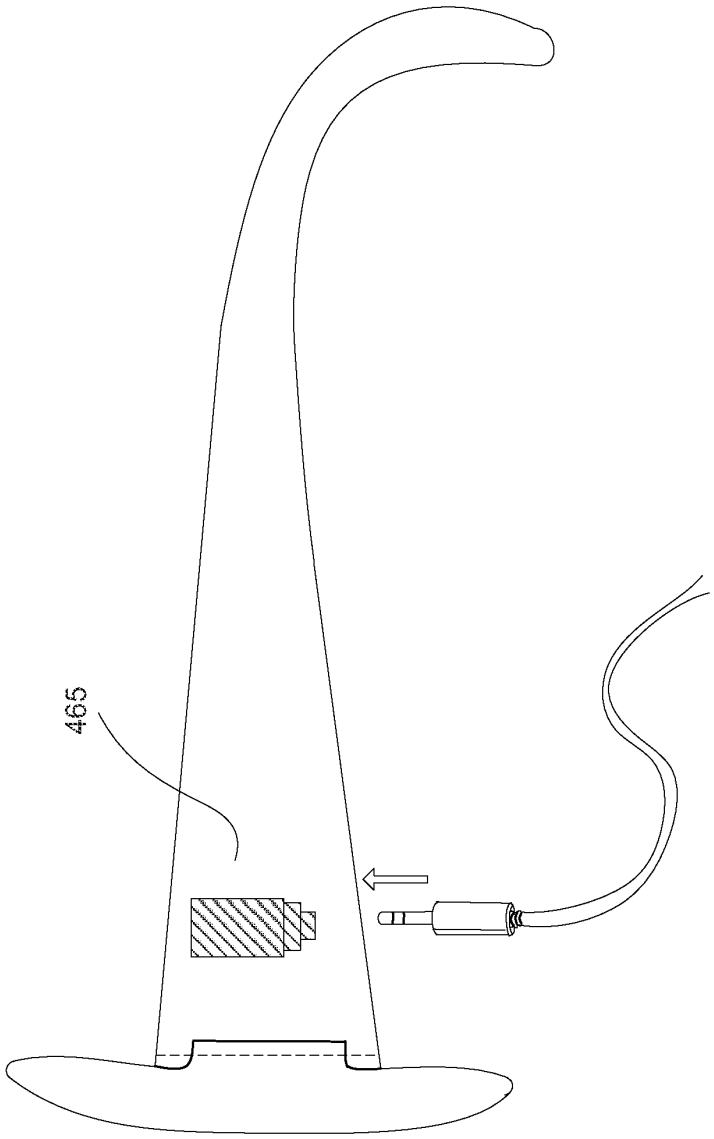


FIG. 8C

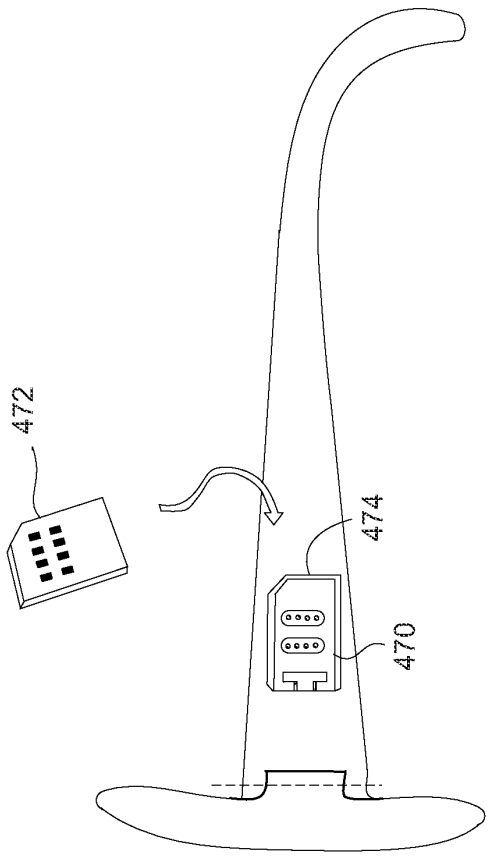


FIG. 8D

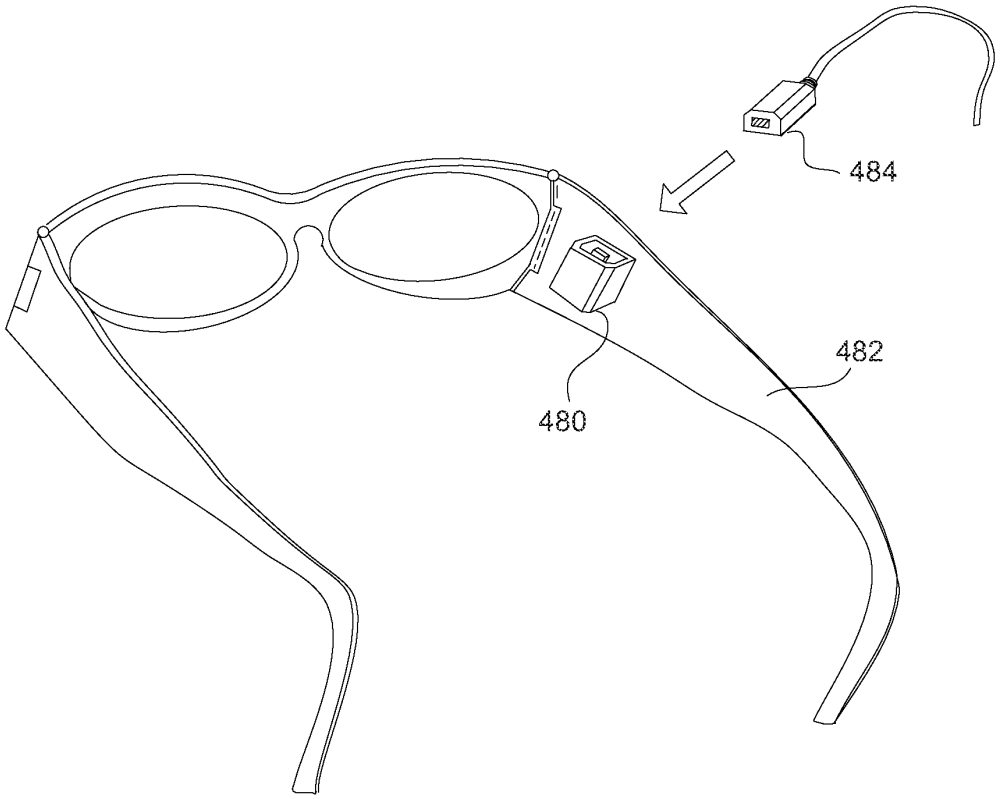


FIG. 8E

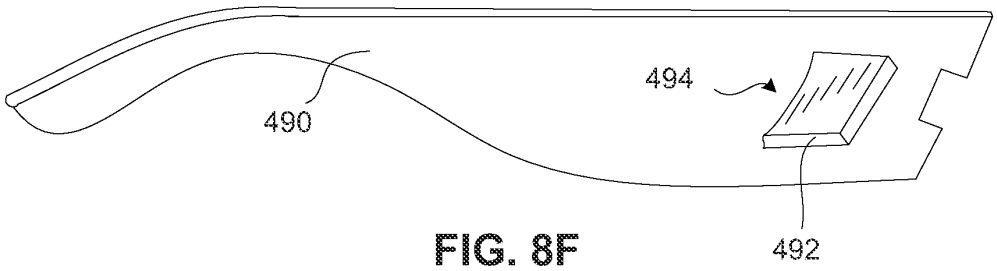


FIG. 8F

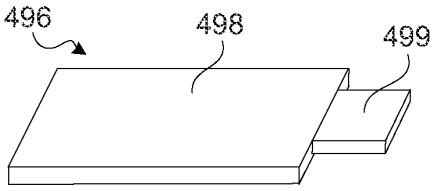


FIG. 8G

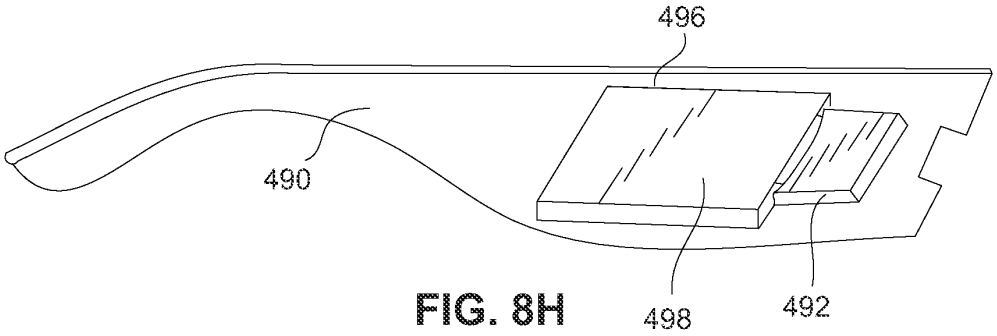


FIG. 8H

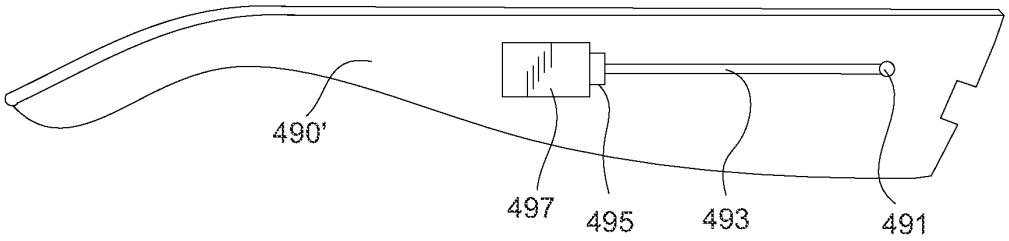


FIG. 8I

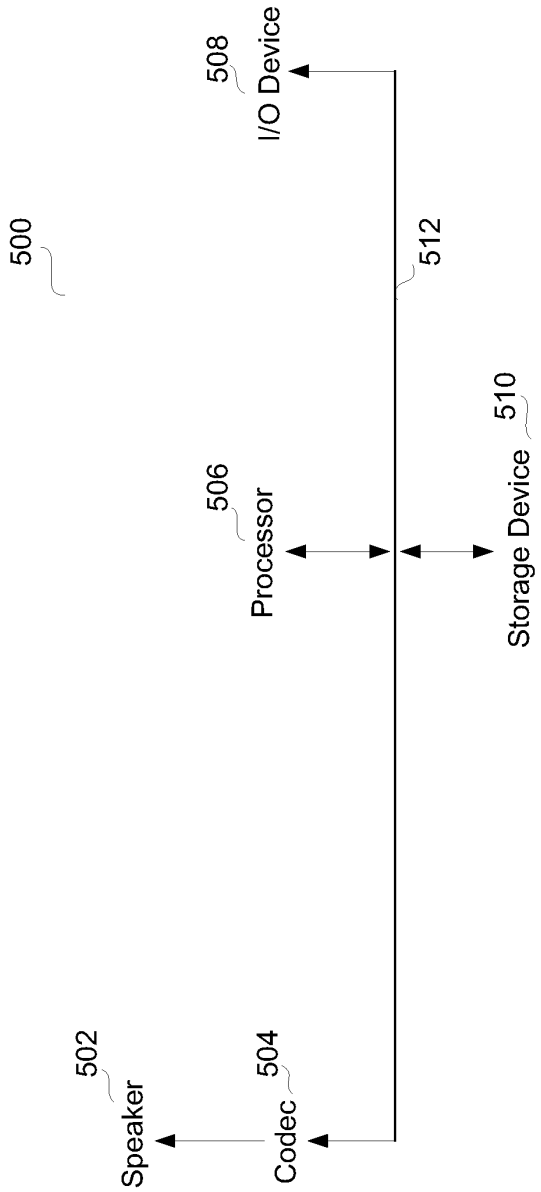

500
502
Speaker
504
Codec
506
Processor
508
I/O Device
510
Storage Device
512

FIG. 9

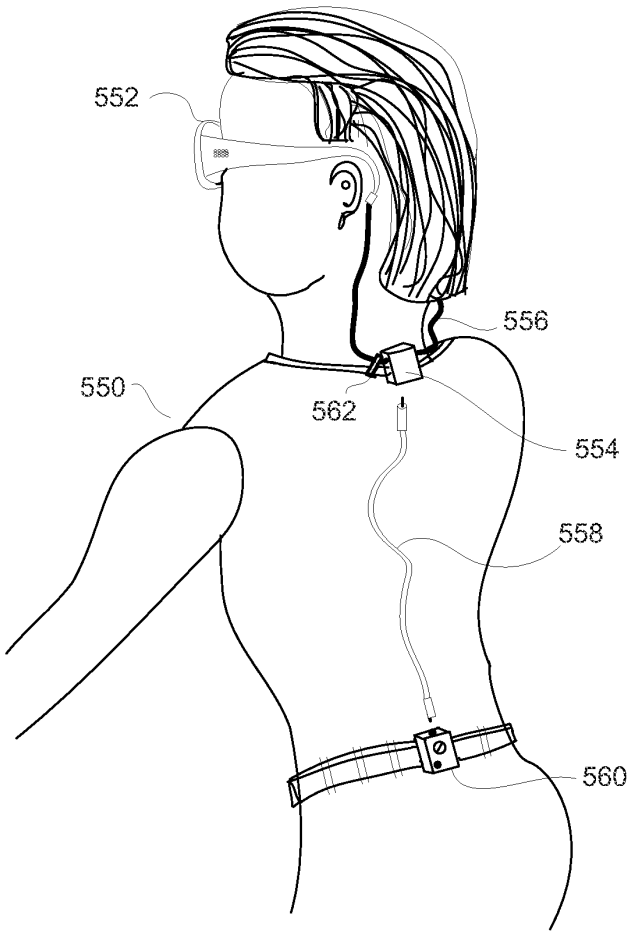


FIG. 10

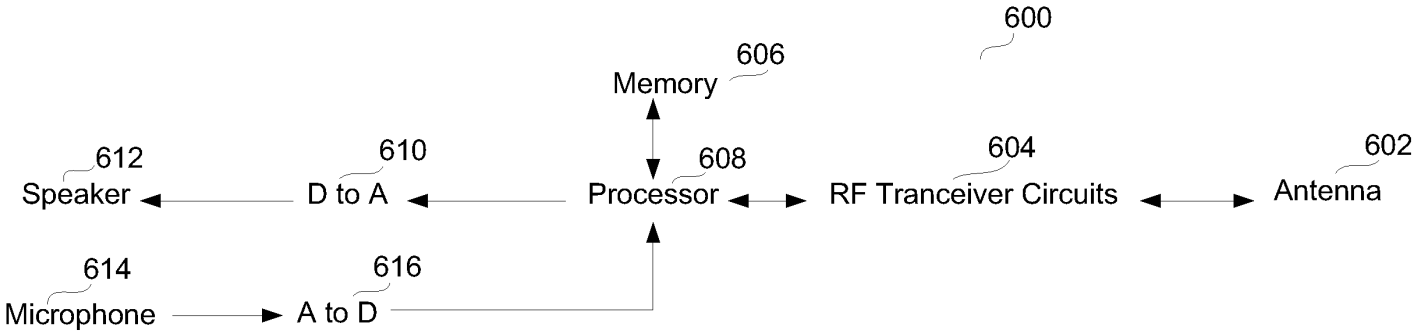


FIG. 11A

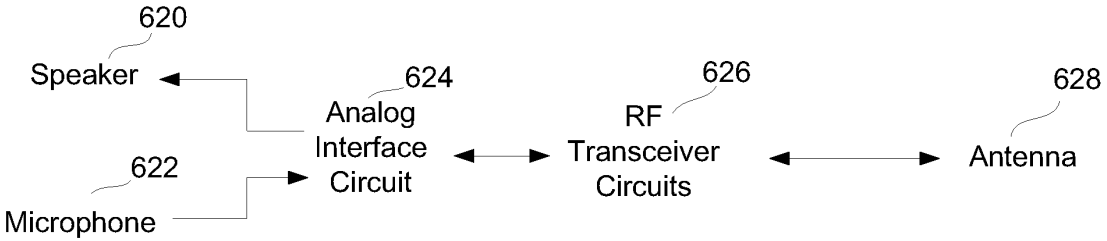


FIG. 11B

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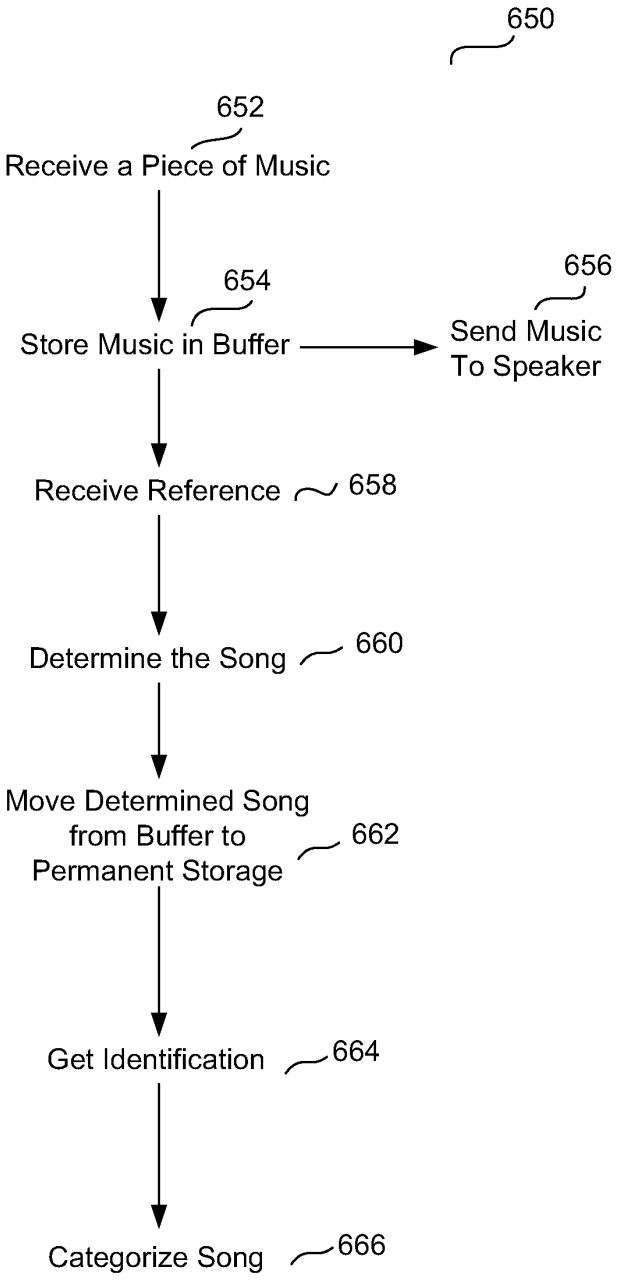

650
652
Receive a Piece of Music
654
Store Music in Buffer
656
Send Music
To Speaker
Receive Reference
658
Determine the Song
660
Move Determined Song
from Buffer to
Permanent Storage
662
Get Identification
664
Categorize Song
666

FIG. 12

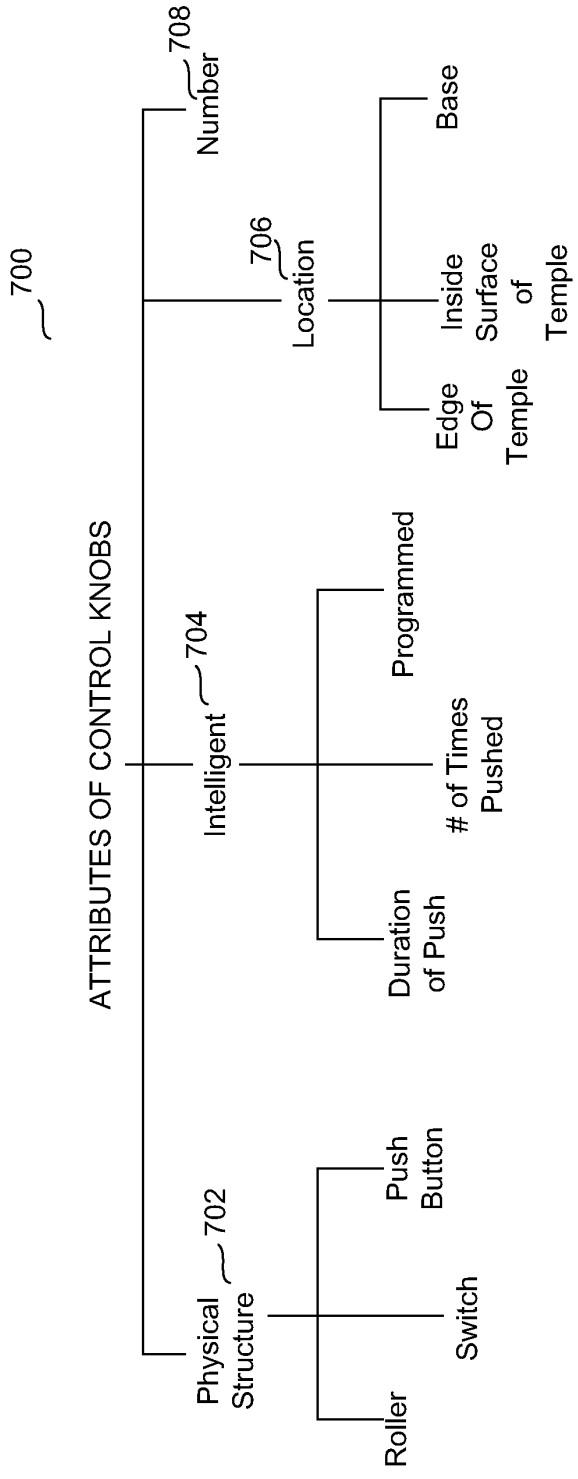

700
ATTRIBUTES OF CONTROL KNOBS
Physical Structure
702
Roller
Push Button
Switch
Intelligent
704
Duration of Push
Programmed
of Times Pushed
Location
706
Edge Of Temple
Inside Surface of Temple
Base
Number
708

FIG. 13

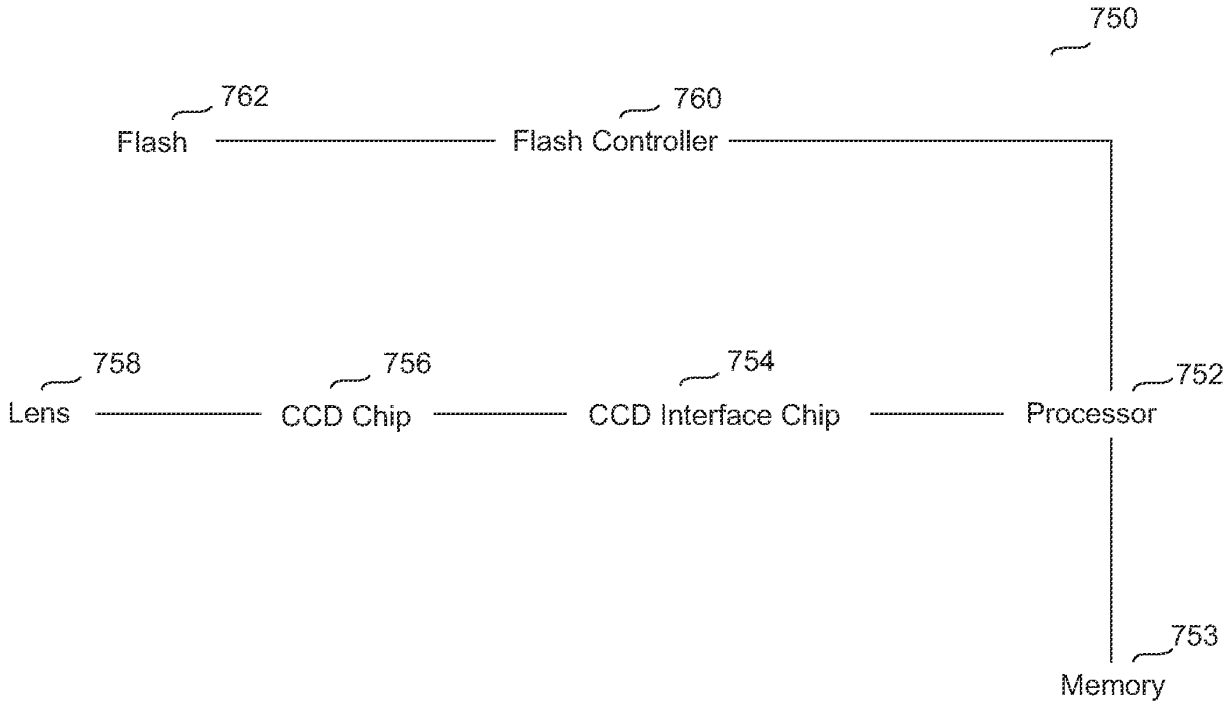


Fig. 14

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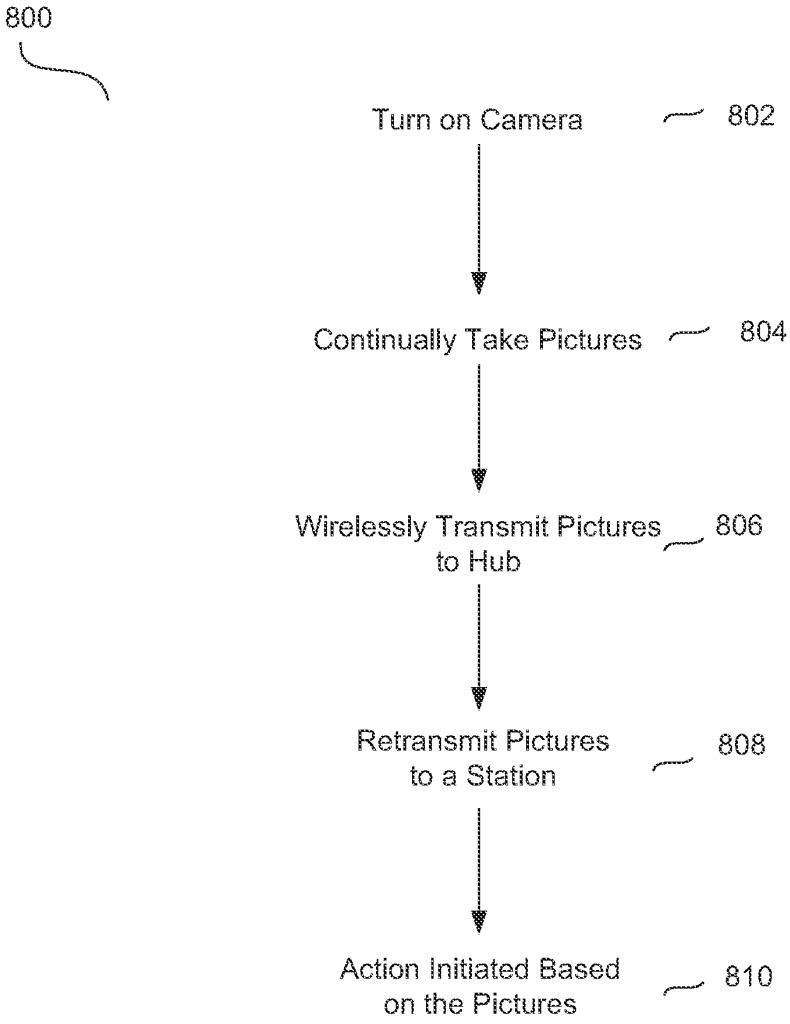

800
Turn on Camera
802
Continually Take Pictures
804
Wirelessly Transmit Pictures to Hub
806
Retransmit Pictures to a Station
808
Action Initiated Based on the Pictures
810

Fig. 15

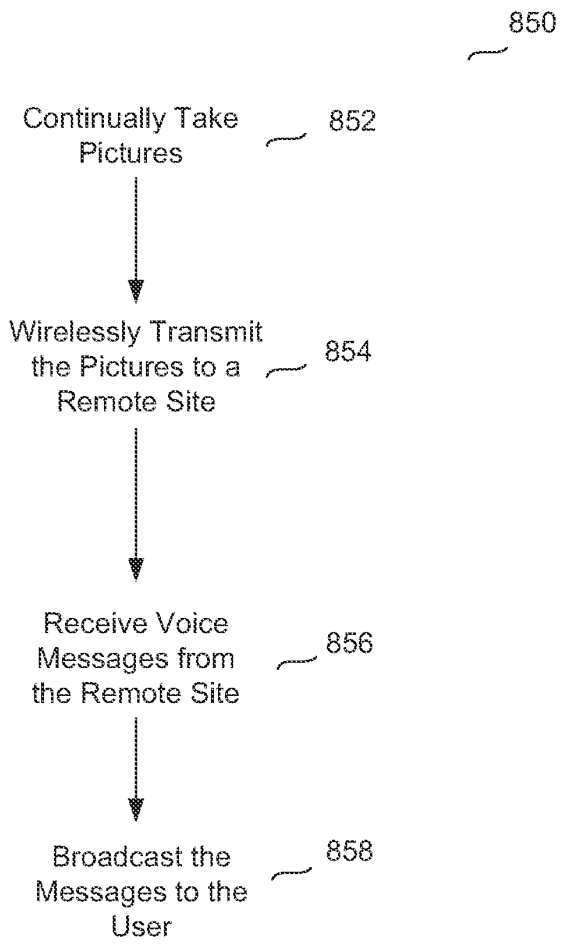

850
Continually Take Pictures
852
Wirelessly Transmit the Pictures to a Remote Site
854
Receive Voice Messages from the Remote Site
856
Broadcast the Messages to the User
858

Fig. 16

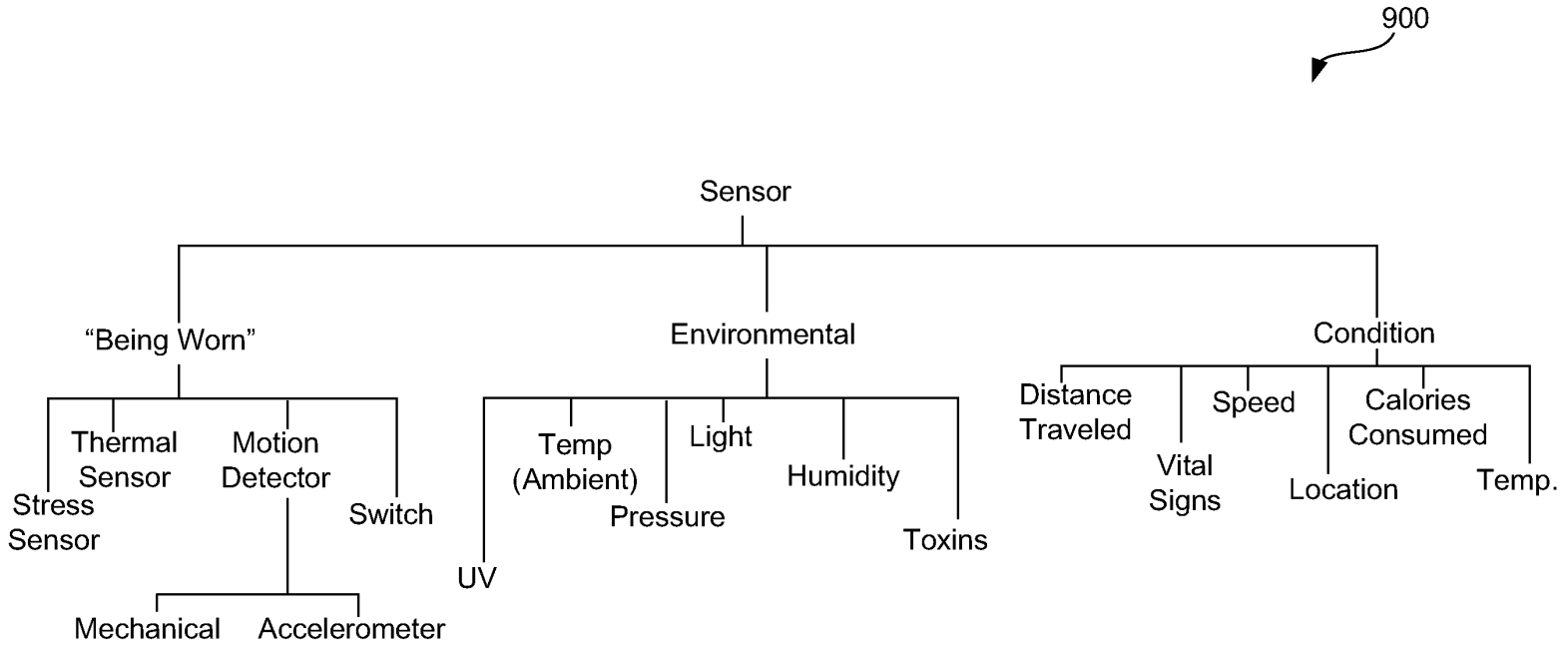


FIG. 17A

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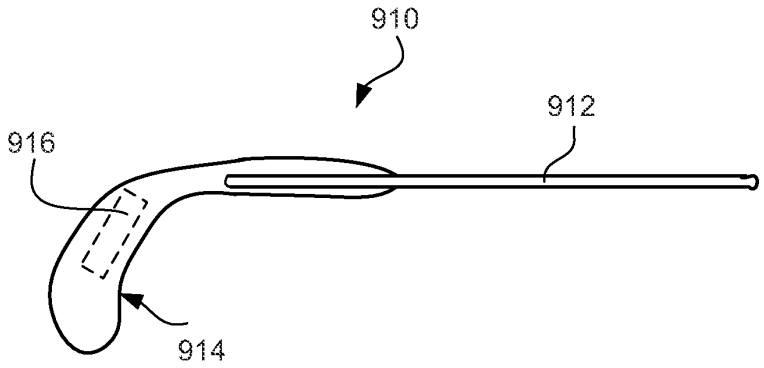


FIG. 17B

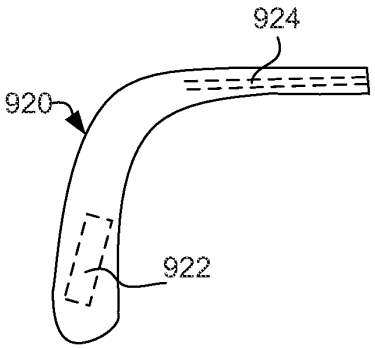


FIG. 17C

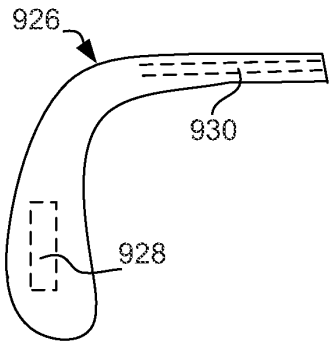


FIG. 17D

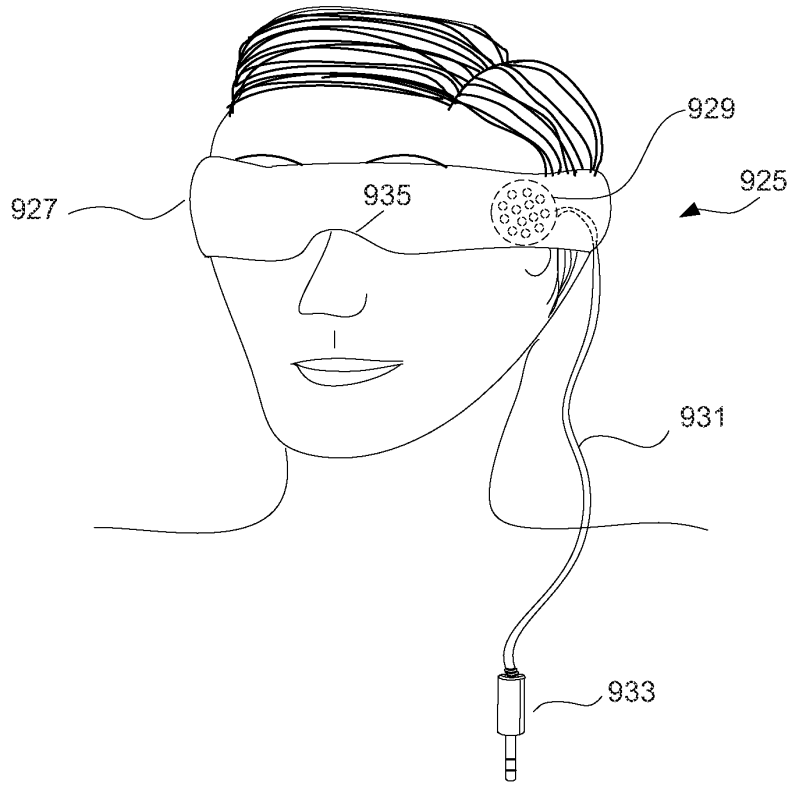


FIG. 18

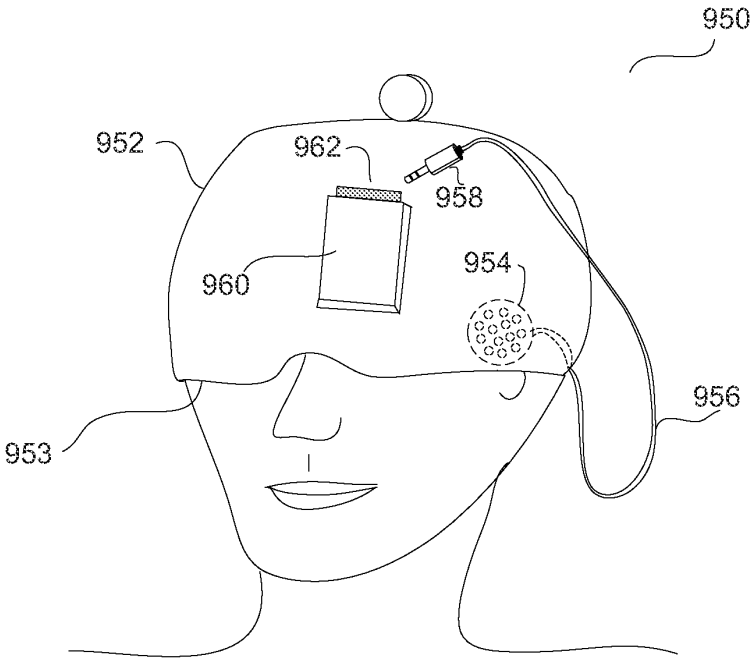


FIG. 19

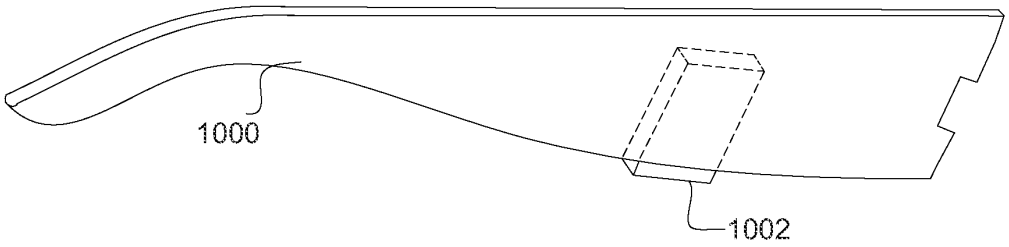


FIG. 20A

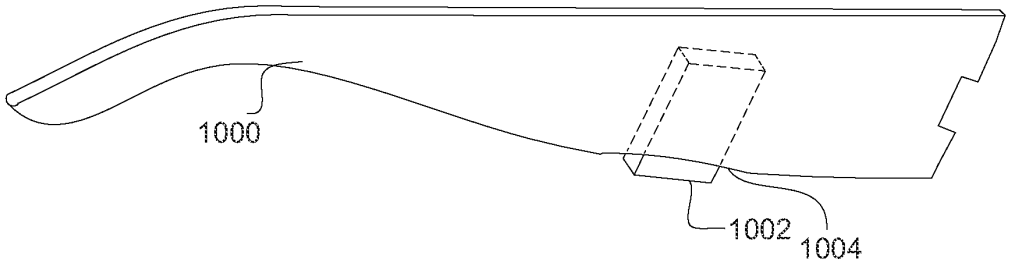


FIG. 20B

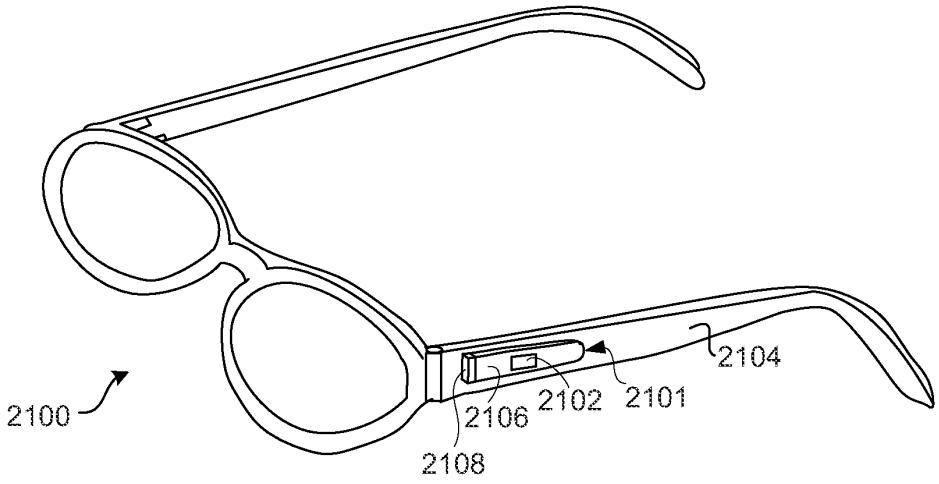


FIG. 21A

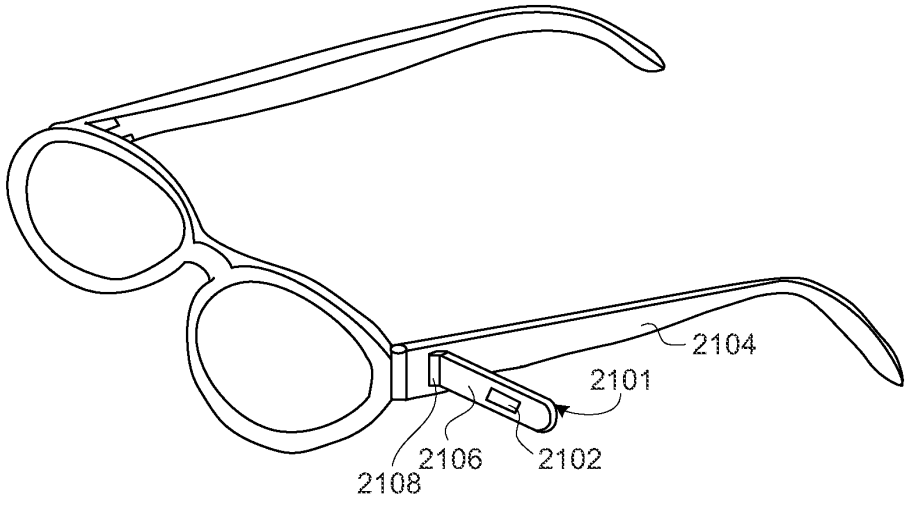


FIG. 21B

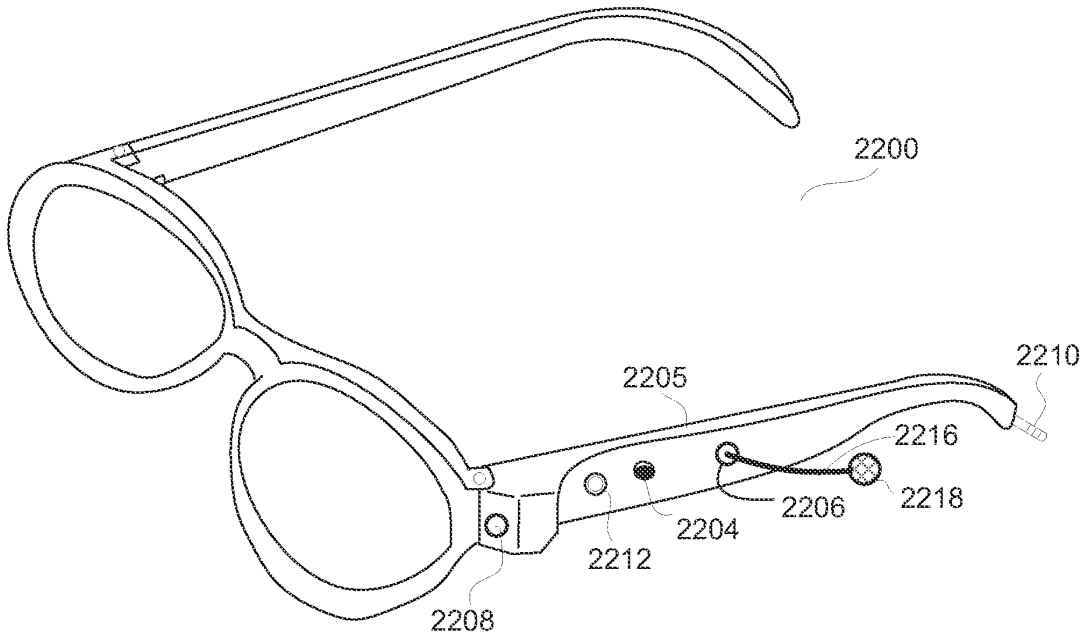


FIG. 22

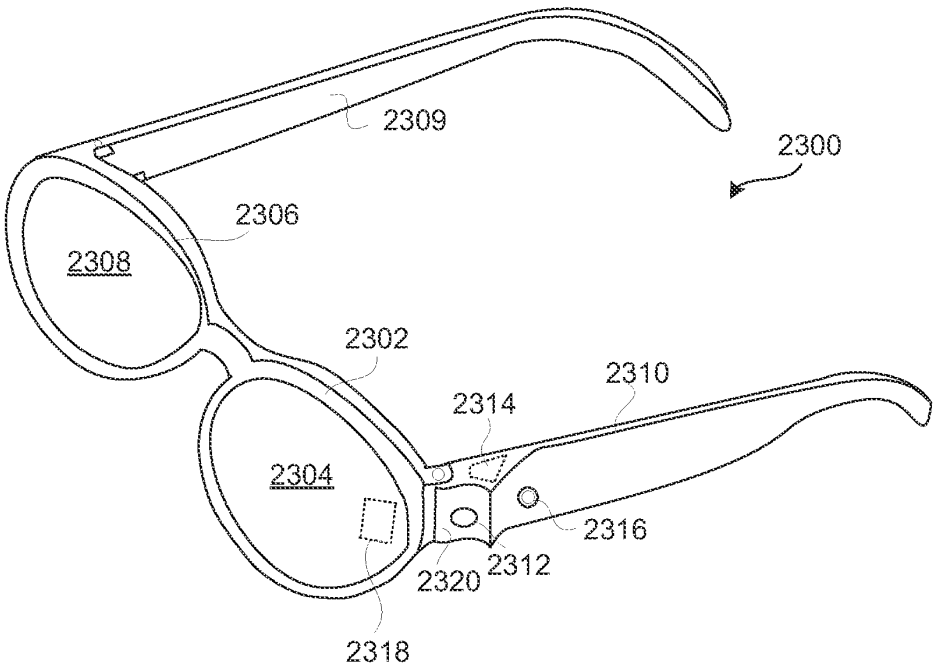


FIG. 23A

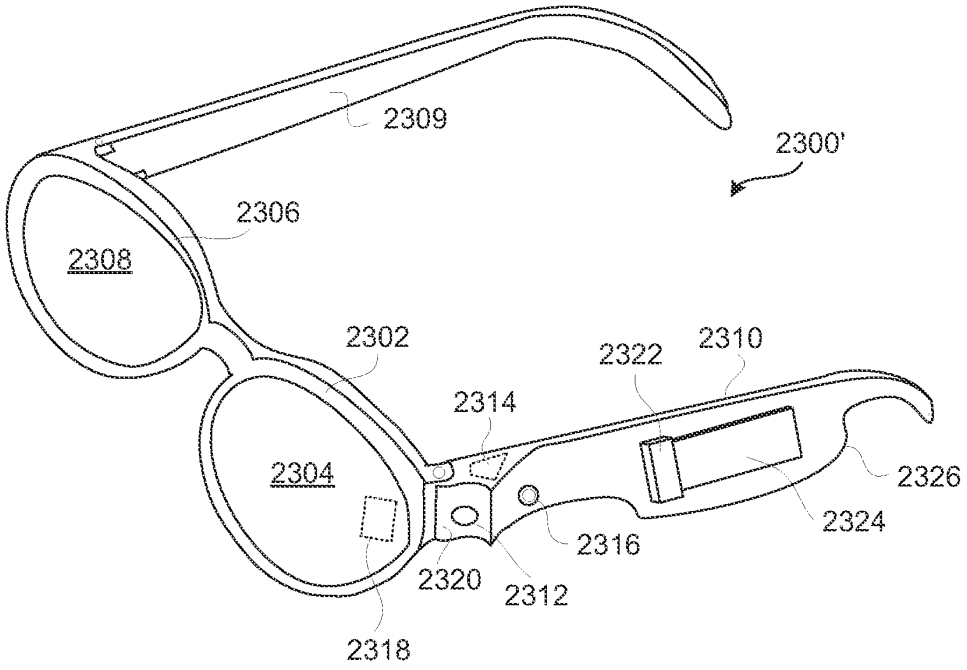

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FIG. 23B

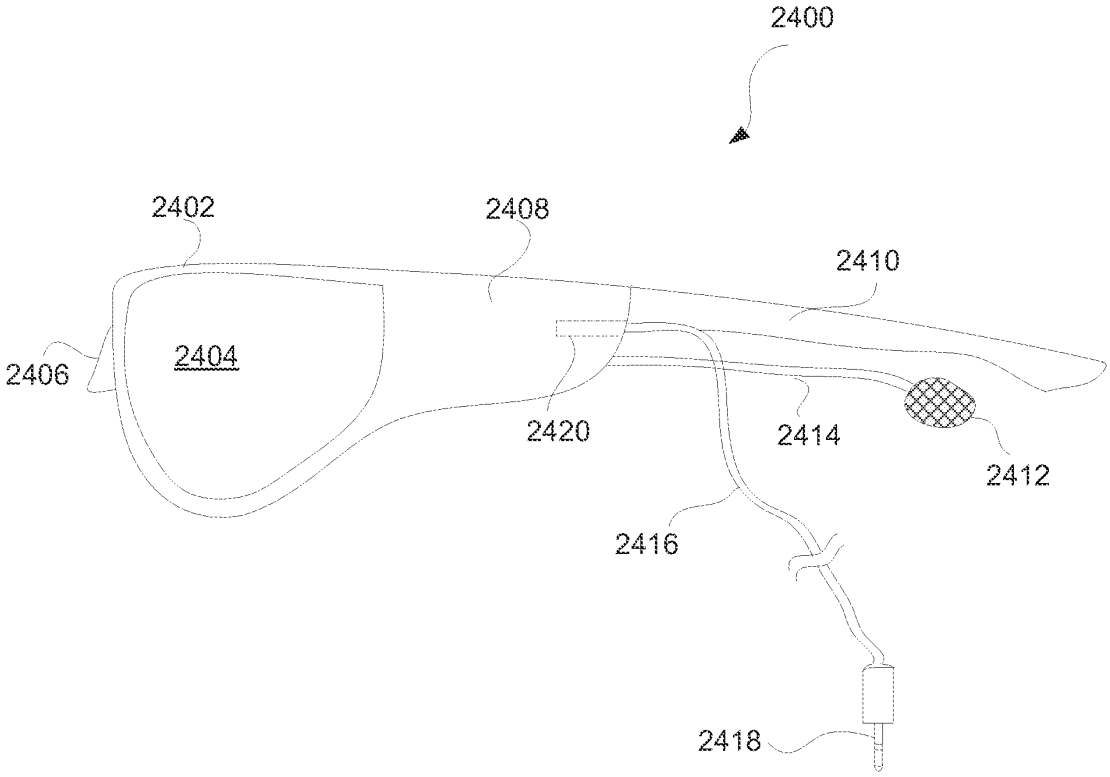


FIG. 24

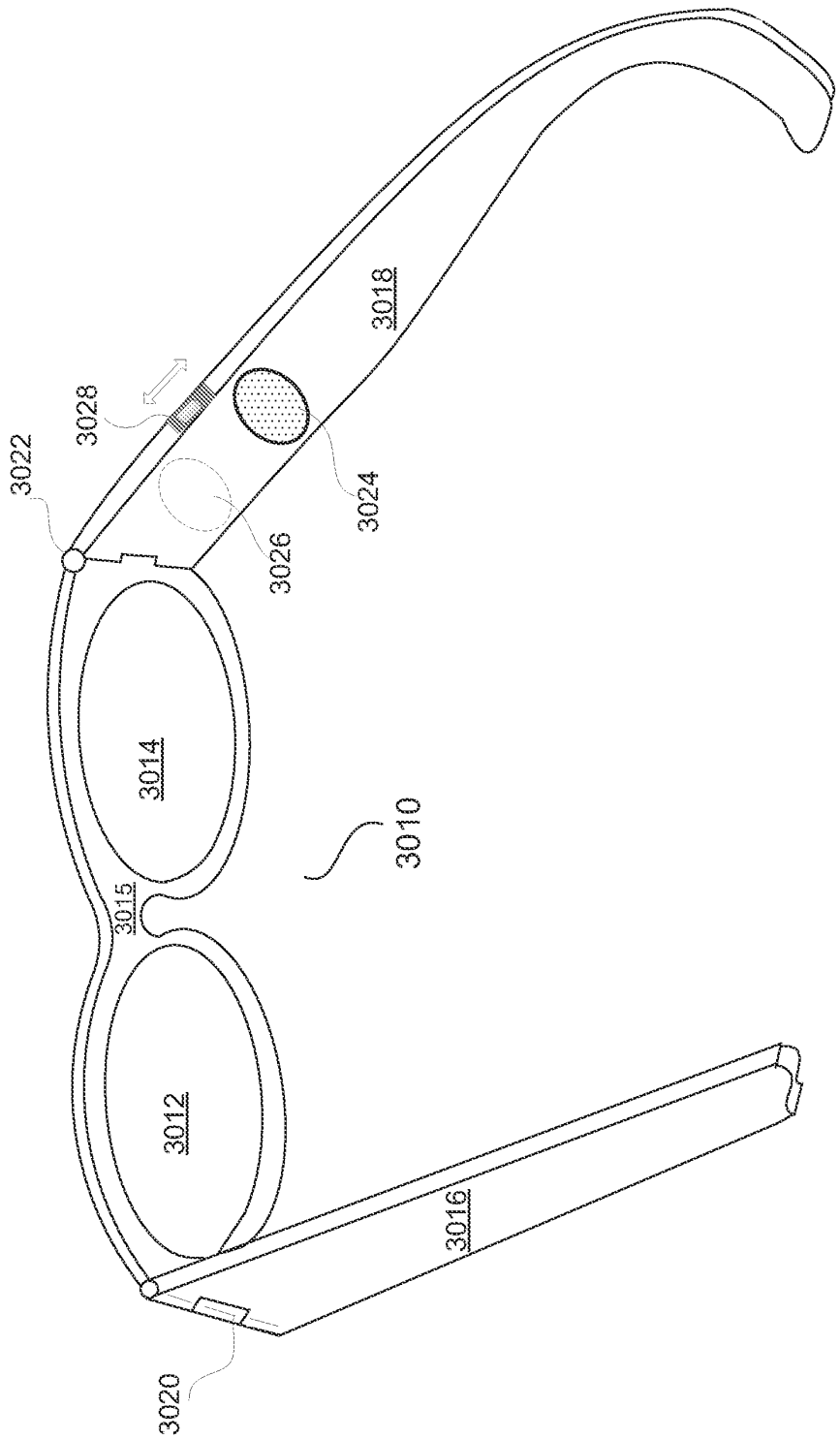


FIG. 25

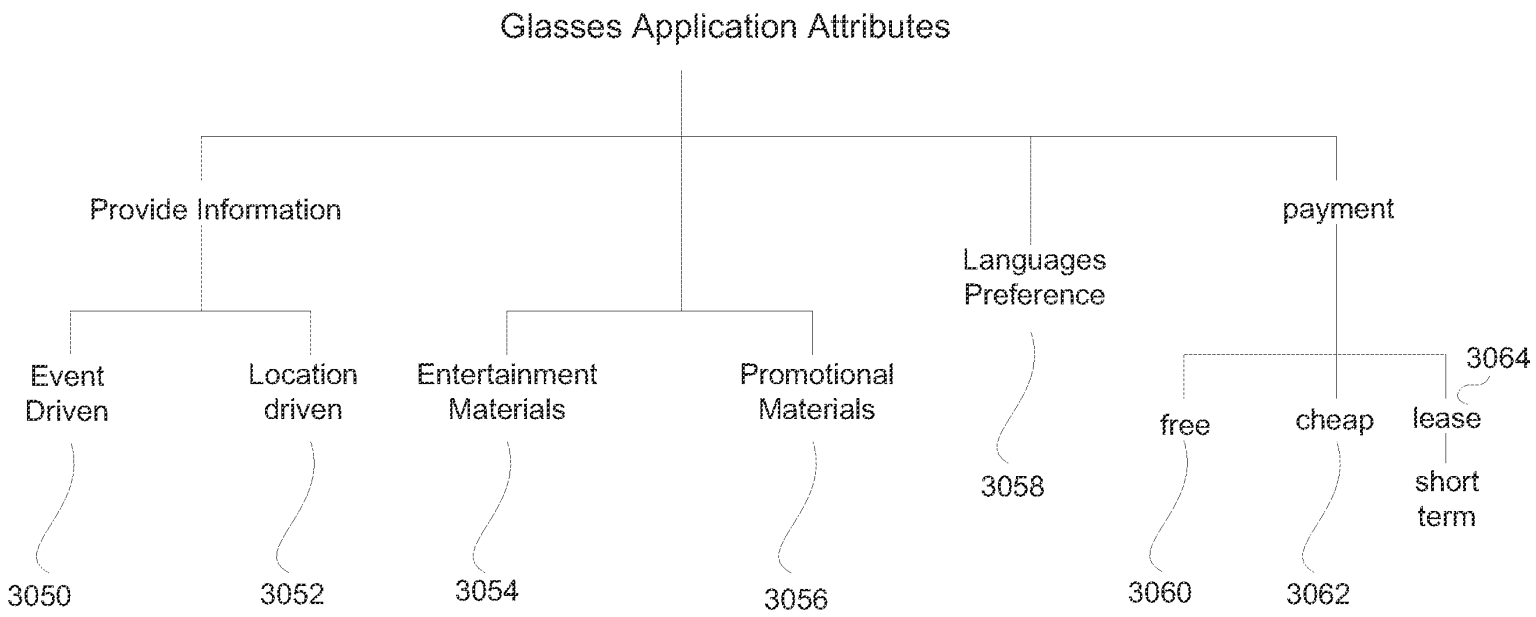


FIG. 26

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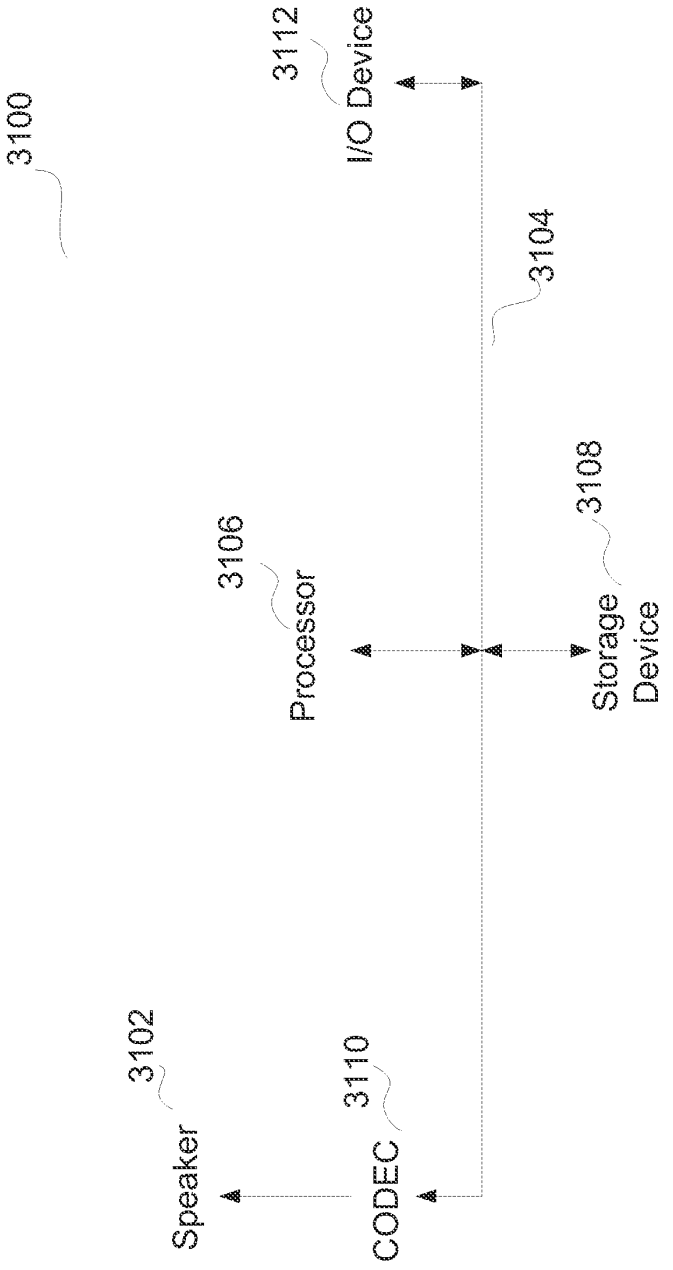

3100
3102
Speaker
3110
CODEC
3104
3106
Processor
3108
Storage Device
3112
I/O Device

FIG. 27

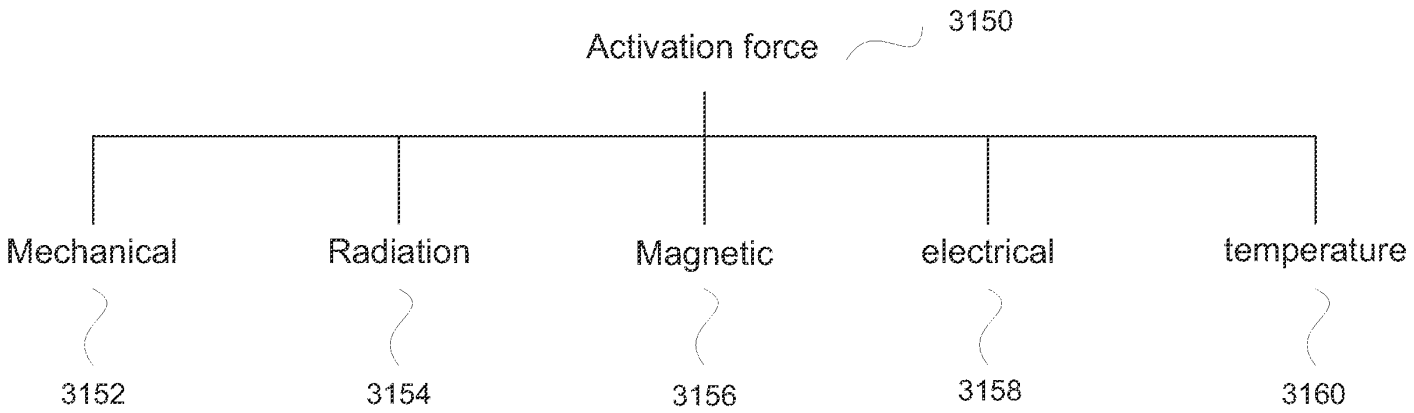


Fig. 28

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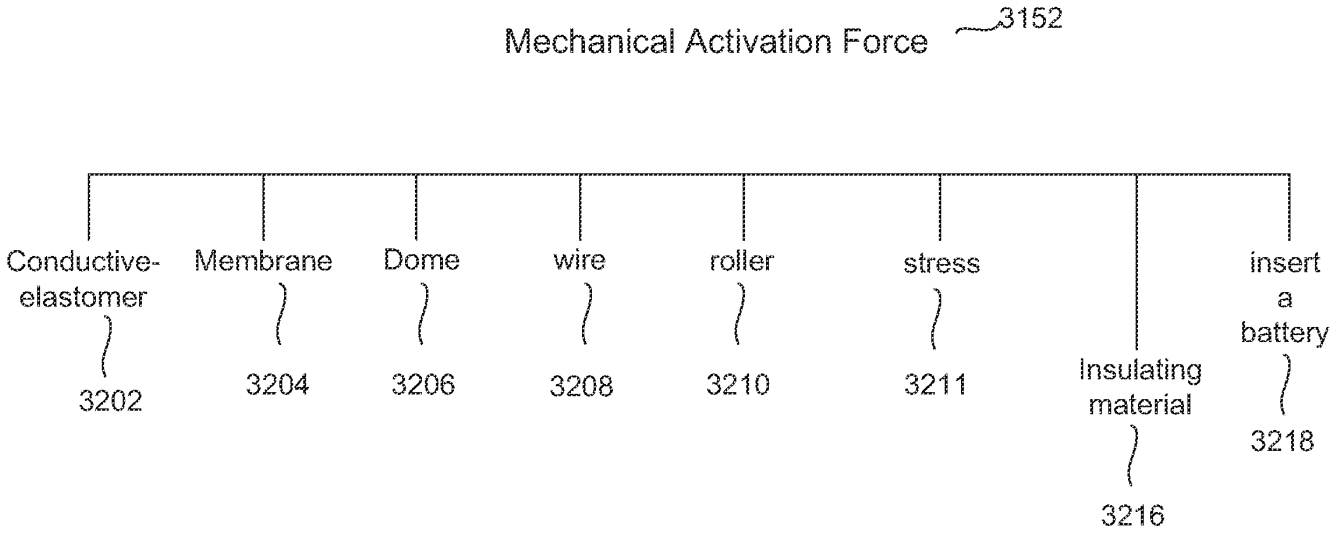


Fig. 29

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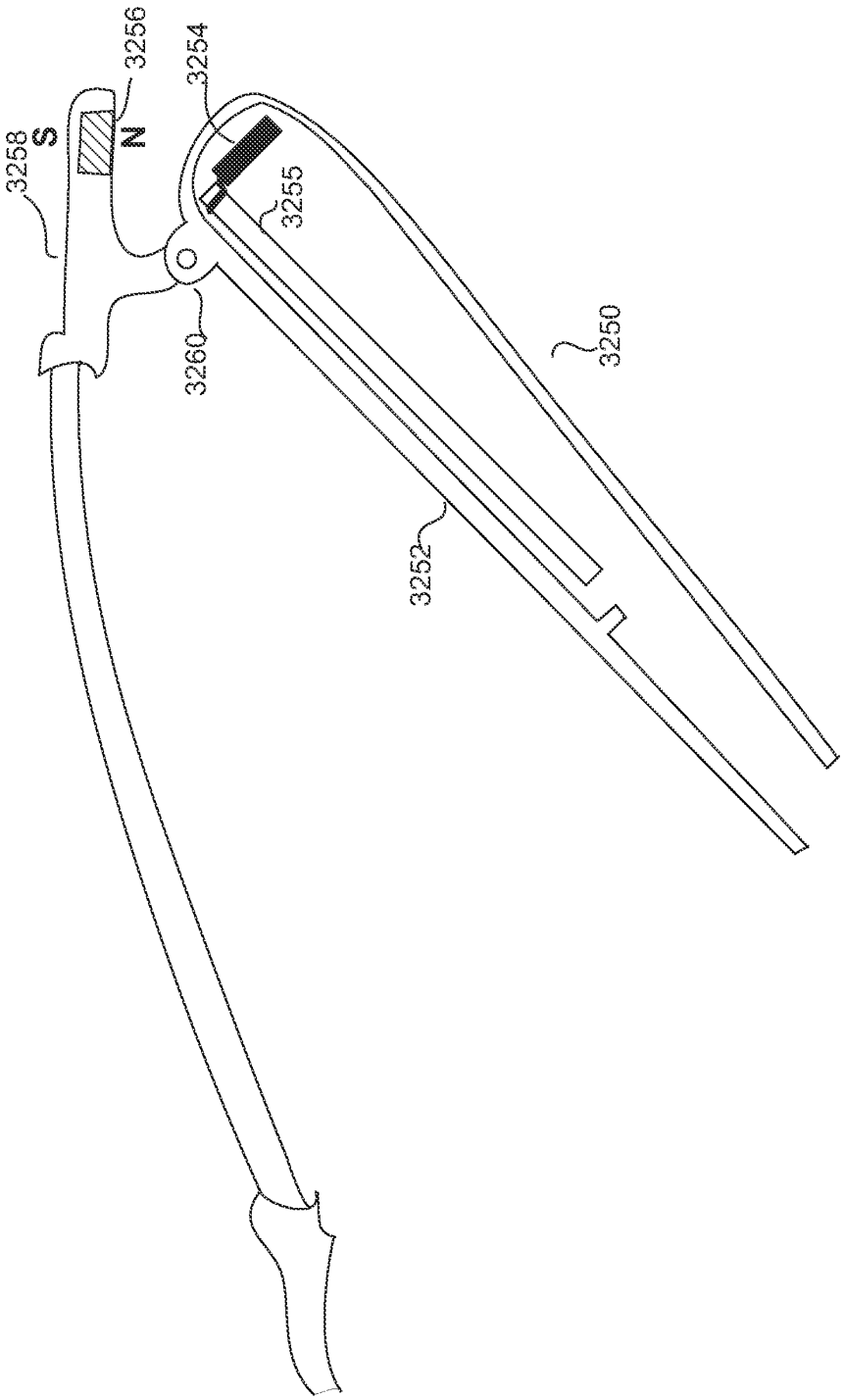


Fig. 30

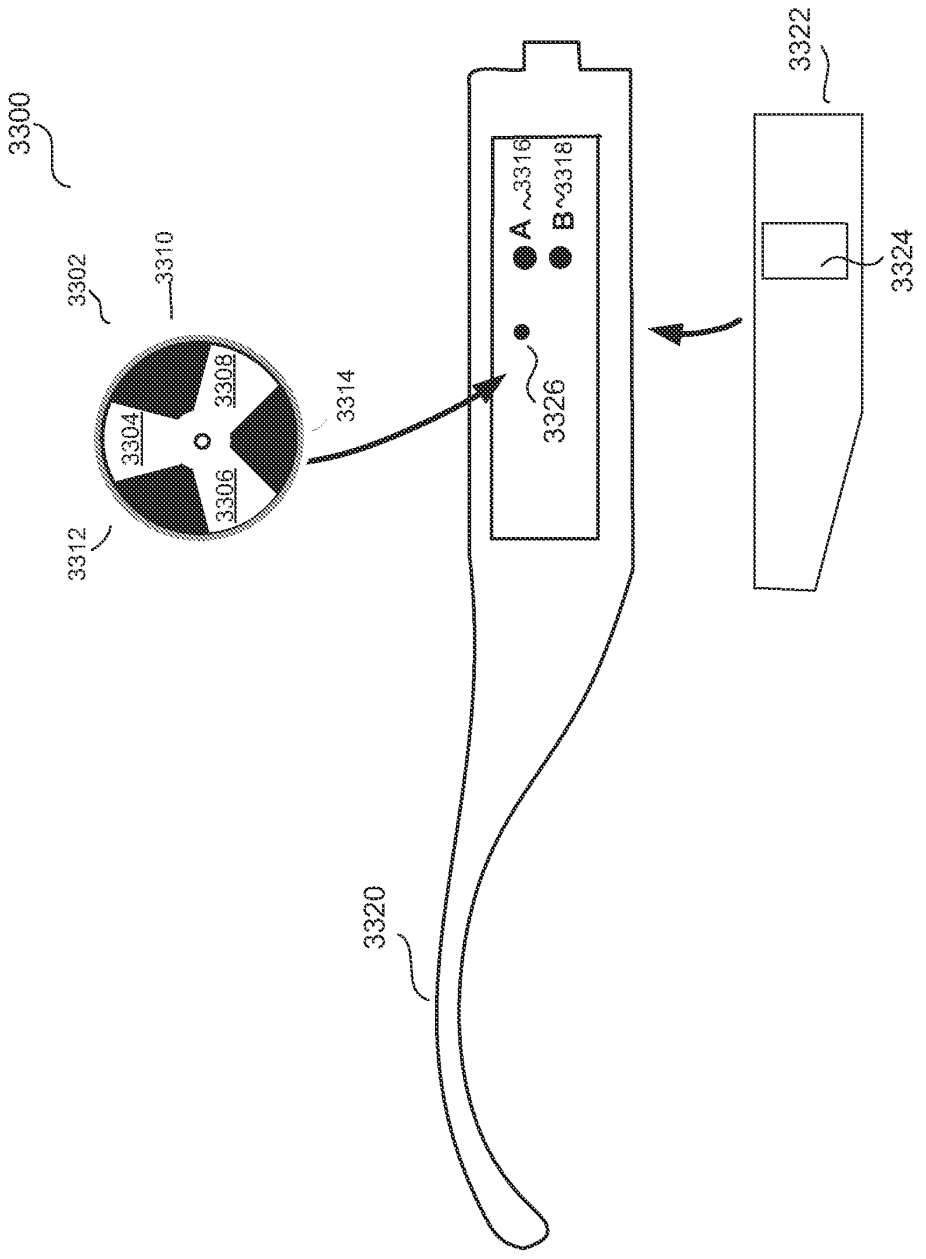

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Fig. 31A

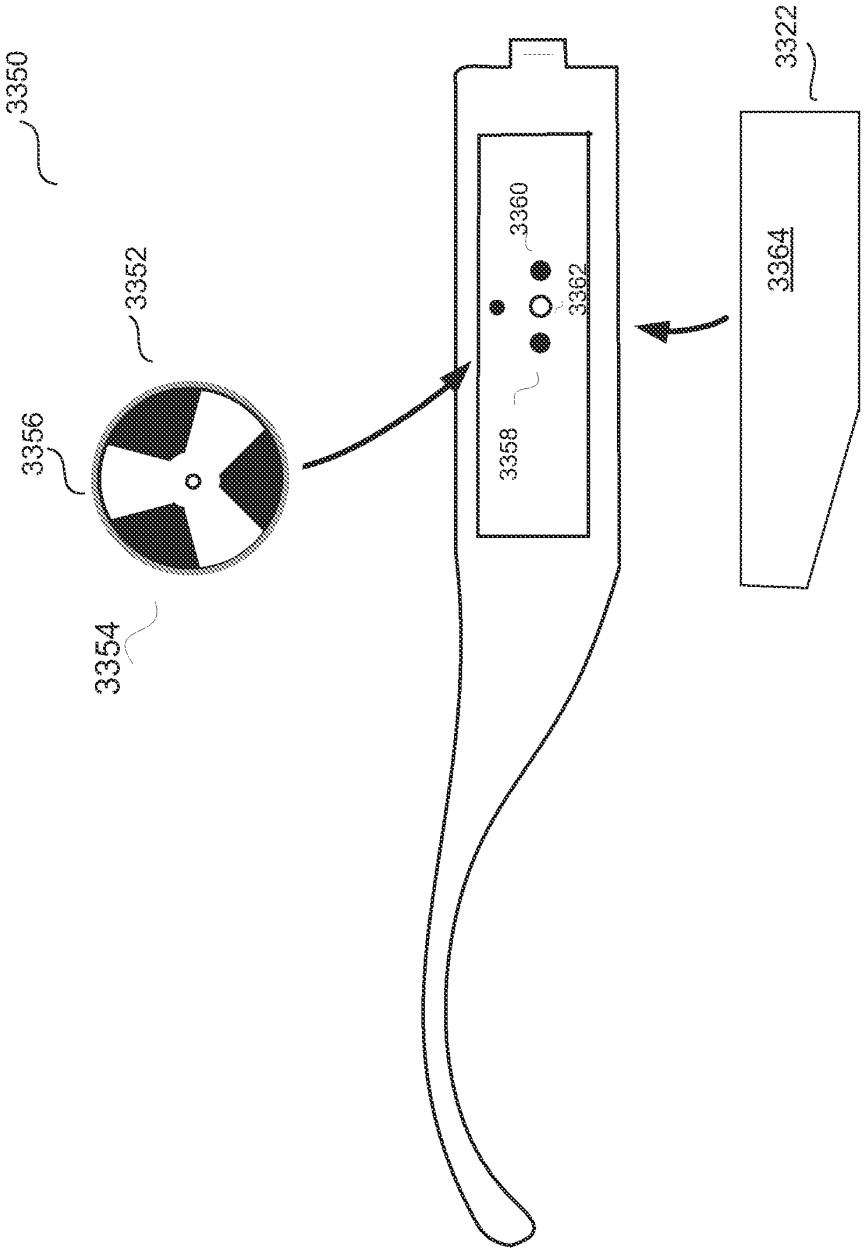


Fig. 31B

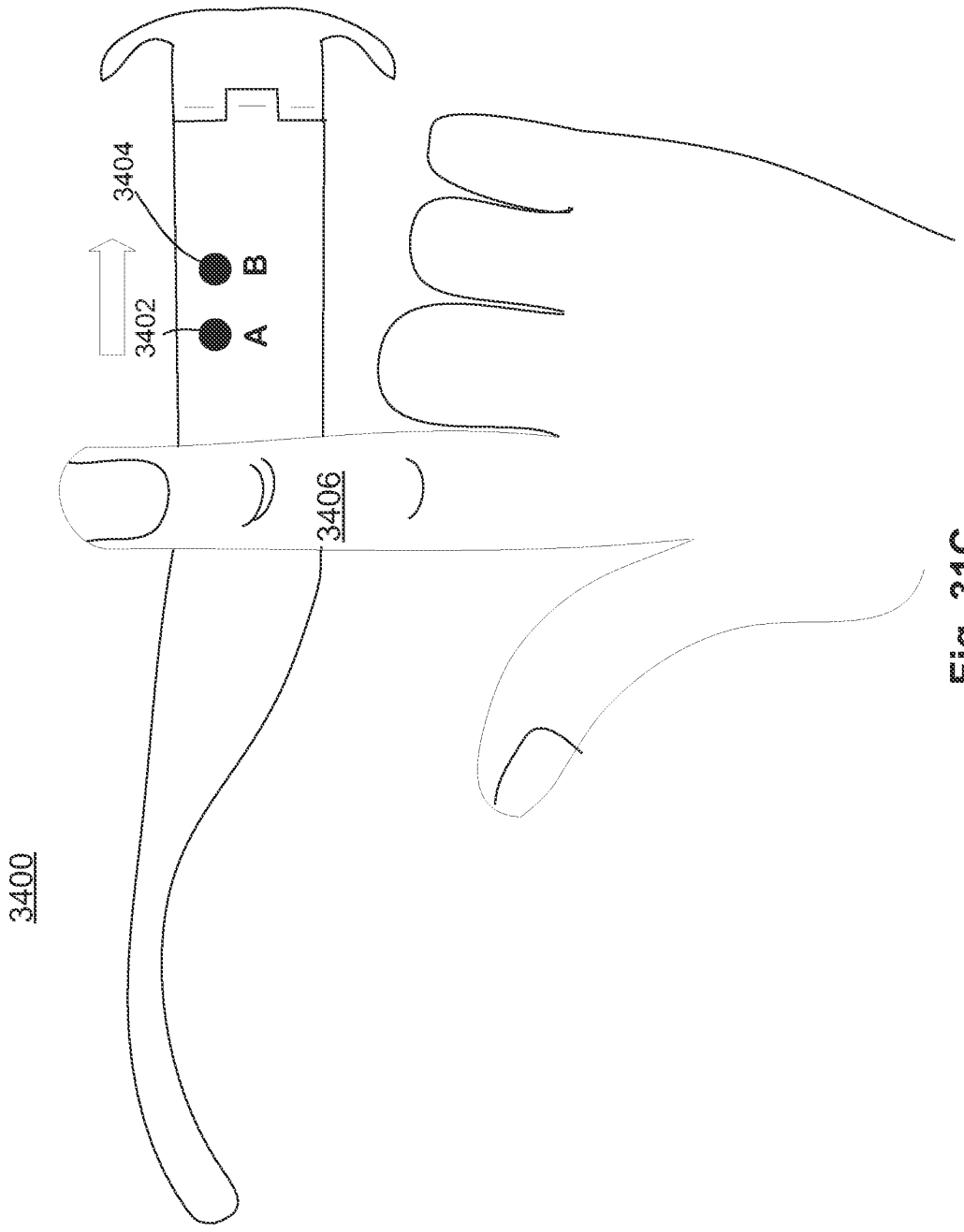


Fig. 31C

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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
18/519,802	11/27/2023		1820	IPVCP006X1C10D1C1	20	2

CONFIRMATION NO. 3510

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

FILING RECEIPT

OC000000065549086

Date Mailed: 12/08/2023

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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 18/224,793 07/21/2023 PAT 11,829,518
which is a DIV of 18/129,660 03/31/2023 PAT 11,803,069
which is a CON of 16/424,018 05/28/2019 PAT 11,630,331
which is a CON of 13/831,419 03/14/2013 PAT 10,345,625
which is a CON of 13/291,020 11/07/2011 PAT 8,430,507
which is a CON of 12/803,732 07/01/2010 PAT 8,434,863
which is a CON of 11/546,685 10/11/2006 PAT 7,806,525
which is a CIP of 11/183,256 07/15/2005 PAT 7,500,747
which claims benefit of 60/592,045 07/28/2004 *
and claims benefit of 60/605,191 08/28/2004
and claims benefit of 60/618,107 10/12/2004
and claims benefit of 60/620,238 10/18/2004
and claims benefit of 60/647,836 01/31/2005

and claims benefit of 60/647,826 01/31/2005
and said 11/546,685 10/11/2006 claims benefit of 60/725,896 10/11/2005
and claims benefit of 60/725,999 10/11/2005
and claims benefit of 60/787,850 04/01/2006
and claims benefit of 60/846,150 09/20/2006

(*) Data provided by applicant is not consistent with PTO records.

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.

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The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 18/519,802**

Projected Publication Date: 03/21/2024

Non-Publication Request: No

Early Publication Request: No

Title

HEAD-WORN DEVICE WITH CONNECTION REGION

Preliminary Class

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

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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 18/519,802

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))	20 minus 20 =	* 0			OR	x =	0
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2 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	1820

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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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/519,802	**12/08/2023 12:29:10 PM Z ET**	**IPVCP006X1C10D1C1**

Title of Invention

HEAD-WORN DEVICE WITH CONNECTION REGION

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	3510	FILED BY	Angela Nijim
PATENT CENTER #	63512663	FILING DATE	-
CUSTOMER #	34071	FIRST NAMED INVENTOR	Thomas A. Howell
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Peter Tong

Documents

TOTAL DOCUMENTS: 3

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
IPVCP006X1C10D1C1_IDSTrans_12-23.pdf	2	Letter specifying the conditions for filing under 37 CFR 1.97	20 KB
IPVCP006X1C10D1C1_1449_12-23.pdf	11	Information Disclosure Statement (IDS) Form (SB08)	92 KB
Warning: This is not a USPTO supplied IDS fillable form. Data in the form cannot be automatically loaded to other USPTO systems.			
IPVCP006X1C10D1C1_Petition_reAge_12-23_AsFiled_12-23.pdf	2	Petition to make special based on Age/Health	212 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
IPVCP006X1C10D1C1_IDSTrans_12-23.pdf	C04D1010EA196B998405638FA95F96CCBEABF223171F12BCEBB0D32E88C2F1208EE02506F9F3B71ED0E8DBD2B023C26D2F04D727E94BC6CF69701301373BACB7
IPVCP006X1C10D1C1_1449_12-23.pdf	ACF224DDB30D6F63C6077F3F57ED1F171AF06F9601B95A50A926D3BACCEBB99191A7012719745805458015 3A7F1C6EBC252319F67B3BEAA4D3DCEB6277F3FF34
IPVCP006X1C10D1C1_Petition_reAge_12-23_AsFiled_12-23.pdf	1FD83EACDA8CA6B5036E099C375B29A56D598538D14404E2782738BDB7FC7556343D7B7091819E28CF01A2419E6F0B7F3E5C1ED7D7B28D324ABDE9599340D21D

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.

Doc code: PET.OP.AGE
Description: Petition to make special based on age/health

PTO/SB/130 (01-19)
Approved for use through 05/31/2024. OMB 0651-0031
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	18/519,802	Confirmation Number	3510	Filing Date	November 27, 2023
Attorney Docket Number (optional)	IPVCP006X1C10D1C1	Art Unit	Not Yet Assigned	Examiner	Not Yet Assigned
First Named Inventor	THOMAS A. HOWELL				
Title of Invention	HEAD-WORN DEVICE WITH CONNECTION REGION				

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 11.18. 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	/Peter P. Tong/	Date (YYYY-MM-DD)	December 8, 2023
Name	Peter P. Tong	Registration Number	35757

A Federal agency may not conduct or sponsor, and a person is not required to respond to, nor shall a person be subject to a penalty for failure to comply with an information collection subject to the requirements of the Paperwork Reduction Act of 1995, unless the information collection has a currently valid OMB Control Number. The OMB Control Number for this information collection is 0651-0031. Public burden for this form is estimated to average 2 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the information collection. Send comments regarding this burden estimate or any other aspect of this information collection, including suggestions for reducing this burden to the Chief Administrative Officer, United States Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450 or email InformationCollection@uspto.gov. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS.** If filing this completed form by mail, 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.

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. The United States Patent and Trademark Office (USPTO) collects the information in this record under authority of 35 U.S.C. 2. The USPTO's system of records is used to manage all applicant and owner information including name, citizenship, residence, post office address, and other information with respect to inventors and their legal representatives pertaining to the applicant's/owner's activities in connection with the invention for which a patent is sought or has been granted. The applicable Privacy Act System of Records Notice for the information collected in this form is COMMERCE/PAT-TM-7 Patent Application Files, available in the Federal Register at 78 FR 19243 (March 29, 2013). https://www.govinfo.gov/content/pkg/FR-2013-03-29/pdf/2013-07341.pdf

Routine uses of the information in this record may include disclosure to:

1) law enforcement, in the event that the system of records indicates a violation or potential violation of law;

2) a federal, state, local, or international agency, in response to its request;

3) a contractor of the USPTO having need for the information in order to perform a contract;

4) the Department of Justice for determination of whether the Freedom of Information Act (FOIA) requires disclosure of the record;

5) a Member of Congress submitting a request involving an individual to whom the record pertains, when the individual has requested the Member's assistance with respect to the subject matter of the record;

6) a court, magistrate, or administrative tribunal, in the course of presenting evidence, including disclosures to opposing counsel in the course of settlement negotiations;

7) the Administrator, General Services Administration (GSA), or their designee, during an inspection of records conducted by GSA under authority of 44 U.S.C. 2904 and 2906, in accordance with the GSA regulations and any other relevant (i.e., GSA or Commerce) directive, where such disclosure shall not be used to make determinations about individuals;

8) 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));

9) the Office of Personnel Management (OPM) for personnel research purposes; and

10) the Office of Management and Budget (OMB) for legislative coordination and clearance.

If you do not furnish the information requested on this form, the USPTO may not be able to process and/or examine your submission, which may result in termination of proceedings, abandonment of the application, and/or expiration of the patent.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: HOWELL et al.	Attorney Docket No.: IPVCP006X1C10D1C1
Application No.: 18/519,802	Examiner: Not Yet Assigned
Filed: November 27, 2023	Group: Not Yet Assigned
Title: HEAD-WORN DEVICE WITH CONNECTION REGION	

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. 18/224,793. 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. IPVCP006X1C10D1C1).

Respectfully submitted,

/Peter P. Tong/

Peter P. Tong
Registration No. 35,757

4010 Moorpark Avenue
Suite 211
San Jose, CA 95117

Form 1449 (Modified)	Atty. Docket No.	IPVCP006X1C10D1C1
	Application No.:	18/519,802
Information Disclosure Statement By Applicant	Applicant	HOWELL et al.
	Filing Date	November 27, 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	

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)	Atty. Docket No.	IPVCP006X1C10D1C1
	Application No.:	18/519,802
Information Disclosure Statement By Applicant	Applicant	HOWELL et al.
	Filing Date	November 27, 2023
	Group	NOT YET ASSIGNED
(Use Several Sheets if Necessary)		Page 2 of 11

		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)	Atty. Docket No.	IPVCP006X1C10D1C1
	Application No.:	18/519,802
Information Disclosure Statement By Applicant	Applicant	HOWELL et al.
	Filing Date	November 27, 2023
	Group	NOT YET ASSIGNED
(Use Several Sheets if Necessary)		Page 3 of 11

	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.

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.	IPVCP006X1C10D1C1
	Application No.:	18/519,802
	Applicant	HOWELL et al.
	Filing Date	November 27, 2023
	Group	NOT YET ASSIGNED
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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.

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.

	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.

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)	Atty. Docket No.	IPVCP006X1C10D1C1
	Application No.:	18/519,802
Information Disclosure Statement By Applicant	Applicant	HOWELL et al.
	Filing Date	November 27, 2023
	Group	NOT YET ASSIGNED
(Use Several Sheets if Necessary)		Page 6 of 11

	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.

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)	Atty. Docket No.	IPVCP006X1C10D1C1
	Application No.:	18/519,802
Information Disclosure Statement By Applicant	Applicant	HOWELL et al.
	Filing Date	November 27, 2023
	Group	NOT YET ASSIGNED
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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. 17/964,853, dated September 15, 2023.
	FR	Office Action for U.S. Patent Application No. 18/129,660, dated May 19, 2023.
	FS	Office Action for U.S. Patent Application No. 18/129,660, dated July 7, 2023.
	FT	Notice of Allowance for U.S. Patent Application No. 18/129,660, dated August 24, 2023.
	FU	Office Action for U.S. Patent Application No. 18/224,793, dated September 7, 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.	IPVCP006X1C10D1C1
	Application No.:	18/519,802
	Applicant	HOWELL et al.
	Filing Date	November 27, 2023
	Group	NOT YET ASSIGNED
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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.	IPVCP006X1C10D1C1
	Application No.:	18/519,802
	Applicant	HOWELL et al.
	Filing Date	November 27, 2023
	Group	NOT YET ASSIGNED
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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.	IPVCP006X1C10D1C1
	Application No.:	18/519,802
	Applicant	HOWELL et al.
	Filing Date	November 27, 2023
	Group	NOT YET ASSIGNED
		Page 10 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.	IPVCP006X1C10D1C1
	Application No.:	18/519,802
	Applicant	HOWELL et al.
	Filing Date	November 27, 2023
	Group	NOT YET ASSIGNED
		Page 11 of 11

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Examiner	Date Considered

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/519,802	11/27/2023	Thomas A. Howell	IPVCP006X1C10D1C1	3510

34071 7590 01/10/2024

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

EXAMINER	
CENTRAL, DOCKET	

ART UNIT	PAPER NUMBER
OPAP	

MAIL DATE	DELIVERY MODE
01/10/2024	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.

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
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In re Application of	:	
Howell et al.	:	
Application No. 18/519,802	:	DECISION ON PETITION
Filed: November 27, 2023	:	
For: HEAD-WORN DEVICE WITH CONNECTION REGION	:	

This is a decision on the petition under 37 CFR 1.102(c)(1), filed December 08, 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.**

An application may be made special upon filing a petition including any evidence showing that the inventor or joint inventor is 65 years of age, or more, such as a statement by the inventor or joint inventor or a statement from a registered practitioner that he or she has evidence that the inventor or joint inventor is 65 years of age or older. No fee is required with such a petition. See 37 CFR 1.102(c).

The instant petition includes a statement by registered attorney Peter P. Tong, having evidence one of the joint inventors in the application is 65 years of age or older. Accordingly, the above-identified application has been accorded "special" status.

Telephone inquiries concerning this decision should be directed to Schene Gray Paralegal Specialist at (571) 272-2581.

/SCHENE C GRAY/
Schene C Gray
Paralegal Specialist, OPET

Notice of References Cited	Application/Control No. 18/519,802	Applicant(s)/Patent Under Reexamination Howell et al.	
	Examiner AMMAR T HAMID	Art Unit 2695	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date YYYY-MM-DD	Name	CPC Classification	US Classification
*	A	US-6769767-B2	2004-08-03	Swab; Gregory	H04W56/0015	351/158
	B					
	C					
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FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date YYYY-MM-DD	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in YYYY-MM-DD format are publication dates. Classifications may be US or foreign.

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/519,802	Howell et al.
	Examiner	**Art Unit**
	AMMAR T HAMID	2695

✓	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	01/23/2024								
	1	✓								
	2	✓								
	3	✓								
	4	✓								
	5	✓								
	6	✓								
	7	✓								
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	16	✓								
	17	✓								
	18	✓								
	19	✓								
	20	✓								

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/519,802	Howell et al.
	Examiner	Art Unit
	AMMAR T HAMID	2695

CPC - Searched*		
Symbol	**Date**	**Examiner**
G06F3/01	01/23/2024	AH
G02C5/001	01/23/2024	AH
G02C5/14	01/23/2024	AH
G02C5/14	01/23/2024	AH
G02C11/10	01/23/2024	AH
G02C11/10	01/23/2024	AH
G10L15/22	01/23/2024	AH

CPC Combination Sets - Searched*		
Symbol	**Date**	**Examiner**

US Classification - Searched*			
Class	**Subclass**	**Date**	**Examiner**
381	111	01/23/2024	AH
351	111	01/23/2024	AH

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	**Date**	**Examiner**
Consulted with examiner Xu Mei for class subclass search	01/23/2024	AH
Text search using PE2E	01/23/2024	AH
Inventor and applicant search using PE2E	01/23/2024	AH
Concept search using IP.com	01/23/2024	AH

/AMMAR T HAMID/ Primary Examiner, Art Unit 2695	/AMMAR T HAMID/ Primary Examiner, Art Unit 2695

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/519,802	Howell et al.
	Examiner	Art Unit
	AMMAR T HAMID	2695

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

/AMMAR T HAMID/ Primary Examiner, Art Unit 2695	/AMMAR T HAMID/ Primary Examiner, Art Unit 2695

Bibliographic Data

Application No: 18/519,802

Foreign Priority claimed: ○ Yes ◉ No

35 USC 119 (a-d) conditions met: ☐ Yes ☑ No ☐ Met After Allowance

Verified and Acknowledged: /AMMAR T HAMID/ (Examiner's Signature) | (Initials)

Title: HEAD-WORN DEVICE WITH CONNECTION REGION

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
11/27/2023	351	2695	IPVCP006X1C10D1C1
RULE			

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CONTINUING DATA

This application is a CON of 18224793 07/21/2023 PAT 11829518

18224793 is a DIV of 18129660 03/31/2023 PAT 11803069

18129660 is a CON of 16424018 05/28/2019 PAT 11630331

16424018 is a CON of 13831419 03/14/2013 PAT 10345625

13831419 is a CON of 13291020 11/07/2011 PAT 8430507

13291020 is a CON of 12803732 07/01/2010 PAT 8434863

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11546685 has PRO of 60846150 09/20/2006

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11183256 has PRO of 60647826 01/31/2005

11183256 has PRO of 60647836 01/31/2005

11183256 has PRO of 60620238 10/18/2004

11183256 has PRO of 60618107 10/12/2004

11183256 has PRO of 60605191 08/28/2004

11183256 has PRO of 60592045 07/28/2004 *

(*) Data provided by applicant is not consistent with PTO record

FOREIGN APPLICATIONS

IF REQUIRED, FOREIGN LICENSE GRANTED**

12/07/2023

STATE OR COUNTRY

UNITED STATES

ADDRESS

IPVENTURE, INC.
4010 Moorpark Avenue
Suite 211
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UNITED STATES

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$1,820

Form 1449 (Modified)	Atty. Docket No.	IPVCP006X1C10D1C1
	Application No.:	18/519,802
Information Disclosure Statement By Applicant	Applicant	HOWELL et al.
	Filing Date	November 27, 2023
	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.						
	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	
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		JP 2002-02511706 A	Apr-02	Japan			X	
		JP 2005-151292	Jun-05	Japan			X abstract	
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		TW 484711	Jun-01	Taiwan			X abstract	

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/AMMAR T HAMID/	01/23/2024

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		WO 01/24576 A1	Apr-01	WIPO				
		WO 02/06881 A2	Jan-02	WIPO				
		WO 03/069394 A1	Aug-03	WIPO			X abstract	
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		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.

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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. 17/964,853, dated September 15, 2023.
	FR	Office Action for U.S. Patent Application No. 18/129,660, dated May 19, 2023.
	FS	Office Action for U.S. Patent Application No. 18/129,660, dated July 7, 2023.
	FT	Notice of Allowance for U.S. Patent Application No. 18/129,660, dated August 24, 2023.
	FU	Office Action for U.S. Patent Application No. 18/224,793, dated September 7, 2023.

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	FV	Notice of Allowance for U.S. Patent Application No. 18/224,793, dated October 2, 2023.
	FW	"±1.5g Dual Axis Micromachined Accelerometer", Freescale Semiconductor, Inc., Motorola Semiconductor Technical Data, MMA6260Q, June 2004, pp. 1-7.
	FX	"APA Announces Shipment of the SunUV™ Personal UV Monitor", Press Release, November 7, 2003, pp. 1-3.
	FY	"Camera Specs Take Candid Snaps", BBC News, 18 September 2003, pp. 1-3.
	FZ	"Cardo Wireless Attaching Clips and Wearing Headset", Cardo Systems, Inc., http://www.cardowireless.com/clips.php, downloaded Nov. 27, 2004, pp. 1-3.
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	GG	"Motorola and Oakley Introduce First Bluetooth Sunglasses-Cutting Edge RAZRWire Line Offers Consumers On-The-Go Connections", Motorola Mediacenter-Press Release, February 14, 2005, pp. 1-2.
	GH	"Oakley Thump: Sunglasses Meet MP3 Player", with image, http://news.designtechnica.com/article4665.html, July 13, 2004.
	GI	"Personal UV monitor," Optics.org, http://optics.org/articles/news/6/6/7/1 (downloaded 12/20/03), June 9, 2000, pp. 1-2.
	GJ	"SafeSun Personal Ultraviolet Light Meter", http://healthchecksystems.com/safesun.htm, downloaded July 12, 2004, pp. 1-4.
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	GL	"SafeSun Personal UV Meter, features, Optix Tech Inc., http://www.safesun.com/features.html, downloaded May 1, 2004, pp. 1-2.
	GM	"Sharper Image - The FM Pedometer", e-Corporate Gifts.com, http://www.e-corporategifts.com/sr353.html, downloaded January 22, 2005, pp. 1-2.
	GN	"Sun UV ™ Personal UV Monitor", APA Optics, Inc., http://www.apaoptics.com/sunuv/uvfacts.html, downloaded December 20, 2003, pp.1-3.
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Examiner /AMMAR T HAMID/	Date Considered 01/23/2024

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.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.T.H/

Form 1449 (Modified)	Atty. Docket No.	IPVCP006X1C10D1C1
	Application No.:	18/519,802
Information Disclosure	Applicant	HOWELL et al.
Statement By Applicant	Filing Date	November 27, 2023
	Group	NOT YET ASSIGNED
(Use Several Sheets if Necessary)		Page 9 of 11

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	GQ	"Ultraviolet Radiation (UVR)", Forum North, Ontario Ministry of Labour, http://www3.mb.sympatico.ca/~ericc/ULTRAVIOLET%20RADIATION.htm, downloaded February 5, 2004, pp. 1-6.
	GR	"What Are Gripples?", Gripping Eyewear, Inc., http://www.grippingeyewear.com/whatare.html, downloaded November 2, 2005.
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	GU	Abrisa Product Information: Commercial Hot Mirror, Abrisa, June 2001, p. 1.
	GV	Alps Spectacle, Air Conduction Glass, Bone Conduction Glass, http://www.alps-inter.com/spec.htm, downloaded December 10, 2003, pp. 1-2.
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	GX	Bone Conduction Headgear HG16 Series, "Voiceducer," http://www.temco-j.co.jp/html/English/HG16.html, downloaded December 10, 2003, pp. 1-3.
	GY	Carnoy, David, "The Ultimate MP3 Player for Athletes? Could be.", CNET Reviews, May 14, 2004, pp. 1-4.
	GZ	Clifford, Michelle A., "Accelerometers Jump into the Consumer Goods Market", Sensors Online, http://www.sensorsmag.com, August 2004.
	HA	Comfees.com, Adjustable Sports Band Style No. 1243, http://shop.store.yahoo.com/comfees/adsportbansty.html, downloaded April 18, 2003, pp. 1-2.
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(Use Several Sheets if Necessary)		Page 10 of 11

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	HM	Pärkkä, Juha, et al., "A Wireless Wellness Monitor for Personal Weight Management", VTT Information Technology, Tampere, Finland, ***November 2000***, p.1.
	HN	Pedometer, Model HJ-112, Omron Instruction Manual, Omron Healthcare, Inc., 2003, pp. 1-27.
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	HP	PNY Technologies, " Executive Attaché" http://www.pny.com/products/flash/execattache.asp downloaded November 16, 2005.
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	HY	SportLine Fitness Pedometer-Model 360, UltimateFatBurner Superstore, http://www.ultimatefatburner-store.com/ac_004.html, downloaded May 10, 2005, pp. 1-2.
	HZ	Steele, Bonnie G. et al., "Bodies in motion: Monitoring daily activity and exercise with motion sensors in people with chronic pulmonary disease", VA Research & Development, Journal of Rehabilitation Research & Development, Vol. 40, No. 5, September/October 2003, Supplement 2, pages 45-58.
	IA	Stevens, Kathy, "Should I Use a Pedometer When I Walk?", Healtheon/WebMD, April 14, 2000.
	IB	Sundgot, Jørgen "2nd-gen Motorola Bluetooth headset", InfoSync World, March 1, 2003, http://www.infosync.no/news/2002/n/2841.html, pp. 1-2.
	IC	SunSensors, Segan Industries, Inc., http://www.segan-ind.com/sunsensor.htm, downloaded February 5, 2004, pp. 1-3.
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	IF	Talking Pedometer, Sportline, Inc., ***June 2001 (Possibly earlier)***, 1 page.
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/AMMAR T HAMID/	01/23/2024

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	Application No.:	18/519,802
	Applicant	HOWELL et al.
	Filing Date	November 27, 2023
	Group	NOT YET ASSIGNED
		Page 11 of 11

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	IJ	UV-Smart, UVA/B Monitor, Model EC-960-PW, Instruction Manual, Tanita Corporation of America, Inc., downloaded November 16, 2001.
	IK	Vitaminder Personal Carb Counter, http://www.auravita.com/products/AURA/ORBU11420.asp. Downloaded November 15, 2005, pp. 1-4.
	IL	Yamada et al. "Development of an eye-movement analyser possessing functions for wireless transmission and autocalibration," Med. Biol. Eng. Comput., No. 28, v.4, July 28, 1990, http://link.springer.com/article/10.1007%2FBF02446149?LI=true, pp. 1-2.

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PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1	2	"20030063763"	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/05 10:48 AM
L2	803	(head ADJ worn glasses) WITH force ADJ sensor	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/05 10:50 AM
L3	1	(head ADJ worn) WITH force ADJ sensor	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/05 10:50 AM
L4	2131	head WITH force ADJ sensor	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/05 10:51 AM
L5	528	head WITH force ADJ sensor AND microphone	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/05 10:51 AM
L6	453	head WITH force ADJ sensor AND microphone AND speaker	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/05 10:51 AM
L7	412	head WITH force ADJ sensor AND microphone AND speaker AND touch	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/05 10:51 AM
L8	295	head WITH force ADJ sensor AND microphone AND speaker AND touch AND bluetooth	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/05 10:52 AM
L9	259	glasses WITH force ADJ sensor AND microphone AND speaker AND touch AND bluetooth	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/05 10:56 AM
L10	259	"glasses" WITH force ADJ sensor AND microphone AND speaker AND touch AND bluetooth	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/05 11:00 AM
L11	2	(glasses) WITH force ADJ sensor AND microphone AND speaker AND touch AND bluetooth	(US-PGPUB; USPAT)	OR	OFF	ON	2023/09/05 11:01 AM
L12	0	(glasses) WITH magnetic WITH attachement AND microphone AND speaker AND touch AND bluetooth	(US-PGPUB; USPAT)	OR	OFF	ON	2023/09/05 11:53 AM
L13	18	(glasses) WITH magnetic WITH	(US-PGPUB; USPAT)	OR	OFF	ON	2023/09/05 11:54 AM

		attach$5 AND microphone AND speaker AND touch AND bluetooth					
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L17	26	glasses WITH magnetic ADJ attach$5	(US-PGPUB; USPAT)	OR	OFF	ON	2023/09/05 12:04 PM
L18	9	smart ADJ glasses WITH force ADJ sensor	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/05 12:20 PM
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L22	439	G02C5/14.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/05 05:39 PM
L23	802	G02C5/143.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/05 05:39 PM
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			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)				
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L54	415	351/111.ccls.	(US-PGPUB; USPAT)	OR	ON	ON	2024/01/23 04:22 PM
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L56	20267	((("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	2024/01/23 04:23 PM

PE2E SEARCH - Search History (Interference)

There are no Interference searches to show.

18519802

Report Run Date: 2024-01-23 UTC
Searches: 1
Markers: 0

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Content: Patent Publications (169)

US Patents | US Designs | US Applications | EPO Patents | EPO Applications | China Patents | China Applications | Japan Patents | Japan Applications | Korea Patents | Korea Applications | WIPO Applications | Argentina Patents | Argentina Applications | Brazil Patents | Brazil Applications | Canada Patents | Canada Applications | Chile Patents | Chile Applications | Colombia Applications | Costa Rica Applications | Cuba Patents | Cuba Applications | Dominican Republic Applications | Ecuador Patents | Ecuador Applications | El Salvador Applications | Guatemala Applications | Honduras Applications | Mexico Patents | Mexico Applications | Nicaragua Patents | Panama Applications | Peru Applications | Trinidad & Tobago Patents | Uruguay Applications | Austria Patents | Austria Applications | Belarus Patents | Belgium Patents | Belgium Applications | Bosnia & Herzegovina Patents | Bosnia & Herzegovina Applications | Bulgaria Patents | Bulgaria Applications | Croatia Patents | Croatia Applications | Czech Republic Patents | Czech Republic Applications | Czechoslovakia Patents | Czechoslovakia Applications | Denmark Patents | Denmark Applications | Estonia Patents | Estonia Applications | EUIPO Patents | Finland Patents | Finland Applications | France Patents | France Applications | Germany Patents | Germany Applications | Great Britain Patents | Great Britain Applications | Greece Patents | Greece Applications | Hungary Patents | Hungary Applications | Iceland Patents | Iceland Applications | Ireland Patents | Ireland Applications | Italy Patents | Italy Applications | Latvia Patents | Latvia Applications | Lithuania Patents | Lithuania Applications | Luxembourg Patents | Luxembourg Applications | Malta Patents | Monaco Patents | Montenegro Patents | Montenegro Applications | Netherlands Patents | Netherlands Applications | Norway Patents | Norway Applications | Poland Patents | Poland Applications | Portugal Patents | Portugal Applications | Republic of Moldova Patents | Republic of Moldova Applications | Romania Patents | Romania Applications | San Marino Patents | San Marino Applications | Serbia Patents | Serbia Applications | Slovakia Patents | Slovakia Applications | Slovenia Patents | Spain Patents | Spain Applications | Sweden Patents | Sweden Applications | Switzerland Patents | Switzerland Applications | Ukraine Patents | Yugoslavia/Serbia and Montenegro Patents | Yugoslavia/Serbia and Montenegro Applications | Armenia Patents | Australia Patents | Australia Applications | Cyprus Patents | Gulf Cooperation Council Patents | Hong Kong Patents | India Patents | India Applications | Indonesia Patents | Indonesia Applications | Israel Patents | Israel Applications | Jordan Patents | Jordan Applications | Kyrgyzstan Patents | Macao Applications | Malaysia Patents | Mongolia Patents | New Zealand Patents | Philippines Patents | Philippines Applications | Saudi Arabia Patents | Saudi Arabia Applications | Singapore Patents | Singapore Applications | Taiwan Patents | Taiwan Applications | Tajikistan Patents | Tajikistan Applications | Thailand Patents | Thailand Applications | Uzbekistan Patents | Vietnam Patents | Algeria Patents | ARIPO Patents | ARIPO Applications | Egypt Patents | Kenya Patents | Malawi Patents | Morocco Patents | Morocco Applications | OAPI Patents | South Africa Patents | Tunisia Applications | Zambia Patents | Zimbabwe Patents | EAPO Patents | EAPO Applications | Georgia Patents | Georgia Applications | Kazakhstan Patents | Kazakhstan Applications | Russia Patents | Russia Applications | Turkey Patents | Turkey Applications

1 **2024-01-23 21:24 UTC | ~31,095,028 results from**

De-Dup: Extended Family Numbers | **Relevance Cut-off:** None | **Sort:** Relevance

Main Concept: Text

A wireless wearable device configured to secure to the head of a user, with the device proximate to at least one ear of the user when the device is worn by the user, to at least help the user hear audio outputs produced by the device, the wireless wearable device comprising: a speaker at least partially in the wireless wearable device; an electrical connector at least partially in the wireless wearable device, wherein the electrical connector includes at least two conductive areas, wherein the at least two conductive areas are configured to removably couple to corresponding conductive contacts of a counterpart connector external to and separate from the wireless wearable device, at least via spring-force, to at least enable each of the at least two conductive areas to be electrically connected to its corresponding conductive contact; a rechargeable battery at least partially in the wireless wearable device; and a microphone at least partially in the wireless wearable device.

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Concept Modifiers: None

Filters: None

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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			
	6.	2002/0081982 A1	Jun-02	Schwartz et al.			
	7.	2002/0084990 A1	Jul-02	Peterson, III			
	8.	2002/0089639 A1	Jul-02	Starner et al.			
	9.	2002/0090103 A1	Jul-02	Calisto, Jr.			
	10.	2002/0098877 A1	Jul-02	Glezerman			
	11.	2002/0101568 A1	Aug-02	Eberl et al.			
	12.	2002/0109600 A1	Aug-02	Mault et al.			
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	14.	2002/0140899 A1	Oct-02	Blum et al.			
	15.	2002/0159023 A1	Oct-02	Swab			
	16.	2002/0197961 A1	Dec-02	Warren			
	17.	2003/0018274 A1	Jan-03	Takahashi et al.			
	18.	2003/0022690 A1	Jan-03	Beyda et al.			
	19.	2003/0032449 A1	Feb-03	Giobbi			
	20.	2003/0062046 A1	Apr-03	Wiesmann et al.			
	21.	2003/0064746 A1	Apr-03	Rader et al.			
	22.	2003/0065257 A1	Apr-03	Mault et al.			
	23.	2003/0067585 A1	Apr-03	Miller et al.			
	24.	2003/0063763 A1	Apr-03	Allred et al.			
	25.	2003/0068057 A1	Apr-03	Miller et al.			
	26.	2003/0083591 A1	May-03	Edwards et al.			
	27.	2003/0091200 A1	May-03	Pompei			

Examiner /AMMAR T HAMID/	Date Considered 01/23/2024

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	28.	2003/0214630 A1	Nov-03	Winterbotham			
	29.	2003/0226978 A1	Dec-03	Ribi et al.			
	30.	2003/0231293 A1	Dec-03	Blum et al.			
	31.	2004/0000733 A1	Jan-04	Swab et al.			
	32.	2004/0005069 A1	Jan-04	Buck			
	33.	2004/0029582 A1	Feb-04	Swab et al.			
	34.	2004/0059212 A1	Mar-04	Abreu			
	35.	2004/0063378 A1	Apr-04	Nelson			
	36.	2004/0096078 A1	May-04	Lin			
	37.	2004/0100384 A1	May-04	Chen et al.			
	38.	2004/0101178 A1	May-04	Fedorovskaya et al.			
	39.	2004/0104864 A1	Jun-04	Nakada			
	40.	2004/0114770 A1	Jun-04	Pompei			
	41.	2004/0128737 A1	Jul-04	Gesten			
	42.	2004/0150986 A1	Aug-04	Chang			
	43.	2004/0156012 A1	Aug-04	Jannard et al.			
	44.	2004/0157649 A1	Aug-04	Jannard et al.			
	45.	2004/0160571 A1	Aug-04	Jannard			
	46.	2004/0160572 A1	Aug-04	Jannard			
	47.	2004/0160573 A1	Aug-04	Jannard et al.			
	48.	2004/0197002 A1	Oct-04	Atsumi et al.			
	49.	2004/0227219 A1	Nov-04	Su			
	50.	2005/0036103 A1	Feb-05	Bloch			
	51.	2005/0067580 A1	Mar-05	Fontaine			
	52.	2005/0078274 A1	Apr-05	Howell et al.			
	53.	2005/0088365 A1	Apr-05	Yamazaki et al.			
	54.	2005/0201585 A1	Sep-05	Jannard et al.			
	55.	2005/0213026 A1	Sep-05	Da Pra'			
	56.	2005/0230596 A1	Oct-05	Howell et al.			

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	57.	2005/0238194 A1	Oct-05	Chornenky			
	58.	2005/0239502 A1	Oct-05	Swab et al.			
	59.	2005/0248717 A1	Nov-05	Howell et al.			
	60.	2005/0248718 A1	Nov-05	Howell et al.			
	61.	2005/0248719 A1	Nov-05	Howell et al.			
	62.	2005/0264752 A1	Dec-05	Howell et al.			
	63.	2005/0278446 A1	Dec-05	Bryant			
	64.	2006/0001827 A1	Jan-06	Howell et al.			
	65.	2006/0003803 A1	Jan-06	Thomas et al.			
	66.	2006/0023158 A1	Feb-06	Howell et al.			
	67.	2006/0034478 A1	Feb-06	Davenport			
	68.	2006/0107822 A1	May-06	Bowen			
	69.	2006/0132382 A1	Jun-06	Jannard			
	70.	2006/0291667 A1	Dec-06	Watanabe et al.			
	71.	2007/0030442 A1	Feb-07	Howell et al.			
	72.	2007/0035830 A1	Feb-07	Matveev et al.			
	73.	2007/0046887 A1	Mar-07	Howell et al.			
	74.	2007/0055888 A1	Mar-07	Miller et al.			
	75.	2007/0098192 A1	May-07	Sipkema			
	76.	2007/0109491 A1	May-07	Howell et al.			
	77.	2007/0186330 A1	Aug-07	Howell et al.			
	78.	2007/0189548 A1	Aug-07	Croft, III			
	79.	2007/0200927 A1	Aug-07	Krenik			
	80.	2007/0208531 A1	Sep-07	Darley et al.			
	81.	2007/0211574 A1	Sep-07	Croft, III			
	82.	2007/0248238 A1	Oct-07	Abreu et al.			
	83.	2007/0270663 A1	Nov-07	Ng et al.			
	84.	2007/0271065 A1	Nov-07	Gupta et al.			
	85.	2007/0271116 A1	Nov-07	Wysocki et al.			

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	86.	2007/0271387 A1	Nov-07	Lydon et al.			
	87.	2007/0279584 A1	Dec-07	Howell et al.			
	88.	2008/0062338 A1	Mar-08	Herzog et al.			
	89.	2008/0068559 A1	Mar-08	Howell et al.			
	90.	2008/0089545 A1	Apr-08	Jannard et al.			
	91.	2008/0100792 A1	May-08	Blum et al.			
	92.	2008/0144854 A1	Jun-08	Abreu			
	93.	2008/0151175 A1	Jun-08	Gross			
	94.	2008/0151179 A1	Jun-08	Howell et al.			
	95.	2008/0158506 A1	Jul-08	Fuziak			
	96.	2008/0211921 A1	Sep-08	Sako et al.			
	97.	2008/0218684 A1	Sep-08	Howell et al.			
	98.	2008/0262392 A1	Oct-08	Ananny et al			
	99.	2008/0278678 A1	Nov-08	Howell et al.			
	100.	2009/0059159 A1	Mar-09	Howell et al.			
	101.	2009/0059381 A1	Mar-09	Jannard			
	102.	2009/0073375 A1	Mar-09	Nakada			
	103.	2009/0141233 A1	Jun-09	Howell et al.			
	104.	2009/0147215 A1	Jun-09	Howell et al.			
	105.	2009/0156128 A1	Jun-09	Franson et al.			
	106.	2009/0251660 A1	Oct-09	Figler et al.			
	107.	2009/0251661 A1	Oct-09	Fuziak, Jr.			
	108.	2009/0296044 A1	Dec-09	Howell et al.			
	109.	2010/0045928 A1	Feb-10	Levy			
	110.	2010/0061579 A1	Mar-10	Rickards et al.			
	111.	2010/0079356 A1	Apr-10	Hoellwarth			
	112.	2010/0105445 A1	Apr-10	BRUNTON et al.			
	113.	2010/0110368 A1	May-10	Chaum			
	114.	2010/0245754 A1	Sep-10	Matsumoto et al.			

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	115.	2010/0296045 A1	Nov-10	Agnoli et al.			
	116.	2010/0309426 A1	Dec-10	Howell et al.			
	117.	2011/0102734 A1	May-11	Howell et al.			
	118.	2011/0164122 A1	Jul-11	Hardacker			
	119.	2011/0187990 A1	Aug-11	Howell et al.			
	120.	2011/0241976 A1	Oct-11	Boger et al.			
	121.	2011/0273365 A1	Nov-11	West et al.			
	122.	2011/0292333 A1	Dec-11	Kozaki et al.			
	123.	2012/0033061 A1	Feb-12	Ko et al.			
	124.	2012/0050668 A1	Mar-12	Howell et al.			
	125.	2012/0062357 A1	Mar-12	Slamka			
	126.	2012/0101411 A1	Apr-12	Hausdorff et al.			
	127.	2012/0133885 A1	May-12	Howell et al.			
	128.	2012/0176580 A1	Jul-12	Sonsino			
	129.	2012/0283894 A1	Nov-12	Naboulsi			
	130.	2013/0072828 A1	Mar-13	Sweis et al.			
	131.	2013/0077175 A1	Mar-13	Hotta et al.			
	132.	2013/0143519 A1	Jun-13	Doezema			
	133.	2013/0172691 A1	Jul-13	Tran			
	134.	2013/0201440 A1	Aug-13	Howell et al.			
	135.	2013/0308089 A1	Nov-13	Howell et al.			
	136.	2014/0132913 A1	May-14	Sweis et al.			
	137.	2014/0176902 A1	Jun-14	Sweis et al.			
	138.	2014/0198293 A1	Jul-14	Sweis et al.			
	139.	2014/0226838 A1	Aug-14	Wingate et al.			
	140.	2014/0268008 A1	Sep-14	Howell et al.			
	141.	2014/0268013 A1	Sep-14	Howell et al.			
	142.	2014/0268017 A1	Sep-14	Sweis et al.			
	143.	2014/0361185 A1	Dec-14	Howell et al.			

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	144.	2015/0085245 A1	Mar-15	Howell et al.				
	145.	2015/0230988 A1	Aug-15	Chao et al.				
	146.	2015/0253590 A1	Sep-15	Howell et al.				
	147.	2015/0277123 A1	Oct-15	CHAUM et al.				
	148.	2015/0338677 A1	Nov-15	Block				
	149.	2016/0098874 A1	Apr-16	Handville et al.				
	150.	2016/0246075 A9	Aug-16	Howell et al.				
	151.	2016/0302992 A1	Oct-16	Sweis et al.				
	152.	2017/0068117 A9	Mar-17	Howell et al.				
	153.	2017/0074721 A1	Mar-17	Howell et al.				
	154.	2017/0090219 A1	Mar-17	Howell et al.				
	155.	2017/0131575 A1	May-17	Howell et al.				
	156.	2017/0146829 A1	May-17	Howell et al.				
	157.	2017/0303187 A1	Oct-17	Crouthamel et al.				
	158.	2018/0122208 A1	May-18	Peyrard				
	159.	2018/0314079 A1	Nov-18	Chao et al.				
	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.				
	165.	2019/0117121 A1	Apr-19	Kutina et al.				
	166.	2019/0187492 A1	Jun-19	Howell et al.				
	167.	2019/0272800 A1	Sep-19	Tao et al.				
	168.	2019/0278110 A1	Sep-19	Howell et al.				
	169.	2019/0285913 A1	Sep-19	Howell et al.				
	170.	2019/0310132 A1	Oct-19	Howell et al.				
	171.	2019/0318589 A1	Oct-19	Howell et al.				
	172.	2019/0369402 A1	Dec-19	Woodman et al.				

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	173.	2019/0378493 A1	Dec-19	KIM et al.			
	174.	2019/0387351 A1	Dec-19	Lyren et al.			
	175.	2020/0012127 A1	Jan-20	Howell et al.			
	176.	2020/0218094 A1	Jul-20	Howell et al.			
	177.	2020/0364992 A1	Nov-20	Howell et al.			
	178.	2021/0000347 A1	Jan-21	Stump			
	179.	2021/0026146 A1	Jan-21	Harder et al.			
	180.	2021/0271116 A1	Sep-21	Chao et al.			
	181.	2021/0364827 A9	Nov-21	Howell et al.			
	182.	2021/0364828 A1	Nov-21	Howell et al.			
	183.	2021/0379425 A1	Dec-21	Tran			
	184.	2021/0399691 A1	Dec-21	SAMINATHAN et al.			
	185.	2022/0008763 A1	Jan-22	SALEH et al.			
	186.	2022/0011603 A1	Jan-22	Howell et al.			
	187.	2022/0034542 A1	Feb-22	Peters et al.			
	188.	2022/0054092 A1	Feb-22	Howell et al.			
	189.	2022/0178743 A1	Jun-22	Howell et al.			
	190.	2022/0260859 A1	Aug-22	Howell et al.			
	191.	2022/0335792 A1	Oct-22	Howell et al.			
	192.	2022/0357599 A1	Nov-22	Howell et al.			
	193.	2022/0415338 A1	Dec-22	Howell et al.			
	194.	2023/0017635 A1	Jan-23	Howell et al.			
	195.	2023/0033660 A1	Feb-23	Howell et al.			
	196.	2023/0057654 A1	Feb-23	Howell et al.			
	197.	2023/0236444 A1	Jul-23	Howell et al.			
	198.	2023/0273464 A1	Aug-23	Howell et al.			
	199.	2023/0359266 A1	Nov-23	Howell et al.			
	200.	320,558	Jun-1885	Hull			
	201.	669,949	Mar-1901	Underwood			

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	202.	1,255,265	Feb-1918	Zachara			
	203.	1,917,745	Jul-33	Weiss			
	204.	2,249,572	Jul-41	Lieber			
	205.	2,638,532	May-53	Brady			
	206.	2,725,462	Nov-55	Vorgang			
	207.	2,794,085	May-57	De Angelis			
	208.	2,818,511	Dec-57	Ullery et al.			
	209.	2,830,132	Apr-58	Borg			
	210.	2,874,230	Feb-59	Carlson			
	211.	2,904,670	Sep-59	Calmes			
	212.	3,060,308	Oct-62	Fortuna			
	213.	3,104,290	Sep-63	Rosemond et al.			
	214.	3,119,903	Jan-64	Rosemond et al.			
	215.	3,597,054	Aug-71	Winter			
	216.	3,710,115	Jan-73	Jubb			
	217.	3,858,001	Dec-74	Bonne			
	218.	3,883,701	May-75	Delorenzo			
	219.	4,165,487	Aug-79	Corderman			
	220.	4,254,451	Mar-81	Cochran, Jr.			
	221.	4,283,127	Aug-81	Rosenwinkel et al.			
	222.	4,322,585	Mar-82	Liautaud			
	223.	4,348,664	Sep-82	Boschetti et al.			
	224.	4,389,217	Jun-83	Baughman et al.			
	225.	4,526,473	Jul-85	Zahn, III			
	226.	4,535,244	Aug-85	Burnham			
	227.	4,608,492	Aug-86	Burnham			
	228.	4,683,587	Jul-87	Silverman			
	229.	4,751,691	Jun-88	Perera			
	230.	4,757,714	Jul-88	Purdy et al.			

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	231.	4,773,095	Sep-88	Zwicker et al.			
	232.	4,806,011	Feb-89	Bettinger			
	233.	4,822,160	April-89	Tsai			
	234.	4,822,161	Apr-89	Jimmy			
	235.	4,851,686	Jul-89	Pearson			
	236.	4,856,086	Aug-89	McCullough			
	237.	4,859,047	Aug-89	Badewitz			
	238.	4,882,769	Nov-89	Gallimore			
	239.	4,904,078	Feb-90	Gorike			
	240.	4,942,629	Jul-90	Stadlmann			
	241.	4,962,469	Oct-90	Ono et al.			
	242.	4,967,268	Oct-90	Lipton et al.			
	243.	4,985,632	Jan-91	Bianco et al.			
	244.	5,008,548	Apr-91	Gat			
	245.	5,015,086	May-91	Okaue et al.			
	246.	5,020,150	May-91	Shannon			
	247.	5,026,151	Jun-91	Waltuck et al.			
	248.	5,036,311	Jul-91	Moran et al.			
	249.	5,050,150	Sep-91	Ikeda			
	250.	5,064,410	Nov-91	Frenkel et al.			
	251.	5,093,576	Mar-92	Edmond et al.			
	252.	5,106,179	Apr-92	Kamaya et al.			
	253.	5,144,344	Sep-92	Takahashi et al.			
	254.	5,148,023	Sep-92	Hayashi et al.			
	255.	5,151,600	Sep-92	Black			
	256.	5,161,250	Nov-92	Ianna et al			
	257.	5,172,256	Dec-92	Sethofer et al.			
	258.	5,264,877	Nov-93	Hussey			
	259.	5,306,917	Apr-94	Black et al.			

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	260.	5,353,378	Oct-94	Hoffman et al.				
	261.	5,359,370	Oct-94	Mugnier				
	262.	5,359,444	Oct-94	Piosenka et al.				
	263.	5,367,345	Nov-94	da Silva				
	264.	5,379,464	Jan-95	Schleger et al.				
	265.	5,382,986	Jan-95	Black et al.				
	266.	5,394,005	Feb-95	Brown et al.				
	267.	5,452,026	Sep-95	Marcy, III				
	268.	5,452,480	Sep-95	Ryden				
	269.	5,455,637	Oct-95	Kallman et al.				
	270.	5,455,640	Oct-95	Gertsikov				
	271.	5,457,751	Oct-95	Such				
	272.	5,463,428	Oct-95	Lipton et al.				
	273.	5,475,798	Dec-95	Handlos				
	274.	5,500,532	Mar-96	Kozicki				
	275.	5,510,961	Apr-96	Peng				
	276.	5,513,384	Apr-96	Brennan et al.				
	277.	5,519,781	May-96	Kurkurudza				
	278.	5,533,130	Jul-96	Staton				
	279.	5,541,641	Jul-96	Shimada				
	280.	5,581,090	Dec-96	Goudjil				
	281.	5,585,871	Dec.-96	Linden				
	282.	5,589,398	Dec-96	Krause et al.				
	283.	5,590,417	Dec-96	Rydbeck				
	284.	5,606,743	Feb-97	Vogt et al.				
	285.	5,608,808	Mar-97	da Silva				
	286.	5,634,201	May-97	Mooring				
	287.	5,671,035	Sep-97	Barnes				
	288.	5,686,727	Nov-97	Reenstra et al.				

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	289.	5,694,475	Dec-97	Boyden			
	290.	5,715,323	Feb-98	Walker			
	291.	5,737,436	Apr-98	Boyden et al.			
	292.	5,777,715	Jul-98	Kruegle et al.			
	293.	5,818,381	Oct-98	Williams			
	294.	5,819,183	Oct-98	Voroba et al.			
	295.	5,835,185	Nov-98	Kallman et al.			
	296.	5,900,720	May-99	Kallman et al.			
	297.	5,903,395	May-99	Rallison et al.			
	298.	5,923,398	Jul-99	Goldman			
	299.	5,941,837	Aug-99	Amano et al.			
	300.	5,946,071	Aug-99	Feldman			
	301.	5,949,516	Sep-99	McCurdy			
	302.	5,966,746	Oct-99	Reedy et al.			
	303.	5,980,037	Nov-99	Conway			
	304.	5,988,812	Nov-99	Wingate			
	305.	5,991,085	Nov-99	Rallison et al.			
	306.	5,992,996	Nov-99	Sawyer			
	307.	5,995,592	Nov-99	Shirai et al.			
	308.	6,091,546	Jul-00	Spitzer			
	309.	6,010,216	Jan-00	Jesiek			
	310.	6,013,919	Jan-00	Schneider et al.			
	311.	6,028,627	Feb-00	Helmsderfer			
	312.	6,046,455	Apr-00	Ribi et al.			
	313.	6,060,321	May-00	Hovorka			
	314.	6,061,580	May-00	Altschul et al.			
	315.	6,091,546	Jul-00	Spitzer			
	316.	6,091,832	Jul-00	Shurman et al.			
	317.	6,115,177	Sep-00	Vossler			

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Form 1449 (Modified)	Atty. Docket No.	IPVCP006X1C10D1C1
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	Group	Not Yet Assigned
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Examiner /AMMAR T HAMID/	Date Considered 01/23/2024

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/519,802	11/27/2023	Thomas A. Howell	IPVCP006X1C10D1C1	3510

34071 7590 01/25/2024

IPVENTURE, INC.
4010 Moorpark Avenue
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EXAMINER	
HAMID, AMMAR T	

ART UNIT	PAPER NUMBER
2695	

MAIL DATE	DELIVERY MODE
01/25/2024	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.** 18/519,802	**Applicant(s)** Howell et al.	
	Examiner AMMAR T HAMID	**Art Unit** 2695	**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 11/27/2023.

☐ 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) 1-20 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) 1-20 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 11/27/2023 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 _____.

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

4) ☐ Other: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

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

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on nonstatutory double patenting provided the reference application or patent either is shown to be commonly owned with the examined application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. See MPEP § 717.02 for applications subject to examination under the first inventor to file provisions of the AIA as explained in MPEP § 2159. See MPEP § 2146 *et seq.* for applications not subject to examination under the first inventor to file provisions of the AIA. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The filing of a terminal disclaimer by itself is not a complete reply to a nonstatutory double patenting (NSDP) rejection. A complete reply requires that the terminal disclaimer be accompanied by a

reply requesting reconsideration of the prior Office action. Even where the NSDP rejection is provisional the reply must be complete. See MPEP § 804, subsection I.B.1. For a reply to a non-final Office action, see 37 CFR 1.111(a). For a reply to final Office action, see 37 CFR 1.113(c). A request for reconsideration while not provided for in 37 CFR 1.113(c) may be filed after final for consideration. See MPEP §§ 706.07(e) and 714.13.

The USPTO Internet website contains terminal disclaimer forms which may be used. Please visit www.uspto.gov/patent/patents-forms. The actual filing date of the application in which the form is filed determines what form (e.g., PTO/SB/25, PTO/SB/26, PTO/AIA/25, or PTO/AIA/26) should be used. A web-based eTerminal Disclaimer may be filled out completely online using web-screens. An eTerminal Disclaimer that meets all requirements is auto-processed and approved immediately upon submission. For more information about eTerminal Disclaimers, refer to www.uspto.gov/patents/apply/applying-online/eterminal-disclaimer.

Claims 1-20 are rejected on the ground of nonstatutory double patenting as being unpatentable over claim 1-20 of U.S. Patent No. 11829518. Although the claims at issue are not identical, they are not patentably distinct from each other because the claims of the application under consideration are a wording variation of the claimed of the patent as shown in the claim mapping table below:

Application under examination	**U. S. Patent No. 11829518**
1. A wireless wearable device configured to secure to the head of a user, with the device proximate to at least one ear of the user when the device is worn by the user, to at least help the user hear audio outputs produced by the device, the wireless wearable device comprising: a speaker at least partially in the wireless	1. (Currently amended) A head-worn wireless electronic apparatus at least configured for producing audio outputs for a user comprising: a speaker in the head-worn wireless electronic apparatus; an electrical connector at the head-worn wireless electronic apparatus, wherein the electrical connector includes at least two

wearable device; an electrical connector at least partially in the wireless wearable device, wherein the electrical connector includes at least two conductive areas, wherein the at least two conductive areas are configured to removably couple to corresponding conductive contacts of a counterpart connector external to and separate from the wireless wearable device, at least via spring-force, to at least enable each of the at least two conductive areas to be electrically connected to its corresponding conductive contact; a rechargeable battery at least partially in the wireless wearable device; and a microphone at least partially in the wireless wearable device.	conductive pads, with the at least two conductive pads both on at least a surface of the head-worn wireless electronic apparatus, and wherein the at least two conductive pads are configured to removably couple to corresponding conductive contacts of a counterpart connector external to and separate from the head-worn wireless electronic apparatus, at least via spring-force, to at least enable each of the at least two conductive pads electrically connected to its corresponding conductive contact; a rechargeable battery in the head-worn wireless electronic apparatus; a microphone in the head-worn wireless electronic apparatus; and a touch-sensitive input surface on the head-worn wireless electronic apparatus, wherein the touch-sensitive input surface is configured to generate at least an electrical signal for an operation of the head-worn wireless electronic apparatus based on receiving at least a touch input.
2. A wireless wearable device as recited in claim 1 comprising another microphone at least partially in the wireless wearable device configured to	3. (Original) A head-worn wireless electronic apparatus as recited in claim 1 comprising at least another microphone in the head-worn wireless electronic apparatus, wherein the microphone is

capture at least sound in vicinity of the wireless wearable device.	configured to be positioned closer to mouth of the user and the another microphone is configured to be positioned further from the mouth of the user, when the head-worn wireless electronic apparatus is worn by the user, and wherein at least the microphone and the another microphone are configured to receive audio inputs, with at least some noise in the audio inputs configured to be cancelled based on using at least the microphone and the another microphone.
3. A wireless wearable device as recited in claim 2 comprising circuitry at least partially in the wireless wearable device configured to cancel at least a portion of the sound captured by the another microphone to produce the audio outputs	3. (Original) A head-worn wireless electronic apparatus as recited in claim 1 comprising at least another microphone in the head-worn wireless electronic apparatus, wherein the microphone is configured to be positioned closer to mouth of the user and the another microphone is configured to be positioned further from the mouth of the user, when the head-worn wireless electronic apparatus is worn by the user, and wherein at least the microphone and the another microphone are configured to receive audio inputs, **with at least some noise in the audio inputs configured to be cancelled based on using**

	at least the microphone and the another microphone.
4. A wireless wearable device as recited in claim 2, wherein at least the microphone and the another microphone are configured to receive audio inputs, with at least some noise in the audio inputs configured to be cancelled based on using at least the microphone and the another microphone.	3. (Original) A head-worn wireless electronic apparatus as recited in claim 1 comprising at least another microphone in the head-worn wireless electronic apparatus, wherein the microphone is configured to be positioned closer to mouth of the user and the another microphone is configured to be positioned further from the mouth of the user, when the head-worn wireless electronic apparatus is worn by the user, and **wherein at least the microphone and the another microphone are configured to receive audio inputs, with at least some noise in the audio inputs configured to be cancelled based on using at least the microphone and the another microphone.**
5. A wireless wearable device as recited in claim 2, wherein the microphone is configured to be positioned closer to mouth of the user than the another microphone, when the wireless wearable device is worn by the user.	3. (Original) A head-worn wireless electronic apparatus as recited in claim 1 comprising at least another microphone in the head-worn wireless electronic apparatus, **wherein the microphone is configured to be positioned closer to mouth of the user and the another microphone is** configured to be positioned further from the

	mouth of the user, when the head-worn wireless electronic apparatus is worn by the user, and wherein at least the microphone and the another microphone are configured to receive audio inputs, with at least some noise in the audio inputs configured to be cancelled based on using at least the microphone and the another microphone.
6. A wireless wearable device as recited in claim 2 comprising a storage medium at least partially in the wireless wearable device configured to store at least computer program codes for facilitating voice recognition to facilitate recognizing at least a word received at least by the microphone for an operation of the wireless wearable device.	2. (Currently amended) A head-worn wireless electronic apparatus as recited in claim 1 comprising: wireless communication circuitry in the head-worn wireless electronic apparatus configured for coupling to at least a Bluetooth network; and **a storage medium configured to store at least computer program codes for facilitating voice recognition to facilitate recognizing at least the a word received by at least the microphone for an operation of the head-worn wireless electronic apparatus.**
7. A wireless wearable device as recited in claim 2 comprising wireless communication circuitry at least partially in the wireless wearable device configured for coupling to at least a Bluetooth network.	2. (Currently amended) A head-worn wireless electronic apparatus as recited in claim 1 comprising: **wireless communication circuitry in the head-worn wireless electronic apparatus configured for coupling to at least a Bluetooth**

	network; and a storage medium configured to store at least computer program codes for facilitating voice recognition to facilitate recognizing at least the a word received by at least the microphone for an operation of the head-worn wireless electronic apparatus.
8. A wireless wearable device as recited in claim 2, wherein the wireless wearable device is configured to be worn in the at least one ear of the user.	15. (New) A head-worn wireless electronic apparatus as recited in claim 1, wherein the apparatus is configured to be worn in an ear of the user.
9. A wireless wearable device as recited in claim 2 comprising a controller at least partially in the wireless wearable device configured to determine whether the wireless wearable device is being worn based on outputs from a sensor at least partially in the wireless wearable device.	5. (Currently amended) A head-worn wireless electronic apparatus as recited in claim 1 comprising a controller configured to determine regarding whether the head-worn wireless electronic apparatus is being used based on outputs from a sensor at least partially in the head-worn wireless electronic apparatus.
10. A wireless wearable device as recited in claim 2 comprising a motion sensor at least partially in the wireless wearable device.	11. (Original) A head-worn wireless electronic apparatus as recited in claim 10 comprising an accelerometer.
11. A wireless wearable device as recited in claim 2 comprising a touch- sensitive input surface on the wireless wearable device, wherein the touch-sensitive input surface is configured to generate	1. (Currently amended) A head-worn wireless electronic apparatus at least configured for producing audio outputs for a user comprising: a speaker in the head-worn wireless electronic

at least an electrical signal for an operation of the wireless wearable device based on receiving at least a touch input.	apparatus; an electrical connector at the head-worn wireless electronic apparatus, wherein the electrical connector includes at least two conductive pads, with the at least two conductive pads both on at least a surface of the head-worn wireless electronic apparatus, and wherein the at least two conductive pads are configured to removably couple to corresponding conductive contacts of a counterpart connector external to and separate from the head-worn wireless electronic apparatus, at least via spring-force, to at least enable each of the at least two conductive pads electrically connected to its corresponding conductive contact; a rechargeable battery in the head-worn wireless electronic apparatus; a microphone in the head-worn wireless electronic apparatus; and **a touch-sensitive input surface on the head-worn wireless electronic apparatus, wherein the touch-sensitive input surface is configured to generate at least an electrical signal for an operation of the head-worn wireless electronic apparatus based on receiving at least a touch input.**

12. A wireless wearable device as recited in claim 2 comprising an area configured for attachment via magnetic force.	7. (Original) A head-worn wireless electronic apparatus as recited in claim 1 comprising an area configured for attachment via magnetic force.
13. A wireless wearable device as recited in claim 12 comprising a magnet in the area.	8. (Original) A head-worn wireless electronic apparatus as recited in claim 7 comprising a magnet in the area.
14. A wireless wearable device as recited in claim 12 comprising a storage medium at least partially in the wireless wearable device configured to store at least computer program codes for facilitating voice recognition to facilitate recognizing at least a word received at least by the microphone for an operation of the wireless wearable device.	12. (Currently amended) A head-worn wireless electronic apparatus as recited in claim 10 comprising: wireless communication circuitry in the head-worn wireless electronic apparatus configured for coupling to at least a Bluetooth network; **and a storage medium configured to store at least computer program codes for facilitating voice recognition to facilitate recognizing at least the a word received at least by the microphone for an operation of the head-worn wireless electronic apparatus.**
15. A wireless wearable device as recited in claim 14 comprising wireless communication circuitry at least partially in the wireless wearable device configured for coupling to at least a Bluetooth network.	12. (Currently amended) A head-worn wireless electronic apparatus as recited in claim 10 comprising: **wireless communication circuitry in the head-worn wireless electronic apparatus configured for coupling to at least a Bluetooth network**; and a storage medium configured to

	store at least computer program codes for facilitating voice recognition to facilitate recognizing at least the a word received at least by the microphone for an operation of the head-worn wireless electronic apparatus.
16. A wireless wearable device as recited in claim 15, wherein the wireless wearable device is configured to be worn in the at least one ear of the user.	15. (New) A head-worn wireless electronic apparatus as recited in claim 1, wherein the apparatus is configured to be worn in an ear of the user.
17. A wireless wearable device as recited in claim 16 comprising a controller at least partially in the wireless wearable device configured to determine whether the wireless wearable device is being worn based on outputs from a sensor at least partially in the wireless wearable device.	13. (Currently amended) A head-worn wireless electronic apparatus as recited in claim 12 comprising a controller configured to determine whether the head-worn wireless electronic apparatus is being used based on outputs from a sensor at least partially in the head-worn wireless electronic apparatus.
18. A wireless wearable device as recited in claim 17 comprising a motion sensor at least partially in the wireless wearable device.	11. (Original) A head-worn wireless electronic apparatus as recited in claim 10 comprising an accelerometer.
19. A wireless wearable device as recited in claim 18 comprising a touch- sensitive input surface on the wireless wearable device, wherein the touch-sensitive input surface is configured to generate at least an electrical signal for an operation of the	1. (Currently amended) A head-worn wireless electronic apparatus at least configured for producing audio outputs for a user comprising: a speaker in the head-worn wireless electronic apparatus; an electrical connector at the head-

wireless wearable device based on receiving at least a touch input.	worn wireless electronic apparatus, wherein the electrical connector includes at least two conductive pads, with the at least two conductive pads both on at least a surface of the head-worn wireless electronic apparatus, and wherein the at least two conductive pads are configured to removably couple to corresponding conductive contacts of a counterpart connector external to and separate from the head-worn wireless electronic apparatus, at least via spring-force, to at least enable each of the at least two conductive pads electrically connected to its corresponding conductive contact; a rechargeable battery in the head-worn wireless electronic apparatus; a microphone in the head-worn wireless electronic apparatus; and a touch-sensitive input surface on the head-worn wireless electronic apparatus, **wherein the touch-sensitive input surface is configured to generate at least an electrical signal for an operation of the head-worn wireless electronic apparatus based on receiving at least a touch input.**
20. A wireless wearable device configured to secure to the head of a user, to at least help the	1. (Currently amended) A head-worn wireless electronic apparatus at least configured for

user hear audio outputs produced by the device, and to be worn in an ear of the user, and the wireless wearable device comprising: a speaker at least partially in the wireless wearable device; an electrical connector at least partially in the wireless wearable device, wherein the electrical connector includes at least two conductive areas, wherein the at least two conductive areas are configured to removably couple to corresponding conductive contacts of a counterpart connector external to and separate from the wireless wearable device, at least via spring-force, to at least enable each of the at least two conductive areas to be electrically connected to its corresponding conductive contact; a rechargeable battery at least partially in the wireless wearable device; a microphone at least partially in the wireless wearable device; another microphone at least partially in the wireless wearable device configured to capture at least sound in vicinity of the wireless wearable device, wherein the microphone is configured to be positioned closer to mouth of the user than the another microphone, when the wireless wearable	producing audio outputs for a user comprising: a speaker in the head-worn wireless electronic apparatus; an electrical connector at the head-worn wireless electronic apparatus, wherein the electrical connector includes at least two conductive pads, with the at least two conductive pads both on at least a surface of the head-worn wireless electronic apparatus, and wherein the at least two conductive pads are configured to removably couple to corresponding conductive contacts of a counterpart connector external to and separate from the head-worn wireless electronic apparatus, at least via spring-force, to at least enable each of the at least two conductive pads electrically connected to its corresponding conductive contact; a rechargeable battery in the head-worn wireless electronic apparatus; a microphone in the head-worn wireless electronic apparatus; and a touch-sensitive input surface on the head-worn wireless electronic apparatus, wherein the touch-sensitive input surface is configured to generate at least an electrical signal for an operation of the head-

device is worn by the user; a storage medium at least partially in the wireless wearable device configured to store at least computer program codes for facilitating voice recognition to facilitate recognizing at least a word received at least by the microphone for an operation of the wireless wearable device; wireless communication circuitry at least partially in the wireless wearable device configured for coupling to at least a Bluetooth network; and an area configured for attachment via magnetic force.	worn wireless electronic apparatus based on receiving at least a touch input. 2. (Currently amended) A head-worn wireless electronic apparatus as recited in claim 1 comprising: wireless communication circuitry in the head-worn wireless electronic apparatus configured for coupling to at least a Bluetooth network; and a storage medium configured to store at least computer program codes for facilitating voice recognition to facilitate recognizing at least the a word received by at least the microphone for an operation of the head-worn wireless electronic apparatus. 7. (Original) A head-worn wireless electronic apparatus as recited in claim 1 comprising an area configured for attachment via magnetic force.

Allowable Subject Matter

Claims 1-20 would be allowed if the nonstatutory double patenting rejection is overcome.

Most relevant prior art of record is Most relevant prior art of record is *Swab et al. (US 6769767 B2)* hereinafter Swab.

Swab teaches A wireless wearable device configured to secure to the head of a user (12 in Fig. 1), with the device proximate to at least one ear of the user when the device is worn by the user (62 in

Fig. 9), to at least help the user hear audio outputs produced by the device 62 in Fig. 9 is a speaker), the wireless wearable device comprising: a speaker at least partially in the wireless wearable device (62 in Fig. 9); an electrical connector at least partially in the wireless wearable device (42, 44, 46, and 48 in Fig. 2a), Swab does not specifically disclose the device further comprising wherein the electrical connector includes at least two conductive areas, wherein the at least two conductive areas are configured to removably couple to corresponding conductive contacts of a counterpart connector external to and separate from the wireless wearable device, at least via spring-force, to at least enable each of the at least two conductive areas to be electrically connected to its corresponding conductive contact; a rechargeable battery at least partially in the wireless wearable device; and a microphone at least partially in the wireless wearable device.

The following is the reason for allowance of claim 1:

Swab alone or in combination with any other prior art of record does not specifically disclose, suggest nor render obvious the limitations wherein the device further comprises wherein the electrical connector includes at least two conductive areas, wherein the at least two conductive areas are configured to removably couple to corresponding conductive contacts of a counterpart connector external to and separate from the wireless wearable device, at least via spring-force, to at least enable each of the at least two conductive areas to be electrically connected to its corresponding conductive contact; a rechargeable battery at least partially in the wireless wearable device; and a microphone at least partially in the wireless wearable device, therefore the claim is allowed for the limitations above in combination with all the other limitations of the claim.

Regarding claims 2-19, claims would be allowed if the nonstatutory double patenting rejection is overcome for their dependency on allowed claim 1.

Regarding claim 20, claim would be allowed if the nonstatutory double patenting rejection is overcome for being the device comprising at least the same elements and performing at least the same

functions performed by the device of would be allowed claim 1 (see reasons for would be allowance of claim 1 above).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AMMAR T HAMID whose telephone number is (571)272-1953. The examiner can normally be reached M-F 9-5, Eastern time.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on (571) 272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is available to registered users. To file and manage patent submissions in Patent Center, visit: https://patentcenter.uspto.gov. Visit https://www.uspto.gov/patents/apply/patent-center for more information about Patent Center and https://www.uspto.gov/patents/docx for information about filing in DOCX format. For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AMMAR T. HAMID
Primary Examiner
Art Unit 2695

/AMMAR T HAMID/
Primary Examiner, Art Unit 2695

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 18/519,802	Filing Date 11/27/2023	☐ 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	02/21/2024	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 23	Minus	** 20	= 3		x $100 =	300
	Independent (37 CFR 1.16(h))	* 3	Minus	*** 3	= 0		x $480 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	300

		(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.	Program Support Specialist
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/CRYSTAL QUEEN/
*** 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.: IPVCP006X1C10D1C1
Application No.: 18/519,802	Examiner: HAMID, AMMAR T.
Filed: November 27, 2023	Group: 2695
Title: HEAD-WORN DEVICE WITH CONNECTION REGION	

INFORMATION DISCLOSURE STATEMENT BEFORE FINAL ACTION OR NOTICE OF ALLOWANCE (37 CFR §§ 1.56 AND 1.97(c))

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

Dear Sir:

The references listed in the attached PTO Form 1449, a copy of which is attached, may be material to examination of the above-identified patent application. Applicants submit this reference in compliance with their duty of disclosure pursuant to 37 CFR §§1.56 and 1.97. The Examiner is requested to make this citation 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 this reference indeed constitutes prior art.

This Information Disclosure Statement is being filed after the mailing date of the first Office Action on the merits, or after three months of the filing date of this application, whichever event occurred last, but it is believed before the mailing date of either: (i) a final action under §1.113 or (ii) a notice of allowance under §1.311, whichever occurs first.

Accompanying this Information Disclosure Statement is

☐ a statement as specified in 37 CFR 1.97(e); or

☒ the fee set forth in 37 CFR 1.17(p).

Electronic Fee in payment of the Information Disclosure Statement Fee is provided herewith. If it is determined that any additional fees are due, the Commissioner is hereby authorized to charge such fees to Deposit Account 50-3874 (Order No. IPVCP006X1C10D1C1).

Respectfully submitted,

/Peter P. Tong/

Peter P. Tong
Registration No. 35,757

4010 Moorpark Avenue
Suite 211
San Jose, CA 95117

Form 1449 (Modified)	Atty. Docket No.	IPVCP006X1C10D1
	Application No.:	18/519,802
Information Disclosure Statement By Applicant	Applicant	HOWELL et al.
	Filing Date	November 27, 2023
	Group	2695
(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.	2002/0146097 A1	Oct-02	Vuori			
	2.	2003/0045283 A1	Mar-03	Hagadoorn			
	3.	2005/0090295 A1	Apr-05	Ali et al.			
	4.	2017/0289323 A1	Oct-17	Gelvin et al.			
	5.	2023/0408850 A1	Dec-23	Howell et al.			
	6.	2024/0036361 A1	Feb-24	Howell et al.			
	7.	5,790,311	Aug-98	Togino			
	8.	7,430,299 B2	Sep-08	Armstrong et al.			
	9.	7,787,647 B2	Aug-10	Hagen et al.			
	10.	8,009,849 B2	Aug-11	Enzmann			
	11.	8,175,886 B2	May-12	Odinak			
	12.	8,251,875 B2	Aug-12	Ellis et al.			
	13.	8,571,241 B2	Oct-13	Larsen			
	14.	8,620,208 B2	Dec-13	Slotznick			
	15.	8,626,246 B2	Jan-14	Shostak			
	16.	9,183,351 B2	Nov-15	Shusterman			
	17.	9,369,814 B2	Jun-16	Victorian et al.			
	18.	11,480,802 B1	Oct-22	Tombelli			
	19.	11,803,069 B2	Oct-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.

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.	IPVCP006X1C10D1
	Application No.:	18/519,802
	Applicant	HOWELL et al.
	Filing Date	November 27, 2023
	Group	2695
		Page 2 of 2

	C	Office Action for U.S. Patent Application No. 18/144,557, dated November 24, 2023.
	D	Notice of Allowance for U.S. Patent Application No. 18/144,557, dated January 11, 2024.
	E	Notice of Allowance for U.S. Patent Application No. 18/238,467, dated November 21, 2023.
	F	Notice of Allowance for U.S. Patent Application No. 16/182,969, dated October 25, 2023.
	G	Election of Species Requirement for U.S. Patent Application No. 18/375,893, dated November 14, 2023.
	H	Office Action for U.S. Patent Application No. 18/375,893, dated December 14, 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
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ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/519,802	**02/21/2024 07:21:30 PM Z ET**	**IPVCP006X1C10D1C1**

Title of Invention

HEAD-WORN DEVICE WITH CONNECTION REGION

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	3510	FILED BY	Angela Nijim
PATENT CENTER #	64399704	AUTHORIZED BY	Peter Tong
CUSTOMER #	34071	FILING DATE	11/27/2023
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	Thomas A. Howell

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
CARD / 9649	**E20242KJ23198117**	**Angela Nijim**

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

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
1806	SUBMISSION OF AN INFORMATION DISCLOSURE STATEMENT	260.00	1	260.00
1202	EACH CLAIM IN EXCESS OF 20	100.00	3	300.00
1814	STATUTORY DISCLAIMER, INCLUDING TERMINAL DISCLAIMER	170.00	1	170.00
			TOTAL AMOUNT:	**$730.00**

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.: IPVCP006X1C10D1C1
Application No.: 18/519,802	Examiner: HAMID, AMMAR T.
Filed: January 25, 2024	Group: 2695
Title: HEAD-WORN DEVICE WITH CONNECTION REGION	

AMENDMENT A TRANSMITTAL

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

Sir:

Transmitted herewith is an 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	Undiscounted Rate Fee
Total Claims	23	MINUS	20	03	x 40 =	x 100 = 300
Independent Claims	3	MINUS	3	00	x 192 =	x 480 =
Multiple Dependent Claim Present and Fee Not Previously Paid					$	$
				Total	$0.00	$300.00

☐ 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. IPVCP006X1C10D1C1).

☒ 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. IPVCP006X1C10D1C1).

Respectfully submitted,

/Peter P. Tong/

Peter P. Tong
Reg. No. 35,757

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 #
18/519,802	**02/21/2024 07:21:30 PM Z ET**	**IPVCP006X1C10D1C1**

Title of Invention

HEAD-WORN DEVICE WITH CONNECTION REGION

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	3510	FILED BY	Angela Nijim
PATENT CENTER #	64399704	FILING DATE	11/27/2023
CUSTOMER #	34071	FIRST NAMED INVENTOR	Thomas A. Howell
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Peter Tong

Documents

TOTAL DOCUMENTS: 5

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
IPVCP006X1C10D1C1_AmdATrans_2-24.pdf	1	Transmittal Letter	16 KB
IPVCP006X1C10D1C1_AmdA_Asfiled_2-24-APP.TEXT.docx	8	Application body structured text document	24 KB
Warning: The automatic document description has been replaced. Dynamic dates have been converted to static dates. Bookmarks were found and have been removed. All artifacts (SmartArt, Drawings, Charts, etc) have been replaced with images. Dynamic dates have been converted to static dates. Bookmarks were found and have been removed.			
IPVCP006X1C10D1C1_AmdA_Asfiled_2-24.pdf	8	Auxiliary PDF of Application	47 KB
IPVCP006X1C10D1C1_IDSTrans_2-24.pdf	2	Letter specifying the conditions for filing under 37 CFR 1.97	20 KB

IPVCP006X1C10D1C1_1449_2-24.pdf	2	Information Disclosure Statement (IDS) Form (SB08)	27 KB

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Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
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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.: IPVCP006X1C10D1C1
Application No.: 18/519,802	Examiner: HAMID, AMMAR T.
Filed: November 27, 2023	Group: 2695
Title: HEAD-WORN DEVICE WITH CONNECTION REGION	

AMENDMENT A

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

Dear Sir:

In response to the Office Action dated January 25, 2024, please amend the above-identified patent application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments are on page 8 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. (Currently amended) A wireless wearable device ~~configured to secure to the head of a user~~, with at least a portion of the wireless wearable device configured to be worn in ~~proximate to~~ at least one ear of ~~the~~ a user ~~when the device is worn by the user~~, to at least help the user hear audio outputs produced by the device, the wireless wearable device comprising:

a speaker at least partially in the wireless wearable device;

an electrical connector at least partially in the wireless wearable device, wherein the electrical connector includes at least two conductive areas, each area on a surface of the wireless wearable device, wherein the at least two conductive areas are configured to removably couple to corresponding conductive contacts of a counterpart connector external to and separate from the wireless wearable device, at least via spring-force, to at least enable each of the at least two conductive areas to be electrically connected to its corresponding conductive contact;

a rechargeable battery at least partially in the wireless wearable device, with the battery configured to be charged via at least the electrical connector; and

a microphone at least partially in the wireless wearable device.

2. (Original) A wireless wearable device as recited in claim 1 comprising another microphone at least partially in the wireless wearable device configured to capture at least sound in vicinity of the wireless wearable device.

3. (Currently amended) A wireless wearable device as recited in claim 2 comprising electronic circuitry at least partially in the wireless wearable device configured to cancel at least a portion of the sound captured by the another microphone to produce the audio outputs.

4. (Currently amended) A wireless wearable device as recited in claim 2, wherein at least the microphone and the another microphone are configured to receive audio inputs, with at least some ~~noise~~ sound in the audio inputs configured to be cancelled based on using at least the microphone and the another microphone.

5. (Original) A wireless wearable device as recited in claim 2, wherein the microphone is configured to be positioned closer to mouth of the user than the another microphone, when the wireless wearable device is worn by the user.

6. (Currently amended) A wireless wearable device as recited in claim 2 comprising a storage medium at least partially in the wireless wearable device configured to store at least computer program codes for facilitating voice recognition to ~~facilitate recognizing~~ recognize at least a word received at least by the microphone for an operation of the wireless wearable device.

7. (Original) A wireless wearable device as recited in claim 2 comprising wireless communication circuitry at least partially in the wireless wearable device configured for coupling to at least a Bluetooth network.

8. (Currently amended) A wireless wearable device as recited in claim 2 comprising:

a touch-sensitive input surface on a portion of the wireless wearable device; and

a storage medium at least partially in the wireless wearable device configured to store at least computer program codes for facilitating an operation of the wireless wearable device based on identifying a sliding user-input action across at least a portion of the touch-sensitive input surface ~~,wherein the wireless wearable device is configured to be worn in the at least one ear of the user~~.

9. (Original) A wireless wearable device as recited in claim 2 comprising a controller at least partially in the wireless wearable device configured to determine

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whether the wireless wearable device is being worn based on outputs from a sensor at least partially in the wireless wearable device.

10. (Original) A wireless wearable device as recited in claim 2 comprising a motion sensor at least partially in the wireless wearable device.

11. (Currently amended) A wireless wearable device as recited in claim 2 comprising a touch-sensitive input surface on the wireless wearable device, wherein the touch-sensitive input surface is configured to facilitate generating ~~generate~~ at least an electrical signal for an operation of the wireless wearable device based on receiving at least a touch input.

12. (Original) A wireless wearable device as recited in claim 2 comprising an area configured for attachment via magnetic force.

13. (Original) A wireless wearable device as recited in claim 12 comprising a magnet in the area.

14. (Currently amended) A wireless wearable device as recited in claim 12 comprising a storage medium at least partially in the wireless wearable device configured to store at least computer program codes for facilitating voice recognition to ~~facilitate recognizing~~ recognize at least a word received at least by the microphone for an operation of the wireless wearable device.

15. (Currently amended) A wireless wearable device as recited in claim 14 comprising wireless communication circuitry at least partially in the wireless wearable device configured for coupling to at least a ~~Bluetooth~~ wireless network.

16. (Currently amended) A wireless wearable device as recited in claim 15 comprising a pressure sensor at least partially in the wireless wearable device~~, wherein the wireless wearable device is configured to be worn in the at least one ear of the user~~.

17. (Currently amended) A wireless wearable device as recited in ~~claim 16~~ claim 15 comprising a controller at least partially in the wireless wearable device configured to determine whether the wireless wearable device is being worn based on outputs from a sensor at least partially in the wireless wearable device.

18. (Original) A wireless wearable device as recited in claim 17 comprising a motion sensor at least partially in the wireless wearable device.

19. (Currently amended) A wireless wearable device as recited in claim 18 comprising a touch-sensitive input surface on the wireless wearable device, wherein the touch-sensitive input surface is configured to facilitate generating ~~generate~~ at least an electrical signal for an operation of the wireless wearable device based on receiving at least a touch input.

20. (Currently amended) A wireless wearable device ~~configured to secure to the head of a user,~~ to at least help ~~the~~ a user hear audio outputs produced by the device, ~~and~~ with at least a portion of the wireless wearable device configured to be worn in an ear of the user, and the wireless wearable device comprising:

a speaker at least partially in the wireless wearable device;

an electrical connector at least partially in the wireless wearable device, wherein the electrical connector includes at least two conductive areas, each area on a surface of the wireless wearable device, wherein the at least two conductive areas are configured to removably couple to corresponding conductive contacts of a counterpart connector external to and separate from the wireless wearable device, at least via spring-force, to at least enable each of the at least two conductive areas to be electrically connected to its corresponding conductive contact;

a rechargeable battery at least partially in the wireless wearable device, with the battery configured to be charged via at least the electrical connector;

a microphone at least partially in the wireless wearable device;

another microphone at least partially in the wireless wearable device configured to capture at least sound in vicinity of the wireless wearable device,

wherein the microphone is configured to be positioned closer to mouth of the user than the another microphone, when the wireless wearable device is worn by the user;

a storage medium at least partially in the wireless wearable device configured to store at least computer program codes for facilitating voice recognition to recognize ~~facilitate recognizing~~ at least a word received at least by the microphone for an operation of the wireless wearable device;

wireless communication circuitry at least partially in the wireless wearable device ~~configured for coupling to at least a Bluetooth network~~; and

an area configured for attachment via magnetic force.

21. (New) A wireless wearable device as recited in claim 20 comprising:

a touch-sensitive input surface on a portion of the wireless wearable device; and

electronic circuitry configured to identify a sliding user-input action across at least a portion of the touch-sensitive input surface.

22. (New) A wireless wearable device to at least help a user hear audio outputs produced by the device, with at least a portion of the wireless wearable device to be worn in an ear of the user, and the wireless wearable device comprising:

a speaker at least partially in the wireless wearable device;

an electrical connector at least partially in the wireless wearable device, wherein the electrical connector includes at least two conductive areas, each area on a surface of the wireless wearable device, wherein the at least two conductive areas are configured to removably couple to corresponding conductive contacts of a counterpart connector external to and separate from the wireless wearable device, at least via spring-force, to at least enable each of the at least two conductive areas to be electrically connected to its corresponding conductive contact;

a rechargeable battery at least partially in the wireless wearable device, with the battery configured to be charged via at least the electrical connector;

a microphone at least partially in the wireless wearable device;

another microphone at least partially in the wireless wearable device configured to capture at least sound in vicinity of the wireless wearable device, wherein the microphone is configured to be positioned closer to mouth of the user than the another microphone, when the wireless wearable device is worn by the user;

wireless communication circuitry at least partially in the wireless wearable device;

a touch-sensitive input surface on the wireless wearable device, wherein the touch-sensitive input surface is configured to facilitate generating at least an electrical signal for an operation of the wireless wearable device based on receiving at least a touch input; and

an area configured for attachment via magnetic force.

23. (New) A wireless wearable device as recited in claim 22 comprising:

a pressure sensor at least partially in the wireless wearable device; and

a controller at least partially in the wireless wearable device configured to determine whether the wireless wearable device is being worn based on outputs from a sensor at least partially in the wireless wearable device.

REMARKS

Applicants previously presented claims 1-20 for examination. The above-identified Office Action has rejected all the claims. By this amendment, Applicants have amended claims 1, 3, 4, 6, 8, 11, 14-17, 19, and 20; and have added claim 21-23. Accordingly, claims 1-23 are pending. Applicants respectfully request that the Examiner reconsider the application in light of the amendments and the remarks expressed herein.

Double Patenting

All claims were rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-20 of U.S. Patent No. 11,829,518. Applicants respectfully disagree. However, to expedite prosecution, Applicants have submitted a terminal disclaimer to obviate the rejection. Accordingly, it is respectfully requested that the Examiner reconsider and withdraw the rejection on the ground of double patenting.

Summary

In view of the foregoing, it is respectfully requested that all outstanding rejections be reconsidered and withdrawn. Reconsideration of the application and an early Notice of Allowance are earnestly solicited.

Reconsideration of the application and an early Notice of Allowance are earnestly solicited. If there are any issues remaining which the Examiner believes could be resolved through either a Supplemental Response or an Examiner's Amendment, the Examiner is respectfully requested to contact the undersigned representative at the telephone number listed below.

Respectfully submitted,

/Peter P. Tong/

Peter P. Tong
Reg. No. 35,757

(650) 903-9200, x102

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PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/519,802	**02/26/2024 05:43:52 PM Z ET**	**IPVCP006X1C10D1C1**

Title of Invention

HEAD-WORN DEVICE WITH CONNECTION REGION

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	3510	FILED BY	Angela Nijim
PATENT CENTER #	64452169	FILING DATE	11/27/2023
CUSTOMER #	34071	FIRST NAMED INVENTOR	Thomas A. Howell
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Peter Tong

Documents

TOTAL DOCUMENTS: 2

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
petition-request.pdf	3	Terminal Disclaimer-Filed (Electronic)	44 KB
grantLetter.pdf	1	Terminal Disclaimer-Electronic-Approved	18 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
petition-request.pdf	139790F6BE568EFE85D7945B1DAE28838CF2B9CD00BE6FA7C5EE8D0660EAAAD1B99F6A611E1203FBD6D9763E5409444025B5C3E7E3DE04DD1E9B77AC82086555
grantLetter.pdf	25D7C7C789955FFD98373C24ADF8A83B00E84336A4AB041F0

8719E5DB6E98B34CC34AA4E204ABB5C9CA8208C26C1A4666
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New Applications Under 35 U.S.C. 111

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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.

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TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A PRIOR PATENT

APPLICATION #	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET #
18519802	11/27/2023	Thomas Howell	IPVCP006X1C10D1C1

Title of Invention

HEAD-WORN DEVICE WITH CONNECTION REGION

- ✓ Filing of terminal disclaimer does not obviate requirement for response under 37 CFR 1.111 to outstanding Office Action
- ✓ This electronic Terminal Disclaimer is not being used for a Joint Research Agreement.

Owner	Percent interest
IngenioSpec, LLC	100%
Total	**100%**

The owner(s) of percent interest listed above in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of any patent granted on pending reference Application Number(s)

Application #	Filing Date

as the term of any patent granted on said reference application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending reference application. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and any patent granted on the reference application are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.
In making the above disclaimer, the owner does not disclaim the terminal part of any patent granted on the instant application that would extend to the expiration date of the full statutory term of any patent granted on said reference application, "as the term of any patent granted on said reference application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending reference application," in the event that any such patent granted on the pending reference application: expires for failure to pay a maintenance fee, is held unenforceable, is found invalid by a court of competent jurisdiction, is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321, has all claims canceled by a reexamination certificate, is reissued, or is in any manner terminated prior to the expiration of its full statutory term as shortened by any terminal disclaimer filed prior to its grant.

The owner(s) of percent interest listed above in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of prior patent number(s)

Patent #
11829518

as the term of said prior patent is presently shortened by any terminal disclaimer. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the prior patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.
In making the above disclaimer, the owner does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term of the prior patent, "as the term of said prior patent is presently shortened by any terminal disclaimer," in the event that said prior patent later:
- expires for failure to pay a maintenance fee;
- is held unenforceable;
- is found invalid by a court of competent jurisdiction;
- is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;
- has all claims canceled by a reexamination certificate;
- is reissued; or
- is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.



I certify, in accordance with 37 CFR 1.4(d)(4) that the terminal disclaimer fee under 37 CFR 1.20(d) required for this terminal disclaimer has already been paid in the above identified application.

I hereby declare that all statements made herein of my own knowledge are true and that all statemnts made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

I certify, in accordance with 37 CFR 1.4(d)(4) that I am: An attorney or agent registered to practice before the Patent and Trademark Office who is of record in this application

Signature	Name	Registration #
/Peter Tong/	Peter Tong	35757

* Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner). Form PTO/SB/96 may be used for making this certification. See MPEP 324.

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APPROVAL LETTER

APPLICATION #	FILING DATE	APPLICANT/PATENT UNDER REEXAMINATION
18/519,802	11/27/2023	Thomas Howell

Title of Invention

HEAD-WORN DEVICE WITH CONNECTION REGION

Electronic terminal disclaimer filed on 02/26/2024

☑ Approved

This patent is subject to a Terminal Disclaimer

Approved / Disapproved by: Electronic Terminal Disclaimer automatically approved

Notice of References Cited	Application/Control No. 18/519,802	Applicant(s)/Patent Under Reexamination Howell et al.	
	Examiner AMMAR T HAMID	Art Unit 2695	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date YYYY-MM-DD	Name	CPC Classification	US Classification
*	A	US-6769767-B2	2004-08-03	Swab; Gregory	H04W56/0015	351/158
	B					
	C					
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date YYYY-MM-DD	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in YYYY-MM-DD format are publication dates. Classifications may be US or foreign.

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/519,802	Howell et al.
	Examiner	**Art Unit**
	AMMAR T HAMID	2695

CPC							
Symbol						**Type**	**Version**
G06F	/	3	/	01		F	2013-01-01
G02C	/	11	/	10		I	2013-01-01
G02C	/	5	/	001		I	2013-01-01
G02C	/	5	/	143		I	2013-01-01
G02C	/	5	/	14		I	2013-01-01
G10L	/	15	/	22		I	2013-01-01
G06F	/	1	/	163		I	2013-01-01

CPC Combination Sets								
Symbol					**Type**	**Set**	**Ranking**	**Version**
	/		/					

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	24	
/AMMAR T HAMID/ Primary Examiner, Art Unit 2695	27 February 2024	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

U.S. Patent and Trademark Office — Part of Paper No.: 20240227

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Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/519,802	Howell et al.
	Examiner	**Art Unit**
	AMMAR T HAMID	2695

INTERNATIONAL CLASSIFICATION					
CLAIMED					
H04R	/	3	/	00	
	/		/		

NON-CLAIMED				
H03G	/	3	/	00

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**
381	110

CROSS REFERENCES(S)						
CLASS	**SUBCLASS (ONE SUBCLASS PER BLOCK)**					
381	104					

NONE (Assistant Examiner) (Date)	**Total Claims Allowed:** 24	
/AMMAR T HAMID/ Primary Examiner, Art Unit 2695 (Primary Examiner) 27 February 2024 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 1

U.S. Patent and Trademark Office Part of Paper No.: 20240227

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Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/519,802	Howell et al.
	Examiner	**Art Unit**
	AMMAR T HAMID	2695

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

CLAIMS

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
	1		10		19										
	2		11		20										
	3		12		21										
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	5		14		23										
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	7		16												
	8		17												
	9		18												

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	24	
/AMMAR T HAMID/ Primary Examiner, Art Unit 2695	27 February 2024	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

U.S. Patent and Trademark Office — Part of Paper No.: 20240227

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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/519,802	Howell et al.
	Examiner	Art Unit
	AMMAR T HAMID	2695

CPC - Searched*		
Symbol	**Date**	**Examiner**
G06F3/01	01/23/2024	AH
G02C5/001	01/23/2024	AH
G02C5/14	01/23/2024	AH
G02C5/14	01/23/2024	AH
G02C11/10	01/23/2024	AH
G02C11/10	01/23/2024	AH
G10L15/22	01/23/2024	AH
G06F3/01	02/27/2024	AH
G02C5/001	02/27/2024	AH
G02C5/14	02/27/2024	AH
G02C11/10	02/27/2024	AH
G10L15/22	02/27/2024	AH

CPC Combination Sets - Searched*		
Symbol	**Date**	**Examiner**

US Classification - Searched*			
Class	**Subclass**	**Date**	**Examiner**
381	111	01/23/2024	AH
351	111	01/23/2024	AH
381	104,110	02/27/2024	AH

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

/AMMAR T HAMID/ Primary Examiner, Art Unit 2695	/AMMAR T HAMID/ Primary Examiner, Art Unit 2695

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/519,802	Howell et al.
	Examiner	Art Unit
	AMMAR T HAMID	2695

Search Notes		
Search Notes	**Date**	**Examiner**
Consulted with examiner Xu Mei for class subclass search	01/23/2024	AH
Text search using PE2E	01/23/2024	AH
Inventor and applicant search using PE2E	01/23/2024	AH
Concept search using IP.com	01/23/2024	AH
Consulted with examiner Xu Mei for class subclass search	02/27/2024	AH
Text search using PE2E	02/27/2024	AH
Inventor and applicant search using PE2E	02/27/2024	AH
Concept search using IP.com	02/27/2024	AH

Interference Search			
US Class/CPC Symbol	**US Subclass/CPC Group**	**Date**	**Examiner**
G06F3/01		02/27/2024	Ah
G02C5/001		02/27/2024	Ah
G02C5/14		02/27/2024	Ah
G02C11/10		02/27/2024	AH
G10L15/22		02/27/2024	AH
381	104,110	02/27/2024	AH

/AMMAR T HAMID/ Primary Examiner, Art Unit 2695	/AMMAR T HAMID/ Primary Examiner, Art Unit 2695

18519802

Report Run Date: 2024-02-27 UTC
Searches: 1
Markers: 0

Apple Inc. EX1002 Page 284

Search #	Timestamp	Results	Page
1	2024-02-27 16:11 UTC	~12,028,812	3

Content: Patent Publications (169)

US Patents | US Designs | US Applications | EPO Patents | EPO Applications | China Patents | China Applications | Japan Patents | Japan Applications | Korea Patents | Korea Applications | WIPO Applications | Argentina Patents | Argentina Applications | Brazil Patents | Brazil Applications | Canada Patents | Canada Applications | Chile Patents | Chile Applications | Colombia Applications | Costa Rica Applications | Cuba Patents | Cuba Applications | Dominican Republic Applications | Ecuador Patents | Ecuador Applications | El Salvador Applications | Guatemala Applications | Honduras Applications | Mexico Patents | Mexico Applications | Nicaragua Patents | Panama Applications | Peru Applications | Trinidad & Tobago Patents | Uruguay Applications | Austria Patents | Austria Applications | Belarus Patents | Belgium Patents | Belgium Applications | Bosnia & Herzegovina Patents | Bosnia & Herzegovina Applications | Bulgaria Patents | Bulgaria Applications | Croatia Patents | Croatia Applications | Czech Republic Patents | Czech Republic Applications | Czechoslovakia Patents | Czechoslovakia Applications | Denmark Patents | Denmark Applications | Estonia Patents | Estonia Applications | EUIPO Patents | Finland Patents | Finland Applications | France Patents | France Applications | Germany Patents | Germany Applications | Great Britain Patents | Great Britain Applications | Greece Patents | Greece Applications | Hungary Patents | Hungary Applications | Iceland Patents | Iceland Applications | Ireland Patents | Ireland Applications | Italy Patents | Italy Applications | Latvia Patents | Latvia Applications | Lithuania Patents | Lithuania Applications | Luxembourg Patents | Luxembourg Applications | Malta Patents | Monaco Patents | Montenegro Patents | Montenegro Applications | Netherlands Patents | Netherlands Applications | Norway Patents | Norway Applications | Poland Patents | Poland Applications | Portugal Patents | Portugal Applications | Republic of Moldova Patents | Republic of Moldova Applications | Romania Patents | Romania Applications | San Marino Patents | San Marino Applications | Serbia Patents | Serbia Applications | Slovakia Patents | Slovakia Applications | Slovenia Patents | Spain Patents | Spain Applications | Sweden Patents | Sweden Applications | Switzerland Patents | Switzerland Applications | Ukraine Patents | Yugoslavia/Serbia and Montenegro Patents | Yugoslavia/Serbia and Montenegro Applications | Armenia Patents | Australia Patents | Australia Applications | Cyprus Patents | Gulf Cooperation Council Patents | Hong Kong Patents | India Patents | India Applications | Indonesia Patents | Indonesia Applications | Israel Patents | Israel Applications | Jordan Patents | Jordan Applications | Kyrgyzstan Patents | Macao Applications | Malaysia Patents | Mongolia Patents | New Zealand Patents | Philippines Patents | Philippines Applications | Saudi Arabia Patents | Saudi Arabia Applications | Singapore Patents | Singapore Applications | Taiwan Patents | Taiwan Applications | Tajikistan Patents | Tajikistan Applications | Thailand Patents | Thailand Applications | Uzbekistan Patents | Vietnam Patents | Algeria Patents | ARIPO Patents | ARIPO Applications | Egypt Patents | Kenya Patents | Malawi Patents | Morocco Patents | Morocco Applications | OAPI Patents | South Africa Patents | Tunisia Applications | Zambia Patents | Zimbabwe Patents | EAPO Patents | EAPO Applications | Georgia Patents | Georgia Applications | Kazakhstan Patents | Kazakhstan Applications | Russia Patents | Russia Applications | Turkey Patents | Turkey Applications

1 **2024-02-27 16:11 UTC | ~12,028,812 results from**

De-Dup: Extended Family Numbers | **Relevance Cut-off:** None | **Sort:** Relevance

Main Concept: Text

A wireless wearable device to at least help a user hear audio outputs produced by the device, with at least a portion of the wireless wearable device to be worn in an ear of the user, and the wireless wearable device comprising: a speaker at least partially in the wireless wearable device; an electrical connector at least partially in the wireless wearable device, wherein the electrical connector includes at least two conductive areas, each area on a surface of the wireless wearable device, wherein the at least two conductive areas are configured to removably couple to corresponding conductive contacts of a counterpart connector external to and separate from the wireless wearable device, at least via spring-force, to at least enable each of the at least two conductive areas to be electrically connected to its corresponding conductive contact; a rechargeable battery at least partially in the wireless wearable device, with the battery configured to be charged via at least the electrical connector; a microphone at least partially in the wireless wearable device; another microphone at least partially in the wireless wearable device configured to capture at least

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sound in vicinity of the wireless wearable device, wherein the microphone is configured to be positioned closer to mouth of the user than the another microphone, when the wireless wearable device is worn by the user; wireless communication circuitry at least partially in the wireless wearable device; a touch-sensitive input surface on the wireless wearable device, wherein the touch-sensitive input surface is configured to facilitate generating at least an electrical signal for an operation of the wireless wearable device based on receiving at least a touch input; and an area configured for attachment via magnetic force.

Concept Modifiers: None

Filters: None

PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1	2	"20030063763"	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/05 10:48 AM
L2	803	(head ADJ worn glasses) WITH force ADJ sensor	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/05 10:50 AM
L3	1	(head ADJ worn) WITH force ADJ sensor	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/05 10:50 AM
L4	2131	head WITH force ADJ sensor	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/05 10:51 AM
L5	528	head WITH force ADJ sensor AND microphone	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/05 10:51 AM
L6	453	head WITH force ADJ sensor AND microphone AND speaker	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/05 10:51 AM
L7	412	head WITH force ADJ sensor AND microphone AND speaker AND touch	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/05 10:51 AM
L8	295	head WITH force ADJ sensor AND microphone AND speaker AND touch AND bluetooth	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/05 10:52 AM
L9	259	glasses WITH force ADJ sensor AND microphone AND speaker AND touch AND bluetooth	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/05 10:56 AM
L10	259	"glasses" WITH force ADJ sensor AND microphone AND speaker AND touch AND bluetooth	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/05 11:00 AM
L11	2	(glasses) WITH force ADJ sensor AND microphone AND speaker AND touch AND bluetooth	(US-PGPUB; USPAT)	OR	OFF	ON	2023/09/05 11:01 AM
L12	0	(glasses) WITH magnetic WITH attachement AND microphone AND speaker AND touch AND bluetooth	(US-PGPUB; USPAT)	OR	OFF	ON	2023/09/05 11:53 AM
L13	18	(glasses) WITH magnetic WITH	(US-PGPUB; USPAT)	OR	OFF	ON	2023/09/05 11:54 AM

		attach$5 AND microphone AND speaker AND touch AND bluetooth					
L14	397	(glasses) WITH magnetic WITH attach$5	(US-PGPUB; USPAT)	OR	OFF	ON	2023/09/05 11:55 AM
L15	21	smart WITH glasses WITH magnetic WITH attach$5	(US-PGPUB; USPAT)	OR	OFF	ON	2023/09/05 11:57 AM
L16	0	smart ADJ glasses WITH magnetic ADJ attach$5	(US-PGPUB; USPAT)	OR	OFF	ON	2023/09/05 12:04 PM
L17	26	glasses WITH magnetic ADJ attach$5	(US-PGPUB; USPAT)	OR	OFF	ON	2023/09/05 12:04 PM
L18	9	smart ADJ glasses WITH force ADJ sensor	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/05 12:20 PM
L19	203	"6769767"	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/05 04:16 PM
L20	4435	G06F3/01.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/05 05:39 PM
L21	571	G02C5/001.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/05 05:39 PM
L22	439	G02C5/14.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/05 05:39 PM
L23	802	G02C5/143.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/05 05:39 PM
L24	3338	G02C11/10.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/05 05:40 PM
L25	14145	G06F1/163.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/05 05:40 PM
L26	23007	G10L15/22.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/05 05:40 PM
L27	332	381/110.ccls.	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/05 05:40 PM
L28	26	((("IngenioSpec") near3 ("LLC"))).AS,AANM.	(USPAT)	OR	ON	ON	2023/09/05 05:41 PM
L29	20117	((("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	2023/09/05 05:41 PM
L30	7	"206302535"	(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	2023/09/06 10:44 AM

			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)				
L31	5	"207475791"	(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	2023/09/06 10:47 AM
L32	27	((("IngenioSpec") near3 ("LLC"))).AS,AANM.	(USPAT)	OR	ON	ON	2023/09/25 12:05 PM
L33	20130	((("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	2023/09/25 12:06 PM
L34	247	381/110.ccls.	(USPAT)	OR	ON	ON	2023/09/25 12:33 PM
L35	1840	G06F3/01.cpc.	(USPAT)	OR	ON	ON	2023/09/25 12:34 PM
L36	321	G02C5/001.cpc.	(USPAT)	OR	ON	ON	2023/09/25 12:34 PM
L37	187	G02C5/14.cpc.	(USPAT)	OR	ON	ON	2023/09/25 12:34 PM
L38	461	G02C5/143.cpc.	(USPAT)	OR	ON	ON	2023/09/25 12:35 PM
L39	1420	G02C11/10.cpc.	(USPAT)	OR	ON	ON	2023/09/25 12:35 PM
L40	6020	G06F1/163.cpc.	(USPAT)	OR	ON	ON	2023/09/25 12:36 PM
L41	9943	G10L15/22.cpc.	(USPAT)	OR	ON	ON	2023/09/25 12:36 PM
L42	247	381/110.ccls.	(USPAT)	OR	ON	ON	2023/09/25 12:36 PM
L43	779	381/104.ccls.	(USPAT)	OR	ON	ON	2023/09/25 12:37 PM

L44	4571	G06F3/01.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2024/01/23 04:18 PM
L45	588	G02C5/001.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2024/01/23 04:19 PM
L46	453	G02C5/14.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2024/01/23 04:19 PM
L47	818	G02C5/143.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2024/01/23 04:19 PM
L48	3509	G02C11/10.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2024/01/23 04:20 PM
L49	14830	G06F1/163.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2024/01/23 04:20 PM
L50	24331	G10L15/22.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2024/01/23 04:20 PM
L51	0	"351.111".ccls.	(US-PGPUB; USPAT)	OR	ON	ON	2024/01/23 04:21 PM
L52	0	"381.111".ccls.	(US-PGPUB; USPAT)	OR	ON	ON	2024/01/23 04:21 PM
L53	845	381/111.ccls.	(US-PGPUB; USPAT)	OR	ON	ON	2024/01/23 04:21 PM
L54	415	351/111.ccls.	(US-PGPUB; USPAT)	OR	ON	ON	2024/01/23 04:22 PM
L55	30	((("IngenioSpec") near3 ("LLC"))).AS,AANM.	(USPAT)	OR	ON	ON	2024/01/23 04:22 PM
L56	20267	((("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	2024/01/23 04:23 PM
L57	30	((("INGENIOSPEC") near3 ("LLC"))).AS,AANM.	(USPAT)	OR	ON	ON	2024/02/27 09:59 AM
L58	20302	((("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	2024/02/27 10:20 AM
L59	9965	G06F3/01.cpc.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2024/02/27 10:20 AM
L60	1188	G02C5/001.cpc.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2024/02/27 10:20 AM
L61	1161	G02C5/14.cpc.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2024/02/27 10:20 AM
L62	1632	G02C5/143.cpc.	(US-PGPUB; USPAT; USOCR; EPO; JPO;	OR	ON	ON	2024/02/27 10:21 AM

			DERWENT)				
L63	5968	G02C11/10.cpc.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2024/02/27 10:21 AM
L64	24513	G06F1/163.cpc.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2024/02/27 10:21 AM
L65	45744	G10L15/22.cpc.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2024/02/27 10:21 AM
L66	822	351/111.ccls.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2024/02/27 10:21 AM
L67	2296	381/104.ccls.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2024/02/27 10:22 AM
L68	695	381/110.ccls.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2024/02/27 10:22 AM

PE2E SEARCH - Search History (Interference)

There are no Interference searches to show.

Bibliographic Data

Application No: 18/519,802

Foreign Priority claimed: ○ Yes ◉ No

35 USC 119 (a-d) conditions met: ☐ Yes ☑ No ☐ Met After Allowance

Verified and Acknowledged: /AMMAR T HAMID/ (Examiner's Signature) | (Initials)

Title: HEAD-WORN DEVICE WITH CONNECTION REGION

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
11/27/2023	351	2695	IPVCP006X1C10D1C1
RULE			

APPLICANTS

IngenioSpec, LLC, San Jose, CA, UNITED STATES

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 18224793 07/21/2023 PAT 11829518

18224793 is a DIV of 18129660 03/31/2023 PAT 11803069

18129660 is a CON of 16424018 05/28/2019 PAT 11630331

16424018 is a CON of 13831419 03/14/2013 PAT 10345625

13831419 is a CON of 13291020 11/07/2011 PAT 8430507

13291020 is a CON of 12803732 07/01/2010 PAT 8434863

12803732 is a CON of 11546685 10/11/2006 PAT 7806525

11546685 has PRO of 60846150 09/20/2006

11546685 has PRO of 60787850 04/01/2006

11546685 has PRO of 60725999 10/11/2005

11546685 has PRO of 60725896 10/11/2005

11546685 is a CIP of 11183256 07/15/2005 PAT 7500747

11183256 has PRO of 60647826 01/31/2005

11183256 has PRO of 60647836 01/31/2005

11183256 has PRO of 60620238 10/18/2004

11183256 has PRO of 60618107 10/12/2004

11183256 has PRO of 60605191 08/28/2004

11183256 has PRO of 60592045 07/28/2004 *

(*) Data provided by applicant is not consistent with PTO record

FOREIGN APPLICATIONS

IF REQUIRED, FOREIGN LICENSE GRANTED**

12/07/2023

STATE OR COUNTRY

UNITED STATES

ADDRESS

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

FILING FEE RECEIVED

$1,820

Form 1449 (Modified)	Atty. Docket No.	IPVCP006X1C10D1
	Application No.:	18/519,802
Information Disclosure Statement By Applicant	Applicant	HOWELL et al.
	Filing Date	November 27, 2023
	Group	2695
(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.	2002/0146097 A1	Oct-02	Vuori			
	2.	2003/0045283 A1	Mar-03	Hagadoorn			
	3.	2005/0090295 A1	Apr-05	Ali et al.			
	4.	2017/0289323 A1	Oct-17	Gelvin et al.			
	5.	2023/0408850 A1	Dec-23	Howell et al.			
	6.	2024/0036361 A1	Feb-24	Howell et al.			
	7.	5,790,311	Aug-98	Togino			
	8.	7,430,299 B2	Sep-08	Armstrong et al.			
	9.	7,787,647 B2	Aug-10	Hagen et al.			
	10.	8,009,849 B2	Aug-11	Enzmann			
	11.	8,175,886 B2	May-12	Odinak			
	12.	8,251,875 B2	Aug-12	Ellis et al.			
	13.	8,571,241 B2	Oct-13	Larsen			
	14.	8,620,208 B2	Dec-13	Slotznick			
	15.	8,626,246 B2	Jan-14	Shostak			
	16.	9,183,351 B2	Nov-15	Shusterman			
	17.	9,369,814 B2	Jun-16	Victorian et al.			
	18.	11,480,802 B1	Oct-22	Tombelli			
	19.	11,803,069 B2	Oct-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.

Examiner	Date Considered
/AMMAR T HAMID/	02/27/2024

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.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.T.H/

Form 1449 (Modified) Information Disclosure Statement By Applicant (Use Several Sheets if Necessary)	Atty. Docket No.	IPVCP006X1C10D1
	Application No.:	18/519,802
	Applicant	HOWELL et al.
	Filing Date	November 27, 2023
	Group	2695
		Page 2 of 2

	C	Office Action for U.S. Patent Application No. 18/144,557, dated November 24, 2023.
	D	Notice of Allowance for U.S. Patent Application No. 18/144,557, dated January 11, 2024.
	E	Notice of Allowance for U.S. Patent Application No. 18/238,467, dated November 21, 2023.
	F	Notice of Allowance for U.S. Patent Application No. 16/182,969, dated October 25, 2023.
	G	Election of Species Requirement for U.S. Patent Application No. 18/375,893, dated November 14, 2023.
	H	Office Action for U.S. Patent Application No. 18/375,893, dated December 14, 2023.

Examiner	Date Considered
/AMMAR T HAMID/	02/27/2024

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.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.T.H/

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NOTICE OF ALLOWANCE AND FEE(S) DUE

34071 7590 03/04/2024

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

EXAMINER	
HAMID, AMMAR T	
ART UNIT	PAPER NUMBER
2695	

DATE MAILED: 03/04/2024

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/519,802	11/27/2023	Thomas A. Howell	IPVCP006X1C10D1C1	3510

TITLE OF INVENTION: HEAD-WORN DEVICE WITH CONNECTION REGION

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1200	$0.00	$0.00	$1200	06/04/2024

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 40% the amount of undiscounted fees, and micro entity fees are 20% the amount of undiscounted fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via the USPTO patent electronic filing system.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications. **Because electronic patent issuance may occur shortly after issue fee payment, any desired continuing application should preferably be filed prior to payment of this issue fee in order not to jeopardize copendency.**

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

34071 7590 03/04/2024

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

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via the USPTO patent electronic filing system or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/519,802	11/27/2023	Thomas A. Howell	IPVCP006X1C10D1C1	3510

TITLE OF INVENTION: HEAD-WORN DEVICE WITH CONNECTION REGION

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1200	$0.00	$0.00	$1200	06/04/2024

EXAMINER	ART UNIT	CLASS-SUBCLASS
HAMID, AMMAR T	2695	351-111000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/AIA/122 or PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/AIA/47 or PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1_____
2_____
3_____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. Fees submitted: ❑Issue Fee ❑Publication Fee (if required)

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*

❑ Electronic Payment via the USPTO patent electronic filing system ❑ Enclosed check ❑ Non-electronic payment by credit card (Attach form PTO-2038)

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

5. **Change in Entity Status** (from status indicated above)

❑ Applicant certifying micro entity status. See 37 CFR 1.29
NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

❑ Applicant asserting small entity status. See 37 CFR 1.27
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

❑ Applicant changing to regular undiscounted fee status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

Apple Inc. EX1002 Page 298

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/519,802	11/27/2023	Thomas A. Howell	IPVCP006X1C10D1C1	3510

34071 7590 03/04/2024

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

EXAMINER	
HAMID, AMMAR T	
ART UNIT	PAPER NUMBER
2695	

DATE MAILED: 03/04/2024

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. 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 30 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, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. 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.

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. The United States Patent and Trademark Office (USPTO) collects the information in this record under authority of 35 U.S.C. 2. The USPTO's system of records is used to manage all applicant and owner information including name, citizenship, residence, post office address, and other information with respect to inventors and their legal representatives pertaining to the applicant's/ owner's activities in connection with the invention for which a patent is sought or has been granted. The applicable Privacy Act System of Records Notice for the information collected in this form is COMMERCE/PAT-TM-7 Patent Application Files, available in the Federal Register at 78 FR 19243 (March 29, 2013).
https://www.govinfo.gov/content/pkg/FR-2013-03-29/pdf/2013-07341.pdf

Routine uses of the information in this record may include disclosure to:

1) law enforcement, in the event that the system of records indicates a violation or potential violation of law;
2) a federal, state, local, or international agency, in response to its request;
3) a contractor of the USPTO having need for the information in order to perform a contract;
4) the Department of Justice for determination of whether the Freedom of Information Act (FOIA) requires disclosure of the record;
5) a Member of Congress submitting a request involving an individual to whom the record pertains, when the individual has requested the Member's assistance with respect to the subject matter of the record;
6) a court, magistrate, or administrative tribunal, in the course of presenting evidence, including disclosures to opposing counsel in the course of settlement negotiations;
7) the Administrator, General Services Administration (GSA), or their designee, during an inspection of records conducted by GSA under authority of 44 U.S.C. 2904 and 2906, in accordance with the GSA regulations and any other relevant (i.e., GSA or Commerce) directive, where such disclosure shall not be used to make determinations about individuals;
8) 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));
9) the Office of Personnel Management (OPM) for personnel research purposes; and
10) the Office of Management and Budget (OMB) for legislative coordination and clearance.

If you do not furnish the information requested on this form, the USPTO may not be able to process and/or examine your submission, which may result in termination of proceedings, abandonment of the application, and/or expiration of the patent.

Notice of Allowability	Application No. 18/519,802	Applicant(s) Howell et al.	
	Examiner AMMAR T HAMID	Art Unit 2695	AIA (FITF) Status No

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

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☑ This communication is responsive to 2/21/2024.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ 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.

3. ☑ The allowed claim(s) is/are 1-24 . As a result of the allowed claim(s), 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.**

4. ☐ 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)).

   * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☑ Notice of References Cited (PTO-892)
2. ☑ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.
5. ☐ Examiner's Amendment/Comment
6. ☑ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/AMMAR T HAMID/ Primary Examiner, Art Unit 2695	/AMMAR T HAMID/ Primary Examiner, Art Unit 2695

Notice *of Pre-AIA or AIA Status*

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

In light of the approval of the terminal disclaimer filed by applicant and approved by office on February 26th 2024, the nonstatutory double patenting rejection is overcome.

Allowable Subject Matter

Claims 1-23 are allowed over prior art of record.

Most relevant prior art of record is Most relevant prior art of record is *Swab et al. (US 6769767 B2)* hereinafter Swab.

Regarding claim 1, Swab teaches A wireless wearable device with at least a portion of the wireless wearable device configured to be worn in at least one ear of a user (12 in Fig. 1and 62 in Fig. 9), to at least help the user hear audio outputs produced by the device (62 in Fig. 9 is a speaker), the wireless wearable device comprising: a speaker at least partially in the wireless wearable device (62 in Fig. 9); an electrical connector at least partially in the wireless wearable device (42, 44, 46, and 48 in Fig. 2a), Swab does not specifically disclose the device further comprising wherein the electrical connector includes at least two conductive areas, each area on a surface of the wireless wearable device, wherein the at least two conductive areas are configured to removably couple to corresponding conductive contacts of a counterpart connector external to and separate from the wireless wearable device, at least via spring-force, to at least enable each of the at least two conductive areas to be electrically connected to its corresponding conductive contact; a rechargeable battery at least partially in the wireless wearable device, with the battery configured to be charged via at least the electrical connector; and a microphone at least partially in the wireless wearable device.

The following is the reason for allowance of claim 1:

Swab alone or in combination with any other prior art of record does not specifically disclose, suggest nor render obvious the limitations wherein the electrical connector includes at least two conductive areas, each area on a surface of the wireless wearable device, wherein the at least two conductive areas are configured to removably couple to corresponding conductive contacts of a counterpart connector external to and separate from the wireless wearable device, at least via spring-force, to at least enable each of the at least two conductive areas to be electrically connected to its corresponding conductive contact; a rechargeable battery at least partially in the wireless wearable device, with the battery configured to be charged via at least the electrical connector; and a microphone at least partially in the wireless wearable device, therefore the claim is allowed for the limitations above in combination with all the other limitations of the claim.

Regarding claims 2-19, claims are allowed for their dependency on allowed claim 1.

Regarding claim 20, claim is allowed for being the device comprising at least the same elements and performing at least the same functions performed by the device of allowed claim 1 (see reasons for allowance of claim 1 above).

Regarding claim 21, claim is allowed for its dependency on allowed claim 20.

Regarding claim 22, claim is allowed for being the device comprising at least the same elements and performing at least the same functions performed by the device of allowed claim 1 (see reason for allowance of claim 1 above).

Regarding claim 23, claim is allowed for its dependency on allowed claim 22.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AMMAR T HAMID whose telephone number is (571)272-1953. The examiner can normally be reached M-F 9-5, Eastern time.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on (571) 272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is available to registered users. To file and manage patent submissions in Patent Center, visit: https://patentcenter.uspto.gov. Visit https://www.uspto.gov/patents/apply/patent-center for more information about Patent Center and https://www.uspto.gov/patents/docx for information about filing in DOCX format. For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AMMAR T. HAMID
Primary Examiner
Art Unit 2695

/AMMAR T HAMID/
Primary Examiner, Art Unit 2695

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/519,802	11/27/2023	Thomas A. Howell	IPVCP006X1C10D1C1	3510

34071 7590 03/20/2024

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

EXAMINER	
HAMID, AMMAR T	

ART UNIT	PAPER NUMBER
2695	

MAIL DATE	DELIVERY MODE
03/20/2024	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.

Corrected ***Notice of Allowability***	**Application No.** 18/519,802	**Applicant(s)** Howell et al.	
	Examiner AMMAR T HAMID	**Art Unit** 2695	**AIA (FITF) Status** No

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

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☑ This communication is responsive to 2/21/2024.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ 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.

3. ☑ The allowed claim(s) is/are 1-23 . As a result of the allowed claim(s), 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.**

4. ☐ 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)).

   * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.
5. ☐ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/AMMAR T HAMID/ Primary Examiner, Art Unit 2695	/AMMAR T HAMID/ Primary Examiner, Art Unit 2695

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/519,802	Howell et al.
	Examiner	**Art Unit**
	AMMAR T HAMID	2695

CPC						
Symbol					**Type**	**Version**
G06F	/	3	/	01	F	2013-01-01
G02C	/	11	/	10	I	2013-01-01
G02C	/	5	/	001	I	2013-01-01
G02C	/	5	/	143	I	2013-01-01
G02C	/	5	/	14	I	2013-01-01
G10L	/	15	/	22	I	2013-01-01
G06F	/	1	/	163	I	2013-01-01

CPC Combination Sets							
Symbol					**Type**	**Set**	**Ranking**	**Version**
	/		/					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	23	
/AMMAR T HAMID/ Primary Examiner, Art Unit 2695	18 March 2024	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

U.S. Patent and Trademark Office — Part of Paper No.: 20240318

Apple Inc. EX1002 Page 307

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/519,802	Howell et al.
	Examiner	**Art Unit**
	AMMAR T HAMID	2695

INTERNATIONAL CLASSIFICATION					
CLAIMED					
H04R	/	3	/	00	
	/		/		

NON-CLAIMED				
H03G	/	3	/	00

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**
381	110

CROSS REFERENCES(S)						
CLASS	**SUBCLASS (ONE SUBCLASS PER BLOCK)**					
381	104					

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 23	
/AMMAR T HAMID/ Primary Examiner, Art Unit 2695 (Primary Examiner)	18 March 2024 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 1

U.S. Patent and Trademark Office — Part of Paper No.: 20240318

Apple Inc. EX1002 Page 308

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/519,802	Howell et al.
	Examiner	**Art Unit**
	AMMAR T HAMID	2695

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

CLAIMS

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
	1		10		19										
	2		11		20										
	3		12		21										
	4		13		22										
	5		14		23										
	6		15												
	7		16												
	8		17												
	9		18												

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	23	
/AMMAR T HAMID/ Primary Examiner, Art Unit 2695	18 March 2024	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

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Apple Inc. EX1002 Page 309

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www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
18/519,802	11/27/2023	Thomas A. Howell	IPVCP006X1C10D1C1

CONFIRMATION NO. 3510

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

PUBLICATION NOTICE

OC000000070025563

Date Mailed: 03/21/2024

Title:HEAD-WORN DEVICE WITH CONNECTION REGION

Publication No.US-2024-0094800-A1
Publication Date:03/21/2024

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently http://www.uspto.gov/patft/.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Public Records Division. The Public Records Division can be reached by telephone at (571) 272-3150 or (800) 972-6382, by facsimile at (571) 273-3250, by mail addressed to the United States Patent and Trademark Office, Public Records Division, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently https://portal.uspto.gov/pair/PublicPair. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Managment, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 18/519,802	Filing Date 11/27/2023	☐ 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	04/01/2024	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 25	Minus	** 23	= 2		x $100 =	200
	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	680

		(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.	SLIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/KAREN L VESTAL/
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Doc code: RCEX
Doc description: Request for Continued Examination (RCE)

PTO/SB/30EFS (01-22)
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REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL
(Submitted Only via EFS-Web)

Application Number	18519802	Filing Date	2023-11-27	Docket Number (if applicable)	IPVCP006X1C10D1C1	Art Unit	
First Named Inventor	HOWELL et al.			Examiner Name	HAMID, AMMAR T.		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

SUBMISSION REQUIRED UNDER 37 CFR 1.114

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☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____

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MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____
(Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

☒ **The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.**
The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No 503874

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Signature of Registered U.S. Patent Practitioner			
Signature	/Peter P. Tong/	Date (YYYY-MM-DD)	2024-03-29
Name	Peter P. Tong	Registration Number	35757

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(54) Title: APPARATUS AND METHOD FOR MEASURING BIOLOGIC PARAMETERS

(57) Abstract: Support structures for positioning sensors on a physiologic tunnel for measuring physical, chemical and biological parameters of the body and to produce an action according to the measured value of the parameters. The support structure includes a sensor fitted on the support structures using a special geometry for acquiring continuous and undisturbed data on the physiology of the body. Signals are transmitted to a remote station by wireless transmission such as by electromagnetic waves, radio waves, infrared, sound and the like or by being reported locally by audio or visual transmission. The physical and chemical parameters include brain function, metabolic function, hydrodynamic function, hydration status, levels of chemical compounds in the blood, and the like. The support structure includes patches, clips, eyeglasses, head mounted gear and the like, containing passive or active sensors positioned at the end of the tunnel with sensing systems positioned on and accessing a physiologic tunnel.

Apparatus and Method for Measuring Biologic Parameters

FIELD OF THE INVENTION

The present invention includes support and sensing structures positioned in a physiologic tunnel for measuring bodily functions and to manage abnormal conditions indicated by the measurements.

BACKGROUND OF THE INVENTION

Interfering constituents and variables can introduce significant source of errors that prevent measured biologic parameters from being of clinical value. In order to bypass said interfering constituents and achieve undisturbed signals invasive and semi-invasive techniques have been used. Such techniques have many drawbacks including difficulties in providing continuous monitoring for long periods of time. Non-invasive techniques also failed to deliver the clinical usefulness needed. The placement of a sensor on the skin characterized by the presence of interfering constituents do not allow obtaining clinically useful nor accurate signals due to the presence of said interfering constituents and background noise which greatly exceeds the signal related to the physiologic parameter being measured.

The most precise, accurate, and clinically useful way of evaluating thermal status of the body in humans and animals is by measuring brain temperature. Brain temperature measurement is the key and universal indicator of both disease and health equally, and is the only vital sign that cannot be artificially changed by emotional states. The other vital signs (heart rate, blood pressure, and respiratory rate) all can be

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influenced and artificially changed by emotional states or voluntary effort.

Body temperature is determined by the temperature of blood, which emits heat as far-infrared radiation. Adipose tissue (fat tissue) absorbs far-infrared and the body is virtually completely protected with a layer of adipose tissue adherent to the skin. Thus measurement of temperature using the skin does not achieve precision nor accuracy because previous techniques using sensors placed on skin included by the presence of adipose tissue.

Because it appeared to be impossible with current technology to non-invasively measure brain temperature, attempts were made to determine internal body temperature, also referred to as core temperature. An invasive, artificial, inconvenient, and costly process is currently used to measure internal (core) temperature consisting of inserting a catheter with a temperature sensor in the urinary canal, rectum or esophagus. But such methodology is not suitable for routine measurement, it is painful, and has potential fatal complications.

Semi-invasive techniques have also being tried. Abreu disclosed in U.S. Patent No. 6,120,460 apparatus and methods for measuring core temperature continuously using a contact lens in the eyelid pocket, but the contact lens is a semi-invasive device which requires prescription by a physician and sometimes it is not easy to place the contact lens in the eye of an infant or even in adults and many people are afraid of touching their eyes.

There are several drawbacks and limitations in the prior art for continuous and/or core measurement of temperature.

Measurement of temperature today is non-continuous, non-core and nurse dependent. Nurses have to stick a

thermometer in the patient's mouth, rectum or ear. To get core temperature nurses invasively place a tube inside the body which can cause infection and costly complications.

Measurement of core temperature on a routine basis in the hospital and/or continuously is very difficult and risky because it requires an invasive procedure with insertion of tubes inside the body or by ingesting a thermometer pill. The thermometer pill can cause diarrhea, measure temperature of the fluid/food ingested and not body temperature, and have fatal complications if the pill obstructs the pancreas or liver ducts. Placement of sensors on the skin do not provide clinically useful measurements because of the presence of many interfering constituents including fat tissue.

It is not possible to acquire precise and clinically useful measurements of not only brain temperature, but also metabolic parameters, physical parameters, chemical parameters, and the like by simply placing a sensor on the skin. One key element is the presence of fat tissue. Fat varies from person to person, fat varies with aging, fat content varies from time to time in the same person, fat attenuates a signal coming from a blood vessel, fat absorbs heat, fat prevents delivery of undisturbed far-infrared radiation, fat increases the distance traveled by the element being measured inside the body and an external sensor placed on the surface of the skin.

There is a need to identify a method and apparatus that can non-invasively, conveniently and continuously monitor brain temperature in a painless, simple, external and safe manner with sensors placed on the skin.

There is further a need to identify a method and apparatus that can conveniently, non-invasively, safely and precisely monitor biological parameters including

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metabolic parameters, physical parameters, chemical parameters, and the like.

There is a need to identify an apparatus and method capable of measuring biological parameters by positioning a sensor on a physiologic tunnel for the acquisition of undisturbed and continuous biological signals.

SUMMARY OF THE INVENTION

The present invention provides methods, apparatus and systems that effectively address the needs of the prior art.

In general, the invention provides a set of sensing systems and reporting means which may be used individually or in combination, which are designed to access a physiologic tunnel to measure biological, physical and chemical parameters. Anatomically and physiologically speaking, the tunnel discovered by the present invention is an anatomic path which conveys undisturbed physiologic signals to the exterior. The tunnel consists of a direct and undisturbed connection between the source of the function (signal) within the body and an external point at the end of the tunnel located on the skin. A physiologic tunnel conveys continuous and integral data on the physiology of the body. An undisturbed signal from within the body is delivered to an external point at the end of the tunnel. A sensor placed on the skin at the end of the tunnel allows optimal signal acquisition without interfering constituents and sources of error.

Included in the present invention are support structures for positioning a sensor on the skin at the end of the tunnel. The present invention discloses devices directed at measuring brain temperature, brain function, metabolic function, hydrodynamic function,

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hydration status, hemodynamic function, body chemistry and the like. The components include devices and methods for evaluating biological parameters using patches, clips, eyeglasses, head mounted gear and the like with sensing systems adapted to access physiologic tunnels to provide precise and clinically useful information about the physiologic status of the wearer and for enhancing the safety and performance of said wearer, and helping to enhance and preserve the life of said wearer by providing adequate reporting means and alert means relating to the biological parameter being monitored. Other components provide for producing direct or indirect actions, acting on another device, or adjusting another device or article of manufacture based on the biological parameter measured.

The search for a better way to measure biological parameters has resulted in long and careful research, which included the discovery of a Brain Temperature Tunnel (BTT) and other physiologic tunnels in humans and animals. The present invention was the first to recognize the physiologic tunnel in the body. The present invention was yet the first to recognize the end of the tunnel on the skin surface in which an optimal signal is acquired and measurements can be done without the presence of interfering constituents and background noise that exceeds the signal being measured. The present invention was also the first to recognize and precisely map the special geometry and location of the tunnel including the main entry point. The present invention was yet first to recognize the precise positioning of sensing systems at the main entry point for optimal signal acquisition. Careful studies have been undertaken including software development for characterizing infrared radiation to precisely determine the different aspects of the tunnel.

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This research has determined that the measurement of brain (core) temperature and other body parameters can be accomplished in a non-invasive and continuous manner in humans and animals with sensors positioned in a confined area of the skin at the end of a physiologic tunnel.

The key function and critical factor for life preservation and human performance is brain temperature. Brain tissue is the tissue in the body most susceptible to thermal damage, by both high and low temperature. Brain temperature is the most clinically relevant parameter to determine the thermal status of the body and the human brain is responsible for 18 to 20% of the heat produced in the body, which is an extraordinary fact considering that the brain represents only 2% of the body weight. The great amount of thermal energy generated in the brain is kept in a confined space and the scalp, skull, fat and CSF (cerebral spinal fluid) form an insulating layer. The recognition of the BTT by the present invention bypasses the insulating barriers and provides a direct connection to inside the brain physiology and physics.

Anatomically and physiologically speaking, a Brain Temperature Tunnel consists of a continuous, direct, and undisturbed connection between the heat source within the brain and an external point at the end of the tunnel. The physical and physiological events at one end of the tunnel inside the brain are reproduced at the opposite end on the skin. A BTT enables the integral and direct heat transfer through the tunnel without interference by heat absorbing elements, i.e., elements that can absorb far-infrared radiation transmitted as heat by blood within the brain. There are six characteristics needed to define a BTT. These characteristics are:

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1) area without heat absorbing elements, i.e., the area must not contain adipose tissue (fat tissue). This is a key and needed characteristic for defining a temperature tunnel,

2) area must have a terminal branch of a vessel in order to deliver the integral amount of heat,

3) terminal branch has to be a direct branch of a blood vessel from the brain,

4) terminal branch has to be superficially located to avoid heat absorption by deep structures such as muscles,

5) area must have a thin and negligible interface between a sensor and the source of thermal energy to achieve high heat flow, and

6) area must not have thermoregulatory arteriovenous shunts.

All six characteristics are present on the skin on the medial canthal area adjacent to the medial corner of the eye above the medial canthal tendon and in the medial third of the upper eyelid. In more detail the end of BTT area on the skin measures about 11 mm in diameter measured from the medial corner of the eye at the medial canthal tendon and extend superiorly for about 6 mm and then extends into the upper eyelid in a horn like projection for another 22 mm.

The BTT area is the only area in the body without adipose tissue, which is in addition supplied by a terminal branch, which has a superficial blood vessel coming from the brain vasculature, and which has a thin interface and no thermoregulatory shunts. The BTT area is supplied by a terminal branch of the superior ophthalmic vein which is a direct connection to the cavernous sinus, said cavernous sinus being an endothelium-lined system of

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venous channels inside the brain which collects and stores thermal energy. The blood vessel supplying the BTT area is void of thermoregulatory arteriovenous shunts and it ends on the skin adjacent to the medial corner of the eye and in the superior aspect of the medial canthal area right at the beginning of the upper eyelid. The blood vessels deliver undisturbed heat to the skin on the medial canthal area and upper eyelid as can be seen in the color as well as black and white photos of infrared images shown in FIGS. 1 and 2. The undisturbed thermal radiation from the brain is delivered to the surface of the skin at the end of the tunnel. The heat is delivered to an area of skin without fat located at the end of the tunnel. The blood vessel delivering heat is located just below the skin and thus there is no absorption of infrared radiation by deep structures.

If the blood vessel is located deep, other tissues and chemical substances would absorb the heat, and that can invalidate the clinical usefulness of the measurement. There is direct heat transfer and the skin in the BTT area is the thinnest skin in the body and is void of thermoregulatory arteriovenous shunts. A very important aspect for optimal measurement of temperature is no interference by fat tissue and direct heat transfer.

The absence of fat tissue in this particular and unique area in the body at the end of the tunnel allows the undisturbed acquisition of the signal. The combination of those six elements allows the undisturbed and integral emission of infrared radiation from the brain in the form of direct heat transfer at the BTT area location, which can be seen in the infrared image photographs (FIGS. 1 to 8). The BTT and physiologic

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tunnels are also referred in this description as the "Target Area".

From a physical standpoint, the BTT is the equivalent of a Brain Thermal Energy tunnel with high total radiant power and high heat flow. The temperature of the brain is determined by the balance between thermal energy produced due to metabolic rate plus the thermal energy delivered by the arterial supply to the brain minus the heat that is removed by cerebral blood flow. Convection of heat between tissue and capillaries is high and the temperature of the cerebral venous blood is in equilibrium with cerebral tissue. Accordingly, parenchymal temperature and thermal energy of the brain can be evaluated by measuring the temperature and thermal energy of the cerebral venous blood. The superior ophthalmic vein has a direct and undisturbed connection to the cavernous sinus and carries cerebral venous blood with a thermal energy capacity of 3.6 $J.ml^{-1}.(°C)^{-1}$ at hematocrit of 45%. Cerebral thermodynamic response, thermal energy, and brain temperature can be evaluated by placing a sensor to capture thermal energy conveyed by the cerebral venous blood at the end of the BTT.

The research concerning BTT and physiologic tunnels involved various activities and studies including: 1) In-vitro histologic analysis of mucosal and superficial body areas; 2) In-vivo studies with temperature evaluation of external areas in humans and animals; 3) In-vivo functional angiographic evaluation of heat source; 4) Morphologic studies of the histomorphometric features of the BTT area; 5) In-vivo evaluation of temperature in the BTT area using: thermocouples, thermistors, and far-infrared; 6) Comparison of the BTT area measurements with the internal eye anatomy and current standard most used (oral) for temperature measurement; 7) Cold and heat

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challenge to determine temperature stability of BTT; and 8) Infrared imaging and isotherm determination. Software for evaluating geometry of tunnel was also developed and used. Simultaneous measurement of a reference temperature and temperature in the BTT area were done using pre-equally calibrated thermistors. A specific circuit with multiple channels was designed for the experiments and data collection.

The measurement of temperature in the BTT area showed almost identical temperature signal between the BTT area and the internal conjunctival anatomy of the eye, which is a continuation of the central nervous system. Measurement of the temperature in the internal conjunctival anatomy of eye as used in the experiment was described by Abreu in U.S. Patents No. 6,120,460 and 6,312,393. The averaged temperature levels for BTT and internal eye were within 0.1 °C (0.18 °F) with an average normothermia value equivalent of 37.1°C (98.8 °F) for the BTT and 37°C (98.6 °F) for the internal eye. Comparison with the standard most used, oral temperature, was also performed. The temperature voltage signal of the BTT area showed an average higher temperature level in the BTT area of an equivalent of 0.3 °C (0.5 °F) when compared to oral.

Subjects underwent cold challenge and heat challenge through exercising and heat room. The lowering and rising of temperature in the BTT area was proportional to the lowering and rising in the oral cavity. However, the rate of temperature change was faster in the BTT area than for oral by about 1.2 minutes, and temperature at the BTT site was 0.5 °C (0.9 °F) higher on few occasions. Subjects of different race, gender, and age were evaluated to determine the precise location of the BTT area across a different population and identify any

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anatomic variation. The location of the BTT was present at the same location in all subjects with no significant anatomic variation, which can be seen in a sample of infrared imaging of different subjects.

The tunnel is located in a crowded anatomic area and thus the positioning of the sensor requires special geometry for optimal alignment with the end of the tunnel. The clinical usefulness of the tunnel can only be achieved with the special positioning of the sensor in relation to anatomic landmarks and the support structure. The tunnel is located in a unique position with distinctive anatomic landmarks that help define the external geometry and location of the end of the tunnel. The main entry point of the tunnel, which is the preferred location for positioning the sensor, requires the sensor to be preferably placed in the outer edge of a support structure. The preferred embodiment for the measurement of biological parameters by accessing a physiologic tunnel includes sensors positioned in a particular geometric position on the support structure.

The support structure includes patches containing sensors. For the purpose of the description any structure containing an adhesive as means to secure said structure to the skin at the end of the tunnel is referred to as a patch including strips with adhesive surfaces such as a "BAND-AID" adhesive bandage. It is understood that a variety of attachment means can be used including adhesives, designs incorporating spring tension pressure attachment, and designs based on other attachment methods such as elastic, rubber, jelly-pads and the like.

The patches are adapted to position sensors at the end of the tunnel for optimal acquisition of the signal. The patch is preferably secured to the area by having an adhesive backing which lays against the skin, although a

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combination of adhesive and other means for creating a stable apposition of the sensor to the tunnel can be used such as fastening or pressure.

Support structures also include clips or structures that are positioned at the end of the tunnel with or without adhesive and which are secured to the area by pressure means. Any structure that uses pressure means to secure said structure to the skin at the end of the tunnel is referred as a clip.

Head-mounted structures are structures mounted on the head or neck for positioning sensors on the end of the tunnel and include head bands with accessories that are adjacent to the tunnel, visors, helmets, headphone, structures wrapping around the ear and the like. For the purpose of this description TempAlert is referred herein as a system that measures temperature in the BTT area and has means to report the measured value and that can incorporate alarm means that are activated when certain levels are reached. Support structures yet include any article that has sensing means in which said sensing means are positioned at the end of the tunnel.

Support structures further include medial canthal pieces of eyeglasses. A medial canthal piece is also referred to herein as a medial canthal pad and includes a pad or a piece which positions sensing means on the skin at the medial canthal area on top of a tunnel, with said medial canthal piece being permanently attached to or mounted to an eyeglass. Any sensing means incorporated in an eyeglass (fixed or removable) for accessing a tunnel are referred to herein as EyEXT including means for sensing physical and chemical parameters. Any article of manufacture that has visual function, or ocular protection, or face protection with a part in contact with the tunnel is referred herein as eyeglasses and

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includes conventional eyeglasses, prescription eyeglasses, reading glasses, sunglasses, goggles of any type, masks (including gas masks, surgical masks, cloth masks, diving masks, eyemask for sleeping and the like) safety glasses, and the like.

For brain temperature evaluation the tunnel area consists of the medial canthal area and the superior aspect of the medial corner of the eye. For brain function evaluation the tunnel area consists of primarily the upper eyelid area. For metabolic function evaluation the tunnel area consists of an area adjacent to the medial corner of the eye and both the upper and lower eyelids.

The measurement of metabolic function, brain function, immunogenic function, physical parameters, physico-chemical parameters and the like includes a variety of support structures with sensors accessing the physiologic tunnels. The sensors are placed in apposition to the skin immediately adjacent to the medial corner of the eye preferably in the superior aspect of the medial canthal area. The sensor can also be positioned in the medial third of the upper eyelid. The sensor is most preferably located at the main entry point of the tunnel which is located on the skin 2.5 mm medial to the corner of the eye and about 3 mm above the medial corner of the eye. The diameter of the main entry point is about 6 to 7 mm. The positioning of the sensor at the main entry point of the tunnel provides the optimum site for measuring physical and chemical parameters of the body.

Besides a sensor that makes contact with the skin at the Target Area, it is understood that sensors which do not make contact with the skin can be equally used. For instance an infrared-based temperature measuring system can be used. The measurement is based on the Stefan-

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Boltzman law of physics in which the total radiation is proportional to the fourth power of the absolute temperature, and the Wien Displacement law in which the product of the peak wavelength and the temperature are constant. The field of view of the non-contact infrared apparatus of the invention is adapted to match the size and geometry of the BTT area on the skin.

A variety of lenses known in the art can be used for achieving the field of view needed for the application. For example, but not by way of limitation, a thermopile can be adapted and positioned in a manner to have a field of view aimed at the main entry point of the BTT area on the skin. The signal is then amplified, converted into a voltage output and digitized by a MCU (microcontroller).

This infrared-based system can be integrated into a support structure that is in contact with the body such as any of the support structures of the present invention. In addition, it is understood that the infrared-based system of the present invention can be integrated as a portable or hand-held unit completely disconnected from the body. The apparatus of the present invention can be held by an operator that aims said apparatus at the BTT area to perform the measurement. The apparatus further includes an extension shaped to be comfortably positioned at the BTT site for measuring biological parameters without discomfort to the subject. The extension in contact with the skin at the BTT is shaped in accordance with the anatomic landmarks and the geometry and size of the BTT site. The infrared radiation sensor is positioned in the extension in contact with the skin for receiving radiation emitted from the BTT site.

The present invention provides a method for measuring biological parameters including the steps of positioning sensing means on the skin area at the end of

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a tunnel, producing a signal corresponding to the biological parameter measured and reporting the value of the parameter measured.

It is also include a method to measure biological parameters by non-contact infrared thermometry comprising the steps of positioning an infrared detector at the BTT site with a field of view that encompasses the BTT site and producing a signal corresponding to the measured infrared radiation. The biological parameters include temperature, blood chemistry, metabolic function and the like.

Temperature and ability to do chemical analysis of blood components is proportional to blood perfusion. The present invention recognizes that the tunnel area, herein also referred as a Target Area, has the highest superficial blood perfusion in the head and has a direct communication with the brain, and that the blood vessels are direct branches of the cerebral vasculature and void of thermoregulatory arteriovenous shunts. It was also recognized that the Target Area has the highest temperature in the surface of the body as can be seen in the photographs of experiments measuring infrared emission from the body and the eye.

The Target Area discovered not only has the thinnest and most homogeneous skin in the whole body but is the only skin area without a fat layer. Since fat absorbs significant amounts of radiation, there is a significant reduction of signal. Furthermore other skin areas only provide imprecise and inaccurate signals because of the large variation of adipose tissue from person to person and also great variability of fat tissue according to age. This interference by a fat layer does not occur in the Target Area. Furthermore, the combined characteristics of the Target Area, contrary to the skin

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