EXHIBIT C - INFRINGEMENT OF THE 11,921,355 PATENT BY APPLE INC.

Overview

Plaintiff IngenioSpec, LLC ("IngenioSpec") accuses Defendant Apple Inc. ("Apple" or "Defendant") of infringement by making, using, offering for sale, selling in and/or importing into the United States the Accused Instrumentalities in violation of 35 U.S.C. § 271. "Accused Instrumentality(ies)" means at least:

The following "Accused Instrumentalities":

- Apple AirPods Pro 2, infringes claims 1-3, 5-19, 21-54, 57-70, 72, 75-82, 85-92, 95-100;
- Apple AirPods 2, infringes claims 17-19, 21, 25-29, 33-45, 49-54, 57-59, 65-67, 69-70, 72, 87-88, 90-92, 98-99;
- Apple AirPods 3, infringes claims 17-18, 29, 33-54, 57-59, 77-79, 81-82, 87-88, 90-92, 98-99;
- Apple AirPods 4, infringes claims 17-18, 29, 33-54, 57-59, 77-79, 81-82, 87-88, 90-92, 98-99;
- Apple AirPods 4 with Active Noise Cancellation, infringes claims 1-2, 7-18, 29-54, 57-60, 77-82, 85-92, 95-100;
- Apple AirPods Pro 1, infringes claims 1-2, 7-18, 29-54, 57-60, 77-82, 85-92, 95-100;
- Apple AirPods Pro 3, infringes claims 1-3, 5-19, 21-54, 57-70, 72, 75-82, 85-92, 95-100;
- Beats Fit Pro, infringes claims 1-2, 7-13, 17-18, 29-45, 49-54, 57-60, 87-92, 95-96, 98-100;
- Beats Solo Pro, infringes claims 1-2, 7-12, 17-18, 29-40, 51-52, 54, 57-60;
- Powerbeats Pro, infringes claims 17-18, 29, 33-45, 49-54, 57-59, 87-88, 90-92, 98-99;
- Powerbeats Pro 2, infringes claims 1-2, 7-13, 17-18, 29-45, 49-54, 57-60, 87-92, 95-96, 98-100;

which may be used in conjunction with any of the following "Host Devices":

- iPhones e.g., iPhone 5, iPhone 5c, iPhone 5S, iPhone SE (1st generation), iPhone 6, iPhone 6 Plus, iPhone 6S, iPhone 6S Plus, iPhone 7, iPhone 7 Plus, iPhone 8, iPhone 8 Plus, iPhone X, iPhone XR, iPhone XS, iPhone XS Max, iPhone 11, iPhone 11 Pro, iPhone 11 Pro Max, iPhone SE (2nd generation), iPhone 12, iPhone 12 mini, iPhone 12 Pro, iPhone 12 Pro Max, iPhone 13, iPhone 13 mini, iPhone 13 Pro, iPhone 13 Pro Max, iPhone SE (3rd generation), iPhone 14, iPhone 14 Plus, iPhone 14 Pro, iPhone 14 Pro Max, iPhone 15, iPhone 15 Plus, iPhone 15 Pro, iPhone 15 Pro Max, iPhone 16, iPhone 16 Plus, iPhone 16 Pro, iPhone 16 Pro Max, iPhone 17, iPhone 17 Pro, iPhone 17 Pro Max, iPhone Air (collectively, the "iPhone Devices");
- iPad Tablets e.g., iPad (5th generation), iPad (6th generation), iPad (7th generation), iPad (8th generation), iPad (9th generation), iPad (10th generation), iPad (11th generation), iPad Air 2, iPad Air (3rd generation), iPad Air (4th generation), iPad Air (5th generation), iPad Air (6th generation), iPad Air (M2, 11-inch), iPad Air (M2, 13-inch), iPad Pro (9.7-inch, 1st generation), iPad Pro (12.9-inch, 1st generation), iPad Pro (10.5-inch, 2nd generation), iPad Pro (12.9-inch, 2nd generation), iPad Pro (11-inch,

3rd generation), iPad Pro (12.9-inch, 3rd generation), iPad Pro (11-inch, 4th generation), iPad Pro (12.9-inch, 4th generation), iPad Pro (11-inch, 5th generation), iPad Pro (12.9-inch, 5th generation), iPad Pro (11-inch, 6th generation), iPad Pro (12.9-inch, 6th generation), iPad Pro (11-inch, 7th generation), iPad Pro (13-inch, 7th generation), iPad mini 4 (4th generation), iPad mini (5th generation), iPad mini (6th generation), (collectively the "iPad Devices");

- iPod Touch (7th generation), (collectively the "Touch Devices")
- Apple Watch (Series 0, 38mm, 2015), Apple Watch (Series 0, 42mm, 2015), Apple Watch Sport (38mm, 2015), Apple Watch Sport (42mm, 2015), Apple Watch Edition (38mm, 2015), Apple Watch Edition (42mm, 2015), Apple Watch Series 1 (38mm, 2016), Apple Watch Series 1 (42mm, 2016), Apple Watch Series 2 (38mm, 2016), Apple Watch Series 2 (42mm, 2016), Apple Watch Series 3 (38mm, 2017), Apple Watch Series 3 (42mm, 2017), Apple Watch Series 4 (40mm, 2018), Apple Watch Series 4 (44mm, 2018), Apple Watch Series 5 (40mm, 2019), Apple Watch Series 5 (44mm, 2019), Apple Watch SE (40mm, 2020), Apple Watch SE (44mm, 2020), Apple Watch Series 6 (40mm, 2020), Apple Watch Series 6 (44mm, 2020), Apple Watch Series 7 (41mm, 2021), Apple Watch Series 7 (45mm, 2021), Apple Watch Ultra (49mm, 2022), Apple Watch Series 8 (41mm, 2022), Apple Watch Series 8 (45mm, 2022), Apple Watch SE (2nd Gen, 40mm, 2022), Apple Watch SE (2nd Gen, 44mm, 2022), Apple Watch Series 9 (41mm, 2023), Apple Watch Series 9 (45mm, 2023), Apple Watch Ultra 2 (49mm, 2023), Apple Watch Series 10 (42mm, 2024), Apple Watch Series 10 (46mm, 2024), (collectively the "Watch Devices");
- MacBook (12-inch, 2017), MacBook Air (13-inch, Intel non-Retina, 2017), MacBook Air (13-inch, Retina, 2018), MacBook Air (13-inch, Retina, 2019), MacBook Air (13-inch, Intel, 2020), MacBook Air (13-inch, M1, 2020), MacBook Air (13-inch, M2, 2022), MacBook Air (15-inch, M2, 2023), MacBook Air (13-inch, M3, 2024), MacBook Air (15-inch, M3, 2024), MacBook Air (13-inch, M4, 2025), MacBook Air (15-inch, M4, 2025), MacBook Pro (13-inch, 2016, Intel, 2-port), MacBook Pro (13-inch, 2016, Intel, 4-port), MacBook Pro (15-inch, 2016, Intel), MacBook Pro (13-inch, 2017, Intel, 2-port), MacBook Pro (13-inch, 2017, Intel, 4-port), MacBook Pro (15-inch, 2017, Intel), MacBook Pro (13-inch, 2018, Intel, 4-port), MacBook Pro (15-inch, 2018, Intel), MacBook Pro (13-inch, 2019, Intel, 2-port), MacBook Pro (13-inch, 2019, Intel, 4-port), MacBook Pro (16-inch, 2019, Intel), MacBook Pro (13-inch, 2020, Intel, 2-port), MacBook Pro (13-inch, 2020, Intel, 4-port), MacBook Pro (13-inch, 2020, M1), MacBook Pro (14-inch, 2021, M1 Pro/M1 Max), MacBook Pro (16-inch, 2021, M1 Pro/M1 Max), MacBook Pro (13-inch, 2022, M2, Touch Bar), MacBook Pro (14-inch, 2023, M2 Pro/M2 Max), MacBook Pro (16-inch, 2023, M2 Pro/M2 Max), MacBook Pro (14-inch, 2023, M3/M3 Pro/M3 Max), MacBook Pro (16-inch, 2023, M3 Pro/M3 Max), MacBook Pro (14-inch, 2024, M4 Pro/M4 Max), MacBook Pro (16-inch, 2024, M4 Pro/M4 Max), MacBook Pro (14-inch, 2025, M4 Pro/M4 Max), MacBook Pro (16-inch, 2025, M4 Pro/M4 Max), (collectively the "Computer Devices");
- Apple TV HD (4th generation, 32GB, 2015), Apple TV HD (4th generation, 64GB, 2015), Apple TV 4K (5th generation, 32GB, 2017), Apple TV 4K (5th generation, 64GB, 2017), Apple TV 4K (6th generation, 32GB, 2021), Apple TV 4K (6th generation, 64GB, 2021), Apple TV 4K (3rd generation, 64GB, Wi-Fi, 2022), Apple TV 4K (3rd generation, 128GB, Wi-Fi + Ethernet, 2022), (collectively the "Apple TV Devices"); and
- Apple Vision Pro (the "Vision Device");

including any charging cases, accessories, editions, collaborations, and model numbers for the identified models.

Apple directly infringes U.S. Patent No. 11,921,355 (the "'355 Patent") by making, using, offering for sale, selling in and/or importing into the United States the Accused Instrumentalities, which meet each and every limitation of the claims as shown in the charts below. Apple also directly infringes the asserted claims of the '355 patent to the extent Apple contracted with, or directed, a third party to perform any of the steps of the asserted claims. Apple also directly infringes the asserted claims of the '355 patent to the extent it conditions participation in an activity or receipt of a benefit upon performance of a step or steps of a patented method and establishes the manner or timing of that performance. Apple may have infringed and continues to infringe the '355 patent through other devices utilizing the same or reasonably similar functionality, including other versions of the Accused Instrumentalities. Apple is therefore liable for infringement of the '355 patent under 35 U.S.C. § 271(a).

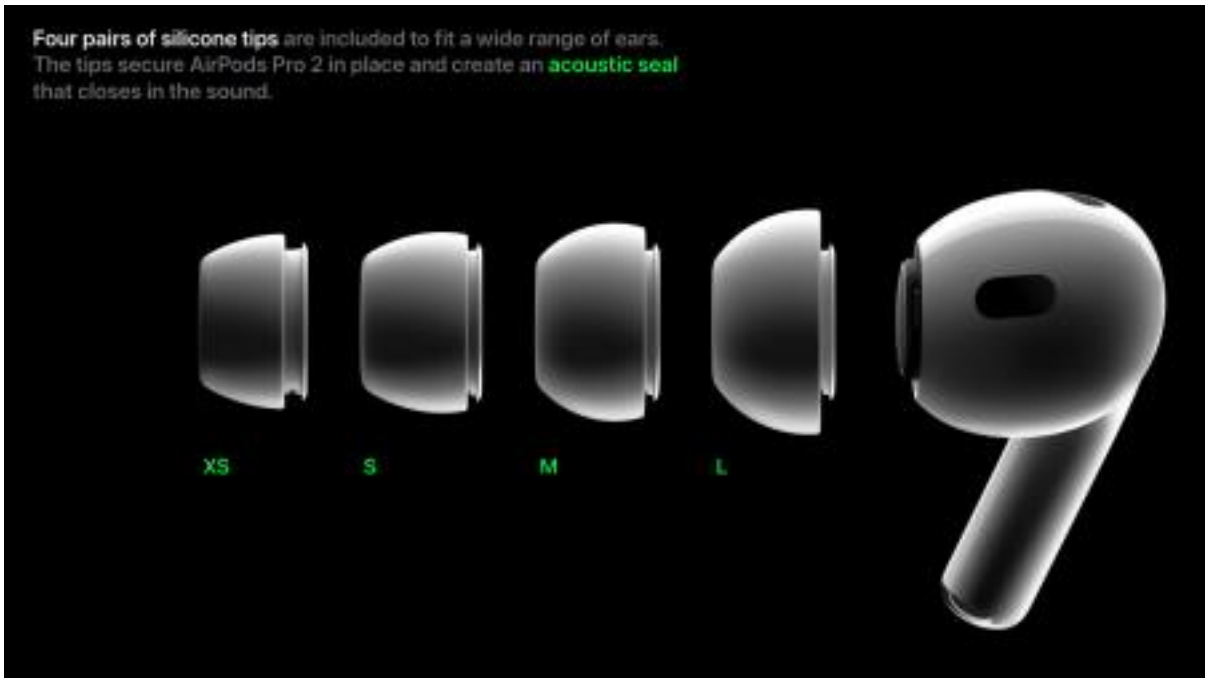
Apple directly or indirectly provides the Accused Instrumentalities to wholesalers, retailers, carriers, and end users of Apple's products in the United States. The wholesalers, retailers, carriers, and end users directly infringe the '355 patent by making, using, selling, offering for sale, and/or importing the Accused Instrumentalities in the United States. Apple actively induces these acts of direct infringement by the wholesalers, retailers, carriers, and end users as demonstrated by the following facts: (A) Apple aids, instructs, or otherwise acts with the intent to cause the wholesalers, retailers, carriers, and end users to perform acts of direct infringement, including without limitation by instructing the users to sell, distribute, and/or operate Apple AirPod devices and features. Apple manifests this intent by providing support services for the Accused Products, including providing instructions, guides, and online materials. See, e.g., https://support.apple.com/guide/airpods/welcome/1.0/web/1.0 (INGENIOSPEC-011211 to INGENIOSPEC-011213) (providing a user manual for AirPods), https://support.apple.com/en-us/docs/airpods (INGENIOSPEC-011210 to INGENIOSPEC-011210), https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/ (INGENIOSPEC-011535 to INGENIOSPEC-011540), https://www.apple.com/eg/airpods-2nd-generation/ (INGENIOSPEC-011200 to INGENIOSPEC-011209), https://www.youtube.com/@Apple/search?query=airpods (INGENIOSPEC-011219 to INGENIOSPEC-011225). For example, Apple's purpose and intent for providing the Accused Instrumentalities to wholesalers, retailers, and carriers is for the wholesalers, retailers, and carriers to offer, resell, and distribute the Accused Instrumentalities throughout the United States so that they can be purchased and used by end users. Such offers for sale, sales, and use of the Accused Instrumentalities constitute acts of direct infringement. (B) At least since the filing of the complaint in this action, Apple has known of the '355 patent. (C) Apple knew that the actions of wholesalers, retailers, carriers and end users would infringe the '355 patent because their downstream offers for sale, sales, and use of the Accused Instrumentalities constitute acts of infringement. (D) Because the '355 patent reads on the Accused Instrumentalities, every offer for sale, sale, or use of the Accused Instrumentalities in the United States constitutes an act of direct infringement. Apple is thereby liable for induced infringement of the asserted claims of the '355 patent under 35 U.S.C. § 271(b).

Apple also contributes to infringement of the '355 patent by offering to sell, selling (including licensing) and importing into the United States each of the Accused Instrumentalities, each of which is especially made or adapted for use in infringement of the '355

patent. The Accused Instrumentalities are a material component for use in practicing the '355 patent and are not a staple article of commerce suitable for substantial non-infringing use. For example, Apple's Accused Instrumentalities constitute a material portion of the invention and have no substantial non-infringing uses. Apple's clients, customers, and end users, direct or otherwise, cause the performance of each and every limitation of the claims, as shown below. Apple is thereby liable for contributory infringement of the asserted claims of the '355 patent under 35 U.S.C. § 271(c).

The asserted claims include elements that are implemented, at least in part, by proprietary and specialized electronics in the Accused Instrumentalities. The precise designs used in them are held secret, at least in part, and are not publicly available in their entirety. An analysis of Apple's documentation may be necessary to fully and accurately describe all infringing features and functionality of the Accused Instrumentalities, and accordingly, Plaintiff reserves the right to supplement these contentions once such information is made available to Plaintiff. Furthermore, Plaintiff reserves the right to revise these contentions, including as discovery in the case progresses, in view of any non-infringement arguments Apple may make (e.g., to allege infringement under the doctrine of equivalents), in view of the Court's final claim construction in this action, and in connection with the provision of expert reports.

11,921,355 Claim 1	Evidence
1. A head-worn personal electronic apparatus operable to at least output customized audio output, comprising:	Each of the Accused Instrumentalities, such as the Apple AirPods Pro 2, is a head-worn personal electronic apparatus operable to at least output customized audio output. 

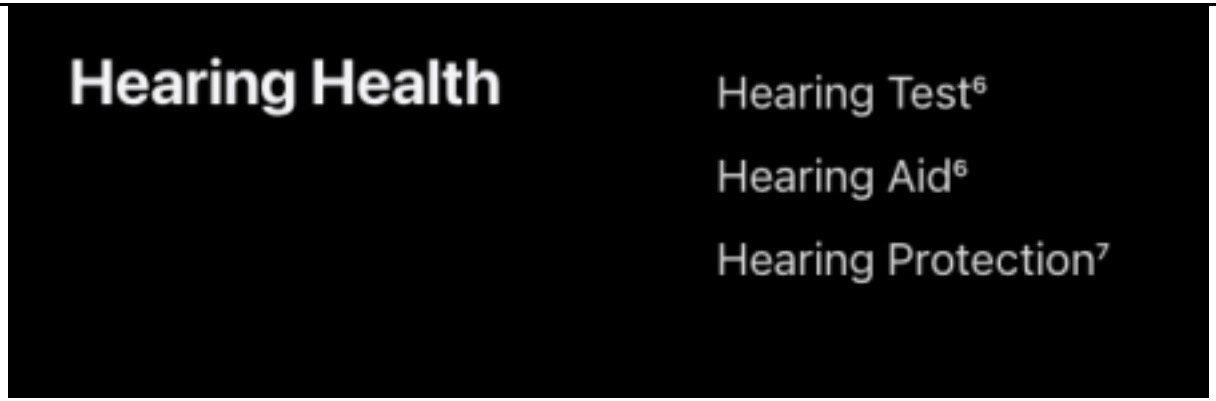
	Source: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/). Each of the Accused Instrumentalities, such as the Apple AirPods Pro 2, is a head-worn personal electronic apparatus.  **Source**: AirPods Pro 2 - Apple (INGENIOSPEC-013541-013563) (available from https://web.archive.org/web/20250904180656/https:/www.apple.com/airpods-pro/).



Source: AirPods Pro 2 - Apple (INGENIOSPEC-013541-013563) (available from https://web.archive.org/web/20250904180656/https:/www.apple.com/airpods-pro/).

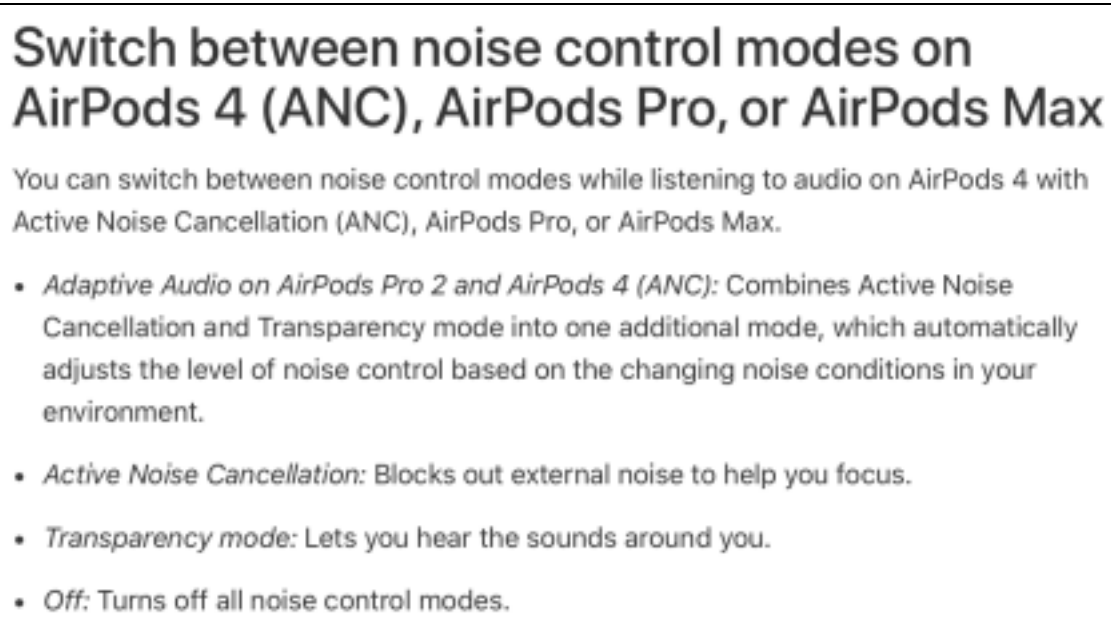
Each of the Accused Instrumentalities, such as the Apple AirPods Pro 2, is operable to at least output customized audio output.

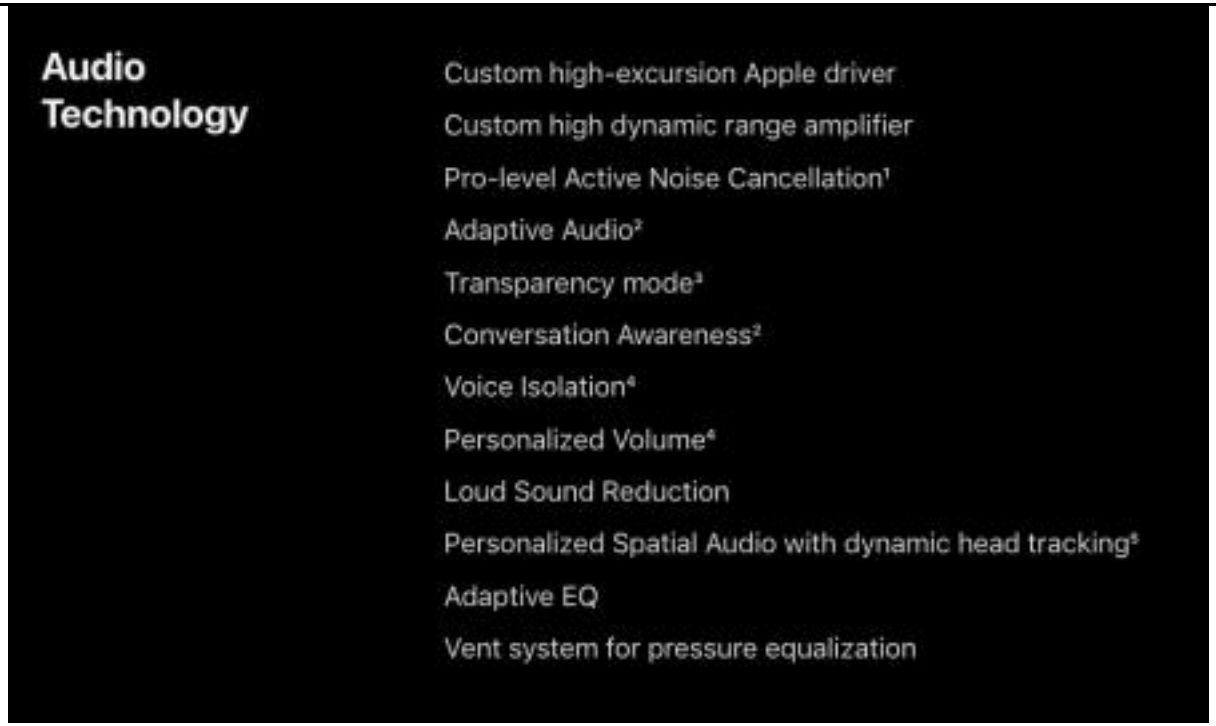
	For example, Apple AirPods Pro 2 can be used as a hearing aid. This customizes the audio output based upon a hearing profile for the user in addition to audio played by the AirPods Pro 2.  **Source**: Hearing Aid feature for AirPods Pro 2 Apple (INGENIOSPEC-013221, INGENIOSPEC-013222-013224) (available from https://www.youtube.com/watch?v=dOuNLS1elWs).



Source: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).

For example, Apple AirPods Pro 2 supports Apple's "Transparency Mode" feature. This customizes the audio output based upon ambient background noise so that a user can hear background noise in addition to audio played by the AirPods Pro 2.

	 **Source**: Switch between noise control modes - Apple Support (INGENIOSPEC-014039-014043) (available from https://support.apple.com/guide/airpods/switch-between-noise-control-modes-dev9812f5cc3/1.0/web/1.0).

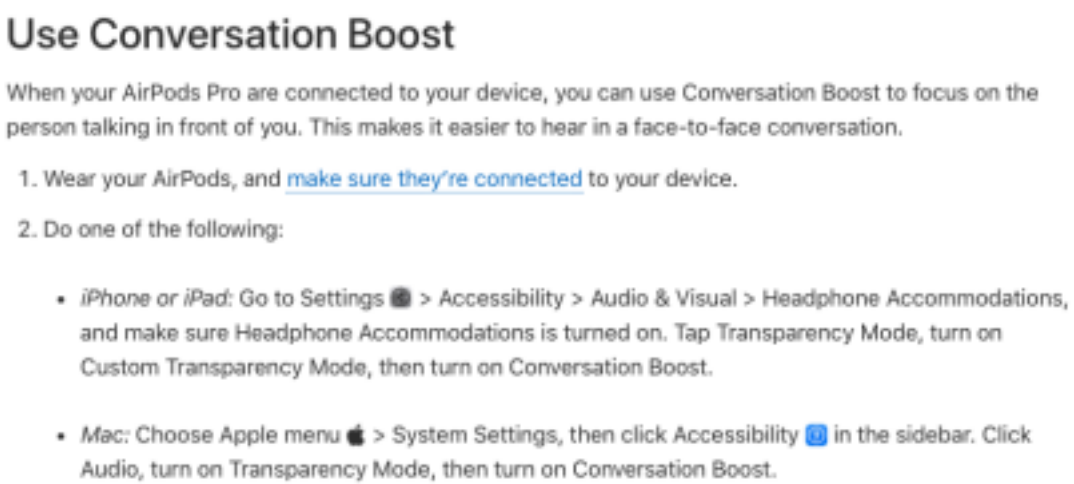


Source: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).

Transparency mode makes it possible for listeners to stay connected to and aware of the world around them. Now, Adaptive Transparency takes this customer-loved feature even further. The powerful H2 chip enables on-device processing, which reduces loud environmental noise — like a passing vehicle siren, construction tools, or even loud speakers at a concert — for more comfortable everyday listening.

Source: Apple announces the next generation of AirPods Pro (INGENIOSPEC-013433-013441) (available from https://www.apple.com/newsroom/2022/09/apple-announces-the-next-generation-of-airpods-pro/).

For example, Apple AirPods Pro 2 supports Apple's "Conversation Boost" feature. This customizes the audio output with emphasis on enhancing speech signals so that a user can hear background noise in addition to audio played by the AirPods Pro 2.



Use Conversation Boost

When your AirPods Pro are connected to your device, you can use Conversation Boost to focus on the person talking in front of you. This makes it easier to hear in a face-to-face conversation.

1. Wear your AirPods, and make sure they're connected to your device.
2. Do one of the following:
   - *iPhone or iPad:* Go to Settings > Accessibility > Audio & Visual > Headphone Accommodations, and make sure Headphone Accommodations is turned on. Tap Transparency Mode, turn on Custom Transparency Mode, then turn on Conversation Boost.
   - *Mac:* Choose Apple menu > System Settings, then click Accessibility in the sidebar. Click Audio, turn on Transparency Mode, then turn on Conversation Boost.

Source: Customize Transparency mode and turn on Conversation Boost for AirPods Pro (INGENIOSPEC-014702-014703) (available from https://support.apple.com/guide/airpods/customize-transparency-mode-turn-conversation-dev966f5f818/web).

Also, Apple's Conversation Awareness feature customizes audio output when the device detects that the user has begun speaking so that a user can hear background noise in addition to audio played by the AirPods Pro 2.

Each of the Accused Instrumentalities, such as the Apple AirPods Pro 2, outputs customized audio output using its speakers.



Source: Speaker Image from AirPods Pro 2 webpage (INGENIOSPEC-014044-014044) (available from https://www.apple.com/airpods-pro/).

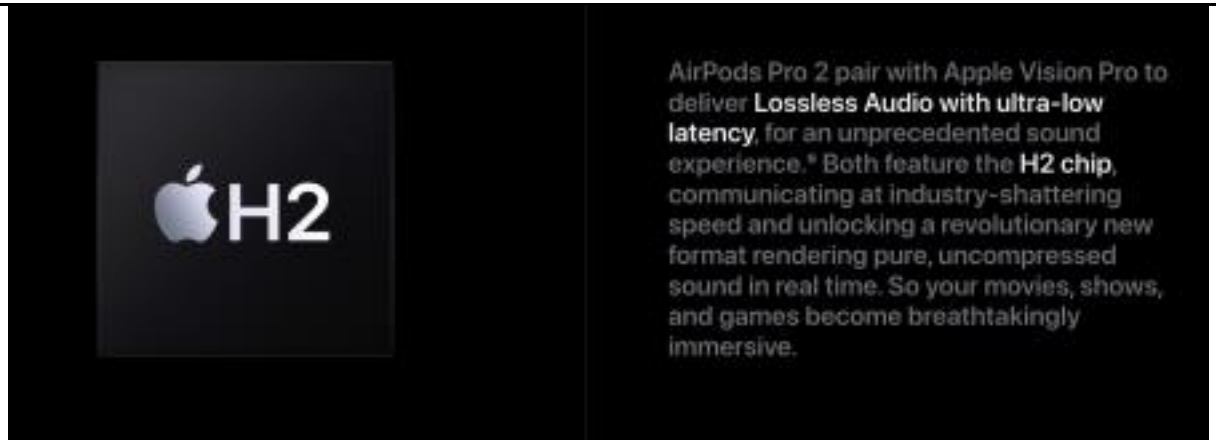


The front of the speaker unit is a black diaphragm.

Source: Apple AirPods Pro 2 Teardown: Upgrade Materials and Design (INGENIOSPEC-013701-013760) (available from https://www.qucox.com/apple-airpods-pro-2-teardown/).



Source: Teardown of Apple AirPods Pro 2 (INGENIOSPEC-013264, INGENIOSPEC-013265-013270) (available from https://www.youtube.com/watch?v=NfzRzb3NI0U).



Source: AirPods Pro 2 - Apple (INGENIOSPEC-013541-013563) (available from https://web.archive.org/web/20250904180656/https:/www.apple.com/airpods-pro/).



Source: AirPods Pro 2 - Apple (INGENIOSPEC-013541-013563) (available from https://web.archive.org/web/20250904180656/https:/www.apple.com/airpods-pro/).

Each of Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

	Device	Citations
	Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501; Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797;
	Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117; Switch between noise control modes - Apple Support, available from https://support.apple.com/guide/airpods/switch-between-noise-control-modes-dev9812f5cc3/1.0/web/1.0. *See* INGENIOSPEC-014039-014043; Customize Transparency mode and turn on Conversation Boost for AirPods Pro, available from https://support.apple.com/guide/airpods/customize-transparency-mode-turn-conversation-dev966f5f818/web. *See* INGENIOSPEC-014702-014703; AirPods Pro Teardown - iFixit, available from https://www.ifixit.com/Teardown/AirPods+Pro+Teardown/127551. *See* INGENIOSPEC-014076-014096; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075;
	Apple AirPods Pro 3	Introducing AirPods Pro 3, the ultimate audio experience, available from https://www.apple.com/in/newsroom/2025/09/airpods-pro-3-introduce-the-ultimate-audio-experience/. *See* INGENIOSPEC-014239-014248; Use the Hearing Aid feature on your AirPods Pro 2 or AirPods Pro 3, available from

			https://support.apple.com/en-us/120992. *See* INGENIOSPEC-013442-013448; Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;
		Beats Fit Pro	Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458; Use your Beats Fit Pro - Apple Support, available from https://support.apple.com/guide/beats/use-beats-fit-pro-dev6f7b5266d/web. *See* INGENIOSPEC-013661-013663; Teardown Report: Beats Fit Pro, available from https://www.52audio.com/archives/98994.html. *See* INGENIOSPEC-014407-014463;
		Beats Solo Pro	Solo Pro Headphones Support - Beats, available from https://www.beatsbydre.com/support/headphones/solo-pro. *See* INGENIOSPEC-013798-013803; Beats by Dre The New Solo Pro, available from https://www.youtube.com/watch?v=V2i1YkfrM54. *See* INGENIOSPEC-013152, INGENIOSPEC-013153-013157; Beats Solo Pro Unboxing and Hands-On, available from https://www.youtube.com/watch?v=PqQkg8FHGdU&t=3s. *See* INGENIOSPEC-013191, INGENIOSPEC-013192-013197; Solo Pro Press Release, available from https://www.beatsbydre.com/content/dam/beats/web/press/solo-pro/solo-pro-press-kit.zip. *See* INGENIOSPEC-014313-014314; Beats By Dre Solo Pro Wireless Bad Battery Replacement Fix Repair Tutorial, available from https://www.youtube.com/watch?v=SBeHaqnw45w. *See* INGENIOSPEC-013144, INGENIOSPEC-013145-013151; Beats User Guide - Pair Beats, available from https://support.apple.com/guide/beats/pair-beats-dev46c519179/1.0/web/1.0. *See* INGENIOSPEC-014011-014014; Solo Pro - Beats by Dre Archive 2, available from

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<tr><td></td><td>https://web.archive.org/web/20200602034251/https://www.beatsbydre.com/headphones/solo-pro. See INGENIOSPEC-013312-013323;</td></tr>
<tr><td>Powerbeats Pro 2</td><td>Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. See INGENIOSPEC-013602-013616;
Powerbeats Pro 2 - High Performance Earbuds with video transcript, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. See INGENIOSPEC-013617-013632;</td></tr>
</table>
Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
</td></tr>
<tr><td>1a. at least one speaker, the at least one speaker being configured to be wearable proximate to an ear of a user;</td><td>Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprise at least one speaker. The Accused Instrumentalities comprise a speaker for each ear.</td></tr>
</table>



Source: Speaker Image from AirPods Pro 2 webpage (INGENIOSPEC-014044-014044) (available from https://www.apple.com/airpods-pro/).



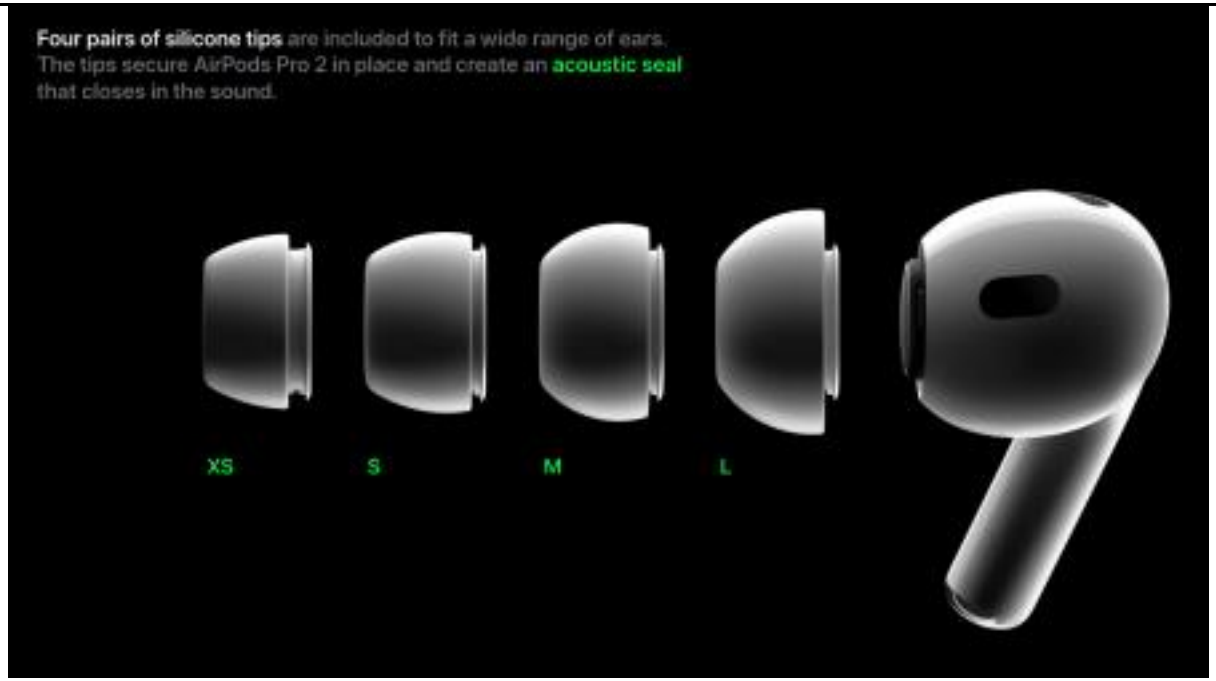
The front of the speaker unit is a black diaphragm.

Source: Apple AirPods Pro 2 Teardown: Upgrade Materials and Design (INGENIOSPEC-013701-013760) (available from https://www.qucox.com/apple-airpods-pro-2-teardown/).



Source: Teardown of Apple AirPods Pro 2 (INGENIOSPEC-013264, INGENIOSPEC-013265-013270) (available from https://www.youtube.com/watch?v=NfzRzb3NI0U).

The at least one speaker is configured to be wearable proximate to an ear of a user.



Source: AirPods Pro 2 - Apple (INGENIOSPEC-013541-013563) (available from https://web.archive.org/web/20250904180656/https:/www.apple.com/airpods-pro/).

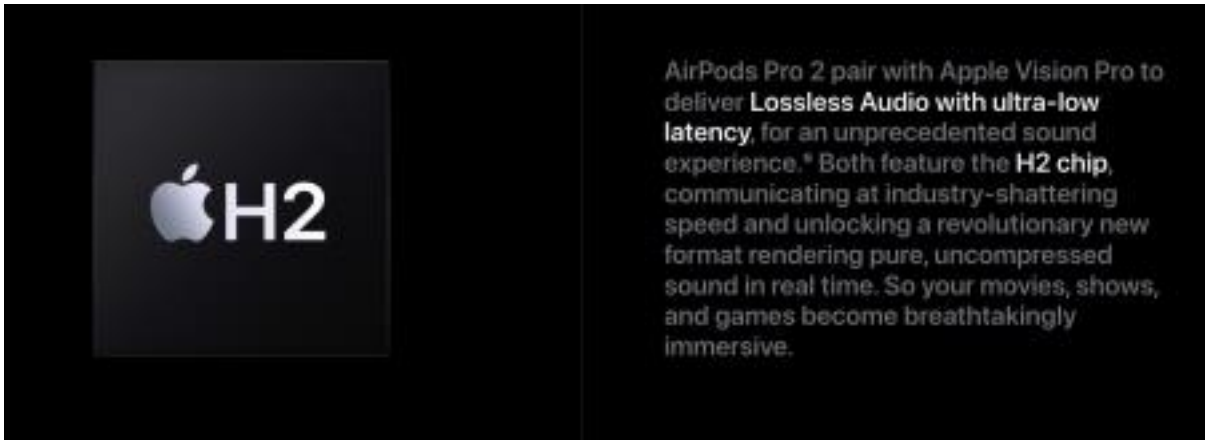


Source: AirPods Pro 2 - Apple (INGENIOSPEC-013541-013563) (available from https://web.archive.org/web/20250904180656/https:/www.apple.com/airpods-pro/).

Each of Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

	Device	Citations
	Apple AirPods 4 with Active Noise Cancellation	Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501;
	Apple AirPods Pro 1	AirPods Pro Teardown - iFixit, available from https://www.ifixit.com/Teardown/AirPods+Pro+Teardown/127551. *See* INGENIOSPEC-014076-014096; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117;
	Apple AirPods Pro 3	Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533; Introducing AirPods Pro 3, the ultimate audio experience, available from https://www.apple.com/in/newsroom/2025/09/airpods-pro-3-introduce-the-ultimate-audio-experience/. *See* INGENIOSPEC-014239-014248;
	Beats Fit Pro	Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458; Teardown Report: Beats Fit Pro, available from https://www.52audio.com/archives/98994.html. *See* INGENIOSPEC-014407-014463;
	Beats Solo Pro	Beats By Dre Solo Pro Wireless Bad Battery Replacement Fix Repair Tutorial, available from https://www.youtube.com/watch?v=SBeHaqnw45w. *See* INGENIOSPEC-013144,

		INGENIOSPEC-013145-013151; Solo Pro Press Release, available from https://www.beatsbydre.com/content/dam/beats/web/press/solo-pro/solo-pro-press-kit.zip. *See* INGENIOSPEC-014313-014314; Solo Pro Headphones Support - Beats, available from https://www.beatsbydre.com/support/headphones/solo-pro. *See* INGENIOSPEC-013798-013803;
	Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds with video transcript, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013617-013632; Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	
1b. a wireless receiver configured to wirelessly receive audio output signals to be output to the user via the at least one speaker; and	Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises a wireless receiver configured to wirelessly receive audio output signals to be output to the user via the at least one speaker. Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises a wireless receiver. For example, each of the Accused Instrumentalities are Bluetooth-compatible. The wireless receiver is comprised of a combination of hardware and/or software. 	

	Source: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/). The wireless receiver is configured to wirelessly receive audio output signals to be output to the user via the at least one speaker. The user is able to listen to, for example, music, video, podcasts, make and receive phone calls, among other auditory media, wirelessly received from Host Device (e.g., iPhone 14).  **Source**: AirPods Pro 2 - Apple (INGENIOSPEC-013541-013563) (available from https://web.archive.org/web/20250904180656/https:/www.apple.com/airpods-pro/).



Source: AirPods Pro 2 - Apple (INGENIOSPEC-013541-013563) (available from https://web.archive.org/web/20250904180656/https:/www.apple.com/airpods-pro/).

The Accused Instrumentalities include one or more speakers and are configured to output audio using the speakers.



Source: Speaker Image from AirPods Pro 2 webpage (INGENIOSPEC-014044-014044) (available from https://www.apple.com/airpods-pro/).

	 The front of the speaker unit is a black diaphragm. **Source**: Apple AirPods Pro 2 Teardown: Upgrade Materials and Design (INGENIOSPEC-013701-013760) (available from https://www.qucox.com/apple-airpods-pro-2-teardown/).



Source: Teardown of Apple AirPods Pro 2 (INGENIOSPEC-013264, INGENIOSPEC-013265-013270) (available from https://www.youtube.com/watch?v=NfzRzb3NI0U).

Each of Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

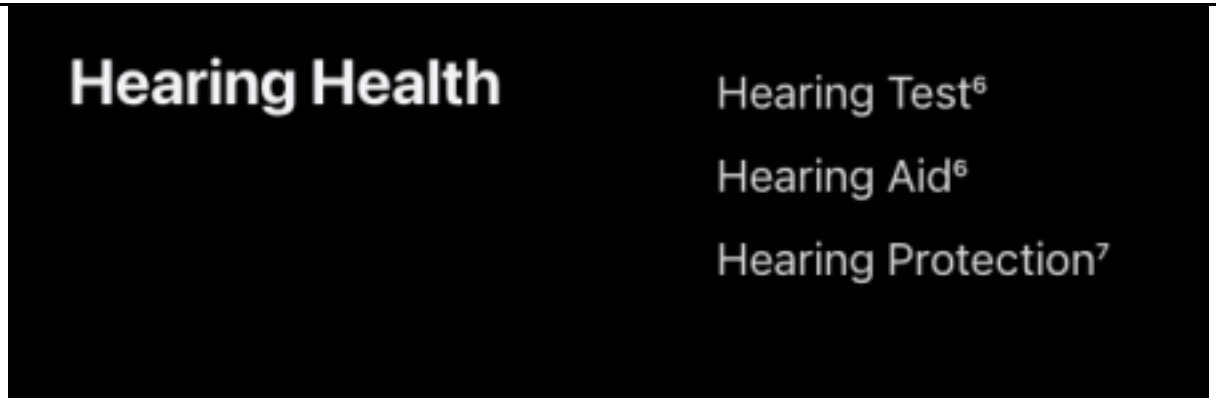
Device	**Citations**

		Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501; Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797;
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117; AirPods Pro Teardown - iFixit, available from https://www.ifixit.com/Teardown/AirPods+Pro+Teardown/127551. *See* INGENIOSPEC-014076-014096; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;
		Beats Fit Pro	Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458; Teardown Report: Beats Fit Pro, available from https://www.52audio.com/archives/98994.html. *See* INGENIOSPEC-014407-014463;
		Beats Solo Pro	Beats User Guide - Pair Beats, available from https://support.apple.com/guide/beats/pair-beats-dev46c519179/1.0/web/1.0. *See* INGENIOSPEC-014011-014014;

<table>
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Beats By Dre Solo Pro Wireless Bad Battery Replacement Fix Repair Tutorial, available from https://www.youtube.com/watch?v=SBeHaqnw45w. See INGENIOSPEC-013144, INGENIOSPEC-013145-013151;
Solo Pro Press Release, available from https://www.beatsbydre.com/content/dam/beats/web/press/solo-pro/solo-pro-press-kit.zip. See INGENIOSPEC-014313-014314;</td></tr>
<tr><td>Powerbeats Pro 2</td><td>Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. See INGENIOSPEC-013602-013616;
Powerbeats Pro 2 - High Performance Earbuds with video transcript, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. See INGENIOSPEC-013617-013632;</td></tr>
</table>
Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
</td></tr>
<tr><td>1c. electronic circuitry including at least an integrated circuit, the electronic circuitry being configured to (i) store hearing characteristics associated with the user;</td><td>Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises electronic circuitry including at least an integrated circuit. The electronic circuitry includes, but is not necessarily limited to, digital signal processors (DSPs), microprocessors, and audio codecs, integrated circuits such as Apple's H1, or H2 chip, volatile and non-volatile memory, and sensors (such as optical sensors, accelerometers, and skin-detection sensors). The integrated circuit of each Accused Instrumentality includes, but is not necessarily limited to, the device's processor (e.g., Apple's W1, H1, or H2 chip).

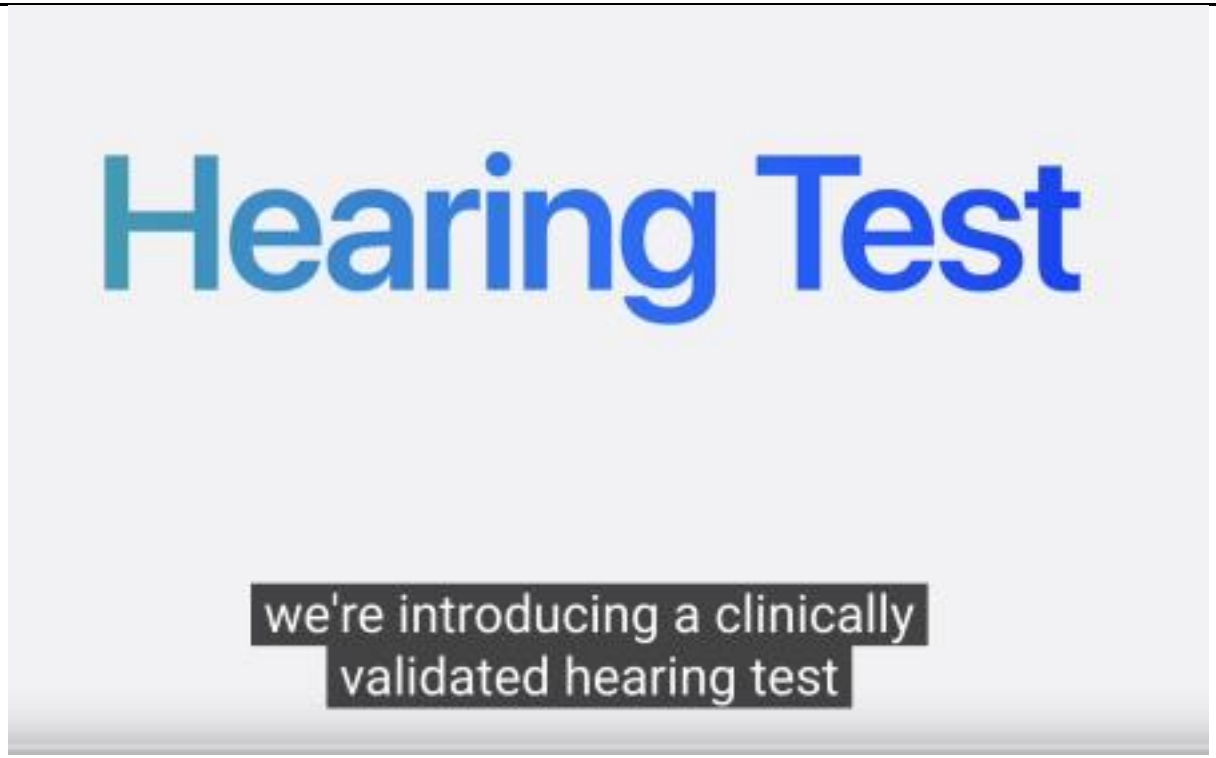
The electronic circuitry is configured to store hearing characteristics associated with the user. The hearing characteristics associated with the user include, but are not necessarily limited to, (a) data and settings within the user's hearing profile as determined via a hearing aid test (see Hearing Test screenshots, below) or by importing an audiogram for the user, (b) custom audio setup data and settings including the inability to hear quiet voices</td></tr>
</table>

	(*see* screenshot "Can you hear someone speaking?", below), and preferences of "Version 1" or "Version 2" of a sample song (*see* screenshots "Comparison 1", "Comparison 2", and "Comparison 3", below). **(a) Hearing Profile and Hearing Test** For example, Apple AirPods Pro 2 can be used as a hearing aid.  **Source**: Hearing Aid feature for AirPods Pro 2 Apple (INGENIOSPEC-013221, INGENIOSPEC-013222-013224) (available from https://www.youtube.com/watch?v=dOuNLS1elWs).

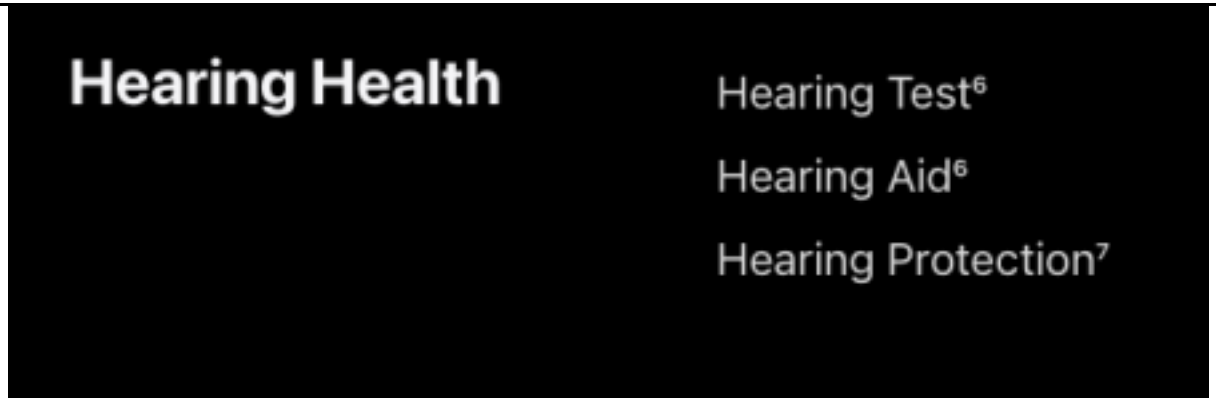


Source: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).

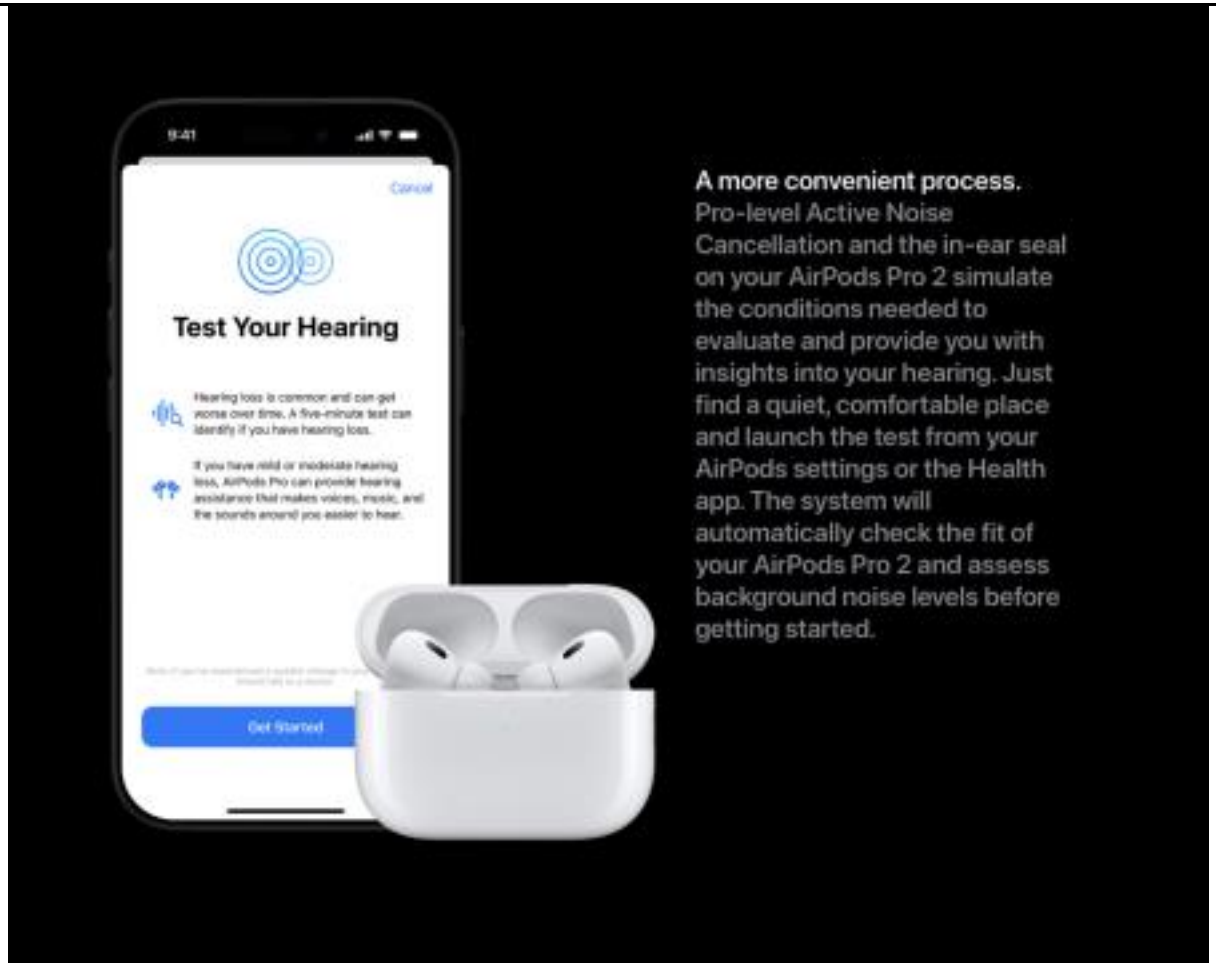
A user can take a hearing test, which builds a hearing profile that stores hearing characteristics associated with the user. Alternatively, the user can configure their hearing profile by adding their audiogram.



Source: Hearing Aid feature for AirPods Pro 2 Apple (INGENIOSPEC-013221, INGENIOSPEC-013222-013224) (available from https://www.youtube.com/watch?v=dOuNLS1elWs).



Source: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).



Source: AirPods Pro 2 - Hearing Health - Apple (INGENIOSPEC-013564-013573) (available from https://www.apple.com/airpods-pro/hearing-health/).

Furthermore, the Accused Instrumentalities can *also* be used to manually adjust hearing characteristics within their hearing profile.

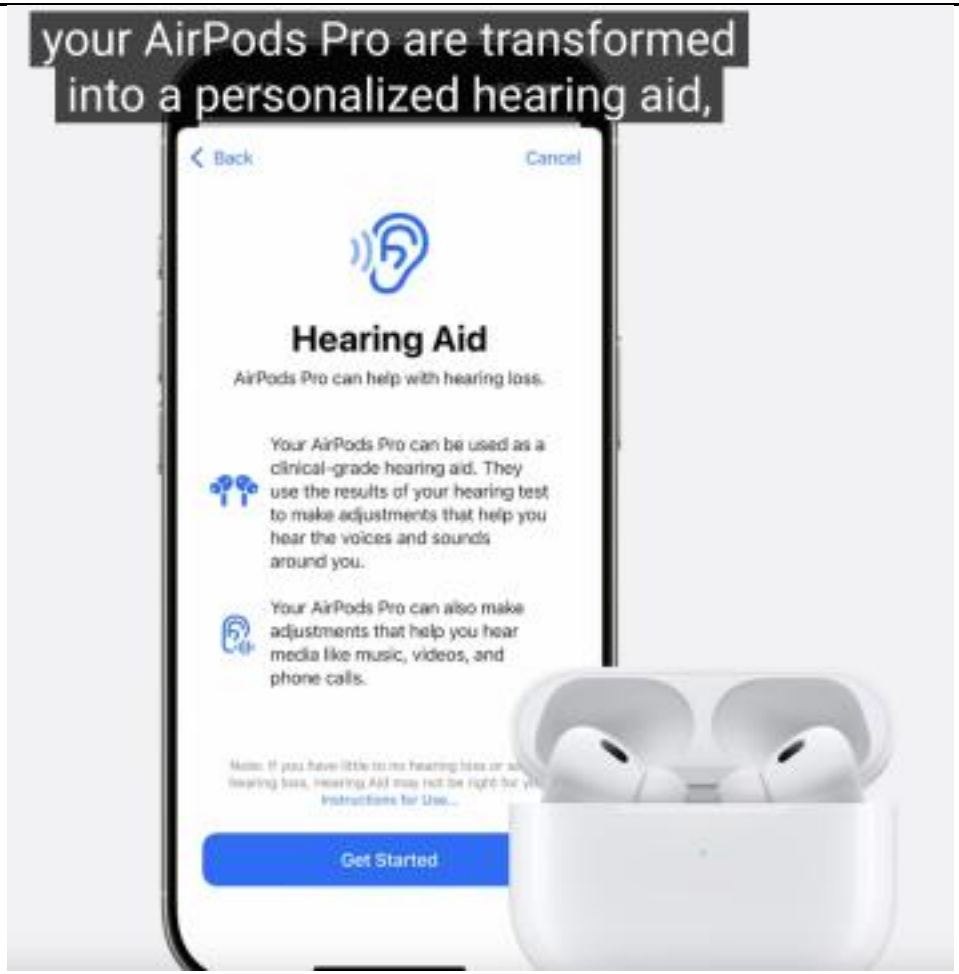
A meaningful difference. After you complete the Hearing Test, if you have mild to moderate hearing loss, your personalized hearing profile will guide you to the Hearing Aid feature. With a quick setup, you'll start hearing more clearly immediately. You can even customize the settings to your needs.

Source: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).

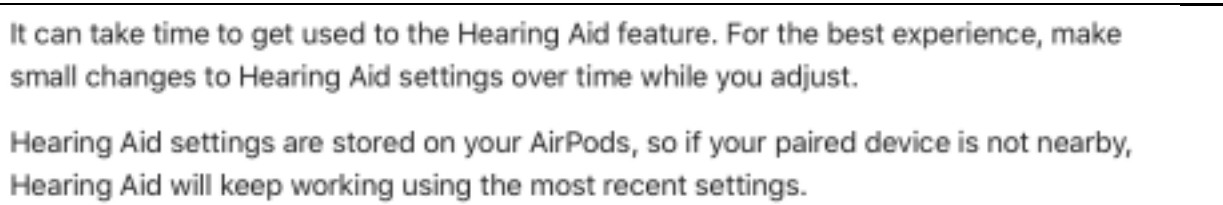
It can take time to get used to the Hearing Aid feature. For the best experience, make small changes to Hearing Aid settings over time while you adjust.

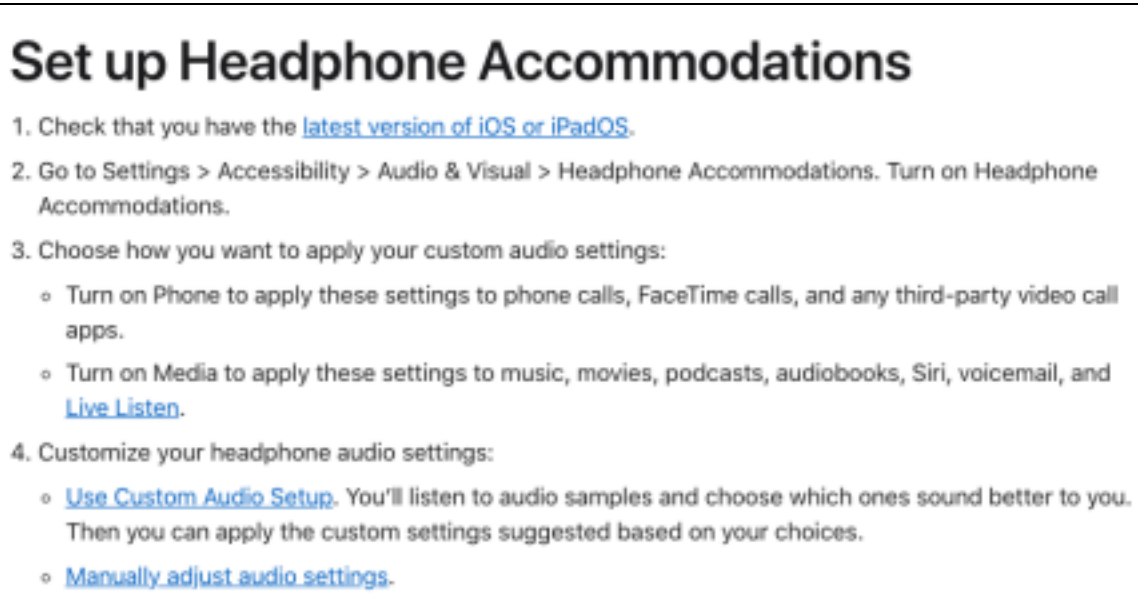
Source: Use the Hearing Aid feature on your AirPods Pro 2 or AirPods Pro 3 (INGENIOSPEC-013442-013448) (available from https://support.apple.com/en-us/120992).

The electronic circuitry of the AirPods Pro 2 is configured to store hearing characteristics associated with the user and customize the received audio output signals to produce customized audio output signals for the user based on the stored hearing characteristics. *See* Claim 1d, *infra*. *See also* https://support.apple.com/en-us/120992 (INGENIOSPEC-011560 to INGENIOSPEC-011566) ("Hearing Aid settings are stored on your AirPods, so if your paired device is not nearby, Hearing Aid will keep working using the most recent settings.").



Source: Hearing Aid feature for AirPods Pro 2 Apple (INGENIOSPEC-013221, INGENIOSPEC-013222-013224) (available from https://www.youtube.com/watch?v=dOuNLS1elWs).

	 **Source**: Use the Hearing Aid feature on your AirPods Pro 2 or AirPods Pro 3 (INGENIOSPEC-013442-013448) (available from https://support.apple.com/en-us/120992). **(b) Custom Audio Setup** In addition, the Accused Instrumentalities, when paired with an iPhone or iPad via Bluetooth, can be used to customize headphone audio levels. Custom headphone audio levels (e.g., an example of a user preference setting and hearing characteristic of the user) customize the received audio output signals to produce customized audio output signals for the user based on the stored hearing characteristics. *See* Claim 1d, *infra*. This is done to amplify soft sounds and adjust certain frequencies in order to enhance the hearing of the user. *See* https://support.apple.com/en-us/102663 (INGENIOSPEC-011302 to INGENIOSPEC-011304).

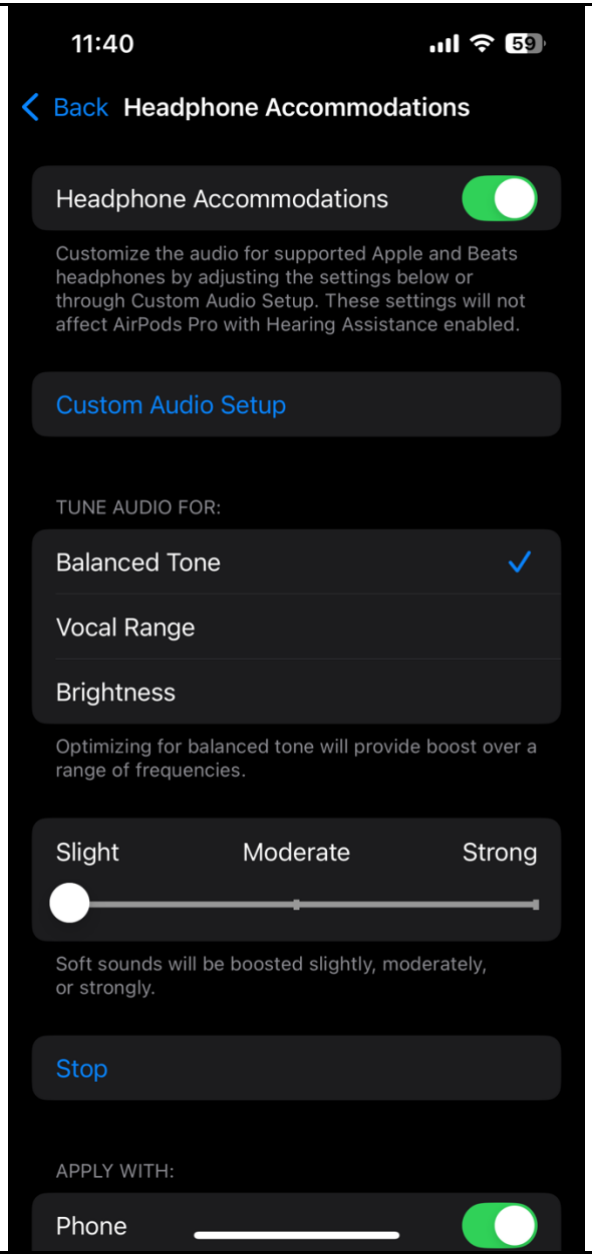


Set up Headphone Accommodations

1. Check that you have the latest version of iOS or iPadOS.
2. Go to Settings > Accessibility > Audio & Visual > Headphone Accommodations. Turn on Headphone Accommodations.
3. Choose how you want to apply your custom audio settings:
   - Turn on Phone to apply these settings to phone calls, FaceTime calls, and any third-party video call apps.
   - Turn on Media to apply these settings to music, movies, podcasts, audiobooks, Siri, voicemail, and Live Listen.
4. Customize your headphone audio settings:
   - Use Custom Audio Setup. You'll listen to audio samples and choose which ones sound better to you. Then you can apply the custom settings suggested based on your choices.
   - Manually adjust audio settings.

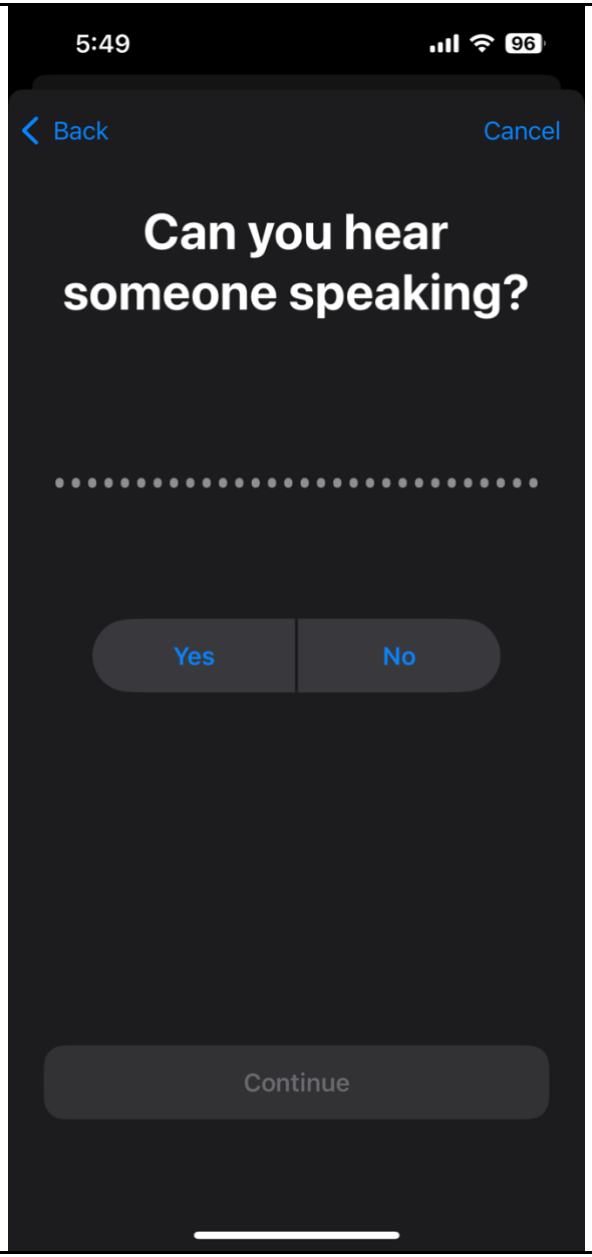
Source: Customize headphone audio levels on your iPhone or iPad (INGENIOSPEC-014699-014701) (available from https://support.apple.com/en-us/102663).

By customizing headphone audio levels, the iPhone or iPad is configured to customize audio output signals to "amplify soft sounds and adjust certain frequencies for [a user's] hearing needs [using] Headphone Accommodations." *See* https://support.apple.com/en-us/102663 (INGENIOSPEC-011302 to INGENIOSPEC-011304). To set up "Headphone Accommodations" a user goes to **Settings > Accessibility > Audio & Visual** then taps **Headphone Accommodations**. The user then taps on **Custom Audio Setup** and follows the instructions on the screen. *See Id.* Headphone Accommodations and Custom Audio Setup allows a user to "change the accessibility settings for [a user's] AirPods to suit [their] needs." *See* https://support.apple.com/guide/airpods/set-headphone-accommodations-devcd05671ab/web (INGENIOSPEC-011430 to INGENIOSPEC-011431). Headphone Accommodations and Custom Audio Setup "[a]mplif[ies] soft sounds and adjust[s] certain frequencies to help music, movies, phone calls, and podcasts sound more crisp and clear." *See id.*


11:40
59
Back
Headphone Accommodations
Headphone Accommodations
Customize the audio for supported Apple and Beats headphones by adjusting the settings below or through Custom Audio Setup. These settings will not affect AirPods Pro with Hearing Assistance enabled.
Custom Audio Setup
TUNE AUDIO FOR:
Balanced Tone
Vocal Range
Brightness
Optimizing for balanced tone will provide boost over a range of frequencies.
Slight
Moderate
Strong
Soft sounds will be boosted slightly, moderately, or strongly.
Stop
APPLY WITH:
Phone

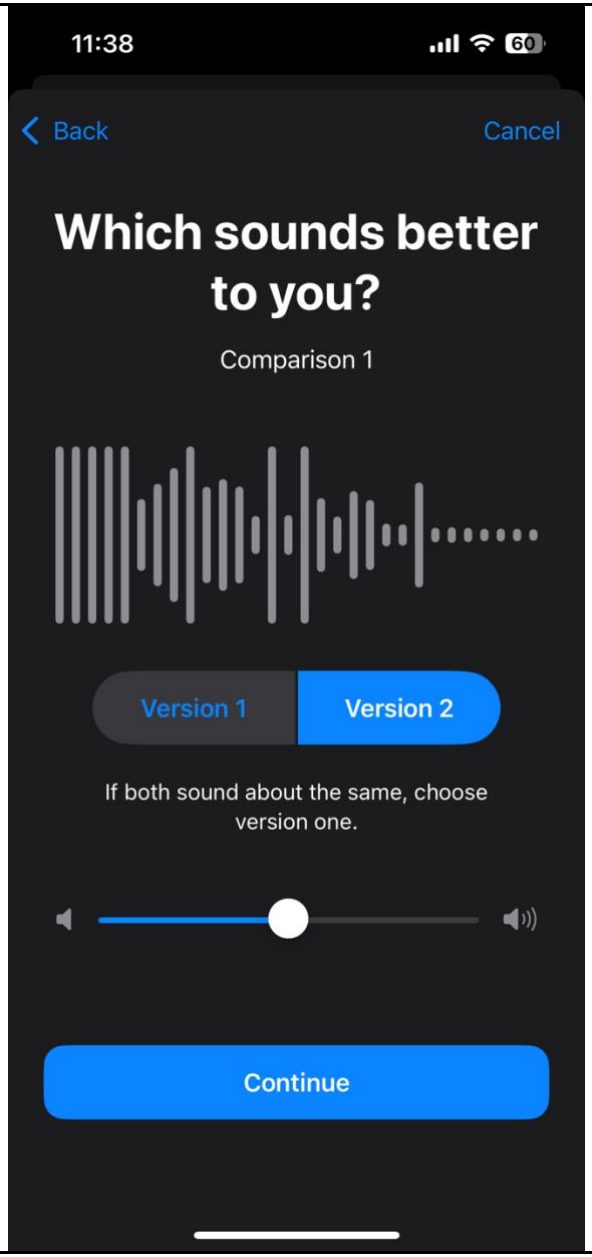
	Source: Screenshot from iPhone configuring "Headphone Accommodations," including "Custom Audio Setup"

Apple Inc. Exhibit 1024 Page 44

		 5:49 96 Back Cancel Can you hear someone speaking? Yes No Continue	

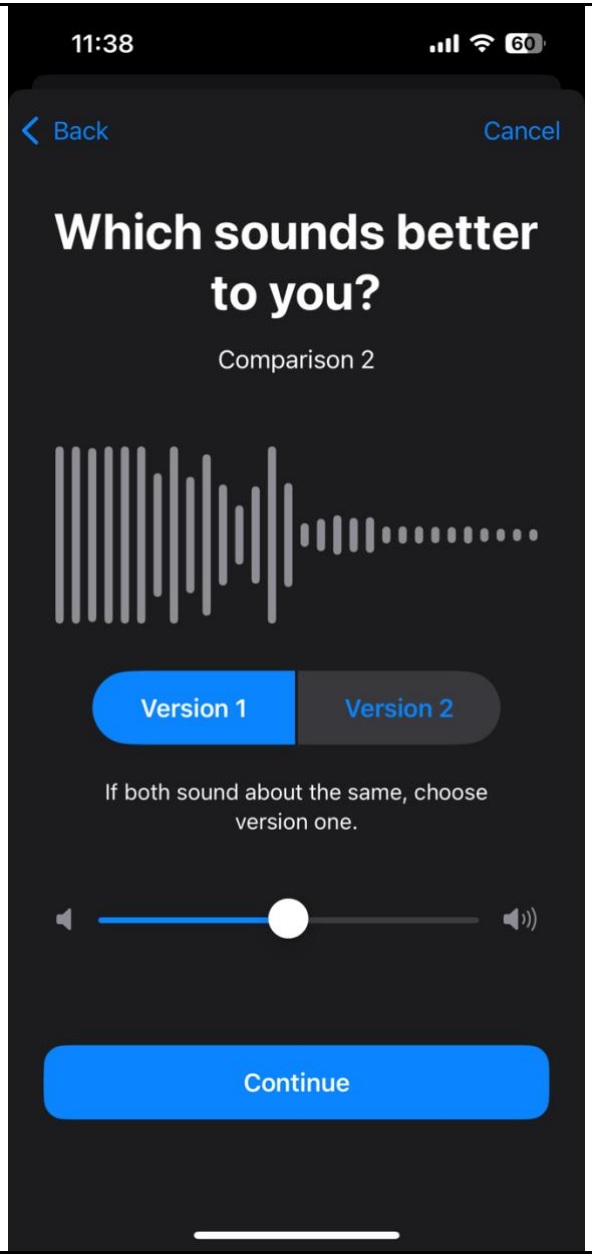
	Source: Screenshot from iPhone configuring "Custom Audio Setup," Can you hear someone speaking?

Apple Inc. Exhibit 1024 Page 46

		 11:38 Back Cancel Which sounds better to you? Comparison 1 Version 1 Version 2 If both sound about the same, choose version one. Continue	

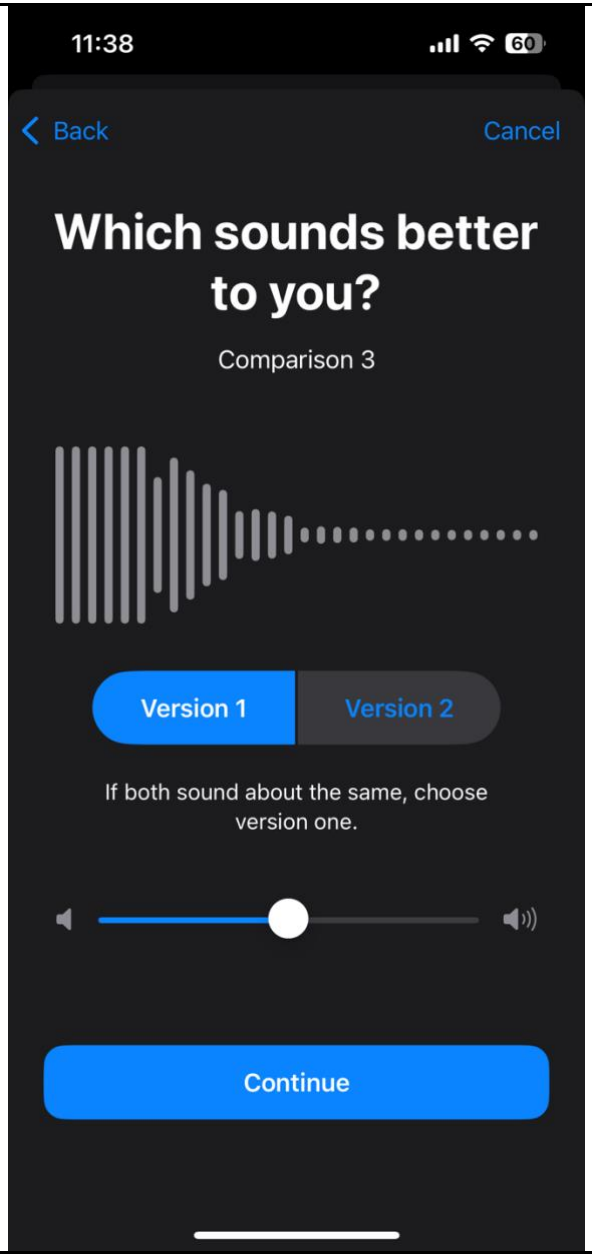
	Source: Screenshot from iPhone configuring "Custom Audio Setup," Comparison 1

Apple Inc. Exhibit 1024 Page 48

		 11:38 Back Cancel Which sounds better to you? Comparison 2 Version 1 Version 2 If both sound about the same, choose version one. Continue	

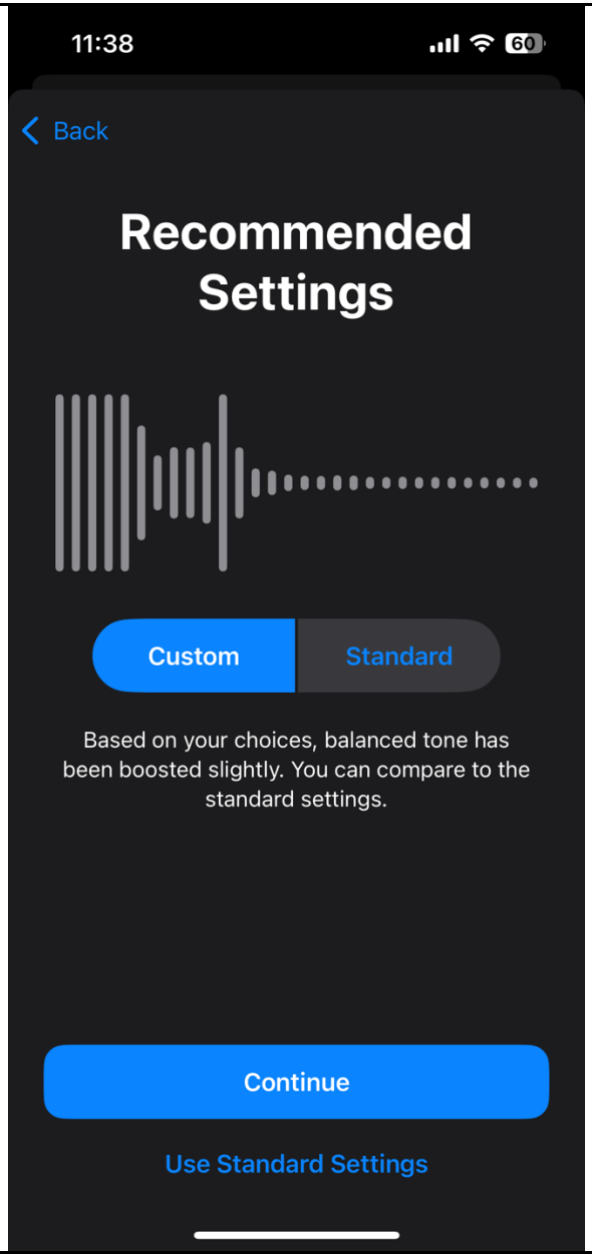
	Source: Screenshot from iPhone configuring "Custom Audio Setup," Comparison 2

Apple Inc. Exhibit 1024 Page 50

		 11:38 Back Cancel Which sounds better to you? Comparison 3 Version 1 Version 2 If both sound about the same, choose version one. Continue	

	Source: Screenshot from iPhone configuring "Custom Audio Setup," Comparison 3

Apple Inc. Exhibit 1024 Page 52

		 11:38 Back Recommended Settings Custom Standard Based on your choices, balanced tone has been boosted slightly. You can compare to the standard settings. Continue Use Standard Settings	

Source: Screenshot from iPhone configuring "Custom Audio Setup," Recommended Settings

The electronic circuitry of the AirPods Pro 2 is configured to store hearing characteristics associated with the user and customize the received audio output signals to produce customized audio output signals for the user based on the stored hearing characteristics. *See* Claim 1d, *infra*.

Each of Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 4 with Active Noise Cancellation	Customize headphone audio levels on your iPhone or iPad, available from https://support.apple.com/en-us/102663. *See* INGENIOSPEC-014699-014701;
Apple AirPods Pro 1	Customize headphone audio levels on your iPhone or iPad, available from https://support.apple.com/en-us/102663. *See* INGENIOSPEC-014699-014701;
Apple AirPods Pro 3	Use the Hearing Aid feature on your AirPods Pro 2 or AirPods Pro 3, available from https://support.apple.com/en-us/120992. *See* INGENIOSPEC-013442-013448; Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; AirPods Pro 3 - Hearing Health, available from https://www.apple.com/airpods-pro/hearing-health/. *See* INGENIOSPEC-013502-013510; Set Headphone Accommodations for AirPods, available

		from https://support.apple.com/guide/airpods/set-headphone-accommodations-devcd05671ab/web. *See* INGENIOSPEC-013296-013297;
	Beats Fit Pro	Customize headphone audio levels on your iPhone or iPad, available from https://support.apple.com/en-us/102663. *See* INGENIOSPEC-014699-014701; Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458;
	Beats Solo Pro	Customize headphone audio levels on your iPhone or iPad, available from https://support.apple.com/en-us/102663. *See* INGENIOSPEC-014699-014701;
	Powerbeats Pro 2	Customize headphone audio levels on your iPhone or iPad, available from https://support.apple.com/en-us/102663. *See* INGENIOSPEC-014699-014701;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	
1d. (ii) customize the received audio output signals to produce customized audio output signals for the user based on at least a portion of the stored hearing characteristics	Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises electronic circuitry including at least an integrated circuit. *See* Claim 1[c], *supra*. The electronic circuitry is configured to customize the received audio output signals to produce customized audio output signals for the user based on at least a portion of the stored hearing characteristics associated with the user such that the customized audio output signals at least compensate for the hearing impairment regarding the user's ability to hear. For example, the Accused Instrumentalities, such as the Apple AirPods Pro 2, are configured to perform **Media Assist**, **Transparency Mode**, **Conversation Boost** and/or **Conversation Awareness**. In the case of each of	

associated with the user such that the customized audio output signals at least compensate for the hearing impairment regarding the user's ability to hear;	these features, the received audio output signals are customized to produce customized audio output signals for the user. **Apple's Media Assist** customizes the received audio output signals to produce customized audio output signals for the user based on at least a portion of the stored hearing characteristics associated with the user in order to compensate for the hearing impairment regarding the user's ability to hear. Media Assist uses the user's stored hearing profile. When Media Assist is enabled, *customized* signals are produced for music, video, phone calls, and FaceTime calls to compensate for the hearing impairment regarding the user's ability to hear. *See* https://support.apple.com/en-us/120992 (INGENIOSPEC-011560 to INGENIOSPEC-011566) ("With Media Assist, the audio adjustments based on your hearing test results can be applied to the sound of music, videos, and calls." And, "After you complete the Hearing Test, if you have mild to moderate hearing loss, your personalized hearing profile will guide you to the Hearing Aid feature. With a quick setup, you'll start hearing more clearly immediately. You can even customize the settings to your needs.")

Set up and use Media Assist

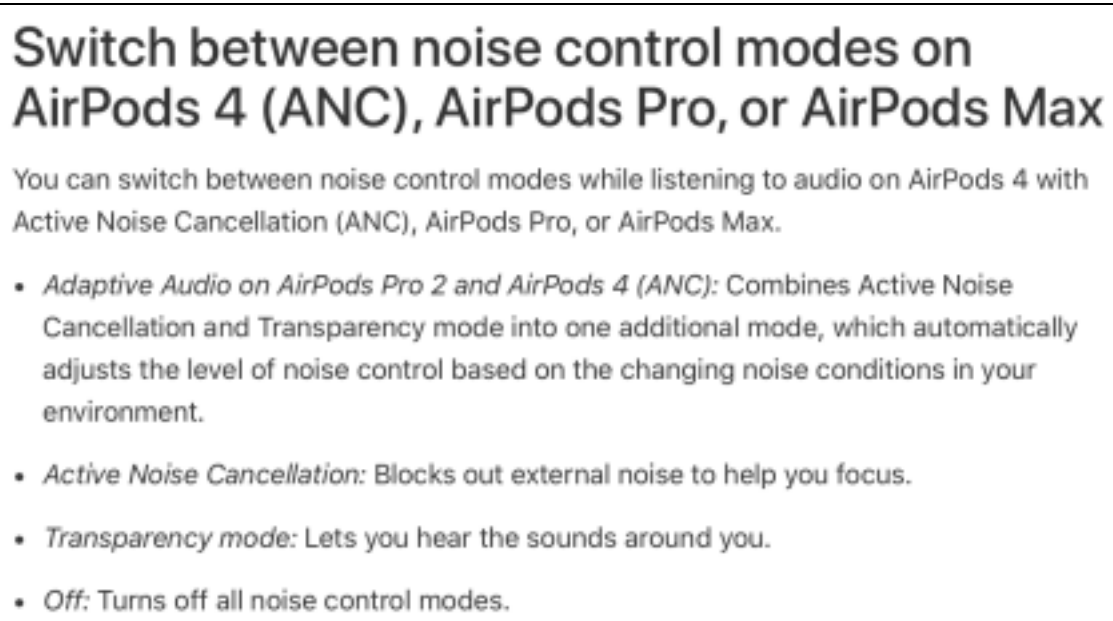
With Media Assist, the audio adjustments based on your hearing test results can be applied to the sound of music, videos, and calls.

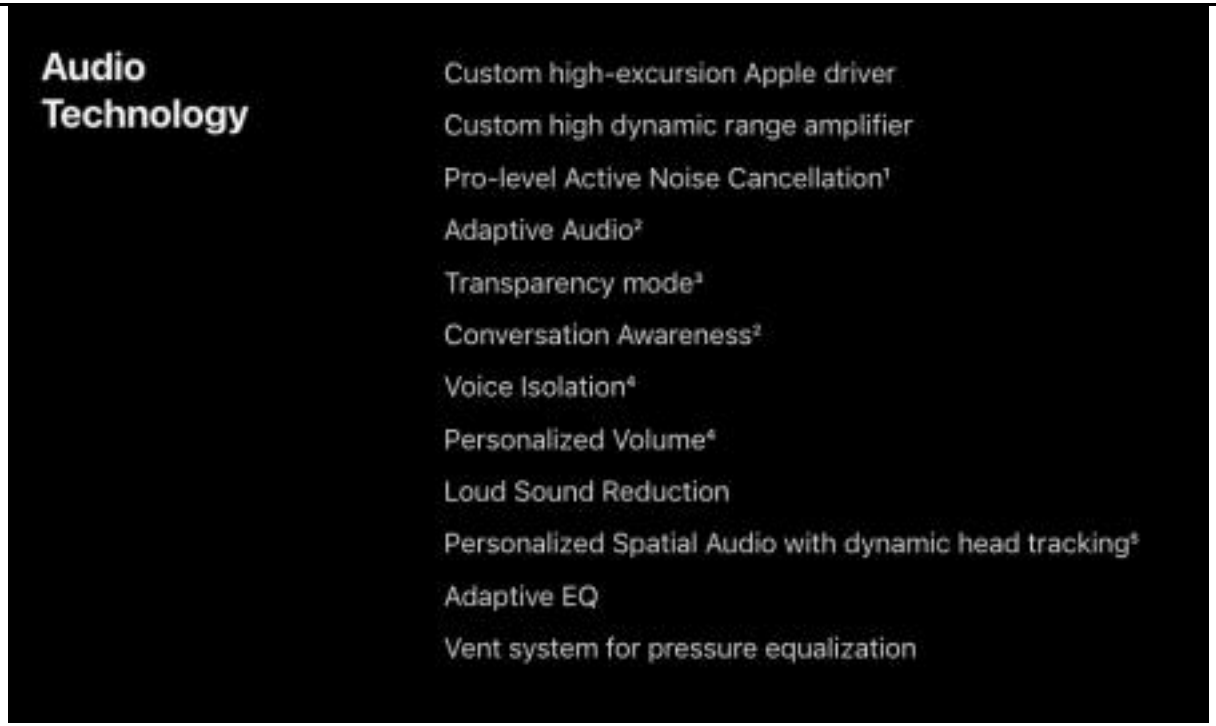
1. With your AirPods in your ears and connected to your paired device:
   - On iPhone or iPad, go to Settings > your AirPods, then tap Hearing Assistance under Hearing Health.
   - On Mac, choose Apple menu > System Settings, click your AirPods in the left sidebar, then click Hearing Health.
2. Tap or click Adjustments, then turn on Media Assist.
3. To apply the audio adjustments based on your test results to music and video playing on your device, turn on Adjust Music and Video.
4. To apply audio adjustments to phone calls and FaceTime calls, turn on Adjust Calls and FaceTime.
5. To adjust the volume of phone calls, music, and videos playing on your device when Hearing Aid is active:
   - Use the physical volume buttons on your device.
   - On iPhone or iPad, open Control Center, touch and hold the volume control, then adjust the volume control . If Hearing Aid is also turned on, you can adjust the amplification control of Hearing Aid separately.
   - On Mac, open Control Center , then drag the volume control under Sound to the left or right.

Most media apps, like Apple Music or Podcasts, also have their own volume controls, so make sure to check the apps if you're having an issue with the volume of music, video, or other media in your AirPods.

Source: Use the Hearing Aid feature on your AirPods Pro 2 or AirPods Pro 3 (INGENIOSPEC-013442-013448) (available from https://support.apple.com/en-us/120992).

Apple's Transparency Mode customizes the received audio output signals based upon external environmental sounds picked-up by the device's one or more microphones, based on at least a portion of the stored hearing characteristics associated with the user. While the user is listening to audio, the device's microphones pick up external audio signals in the user's environment.

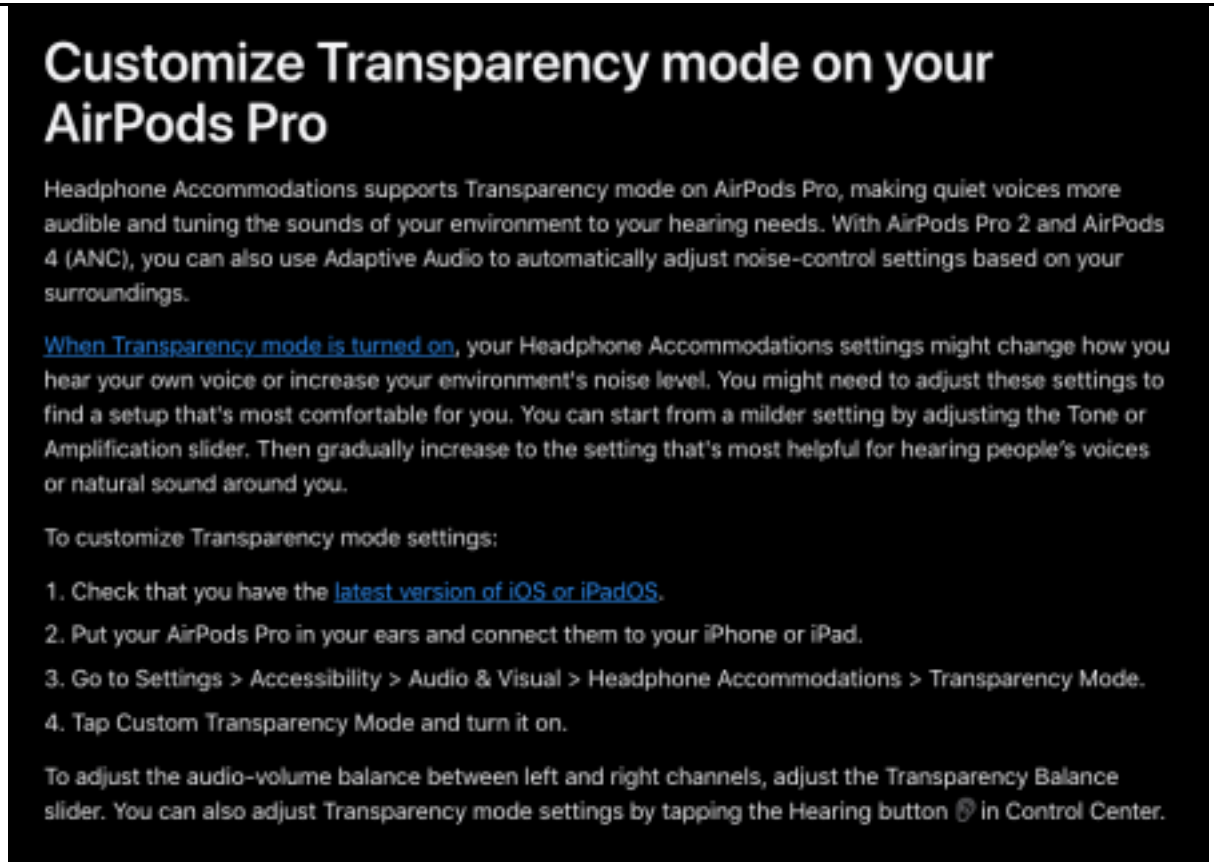
	 **Source**: Switch between noise control modes - Apple Support (INGENIOSPEC-014039-014043) (available from https://support.apple.com/guide/airpods/switch-between-noise-control-modes-dev9812f5cc3/1.0/web/1.0).



Source: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).

Transparency mode makes it possible for listeners to stay connected to and aware of the world around them. Now, Adaptive Transparency takes this customer-loved feature even further. The powerful H2 chip enables on-device processing, which reduces loud environmental noise — like a passing vehicle siren, construction tools, or even loud speakers at a concert — for more comfortable everyday listening.

	Source: Apple announces the next generation of AirPods Pro (INGENIOSPEC-013433-013441) (available from https://www.apple.com/newsroom/2022/09/apple-announces-the-next-generation-of-airpods-pro/). The Accused Instrumentalities are configured to dynamically change the level of the received audio output signals while simultaneously enhance the voices of persons speaking nearby, based upon the user's hearing profile and/or Custom Audio Setup settings described above. The received audio output signals are *customized* so that the user hears both the audio content and background sounds from their environment. For example, the Accused Instrumentalities attenuate certain frequencies of the received audio output signals, including low- and mid-range frequencies, to create room for the external audio signal so that environmental sounds are not drowned out. In addition, the Accused Instrumentalities perform dynamic gain adjustment by lowering the volume of the received audio output signals so that the added external audio signal remains audible and natural. Finally, Apple's Transparency Mode customizes the received audio output signals using the external audio signal that has been adjusted based on at least one hearing characteristic of the user. As such, the customized audio output signals delivered to the device's speaker are a customized version of the received audio output signals based on at least a portion of the stored hearing characteristics associated with the user.



Customize Transparency mode on your AirPods Pro

Headphone Accommodations supports Transparency mode on AirPods Pro, making quiet voices more audible and tuning the sounds of your environment to your hearing needs. With AirPods Pro 2 and AirPods 4 (ANC), you can also use Adaptive Audio to automatically adjust noise-control settings based on your surroundings.

When Transparency mode is turned on, your Headphone Accommodations settings might change how you hear your own voice or increase your environment's noise level. You might need to adjust these settings to find a setup that's most comfortable for you. You can start from a milder setting by adjusting the Tone or Amplification slider. Then gradually increase to the setting that's most helpful for hearing people's voices or natural sound around you.

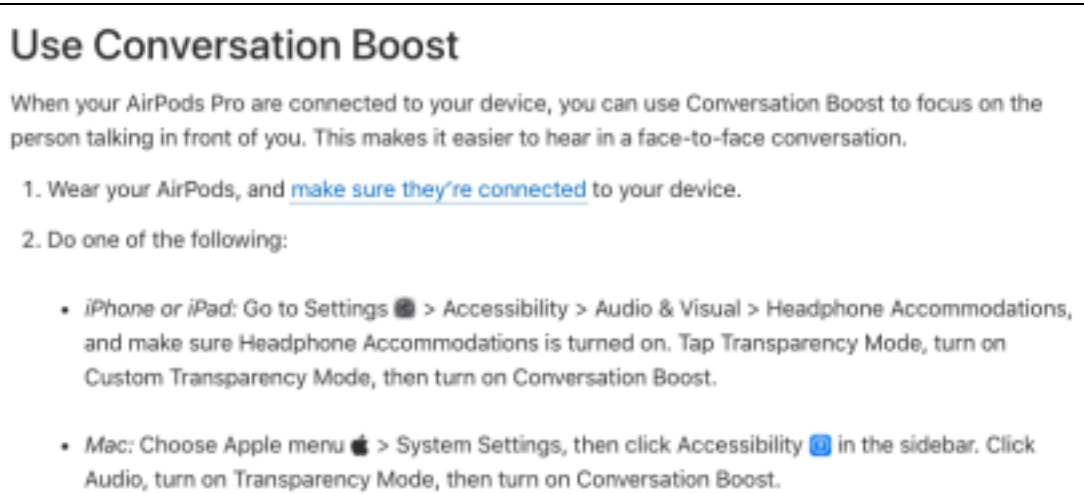
To customize Transparency mode settings:

1. Check that you have the latest version of iOS or iPadOS.
2. Put your AirPods Pro in your ears and connect them to your iPhone or iPad.
3. Go to Settings > Accessibility > Audio & Visual > Headphone Accommodations > Transparency Mode.
4. Tap Custom Transparency Mode and turn it on.

To adjust the audio-volume balance between left and right channels, adjust the Transparency Balance slider. You can also adjust Transparency mode settings by tapping the Hearing button in Control Center.

Source: https://support.apple.com/en-us/102663 (INGENIOSPEC-011302 to INGENIOSPEC-011304)

In addition, **Apple's Conversation Boost** customizes the received audio signals based upon external environmental sounds picked up by the device microphones, with emphasis on enhancing speech signals based on at least a portion of the stored hearing characteristics associated with the user. While the user is listening to audio played by the audio system, the microphones capture external audio signals from the user's environment.



Use Conversation Boost

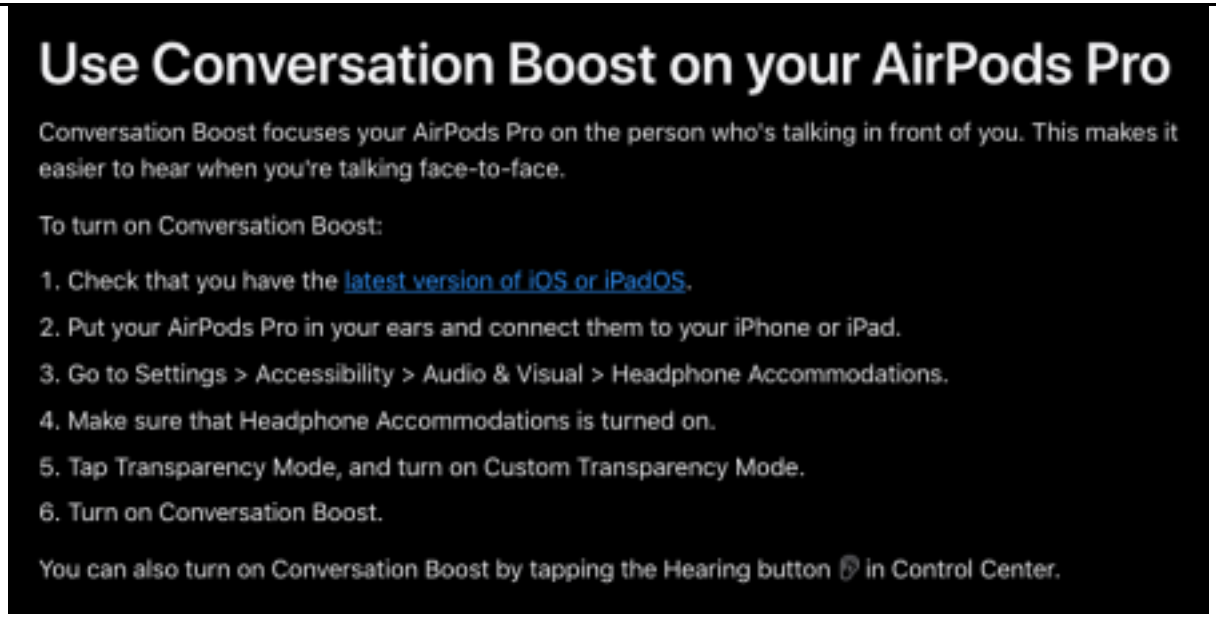
When your AirPods Pro are connected to your device, you can use Conversation Boost to focus on the person talking in front of you. This makes it easier to hear in a face-to-face conversation.

1. Wear your AirPods, and make sure they're connected to your device.
2. Do one of the following:
   - *iPhone or iPad:* Go to Settings > Accessibility > Audio & Visual > Headphone Accommodations, and make sure Headphone Accommodations is turned on. Tap Transparency Mode, turn on Custom Transparency Mode, then turn on Conversation Boost.
   - *Mac:* Choose Apple menu > System Settings, then click Accessibility in the sidebar. Click Audio, turn on Transparency Mode, then turn on Conversation Boost.

Source: Customize Transparency mode and turn on Conversation Boost for AirPods Pro (INGENIOSPEC-014702-014703) (available from https://support.apple.com/guide/airpods/customize-transparency-mode-turn-conversation-dev966f5f818/web).

The Accused Instrumentalities are configured to dynamically change the level of the received audio signals while simultaneously enhance the voices of persons speaking nearby by selectively amplify portions corresponding to speech frequencies, based upon the user's hearing profile and/or Custom Audio Setup settings described above.

The received audio signals are *customized* so that the user hears both the audio content along with amplified speech from person speaking nearby. For example, the Accused Instrumentalities apply attenuation of non-speech frequencies of the received audio signals to create room for the external speech signal so that voices are not drowned out. In addition, the Accused Instrumentalities perform dynamic gain adjustment by lowering the volume of the received audio signals so that the speech component of the external audio signal remains audible and natural. Finally, Apple's Conversation Boost customizes the received audio signals using the speech-enhanced external audio signal that has been adjusted based on at least one hearing characteristic of the user. As such, the customized audio output signals delivered to the device's speaker is a customized version of the received audio signals based on at least a portion of the stored hearing characteristics associated with the user.

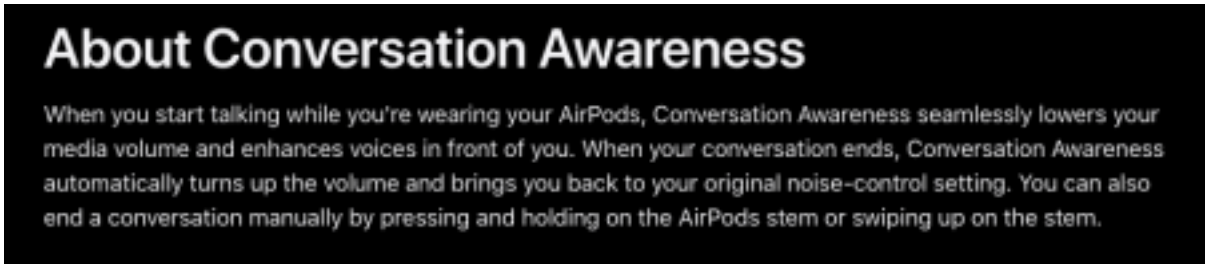


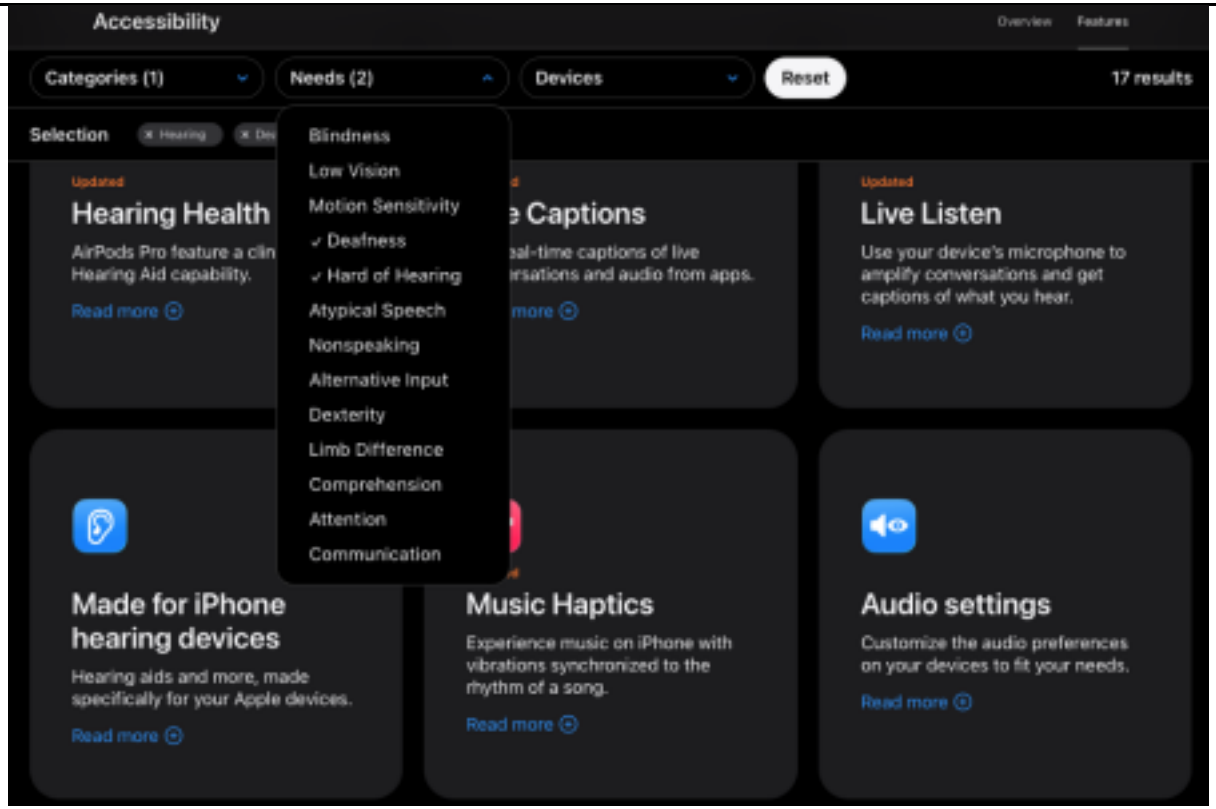
Source: https://support.apple.com/en-us/102663 (INGENIOSPEC-011302 to INGENIOSPEC-011304)

Furthermore, **Apple's Conversation Awareness** customizes the received audio signals based on at least a portion of the stored hearing characteristics associated with the user when the device detects that the user has begun speaking. While the user is listening to audio played by the audio system, the microphones capture external audio signals from the user's environment.

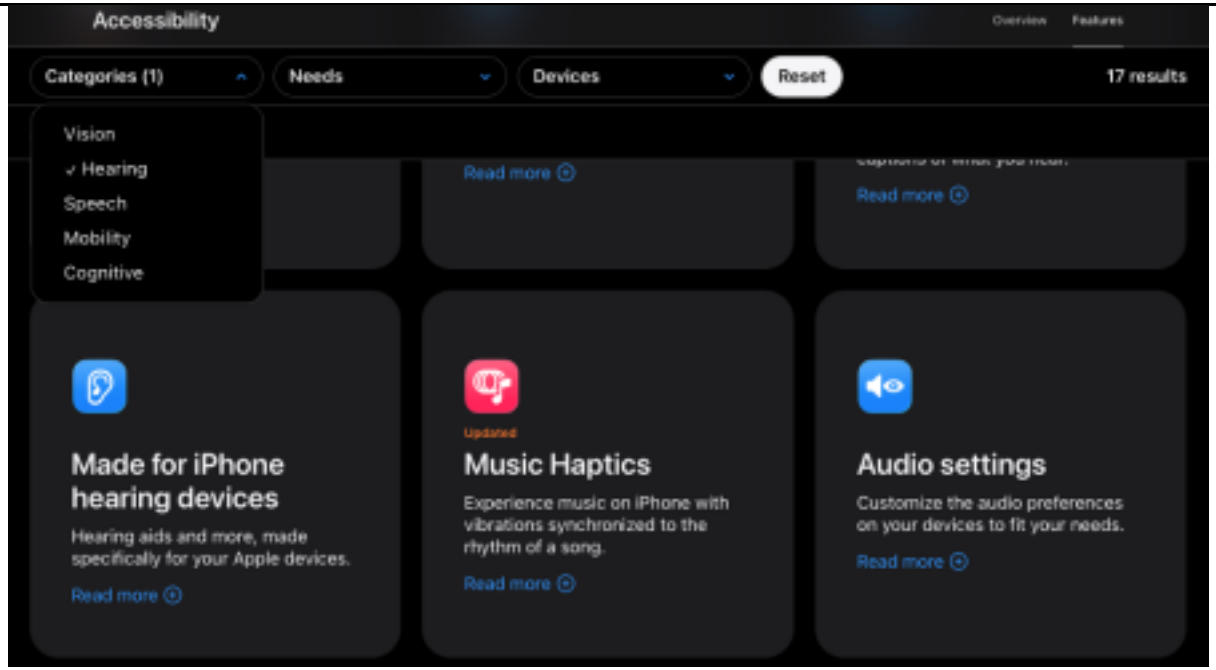
The Accused Instrumentalities are configured to dynamically change the level of the received audio signals while simultaneously enhance the voices of persons speaking nearby by selectively amplify portions corresponding to speech frequencies, based upon the user's hearing profile and/or Custom Audio Setup settings described above.

The received audio signals is *customized* so that the user hears both the audio content and the conversation, without needing to remove the device from their ears. For example, the Accused Instrumentalities attenuate portions of the received audio signals, including music and media playback, to create room for the external audio signals so that speech remains clear and natural. In addition, the Accused Instrumentalities perform dynamic gain adjustment by lowering the volume of the received audio signals while raising the gain applied to external voices. Finally, Apple's Conversation Awareness customizes the received audio signals using the speech-enhanced

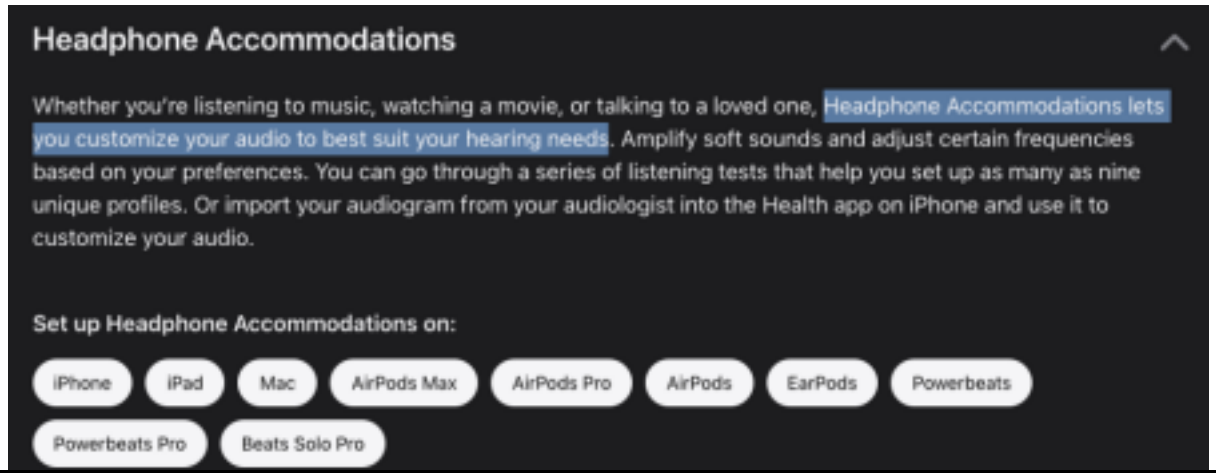
	external audio signal that has been adjusted based on at least one hearing characteristic of the user. As such, the customized audio output signals delivered to the device's speaker is a customized version of the received audio signals based on at least a portion of the stored hearing characteristics associated with the user.  **Source**: https://support.apple.com/en-us/104979 (INGENIOSPEC-014799-014800) The customizations described above are based on at least a portion of the stored hearing characteristics associated with the user. *See* Claim 1c, *supra*. The customized audio output signals at least compensates for the hearing impairment regarding the user's ability to hear (e.g., by using hearing characteristics within the hearing profile created by a hearing test, and/or hearing characteristics determined during custom audio setup). *See* https://support.apple.com/en-us/120992 (INGENIOSPEC-011560 to INGENIOSPEC-011566) ("AirPods Pro 2 and AirPods Pro 3 provide a clinical-grade Hearing Aid feature for perceived mild to moderate hearing loss, as well as a Media Assist feature that enhances the clarity of music, video, and calls."). *See also* https://support.apple.com/guide/airpods/set-headphone-accommodations-devcd05671ab/web (INGENIOSPEC-011430 to INGENIOSPEC-011431) (Headphone Accommodations and Custom Audio Setup "[a]mplif[ies] soft sounds and adjust[s] certain frequencies to help music, movies, phone calls, and podcasts sound more crisp and clear.") Custom Audio Setup is part of Apple's Accessibility features for users with deafness, or who are hard of hearing. Headphone Accommodations and Custom Audio Setup allows a user to "change the accessibility settings for [a user's] AirPods to suit [their] needs."



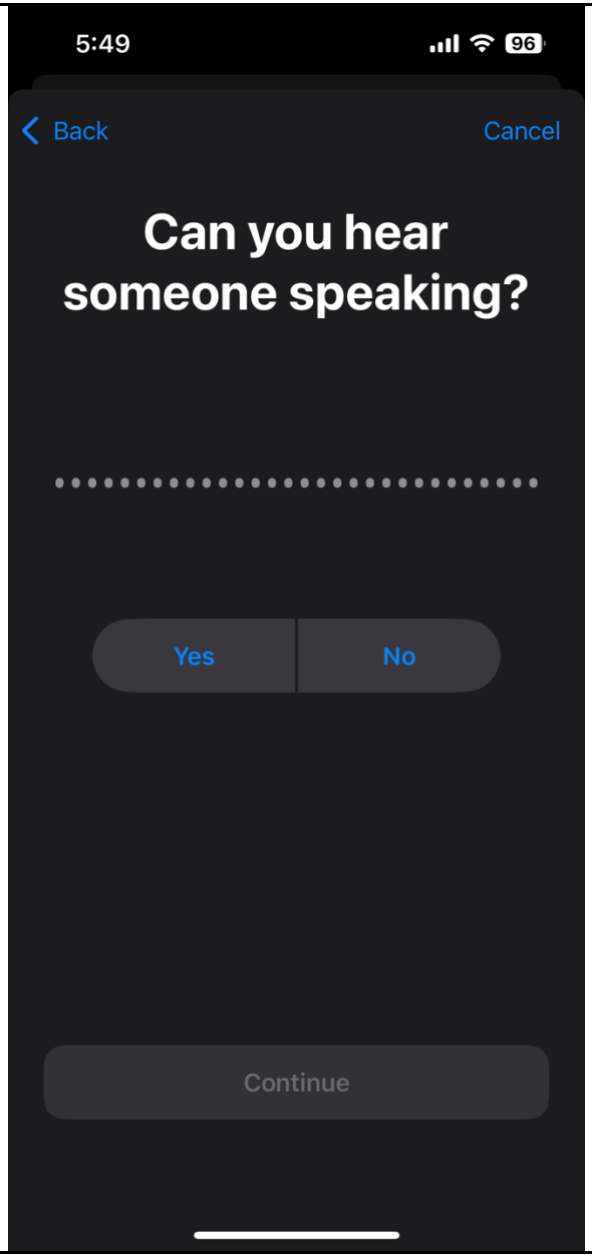
Source: https://www.apple.com/accessibility/features/ (INGENIOSPEC-014704-014718)



Source: https://www.apple.com/accessibility/features/ (INGENIOSPEC-014704-014718)



	Source: https://www.apple.com/accessibility/features/ (INGENIOSPEC-014704-014718), under “Audio settings” Moreover, Custom Audio Setup begins with a hearing test.

		 5:49 96 Back Cancel Can you hear someone speaking? Yes No Continue	

Source: Screenshot from iPhone configuring "Custom Audio Setup," Can you hear someone speaking?

Each of Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501; Customize headphone audio levels on your iPhone or iPad, available from https://support.apple.com/en-us/102663. *See* INGENIOSPEC-014699-014701;
Apple AirPods Pro 1	Switch between noise control modes - Apple Support, available from https://support.apple.com/guide/airpods/switch-between-noise-control-modes-dev9812f5cc3/1.0/web/1.0. *See* INGENIOSPEC-014039-014043; AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117; Customize headphone audio levels on your iPhone or iPad, available from https://support.apple.com/en-us/102663. *See* INGENIOSPEC-014699-014701;
Apple AirPods Pro 3	Use the Hearing Aid feature on your AirPods Pro 2 or AirPods Pro 3, available from https://support.apple.com/en-us/120992. *See* INGENIOSPEC-013442-013448; Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;

			AirPods Pro 3 - Hearing Health, available from https://www.apple.com/airpods-pro/hearing-health/. *See* INGENIOSPEC-013502-013510; Introducing AirPods Pro 3, the ultimate audio experience, available from https://www.apple.com/in/newsroom/2025/09/airpods-pro-3-introduce-the-ultimate-audio-experience/. *See* INGENIOSPEC-014239-014248; Set Headphone Accommodations for AirPods, available from https://support.apple.com/guide/airpods/set-headphone-accommodations-devcd05671ab/web. *See* INGENIOSPEC-013296-013297;
		Beats Fit Pro	Use your Beats Fit Pro - Apple Support, available from https://support.apple.com/guide/beats/use-beats-fit-pro-dev6f7b5266d/web. *See* INGENIOSPEC-013661-013663; Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458; Customize headphone audio levels on your iPhone or iPad, available from https://support.apple.com/en-us/102663. *See* INGENIOSPEC-014699-014701;
		Beats Solo Pro	Solo Pro Press Release, available from https://www.beatsbydre.com/content/dam/beats/web/press/solo-pro/solo-pro-press-kit.zip. *See* INGENIOSPEC-014313-014314; Beats Solo Pro Unboxing and Hands-On, available from https://www.youtube.com/watch?v=PqQkg8FHGdU&t=3s. *See* INGENIOSPEC-013191, INGENIOSPEC-013192-013197; Solo Pro - Beats by Dre Archive 2, available from https://web.archive.org/web/20200602034251/https://www.beatsbydre.com/headphones/solo-pro. *See* INGENIOSPEC-013312-013323; Customize headphone audio levels on your iPhone or iPad, available from https://support.apple.com/en-us/102663. *See* INGENIOSPEC-014699-014701;
		Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds with video transcript, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-

	earbuds-electric-orange. *See* INGENIOSPEC-013617-013632; Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616; Customize headphone audio levels on your iPhone or iPad, available from https://support.apple.com/en-us/102663. *See* INGENIOSPEC-014699-014701; Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
1e. and (iii) output the customized audio output signals to the at least one speaker, wherein the at least one speaker is configured to generate at least a portion of the customized audio output for the user in accordance with at least the portion of the customized audio output signals.	Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises at least one speaker. *See* Claim 1a, *supra*. Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises electronic circuitry configured to customize the received audio output signals to produce customized audio output signals. *See* Claim 1d, *supra*. The electronic circuitry is *also* configured to output the customized audio output signals to the at least one speaker. The at least one speaker is configured to generate at least a portion of the customized audio output for the user in accordance with at least the portion of the customized audio output signals. For example, the speakers of the Accused Instrumentalities are configured to generate at least a portion of the customized audio output described in Claim 1d, *supra*. At least a portion of the customized audio output signals will be output by the speakers for the Accused Instrumentalities thereby improving and enhancing the user's hearing experience. As such, the user hears customized audio output signals that compensate for their hearing impairment.



Source: Speaker Image from AirPods Pro 2 webpage (INGENIOSPEC-014044-014044) (available from https://www.apple.com/airpods-pro/).

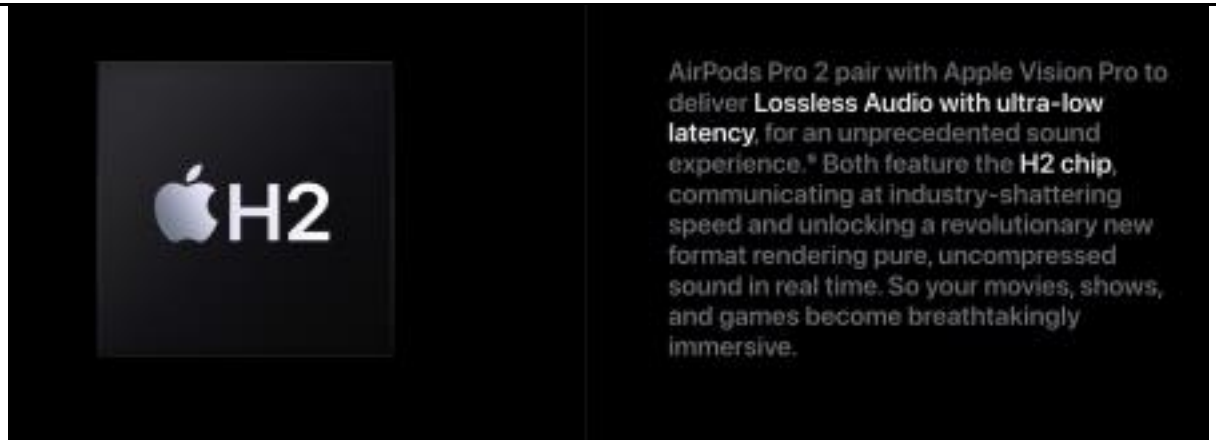


The front of the speaker unit is a black diaphragm.

Source: Apple AirPods Pro 2 Teardown: Upgrade Materials and Design (INGENIOSPEC-013701-013760) (available from https://www.qucox.com/apple-airpods-pro-2-teardown/).



Source: Teardown of Apple AirPods Pro 2 (INGENIOSPEC-013264, INGENIOSPEC-013265-013270) (available from https://www.youtube.com/watch?v=NfzRzb3NI0U).



Source: AirPods Pro 2 - Apple (INGENIOSPEC-013541-013563) (available from https://web.archive.org/web/20250904180656/https:/www.apple.com/airpods-pro/).



Source: AirPods Pro 2 - Apple (INGENIOSPEC-013541-013563) (available from https://web.archive.org/web/20250904180656/https:/www.apple.com/airpods-pro/).

Each of Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

	Device	**Citations**
	Apple AirPods 4 with Active Noise Cancellation	Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
	Apple AirPods Pro 1	AirPods Pro Teardown - iFixit, available from https://www.ifixit.com/Teardown/AirPods+Pro+Teardown/127551. *See* INGENIOSPEC-014076-014096; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117;
	Apple AirPods Pro 3	Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;
	Beats Fit Pro	Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458; Teardown Report: Beats Fit Pro, available from https://www.52audio.com/archives/98994.html. *See* INGENIOSPEC-014407-014463;
	Beats Solo Pro	Beats By Dre Solo Pro Wireless Bad Battery Replacement Fix Repair Tutorial, available from https://www.youtube.com/watch?v=SBeHaqnw45w. *See* INGENIOSPEC-013144, INGENIOSPEC-013145-013151;

		Solo Pro Press Release, available from https://www.beatsbydre.com/content/dam/beats/web/press/solo-pro/solo-pro-press-kit.zip. *See* INGENIOSPEC-014313-014314; Beats User Guide - Pair Beats, available from https://support.apple.com/guide/beats/pair-beats-dev46c519179/1.0/web/1.0. *See* INGENIOSPEC-014011-014014; Solo Pro - Beats by Dre Archive 2, available from https://web.archive.org/web/20200602034251/https://www.beatsbydre.com/headphones/solo-pro. *See* INGENIOSPEC-013312-013323;
	Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds with video transcript, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013617-013632;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	

11,921,355 Claim 2	**Evidence**
2. A head-worn personal electronic apparatus as recited in claim 1, wherein the received audio output signals are wirelessly received from a mobile communication device associated with the user.	Every claim limitation of claim 1 is present in the Accused Instrumentalities as described above and incorporated herein by reference. The Accused Instrumentalities, such as Apple AirPods Pro 2, comprise a wireless receiver configured to wirelessly receive audio output signals to be output to the user via the at least one speaker. *See* Claim 1b, *supra*. The received audio output signals are wirelessly received from a mobile communication device associated with the user. For example, the Accused Instrumentalities, such as Apple AirPods Pro 2, are Bluetooth-compatible devices. *See* Claim 1b, *supra*.

	 **Source**: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/). The Accused Instrumentalities are capable of pairing with mobile communication devices such as an Apple iPhone. **Pair AirPods with iPhone or iPad** Before you begin, make sure your device has the latest version of iOS or iPadOS installed. When pairing, your device must also be connected to a Wi-Fi or cellular network, or you may not have access to Find My features. 1. On your device, go to Settings > Bluetooth, turn on Bluetooth, then do one of the following: • *AirPods or AirPods Pro:* Open the case with your AirPods inside, then hold it next to your device. • *AirPods Max:* Take your AirPods Max out of the Smart Case, and within 60 seconds, hold them next to the device that you want to pair until the setup animation appears. If you don't see the animation, you can pair AirPods Max with your device manually. Go to Settings > Bluetooth, then select your AirPods. Press and hold the noise control button on AirPods Max for about 5 seconds, or until the light flashes white. If you have AirPods Max (USB-C), you can also pair your AirPods with your device by connecting them using a USB-C to USB-C cable. 2. Follow the onscreen instructions, then tap Done. **Source**: Pair AirPods with an Apple device - Apple Support (INGENIOSPEC-014020-014023) (available from https://support.apple.com/guide/airpods/pair-airpods-with-an-apple-device-dev7c85810f2/web).

The Accused Instrumentalities are also able to pair with other mobile communication devices such as Apple iPads, iPod Touches, MacBook Computers, Apple Watches, and the Apple Vision Pro, among other Bluetooth-compatible mobile communication devices (e.g., Android devices).

Each of Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Pair AirPods with an Apple device - Apple Support, available from https://support.apple.com/guide/airpods/pair-airpods-with-an-apple-device-dev7c85810f2/web. *See* INGENIOSPEC-014020-014023;
Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Pair AirPods with an Apple device - Apple Support, available from https://support.apple.com/guide/airpods/pair-airpods-with-an-apple-device-dev7c85810f2/web. *See* INGENIOSPEC-014020-014023;
Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;

	Beats Fit Pro	Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458; Beats User Guide - Pair Beats, available from https://support.apple.com/en-ca/guide/beats/dev46c519179/1.0/web/1.0. *See* INGENIOSPEC-014644-014647;
	Beats Solo Pro	Beats User Guide - Pair Beats, available from https://support.apple.com/guide/beats/pair-beats-dev46c519179/1.0/web/1.0. *See* INGENIOSPEC-014011-014014;
	Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616; Beats User Guide - Pair Beats, available from https://support.apple.com/guide/beats/pair-beats-dev46c519179/1.0/web/1.0. *See* INGENIOSPEC-014011-014014; Powerbeats Pro 2, available from https://www.beatsbydre.com/earbuds/powerbeats-pro-2/MX743/electric-orange. *See* INGENIOSPEC-013371-013387;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	

11,921,355 Claim 3	Evidence
3. A head-worn personal electronic apparatus as recited in claim 1, wherein the head-worn personal electronic apparatus comprises: a touch sensitive surface at least partially contained within the head-worn personal electronic apparatus and configured to sense a touch input associated with the user, wherein the sensed touch input operating to at least alter operation of the head-worn electronic personal audio apparatus.	Every claim limitation of claim 1 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Each of the Accused Instrumentalities, such as the Apple AirPods Pro 2, comprises a touch sensitive surface at least partially contained within the head-worn personal electronic apparatus. The touch sensitive surface responds to the user's touch. For example, Apple AirPods Pro 2 comprises a touch sensitive surface on its stem.

AirPods Pro 2 controls and gestures



With the Touch control on the stem of both AirPods Pro 2, you can do any of the following:

- *Play and pause audio*: Press the stem. To resume playback, press it again.
- *Play the next track*: Double-press the stem.
- *Play the previous track*: Triple-press the stem.
- *Answer a call*: When you receive a call, press the stem.
- *Adjust volume*: Lightly swipe up or down on the stem.

  You can also turn on Personalized Volume to automatically adjust the volume based on listening preferences and your environment. See Use Conversation Awareness or Personalized Volume.
- *Switch between Active Noise Cancellation, Transparency mode, and Adaptive Audio*: You can set either of your AirPods to perform this action when you press and hold the stem. See Change what the force sensor or Touch control does.
- *Activate Siri*: You can set either of your AirPods to perform this action when you press and hold the stem. See Use Siri with AirPods.

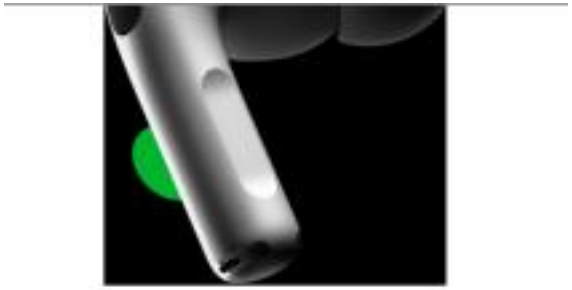
Use head gestures to respond to Siri

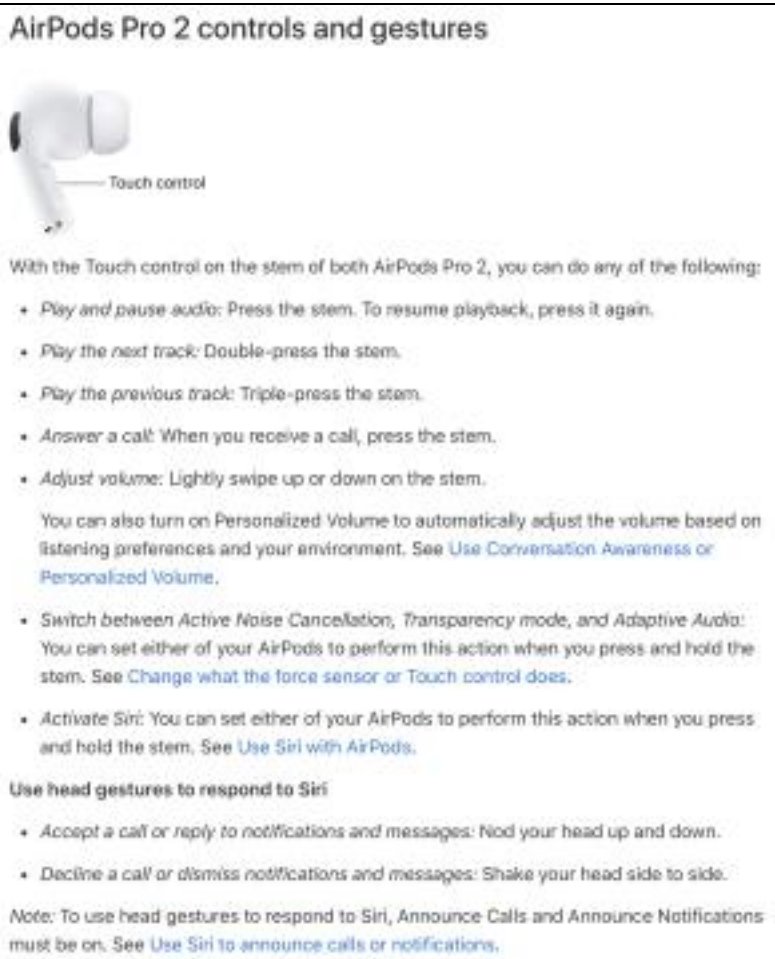
- *Accept a call or reply to notifications and messages*: Nod your head up and down.
- *Decline a call or dismiss notifications and messages*: Shake your head side to side.

Note: To use head gestures to respond to Siri, Announce Calls and Announce Notifications must be on. See Use Siri to announce calls or notifications.

Source: Use controls and gestures with your AirPods - Apple Support (INGENIOSPEC-014024-014029) (available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/1.0/web/1.0).

The touch sensitive surface is configured to sense a touch input associated with the user, and wherein the sensed touch input alters operation of the Accused Instrumentality. The sensed touch input alters operation of the device.

	For example, the sensed touch input can increase or decrease volume based upon a slide of a finger on the touch sensitive surface.  Just touch to adjust. Touch control lets you manage playback functions from the stem. Swipe up or down to adjust volume, press to play and pause music or mute and unmute yourself on calls, and press twice to end a call. You can also hold the stem to switch between listening modes. **Source**: AirPods Pro 2 - Apple (INGENIOSPEC-013541-013563) (available from https://web.archive.org/web/20250904180656/https:/www.apple.com/airpods-pro/).



AirPods Pro 2 controls and gestures

Touch control

With the Touch control on the stem of both AirPods Pro 2, you can do any of the following:

- *Play and pause audio*: Press the stem. To resume playback, press it again.
- *Play the next track*: Double-press the stem.
- *Play the previous track*: Triple-press the stem.
- *Answer a call*: When you receive a call, press the stem.
- *Adjust volume*: Lightly swipe up or down on the stem.

  You can also turn on Personalized Volume to automatically adjust the volume based on listening preferences and your environment. See Use Conversation Awareness or Personalized Volume.
- *Switch between Active Noise Cancellation, Transparency mode, and Adaptive Audio*: You can set either of your AirPods to perform this action when you press and hold the stem. See Change what the force sensor or Touch control does.
- *Activate Siri*: You can set either of your AirPods to perform this action when you press and hold the stem. See Use Siri with AirPods.

Use head gestures to respond to Siri

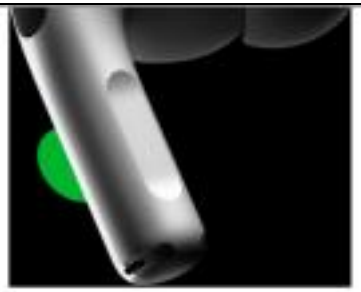
- *Accept a call or reply to notifications and messages*: Nod your head up and down.
- *Decline a call or dismiss notifications and messages*: Shake your head side to side.

Note: To use head gestures to respond to Siri, Announce Calls and Announce Notifications must be on. See Use Siri to announce calls or notifications.

Source: Use controls and gestures with your AirPods - Apple Support (INGENIOSPEC-014024-014029) (available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/1.0/web/1.0).

For another example, sensed inputs can Play or Pause music, advance to the next track in a playlist, return to the previous track in a playlist, activate Siri, and/or answer or hang up a phone call based on a tap(s).

	Apple AirPods Pro 3 *also* meets the claimed limitation for the same reasons. Refer to the table below for corresponding evidence to Apple AirPods Pro 3. **Device** / **Citations** Apple AirPods Pro 3 — Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533; Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
11,921,355 Claim 5	**Evidence**
5. A head-worn personal electronic apparatus recited in claim 3, wherein the at least one operation of the head-worn personal electronic apparatus being altered concerns control of the customized audio output being provided to the user.	Every claim limitation of claim 3 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises a touch sensitive surface at least partially contained within the head-worn personal electronic apparatus and configured to sense a touch input associated with the user, wherein the sensed touch input alters operation of the head-worn electronic personal audio apparatus. *See* Claim 3, *supra*. The at least one operation being altered concerns control of the customized audio output being provided to the user. For example, the touch sensitive surface can be used to control the volume of the audio output signals to be output to the user via the at least one speaker.



Just touch
to adjust.

Touch control lets you manage playback functions from the stem. Swipe up or down to adjust volume, press to play and pause music or mute and unmute yourself on calls, and press twice to end a call. You can also hold the stem to switch between listening modes.

Source: AirPods Pro 2 - Apple (INGENIOSPEC-013541-013563) (available from https://web.archive.org/web/20250904180656/https:/www.apple.com/airpods-pro/).

AirPods Pro 2 controls and gestures



With the Touch control on the stem of both AirPods Pro 2, you can do any of the following:

- *Play and pause audio*: Press the stem. To resume playback, press it again.
- *Play the next track*: Double-press the stem.
- *Play the previous track*: Triple-press the stem.
- *Answer a call*: When you receive a call, press the stem.
- *Adjust volume*: Lightly swipe up or down on the stem.

  You can also turn on Personalized Volume to automatically adjust the volume based on listening preferences and your environment. See Use Conversation Awareness or Personalized Volume.
- *Switch between Active Noise Cancellation, Transparency mode, and Adaptive Audio*: You can set either of your AirPods to perform this action when you press and hold the stem. See Change what the force sensor or Touch control does.
- *Activate Siri*: You can set either of your AirPods to perform this action when you press and hold the stem. See Use Siri with AirPods.

Use head gestures to respond to Siri

- *Accept a call or reply to notifications and messages*: Nod your head up and down.
- *Decline a call or dismiss notifications and messages*: Shake your head side to side.

Note: To use head gestures to respond to Siri, Announce Calls and Announce Notifications must be on. See Use Siri to announce calls or notifications.

Source: Use controls and gestures with your AirPods - Apple Support (INGENIOSPEC-014024-014029) (available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/1.0/web/1.0).

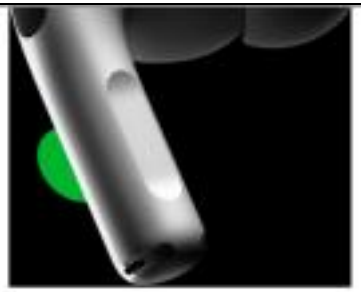
For another example, sensed inputs can Play or Pause music, advance to the next track in a playlist, return to the previous track in a playlist, activate Siri, and/or answer or hang up a phone call based on a tap(s).

<table>
<tr><td></td><td>Apple AirPods Pro 3 also meets the claimed limitation for the same reasons. Refer to the table below for corresponding evidence to Apple AirPods Pro 3.

<table><tr><th>Device</th><th>Citations</th></tr><tr><td>Apple AirPods Pro 3</td><td>Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. See INGENIOSPEC-013511-013533; Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. See INGENIOSPEC-014249-014255;</td></tr></table>
Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.</td></tr>
<tr><th>11,921,355
Claim 6</th><th>Evidence</th></tr>
<tr><td>6. A head-worn personal electronic apparatus as recited in claim 3, wherein the head-worn personal electronic apparatus is configured to detect at least a sliding of a finger action with respect to the touch sensitive surface.</td><td>Every claim limitation of claim 3 is present in the Accused Instrumentalities as described above and incorporated herein by reference.

Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises a touch sensitive surface at least partially contained within the head-worn personal electronic apparatus and configured to sense a touch input associated with the user, wherein the sensed touch input alters operation of the head-worn electronic personal audio apparatus. See Claim 3, supra.

Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, is configured to detect at least a sliding of a finger action with respect to the touch sensitive surface when the user swipes the touch-sensitive stem of the Apple AirPods Pro 2. For example, depending on the direction of the user's input the volume can be increased or decreased.</td></tr>
</table>



Just touch
to adjust.

Touch control lets you manage playback functions from the stem. Swipe up or down to adjust volume, press to play and pause music or mute and unmute yourself on calls, and press twice to end a call. You can also hold the stem to switch between listening modes.

Source: AirPods Pro 2 - Apple (INGENIOSPEC-013541-013563) (available from https://web.archive.org/web/20250904180656/https:/www.apple.com/airpods-pro/).

AirPods Pro 2 controls and gestures



With the Touch control on the stem of both AirPods Pro 2, you can do any of the following:

- *Play and pause audio*: Press the stem. To resume playback, press it again.
- *Play the next track*: Double-press the stem.
- *Play the previous track*: Triple-press the stem.
- *Answer a call*: When you receive a call, press the stem.
- *Adjust volume*: Lightly swipe up or down on the stem.

  You can also turn on Personalized Volume to automatically adjust the volume based on listening preferences and your environment. See Use Conversation Awareness or Personalized Volume.
- *Switch between Active Noise Cancellation, Transparency mode, and Adaptive Audio*: You can set either of your AirPods to perform this action when you press and hold the stem. See Change what the force sensor or Touch control does.
- *Activate Siri*: You can set either of your AirPods to perform this action when you press and hold the stem. See Use Siri with AirPods.

Use head gestures to respond to Siri

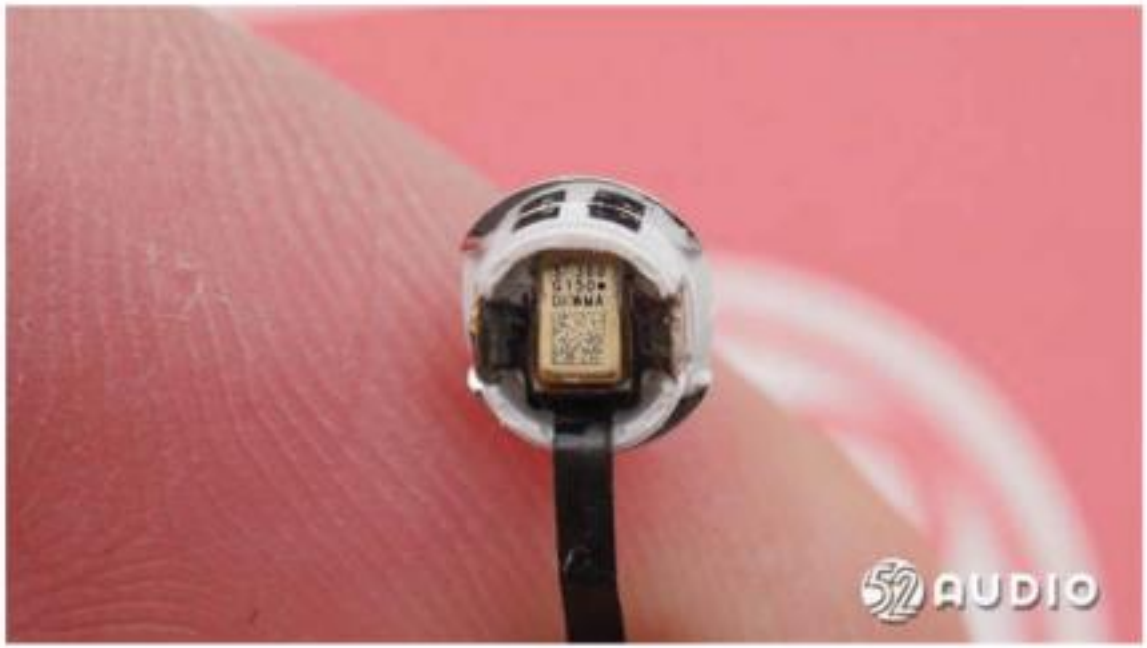
- *Accept a call or reply to notifications and messages*: Nod your head up and down.
- *Decline a call or dismiss notifications and messages*: Shake your head side to side.

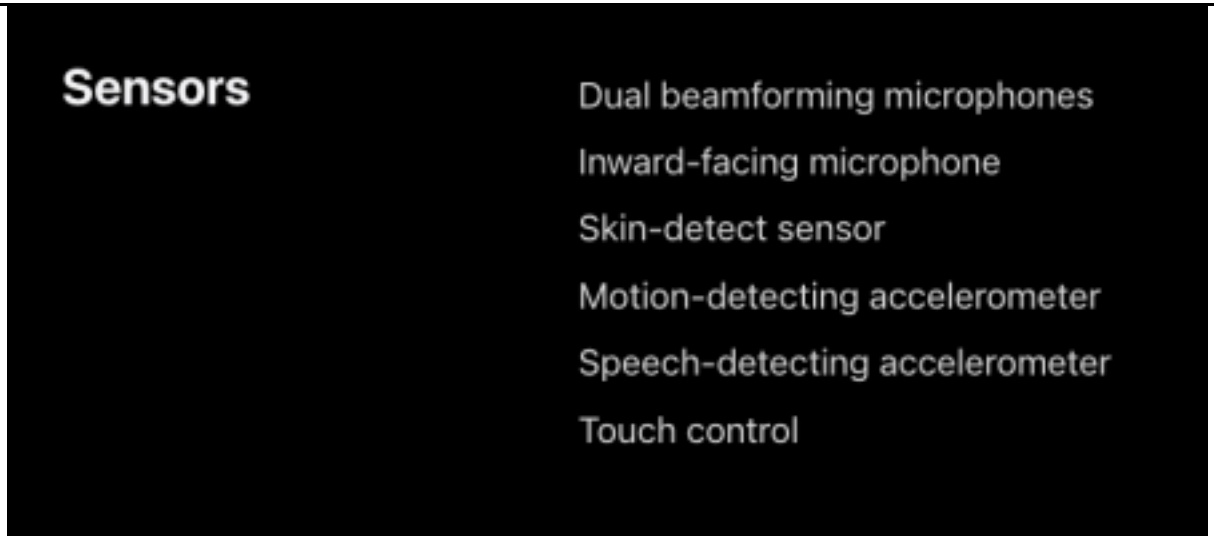
Note: To use head gestures to respond to Siri, Announce Calls and Announce Notifications must be on. See Use Siri to announce calls or notifications.

Source: Use controls and gestures with your AirPods - Apple Support (INGENIOSPEC-014024-014029) (available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/1.0/web/1.0).

Apple AirPods Pro 3 *also* meets the claimed limitation for the same reasons. Refer to the table below for corresponding evidence to Apple AirPods Pro 3.

	<table><tr><th>Device</th><th>Citations</th></tr><tr><td>Apple AirPods Pro 3</td><td>Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533; Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;</td></tr></table> Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
11,921,355 Claim 7	**Evidence**
7. A head-worn personal electronic apparatus as recited in claim 1, wherein the head-worn personal electronic apparatus comprises:	Every claim limitation of claim 1 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
7a. a first microphone configured to pick up at least audio input from at least the user, the first microphone being at least partially in the head-worn personal	Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises a first microphone configured to pick up at least audio input from at least the user. The first microphone is at least partially in the head-worn personal electronic apparatus.

electronic apparatus and is positioned to be directed towards the user when the head-worn personal electronic apparatus is being worn by the user; and	 Bottom pickup microphone. **Source**: Apple AirPods Pro 2 Teardown: Upgrade Materials and Design (INGENIOSPEC-013701-013760) (available from https://www.qucox.com/apple-airpods-pro-2-teardown/).



Source: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).

The first microphone is positioned so that it is directed towards the user when the head-worn personal electronic apparatus is being worn by the user. The microphone can, for example, capture the user's voice during phone calls, video conferences, or when issuing voice commands to Siri.

Each of Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

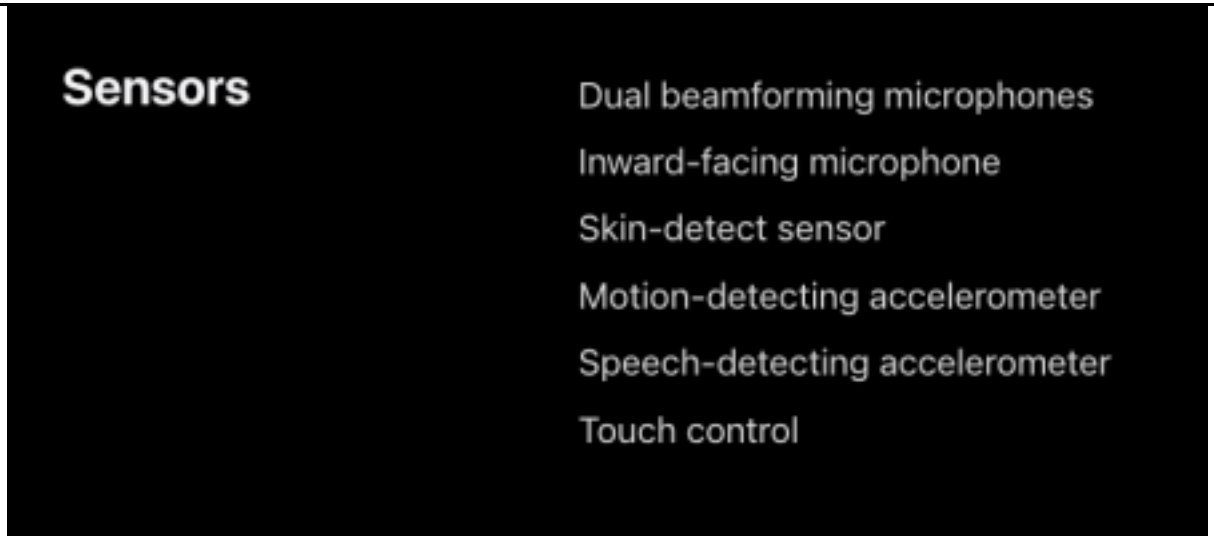
Device	**Citations**
Apple AirPods 4 with Active Noise Cancellation	Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; AirPods 4 - Technical Specifications, available from

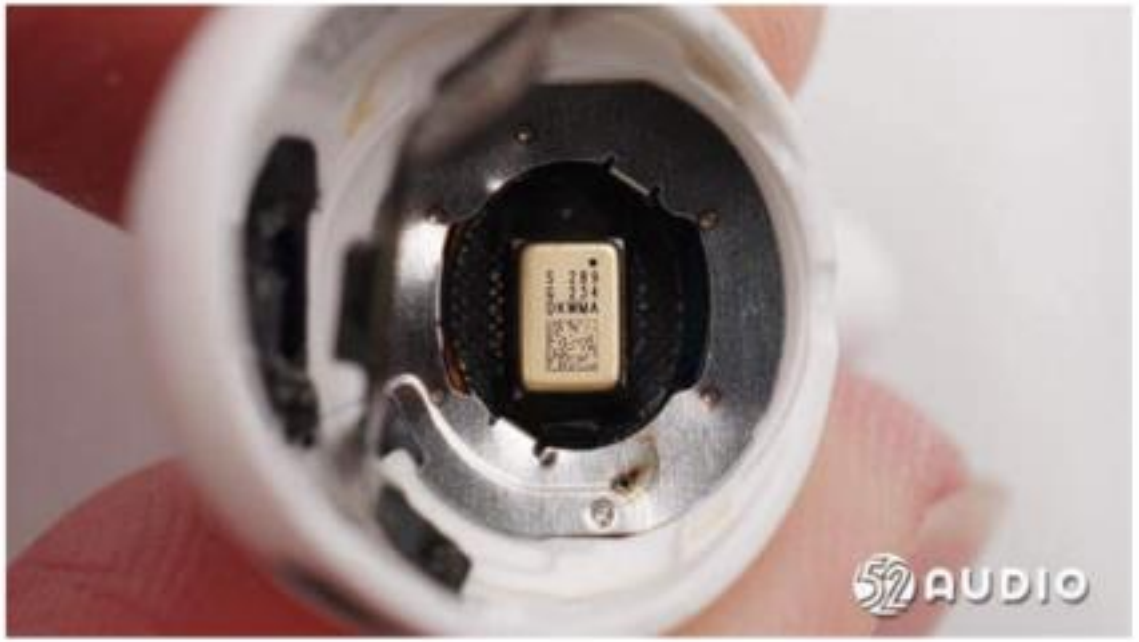
			https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;
		Beats Fit Pro	Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458; Teardown Report: Beats Fit Pro, available from https://www.52audio.com/archives/98994.html. *See* INGENIOSPEC-014407-014463;
		Beats Solo Pro	Replacement Parts List, available from https://www.joesge.com/products/beats-solo-pro-wireless-headphones-repair-parts?srsltid=AfmBOoohkWL6z6LfgJ6-r9iZYIxup4uhO-LU6DQhzGFOFk4vPOj3vouM. *See* INGENIOSPEC-013836-013844; Solo Pro Press Release, available from https://www.beatsbydre.com/content/dam/beats/web/press/solo-pro/solo-pro-press-kit.zip. *See* INGENIOSPEC-014313-014314;

	<table><tr><td>Powerbeats Pro 2</td><td>Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616;</td></tr></table> Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
7b. a second microphone configured to pick up at least ambient sound input associated with an environment in the vicinity of the head-worn personal electronic apparatus, the second microphone being positioned to be directed away from the user when the head-worn wearable electronic device is being worn by the user.	Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises a second microphone configured to pick up at least ambient sound input associated with an environment in the vicinity of the head-worn personal electronic apparatus.



Source: Noise-Cancelling Microphones Image from AirPods Pro2 (INGENIOSPEC-014019-014019) (available from https://www.apple.com/airpods-pro/).

	 **Source**: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).



A metal protective cover is arranged above the noise cancellation microphone.

Source: Apple AirPods Pro 2 Teardown: Upgrade Materials and Design (INGENIOSPEC-013701-013760) (available from https://www.qucox.com/apple-airpods-pro-2-teardown/).

The second microphone is positioned to be directed away from the user when the head-worn wearable electronic device is being worn by the user. The second microphone can help reduce environmental noise from desired audio.

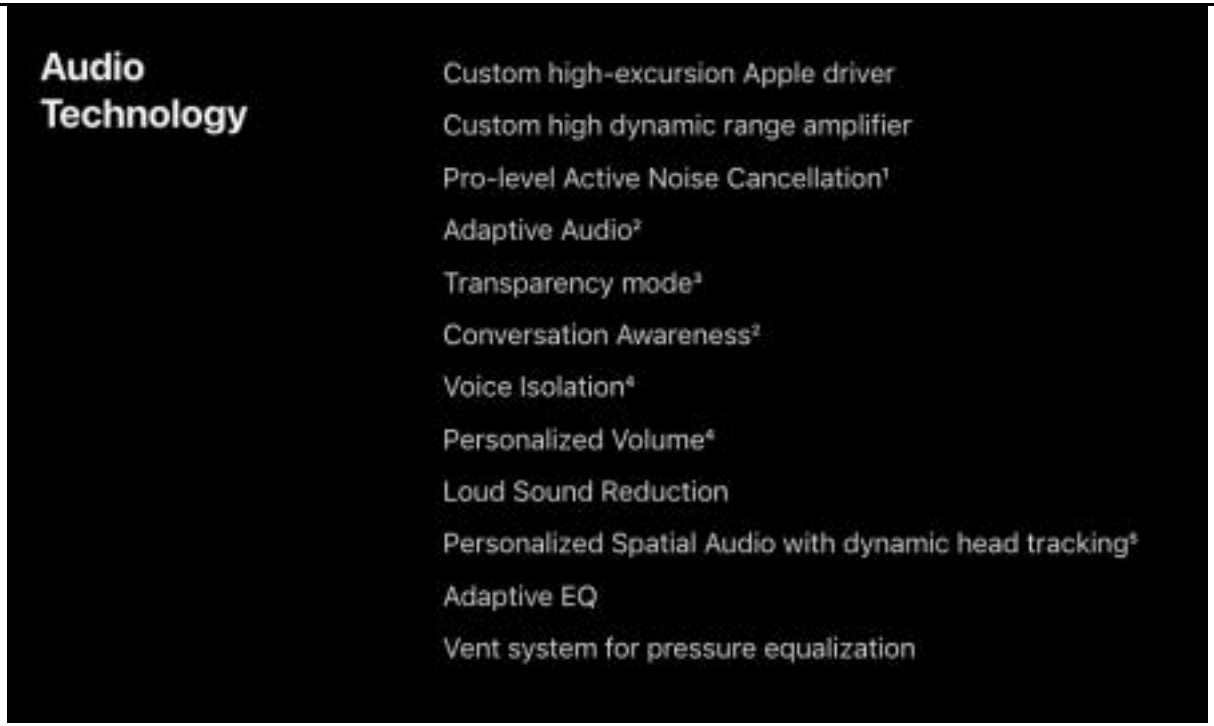
Each of Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 4 with Active Noise Cancellation	Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117;
Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;
Beats Fit Pro	Teardown Report: Beats Fit Pro, available from https://www.52audio.com/archives/98994.html. *See* INGENIOSPEC-014407-014463; Beats Fit Pro True Wireless Earbuds — Beats Black, available from https://www.apple.com/shop/product/MK2F3LL/A/beats-fit-pro-true-wireless-earbuds-beats-black. *See* INGENIOSPEC-013302-013309;

	Beats Solo Pro	Beats-Solo-Pro-Wireless-Headphones-User-Guide, available from https://manuals.plus/wp-content/uploads/2023/05/Beats-Solo-Pro-Wireless-Headphones-User-Guide.pdf. *See* INGENIOSPEC-013808-013835; Solo Pro - Beats by Dre Archive 2, available from https://web.archive.org/web/20200602034251/https://www.beatsbydre.com/headphones/solo-pro. *See* INGENIOSPEC-013312-013323; Solo Pro Press Release, available from https://www.beatsbydre.com/content/dam/beats/web/press/solo-pro/solo-pro-press-kit.zip. *See* INGENIOSPEC-014313-014314;
	Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	

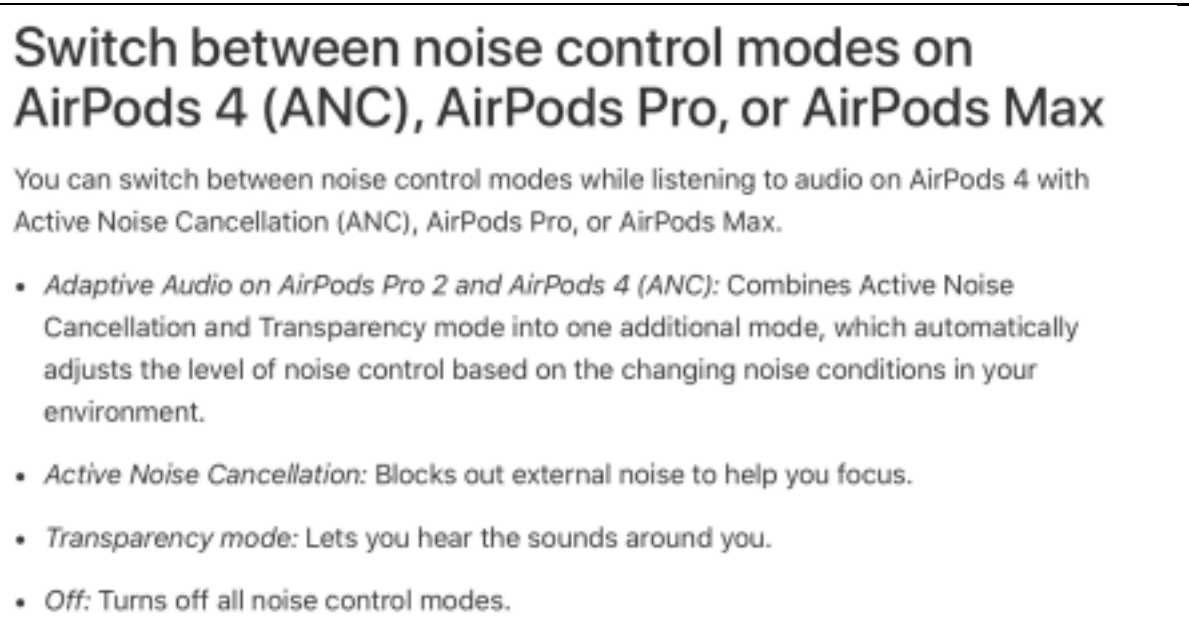
11,921,355 Claim 8	**Evidence**
8. A head-worn personal electronic apparatus as recited in claim 7,	Every claim limitation of claim 7 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
8a. wherein the electronic circuitry is configured to: determine an ambient sound level; and modify	Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises electronic circuitry including at least an integrated circuit. *See* Claim 1c, *supra*. The electronic circuitry is configured to (i) determine an ambient sound level; and (ii) modify audio output to the at least one speaker dependent at least in part on the ambient sound level.

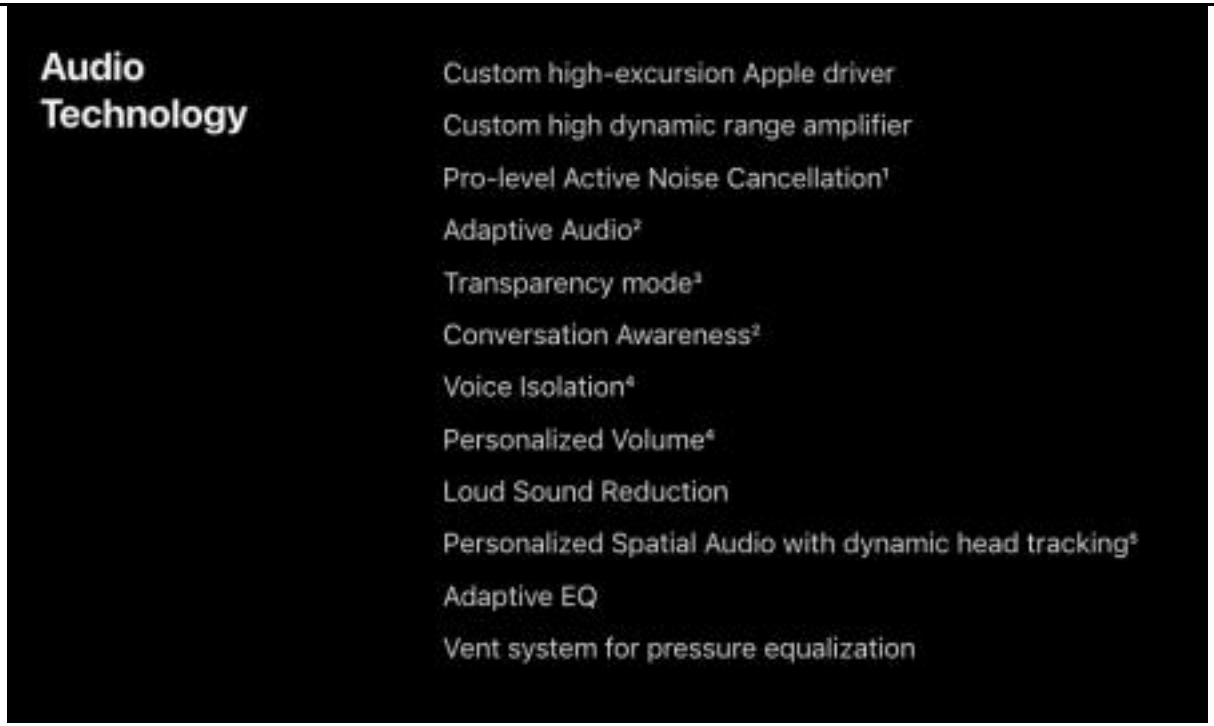
audio output to the at least one speaker dependent at least in part on the ambient sound level.	Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises a second microphone configured to pick up at least ambient sound input associated with an environment in the vicinity of the head-worn personal electronic apparatus. *See* Claim 7b, *supra*. The electronic circuitry of the Accused Instrumentalities determines an ambient sound level based upon ambient sound input picked up using at least the second microphone. The electronic circuitry further modifies audio output to the speakers dependent, at least in part, on the ambient sound level. For example, noise-cancelling mode cancels out at least a portion of the sound surrounding the user. This is done using the determined ambient sound level. The speaker is used to output the desired audio content while suppressing external noise. **Switch between noise control modes on AirPods 4 (ANC), AirPods Pro, or AirPods Max** You can switch between noise control modes while listening to audio on AirPods 4 with Active Noise Cancellation (ANC), AirPods Pro, or AirPods Max. • *Adaptive Audio on AirPods Pro 2 and AirPods 4 (ANC):* Combines Active Noise Cancellation and Transparency mode into one additional mode, which automatically adjusts the level of noise control based on the changing noise conditions in your environment. • *Active Noise Cancellation:* Blocks out external noise to help you focus. • *Transparency mode:* Lets you hear the sounds around you. • *Off:* Turns off all noise control modes. **Source**: Switch between noise control modes - Apple Support (INGENIOSPEC-014039-014043) (available from https://support.apple.com/guide/airpods/switch-between-noise-control-modes-dev9812f5cc3/1.0/web/1.0).



Source: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).

As another example, transparency mode allows the user to still hear at least a portion of their surroundings. This is done using the determined ambient sound level. The speaker is used to output both the external ambient sounds and the audio content for the user.

	 **Source**: Switch between noise control modes - Apple Support (INGENIOSPEC-014039-014043) (available from https://support.apple.com/guide/airpods/switch-between-noise-control-modes-dev9812f5cc3/1.0/web/1.0).



Source: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).

Transparency mode makes it possible for listeners to stay connected to and aware of the world around them. Now, Adaptive Transparency takes this customer-loved feature even further. The powerful H2 chip enables on-device processing, which reduces loud environmental noise — like a passing vehicle siren, construction tools, or even loud speakers at a concert — for more comfortable everyday listening.

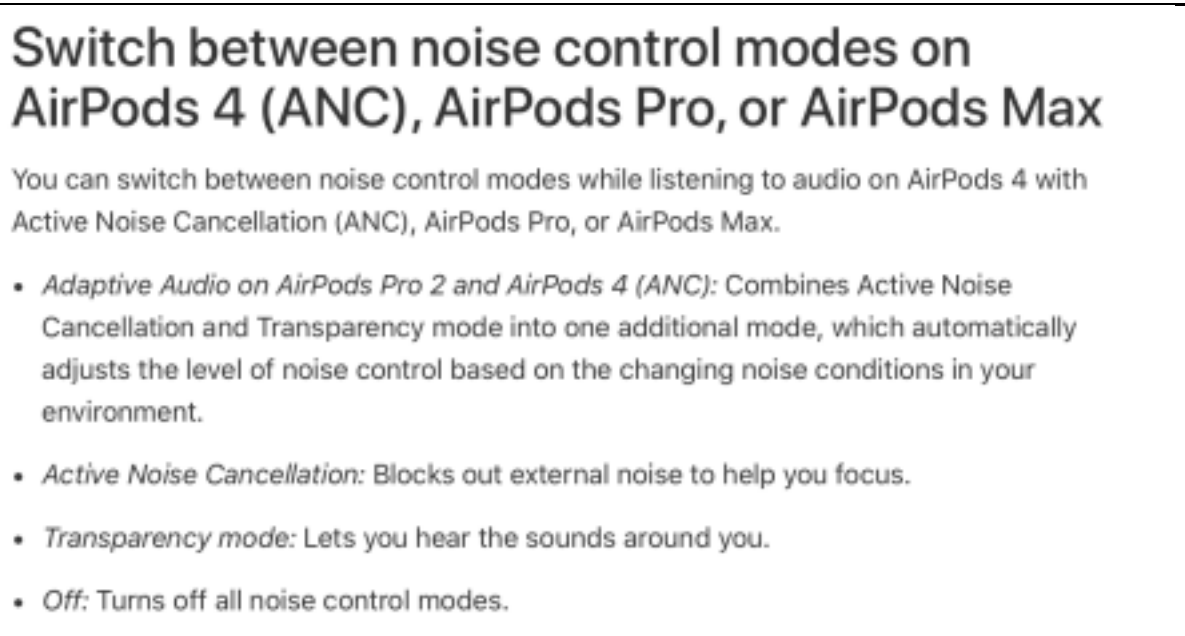
Source: Apple announces the next generation of AirPods Pro (INGENIOSPEC-013433-013441) (available from https://www.apple.com/newsroom/2022/09/apple-announces-the-next-generation-of-airpods-pro/).

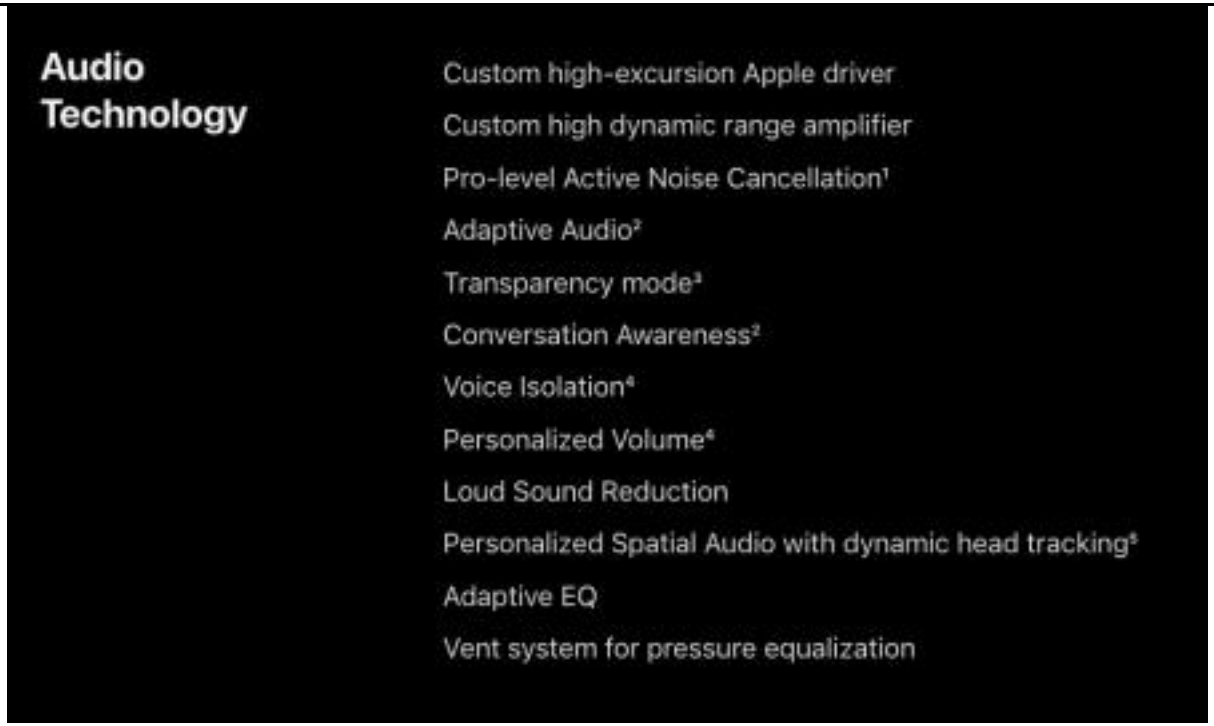
Each of Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501;
Apple AirPods Pro 1	Switch between noise control modes - Apple Support, available from https://support.apple.com/guide/airpods/switch-between-noise-control-modes-dev9812f5cc3/1.0/web/1.0. *See* INGENIOSPEC-014039-014043; AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117;
Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Introducing AirPods Pro 3, the ultimate audio experience, available from https://www.apple.com/in/newsroom/2025/09/airpods-pro-3-introduce-the-ultimate-audio-experience/. *See* INGENIOSPEC-014239-014248;

	Beats Fit Pro	Use your Beats Fit Pro - Apple Support, available from https://support.apple.com/guide/beats/use-beats-fit-pro-dev6f7b5266d/web. *See* INGENIOSPEC-013661-013663; Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458;
	Beats Solo Pro	Solo Pro Press Release, available from https://www.beatsbydre.com/content/dam/beats/web/press/solo-pro/solo-pro-press-kit.zip. *See* INGENIOSPEC-014313-014314; Beats Solo Pro Unboxing and Hands-On, available from https://www.youtube.com/watch?v=PqQkg8FHGdU&t=3s. *See* INGENIOSPEC-013191, INGENIOSPEC-013192-013197; Solo Pro - Beats by Dre Archive 2, available from https://web.archive.org/web/20200602034251/https://www.beatsbydre.com/headphones/solo-pro. *See* INGENIOSPEC-013312-013323; Beats by Dre The New Solo Pro, available from https://www.youtube.com/watch?v=V2i1YkfrM54. *See* INGENIOSPEC-013152, INGENIOSPEC-013153-013157;
	Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds with video transcript, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013617-013632; Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	

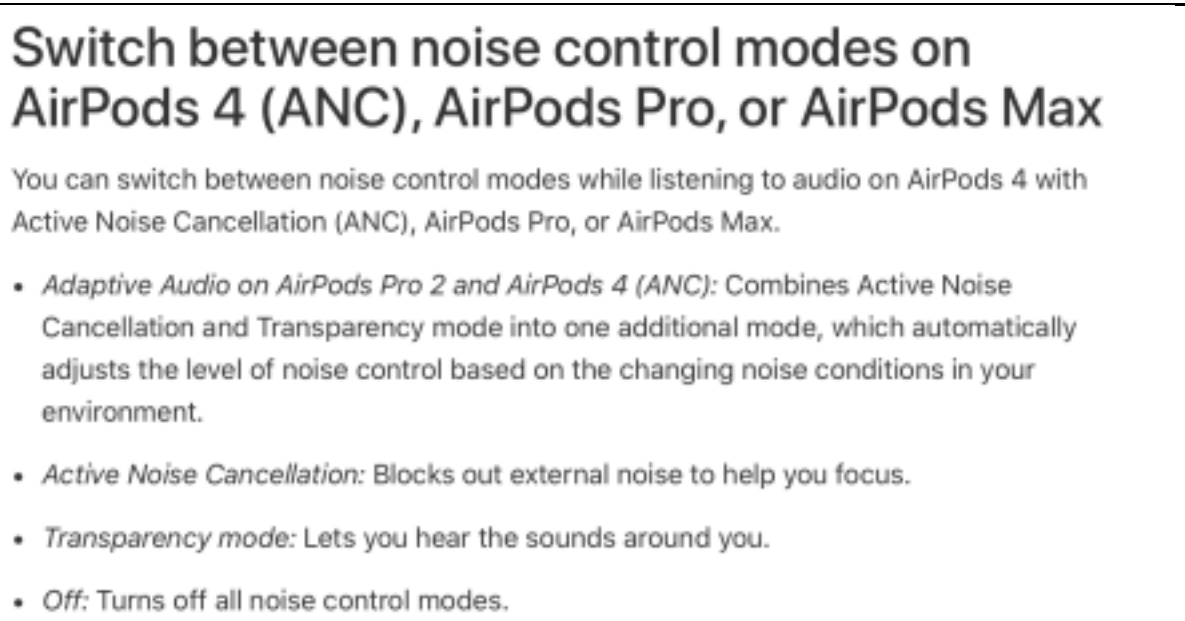
11,921,355 Claim 9	Evidence
9. A head-worn personal electronic apparatus as recited in claim 7,	Every claim limitation of claim 7 is present in the Accused Instrumentalities as described above and incorporated herein by reference.
9a. wherein the electronic circuitry is configured to: produce an ambient audio output signal based on at least the ambient sound input; and provide at least the ambient audio output signal to the at least one speaker.	Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises electronic circuitry including at least an integrated circuit. *See* Claim 1c, *supra*. The electronic circuitry is configured to (i) produce an ambient audio output signal based on at least the ambient sound input and (ii) provide at least the ambient audio output signal to the at least one speaker. Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises a second microphone configured to pick up at least ambient sound input associated with an environment in the vicinity of the head-worn personal electronic apparatus. *See* Claim 7b, *supra*. The electronic circuitry of the Accused Instrumentalities can produce an ambient audio output signal based on at least the ambient sound input. The electronic circuitry further provide at least the ambient audio output signal to the at least one speaker. For example, noise-cancelling mode cancels out at least a portion of the sound surrounding the user. This is done using the ambient audio output signal based on at least the ambient sound input. The speaker is used to output the desired audio content while suppressing external noise.

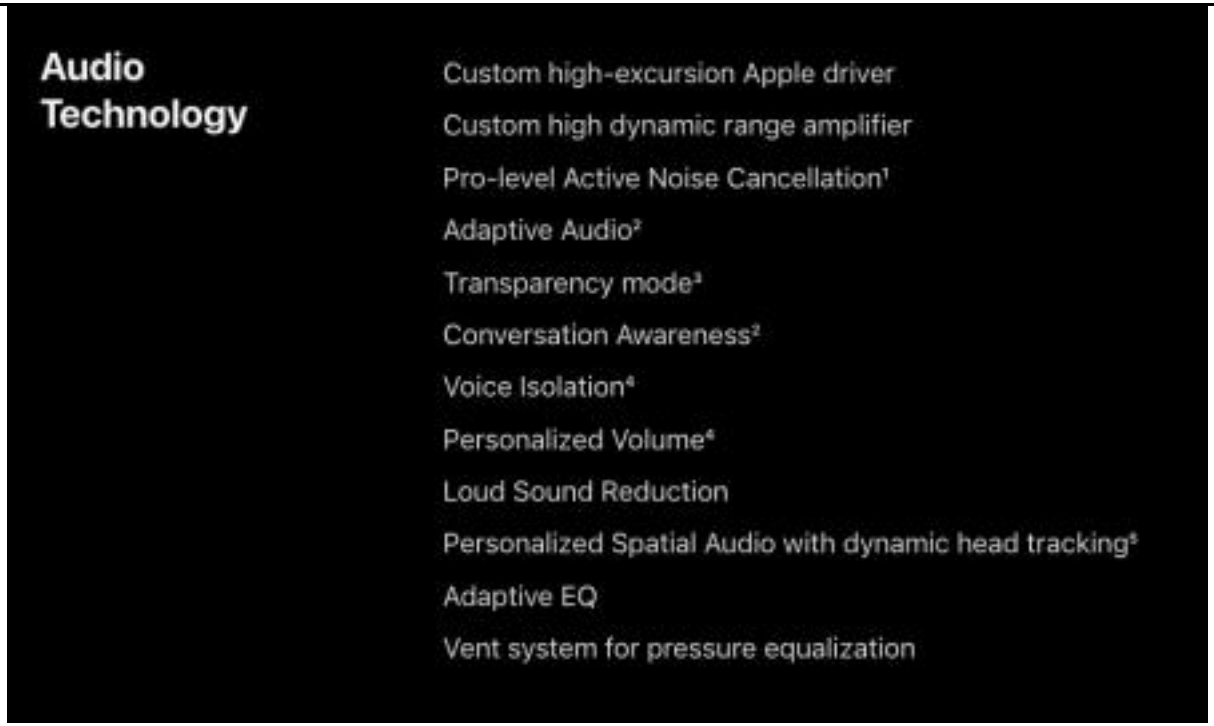
	 **Source**: Switch between noise control modes - Apple Support (INGENIOSPEC-014039-014043) (available from https://support.apple.com/guide/airpods/switch-between-noise-control-modes-dev9812f5cc3/1.0/web/1.0).



Source: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).

As another example, transparency mode allows the user to still hear at least a portion of their surroundings. This is done using the ambient audio output signal based on at least the ambient sound input. The speaker is used to output both the external ambient sounds and the audio content for the user.

	 **Source**: Switch between noise control modes - Apple Support (INGENIOSPEC-014039-014043) (available from https://support.apple.com/guide/airpods/switch-between-noise-control-modes-dev9812f5cc3/1.0/web/1.0).



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Transparency mode makes it possible for listeners to stay connected to and aware of the world around them. Now, Adaptive Transparency takes this customer-loved feature even further. The powerful H2 chip enables on-device processing, which reduces loud environmental noise — like a passing vehicle siren, construction tools, or even loud speakers at a concert — for more comfortable everyday listening.

Source: Apple announces the next generation of AirPods Pro (INGENIOSPEC-013433-013441) (available from https://www.apple.com/newsroom/2022/09/apple-announces-the-next-generation-of-airpods-pro/).

Each of Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501;
Apple AirPods Pro 1	Switch between noise control modes - Apple Support, available from https://support.apple.com/guide/airpods/switch-between-noise-control-modes-dev9812f5cc3/1.0/web/1.0. *See* INGENIOSPEC-014039-014043; AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117;
Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Introducing AirPods Pro 3, the ultimate audio experience, available from https://www.apple.com/in/newsroom/2025/09/airpods-pro-3-introduce-the-ultimate-audio-experience/. *See* INGENIOSPEC-014239-014248;

	Beats Fit Pro	Use your Beats Fit Pro - Apple Support, available from https://support.apple.com/guide/beats/use-beats-fit-pro-dev6f7b5266d/web. *See* INGENIOSPEC-013661-013663; Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458;
	Beats Solo Pro	Solo Pro Press Release, available from https://www.beatsbydre.com/content/dam/beats/web/press/solo-pro/solo-pro-press-kit.zip. *See* INGENIOSPEC-014313-014314; Beats Solo Pro Unboxing and Hands-On, available from https://www.youtube.com/watch?v=PqQkg8FHGdU&t=3s. *See* INGENIOSPEC-013191, INGENIOSPEC-013192-013197; Solo Pro - Beats by Dre Archive 2, available from https://web.archive.org/web/20200602034251/https://www.beatsbydre.com/headphones/solo-pro. *See* INGENIOSPEC-013312-013323; Beats by Dre The New Solo Pro, available from https://www.youtube.com/watch?v=V2i1YkfrM54. *See* INGENIOSPEC-013152, INGENIOSPEC-013153-013157;
	Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds with video transcript, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013617-013632; Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	

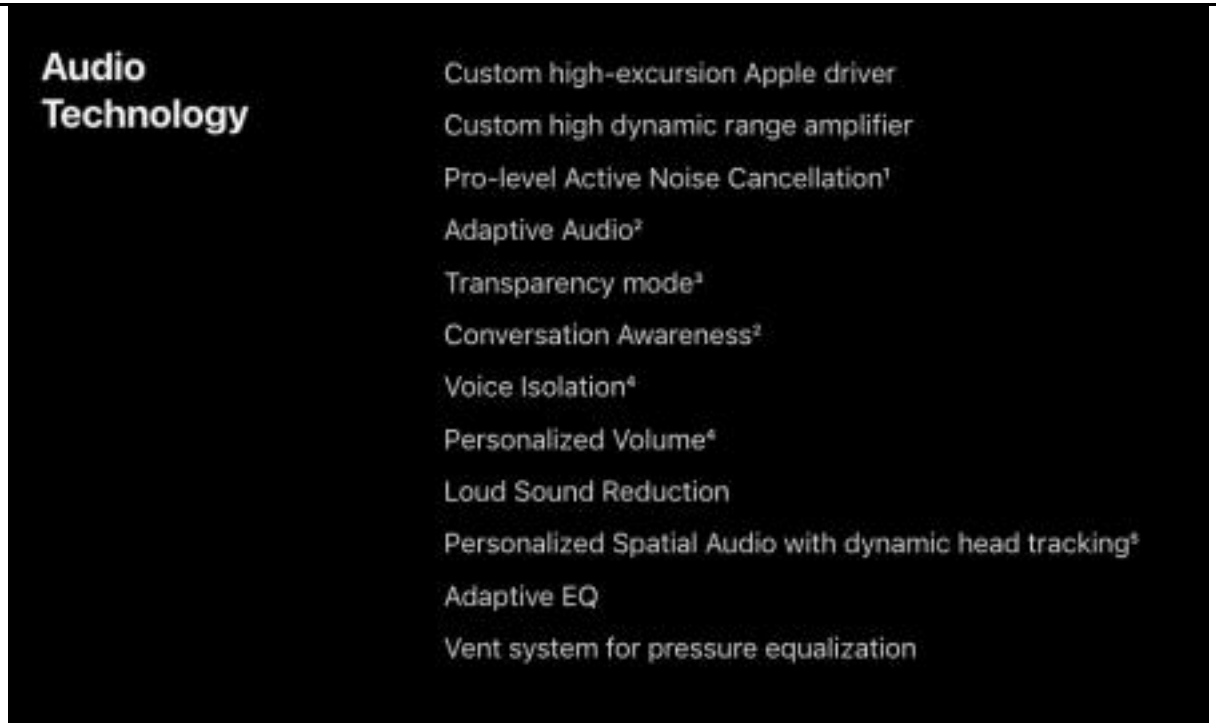
11,921,355 Claim 10	Evidence
10. A head-worn personal electronic apparatus as recited in claim 7,	Every claim limitation of claim 7 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
10a. wherein the electronic circuitry is configured to: determine an ambient noise level based on at least the ambient sound input, wherein the ambient audio output signal is dependent on the ambient noise level.	Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises electronic circuitry including at least an integrated circuit. *See* Claim 1c, *supra*. The electronic circuitry is configured to determine an ambient noise level based on at least the ambient sound input, wherein the ambient audio output signal is dependent on the ambient noise level. Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises a second microphone configured to pick up at least ambient sound input associated with an environment in the vicinity of the head-worn personal electronic apparatus. *See* Claim 7b, *supra*. The electronic circuitry of the Accused Instrumentalities determines an ambient noise level based on at least the ambient sound input and ambient noise level. The electronic circuitry further provides at least the ambient audio output signal to the at least one speaker, wherein the ambient audio output signal is dependent upon the ambient noise level. For example, noise-cancelling mode cancels out the sound surrounding the user. This is done using the ambient audio output signal based on at least the ambient sound input and ambient noise level. The speaker is used to play only the desired audio content while suppressing external noise.

Switch between noise control modes on AirPods 4 (ANC), AirPods Pro, or AirPods Max

You can switch between noise control modes while listening to audio on AirPods 4 with Active Noise Cancellation (ANC), AirPods Pro, or AirPods Max.

- *Adaptive Audio on AirPods Pro 2 and AirPods 4 (ANC):* Combines Active Noise Cancellation and Transparency mode into one additional mode, which automatically adjusts the level of noise control based on the changing noise conditions in your environment.
- *Active Noise Cancellation:* Blocks out external noise to help you focus.
- *Transparency mode:* Lets you hear the sounds around you.
- *Off:* Turns off all noise control modes.

Source: Switch between noise control modes - Apple Support (INGENIOSPEC-014039-014043) (available from https://support.apple.com/guide/airpods/switch-between-noise-control-modes-dev9812f5cc3/1.0/web/1.0).



Source: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).

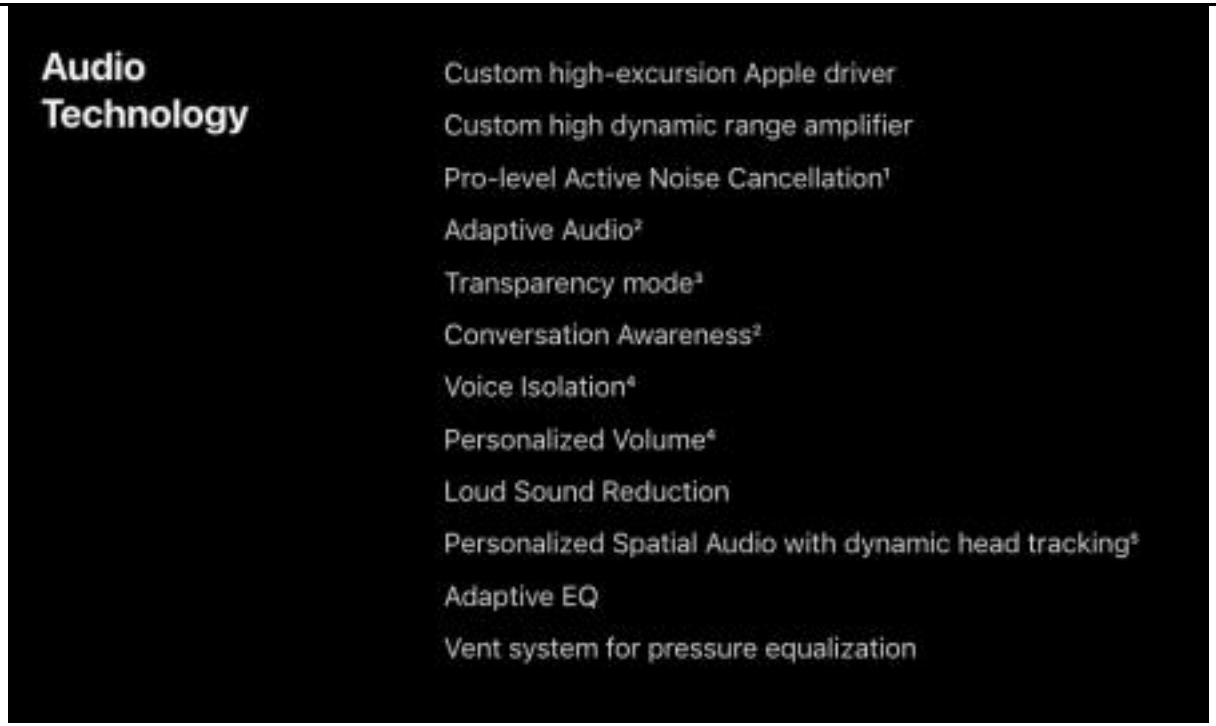
As another example, transparency mode allows the user to still hear their surroundings. This is done using the ambient audio output signal based on at least the ambient sound input and ambient noise level. The speaker is used to play both the external ambient sounds and the audio content for the user.

Switch between noise control modes on AirPods 4 (ANC), AirPods Pro, or AirPods Max

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Source: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).

Transparency mode makes it possible for listeners to stay connected to and aware of the world around them. Now, Adaptive Transparency takes this customer-loved feature even further. The powerful H2 chip enables on-device processing, which reduces loud environmental noise — like a passing vehicle siren, construction tools, or even loud speakers at a concert — for more comfortable everyday listening.

Source: Apple announces the next generation of AirPods Pro (INGENIOSPEC-013433-013441) (available from https://www.apple.com/newsroom/2022/09/apple-announces-the-next-generation-of-airpods-pro/).

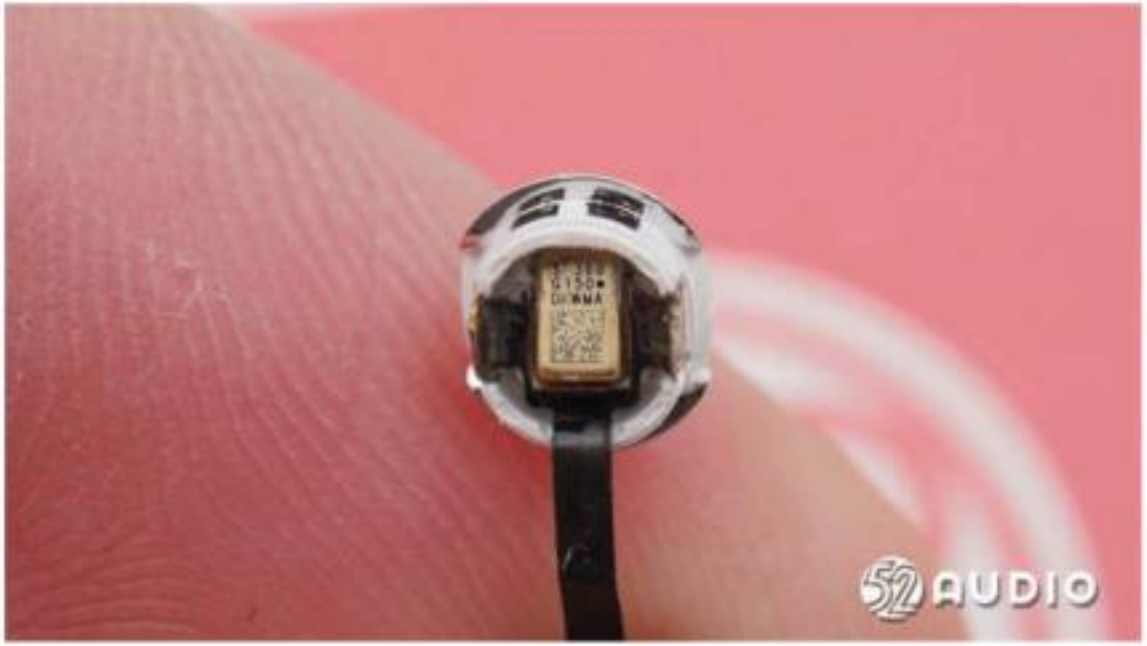
As another example, Personalize Volume learns the volume levels a user uses and the listening environments they regularly listen in. Personalized Volume uses this information to provide the user with the optimum listening experience. This is done using the ambient audio output signal based on at least the ambient sound input and ambient noise level. The speaker is used to play both the external ambient sounds and the audio content for the user.

Each of Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501;
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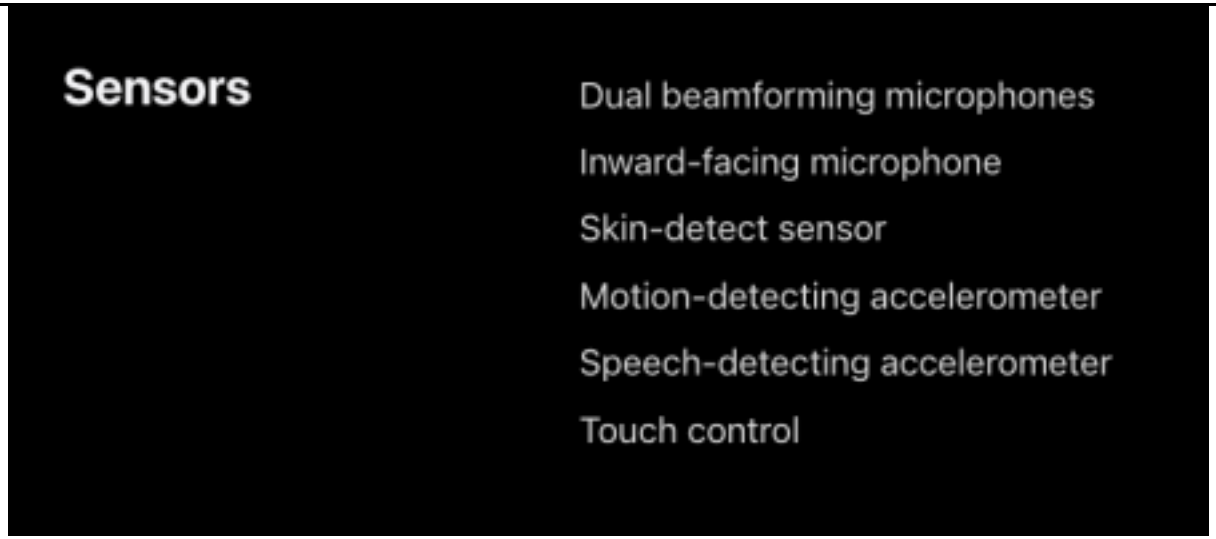
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Introducing AirPods Pro 3, the ultimate audio experience, available from https://www.apple.com/in/newsroom/2025/09/airpods-pro-3-introduce-the-ultimate-audio-experience/. *See* INGENIOSPEC-014239-014248;
		Beats Fit Pro	Use your Beats Fit Pro - Apple Support, available from https://support.apple.com/guide/beats/use-beats-fit-pro-dev6f7b5266d/web. *See* INGENIOSPEC-013661-013663; Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458;
		Beats Solo Pro	Solo Pro Press Release, available from https://www.beatsbydre.com/content/dam/beats/web/press/solo-pro/solo-pro-press-kit.zip. *See* INGENIOSPEC-014313-014314; Beats Solo Pro Unboxing and Hands-On, available from https://www.youtube.com/watch?v=PqQkg8FHGdU&t=3s. *See* INGENIOSPEC-013191, INGENIOSPEC-013192-013197; Solo Pro - Beats by Dre Archive 2, available from https://web.archive.org/web/20200602034251/https://www.beatsbydre.com/headphones/solo-pro. *See* INGENIOSPEC-013312-013323; Beats by Dre The New Solo Pro, available from https://www.youtube.com/watch?v=V2i1YkfrM54. *See* INGENIOSPEC-013152, INGENIOSPEC-013153-013157;
		Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds with video transcript, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013617-013632; Powerbeats Pro 2 - High Performance Earbuds, available from

	https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616; Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
11,921,355 Claim 11	**Evidence**
11. A head-worn personal electronic apparatus as recited in claim 1, wherein the head-worn personal electronic apparatus comprises:	Every claim limitation of claim 1 is present in the Accused Instrumentalities as described above and incorporated herein by reference.
11a. a first microphone; and	Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises a first microphone. For example, the first microphone can be configured to pick up at least audio input from at least the user.



Bottom pickup microphone.

Source: Apple AirPods Pro 2 Teardown: Upgrade Materials and Design (INGENIOSPEC-013701-013760) (available from https://www.qucox.com/apple-airpods-pro-2-teardown/).



Source: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).

The first microphone can capture at least the user's voice during phone calls, video conferences, or when issuing voice commands to Siri.

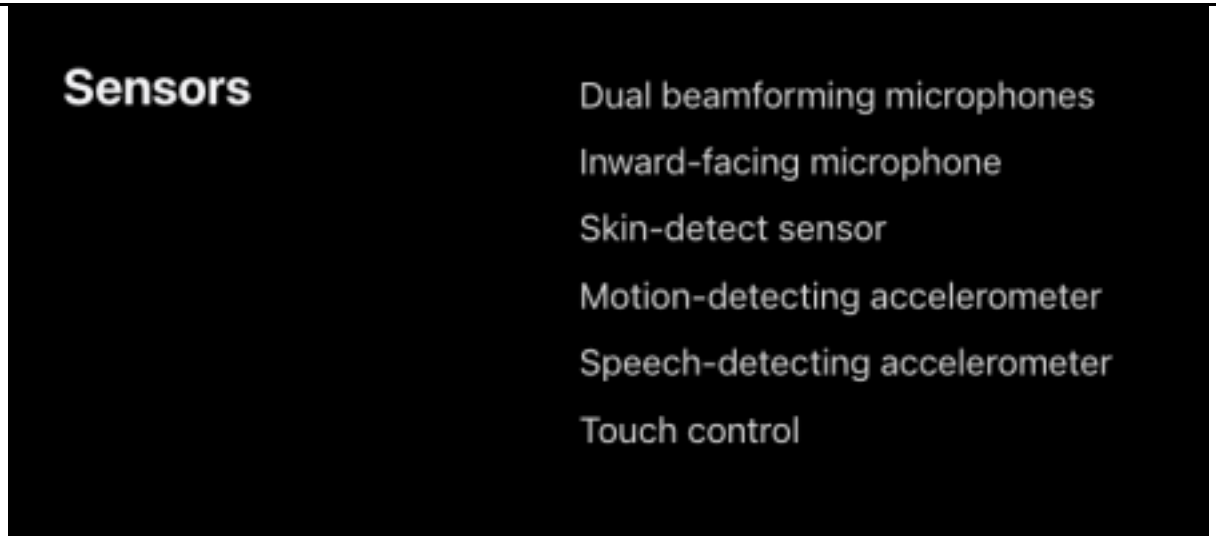
Each of Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

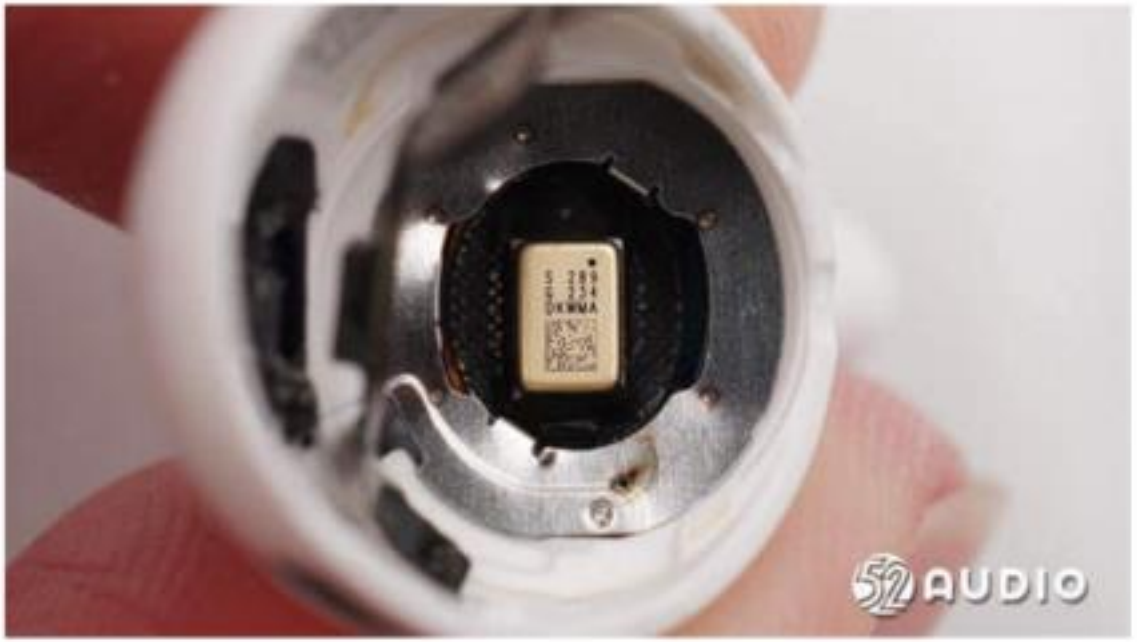
Device	**Citations**
Apple AirPods 4 with Active Noise Cancellation	Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; AirPods 4 - Technical Specifications, available from

			https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;
		Beats Fit Pro	Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458; Teardown Report: Beats Fit Pro, available from https://www.52audio.com/archives/98994.html. *See* INGENIOSPEC-014407-014463;
		Beats Solo Pro	Replacement Parts List, available from https://www.joesge.com/products/beats-solo-pro-wireless-headphones-repair-parts?srsltid=AfmBOoohkWL6z6LfgJ6-r9iZYIxup4uhO-LU6DQhzGFOFk4vPOj3vouM. *See* INGENIOSPEC-013836-013844; Solo Pro Press Release, available from https://www.beatsbydre.com/content/dam/beats/web/press/solo-pro/solo-pro-press-kit.zip. *See* INGENIOSPEC-014313-014314;

	Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	
11b. a second microphone;	Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises a second microphone. For example, the second microphone can be configured to pick up at least environmental audio input associated with an environment in the vicinity of the head-worn wearable electronic device.	

	 **Source**: Noise-Cancelling Microphones Image from AirPods Pro2 (INGENIOSPEC-014019-014019) (available from https://www.apple.com/airpods-pro/).

	 **Source**: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).



A metal protective cover is arranged above the noise cancellation microphone.

Source: Apple AirPods Pro 2 Teardown: Upgrade Materials and Design (INGENIOSPEC-013701-013760) (available from https://www.qucox.com/apple-airpods-pro-2-teardown/).

For example, the second microphone can be positioned to be directed away from the user when the head-worn wearable electronic device is being worn by the user. The second microphone can help reduce environmental noise from desired audio.

Each of Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

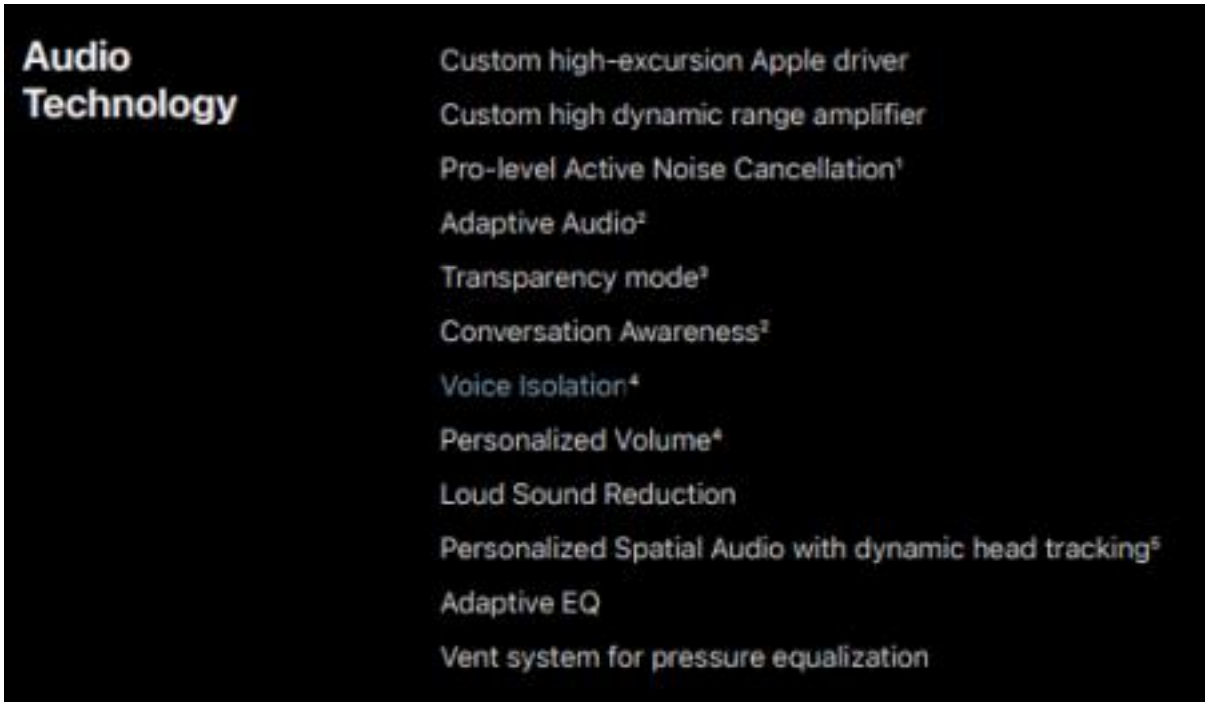
Device	**Citations**
Apple AirPods 4 with Active Noise Cancellation	Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117;
Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;
Beats Fit Pro	Teardown Report: Beats Fit Pro, available from https://www.52audio.com/archives/98994.html. *See* INGENIOSPEC-014407-014463; Beats Fit Pro True Wireless Earbuds — Beats Black, available from https://www.apple.com/shop/product/MK2F3LL/A/beats-fit-pro-true-wireless-earbuds-beats-black. *See* INGENIOSPEC-013302-013309;

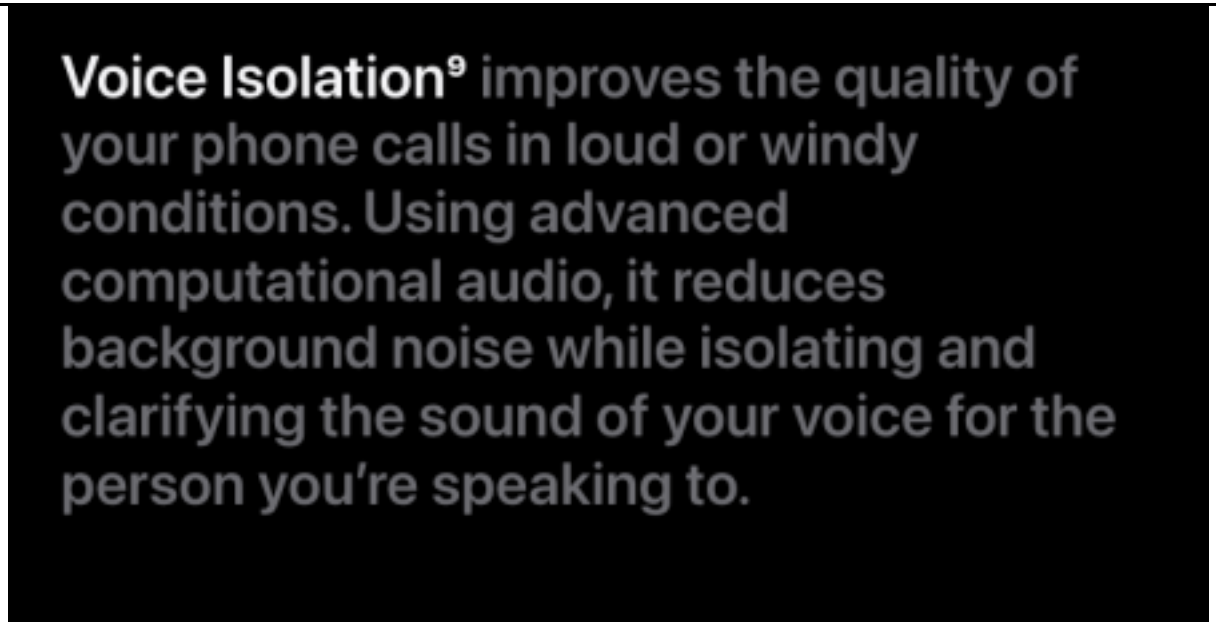
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<tr><td>Beats Solo Pro</td><td>Beats-Solo-Pro-Wireless-Headphones-User-Guide, available from https://manuals.plus/wp-content/uploads/2023/05/Beats-Solo-Pro-Wireless-Headphones-User-Guide.pdf. See INGENIOSPEC-013808-013835;
Solo Pro - Beats by Dre Archive 2, available from https://web.archive.org/web/20200602034251/https://www.beatsbydre.com/headphones/solo-pro. See INGENIOSPEC-013312-013323;
Solo Pro Press Release, available from https://www.beatsbydre.com/content/dam/beats/web/press/solo-pro/solo-pro-press-kit.zip. See INGENIOSPEC-014313-014314;</td></tr>
<tr><td>Powerbeats Pro 2</td><td>Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. See INGENIOSPEC-013602-013616;</td></tr>
</table>
Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
</td></tr>
<tr><td>11c. wherein the first microphone is configured to pick up at least audio input from at least the user, wherein the second microphone is configured to pick up at least environmental audio input associated with an environment in the</td><td>Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises a first microphone configured to pick up at least audio input from at least the user. See Claim 11a, supra.

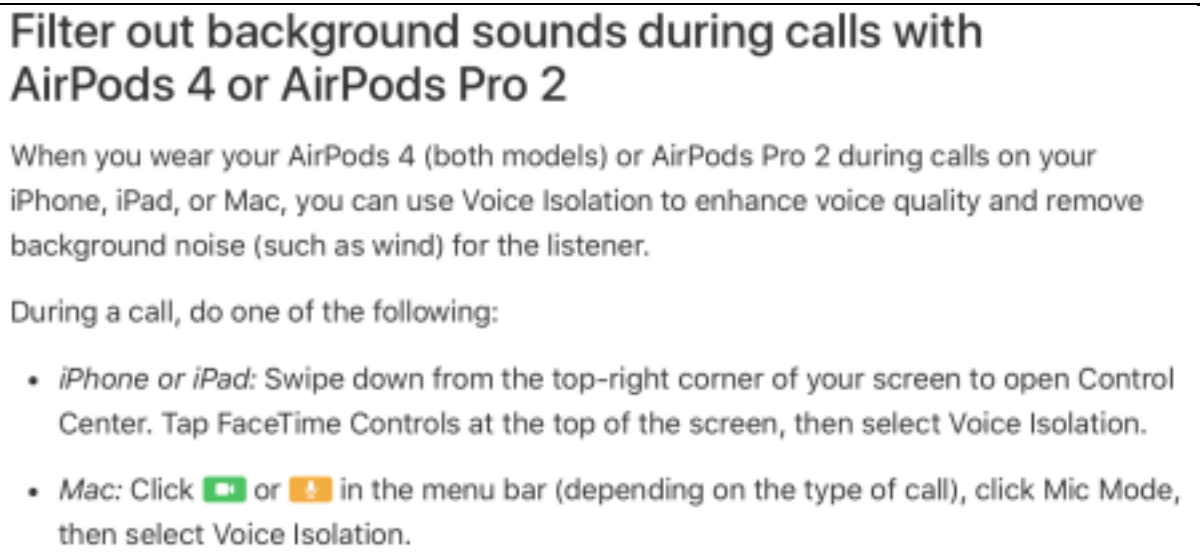
Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises a second microphone configured to pick up at least environmental audio input associated with an environment in the vicinity of the head-worn wearable electronic device. See Claim 11b, supra.

Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises electronic circuitry including at least an integrated circuit. See Claim 1c, supra. The electronic circuitry is configured to process the audio input from at least the user picked-up via the first microphone to remove at least a portion of the environmental audio input associated with the environment picked-up via the second microphone.

For example, Apple's Voice Isolation uses the first microphone to capture at least the user’s speech, while the second microphone captures at least the ambient noise. The apparatus then processes these inputs together to</td></tr>
</table>

vicinity of the head-worn wearable electronic device, and wherein the electronic circuitry is configured to process the audio input from at least the user picked-up via the first microphone to remove at least a portion of the environmental audio input associated with the environment picked-up via the second microphone.	remove or suppress at least a portion of the ambient noise picked up by the second microphone, so the user's speech less interfered with by the ambient noise.  **Source**: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).

	 **Source**: AirPods Pro 2 - Apple (INGENIOSPEC-013541-013563) (available from https://web.archive.org/web/20250904180656/https:/www.apple.com/airpods-pro/).



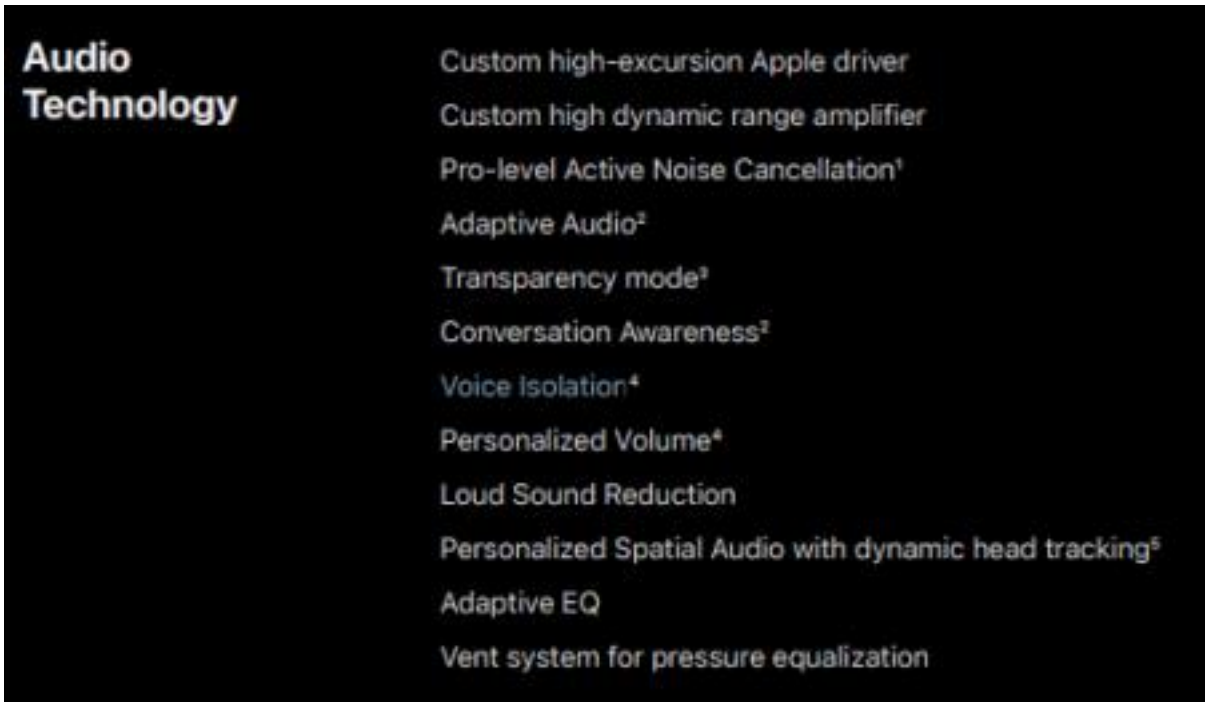
Source: Make and answer calls - Apple Support (INGENIOSPEC-014036-014038) (available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0).

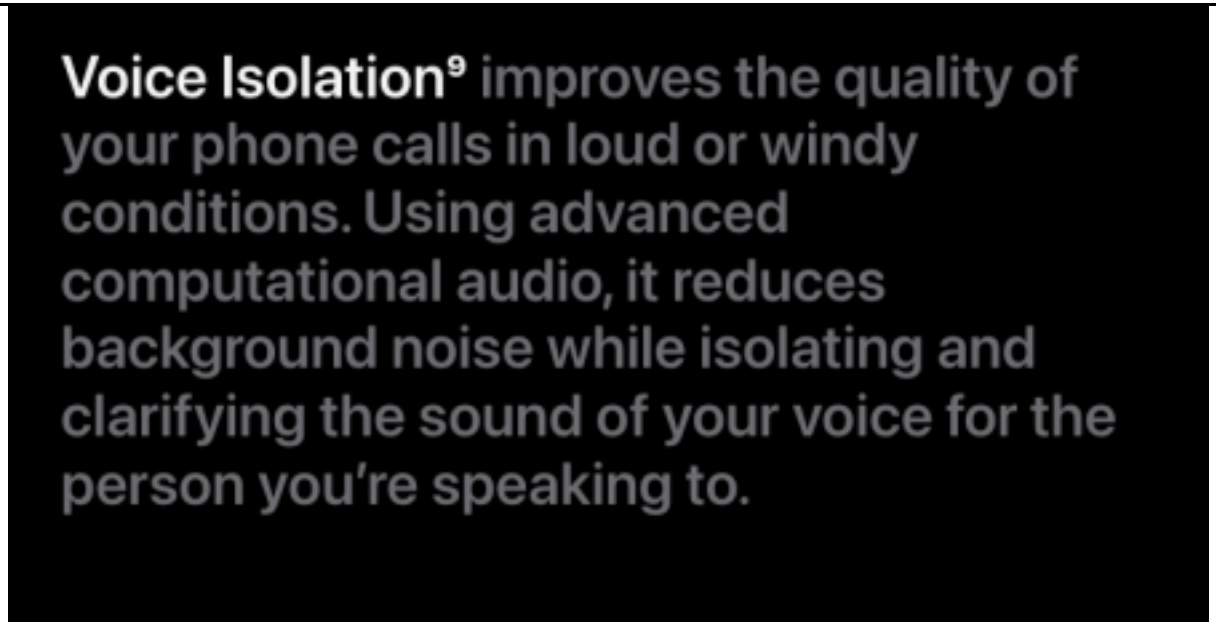
Each of Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038;

		Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501;
	Apple AirPods Pro 1	How To Enable Voice Isolation On AirPods - YouTube, available from https://www.youtube.com/watch?v=_gpVEHX7WOw. *See* INGENIOSPEC-014672-014674; AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056;
	Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;
	Beats Fit Pro	Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458;
	Beats Solo Pro	Solo Pro Press Release, available from https://www.beatsbydre.com/content/dam/beats/web/press/solo-pro/solo-pro-press-kit.zip. *See* INGENIOSPEC-014313-014314;
	Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	

11,921,355 Claim 12	Evidence
12. A head-worn personal electronic apparatus as recited in claim 1, wherein the head-worn wearable electronic device comprises at least a first microphone and a second microphone, wherein the first microphone is configured to pick up at least audio sound from at least the user, wherein the second microphone is configured to pick up at least ambient noise associated with an environment in the vicinity of the head-worn wearable electronic device, and wherein the electronic circuitry is configured to:	Every claim limitation of claim 1 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, is a head-worn personal electronic apparatus as recited in Claim 1. *See* Claim 1, *supra*. The Accused Instrumentalities comprise a first microphone configured to pick up at least audio sound from at least the user. *See* Claim 11, *supra*. The Accused Instrumentalities also comprise a second microphone configured to pick up at least ambient noise associated with an environment in the vicinity of the head-worn wearable electronic device. *See* Claim 11, *supra*. Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.

12a. determine an ambient noise level based on at least the ambient noise; and modify at least a portion of the audio sound picked-up via the first microphone, with the modification being at least in part dependent on the ambient noise level.	Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises electronic circuitry including at least an integrated circuit. *See* Claim 1c, *supra*. The electronic circuitry is configured to determine an ambient noise level based on at least the ambient noise and modify at least a portion of the audio sound picked-up via the first microphone, with the modification being at least in part dependent on the ambient noise level. For example, Apple's Voice Isolation uses the first microphone to capture at least the user's speech, while the second microphone captures at least the ambient noise. The apparatus then processes these inputs together to remove or suppress at least a portion of the ambient noise picked up by the second microphone, so the user's speech less interfered with by the ambient noise.  **Source**: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).



Source: AirPods Pro 2 - Apple (INGENIOSPEC-013541-013563) (available from https://web.archive.org/web/20250904180656/https:/www.apple.com/airpods-pro/).

Filter out background sounds during calls with AirPods 4 or AirPods Pro 2

When you wear your AirPods 4 (both models) or AirPods Pro 2 during calls on your iPhone, iPad, or Mac, you can use Voice Isolation to enhance voice quality and remove background noise (such as wind) for the listener.

During a call, do one of the following:

- *iPhone or iPad:* Swipe down from the top-right corner of your screen to open Control Center. Tap FaceTime Controls at the top of the screen, then select Voice Isolation.
- *Mac:* Click  or  in the menu bar (depending on the type of call), click Mic Mode, then select Voice Isolation.

Source: Make and answer calls - Apple Support (INGENIOSPEC-014036-014038) (available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0).

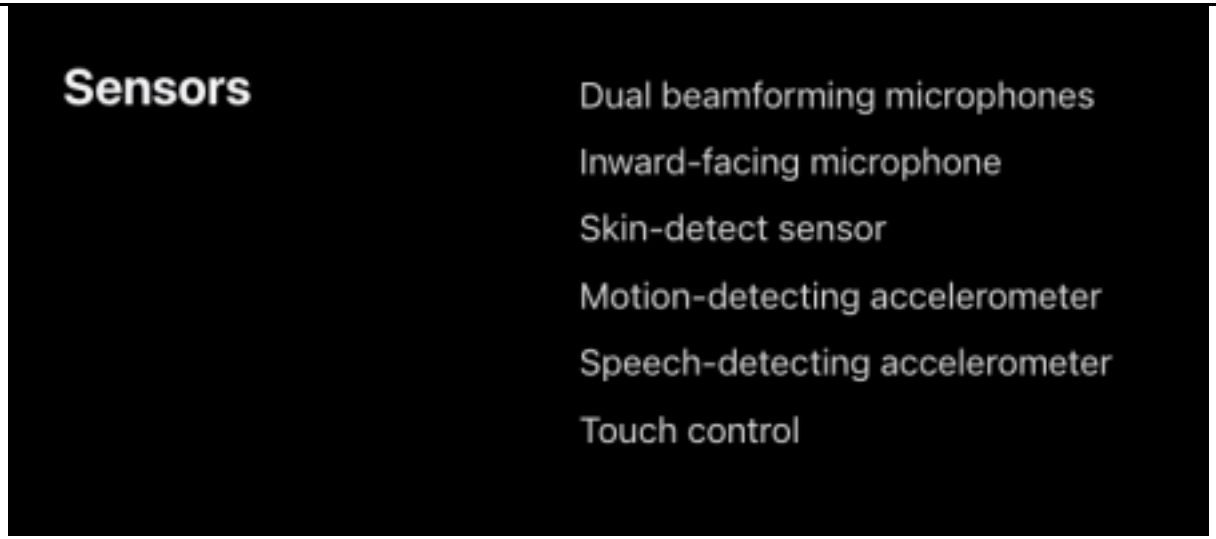
As another example, Personalize Volume learns the volume levels a user uses and the listening environments they regularly listen in. Personalized Volume uses this information to provide the user with the optimum listening experience. The ambient audio output signal is based on at least an ambient noise level, where the ambient noise level is determined based on the ambient sound input. The speaker is used to play output the desired audio content.

Each of Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**

		Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501;
		Apple AirPods Pro 1	How To Enable Voice Isolation On AirPods - YouTube, available from https://www.youtube.com/watch?v=_gpVEHX7WOw. *See* INGENIOSPEC-014672-014674; AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;
		Beats Fit Pro	Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458;
		Beats Solo Pro	Solo Pro Press Release, available from https://www.beatsbydre.com/content/dam/beats/web/press/solo-pro/solo-pro-press-kit.zip. *See* INGENIOSPEC-014313-014314;

	Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	
11,921,355 Claim 13	**Evidence**	
13. A head-worn personal electronic apparatus as recited in claim 1, wherein the head-worn personal electronic apparatus comprises:	Every claim limitation of claim 1 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	
13a. a radiation detector configured to capture radiation data,	Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises a radiation detector configured to capture radiation data. The radiation detector is an infrared light detector. The radiation detector is configured to detect radiation from an infrared light emitter. The radiation detector can help determine if the device is being worn based upon the detected infrared light.	



Source: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).

Turn off automatic ear detection

Your AirPods Pro automatically stop playing audio when you take them off, and resume playback when you put them back on. You can change this setting.

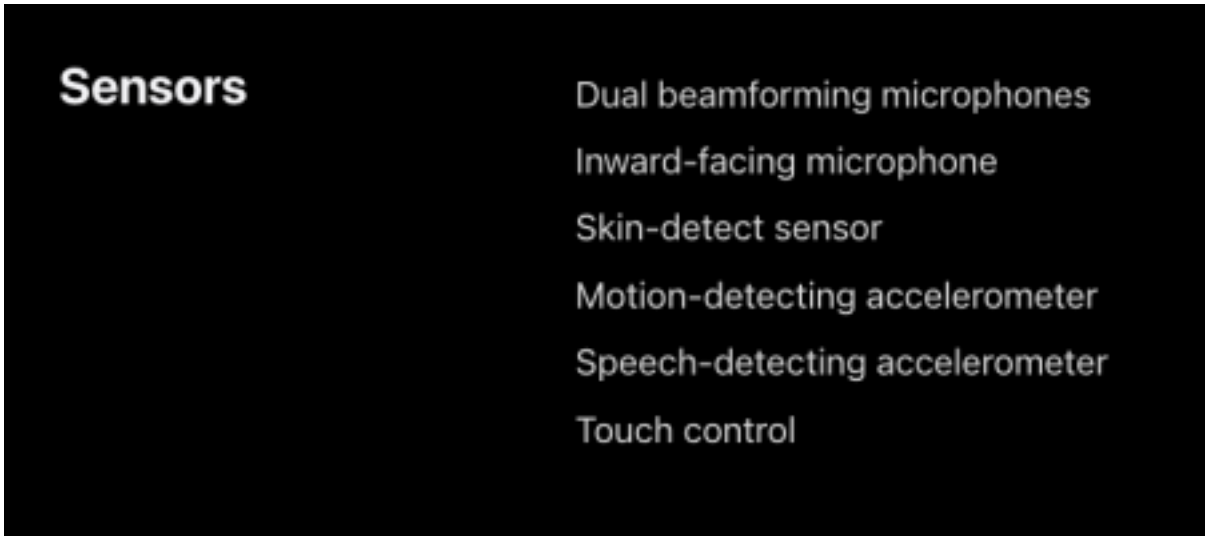
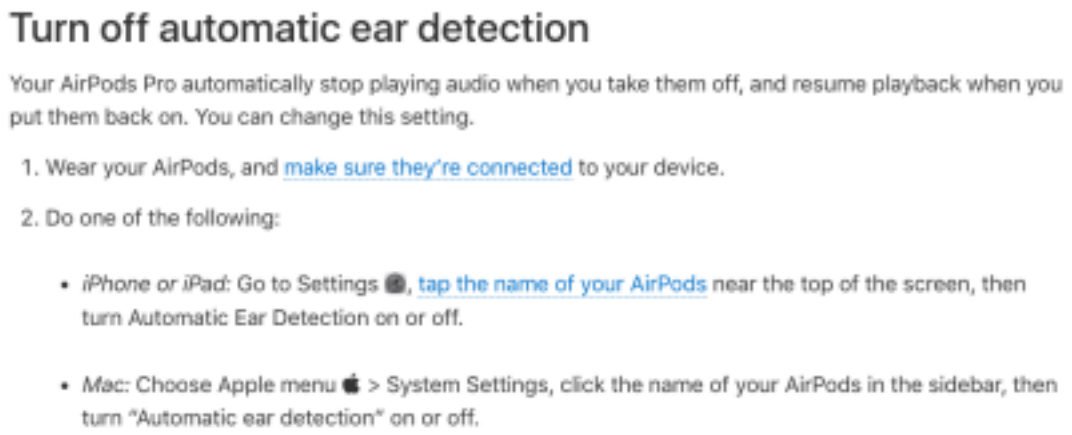
1. Wear your AirPods, and make sure they're connected to your device.
2. Do one of the following:
   - *iPhone or iPad:* Go to Settings, tap the name of your AirPods near the top of the screen, then turn Automatic Ear Detection on or off.
   - *Mac:* Choose Apple menu > System Settings, click the name of your AirPods in the sidebar, then turn "Automatic ear detection" on or off.

Source: Change settings for AirPods Pro 1 and 2 (INGENIOSPEC-014030-014032) (available from https://support.apple.com/guide/airpods/change-settings-for-airpods-pro-1-and-2-dev6cbd13615/1.0/web/1.0#devc07789cad).

Each of Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; Change the settings of your AirPods and AirPods Pro - Apple Support, available from https://support.apple.com/en-us/108764. *See* INGENIOSPEC-013692-013694;
Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Change settings for AirPods Pro 1 and 2, available from https://support.apple.com/guide/airpods/change-settings-for-airpods-pro-1-and-2-

		dev6cbd13615/1.0/web/1.0#devc07789cad. *See* INGENIOSPEC-014030-014032;
	Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;
	Beats Fit Pro	Beats User Guide - Turn Beats Automatic Ear Detection On or Off, available from https://support.apple.com/guide/beats/turn-automatic-ear-detection-on-or-off-dev82c456e13/1.0/web/1.0. *See* INGENIOSPEC-013657-013657; Customize controls on your Beats, available from https://support.apple.com/guide/beats/customize-beats-controls-dev9eeff2d7b/web. *See* INGENIOSPEC-013658-013658; Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458;
	Powerbeats Pro 2	Powerbeats Pro 2, available from https://www.beatsbydre.com/earbuds/powerbeats-pro-2/MX743/electric-orange. *See* INGENIOSPEC-013371-013387;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	
13b. wherein the electronic circuitry is configured to process at least the radiation data	Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises electronic circuitry including at least an integrated circuit. *See* Claim 1c, *supra*. The electronic circuitry is configured to process at least the radiation data captured by the radiation detector. For example, the electronic circuitry, including at least an integrated circuit, processes the data from the radiation detector, along with other signal inputs, to determine if the device is being worn based upon the detected infrared radiation. As such, the electronic circuitry of the	

captured by the radiation detector, and wherein the electronic circuitry is configured to determine whether the head-worn personal electronic apparatus is being worn by a user based on at least the processed radiation data.	Accused Instrumentalities is configured to determine whether the device is being worn by a user based on at least the processed radiation data.  **Source**: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).  Turn off automatic ear detection Your AirPods Pro automatically stop playing audio when you take them off, and resume playback when you put them back on. You can change this setting. 1. Wear your AirPods, and make sure they're connected to your device. 2. Do one of the following: • *iPhone or iPad*: Go to Settings, tap the name of your AirPods near the top of the screen, then turn Automatic Ear Detection on or off. • *Mac*: Choose Apple menu > System Settings, click the name of your AirPods in the sidebar, then turn "Automatic ear detection" on or off.

Source: Change settings for AirPods Pro 1 and 2 (INGENIOSPEC-014030-014032) (available from https://support.apple.com/guide/airpods/change-settings-for-airpods-pro-1-and-2-dev6cbd13615/1.0/web/1.0#devc07789cad).

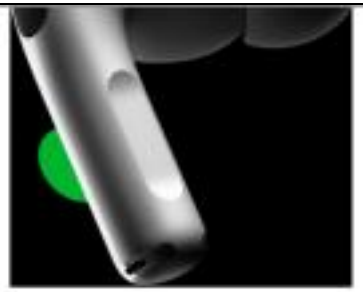
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Device	**Citations**
Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; Change the settings of your AirPods and AirPods Pro - Apple Support, available from https://support.apple.com/en-us/108764. *See* INGENIOSPEC-013692-013694;
Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Change settings for AirPods Pro 1 and 2, available from https://support.apple.com/guide/airpods/change-settings-for-airpods-pro-1-and-2-

		dev6cbd13615/1.0/web/1.0#devc07789cad. *See* INGENIOSPEC-014030-014032;
	Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;
	Beats Fit Pro	Beats User Guide - Turn Beats Automatic Ear Detection On or Off, available from https://support.apple.com/guide/beats/turn-automatic-ear-detection-on-or-off-dev82c456e13/1.0/web/1.0. *See* INGENIOSPEC-013657-013657; Customize controls on your Beats, available from https://support.apple.com/guide/beats/customize-beats-controls-dev9eeff2d7b/web. *See* INGENIOSPEC-013658-013658; Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458;
	Powerbeats Pro 2	Powerbeats Pro 2, available from https://www.beatsbydre.com/earbuds/powerbeats-pro-2/MX743/electric-orange. *See* INGENIOSPEC-013371-013387;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	

11,921,355 Claim 14	**Evidence**
14. A head-worn personal electronic apparatus as recited	Every claim limitation of claim 1 is present in the Accused Instrumentalities as described above and incorporated herein by reference.

in claim 1, wherein the head-worn personal electronic apparatus includes a force sensor configured to receive a user input based at least on sensing force applied to the force sensor, and wherein the force sensor is configured to detect the user input, the detected user input operating to alter at least an operation of the head-worn wearable electronic device.	Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, includes a force sensor. The force sensor is configured to receive a user input based at least on sensing force applied to the force sensor (e.g., when a user squeezes the force sensor). As such, the force sensor is configured to detect the user input, and the detected user input alters at least an operation of the head-worn wearable electronic device. For example, based upon input to the pressure sensor (e.g., a squeeze), the Apple AirPods Pro 2 may play or pause audio, skip to the next or previous track in a playlist, answer a phone call, or activate Siri, among other actions.



Just touch
to adjust.

Touch control lets you manage playback functions from the stem. Swipe up or down to adjust volume, press to play and pause music or mute and unmute yourself on calls, and press twice to end a call. You can also hold the stem to switch between listening modes.

Source: AirPods Pro 2 - Apple (INGENIOSPEC-013541-013563) (available from https://web.archive.org/web/20250904180656/https:/www.apple.com/airpods-pro/).

AirPods Pro 2 controls and gestures



With the Touch control on the stem of both AirPods Pro 2, you can do any of the following:

- *Play and pause audio:* Press the stem. To resume playback, press it again.
- *Play the next track:* Double-press the stem.
- *Play the previous track:* Triple-press the stem.
- *Answer a call:* When you receive a call, press the stem.
- *Adjust volume:* Lightly swipe up or down on the stem.

  You can also turn on Personalized Volume to automatically adjust the volume based on listening preferences and your environment. See Use Conversation Awareness or Personalized Volume.
- *Switch between Active Noise Cancellation, Transparency mode, and Adaptive Audio:* You can set either of your AirPods to perform this action when you press and hold the stem. See Change what the force sensor or Touch control does.
- *Activate Siri:* You can set either of your AirPods to perform this action when you press and hold the stem. See Use Siri with AirPods.

Use head gestures to respond to Siri

- *Accept a call or reply to notifications and messages:* Nod your head up and down.
- *Decline a call or dismiss notifications and messages:* Shake your head side to side.

Note: To use head gestures to respond to Siri, Announce Calls and Announce Notifications must be on. See Use Siri to announce calls or notifications.

Source: Use controls and gestures with your AirPods - Apple Support (INGENIOSPEC-014024-014029) (available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/1.0/web/1.0).

Make and answer calls

1. Wear your AirPods and make sure they're connected to your iPhone, iPad, or Apple Watch (with cellular or Wi-Fi).
2. Do one of the following:
   - *Make a call:* Say "Hey Siri," or press and hold the force sensor, then say something like "Call Eliza's mobile." On an iPad without cellular, say something like "Make a FaceTime call."

     You can also make a call on your device, such as in the FaceTime app or Phone app.
   - *Answer a call:* Press the stem once on either of your AirPods.

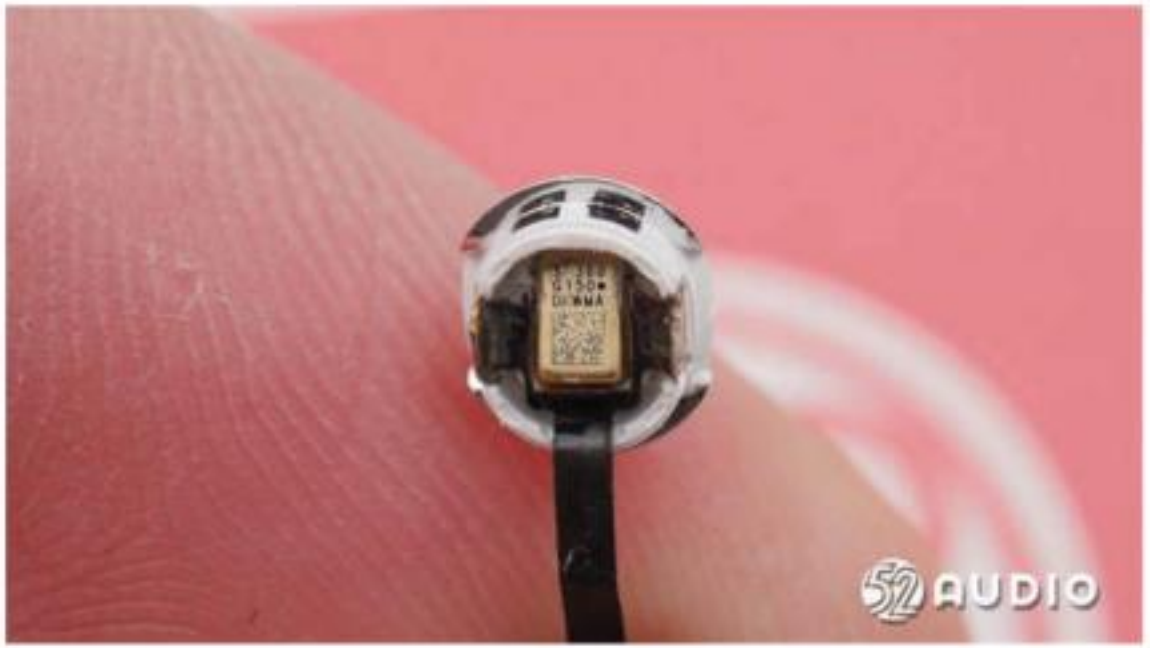
Source: Make and answer calls - Apple Support (INGENIOSPEC-014036-014038) (available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0).

Each of Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1 and Apple AirPods Pro 3 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Pause, skip, and adjust volume with your AirPods and AirPods Pro, available from https://support.apple.com/en-

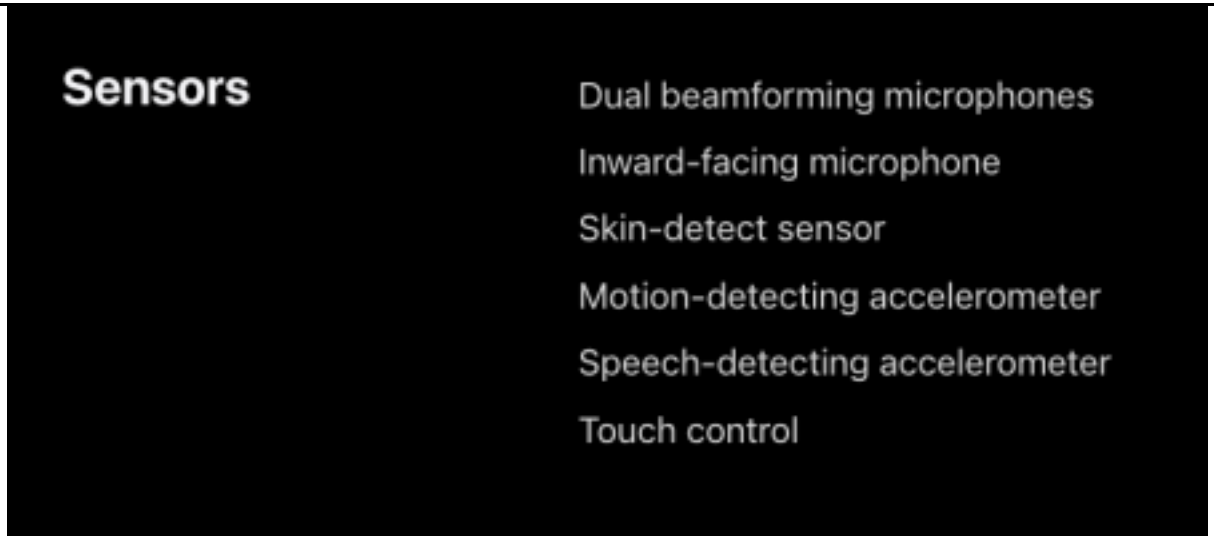
		us/102628. *See* INGENIOSPEC-013298-013301; Use controls and gestures with your AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/1.0/web/1.0. *See* INGENIOSPEC-014024-014029;
	Apple AirPods Pro 1	Use controls and gestures with your AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/1.0/web/1.0. *See* INGENIOSPEC-014024-014029; Pause, skip, and adjust volume with your AirPods and AirPods Pro, available from https://support.apple.com/en-us/102628. *See* INGENIOSPEC-013298-013301; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075;
	Apple AirPods Pro 3	Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533; Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	

11,921,355 Claim 15	Evidence
15. A head-worn personal electronic apparatus as recited in claim 14, wherein the head-worn personal electronic apparatus comprises:	Every claim limitation of claim 14 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
15a. a first microphone at least partially contained within the head-worn personal electronic apparatus, the first microphone being positioned to pick up at least audio input from at least the user; and	Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises a first microphone at least partially contained within the head-worn personal electronic apparatus. The first microphone is positioned to pick up at least audio input from at least the user.



Bottom pickup microphone.

Source: Apple AirPods Pro 2 Teardown: Upgrade Materials and Design (INGENIOSPEC-013701-013760) (available from https://www.qucox.com/apple-airpods-pro-2-teardown/).



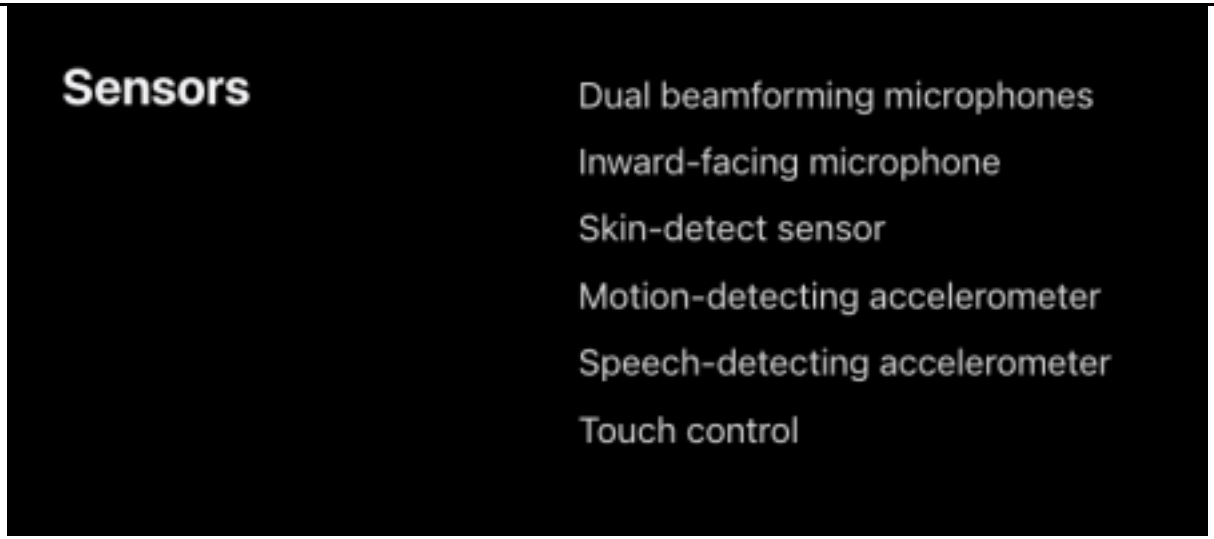
Source: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).

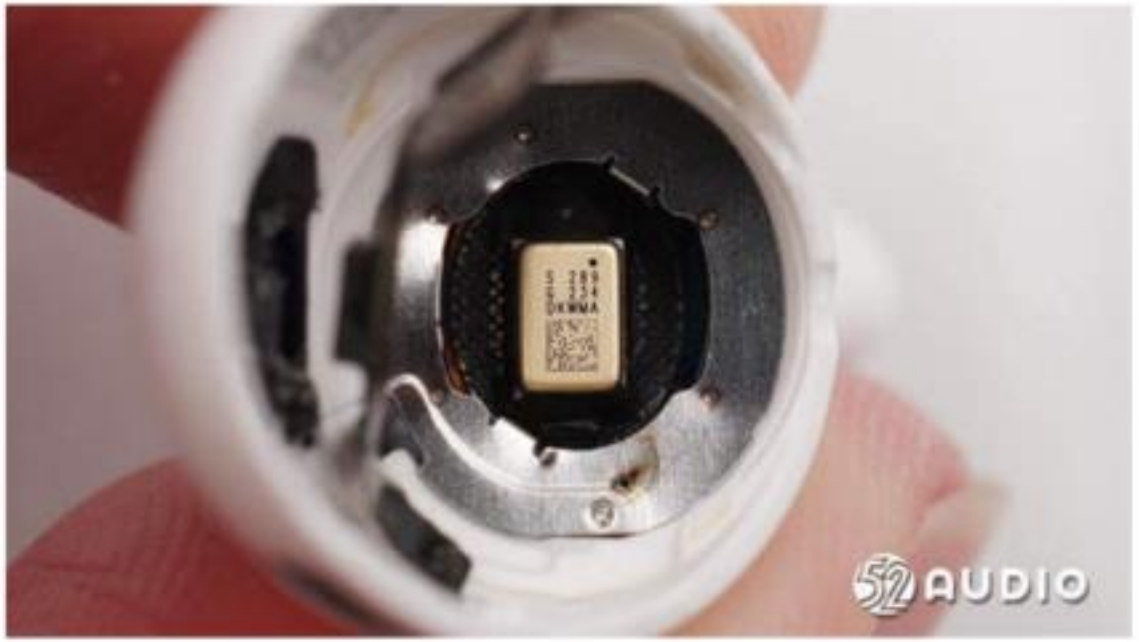
Each of Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1 and Apple AirPods Pro 3 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 4 with Active Noise Cancellation	Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;

<table>
<tr><td></td><td>
<table>
<tr><td>Apple AirPods Pro 1</td><td>AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. See INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. See INGENIOSPEC-014057-014075;</td></tr>
<tr><td>Apple AirPods Pro 3</td><td>Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. See INGENIOSPEC-014249-014255;</td></tr>
</table>
Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
</td></tr>
<tr><td>15b. a second microphone at least partially contained within the head-worn personal electronic apparatus, the second microphone being positioned to pick up at least environmental audio input associated with an environment around the head-worn personal electronic apparatus,</td><td>Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises a second microphone at least partially contained within the head-worn personal electronic apparatus. The first microphone is positioned to pick up at least environmental audio input associated with an environment around the head-worn personal electronic apparatus.</td></tr>
</table>

	 **Source**: Noise-Cancelling Microphones Image from AirPods Pro2 (INGENIOSPEC-014019-014019) (available from https://www.apple.com/airpods-pro/).

	 **Source**: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).



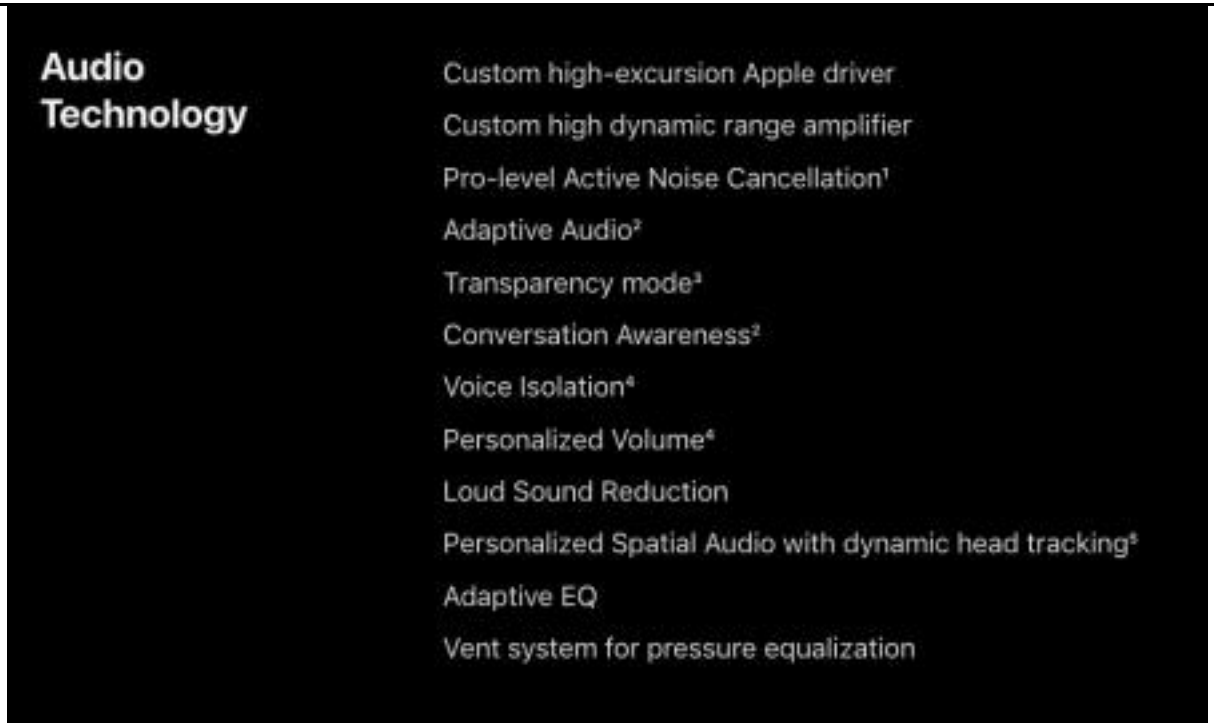
A metal protective cover is arranged above the noise cancellation microphone.

Source: Apple AirPods Pro 2 Teardown: Upgrade Materials and Design (INGENIOSPEC-013701-013760) (available from https://www.qucox.com/apple-airpods-pro-2-teardown/).

Each of Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1 and Apple AirPods Pro 3 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

	Device	**Citations**
	Apple AirPods 4 with Active Noise Cancellation	Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
	Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117;
	Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;

	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
15c. wherein the electronic circuitry is configured to modify the customized audio output signals to be output to the user via the at least one speaker to cancel at least a portion of noise associated with the environment, the modification of the customized audio output signals being dependent at least in part on the environmental audio input picked-up via the second microphone.	Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises electronic circuitry including at least an integrated circuit. *See* Claim 1c, *supra*. The electronic circuitry is configured to modify the customized audio output signals to be output to the user via the at least one speaker to cancel at least a portion of noise associated with the environment. The modification is dependent at least in part on the environmental audio input picked-up via the second microphone. For example, undesired noise can be at least partially canceled from the customized audio output signals. **Switch between noise control modes on AirPods 4 (ANC), AirPods Pro, or AirPods Max** You can switch between noise control modes while listening to audio on AirPods 4 with Active Noise Cancellation (ANC), AirPods Pro, or AirPods Max. • *Adaptive Audio on AirPods Pro 2 and AirPods 4 (ANC):* Combines Active Noise Cancellation and Transparency mode into one additional mode, which automatically adjusts the level of noise control based on the changing noise conditions in your environment. • *Active Noise Cancellation:* Blocks out external noise to help you focus. • *Transparency mode:* Lets you hear the sounds around you. • *Off:* Turns off all noise control modes. **Source**: Switch between noise control modes - Apple Support (INGENIOSPEC-014039-014043) (available from https://support.apple.com/guide/airpods/switch-between-noise-control-modes-dev9812f5cc3/1.0/web/1.0).



Source: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).

Each of Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1 and Apple AirPods Pro 3 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;

		Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501;
	Apple AirPods Pro 1	Switch between noise control modes - Apple Support, available from https://support.apple.com/guide/airpods/switch-between-noise-control-modes-dev9812f5cc3/1.0/web/1.0. *See* INGENIOSPEC-014039-014043; AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117;
	Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Introducing AirPods Pro 3, the ultimate audio experience, available from https://www.apple.com/in/newsroom/2025/09/airpods-pro-3-introduce-the-ultimate-audio-experience/. *See* INGENIOSPEC-014239-014248;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	

<table>
<tr><th>11,921,355
Claim 16</th><th>Evidence</th></tr>
<tr><td>16. A head-worn personal electronic apparatus as recited in claim 15, wherein the head-worn personal electronic apparatus comprises:</td><td>Every claim limitation of claim 15 is present in the Accused Instrumentalities as described above and incorporated herein by reference.

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.</td></tr>
<tr><td>16a. a radiation detector configured to capture radiation data,</td><td>See Claim 13a, supra.

Each of Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1 and Apple AirPods Pro 3 also meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

<table><tr><th>Device</th><th>Citations</th></tr><tr><td>Apple AirPods 4 with Active Noise Cancellation</td><td>AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. See INGENIOSPEC-014675-014686;
Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. See INGENIOSPEC-013761-013797;
Change the settings of your AirPods and AirPods Pro - Apple Support, available from https://support.apple.com/en-us/108764. See INGENIOSPEC-013692-013694;</td></tr><tr><td>Apple AirPods Pro 1</td><td>AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. See INGENIOSPEC-</td></tr></table></td></tr>
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		014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Change settings for AirPods Pro 1 and 2, available from https://support.apple.com/guide/airpods/change-settings-for-airpods-pro-1-and-2-dev6cbd13615/1.0/web/1.0#devc07789cad. *See* INGENIOSPEC-014030-014032;
	Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.

16b. wherein the electronic circuitry is configured to process at least the radiation data captured by the radiation detector, and configured to determine whether the head-worn personal electronic apparatus is being worn by a user based on at least the

See Claim 13b, *supra*.

Each of Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1 and Apple AirPods Pro 3 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-

processed radiation data.		teardown/. *See* INGENIOSPEC-013761-013797; Change the settings of your AirPods and AirPods Pro - Apple Support, available from https://support.apple.com/en-us/108764. *See* INGENIOSPEC-013692-013694;
	Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Change settings for AirPods Pro 1 and 2, available from https://support.apple.com/guide/airpods/change-settings-for-airpods-pro-1-and-2-dev6cbd13615/1.0/web/1.0#devc07789cad. *See* INGENIOSPEC-014030-014032;
	Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	

11,921,355 Claim 17	**Evidence**
17. A head-worn personal electronic apparatus operable to at least output	Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, is a head-worn personal electronic apparatus operable to at least output customized audio output as recited in Claim 1. *See* Claim 1, *supra*. Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro, Powerbeats Pro and Powerbeats Pro

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<tr>
<td>customized audio output, comprising:</td>
<td>2 also meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.
<table>
<tr><th>Device</th><th>Citations</th></tr>
<tr><td>Apple AirPods 2</td><td>AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. See INGENIOSPEC-013926-013932;
AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. See INGENIOSPEC-014277-014286;
If your left or right AirPod is not working, available from https://support.apple.com/en-us/100494. See INGENIOSPEC-013923-013925;
Apple AirPods 2 In-Depth Teardown Review by 52AUDIO, available from https://www.chargerlab.com/apple-airpod-2-in-depth-teardown-review/. See INGENIOSPEC-013937-014004;</td></tr>
<tr><td>Apple AirPods 3</td><td>Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. See INGENIOSPEC-014141-014150;
Apple AirPods 3 true wireless earphones teardown, available from https://www.qucox.com/apple-airpods-3-teardown/. See INGENIOSPEC-014163-014238;</td></tr>
<tr><td>Apple AirPods 4</td><td>AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. See INGENIOSPEC-014675-014686;
Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. See INGENIOSPEC-014260-014276;
Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. See INGENIOSPEC-013664-013691;</td></tr>
<tr><td>Apple AirPods 4 with Active</td><td>AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. See INGENIOSPEC-014675-014686;</td></tr>
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</table>

		Noise Cancellation	Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501; Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797;
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117; Switch between noise control modes - Apple Support, available from https://support.apple.com/guide/airpods/switch-between-noise-control-modes-dev9812f5cc3/1.0/web/1.0. *See* INGENIOSPEC-014039-014043; Customize Transparency mode and turn on Conversation Boost for AirPods Pro, available from https://support.apple.com/guide/airpods/customize-transparency-mode-turn-conversation-dev966f5f818/web. *See* INGENIOSPEC-014702-014703; AirPods Pro Teardown - iFixit, available from https://www.ifixit.com/Teardown/AirPods+Pro+Teardown/127551. *See* INGENIOSPEC-014076-014096; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075;
		Apple AirPods Pro 3	Introducing AirPods Pro 3, the ultimate audio experience, available from https://www.apple.com/in/newsroom/2025/09/airpods-pro-3-introduce-the-ultimate-audio-experience/. *See* INGENIOSPEC-014239-014248; Use the Hearing Aid feature on your AirPods Pro 2 or AirPods Pro 3, available from https://support.apple.com/en-us/120992. *See* INGENIOSPEC-013442-013448; Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;

		Beats Fit Pro	Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458; Use your Beats Fit Pro - Apple Support, available from https://support.apple.com/guide/beats/use-beats-fit-pro-dev6f7b5266d/web. *See* INGENIOSPEC-013661-013663; Teardown Report: Beats Fit Pro, available from https://www.52audio.com/archives/98994.html. *See* INGENIOSPEC-014407-014463;
		Beats Solo Pro	Solo Pro Headphones Support - Beats, available from https://www.beatsbydre.com/support/headphones/solo-pro. *See* INGENIOSPEC-013798-013803; Beats by Dre The New Solo Pro, available from https://www.youtube.com/watch?v=V2i1YkfrM54. *See* INGENIOSPEC-013152, INGENIOSPEC-013153-013157; Beats Solo Pro Unboxing and Hands-On, available from https://www.youtube.com/watch?v=PqQkg8FHGdU&t=3s. *See* INGENIOSPEC-013191, INGENIOSPEC-013192-013197; Solo Pro Press Release, available from https://www.beatsbydre.com/content/dam/beats/web/press/solo-pro/solo-pro-press-kit.zip. *See* INGENIOSPEC-014313-014314; Beats By Dre Solo Pro Wireless Bad Battery Replacement Fix Repair Tutorial, available from https://www.youtube.com/watch?v=SBeHaqnw45w. *See* INGENIOSPEC-013144, INGENIOSPEC-013145-013151; Beats User Guide - Pair Beats, available from https://support.apple.com/guide/beats/pair-beats-dev46c519179/1.0/web/1.0. *See* INGENIOSPEC-014011-014014; Solo Pro - Beats by Dre Archive 2, available from https://web.archive.org/web/20200602034251/https://www.beatsbydre.com/headphones/solo-pro. *See* INGENIOSPEC-013312-013323;
		Powerbeats Pro	Beats Global Press Room, available from https://www.beatsbydre.com/company/press. *See* INGENIOSPEC-014290-014297;

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<tr><td></td><td>
<table>
<tr><td></td><td>Powerbeats Pro - Apples Sporty AirPods Alternative - MacRumors, available from https://www.macrumors.com/guide/powerbeats-pro/. See INGENIOSPEC-013854-013882;
Wearing your AirPods, EarPods, or Beats device, available from https://support.apple.com/en-us/101598. See INGENIOSPEC-014301-014302;
How to get the best fit and sound with your Powerbeats Pro | Comfort, available from https://www.youtube.com/watch?v=I9t6YW3o-xc. See INGENIOSPEC-013232, INGENIOSPEC-013233-013237;
Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. See INGENIOSPEC-014287-014289;
Powerbeats Pro Teardown, available from https://www.youtube.com/watch?v=vEHwL59jOPg. See INGENIOSPEC-013271, INGENIOSPEC-013272-013277;</td></tr>
<tr><td>Powerbeats Pro 2</td><td>Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. See INGENIOSPEC-013602-013616;
Powerbeats Pro 2 - High Performance Earbuds with video transcript, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. See INGENIOSPEC-013617-013632;</td></tr>
</table>
Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
</td></tr>
<tr><td>17a. at least one speaker, the at least one speaker being configured to be wearable proximate to an ear of a user;</td><td>See Claim 1a.

Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro, Powerbeats Pro and Powerbeats Pro 2 also meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.</td></tr>
</table>

	Device	Citations
	Apple AirPods 2	If your left or right AirPod is not working, available from https://support.apple.com/en-us/100494. *See* INGENIOSPEC-013923-013925; Apple AirPods 2 In-Depth Teardown Review by 52AUDIO, available from https://www.chargerlab.com/apple-airpod-2-in-depth-teardown-review/. *See* INGENIOSPEC-013937-014004; AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286;
	Apple AirPods 3	Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150; Apple AirPods 3 true wireless earphones teardown, available from https://www.qucox.com/apple-airpods-3-teardown/. *See* INGENIOSPEC-014163-014238;
	Apple AirPods 4	Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. *See* INGENIOSPEC-013664-013691; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-014260-014276;
	Apple AirPods 4 with Active Noise Cancellation	Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501;

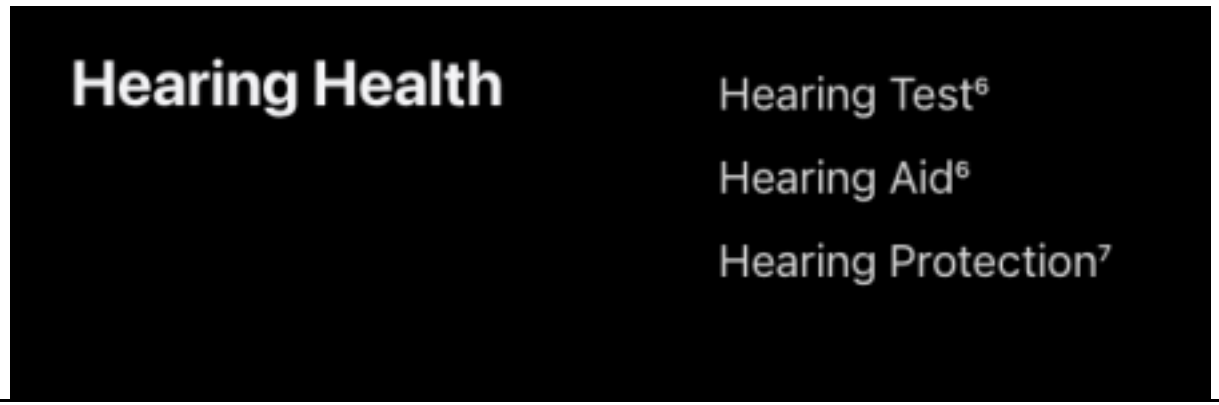
		Apple AirPods Pro 1	AirPods Pro Teardown - iFixit, available from https://www.ifixit.com/Teardown/AirPods+Pro+Teardown/127551. *See* INGENIOSPEC-014076-014096; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533; Introducing AirPods Pro 3, the ultimate audio experience, available from https://www.apple.com/in/newsroom/2025/09/airpods-pro-3-introduce-the-ultimate-audio-experience/. *See* INGENIOSPEC-014239-014248;
		Beats Fit Pro	Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458; Teardown Report: Beats Fit Pro, available from https://www.52audio.com/archives/98994.html. *See* INGENIOSPEC-014407-014463;
		Beats Solo Pro	Beats By Dre Solo Pro Wireless Bad Battery Replacement Fix Repair Tutorial, available from https://www.youtube.com/watch?v=SBeHaqnw45w. *See* INGENIOSPEC-013144, INGENIOSPEC-013145-013151; Solo Pro Press Release, available from https://www.beatsbydre.com/content/dam/beats/web/press/solo-pro/solo-pro-press-kit.zip. *See* INGENIOSPEC-014313-014314; Solo Pro Headphones Support - Beats, available from https://www.beatsbydre.com/support/headphones/solo-pro. *See* INGENIOSPEC-013798-013803;

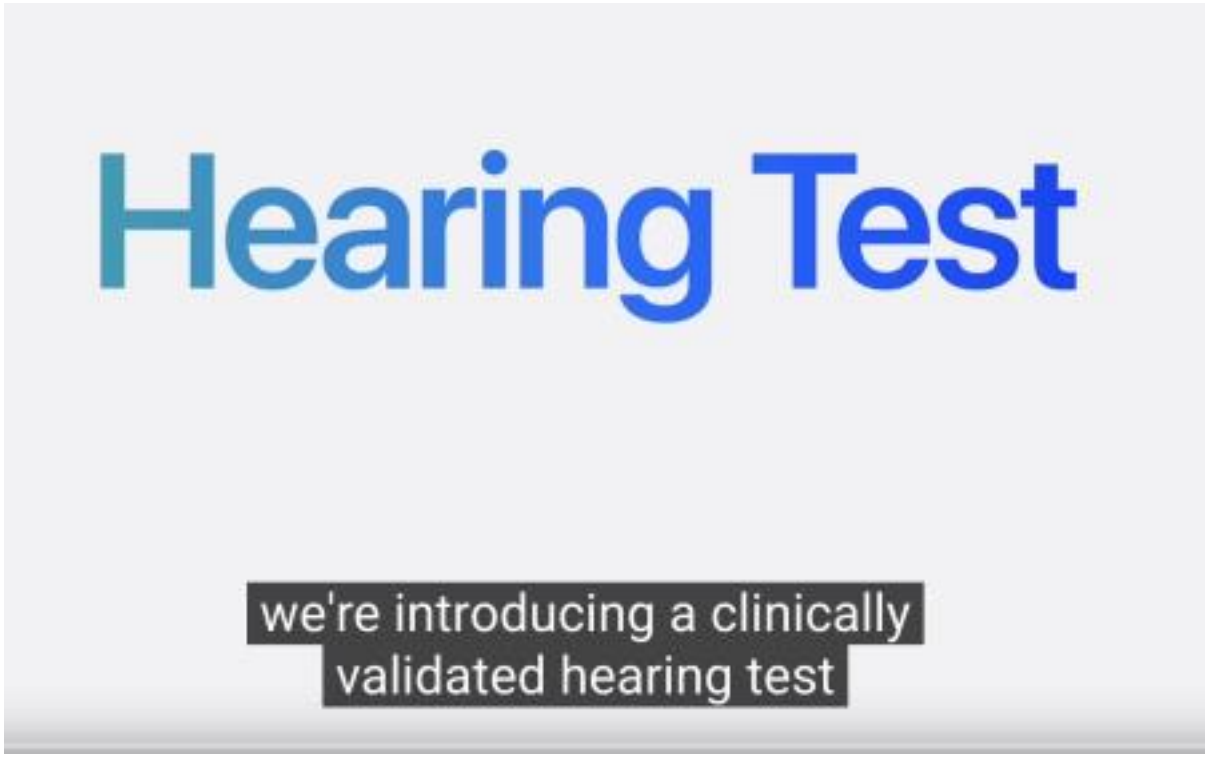
	Powerbeats Pro	Powerbeats Pro Teardown, available from https://www.youtube.com/watch?v=vEHwL59jOPg. *See* INGENIOSPEC-013271, INGENIOSPEC-013272-013277; Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289; Wearing your AirPods, EarPods, or Beats device, available from https://support.apple.com/en-us/101598. *See* INGENIOSPEC-014301-014302; How to get the best fit and sound with your Powerbeats Pro | Comfort, available from https://www.youtube.com/watch?v=I9t6YW3o-xc. *See* INGENIOSPEC-013232, INGENIOSPEC-013233-013237;
	Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds with video transcript, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013617-013632; Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	
17b. a wireless receiver configured to wirelessly receive customized audio output signals for the user, the customized audio output signals having been	Each of the Accused Instrumentalities, such as the Apple AirPods Pro 2, comprises a wireless receiver configured to wirelessly receive customized audio output signals for the user. For example, AirPods Pro 2 is a Bluetooth-compatible device and comprises a wireless receiver supporting Bluetooth communication standard. 	

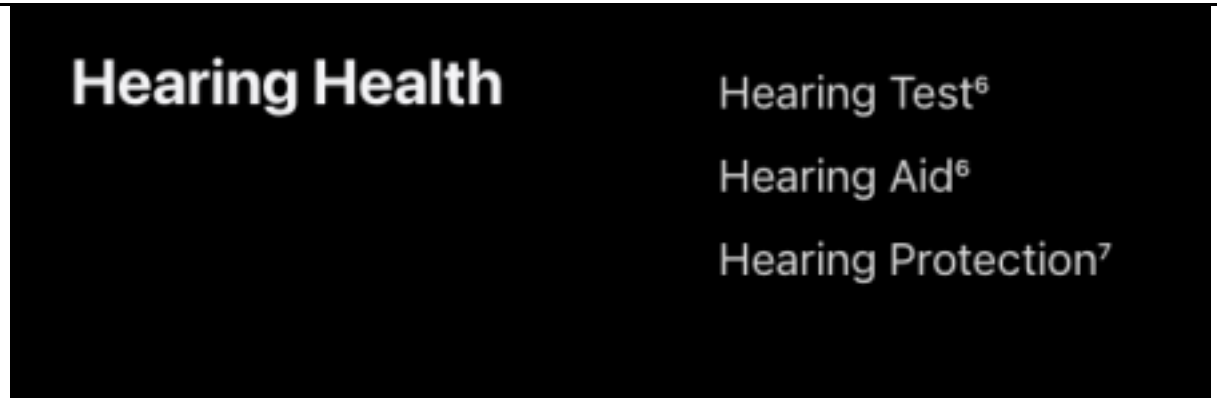
customized based on at least predetermined hearing characteristics associated with the user such that the customized audio output signals at least compensate for the hearing impairment regarding the user's ability to hear;	**Source**: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/). The wireless receiver is configured to wirelessly receive customized audio output signals for the user from a Host Device. The customized audio output signals are audio output signals pertaining to music, videos, podcasts, phone calls, and/or other auditory media that have been customized based on at least predetermined hearing characteristics associated with the user. The predetermined hearing characteristics associated with the user include, but are not necessarily limited to, (a) data and settings within the user's hearing profile as determined via a hearing aid test (*see* Hearing Test screenshots, below) or by importing an audiogram for the user, (b) custom audio setup data and settings including the inability to hear quiet voices (*see* screenshot "Can you hear someone speaking?", below), and preferences of "Version 1" or "Version 2" of a sample song (*see* screenshots "Comparison 1", "Comparison 2", and "Comparison 3", below). **(a) Hearing Profile and Hearing Test** For example, the Accused Instrumentalities, such as Apple AirPods Pro 2 can be used as a hearing aid when paired with a Host Device.



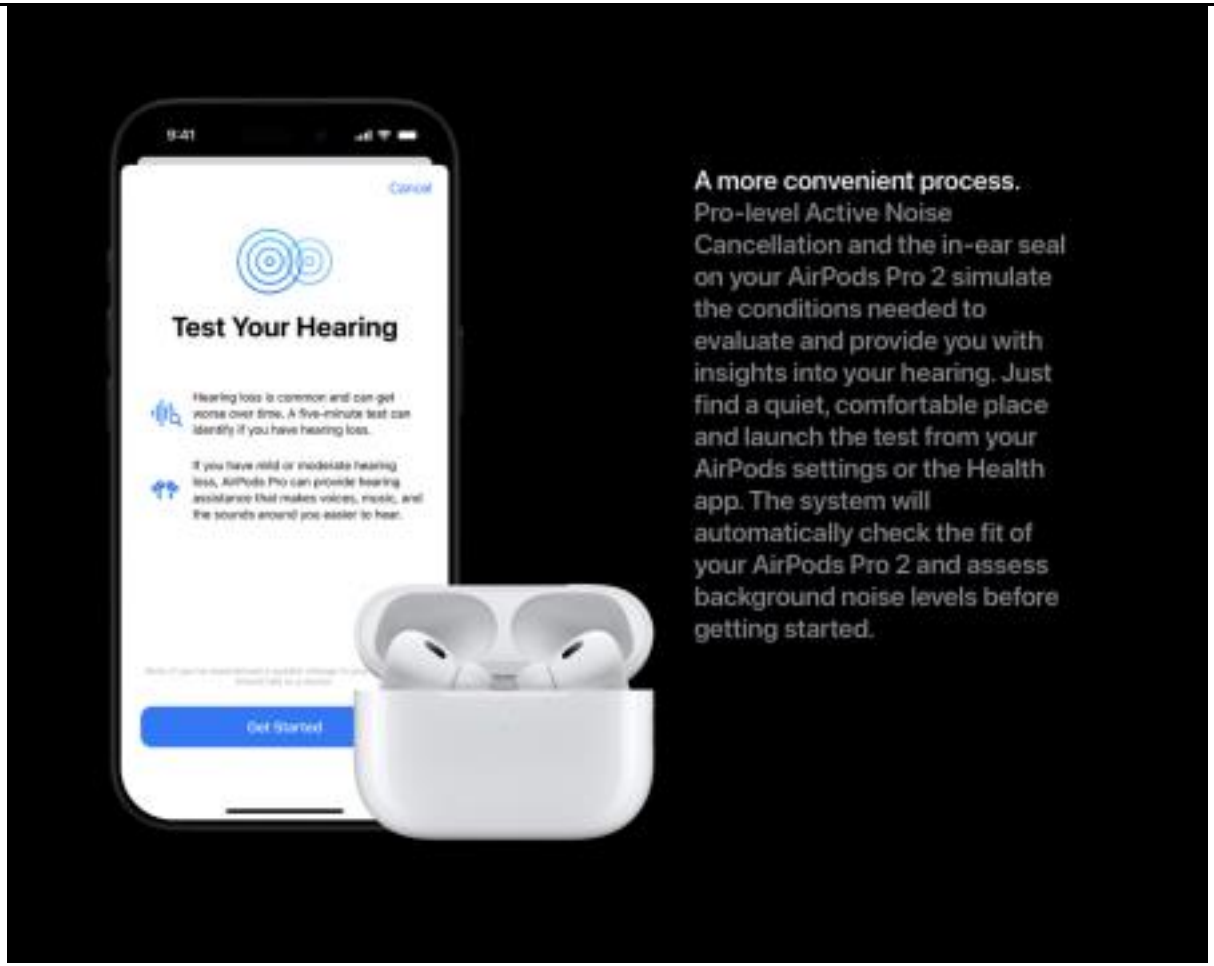
Source: Hearing Aid feature for AirPods Pro 2 Apple (INGENIOSPEC-013221, INGENIOSPEC-013222-013224) (available from https://www.youtube.com/watch?v=dOuNLS1elWs).



	Source: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/). A user can take a hearing test, which builds a hearing profile that stores predetermined hearing characteristics associated with the user. Alternatively, the user can configure their hearing profile by adding their audiogram.  **Source**: Hearing Aid feature for AirPods Pro 2 Apple (INGENIOSPEC-013221, INGENIOSPEC-013222-013224) (available from https://www.youtube.com/watch?v=dOuNLS1elWs).

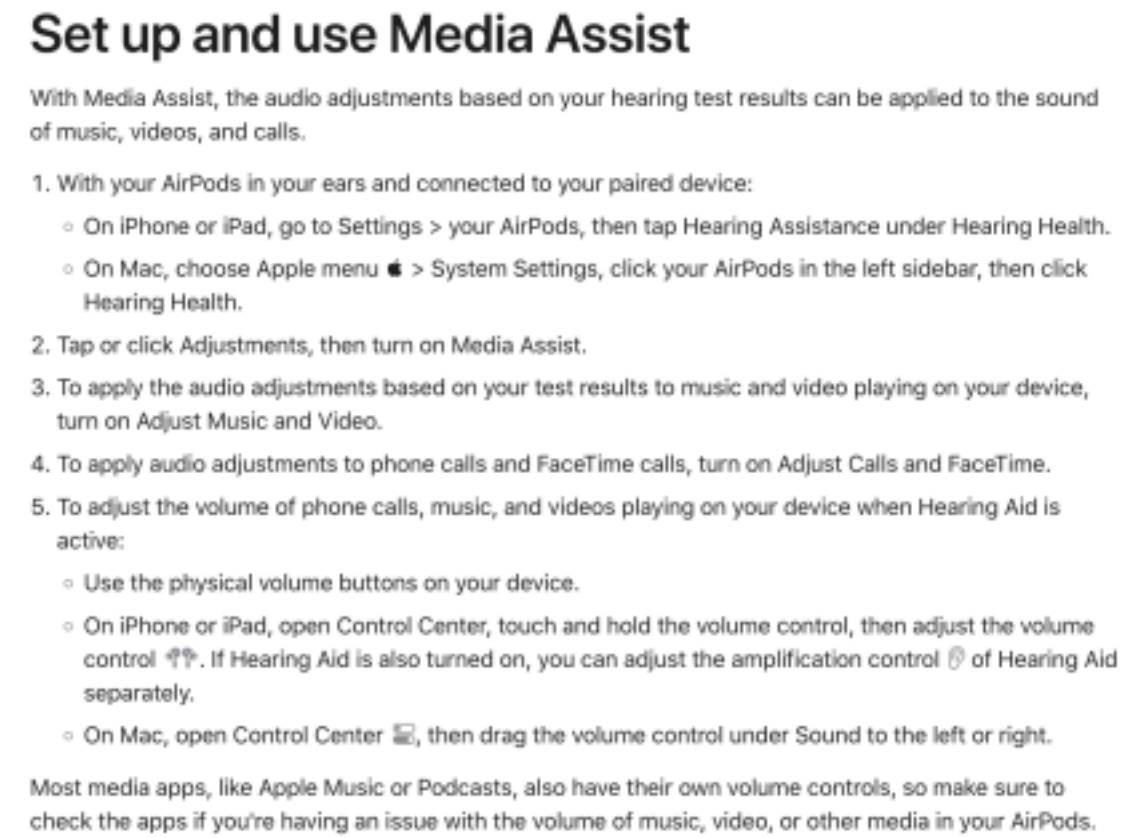


Source: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).



Source: AirPods Pro 2 - Hearing Health - Apple (INGENIOSPEC-013564-013573) (available from https://www.apple.com/airpods-pro/hearing-health/).

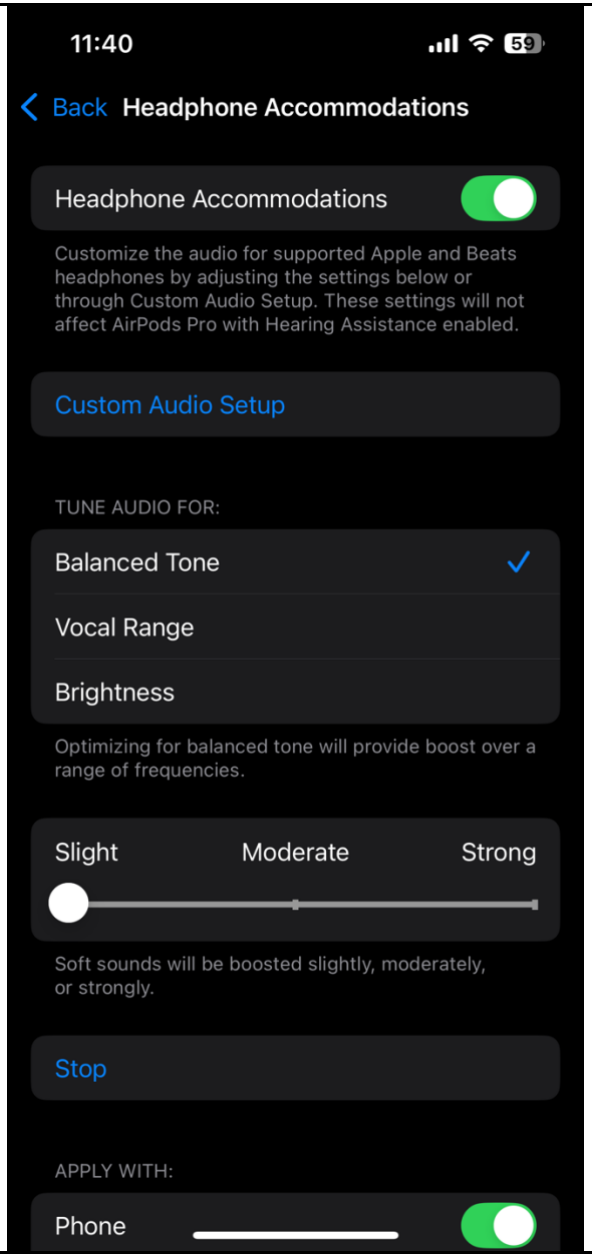
The Host Devices are configured to customize audio output signals for the user based on at least predetermined hearing characteristics associated with the user in their hearing profile. When Media Assist is enabled, customized audio output signals are produced for *inter alia* music, video, phone calls, and FaceTime calls such

	that the customized audio output signals at least compensate for the hearing impairment regarding the user's ability to hear.  **Source**: Use the Hearing Aid feature on your AirPods Pro 2 or AirPods Pro 3 (INGENIOSPEC-013442-013448) (available from https://support.apple.com/en-us/120992). **(b) Custom Audio Setup** In addition, the Accused Instrumentalities, when paired with an iPhone or iPad, can be used to customize headphone audio levels. Custom Audio Setup (e.g., an example of predetermined hearing characteristics

	associated with the user) customizes audio output signals for the user based on at least predetermined hearing characteristics associated with the user. This is done to amplify soft sounds and adjust certain frequencies in order to enhance the hearing of a hearing impaired user. *See* https://support.apple.com/en-us/102663 (INGENIOSPEC-011302 to INGENIOSPEC-011304). **Set up Headphone Accommodations** 1. Check that you have the latest version of iOS or iPadOS. 2. Go to Settings > Accessibility > Audio & Visual > Headphone Accommodations. Turn on Headphone Accommodations. 3. Choose how you want to apply your custom audio settings: ◦ Turn on Phone to apply these settings to phone calls, FaceTime calls, and any third-party video call apps. ◦ Turn on Media to apply these settings to music, movies, podcasts, audiobooks, Siri, voicemail, and Live Listen. 4. Customize your headphone audio settings: ◦ Use Custom Audio Setup. You'll listen to audio samples and choose which ones sound better to you. Then you can apply the custom settings suggested based on your choices. ◦ Manually adjust audio settings. **Source**: Customize headphone audio levels on your iPhone or iPad (INGENIOSPEC-014699-014701) (available from https://support.apple.com/en-us/102663). A user can set up custom audio levels, which builds a hearing profile that stores predetermined hearing characteristics associated with the user. To set up "Headphone Accommodations" a user goes to **Settings > Accessibility > Audio & Visual** then taps **Headphone Accommodations**. The user then taps on **Custom Audio Setup** and follows the instructions. *See Id.* Headphone Accommodations and Custom Audio Setup allows a user to "change the accessibility settings for [a user's] AirPods to suit [their] needs." *See* https://support.apple.com/guide/airpods/set-headphone-accommodations-devcd05671ab/web (INGENIOSPEC-011430 to INGENIOSPEC-011431). Headphone Accommodations and Custom Audio Setup

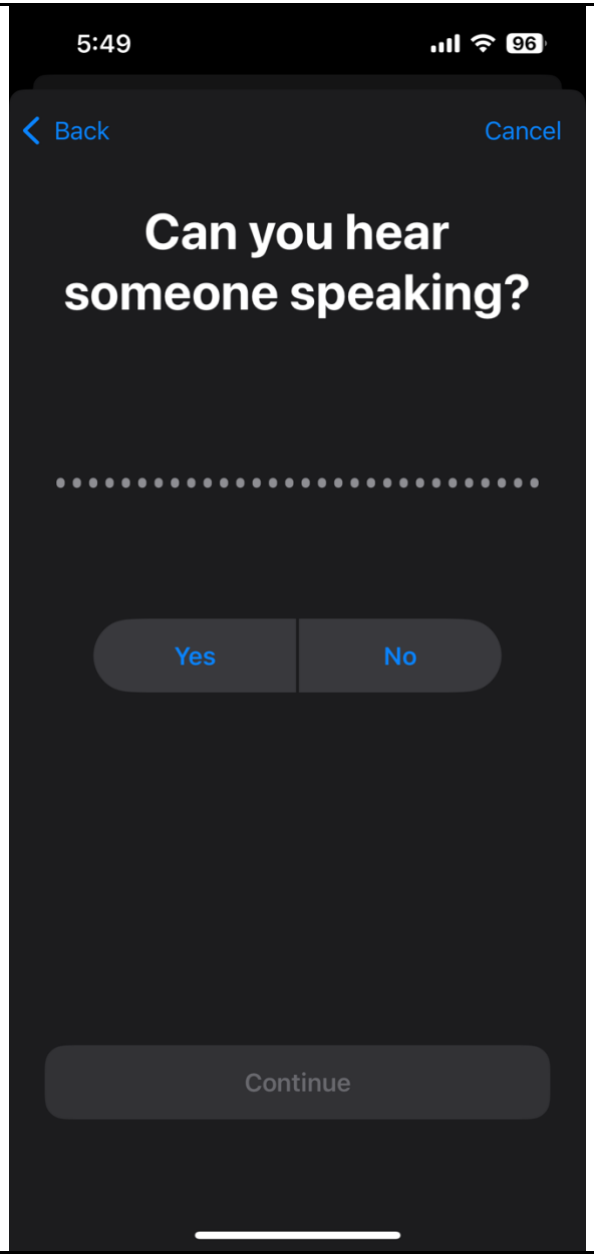
	"[a]mplif[ies] soft sounds and adjust[s] certain frequencies to help music, movies, phone calls, and podcasts sound more crisp and clear." *See id.*

Apple Inc. Exhibit 1024 Page 181


11:40
59
Back
Headphone Accommodations
Headphone Accommodations
Customize the audio for supported Apple and Beats headphones by adjusting the settings below or through Custom Audio Setup. These settings will not affect AirPods Pro with Hearing Assistance enabled.
Custom Audio Setup
TUNE AUDIO FOR:
Balanced Tone
Vocal Range
Brightness
Optimizing for balanced tone will provide boost over a range of frequencies.
Slight
Moderate
Strong
Soft sounds will be boosted slightly, moderately, or strongly.
Stop
APPLY WITH:
Phone

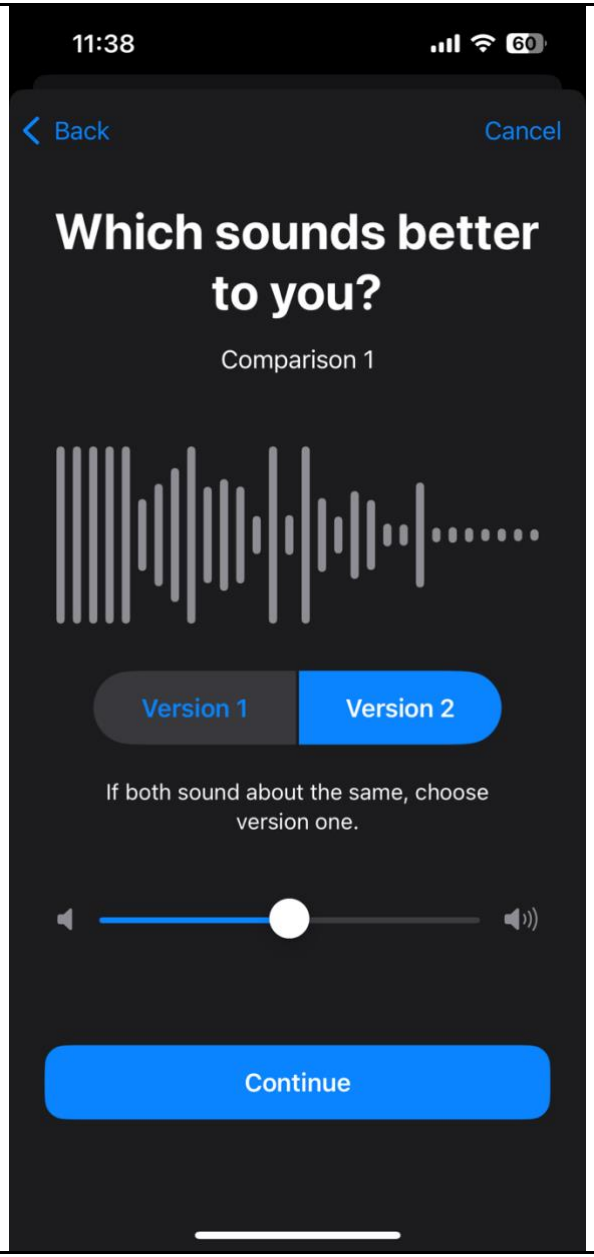
	Source: Screenshot from iPhone configuring "Headphone Accommodations," including "Custom Audio Setup"

Apple Inc. Exhibit 1024 Page 183

		 5:49 96 Back Cancel Can you hear someone speaking? Yes No Continue	

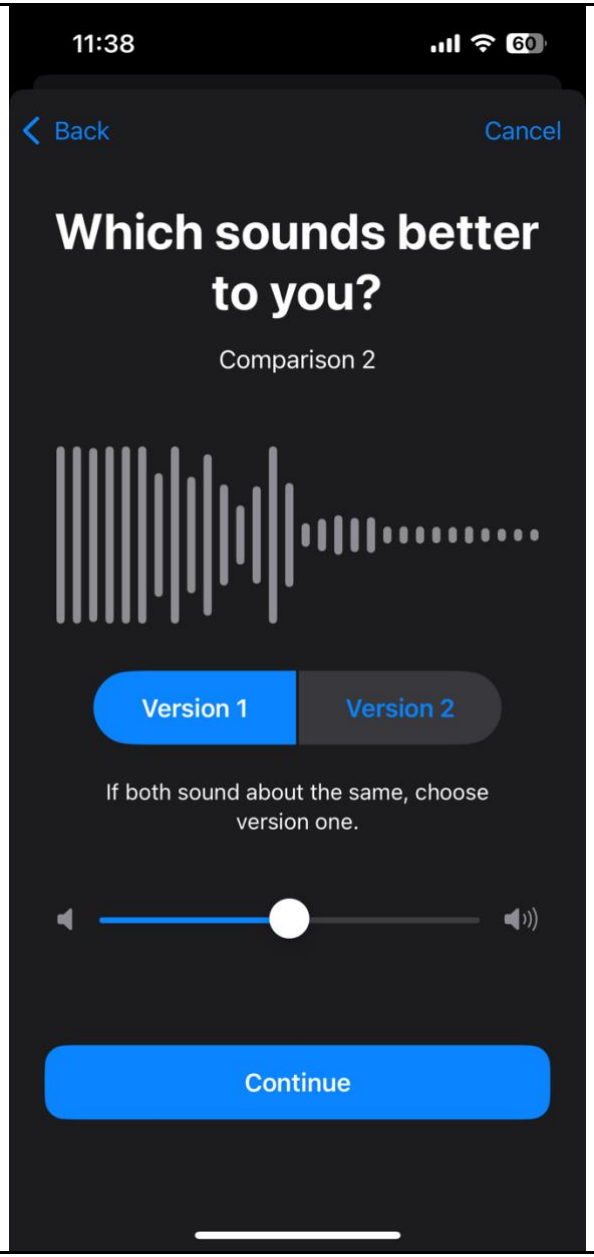
	Source: Screenshot from iPhone configuring "Custom Audio Setup," Can you hear someone speaking?

Apple Inc. Exhibit 1024 Page 185

		 11:38 Back Cancel Which sounds better to you? Comparison 1 Version 1 Version 2 If both sound about the same, choose version one. Continue	

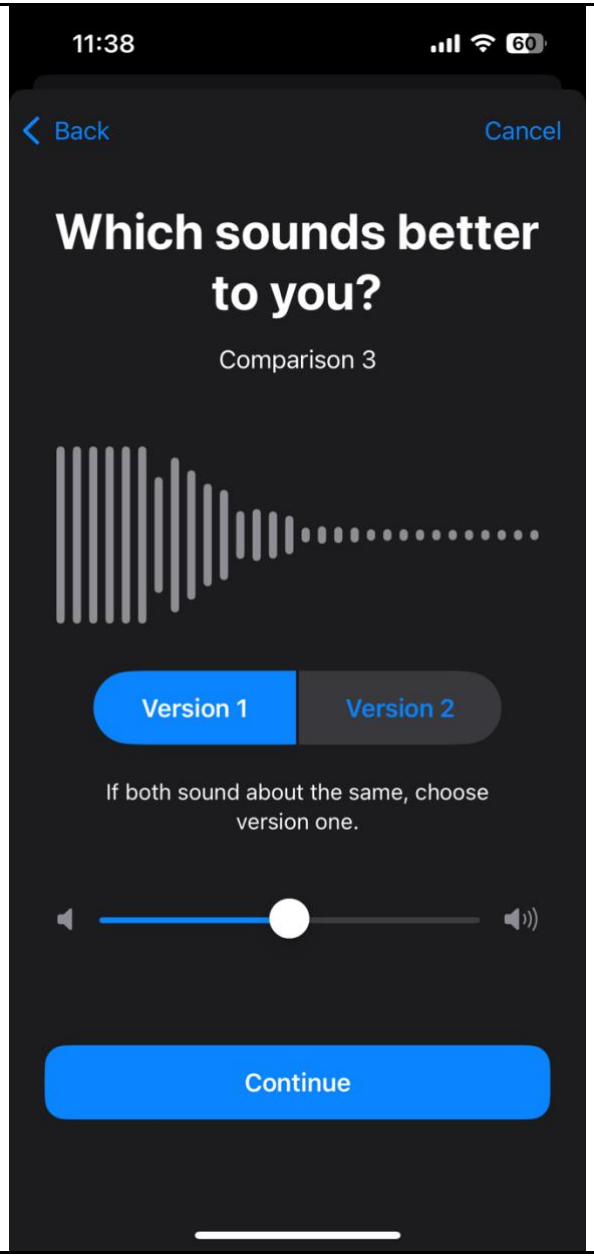
	Source: Screenshot from iPhone configuring "Custom Audio Setup," Comparison 1

Apple Inc. Exhibit 1024 Page 187

		 11:38 60 Back Cancel Which sounds better to you? Comparison 2 Version 1 Version 2 If both sound about the same, choose version one. Continue	

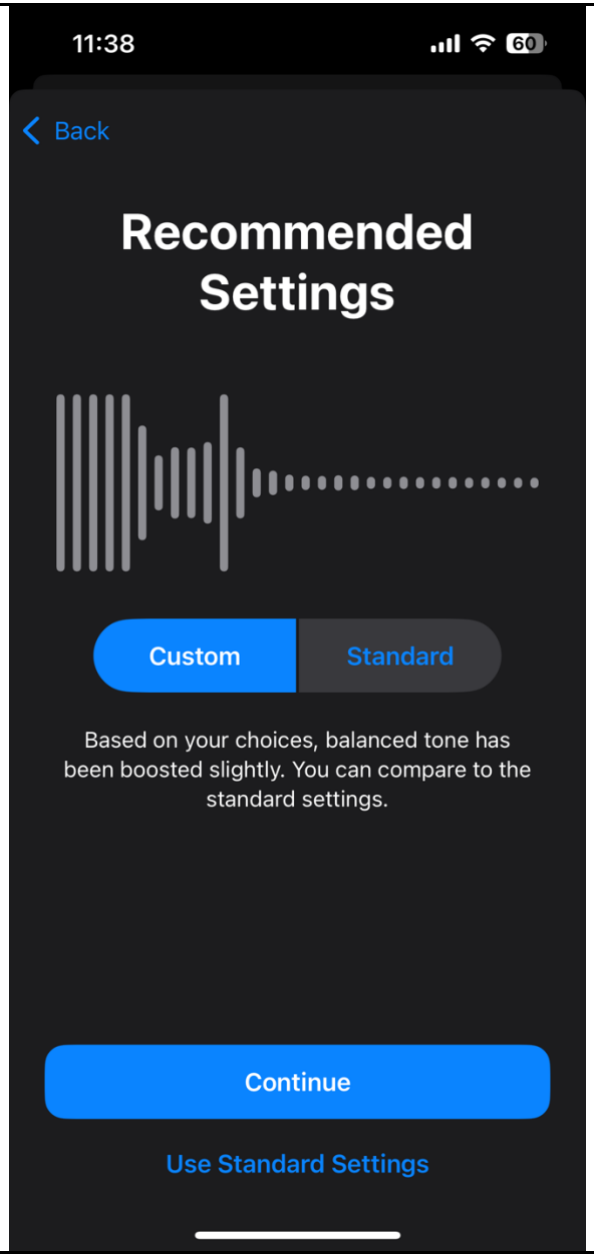
	Source: Screenshot from iPhone configuring "Custom Audio Setup," Comparison 2

Apple Inc. Exhibit 1024 Page 189

		 11:38 60 Back Cancel Which sounds better to you? Comparison 3 Version 1 Version 2 If both sound about the same, choose version one. Continue	

	Source: Screenshot from iPhone configuring "Custom Audio Setup," Comparison 3

Apple Inc. Exhibit 1024 Page 191

		 11:38 Back Recommended Settings Custom Standard Based on your choices, balanced tone has been boosted slightly. You can compare to the standard settings. Continue Use Standard Settings	

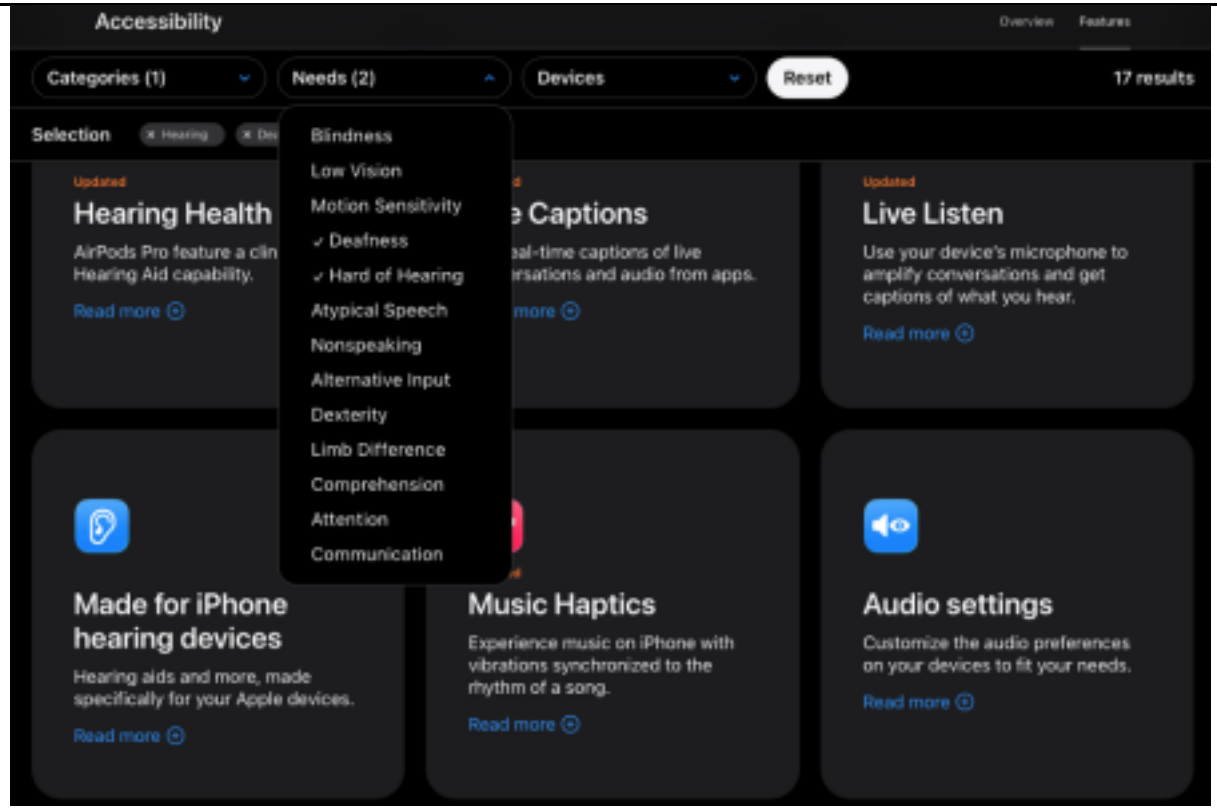
	Source: Screenshot from iPhone configuring "Custom Audio Setup," Recommended Settings As shown above, during Custom Audio Setup a Host Device performs a hearing assessment by presenting a series of sample audio to the user, receiving input from the user in response, and making adjustments to the hearing profile. When configured, the Host Device customizes audio output signals for the user based on at least predetermined hearing characteristics associated with the user in their hearing profile. For example, customized audio output signals are produced for *inter alia* music, video, phone calls, and FaceTime calls such that the customized audio output signals at least compensate for the hearing impairment regarding the user's ability to hear. **Set headphone accommodations on iPhone or iPad** 1. On your iPhone or iPad, go to Settings > Accessibility > Audio & Visual > Headphone Accommodations, then turn on Headphone Accommodations. 2. Tap Custom Audio Setup, then follow the onscreen instructions. Or manually set any of the following: • *Tune Audio For:* Choose Balanced Tone, Vocal Range, or Brightness. • *Level:* Choose Slight, Moderate, or Strong amplification of soft sounds. • *Phone:* Apply these audio settings to phone calls. • *Media:* Apply these audio settings to media playback. • *Transparency mode on AirPods Pro (all models):* Turn on Custom Transparency Mode and adjust the amplification, balance, and tone to help you hear what's happening around you. See Customize Transparency mode and turn on Conversation Boost. 3. To preview your audio settings, tap Play Sample. **Source**: https://support.apple.com/guide/airpods/set-headphone-accommodations-devcd05671ab/web (INGENIOSPEC-011430 to INGENIOSPEC-011431)

Set headphone accommodations on Mac

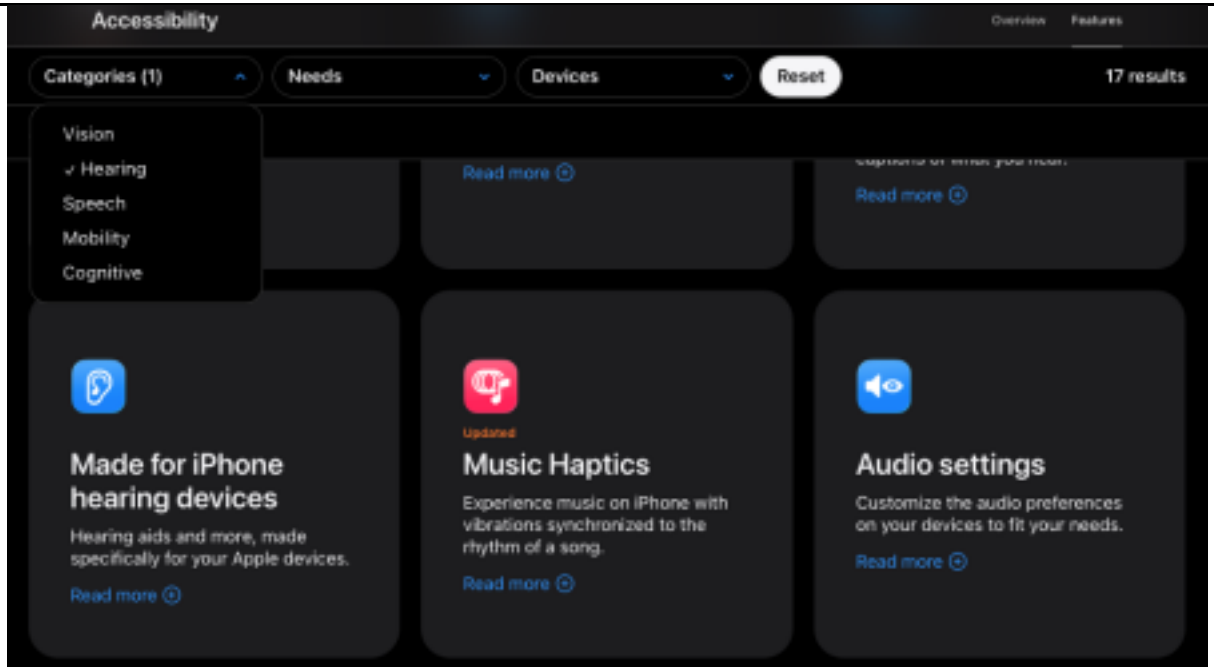
1. On your Mac, choose Apple menu > System Settings, then click Accessibility in the sidebar.
2. Click Audio, choose your AirPods, then turn on Headphone Accommodations.
3. Click Custom Audio Setup, then follow the onscreen instructions. Or manually set any of the following:
   - *Tune audio for:* Choose Balanced Tone, Vocal Range, or Brightness.
   - *Optimization:* Choose Slight, Moderate, or Strong amplification of soft sounds.
   - *Phone:* Apply these audio settings to phone calls.
   - *Media:* Apply these audio settings to media playback.
   - *Transparency mode on AirPods Pro (all models):* Turn on Transparency Mode and adjust the amplification, balance, tone, and more to help you hear what's happening around you. See Customize Transparency mode and turn on Conversation Boost.
4. To preview your audio settings, click Play Sample.

Source: https://support.apple.com/guide/airpods/set-headphone-accommodations-devcd05671ab/web (INGENIOSPEC-011430 to INGENIOSPEC-011431)

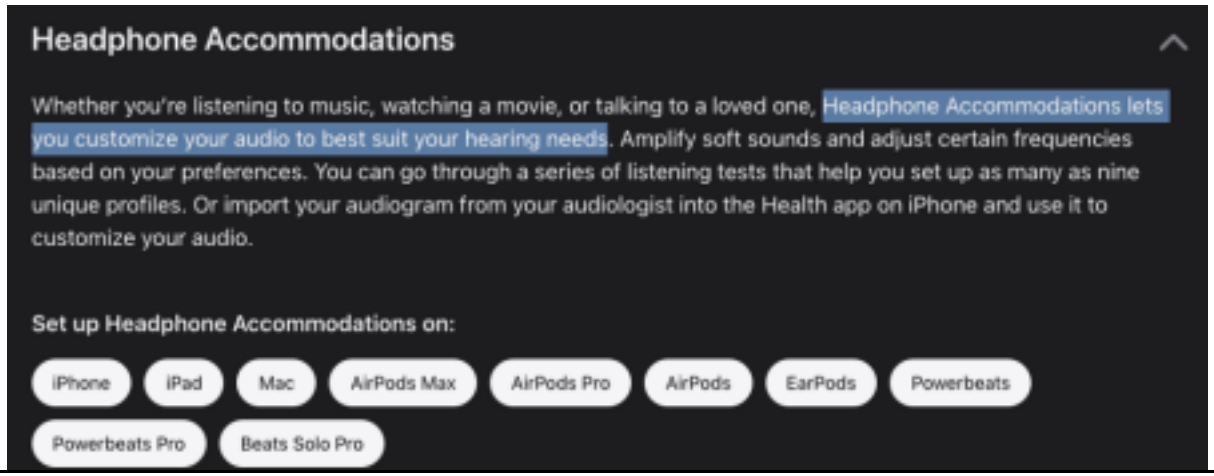
Custom Audio Setup is part of Apple's Accessibility features for users with deafness, or who are hard of hearing. Headphone Accommodations and Custom Audio Setup allows a user to "change the accessibility settings for [a user's] AirPods to suit [their] needs." *See* https://support.apple.com/guide/airpods/set-headphone-accommodations-devcd05671ab/web (INGENIOSPEC-011430 to INGENIOSPEC-011431). Headphone Accommodations and Custom Audio Setup "[a]mplif[ies] soft sounds and adjust[s] certain frequencies to help music, movies, phone calls, and podcasts sound more crisp and clear." *See id.*



Source: https://www.apple.com/accessibility/features/ (INGENIOSPEC-014704-014718)

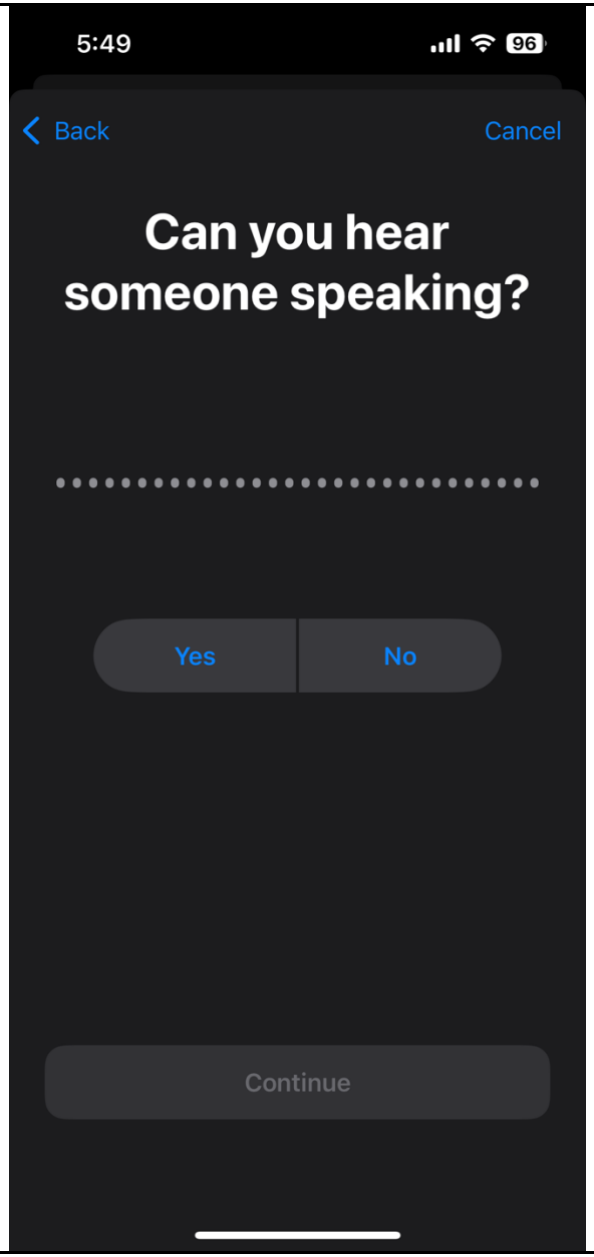


Source: https://www.apple.com/accessibility/features/ (INGENIOSPEC-014704-014718)

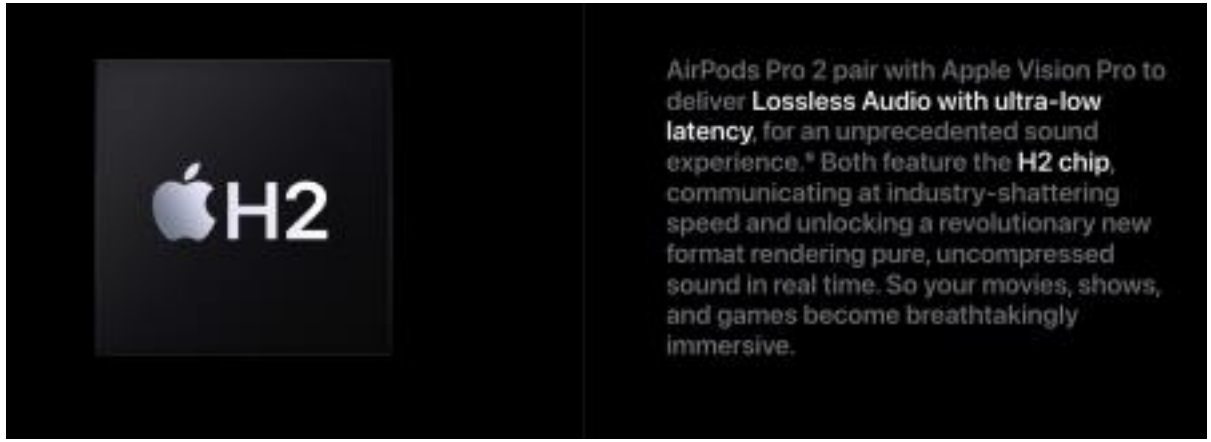


	Source: https://www.apple.com/accessibility/features/ (INGENIOSPEC-014704-014718), under “Audio settings” Moreover, Custom Audio Setup begins with a hearing test.

Apple Inc. Exhibit 1024 Page 197

		 5:49 96 Back Cancel Can you hear someone speaking? Yes No Continue	

	Source: Screenshot from iPhone configuring "Custom Audio Setup," Can you hear someone speaking? Based upon the user's Hearing Test and/or Custom Audio Setup, the created hearing profile and predetermined hearing characteristics are used to customize audio output signals to compensate for the hearing impairment regarding the user's ability to hear. For example, the customized audio output signals improve the user's ability to hear such as higher-frequency consonant sounds in speech or lower-frequency background tones in music. *See* https://support.apple.com/en-us/120992 (INGENIOSPEC-011560 to INGENIOSPEC-011566) ("With Media Assist, the audio adjustments based on your hearing test results can be applied to the sound of music, videos, and calls." And, "After you complete the Hearing Test, if you have mild to moderate hearing loss, your personalized hearing profile will guide you to the Hearing Aid feature. With a quick setup, you'll start hearing more clearly immediately. You can even customize the settings to your needs.") *and* https://support.apple.com/en-us/111765 (INGENIOSPEC-011314 to INGENIOSPEC-011315) ("Use Headphone Accommodations to customize headphone audio settings to amplify soft sounds and adjust certain frequencies for your hearing needs. You can also use your audiogram data from the Health app to customize audio settings.") *See also* https://support.apple.com/en-us/111765 (INGENIOSPEC-011314 to INGENIOSPEC-011315) ("iOS and iPadOS devices are filled with accessibility features like these, which can help people who are deaf, have limited hearing, or have unique hearing needs use their devices") *and* https://support.apple.com/guide/airpods/set-headphone-accommodations-devcd05671ab/web (INGENIOSPEC-011430 to INGENIOSPEC-011431) (Headphone Accommodations and Custom Audio Setup "[a]mplif[ies] soft sounds and adjust[s] certain frequencies to help music, movies, phone calls, and podcasts sound more crisp and clear.") *See also* https://support.apple.com/en-us/102663 (INGENIOSPEC-011302 to INGENIOSPEC-011304) ("When using automatic device switching with your headphones, your custom audio settings will transfer between your iPhone, your iPad, your paired Apple Watch (on watchOS 7), your Mac running macOS Sequoia (depending on your model of AirPods), and your Apple Vision Pro.") *and* https://support.apple.com/guide/airpods/hearing-health-features-airpods-pro-2-devd9aac5b42/web (INGENIOSPEC-014801-014805) ("The Hearing Aid feature is intended only for people with perceived mild to moderate hearing loss. ... [Step] 2. Do one of the following: iPhone or iPad: Go to Settings, tap the name of your AirPods near the top of the screen, then tap Hearing Assistance.").

	As discussed above, the wireless receiver of the Accused Instrumentalities is configured to wirelessly receive customized audio output signals for the user. The customized audio output signals are output using the speakers of the Accused Instrumentalities (*see* Claim 17c, *infra*), thereby improving and enhancing the user's hearing experience.  **Source**: AirPods Pro 2 - Apple (INGENIOSPEC-013541-013563) (available from https://web.archive.org/web/20250904180656/https:/www.apple.com/airpods-pro/).



Source: AirPods Pro 2 - Apple (INGENIOSPEC-013541-013563) (available from https://web.archive.org/web/20250904180656/https:/www.apple.com/airpods-pro/).

Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro, Powerbeats Pro and Powerbeats Pro

2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 2	AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932; Customize headphone audio levels on your iPhone or iPad, available from https://support.apple.com/en-us/102663. *See* INGENIOSPEC-014699-014701; AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286;
Apple AirPods 3	AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158; Customize headphone audio levels on your iPhone or iPad, available from https://support.apple.com/en-us/102663. *See* INGENIOSPEC-014699-014701; Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150;
Apple AirPods 4	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Customize headphone audio levels on your iPhone or iPad, available from https://support.apple.com/en-us/102663. *See* INGENIOSPEC-014699-014701; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-014260-014276;
Apple AirPods 4 with Active	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;

		Noise Cancellation	Customize headphone audio levels on your iPhone or iPad, available from https://support.apple.com/en-us/102663. *See* INGENIOSPEC-014699-014701; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501;
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Customize headphone audio levels on your iPhone or iPad, available from https://support.apple.com/en-us/102663. *See* INGENIOSPEC-014699-014701; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Use the Hearing Aid feature on your AirPods Pro 2 or AirPods Pro 3, available from https://support.apple.com/en-us/120992. *See* INGENIOSPEC-013442-013448; AirPods Pro 3 - Hearing Health, available from https://www.apple.com/airpods-pro/hearing-health/. *See* INGENIOSPEC-013502-013510; Set Headphone Accommodations for AirPods, available from https://support.apple.com/guide/airpods/set-headphone-accommodations-devcd05671ab/web. *See* INGENIOSPEC-013296-013297; Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;
		Beats Fit Pro	Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458; Customize headphone audio levels on your iPhone or iPad, available from https://support.apple.com/en-us/102663. *See* INGENIOSPEC-014699-014701;

	Beats Solo Pro	Beats User Guide - Pair Beats, available from https://support.apple.com/guide/beats/pair-beats-dev46c519179/1.0/web/1.0. *See* INGENIOSPEC-014011-014014; Customize headphone audio levels on your iPhone or iPad, available from https://support.apple.com/en-us/102663. *See* INGENIOSPEC-014699-014701; Solo Pro - Beats by Dre Archive 2, available from https://web.archive.org/web/20200602034251/https://www.beatsbydre.com/headphones/solo-pro. *See* INGENIOSPEC-013312-013323;
	Powerbeats Pro	Powerbeats Pro Teardown, available from https://www.youtube.com/watch?v=vEHwL59jOPg. *See* INGENIOSPEC-013271, INGENIOSPEC-013272-013277; Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289; Customize headphone audio levels on your iPhone or iPad, available from https://support.apple.com/en-us/102663. *See* INGENIOSPEC-014699-014701;
	Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616; Customize headphone audio levels on your iPhone or iPad, available from https://support.apple.com/en-us/102663. *See* INGENIOSPEC-014699-014701; Powerbeats Pro 2 - High Performance Earbuds with video transcript, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013617-013632;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	
17c. and electronic circuitry including	Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises electronic circuitry including at least an integrated circuit. The electronic circuitry includes, but is not necessarily limited to, digital signal	

at least an integrated circuit, the electronic circuitry being configured to output the customized audio output signals to the at least one speaker, wherein the at least one speaker is configured to generate at least a portion of the customized audio output for the user in accordance with at least the portion of the customized audio output signals.	processors (DSPs), microprocessors, and audio codecs, integrated circuits such as Apple's H1, or H2 chip, volatile and non-volatile memory, and sensors (such as optical sensors, accelerometers, and skin-detection sensors). The integrated circuit of each Accused Instrumentality includes, but is not necessarily limited to, the device's processor (e.g., Apple's H1, or H2 chip). The electronic circuitry is configured to output the customized audio output signals to the at least one speaker, wherein the at least one speaker is configured to generate at least a portion of the customized audio output for the user in accordance with at least the portion of the customized audio output signals. For example, the speakers of the Accused Instrumentalities are configured to generate at least a portion of the customized audio output described in Claim 17b, *supra*. At least a portion of the customized audio output signals will be output by the speakers for the Accused Instrumentalities thereby improving and enhancing the user's hearing experience. As such, the user hears customized audio output signals that compensate for their hearing impairment.



Source: Speaker Image from AirPods Pro 2 webpage (INGENIOSPEC-014044-014044) (available from https://www.apple.com/airpods-pro/).

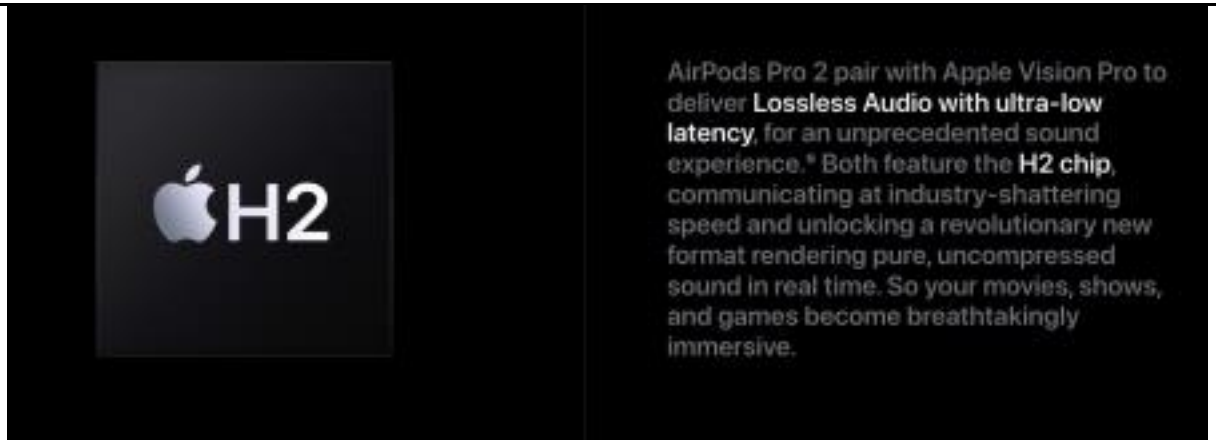


The front of the speaker unit is a black diaphragm.

Source: Apple AirPods Pro 2 Teardown: Upgrade Materials and Design (INGENIOSPEC-013701-013760) (available from https://www.qucox.com/apple-airpods-pro-2-teardown/).



Source: Teardown of Apple AirPods Pro 2 (INGENIOSPEC-013264, INGENIOSPEC-013265-013270) (available from https://www.youtube.com/watch?v=NfzRzb3NI0U).



Source: AirPods Pro 2 - Apple (INGENIOSPEC-013541-013563) (available from https://web.archive.org/web/20250904180656/https:/www.apple.com/airpods-pro/).



Source: AirPods Pro 2 - Apple (INGENIOSPEC-013541-013563) (available from https://web.archive.org/web/20250904180656/https:/www.apple.com/airpods-pro/).

Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro, Powerbeats Pro and Powerbeats Pro

2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 2	If your left or right AirPod is not working, available from https://support.apple.com/en-us/100494. *See* INGENIOSPEC-013923-013925; Apple AirPods 2 In-Depth Teardown Review by 52AUDIO, available from https://www.chargerlab.com/apple-airpod-2-in-depth-teardown-review/. *See* INGENIOSPEC-013937-014004; AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286;
Apple AirPods 3	Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150; Apple AirPods 3 true wireless earphones teardown, available from https://www.qucox.com/apple-airpods-3-teardown/. *See* INGENIOSPEC-014163-014238;
Apple AirPods 4	Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. *See* INGENIOSPEC-013664-013691; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-014260-014276; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
Apple AirPods 4 with Active	Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501;

		Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
		Apple AirPods Pro 1	AirPods Pro Teardown - iFixit, available from https://www.ifixit.com/Teardown/AirPods+Pro+Teardown/127551. *See* INGENIOSPEC-014076-014096; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;
		Beats Fit Pro	Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458; Teardown Report: Beats Fit Pro, available from https://www.52audio.com/archives/98994.html. *See* INGENIOSPEC-014407-014463;
		Beats Solo Pro	Beats By Dre Solo Pro Wireless Bad Battery Replacement Fix Repair Tutorial, available from https://www.youtube.com/watch?v=SBeHaqnw45w. *See* INGENIOSPEC-013144, INGENIOSPEC-013145-013151; Solo Pro Press Release, available from https://www.beatsbydre.com/content/dam/beats/web/press/solo-pro/solo-pro-press-kit.zip. *See* INGENIOSPEC-014313-014314; Beats User Guide - Pair Beats, available from https://support.apple.com/guide/beats/pair-beats-dev46c519179/1.0/web/1.0. *See* INGENIOSPEC-014011-014014; Solo Pro - Beats by Dre Archive 2, available from

		https://web.archive.org/web/20200602034251/https://www.beatsbydre.com/headphones/solo-pro. *See* INGENIOSPEC-013312-013323;
	Powerbeats Pro	Powerbeats Pro Teardown, available from https://www.youtube.com/watch?v=vEHwL59jOPg. *See* INGENIOSPEC-013271, INGENIOSPEC-013272-013277; Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289;
	Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds with video transcript, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013617-013632;

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.

11,921,355 Claim 18	**Evidence**
18. A head-worn personal electronic apparatus as recited in claim 17, wherein the customized audio output signals are wirelessly received from a mobile communication	Every claim limitation of claim 17 is present in the Accused Instrumentalities as described above and incorporated herein by reference. The Accused Instrumentalities, such as Apple AirPods Pro 2, comprise a wireless receiver configured to wirelessly customized audio output signals to be output to the user via the at least one speaker. *See* Claim 1b, *supra*. The received customized audio output signals are wirelessly received from a mobile communication device associated with the user. For example, the Accused Instrumentalities, such as Apple AirPods Pro 2, are Bluetooth-compatible devices. *See* Claim 17b, *supra*.

device associated with the user.	 **Source**: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/). The Accused Instrumentalities are capable of pairing with mobile communication devices such as an Apple iPhone. **Pair AirPods with iPhone or iPad** Before you begin, make sure your device has the latest version of iOS or iPadOS installed. When pairing, your device must also be connected to a Wi-Fi or cellular network, or you may not have access to Find My features. 1. On your device, go to Settings > Bluetooth, turn on Bluetooth, then do one of the following: • *AirPods or AirPods Pro:* Open the case with your AirPods inside, then hold it next to your device. • *AirPods Max:* Take your AirPods Max out of the Smart Case, and within 60 seconds, hold them next to the device that you want to pair until the setup animation appears. If you don't see the animation, you can pair AirPods Max with your device manually. Go to Settings > Bluetooth, then select your AirPods. Press and hold the noise control button on AirPods Max for about 5 seconds, or until the light flashes white. If you have AirPods Max (USB-C), you can also pair your AirPods with your device by connecting them using a USB-C to USB-C cable. 2. Follow the onscreen instructions, then tap Done. **Source**: Pair AirPods with an Apple device - Apple Support (INGENIOSPEC-014020-014023) (available from https://support.apple.com/guide/airpods/pair-airpods-with-an-apple-device-dev7c85810f2/web).

The Accused Instrumentalities are also able to pair with, and receive customized audio output signals from, other mobile communication devices such as Apple iPads. *See* https://support.apple.com/en-us/102663 (INGENIOSPEC-011302 to INGENIOSPEC-011304).

Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 2	AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932; AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286; Pair AirPods with an Apple device - Apple Support, available from https://support.apple.com/guide/airpods/pair-airpods-with-an-apple-device-dev7c85810f2/web. *See* INGENIOSPEC-014020-014023;
Apple AirPods 3	AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158; Pair AirPods with an Apple device - Apple Support, available from https://support.apple.com/guide/airpods/pair-airpods-with-an-apple-device-dev7c85810f2/web. *See* INGENIOSPEC-014020-014023;
Apple AirPods 4	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;

			Pair AirPods with an Apple device - Apple Support, available from https://support.apple.com/guide/airpods/pair-airpods-with-an-apple-device-dev7c85810f2/web. *See* INGENIOSPEC-014020-014023;
		Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Pair AirPods with an Apple device - Apple Support, available from https://support.apple.com/guide/airpods/pair-airpods-with-an-apple-device-dev7c85810f2/web. *See* INGENIOSPEC-014020-014023;
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Pair AirPods with an Apple device - Apple Support, available from https://support.apple.com/guide/airpods/pair-airpods-with-an-apple-device-dev7c85810f2/web. *See* INGENIOSPEC-014020-014023;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;
		Beats Fit Pro	Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458; Beats User Guide - Pair Beats, available from https://support.apple.com/en-ca/guide/beats/dev46c519179/1.0/web/1.0. *See* INGENIOSPEC-014644-014647;

	Beats Solo Pro	Beats User Guide - Pair Beats, available from https://support.apple.com/guide/beats/pair-beats-dev46c519179/1.0/web/1.0. *See* INGENIOSPEC-014011-014014;
	Powerbeats Pro	Powerbeats Pro Teardown, available from https://www.youtube.com/watch?v=vEHwL59jOPg. *See* INGENIOSPEC-013271, INGENIOSPEC-013272-013277; Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289; Beats User Guide - Pair Beats, available from https://support.apple.com/guide/beats/pair-beats-dev46c519179/1.0/web/1.0. *See* INGENIOSPEC-014011-014014;
	Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616; Beats User Guide - Pair Beats, available from https://support.apple.com/guide/beats/pair-beats-dev46c519179/1.0/web/1.0. *See* INGENIOSPEC-014011-014014; Powerbeats Pro 2, available from https://www.beatsbydre.com/earbuds/powerbeats-pro-2/MX743/electric-orange. *See* INGENIOSPEC-013371-013387;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	

<table>
<tr><th>11,921,355
Claim 19</th><th>Evidence</th></tr>
<tr><td>19. A head-worn personal electronic apparatus as recited in claim 17, wherein the head-worn personal electronic apparatus comprises: a touch sensitive surface at least partially contained within the head-worn personal electronic apparatus and configured to sense a touch input associated with the user, wherein the sensed touch input operating to at least alter operation of the head-worn electronic personal audio apparatus.</td><td>Every claim limitation of claim 17 is present in the Accused Instrumentalities as described above and incorporated herein by reference.

See Claim 3, supra.

Each of Apple AirPods 2 and Apple AirPods Pro 3 also meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

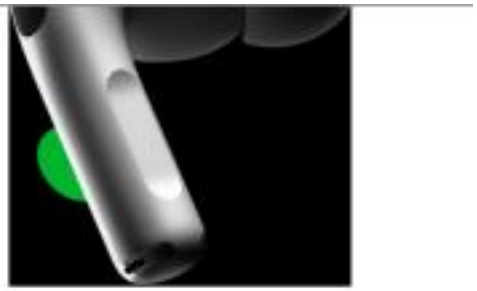
<table><tr><th>Device</th><th>Citations</th></tr><tr><td>Apple AirPods 2</td><td>Use controls and gestures with your AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/web. See INGENIOSPEC-014548-014553;</td></tr><tr><td>Apple AirPods Pro 3</td><td>Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. See INGENIOSPEC-013511-013533; Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. See INGENIOSPEC-014249-014255;</td></tr></table>
Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.</td></tr>
<tr><th>11,921,355
Claim 21</th><th>Evidence</th></tr>
<tr><td>21. A head-worn personal electronic apparatus recited in claim 19, wherein</td><td>Every claim limitation of claim 19 is present in the Accused Instrumentalities as described above and incorporated herein by reference.</td></tr>
</table>

<table>
<tr><td>the at least one operation of the head-worn personal electronic apparatus being altered concerns control of the customized audio output being provided to the user.</td><td>See Claim 5, supra.

Each of Apple AirPods 2 and Apple AirPods Pro 3 also meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

<table><tr><th>Device</th><th>Citations</th></tr><tr><td>Apple AirPods 2</td><td>Use controls and gestures with your AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/web. See INGENIOSPEC-014548-014553;</td></tr><tr><td>Apple AirPods Pro 3</td><td>Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. See INGENIOSPEC-013511-013533; Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. See INGENIOSPEC-014249-014255;</td></tr></table>
Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.</td></tr>
<tr><th>11,921,355
Claim 22</th><th>Evidence</th></tr>
<tr><td>22. A head-worn personal electronic apparatus as recited in claim 19, wherein the head-worn personal electronic apparatus is configured to</td><td>Every claim limitation of claim 19 is present in the Accused Instrumentalities as described above and incorporated herein by reference.

Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises a touch sensitive surface at least partially contained within the head-worn personal electronic apparatus and configured to sense a touch input associated with the user, wherein the sensed touch input operating to at least alter operation of the head-worn electronic personal audio apparatus. See Claim 19, supra.</td></tr>
</table>

distinguish at least a direction of the user input with respect to the touch sensitive surface.	Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, is configured to distinguish a direction of input when the user swipes the touch-sensitive stem of the Apple AirPods Pro 2. For example, depending on the direction of the user's input the volume can be increased or decreased.  Just touch to adjust. Touch control lets you manage playback functions from the stem. Swipe up or down to adjust volume, press to play and pause music or mute and unmute yourself on calls, and press twice to end a call. You can also hold the stem to switch between listening modes. **Source**: AirPods Pro 2 - Apple (INGENIOSPEC-013541-013563) (available from https://web.archive.org/web/20250904180656/https:/www.apple.com/airpods-pro/).

AirPods Pro 2 controls and gestures



With the Touch control on the stem of both AirPods Pro 2, you can do any of the following:

- *Play and pause audio*: Press the stem. To resume playback, press it again.
- *Play the next track*: Double-press the stem.
- *Play the previous track*: Triple-press the stem.
- *Answer a call*: When you receive a call, press the stem.
- *Adjust volume*: Lightly swipe up or down on the stem.

  You can also turn on Personalized Volume to automatically adjust the volume based on listening preferences and your environment. See Use Conversation Awareness or Personalized Volume.
- *Switch between Active Noise Cancellation, Transparency mode, and Adaptive Audio*: You can set either of your AirPods to perform this action when you press and hold the stem. See Change what the force sensor or Touch control does.
- *Activate Siri*: You can set either of your AirPods to perform this action when you press and hold the stem. See Use Siri with AirPods.

Use head gestures to respond to Siri

- *Accept a call or reply to notifications and messages*: Nod your head up and down.
- *Decline a call or dismiss notifications and messages*: Shake your head side to side.

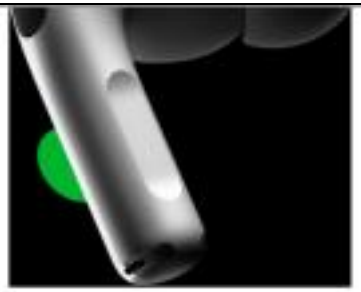
Note: To use head gestures to respond to Siri, Announce Calls and Announce Notifications must be on. See Use Siri to announce calls or notifications.

Source: Use controls and gestures with your AirPods - Apple Support (INGENIOSPEC-014024-014029) (available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/1.0/web/1.0).

Apple AirPods Pro 3 *also* meets the claimed limitation for the same reasons. Refer to the table below for corresponding evidence to Apple AirPods Pro 3.

	<table><tr><th>Device</th><th>Citations</th></tr><tr><td>Apple AirPods Pro 3</td><td>Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533; Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;</td></tr></table> Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
11,921,355 Claim 23	**Evidence**
23. A head-worn personal electronic apparatus as recited in claim 19, wherein the head-worn personal electronic apparatus is configured to detect at least a sliding of a finger action with respect to the touch sensitive surface.	Every claim limitation of claim 19 is present in the Accused Instrumentalities as described above and incorporated herein by reference. *See* Claim 6 and Claim 22, *supra*. Apple AirPods Pro 3 *also* meets the claimed limitation for the same reasons. Refer to the table below for corresponding evidence to Apple AirPods Pro 3. <table><tr><th>Device</th><th>Citations</th></tr><tr><td>Apple AirPods Pro 3</td><td>Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533; Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;</td></tr></table>

	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
11,921,355 Claim 24	**Evidence**
24. A head-worn personal electronic apparatus as recited in claim 19, wherein the head-worn personal electronic apparatus is configured to facilitate determination at least whether the user input pertains to a forward sliding action or a backward sliding action with respect to the touch sensitive surface.	Every claim limitation of claim 19 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises a touch sensitive surface at least partially contained within the head-worn personal electronic apparatus and configured to sense a touch input associated with the user, wherein the sensed touch input operating to at least alter operation of the head-worn electronic personal audio apparatus. *See* Claim 19, *supra*. Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, is configured to distinguish a direction of input when the user swipes the touch-sensitive stem of the Apple AirPods Pro 2. For example, depending on the direction of the user's input the volume can be increased or decreased. A forward sliding action (sliding the finger up the stem) increases volume; whereas a backward sliding action (sliding the figure down the stem) decreases volume.



Just touch
to adjust.

Touch control lets you manage playback functions from the stem. Swipe up or down to adjust volume, press to play and pause music or mute and unmute yourself on calls, and press twice to end a call. You can also hold the stem to switch between listening modes.

Source: AirPods Pro 2 - Apple (INGENIOSPEC-013541-013563) (available from https://web.archive.org/web/20250904180656/https:/www.apple.com/airpods-pro/).

AirPods Pro 2 controls and gestures



With the Touch control on the stem of both AirPods Pro 2, you can do any of the following:

- *Play and pause audio*: Press the stem. To resume playback, press it again.
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- *Play the previous track*: Triple-press the stem.
- *Answer a call*: When you receive a call, press the stem.
- *Adjust volume*: Lightly swipe up or down on the stem.

  You can also turn on Personalized Volume to automatically adjust the volume based on listening preferences and your environment. See Use Conversation Awareness or Personalized Volume.
- *Switch between Active Noise Cancellation, Transparency mode, and Adaptive Audio*: You can set either of your AirPods to perform this action when you press and hold the stem. See Change what the force sensor or Touch control does.
- *Activate Siri*: You can set either of your AirPods to perform this action when you press and hold the stem. See Use Siri with AirPods.

Use head gestures to respond to Siri

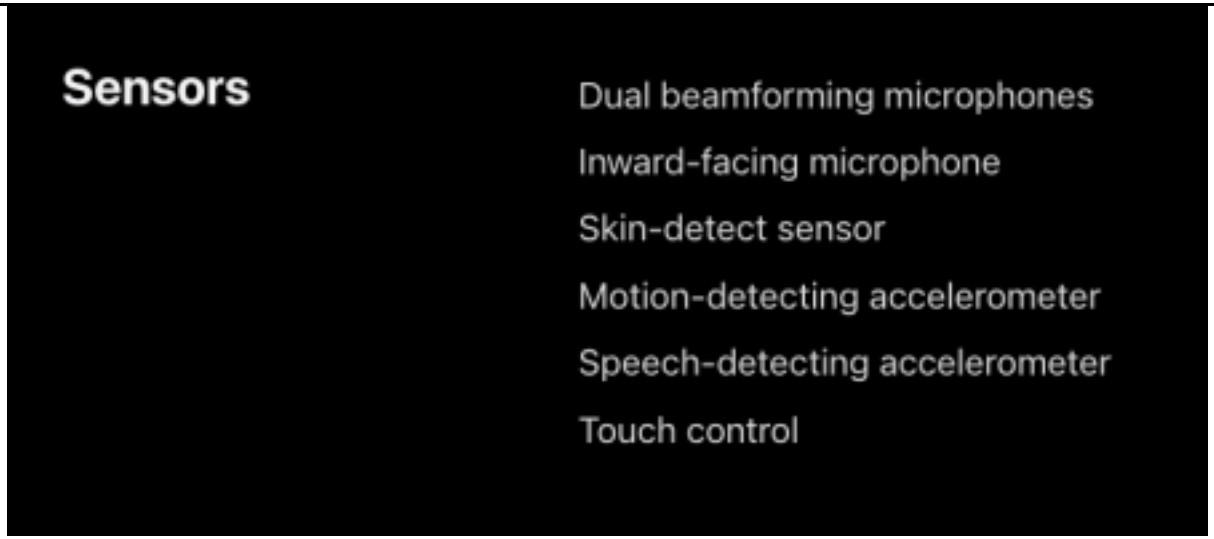
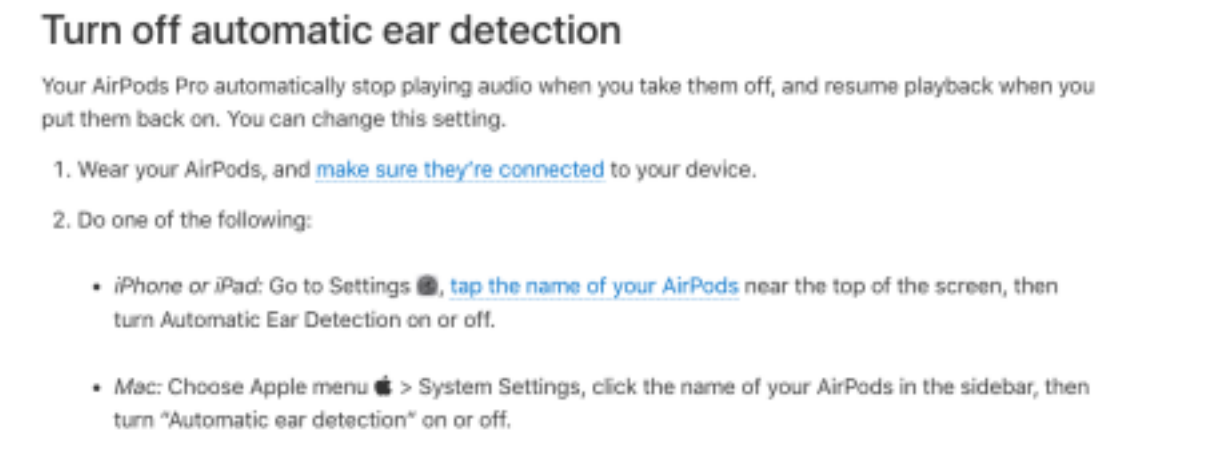
- *Accept a call or reply to notifications and messages*: Nod your head up and down.
- *Decline a call or dismiss notifications and messages*: Shake your head side to side.

Note: To use head gestures to respond to Siri, Announce Calls and Announce Notifications must be on. See Use Siri to announce calls or notifications.

Source: Use controls and gestures with your AirPods - Apple Support (INGENIOSPEC-014024-014029) (available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/1.0/web/1.0).

Apple AirPods Pro 3 *also* meets the claimed limitation for the same reasons. Refer to the table below for corresponding evidence to Apple AirPods Pro 3.

	<table><tr><th>Device</th><th>Citations</th></tr><tr><td>Apple AirPods Pro 3</td><td>Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533; Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;</td></tr></table> Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
11,921,355 Claim 25	**Evidence**
25. A head-worn personal electronic apparatus as recited in claim 19, wherein the head-worn personal electronic apparatus comprises: a sensor at least partially contained within the head-worn personal electronic structure and configured to sense data indicative of whether the head-worn personal electronic apparatus	Every claim limitation of claim 19 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises one or more sensors configured to sense data indicative of whether the head-worn personal electronic apparatus is being worn by the user. The one or more sensors include, but are not necessarily limited to, optical sensors, infrared sensors, and/or proximity sensors capable of detecting whether something (like the skin of a user's ear canal) is close. If the sensor "sees" darkness or absorption consistent with skin, it registers as being worn. Alternatively, skin detection sensors can distinguish between human skin and other surfaces (like a table or pocket). These sensors prevent false triggers when the Accused Instrumentalities are just sitting somewhere. Moreover, accelerometers help confirm movement consistent with being worn (e.g., subtle vibrations when a user walks or speaks). The onboard chip of each of the Apple AirPods Pro 2 earbuds is configured to use data from these sensors to decide whether the earbuds are in-ear. The Accused Instrumentalities may rely on one of these sensors or multiple sensors in combination. These one or more sensors are at least partially contained within the head-worn personal electronic structure and are used to determine if the Accused Instrumentalities are being worn by the user.

is being worn by the user.	 **Source**: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/). 

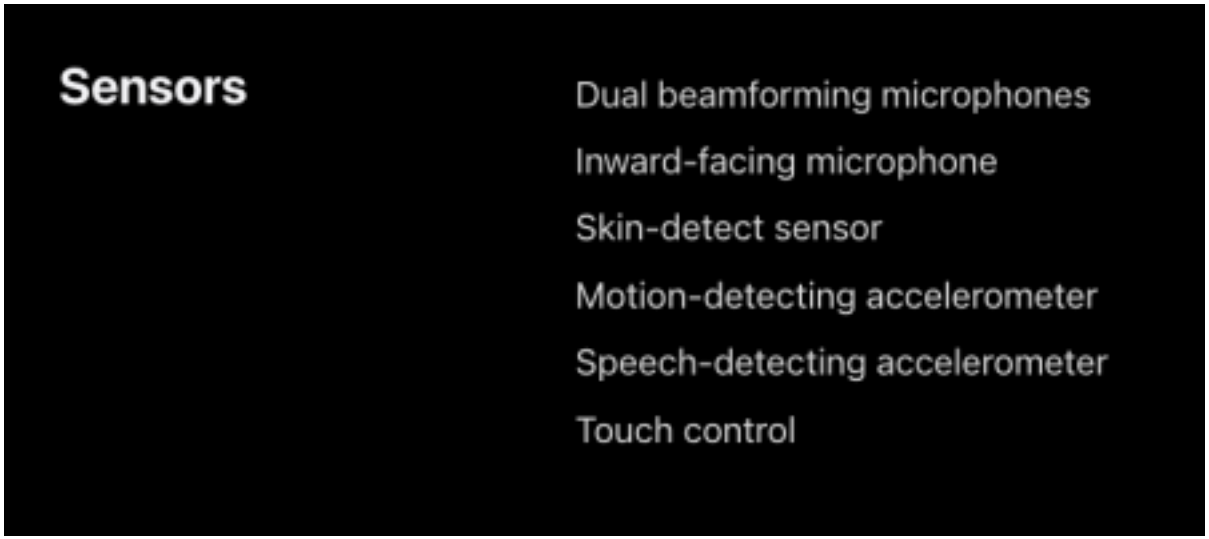
Source: Change settings for AirPods Pro 1 and 2 (INGENIOSPEC-014030-014032) (available from https://support.apple.com/guide/airpods/change-settings-for-airpods-pro-1-and-2-dev6cbd13615/1.0/web/1.0#devc07789cad).

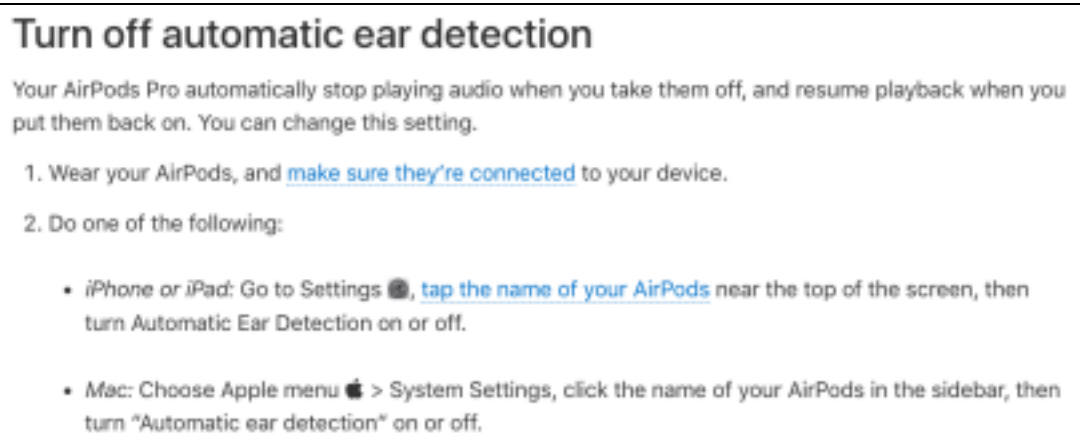
Each of Apple AirPods 2 and Apple AirPods Pro 3 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 2	AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286; AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932;
Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.

11,921,355 Claim 26	**Evidence**
26. A head-worn personal electronic apparatus as recited in claim 25, wherein the head-worn personal electronic	Every claim limitation of claim 25 is present in the Accused Instrumentalities as described above and incorporated herein by reference.

apparatus is configured to at least alter operation of the head-worn personal electronic apparatus based at least in part on the sensed data from the sensor.	Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprise a sensor at least partially contained within the head-worn personal electronic structure and configured to sense data indicative of whether the head-worn personal electronic apparatus is being worn by the user. *See* Claim 25, *supra*. Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, are configured to alter operation based at least in part on the sensed data from the one or more sensors used to determine whether the device is being worn by the user. For example, the Accused Instrumentalities, such as Apple AirPods Pro 2, will play audio when being worn, but pause playing audio when removed from the user's ears. *See e.g.,* https://support.apple.com/en-us/108764 (INGENIOSPEC-011265 to INGENIOSPEC-011267) ("By default, AirPods sense when they're in your ear and receive the audio from your device. AirPods also pause and resume playback when you remove one of your AirPods, or stop playback—and won't resume—when you remove both. "); and https://support.apple.com/guide/beats/turn-automatic-ear-detection-on-or-off-dev82c456e13/web ("Supported Beats feature Automatic Ear Detection. On Apple devices, audio is automatically transferred from connected devices to your Beats. On Android devices, the earphones sense when they’re in your ears and automatically play audio.")  **Source**: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).



Turn off automatic ear detection

Your AirPods Pro automatically stop playing audio when you take them off, and resume playback when you put them back on. You can change this setting.

1. Wear your AirPods, and make sure they're connected to your device.
2. Do one of the following:
   - *iPhone or iPad:* Go to Settings, tap the name of your AirPods near the top of the screen, then turn Automatic Ear Detection on or off.
   - *Mac:* Choose Apple menu > System Settings, click the name of your AirPods in the sidebar, then turn "Automatic ear detection" on or off.

Source: Change settings for AirPods Pro 1 and 2 (INGENIOSPEC-014030-014032) (available from https://support.apple.com/guide/airpods/change-settings-for-airpods-pro-1-and-2-dev6cbd13615/1.0/web/1.0#devc07789cad).

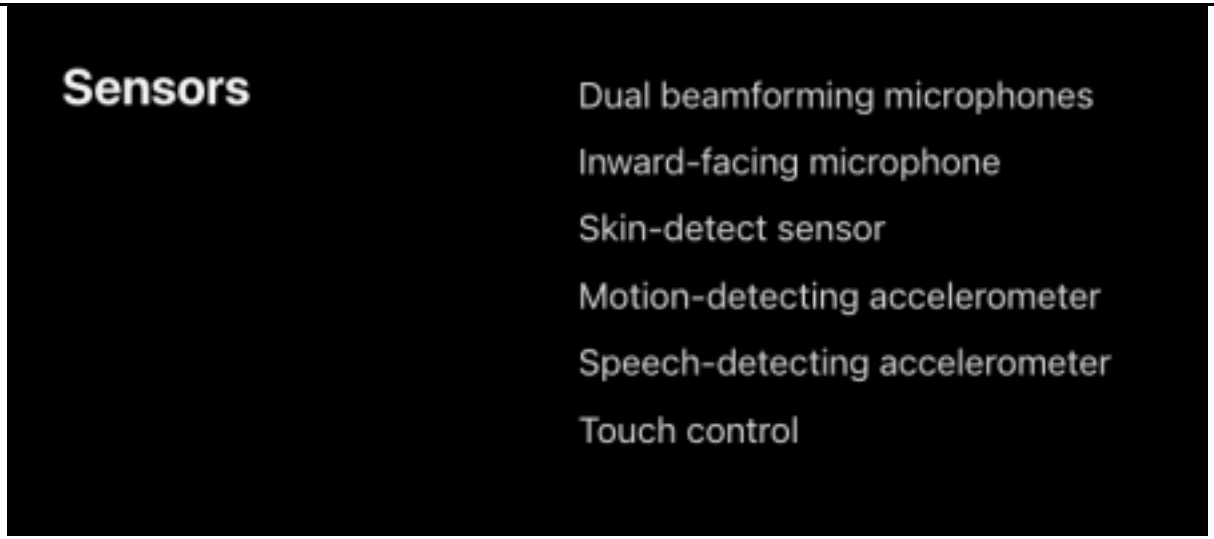
Each of Apple AirPods 2 and Apple AirPods Pro 3 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 2	AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286; AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932;

	Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.

11,921,355 Claim 27	**Evidence**
27. A head-worn personal electronic apparatus as recited in claim 26, wherein the operation of the head-worn personal electronic apparatus being altered concerns control of the audio output being provided to the user.	Every claim limitation of claim 26 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprise a sensor at least partially contained within the head-worn personal electronic structure and configured to sense data indicative of whether the head-worn personal electronic apparatus is being worn by the user. *See* Claim 25, *supra*. Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, are configured to at least alter operation of the head-worn personal electronic apparatus based at least in part on the sensed data from the sensor. *See* Claim 26, *supra*. The operation being altered concerns control of the audio output being provided to the user. For example, the Accused Instrumentalities will play audio when being worn, but pause playing audio when removed from the user's ears. *See e.g.,* https://support.apple.com/en-us/108764 (INGENIOSPEC-011265 to INGENIOSPEC-011267) ("By default, AirPods sense when they're in your ear and receive the audio from your device. AirPods also pause and resume playback when you remove one of your AirPods, or stop playback—and won't resume—when you remove both. "); and https://support.apple.com/guide/beats/turn-automatic-ear-detection-on-or-off-dev82c456e13/web ("Supported Beats feature Automatic Ear Detection. On Apple devices, audio is automatically transferred from connected devices to your Beats. On Android devices, the earphones sense when they’re in your ears and automatically play audio.")



Source: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).

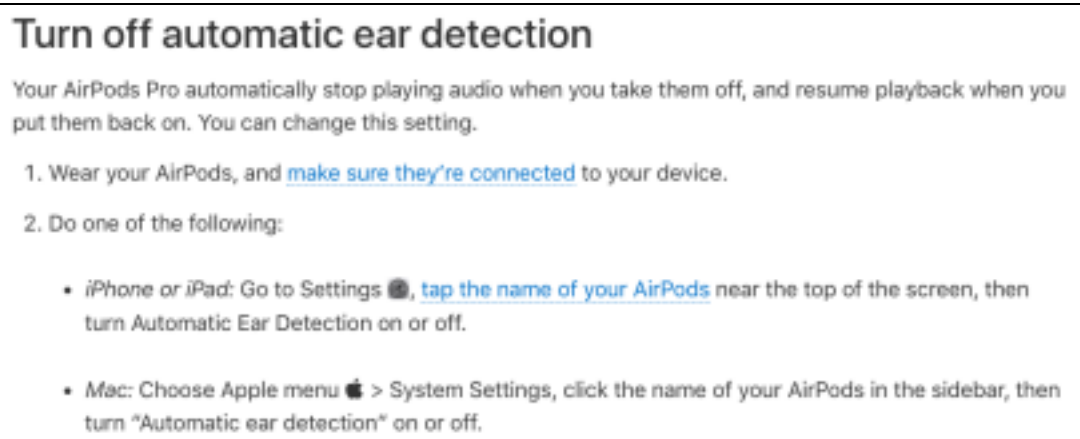
Turn off automatic ear detection

Your AirPods Pro automatically stop playing audio when you take them off, and resume playback when you put them back on. You can change this setting.

1. Wear your AirPods, and make sure they're connected to your device.
2. Do one of the following:
   - *iPhone or iPad:* Go to Settings, tap the name of your AirPods near the top of the screen, then turn Automatic Ear Detection on or off.
   - *Mac:* Choose Apple menu > System Settings, click the name of your AirPods in the sidebar, then turn "Automatic ear detection" on or off.

	Source: Change settings for AirPods Pro 1 and 2 (INGENIOSPEC-014030-014032) (available from https://support.apple.com/guide/airpods/change-settings-for-airpods-pro-1-and-2-dev6cbd13615/1.0/web/1.0#devc07789cad). Each of Apple AirPods 2 and Apple AirPods Pro 3 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device. **Device** / **Citations** Apple AirPods 2 — AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286; AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932; Apple AirPods Pro 3 — Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
11,921,355 Claim 28	**Evidence**
28. A head-worn personal electronic apparatus as recited in claim 26, wherein the operation of the head-worn personal	Every claim limitation of claim 26 is present in the Accused Instrumentalities as described above and incorporated herein by reference.

electronic apparatus being altered concerns operation of the head-worn personal electronic apparatus in a lower power operation.	Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprise a sensor at least partially contained within the head-worn personal electronic structure and configured to sense data indicative of whether the head-worn personal electronic apparatus is being worn by the user. *See* Claim 25, *supra*. Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, are configured to at least alter operation of the head-worn personal electronic apparatus based at least in part on the sensed data from the sensor. *See* Claim 26, *supra*. The operation being altered concerns placing the Accused Instrumentalities into a lower power operation, when not being worn. For example, each of the Accused Instrumentalities, such as Apple AirPods Pro 2, will function normally when it is being worn, but enter a low-power mode when it is removed from the user's ears. **Do AirPods Lose Battery When Not In Case?** Yes, your AirPods will lose battery power when not in the case. Your battery drainage will occur naturally as if the AirPods are still in usage but in low power mode. This is largely based on the fact that the AirPods enter a low power while the proximity sensor remains active. This occurs to maintain the Bluetooth connection to resume playback once you place them back on. Many people are guilty of forgetting to place their AirPods back in the case overnight. If you are one of them then you most probably noticed that you lost around 20% or more of your battery power. If your AirPods were already running low on battery power then you could easily wake up to a pair of dead AirPods that need to be fully charged before using them. **Source**: Do AirPods Lose Battery When Not in Case (INGENIOSPEC-014694-014698) (available from https://burga.com/blogs/news/do-airpods-lose-battery-when-not-in-case).



Turn off automatic ear detection

Your AirPods Pro automatically stop playing audio when you take them off, and resume playback when you put them back on. You can change this setting.

1. Wear your AirPods, and make sure they're connected to your device.
2. Do one of the following:
   - *iPhone or iPad:* Go to Settings, tap the name of your AirPods near the top of the screen, then turn Automatic Ear Detection on or off.
   - *Mac:* Choose Apple menu > System Settings, click the name of your AirPods in the sidebar, then turn "Automatic ear detection" on or off.

Source: Change settings for AirPods Pro 1 and 2 (INGENIOSPEC-014030-014032) (available from https://support.apple.com/guide/airpods/change-settings-for-airpods-pro-1-and-2-dev6cbd13615/1.0/web/1.0#devc07789cad).



Source: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).

Each of Apple AirPods 2 and Apple AirPods Pro 3 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 2	Do AirPods Lose Battery When Not in Case, available from https://burga.com/blogs/news/do-airpods-lose-battery-when-not-in-case. *See* INGENIOSPEC-014694-014698; AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932; AirPods (2nd generation) Overview, available from

		https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286;
	Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Do AirPods Lose Battery When Not in Case, available from https://burga.com/blogs/news/do-airpods-lose-battery-when-not-in-case. *See* INGENIOSPEC-014694-014698;

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.

11,921,355 Claim 29	**Evidence**
29. A head-worn personal electronic apparatus as recited in claim 17, wherein the head-worn personal electronic apparatus comprises:	Every claim limitation of claim 17 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
29a. a first microphone configured to pick up at least audio input from at least the user, the first microphone being at least partially in the	*See* Claim 7a, *supra*. Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

head-worn personal electronic apparatus and is positioned to be directed towards the user when the head-worn personal electronic apparatus is being worn by the user;		**Device**	**Citations**
		Apple AirPods 2	AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286; AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932; Apple AirPods 2 In-Depth Teardown Review by 52AUDIO, available from https://www.chargerlab.com/apple-airpod-2-in-depth-teardown-review/. *See* INGENIOSPEC-013937-014004;
		Apple AirPods 3	Apple AirPods 3 true wireless earphones teardown, available from https://www.qucox.com/apple-airpods-3-teardown/. *See* INGENIOSPEC-014163-014238; Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150; AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158;
		Apple AirPods 4	Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. *See* INGENIOSPEC-013664-013691; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;

		Apple AirPods 4 with Active Noise Cancellation	Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;
		Beats Fit Pro	Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458; Teardown Report: Beats Fit Pro, available from https://www.52audio.com/archives/98994.html. *See* INGENIOSPEC-014407-014463;
		Beats Solo Pro	Replacement Parts List, available from https://www.joesge.com/products/beats-solo-pro-wireless-headphones-repair-parts?srsltid=AfmBOoohkWL6z6LfgJ6-r9iZYIxup4uhO-LU6DQhzGFOFk4vPOj3vouM. *See* INGENIOSPEC-013836-013844; Solo Pro Press Release, available from

		https://www.beatsbydre.com/content/dam/beats/web/press/solo-pro/solo-pro-press-kit.zip. *See* INGENIOSPEC-014313-014314;
	Powerbeats Pro	Best Buy -- Powerbeats Pro Features, available from https://www.bestbuy.com/product/beats-powerbeats-pro-totally-wireless-earbuds-black/JJ8XJS3FXY. *See* INGENIOSPEC-013883-013883; Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289;
	Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616;

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.

29b. and a second microphone configured to pick up at least ambient sound input associated with an environment in the vicinity of the head-worn personal electronic apparatus, the second microphone being

See Claim 7b, *supra*.

Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**

positioned to be directed away from the user when the head-worn wearable electronic device is being worn by the user.		Apple AirPods 2	AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286; AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932; Apple AirPods 2 In-Depth Teardown Review by 52AUDIO, available from https://www.chargerlab.com/apple-airpod-2-in-depth-teardown-review/. *See* INGENIOSPEC-013937-014004;
		Apple AirPods 3	Apple AirPods 3 true wireless earphones teardown, available from https://www.qucox.com/apple-airpods-3-teardown/. *See* INGENIOSPEC-014163-014238; Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150; AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158;
		Apple AirPods 4	Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. *See* INGENIOSPEC-013664-013691; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
		Apple AirPods 4 with Active Noise Cancellation	Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from

			https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;
		Beats Fit Pro	Teardown Report: Beats Fit Pro, available from https://www.52audio.com/archives/98994.html. *See* INGENIOSPEC-014407-014463; Beats Fit Pro True Wireless Earbuds — Beats Black, available from https://www.apple.com/shop/product/MK2F3LL/A/beats-fit-pro-true-wireless-earbuds-beats-black. *See* INGENIOSPEC-013302-013309;
		Beats Solo Pro	Beats-Solo-Pro-Wireless-Headphones-User-Guide, available from https://manuals.plus/wp-content/uploads/2023/05/Beats-Solo-Pro-Wireless-Headphones-User-Guide.pdf. *See* INGENIOSPEC-013808-013835; Solo Pro - Beats by Dre Archive 2, available from https://web.archive.org/web/20200602034251/https://www.beatsbydre.com/headphones/solo-pro. *See* INGENIOSPEC-013312-013323; Solo Pro Press Release, available from https://www.beatsbydre.com/content/dam/beats/web/press/solo-pro/solo-pro-press-kit.zip. *See* INGENIOSPEC-014313-014314;
		Powerbeats Pro	Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289;

<table>
<tr><td></td><td>
<table>
<tr><td>Powerbeats Pro 2</td><td>Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. See INGENIOSPEC-013602-013616;</td></tr>
</table>

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.</td></tr>
<tr><th>11,921,355
Claim 30</th><th>Evidence</th></tr>
<tr><td>30. A head-worn personal electronic apparatus as recited in claim 29,</td><td>Every claim limitation of claim 29 is present in the Accused Instrumentalities as described above and incorporated herein by reference.

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.</td></tr>
<tr><td>30a. wherein the electronic circuitry is configured to: determine an ambient sound level; and modify audio output to the at least one speaker dependent at least in part on the ambient sound level.</td><td>See Claim 8, supra.

Each of Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro and Powerbeats Pro 2 also meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.
<table>
<tr><th>Device</th><th>Citations</th></tr>
<tr><td>Apple AirPods 4 with Active Noise Cancellation</td><td>AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. See INGENIOSPEC-014675-014686;
Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. See INGENIOSPEC-013484-013501;</td></tr>
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		Apple AirPods Pro 1	Switch between noise control modes - Apple Support, available from https://support.apple.com/guide/airpods/switch-between-noise-control-modes-dev9812f5cc3/1.0/web/1.0. *See* INGENIOSPEC-014039-014043; AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Introducing AirPods Pro 3, the ultimate audio experience, available from https://www.apple.com/in/newsroom/2025/09/airpods-pro-3-introduce-the-ultimate-audio-experience/. *See* INGENIOSPEC-014239-014248;
		Beats Fit Pro	Use your Beats Fit Pro - Apple Support, available from https://support.apple.com/guide/beats/use-beats-fit-pro-dev6f7b5266d/web. *See* INGENIOSPEC-013661-013663; Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458;
		Beats Solo Pro	Solo Pro Press Release, available from https://www.beatsbydre.com/content/dam/beats/web/press/solo-pro/solo-pro-press-kit.zip. *See* INGENIOSPEC-014313-014314; Beats Solo Pro Unboxing and Hands-On, available from https://www.youtube.com/watch?v=PqQkg8FHGdU&t=3s. *See* INGENIOSPEC-013191, INGENIOSPEC-013192-013197; Solo Pro - Beats by Dre Archive 2, available from https://web.archive.org/web/20200602034251/https://www.beatsbydre.com/headphones/solo-pro. *See* INGENIOSPEC-013312-013323; Beats by Dre The New Solo Pro, available from

		https://www.youtube.com/watch?v=V2i1YkfrM54. *See* INGENIOSPEC-013152, INGENIOSPEC-013153-013157;
	Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds with video transcript, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013617-013632; Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616;

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.

11,921,355 Claim 31	**Evidence**
31. A head-worn personal electronic apparatus as recited in claim 29, wherein the electronic circuitry is configured to:	Every claim limitation of claim 29 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
31a. produce an ambient audio output signal based on at least the ambient sound input; and provide at least the ambient audio output signal	*See* Claim 9a, *supra*. Each of Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**

to the at least one speaker.		Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501;
		Apple AirPods Pro 1	Switch between noise control modes - Apple Support, available from https://support.apple.com/guide/airpods/switch-between-noise-control-modes-dev9812f5cc3/1.0/web/1.0. *See* INGENIOSPEC-014039-014043; AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Introducing AirPods Pro 3, the ultimate audio experience, available from https://www.apple.com/in/newsroom/2025/09/airpods-pro-3-introduce-the-ultimate-audio-experience/. *See* INGENIOSPEC-014239-014248;
		Beats Fit Pro	Use your Beats Fit Pro - Apple Support, available from https://support.apple.com/guide/beats/use-beats-fit-pro-dev6f7b5266d/web. *See* INGENIOSPEC-013661-013663; Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458;
		Beats Solo Pro	Solo Pro Press Release, available from https://www.beatsbydre.com/content/dam/beats/web/press/solo-pro/solo-pro-press-kit.zip. *See* INGENIOSPEC-014313-014314; Beats Solo Pro Unboxing and Hands-On, available from

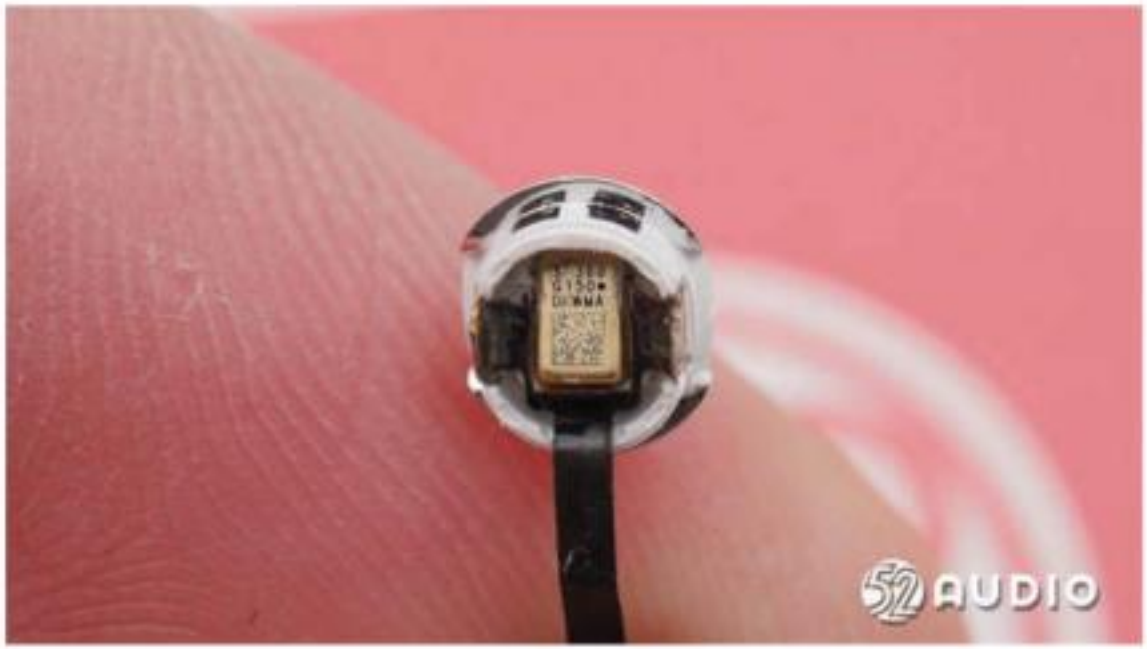
		https://www.youtube.com/watch?v=PqQkg8FHGdU&t=3s. *See* INGENIOSPEC-013191, INGENIOSPEC-013192-013197; Solo Pro - Beats by Dre Archive 2, available from https://web.archive.org/web/20200602034251/https://www.beatsbydre.com/headphones/solo-pro. *See* INGENIOSPEC-013312-013323; Beats by Dre The New Solo Pro, available from https://www.youtube.com/watch?v=V2i1YkfrM54. *See* INGENIOSPEC-013152, INGENIOSPEC-013153-013157;
	Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds with video transcript, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013617-013632; Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	

11,921,355 Claim 32	**Evidence**
32. A head-worn personal electronic apparatus as recited in claim 31,	Every claim limitation of claim 31 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
32a. wherein the electronic circuitry is configured to: determine an ambient noise level	*See* Claim 10a, *supra*.

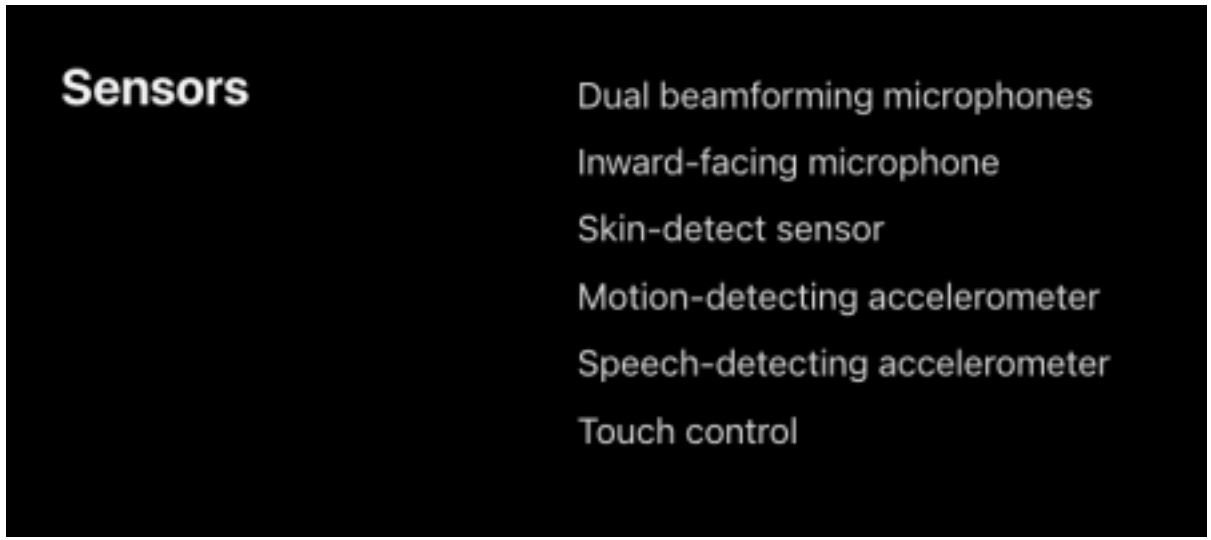
<table>
<tr>
<td>based on at least the ambient sound input, wherein the ambient audio output signal is dependent on the ambient noise level.</td>
<td>Each of Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro and Powerbeats Pro 2 also meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.
<table>
<tr><th>Device</th><th>Citations</th></tr>
<tr><td>Apple AirPods 4 with Active Noise Cancellation</td><td>AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. See INGENIOSPEC-014675-014686;
Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. See INGENIOSPEC-013484-013501;</td></tr>
<tr><td>Apple AirPods Pro 1</td><td>Switch between noise control modes - Apple Support, available from https://support.apple.com/guide/airpods/switch-between-noise-control-modes-dev9812f5cc3/1.0/web/1.0. See INGENIOSPEC-014039-014043;
AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. See INGENIOSPEC-014050-014056;
Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. See INGENIOSPEC-014108-014117;</td></tr>
<tr><td>Apple AirPods Pro 3</td><td>Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. See INGENIOSPEC-014249-014255;
Introducing AirPods Pro 3, the ultimate audio experience, available from https://www.apple.com/in/newsroom/2025/09/airpods-pro-3-introduce-the-ultimate-audio-experience/. See INGENIOSPEC-014239-014248;</td></tr>
<tr><td>Beats Fit Pro</td><td>Use your Beats Fit Pro - Apple Support, available from https://support.apple.com/guide/beats/use-beats-fit-pro-dev6f7b5266d/web. See INGENIOSPEC-013661-013663;</td></tr>
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		Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458;
	Beats Solo Pro	Solo Pro Press Release, available from https://www.beatsbydre.com/content/dam/beats/web/press/solo-pro/solo-pro-press-kit.zip. *See* INGENIOSPEC-014313-014314; Beats Solo Pro Unboxing and Hands-On, available from https://www.youtube.com/watch?v=PqQkg8FHGdU&t=3s. *See* INGENIOSPEC-013191, INGENIOSPEC-013192-013197; Solo Pro - Beats by Dre Archive 2, available from https://web.archive.org/web/20200602034251/https://www.beatsbydre.com/headphones/solo-pro. *See* INGENIOSPEC-013312-013323; Beats by Dre The New Solo Pro, available from https://www.youtube.com/watch?v=V2i1YkfrM54. *See* INGENIOSPEC-013152, INGENIOSPEC-013153-013157;
	Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds with video transcript, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013617-013632; Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	

11,921,355 Claim 33	**Evidence**
33. A head-worn personal electronic apparatus as recited	Every claim limitation of claim 17 is present in the Accused Instrumentalities as described above and incorporated herein by reference.

in claim 17, wherein the head-worn personal electronic apparatus comprises:	Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, is a head-worn personal electronic apparatus as recited in Claim 1. *See* Claim 1, *supra*. Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
33a. a first microphone configured to pick up at least audio input from at least the user, the first microphone being at least partially in the head-worn personal electronic apparatus;	Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises a first microphone configured to pick up at least audio input from at least the user. The first microphone is at least partially in the head-worn personal electronic apparatus.  Bottom pickup microphone.

Source: Apple AirPods Pro 2 Teardown: Upgrade Materials and Design (INGENIOSPEC-013701-013760) (available from https://www.qucox.com/apple-airpods-pro-2-teardown/).



Source: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).

The first microphone is positioned so that it is directed towards the user when the head-worn personal electronic apparatus is being worn by the user. The microphone captures the user's voice during phone calls, video conferences, or when issuing voice commands to Siri.

Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

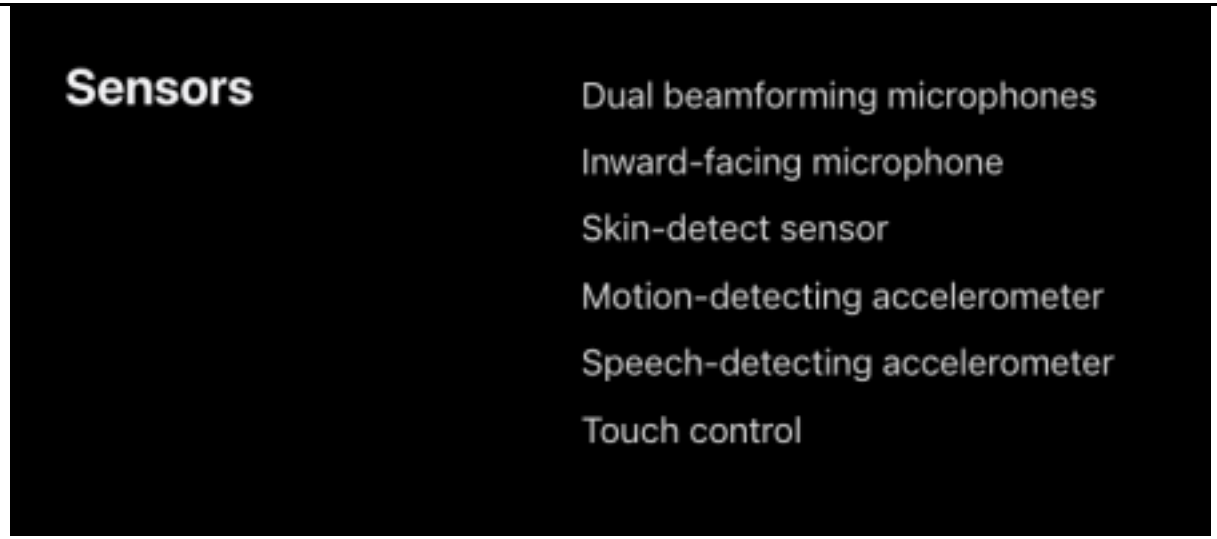
Device	**Citations**

		Apple AirPods 2	AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286; AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932; Apple AirPods 2 In-Depth Teardown Review by 52AUDIO, available from https://www.chargerlab.com/apple-airpod-2-in-depth-teardown-review/. *See* INGENIOSPEC-013937-014004;
		Apple AirPods 3	Apple AirPods 3 true wireless earphones teardown, available from https://www.qucox.com/apple-airpods-3-teardown/. *See* INGENIOSPEC-014163-014238; Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150; AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158;
		Apple AirPods 4	Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. *See* INGENIOSPEC-013664-013691; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
		Apple AirPods 4 with Active Noise Cancellation	Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; AirPods 4 - Technical Specifications, available from

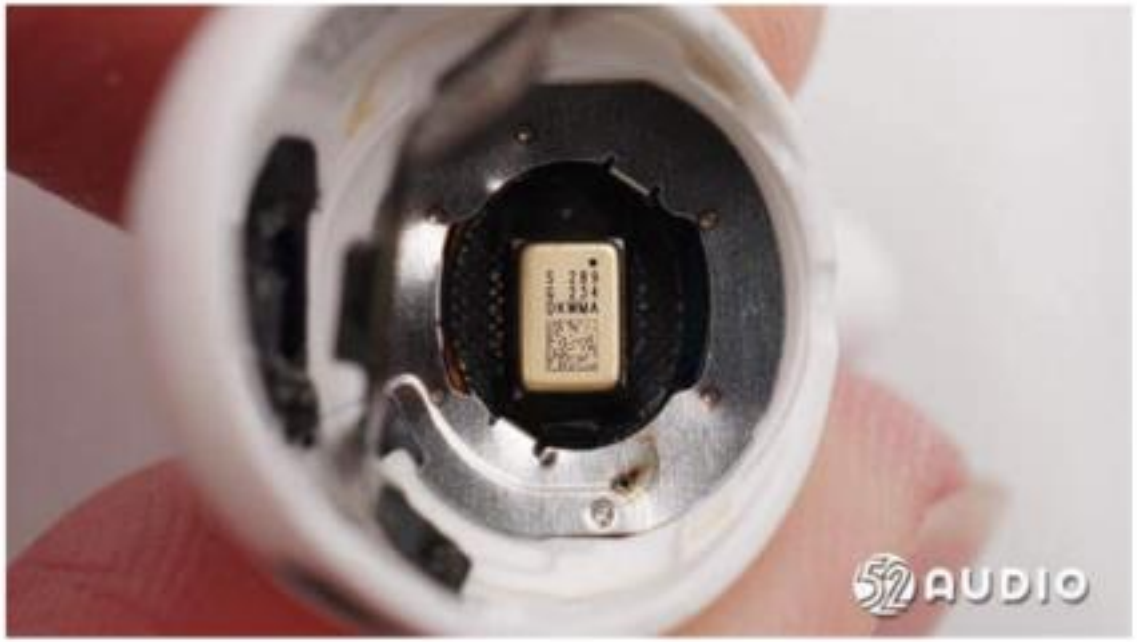
			https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;
		Beats Fit Pro	Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458; Teardown Report: Beats Fit Pro, available from https://www.52audio.com/archives/98994.html. *See* INGENIOSPEC-014407-014463;
		Beats Solo Pro	Replacement Parts List, available from https://www.joesge.com/products/beats-solo-pro-wireless-headphones-repair-parts?srsltid=AfmBOoohkWL6z6LfgJ6-r9iZYIxup4uhO-LU6DQhzGFOFk4vPOj3vouM. *See* INGENIOSPEC-013836-013844; Solo Pro Press Release, available from https://www.beatsbydre.com/content/dam/beats/web/press/solo-pro/solo-pro-press-kit.zip. *See* INGENIOSPEC-014313-014314;

	Powerbeats Pro	Best Buy -- Powerbeats Pro Features, available from https://www.bestbuy.com/product/beats-powerbeats-pro-totally-wireless-earbuds-black/JJ8XJS3FXY. *See* INGENIOSPEC-013883-013883; Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289;
	Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	
33b. and a second microphone configured to pick up at least ambient sound input associated with an environment in the vicinity of the head-worn personal electronic apparatus, the second microphone being at least partially in the head-worn personal	Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises a second microphone configured to pick up at least ambient sound input associated with an environment in the vicinity of the head-worn personal electronic apparatus. The second microphone is also at least partially in the head-worn personal electronic apparatus.	

electronic apparatus,	 **Source**: Noise-Cancelling Microphones Image from AirPods Pro2 (INGENIOSPEC-014019-014019) (available from https://www.apple.com/airpods-pro/).



Source: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).



A metal protective cover is arranged above the noise cancellation microphone.

Source: Apple AirPods Pro 2 Teardown: Upgrade Materials and Design (INGENIOSPEC-013701-013760) (available from https://www.qucox.com/apple-airpods-pro-2-teardown/).

For example, the second microphone can be positioned to be directed away from the user when the head-worn wearable electronic device is being worn by the user. The second microphone can help reduce environmental noise from desired audio.

Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 2	AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286; AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932; Apple AirPods 2 In-Depth Teardown Review by 52AUDIO, available from https://www.chargerlab.com/apple-airpod-2-in-depth-teardown-review/. *See* INGENIOSPEC-013937-014004;
Apple AirPods 3	Apple AirPods 3 true wireless earphones teardown, available from https://www.qucox.com/apple-airpods-3-teardown/. *See* INGENIOSPEC-014163-014238; Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150; AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158;
Apple AirPods 4	Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. *See* INGENIOSPEC-013664-013691; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;

		Apple AirPods 4 with Active Noise Cancellation	Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;
		Beats Fit Pro	Teardown Report: Beats Fit Pro, available from https://www.52audio.com/archives/98994.html. *See* INGENIOSPEC-014407-014463; Beats Fit Pro True Wireless Earbuds — Beats Black, available from https://www.apple.com/shop/product/MK2F3LL/A/beats-fit-pro-true-wireless-earbuds-beats-black. *See* INGENIOSPEC-013302-013309;
		Beats Solo Pro	Beats-Solo-Pro-Wireless-Headphones-User-Guide, available from https://manuals.plus/wp-content/uploads/2023/05/Beats-Solo-Pro-Wireless-Headphones-User-Guide.pdf. *See* INGENIOSPEC-013808-013835; Solo Pro - Beats by Dre Archive 2, available from https://web.archive.org/web/20200602034251/https://www.beatsbydre.com/headphones/solo-pro. *See* INGENIOSPEC-013312-013323;

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<tr><td></td><td>Solo Pro Press Release, available from https://www.beatsbydre.com/content/dam/beats/web/press/solo-pro/solo-pro-press-kit.zip. See INGENIOSPEC-014313-014314;</td></tr>
<tr><td>Powerbeats Pro</td><td>Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. See INGENIOSPEC-014287-014289;</td></tr>
<tr><td>Powerbeats Pro 2</td><td>Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. See INGENIOSPEC-013602-013616;</td></tr>
</table>

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
</td></tr>
<tr><td>33c. wherein the second microphone is positioned to be further away from mouth of the user than the first microphone when at least the head-worn personal electronic apparatus of the head-worn personal electronic apparatus is being worn.</td><td>The second microphone of each of the Accused Instrumentalities, such as Apple AirPods Pro 2, is positioned to be further away from mouth of the user than the first microphone when the device is being worn. As shown above, the first microphone is configured to capture the user’s voice during phone calls, video conferences, or when issuing voice commands to Siri; whereas the second microphone is configured to pick up at least ambient sounds in the environment help reduce environmental noise from desired audio.

Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro, Powerbeats Pro and Powerbeats Pro 2 also meet the claimed limitation for the same reasons.

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.</td></tr>
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<table>
<tr><th>11,921,355
Claim 34</th><th>Evidence</th></tr>
<tr><td>34. A head-worn personal electronic apparatus as recited in claim 17, wherein the head-worn personal electronic apparatus comprises:</td><td>Every claim limitation of claim 17 is present in the Accused Instrumentalities as described above and incorporated herein by reference.

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.</td></tr>
<tr><td>34a. a first microphone;</td><td>See Claim 11a, supra.

Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro, Powerbeats Pro and Powerbeats Pro 2 also meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

<table>
<tr><th>Device</th><th>Citations</th></tr>
<tr><td>Apple AirPods 2</td><td>AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. See INGENIOSPEC-014277-014286;
AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. See INGENIOSPEC-013926-013932;
Apple AirPods 2 In-Depth Teardown Review by 52AUDIO, available from https://www.chargerlab.com/apple-airpod-2-in-depth-teardown-review/. See INGENIOSPEC-013937-014004;</td></tr>
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		Apple AirPods 3	Apple AirPods 3 true wireless earphones teardown, available from https://www.qucox.com/apple-airpods-3-teardown/. *See* INGENIOSPEC-014163-014238; Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150; AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158;
		Apple AirPods 4	Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. *See* INGENIOSPEC-013664-013691; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
		Apple AirPods 4 with Active Noise Cancellation	Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075;

		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;
		Beats Fit Pro	Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458; Teardown Report: Beats Fit Pro, available from https://www.52audio.com/archives/98994.html. *See* INGENIOSPEC-014407-014463;
		Beats Solo Pro	Replacement Parts List, available from https://www.joesge.com/products/beats-solo-pro-wireless-headphones-repair-parts?srsltid=AfmBOoohkWL6z6LfgJ6-r9iZYIxup4uhO-LU6DQhzGFOFk4vPOj3vouM. *See* INGENIOSPEC-013836-013844; Solo Pro Press Release, available from https://www.beatsbydre.com/content/dam/beats/web/press/solo-pro/solo-pro-press-kit.zip. *See* INGENIOSPEC-014313-014314;
		Powerbeats Pro	Best Buy -- Powerbeats Pro Features, available from https://www.bestbuy.com/product/beats-powerbeats-pro-totally-wireless-earbuds-black/JJ8XJS3FXY. *See* INGENIOSPEC-013883-013883; Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289;
		Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-

		high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616;

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.

34b. and a second microphone;

See Claim 11b, *supra*.

Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 2	AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286; AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932; Apple AirPods 2 In-Depth Teardown Review by 52AUDIO, available from https://www.chargerlab.com/apple-airpod-2-in-depth-teardown-review/. *See* INGENIOSPEC-013937-014004;
Apple AirPods 3	Apple AirPods 3 true wireless earphones teardown, available from https://www.qucox.com/apple-airpods-3-teardown/. *See* INGENIOSPEC-014163-014238; Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150; AirPods (3rd Generation) - Technical Specs, available from

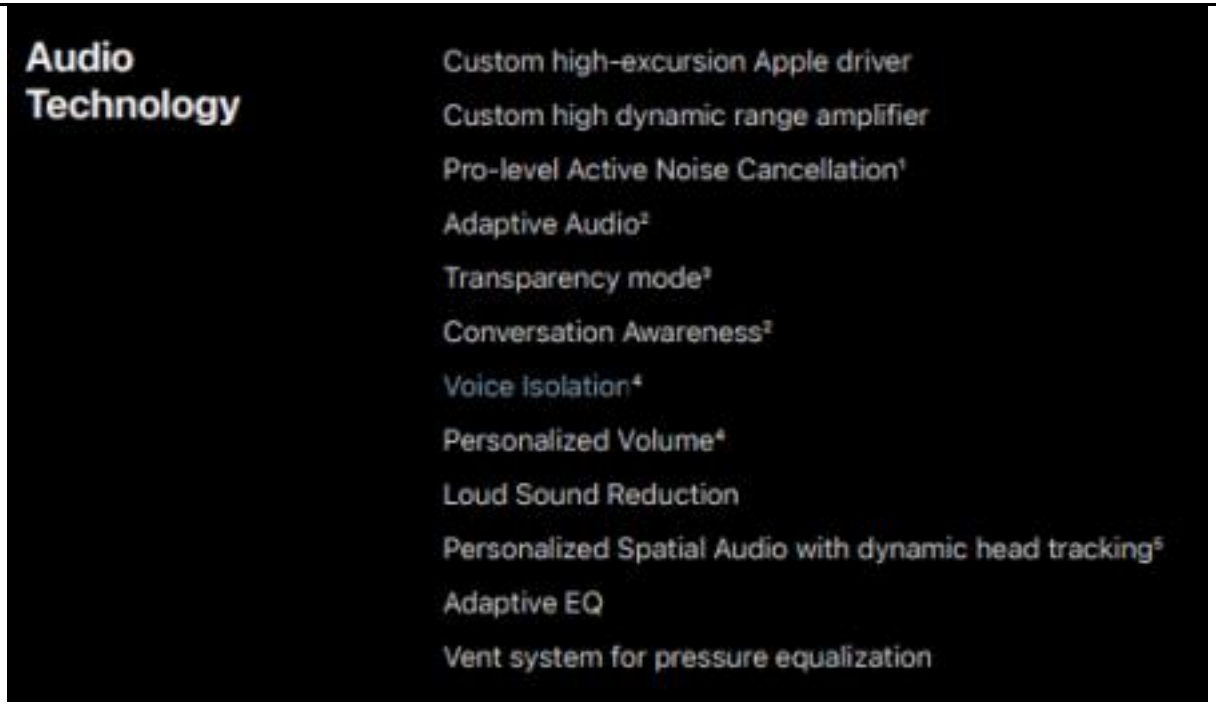
			https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158;
		Apple AirPods 4	Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. *See* INGENIOSPEC-013664-013691; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
		Apple AirPods 4 with Active Noise Cancellation	Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;
		Beats Fit Pro	Teardown Report: Beats Fit Pro, available from https://www.52audio.com/archives/98994.html. *See* INGENIOSPEC-014407-014463; Beats Fit Pro True Wireless Earbuds — Beats Black, available from

		https://www.apple.com/shop/product/MK2F3LL/A/beats-fit-pro-true-wireless-earbuds-beats-black. *See* INGENIOSPEC-013302-013309;
	Beats Solo Pro	Beats-Solo-Pro-Wireless-Headphones-User-Guide, available from https://manuals.plus/wp-content/uploads/2023/05/Beats-Solo-Pro-Wireless-Headphones-User-Guide.pdf. *See* INGENIOSPEC-013808-013835; Solo Pro - Beats by Dre Archive 2, available from https://web.archive.org/web/20200602034251/https://www.beatsbydre.com/headphones/solo-pro. *See* INGENIOSPEC-013312-013323; Solo Pro Press Release, available from https://www.beatsbydre.com/content/dam/beats/web/press/solo-pro/solo-pro-press-kit.zip. *See* INGENIOSPEC-014313-014314;
	Powerbeats Pro	Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289;
	Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	
34c. wherein the first microphone is configured to pick up at least audio input from at least the user, wherein the second	*See* Claim 11c, *supra*. Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.	

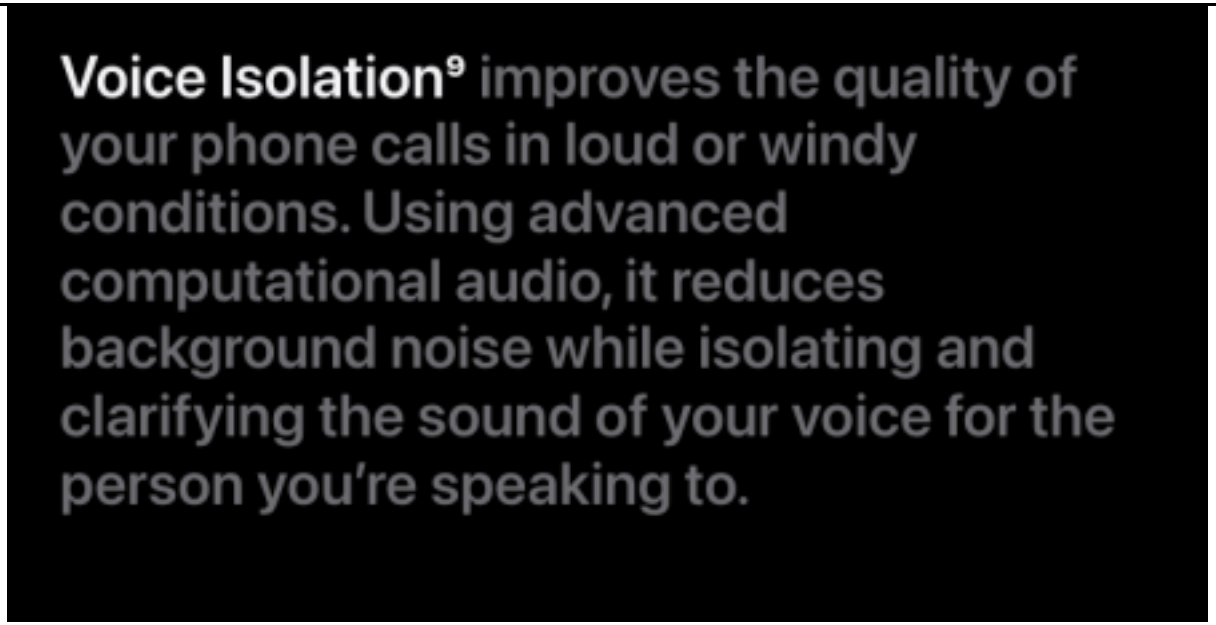
microphone is configured to pick up at least environmental audio input associated with an environment in the vicinity of the head-worn wearable electronic device, and wherein the electronic circuitry is configured to process the audio input from at least the user picked-up via the first microphone to remove at least a portion of the environmental audio input associated with the environment picked-up via the second microphone.		**Device**	**Citations**
		Apple AirPods 2	AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932;
		Apple AirPods 3	Which AirPods model should you buy?, available from https://www.theverge.com/2021/10/19/22733797/airpods-2-3-pro-max-which-to-buy. *See* INGENIOSPEC-013410-013429; Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150;
		Apple AirPods 4	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-014260-014276;
		Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038;

			Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501;
		Apple AirPods Pro 1	How To Enable Voice Isolation On AirPods - YouTube, available from https://www.youtube.com/watch?v=_gpVEHX7WOw. *See* INGENIOSPEC-014672-014674; AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;
		Beats Fit Pro	Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458;
		Beats Solo Pro	Solo Pro Press Release, available from https://www.beatsbydre.com/content/dam/beats/web/press/solo-pro/solo-pro-press-kit.zip. *See* INGENIOSPEC-014313-014314;
		Powerbeats Pro	Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289;
		Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616;

	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
11,921,355 Claim 35	**Evidence**
35. A head-worn personal electronic apparatus as recited in claim 34, wherein the audio input from at least the user picked-up via the first microphone includes at least a voice input, and wherein the environmental audio input associated with the environment includes at least ambient noise.	Every claim limitation of claim 34 is present in the Accused Instrumentalities as described above and incorporated herein by reference. The first microphone of each of the Accused Instrumentalities, such as Apple AirPods Pro 2, is configured to pick up at least audio input from at least the user. *See* Claim 34a and 34c, *supra*. The audio input from at least the user picked-up via the first microphone includes at least a voice input. For example, the first microphone can pick up voice command from the user and/or use the first microphone to pick up the user's voice when on a phone call, video call, creating a voice memo, video, or other voice recording. The second microphone of each of the Accused Instrumentalities, such as Apple AirPods Pro 2, is configured to pick up at least environmental audio input associated with an environment in the vicinity of the head-worn wearable electronic device. *See* Claim 34b and 34c, *supra*. The environmental audio input associated with the environment picked up by the second microphone includes at least ambient noise. For example, the ambient noise can be eliminated (or filtered out) in order to make the users voice more clear on phone calls, video calls, voice memos, videos, or other voice recordings. For example, Apple's Voice Isolation uses the first microphone to capture at least the user's speech, while the second microphone captures at least the ambient noise. The apparatus then processes these inputs together to remove or suppress at least a portion of the ambient noise picked up by the second microphone, so the user's speech less interfered with by the ambient noise.



Source: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).



Source: AirPods Pro 2 - Apple (INGENIOSPEC-013541-013563) (available from https://web.archive.org/web/20250904180656/https:/www.apple.com/airpods-pro/).

Filter out background sounds during calls with AirPods 4 or AirPods Pro 2

When you wear your AirPods 4 (both models) or AirPods Pro 2 during calls on your iPhone, iPad, or Mac, you can use Voice Isolation to enhance voice quality and remove background noise (such as wind) for the listener.

During a call, do one of the following:

- *iPhone or iPad:* Swipe down from the top-right corner of your screen to open Control Center. Tap FaceTime Controls at the top of the screen, then select Voice Isolation.
- *Mac:* Click  or  in the menu bar (depending on the type of call), click Mic Mode, then select Voice Isolation.

Source: Make and answer calls - Apple Support (INGENIOSPEC-014036-014038) (available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0).

Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

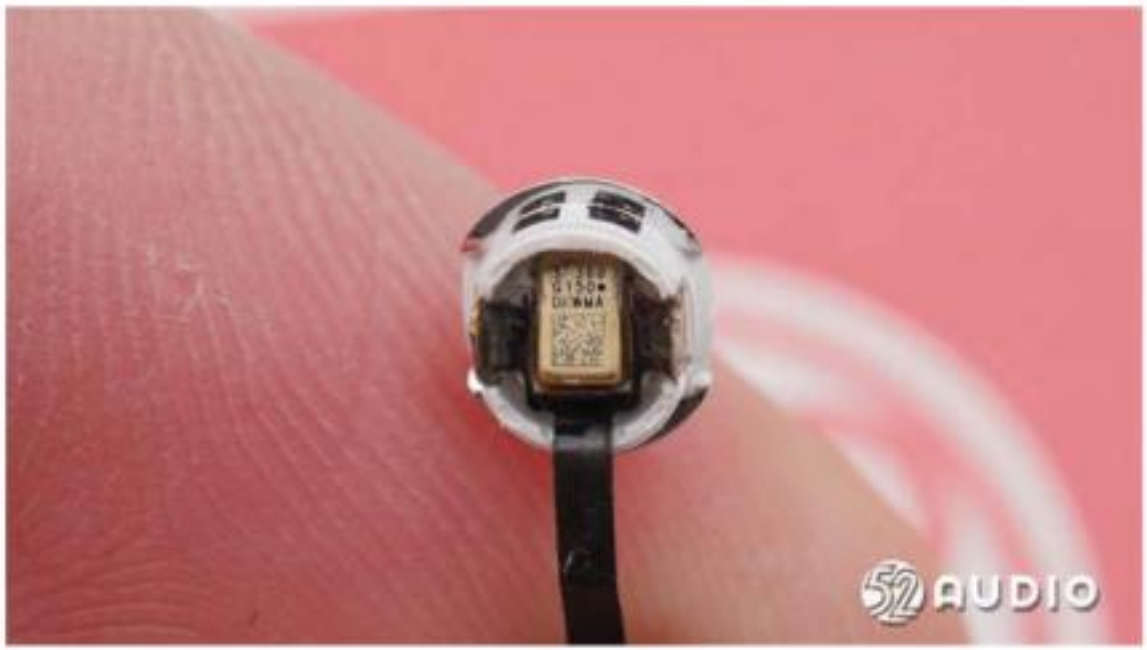
Device	**Citations**
Apple AirPods 2	AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286; AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932; Apple AirPods 2 In-Depth Teardown Review by 52AUDIO, available from

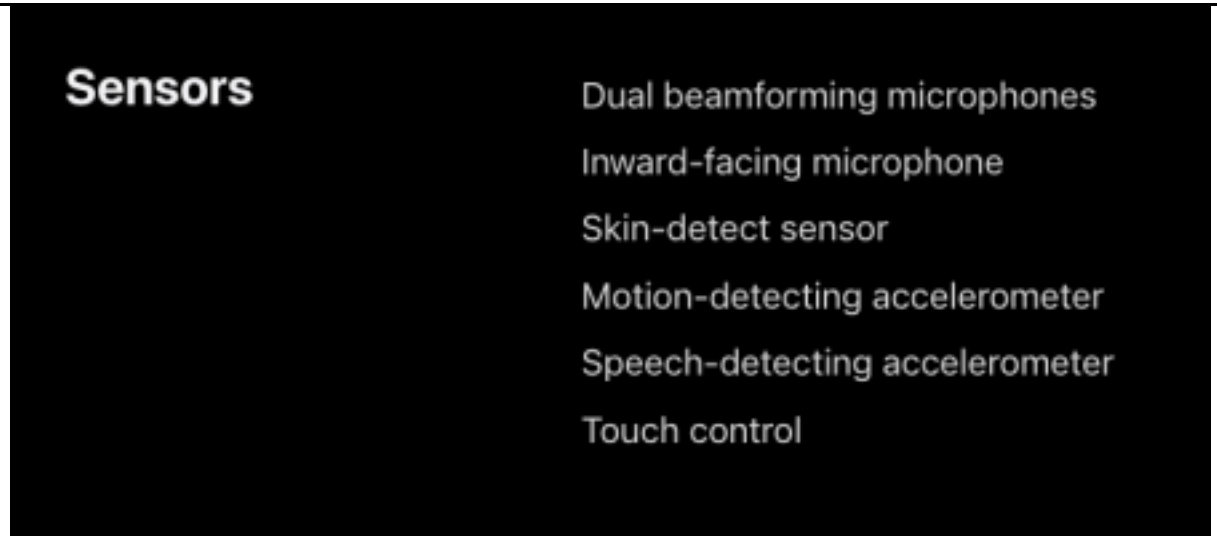
			https://www.chargerlab.com/apple-airpod-2-in-depth-teardown-review/. *See* INGENIOSPEC-013937-014004;
		Apple AirPods 3	Apple AirPods 3 true wireless earphones teardown, available from https://www.qucox.com/apple-airpods-3-teardown/. *See* INGENIOSPEC-014163-014238; Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150; AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158; Which AirPods model should you buy?, available from https://www.theverge.com/2021/10/19/22733797/airpods-2-3-pro-max-which-to-buy. *See* INGENIOSPEC-013410-013429;
		Apple AirPods 4	Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. *See* INGENIOSPEC-013664-013691; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-014260-014276;
		Apple AirPods 4 with Active Noise Cancellation	Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-

			devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501;
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117; How To Enable Voice Isolation On AirPods - YouTube, available from https://www.youtube.com/watch?v=_gpVEHX7WOw. *See* INGENIOSPEC-014672-014674;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;
		Beats Fit Pro	Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458; Teardown Report: Beats Fit Pro, available from https://www.52audio.com/archives/98994.html. *See* INGENIOSPEC-014407-014463; Beats Fit Pro True Wireless Earbuds — Beats Black, available from https://www.apple.com/shop/product/MK2F3LL/A/beats-fit-pro-true-wireless-earbuds-beats-black. *See* INGENIOSPEC-013302-013309;
		Beats Solo Pro	Replacement Parts List, available from https://www.joesge.com/products/beats-solo-pro-wireless-headphones-repair-parts?srsltid=AfmBOoohkWL6z6LfgJ6-r9iZYIxup4uhO-LU6DQhzGFOFk4vPOj3vouM. *See* INGENIOSPEC-013836-013844; Solo Pro Press Release, available from

		https://www.beatsbydre.com/content/dam/beats/web/press/solo-pro/solo-pro-press-kit.zip. *See* INGENIOSPEC-014313-014314; Beats-Solo-Pro-Wireless-Headphones-User-Guide, available from https://manuals.plus/wp-content/uploads/2023/05/Beats-Solo-Pro-Wireless-Headphones-User-Guide.pdf. *See* INGENIOSPEC-013808-013835; Solo Pro - Beats by Dre Archive 2, available from https://web.archive.org/web/20200602034251/https://www.beatsbydre.com/headphones/solo-pro. *See* INGENIOSPEC-013312-013323;
	Powerbeats Pro	Best Buy -- Powerbeats Pro Features, available from https://www.bestbuy.com/product/beats-powerbeats-pro-totally-wireless-earbuds-black/JJ8XJS3FXY. *See* INGENIOSPEC-013883-013883; Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289;
	Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	

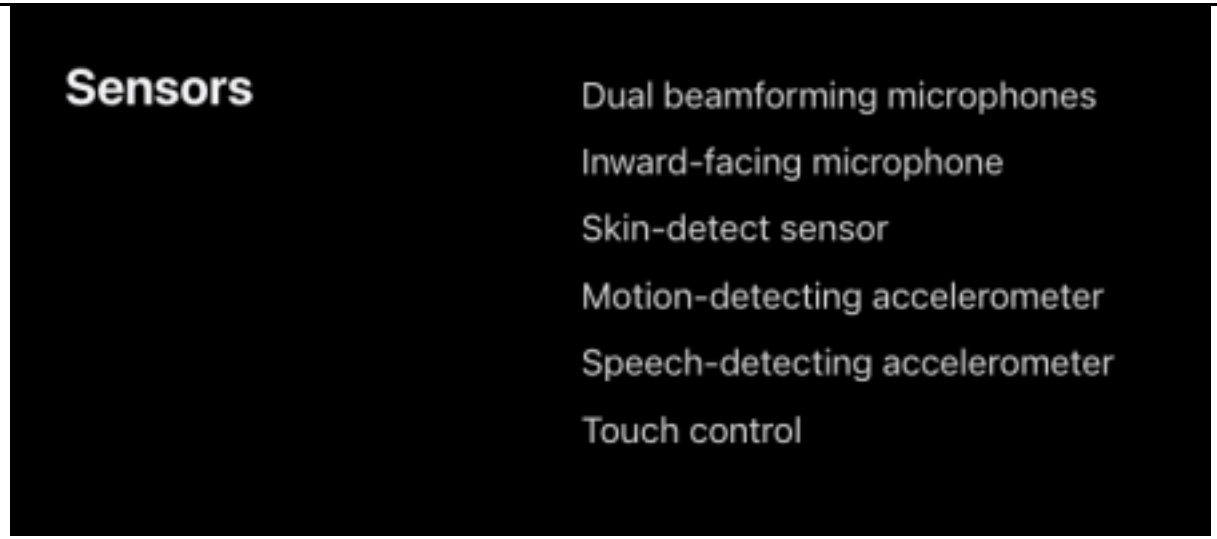
11,921,355 Claim 36	**Evidence**
36. A head-worn personal electronic apparatus as recited in claim 34, wherein the first microphone is at	Every claim limitation of claim 34 is present in the Accused Instrumentalities as described above and incorporated herein by reference. The first microphone of each of the Accused Instrumentalities, such as Apple AirPods Pro 2, is configured to pick up at least audio input from at least the user. *See* Claim 34a and 34c, *supra*. The first microphone is at least

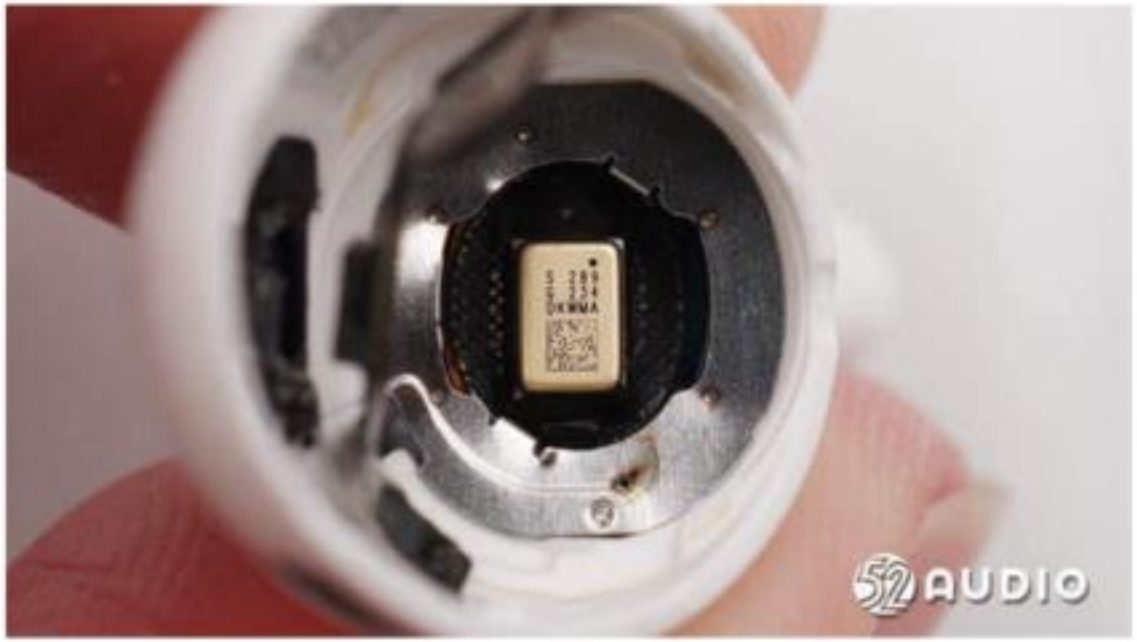
least partially in the head-worn personal electronic apparatus and is positioned so as to be directed towards the user of the head-worn personal electronic apparatus, and wherein the second microphone is at least partially in the head-worn personal electronic apparatus and is positioned so as to be directed away from the user of the head-worn personal electronic apparatus.	partially in the head-worn personal electronic apparatus and is positioned so as to be directed towards the user of the head-worn personal electronic apparatus.  Bottom pickup microphone. **Source**: Apple AirPods Pro 2 Teardown: Upgrade Materials and Design (INGENIOSPEC-013701-013760) (available from https://www.qucox.com/apple-airpods-pro-2-teardown/).

	 **Source**: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/). The second microphone of each of the Accused Instrumentalities, such as Apple AirPods Pro 2, is configured to pick up at least environmental audio input associated with an environment in the vicinity of the head-worn wearable electronic device. *See* Claim 34b and 34c, *supra*. The second microphone is at least partially in the head-worn personal electronic apparatus and is positioned so as to be directed away from the user of the head-worn personal electronic apparatus.



Source: Noise-Cancelling Microphones Image from AirPods Pro2 (INGENIOSPEC-014019-014019) (available from https://www.apple.com/airpods-pro/).

	 **Source**: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).



A metal protective cover is arranged above the noise cancellation microphone.

Source: Apple AirPods Pro 2 Teardown: Upgrade Materials and Design (INGENIOSPEC-013701-013760) (available from https://www.qucox.com/apple-airpods-pro-2-teardown/).

Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

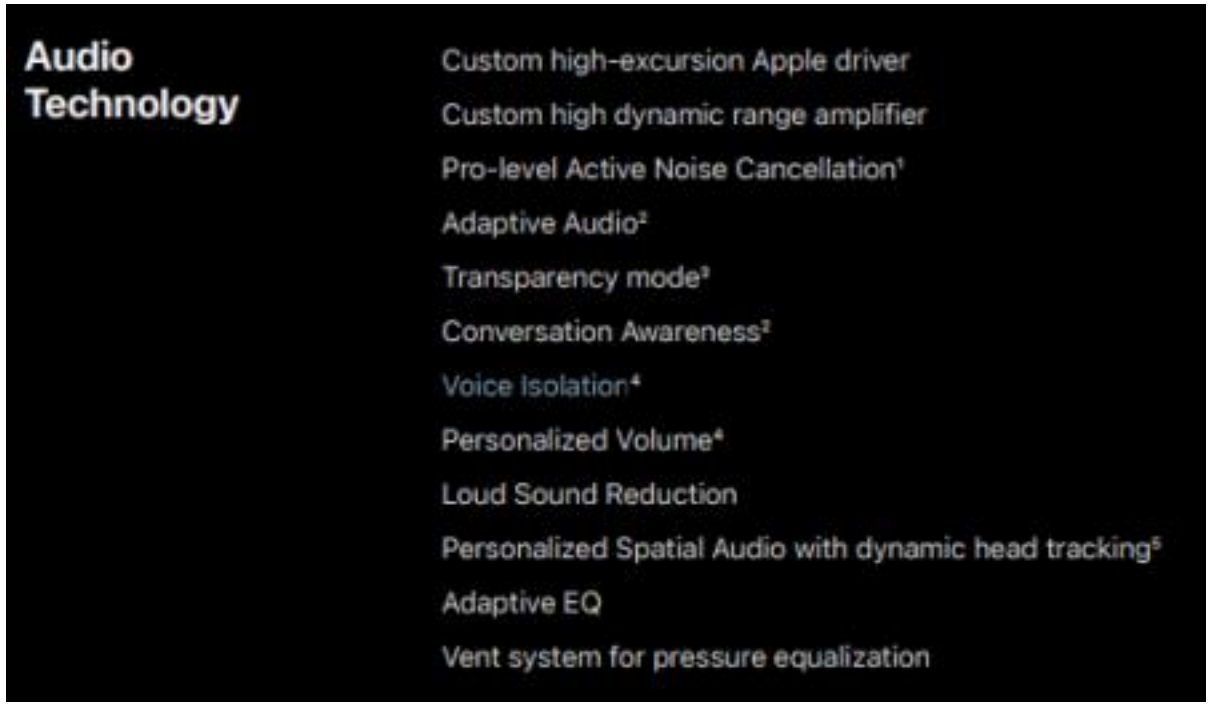
		Device	Citations
		Apple AirPods 2	AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286; AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932; Apple AirPods 2 In-Depth Teardown Review by 52AUDIO, available from https://www.chargerlab.com/apple-airpod-2-in-depth-teardown-review/. *See* INGENIOSPEC-013937-014004;
		Apple AirPods 3	Apple AirPods 3 true wireless earphones teardown, available from https://www.qucox.com/apple-airpods-3-teardown/. *See* INGENIOSPEC-014163-014238; Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150; AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158;
		Apple AirPods 4	Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. *See* INGENIOSPEC-013664-013691; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
		Apple AirPods 4 with Active Noise Cancellation	Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;

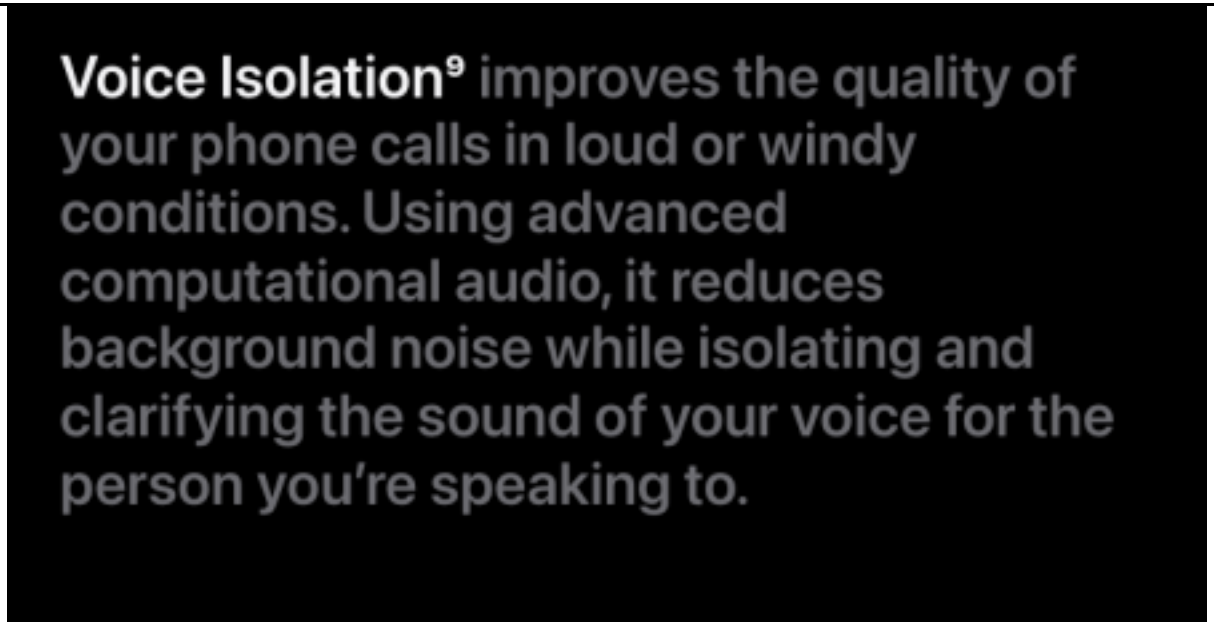
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;
		Beats Fit Pro	Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458; Teardown Report: Beats Fit Pro, available from https://www.52audio.com/archives/98994.html. *See* INGENIOSPEC-014407-014463; Beats Fit Pro True Wireless Earbuds — Beats Black, available from https://www.apple.com/shop/product/MK2F3LL/A/beats-fit-pro-true-wireless-earbuds-beats-black. *See* INGENIOSPEC-013302-013309;
		Beats Solo Pro	Replacement Parts List, available from https://www.joesge.com/products/beats-solo-pro-wireless-headphones-repair-parts?srsltid=AfmBOoohkWL6z6LfgJ6-r9iZYIxup4uhO-LU6DQhzGFOFk4vPOj3vouM. *See* INGENIOSPEC-013836-013844; Solo Pro Press Release, available from https://www.beatsbydre.com/content/dam/beats/web/press/solo-pro/solo-pro-press-kit.zip. *See* INGENIOSPEC-014313-014314; Beats-Solo-Pro-Wireless-Headphones-User-Guide, available from https://manuals.plus/wp-content/uploads/2023/05/Beats-Solo-Pro-Wireless-Headphones-User-Guide.pdf. *See* INGENIOSPEC-013808-013835; Solo Pro - Beats by Dre Archive 2, available from

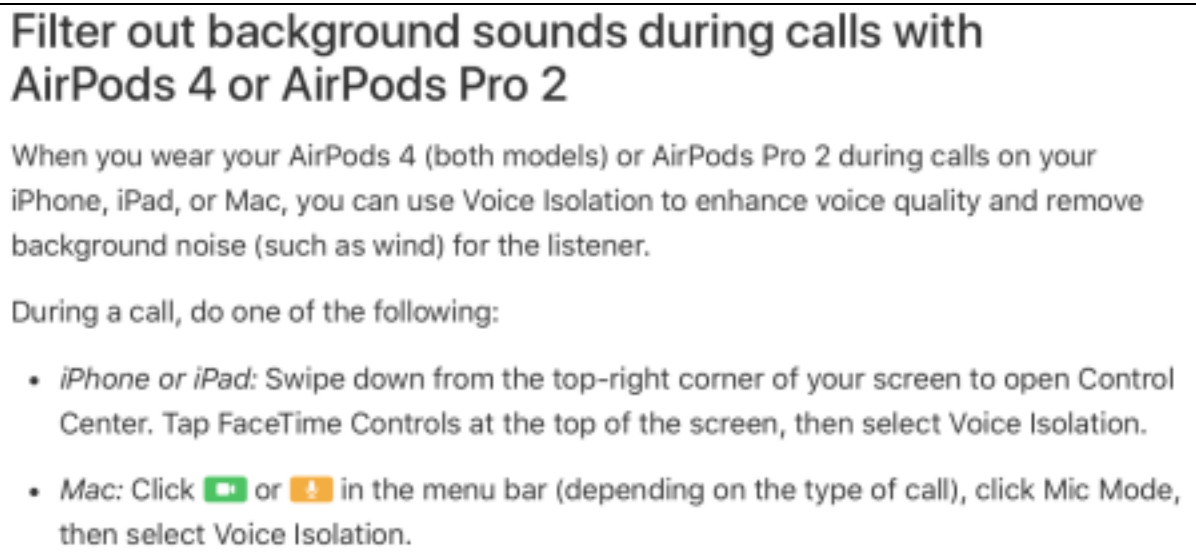
		https://web.archive.org/web/20200602034251/https://www.beatsbydre.com/headphones/solo-pro. *See* INGENIOSPEC-013312-013323;
	Powerbeats Pro	Best Buy -- Powerbeats Pro Features, available from https://www.bestbuy.com/product/beats-powerbeats-pro-totally-wireless-earbuds-black/JJ8XJS3FXY. *See* INGENIOSPEC-013883-013883; Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289;
	Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616;

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.

11,921,355 Claim 37	**Evidence**
37. A head-worn personal electronic apparatus as recited in claim 36, wherein the audio input from at least the user includes at least a voice input, and wherein the environmental audio input includes	Every claim limitation of claim 36 is present in the Accused Instrumentalities as described above and incorporated herein by reference. The first microphone of each of the Accused Instrumentalities, such as Apple AirPods Pro 2, is configured to pick up at least audio input from at least the user. *See* Claim 34a and 34c, *supra*. The audio input from at least the user picked-up via the first microphone includes at least a voice input. For example, the first microphone can pick up voice command from the user and/or use the first microphone to pick up the user's voice when on a phone call, video call, creating a voice memo, video, or other voice recording. The second microphone of each of the Accused Instrumentalities, such as Apple AirPods Pro 2, is configured to pick up at least environmental audio input associated with an environment in the vicinity of the head-worn wearable electronic device. *See* Claim 34b and 34c, *supra*. The environmental audio input associated with the environment picked up by the second microphone includes at least ambient noise. For example, the ambient noise

at least ambient noise.	can be eliminated (or filtered out) in order to make the users voice more clear on phone calls, video calls, voice memos, videos, or other voice recordings. For example, Apple's Voice Isolation uses the first microphone to capture at least the user's speech, while the second microphone captures at least the ambient noise. The apparatus then processes these inputs together to remove or suppress at least a portion of the ambient noise picked up by the second microphone, so the user's speech less interfered with by the ambient noise.  **Source**: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).

	 **Source**: AirPods Pro 2 - Apple (INGENIOSPEC-013541-013563) (available from https://web.archive.org/web/20250904180656/https:/www.apple.com/airpods-pro/).



Source: Make and answer calls - Apple Support (INGENIOSPEC-014036-014038) (available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0).

Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

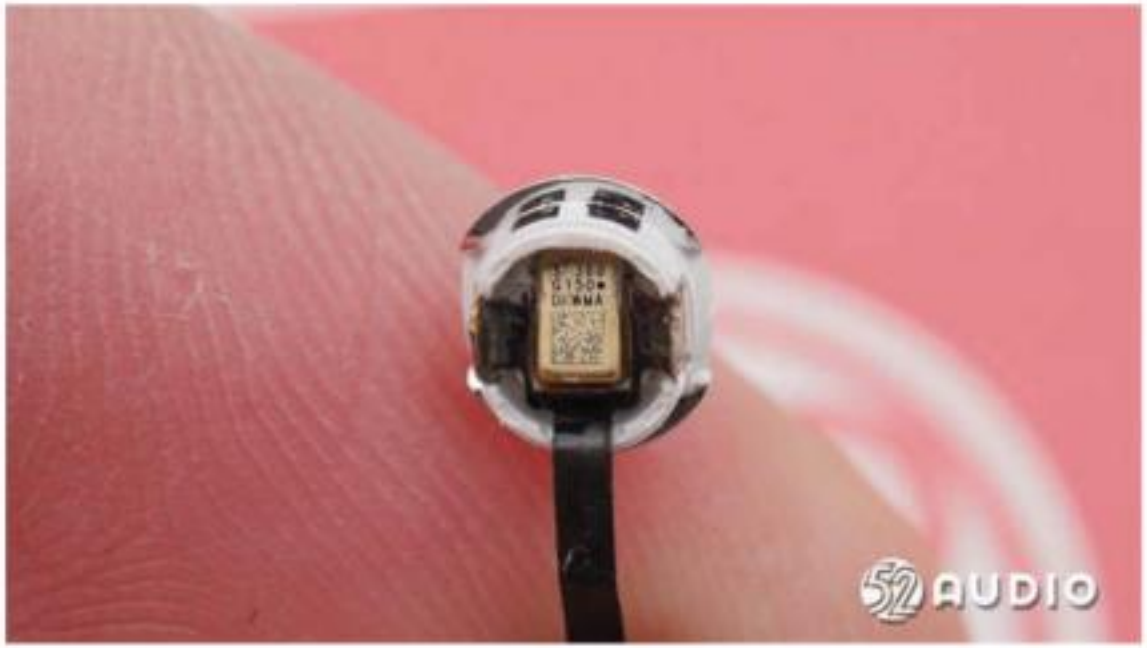
Device	**Citations**
Apple AirPods 2	AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286; AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932; Apple AirPods 2 In-Depth Teardown Review by 52AUDIO, available from

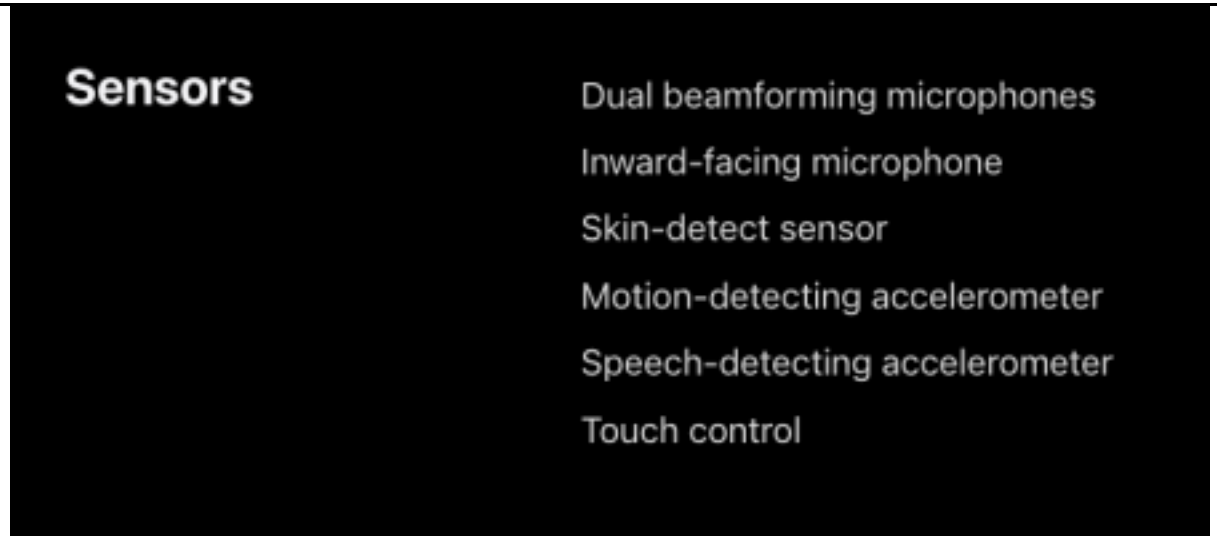
			https://www.chargerlab.com/apple-airpod-2-in-depth-teardown-review/. *See* INGENIOSPEC-013937-014004;
		Apple AirPods 3	Apple AirPods 3 true wireless earphones teardown, available from https://www.qucox.com/apple-airpods-3-teardown/. *See* INGENIOSPEC-014163-014238; Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150; AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158; Which AirPods model should you buy?, available from https://www.theverge.com/2021/10/19/22733797/airpods-2-3-pro-max-which-to-buy. *See* INGENIOSPEC-013410-013429;
		Apple AirPods 4	Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. *See* INGENIOSPEC-013664-013691; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-014260-014276;
		Apple AirPods 4 with Active Noise Cancellation	Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-

			devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501;
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117; How To Enable Voice Isolation On AirPods - YouTube, available from https://www.youtube.com/watch?v=_gpVEHX7WOw. *See* INGENIOSPEC-014672-014674;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;
		Beats Fit Pro	Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458; Teardown Report: Beats Fit Pro, available from https://www.52audio.com/archives/98994.html. *See* INGENIOSPEC-014407-014463; Beats Fit Pro True Wireless Earbuds — Beats Black, available from https://www.apple.com/shop/product/MK2F3LL/A/beats-fit-pro-true-wireless-earbuds-beats-black. *See* INGENIOSPEC-013302-013309;
		Beats Solo Pro	Replacement Parts List, available from https://www.joesge.com/products/beats-solo-pro-wireless-headphones-repair-parts?srsltid=AfmBOoohkWL6z6LfgJ6-r9iZYIxup4uhO-LU6DQhzGFOFk4vPOj3vouM. *See* INGENIOSPEC-013836-013844; Solo Pro Press Release, available from

		https://www.beatsbydre.com/content/dam/beats/web/press/solo-pro/solo-pro-press-kit.zip. *See* INGENIOSPEC-014313-014314; Beats-Solo-Pro-Wireless-Headphones-User-Guide, available from https://manuals.plus/wp-content/uploads/2023/05/Beats-Solo-Pro-Wireless-Headphones-User-Guide.pdf. *See* INGENIOSPEC-013808-013835; Solo Pro - Beats by Dre Archive 2, available from https://web.archive.org/web/20200602034251/https://www.beatsbydre.com/headphones/solo-pro. *See* INGENIOSPEC-013312-013323;
	Powerbeats Pro	Best Buy -- Powerbeats Pro Features, available from https://www.bestbuy.com/product/beats-powerbeats-pro-totally-wireless-earbuds-black/JJ8XJS3FXY. *See* INGENIOSPEC-013883-013883; Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289;
	Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	

11,921,355 Claim 38	**Evidence**
38. A head-worn personal electronic apparatus as recited in claim 17, wherein the head-worn wearable	Every claim limitation of claim 17 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.

electronic device comprises:	
38a. a first microphone configured to pick up at least audio input from at least the user;	Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises a first microphone configured to pick up at least audio input from at least the user.  Bottom pickup microphone. **Source**: Apple AirPods Pro 2 Teardown: Upgrade Materials and Design (INGENIOSPEC-013701-013760) (available from https://www.qucox.com/apple-airpods-pro-2-teardown/).



Source: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).

Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

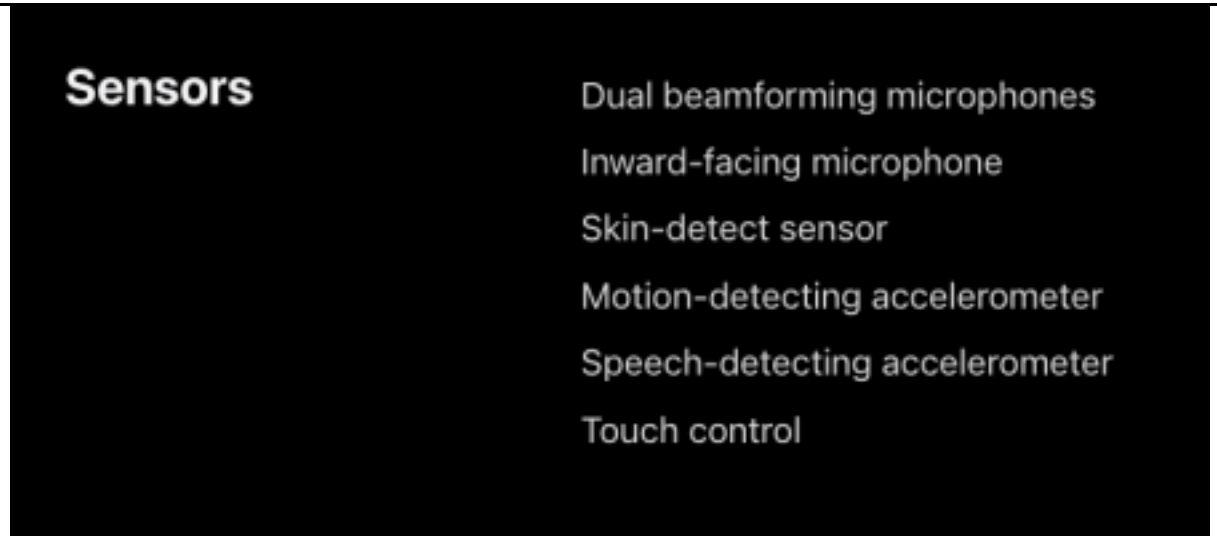
Device	**Citations**
Apple AirPods 2	AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286; AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932; Apple AirPods 2 In-Depth Teardown Review by 52AUDIO, available

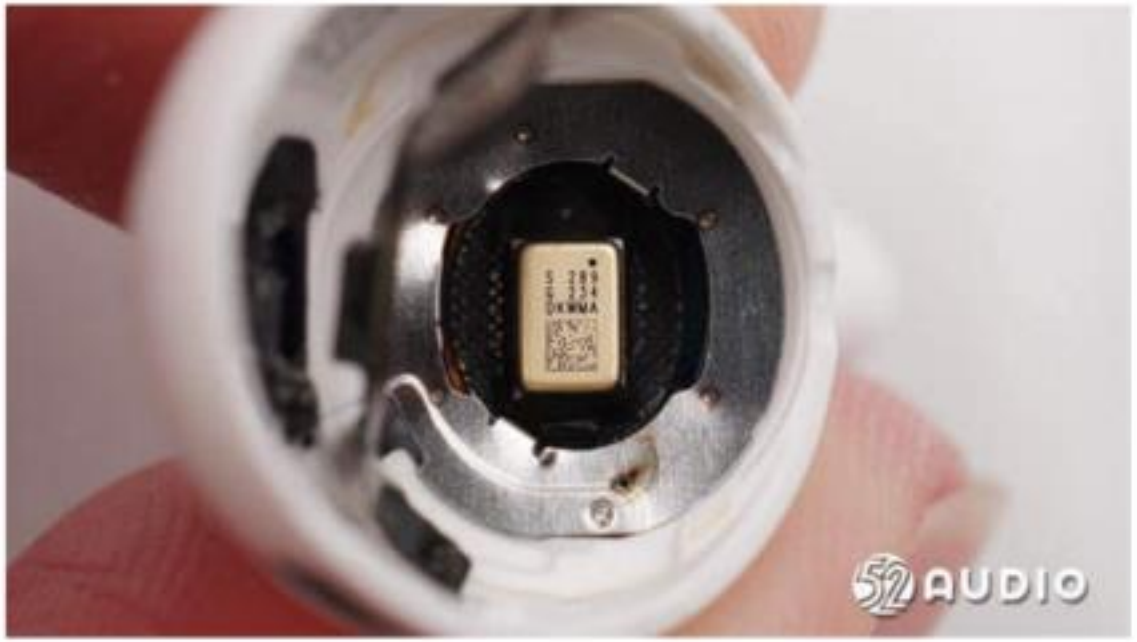
			from https://www.chargerlab.com/apple-airpod-2-in-depth-teardown-review/. *See* INGENIOSPEC-013937-014004;
		Apple AirPods 3	Apple AirPods 3 true wireless earphones teardown, available from https://www.qucox.com/apple-airpods-3-teardown/. *See* INGENIOSPEC-014163-014238; Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150; AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158;
		Apple AirPods 4	Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. *See* INGENIOSPEC-013664-013691; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
		Apple AirPods 4 with Active Noise Cancellation	Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort,

			available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;
		Beats Fit Pro	Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458; Teardown Report: Beats Fit Pro, available from https://www.52audio.com/archives/98994.html. *See* INGENIOSPEC-014407-014463;
		Beats Solo Pro	Replacement Parts List, available from https://www.joesge.com/products/beats-solo-pro-wireless-headphones-repair-parts?srsltid=AfmBOoohkWL6z6LfgJ6-r9iZYIxup4uhO-LU6DQhzGFOFk4vPOj3vouM. *See* INGENIOSPEC-013836-013844; Solo Pro Press Release, available from https://www.beatsbydre.com/content/dam/beats/web/press/solo-pro/solo-pro-press-kit.zip. *See* INGENIOSPEC-014313-014314;
		Powerbeats Pro	Best Buy -- Powerbeats Pro Features, available from https://www.bestbuy.com/product/beats-powerbeats-pro-totally-wireless-earbuds-black/JJ8XJS3FXY. *See* INGENIOSPEC-013883-013883; Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289;

	Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	
38b. and a second microphone configured to pickup at least environmental audio input associated with environmental sound in the vicinity of the head-worn personal electronic apparatus, and	Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises a second microphone configured to pickup at least environmental audio input associated with environmental sound in the vicinity of the device.	

	 **Source**: Noise-Cancelling Microphones Image from AirPods Pro2 (INGENIOSPEC-014019-014019) (available from https://www.apple.com/airpods-pro/).

	 **Source**: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).



A metal protective cover is arranged above the noise cancellation microphone.

Source: Apple AirPods Pro 2 Teardown: Upgrade Materials and Design (INGENIOSPEC-013701-013760) (available from https://www.qucox.com/apple-airpods-pro-2-teardown/).

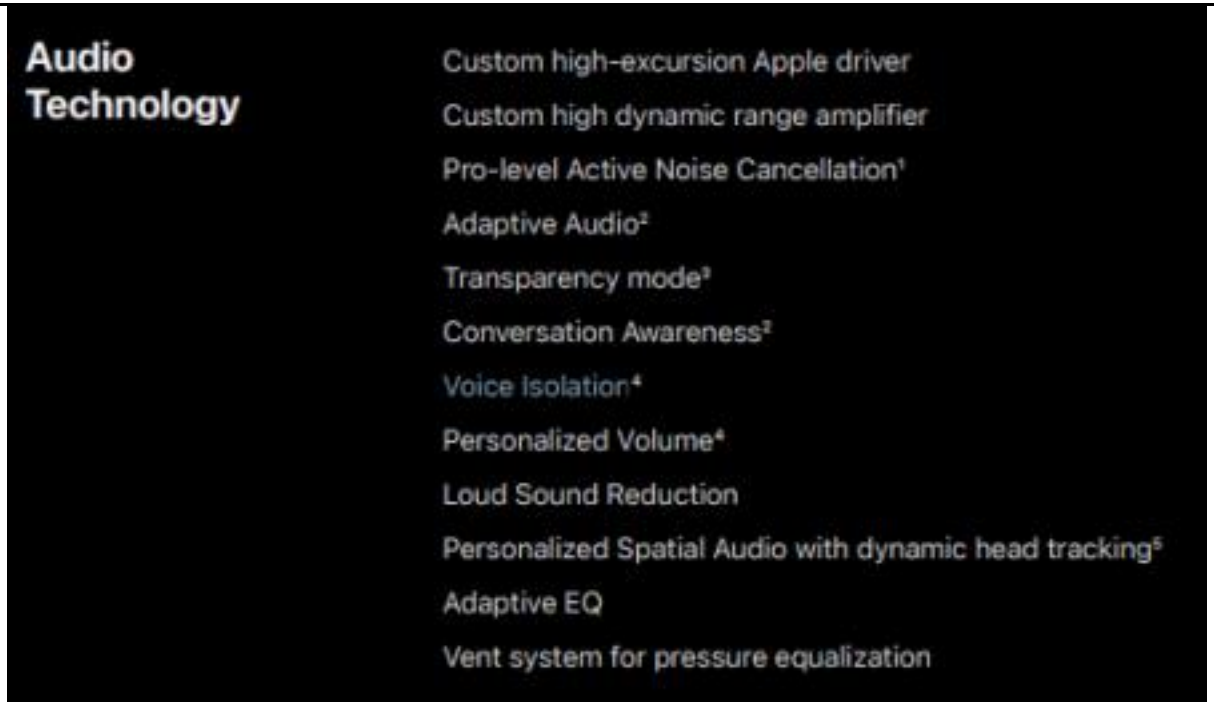
Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

		Device	Citations
		Apple AirPods 2	AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286; AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932; Apple AirPods 2 In-Depth Teardown Review by 52AUDIO, available from https://www.chargerlab.com/apple-airpod-2-in-depth-teardown-review/. *See* INGENIOSPEC-013937-014004;
		Apple AirPods 3	Apple AirPods 3 true wireless earphones teardown, available from https://www.qucox.com/apple-airpods-3-teardown/. *See* INGENIOSPEC-014163-014238; Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150; AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158;
		Apple AirPods 4	Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. *See* INGENIOSPEC-013664-013691; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
		Apple AirPods 4 with Active Noise Cancellation	Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;

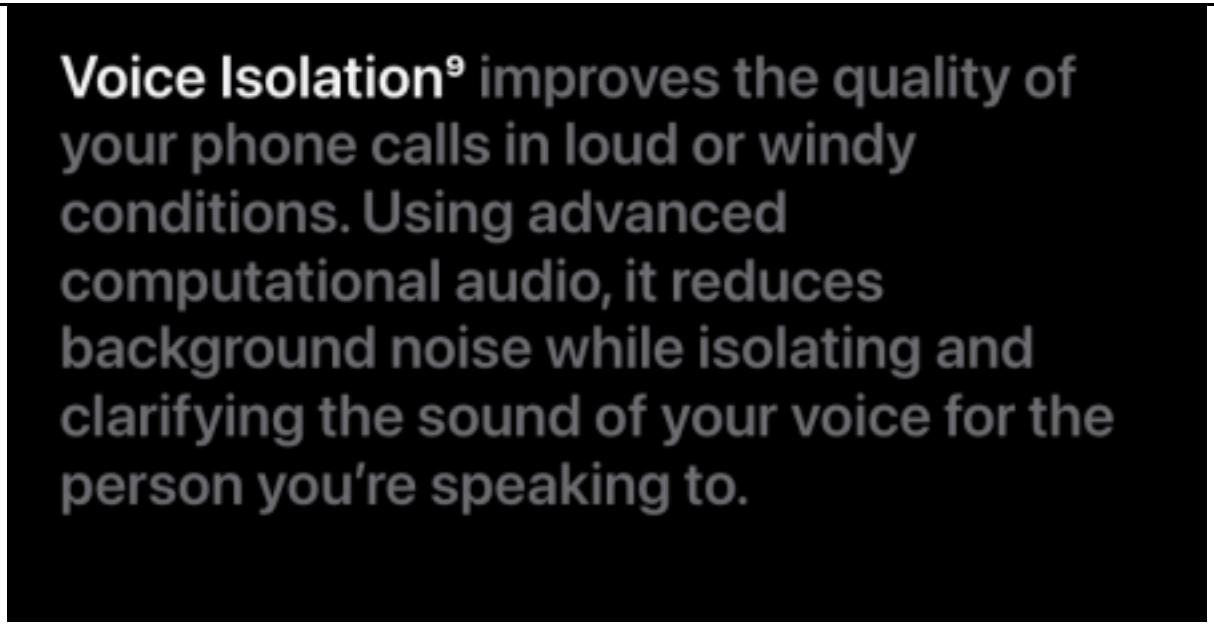
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;
		Beats Fit Pro	Teardown Report: Beats Fit Pro, available from https://www.52audio.com/archives/98994.html. *See* INGENIOSPEC-014407-014463; Beats Fit Pro True Wireless Earbuds — Beats Black, available from https://www.apple.com/shop/product/MK2F3LL/A/beats-fit-pro-true-wireless-earbuds-beats-black. *See* INGENIOSPEC-013302-013309;
		Beats Solo Pro	Beats-Solo-Pro-Wireless-Headphones-User-Guide, available from https://manuals.plus/wp-content/uploads/2023/05/Beats-Solo-Pro-Wireless-Headphones-User-Guide.pdf. *See* INGENIOSPEC-013808-013835; Solo Pro - Beats by Dre Archive 2, available from https://web.archive.org/web/20200602034251/https://www.beatsbydre.com/headphones/solo-pro. *See* INGENIOSPEC-013312-013323; Solo Pro Press Release, available from https://www.beatsbydre.com/content/dam/beats/web/press/solo-pro/solo-pro-press-kit.zip. *See* INGENIOSPEC-014313-014314;

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<tr><td>Powerbeats Pro</td><td>Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. See INGENIOSPEC-014287-014289;</td></tr>
<tr><td>Powerbeats Pro 2</td><td>Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. See INGENIOSPEC-013602-013616;</td></tr>
</table>
Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
</td></tr>
<tr><td>38c. wherein the electronic circuitry is configured to: determine an environmental sound level based on at least the environmental audio input; and amplify at least a portion of the audio input from the first microphone, with the amplification being at least in part dependent on the environmental sound level.</td><td>Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises electronic circuitry including at least an integrated circuit. See Claim 17c, supra. The electronic circuitry of each of the Accused Instrumentalities is configured to determine an environmental sound level based on at least the environmental audio input. Based on the environmental sound level, at least a portion of the audio input from the first microphone is amplified, with the amplification being based at least in part on the environmental sound level.

For example, Apple's Voice Isolation uses the first microphone to capture the user’s speech, while the second microphone captures the surrounding environmental audio. The system then processes these inputs together to remove or suppress at least a portion of the environmental audio picked up by the second microphone and amplify at least a portion of the audio input from the first microphone. This isolated the user's voice and make their speech clear.</td></tr>
</table>



Source: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).

	 **Source**: AirPods Pro 2 - Apple (INGENIOSPEC-013541-013563) (available from https://web.archive.org/web/20250904180656/https:/www.apple.com/airpods-pro/).

Filter out background sounds during calls with AirPods 4 or AirPods Pro 2

When you wear your AirPods 4 (both models) or AirPods Pro 2 during calls on your iPhone, iPad, or Mac, you can use Voice Isolation to enhance voice quality and remove background noise (such as wind) for the listener.

During a call, do one of the following:

- *iPhone or iPad:* Swipe down from the top-right corner of your screen to open Control Center. Tap FaceTime Controls at the top of the screen, then select Voice Isolation.
- *Mac:* Click  or  in the menu bar (depending on the type of call), click Mic Mode, then select Voice Isolation.

Source: Make and answer calls - Apple Support (INGENIOSPEC-014036-014038) (available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0).

Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 2	AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286; AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932; Apple AirPods 2 In-Depth Teardown Review by 52AUDIO, available from

			https://www.chargerlab.com/apple-airpod-2-in-depth-teardown-review/. *See* INGENIOSPEC-013937-014004;
		Apple AirPods 3	Apple AirPods 3 true wireless earphones teardown, available from https://www.qucox.com/apple-airpods-3-teardown/. *See* INGENIOSPEC-014163-014238; Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150; AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158; Which AirPods model should you buy?, available from https://www.theverge.com/2021/10/19/22733797/airpods-2-3-pro-max-which-to-buy. *See* INGENIOSPEC-013410-013429;
		Apple AirPods 4	Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. *See* INGENIOSPEC-013664-013691; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-014260-014276;
		Apple AirPods 4 with Active Noise Cancellation	Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-

			devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501;
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117; How To Enable Voice Isolation On AirPods - YouTube, available from https://www.youtube.com/watch?v=_gpVEHX7WOw. *See* INGENIOSPEC-014672-014674;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;
		Beats Fit Pro	Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458; Teardown Report: Beats Fit Pro, available from https://www.52audio.com/archives/98994.html. *See* INGENIOSPEC-014407-014463; Beats Fit Pro True Wireless Earbuds — Beats Black, available from https://www.apple.com/shop/product/MK2F3LL/A/beats-fit-pro-true-wireless-earbuds-beats-black. *See* INGENIOSPEC-013302-013309;
		Beats Solo Pro	Replacement Parts List, available from https://www.joesge.com/products/beats-solo-pro-wireless-headphones-repair-parts?srsltid=AfmBOoohkWL6z6LfgJ6-r9iZYIxup4uhO-LU6DQhzGFOFk4vPOj3vouM. *See* INGENIOSPEC-013836-013844; Solo Pro Press Release, available from

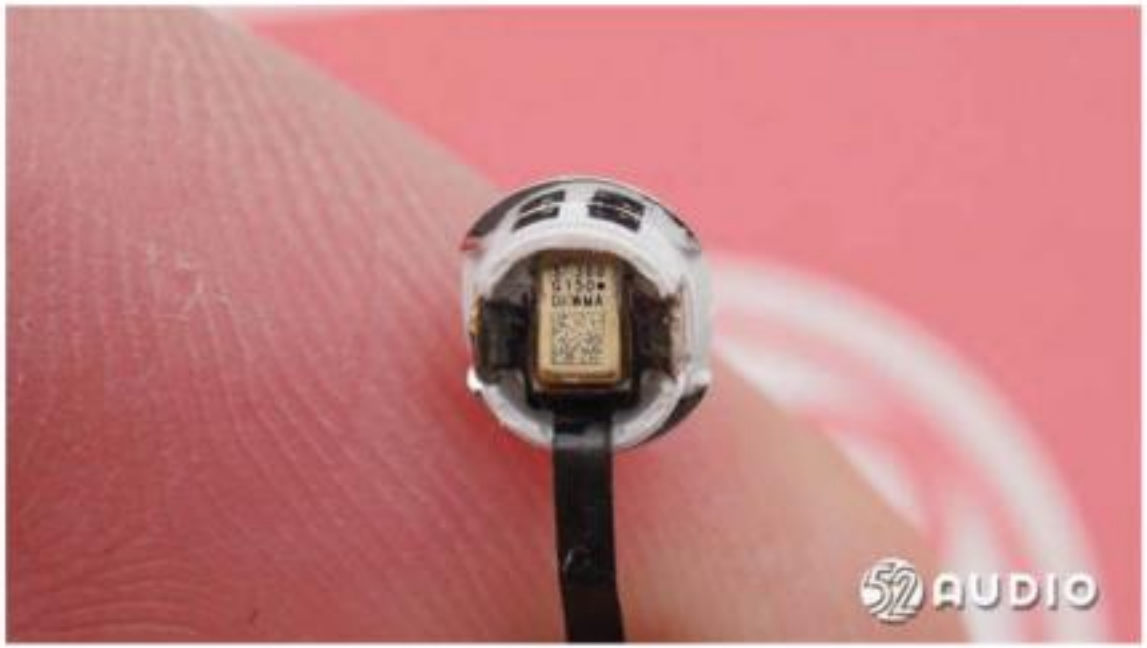
		https://www.beatsbydre.com/content/dam/beats/web/press/solo-pro/solo-pro-press-kit.zip. *See* INGENIOSPEC-014313-014314; Beats-Solo-Pro-Wireless-Headphones-User-Guide, available from https://manuals.plus/wp-content/uploads/2023/05/Beats-Solo-Pro-Wireless-Headphones-User-Guide.pdf. *See* INGENIOSPEC-013808-013835; Solo Pro - Beats by Dre Archive 2, available from https://web.archive.org/web/20200602034251/https://www.beatsbydre.com/headphones/solo-pro. *See* INGENIOSPEC-013312-013323;
	Powerbeats Pro	Best Buy -- Powerbeats Pro Features, available from https://www.bestbuy.com/product/beats-powerbeats-pro-totally-wireless-earbuds-black/JJ8XJS3FXY. *See* INGENIOSPEC-013883-013883; Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289;
	Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	
11,921,355 Claim 39	**Evidence**	
39. A head-worn personal electronic apparatus as recited in claim 17, wherein the head-worn wearable	Every claim limitation of claim 17 is present in the Accused Instrumentalities as described above and incorporated herein by reference. *See* Claim 12-preamble, *supra*.	

electronic device comprises at least a first microphone and a second microphone, wherein the first microphone is configured to pick up at least audio sound from at least the user, wherein the second microphone is configured to pick up at least ambient noise associated with an environment in the vicinity of the head-worn wearable electronic device, and wherein the electronic circuitry is configured to:	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
39a. determine an ambient noise level based on at least the ambient noise; and modify at least a portion of the audio sound picked-up via the first	*See* Claim 12a, *supra*. Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

microphone, with the modification being at least in part dependent on the ambient noise level.		**Device**	**Citations**
		Apple AirPods 2	AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932;
		Apple AirPods 3	Which AirPods model should you buy?, available from https://www.theverge.com/2021/10/19/22733797/airpods-2-3-pro-max-which-to-buy. *See* INGENIOSPEC-013410-013429; Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150;
		Apple AirPods 4	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-014260-014276;
		Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038;

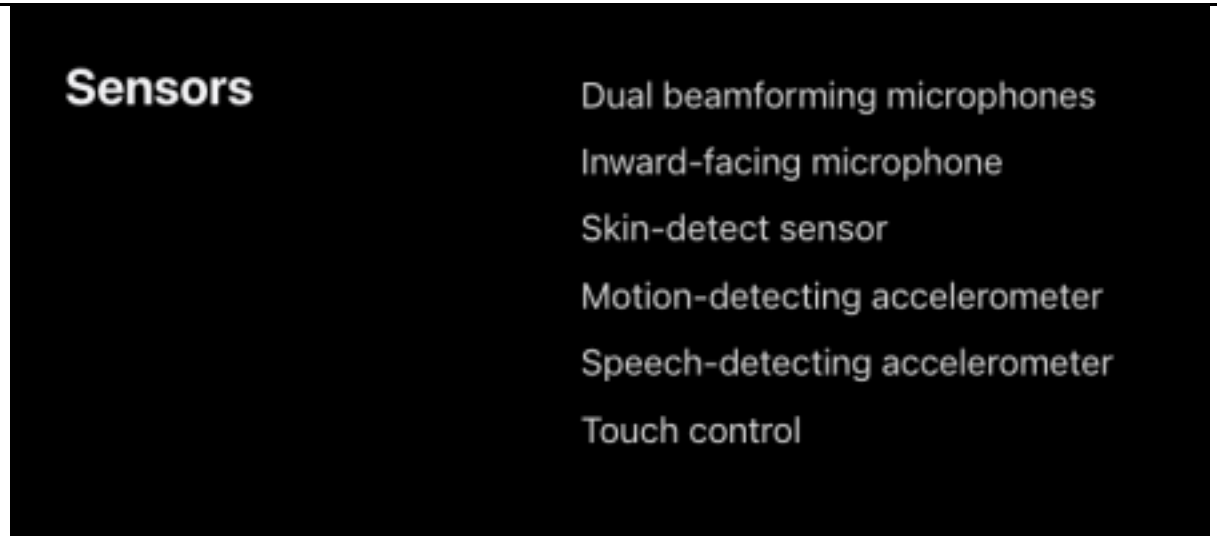
			Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501;
		Apple AirPods Pro 1	How To Enable Voice Isolation On AirPods - YouTube, available from https://www.youtube.com/watch?v=_gpVEHX7WOw. *See* INGENIOSPEC-014672-014674; AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;
		Beats Fit Pro	Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458;
		Beats Solo Pro	Solo Pro Press Release, available from https://www.beatsbydre.com/content/dam/beats/web/press/solo-pro/solo-pro-press-kit.zip. *See* INGENIOSPEC-014313-014314;
		Powerbeats Pro	Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289;
		Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616;

	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
11,921,355 Claim 40	**Evidence**
40. A head-worn personal electronic apparatus as recited in claim 17, wherein the head-worn personal electronic apparatus comprises:	Every claim limitation of claim 17 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
40a. a first microphone configured to receive audio picked-up from the user;	Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises a first microphone configured to pick up at least audio input from at least the user.



Bottom pickup microphone.

Source: Apple AirPods Pro 2 Teardown: Upgrade Materials and Design (INGENIOSPEC-013701-013760) (available from https://www.qucox.com/apple-airpods-pro-2-teardown/).



Source: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).

Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 2	AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286; AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932; Apple AirPods 2 In-Depth Teardown Review by 52AUDIO, available

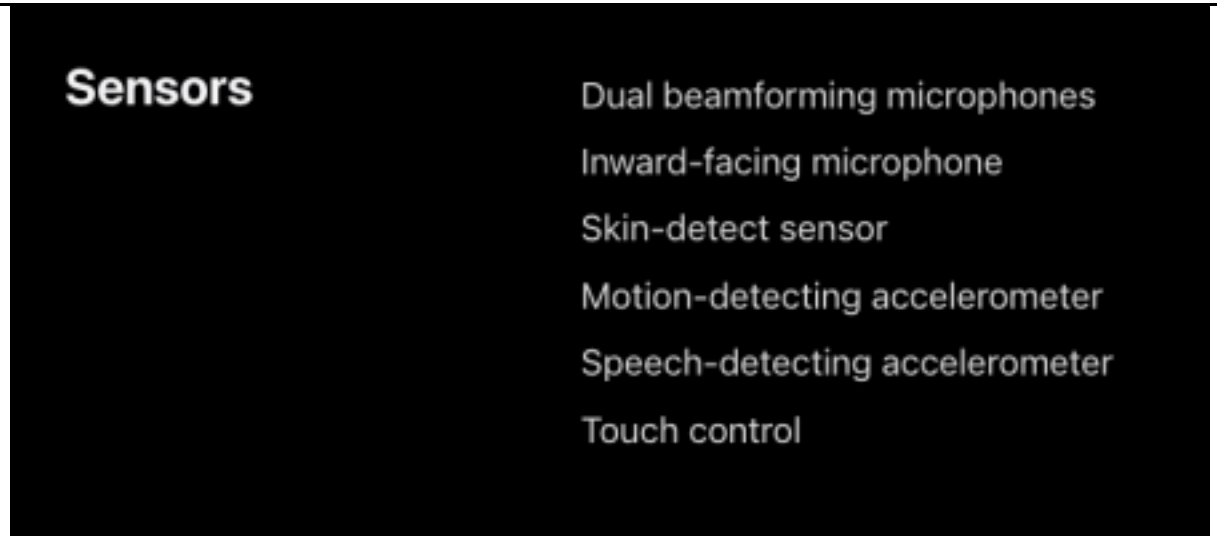
			from https://www.chargerlab.com/apple-airpod-2-in-depth-teardown-review/. *See* INGENIOSPEC-013937-014004;
		Apple AirPods 3	Apple AirPods 3 true wireless earphones teardown, available from https://www.qucox.com/apple-airpods-3-teardown/. *See* INGENIOSPEC-014163-014238; Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150; AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158;
		Apple AirPods 4	Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. *See* INGENIOSPEC-013664-013691; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
		Apple AirPods 4 with Active Noise Cancellation	Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort,

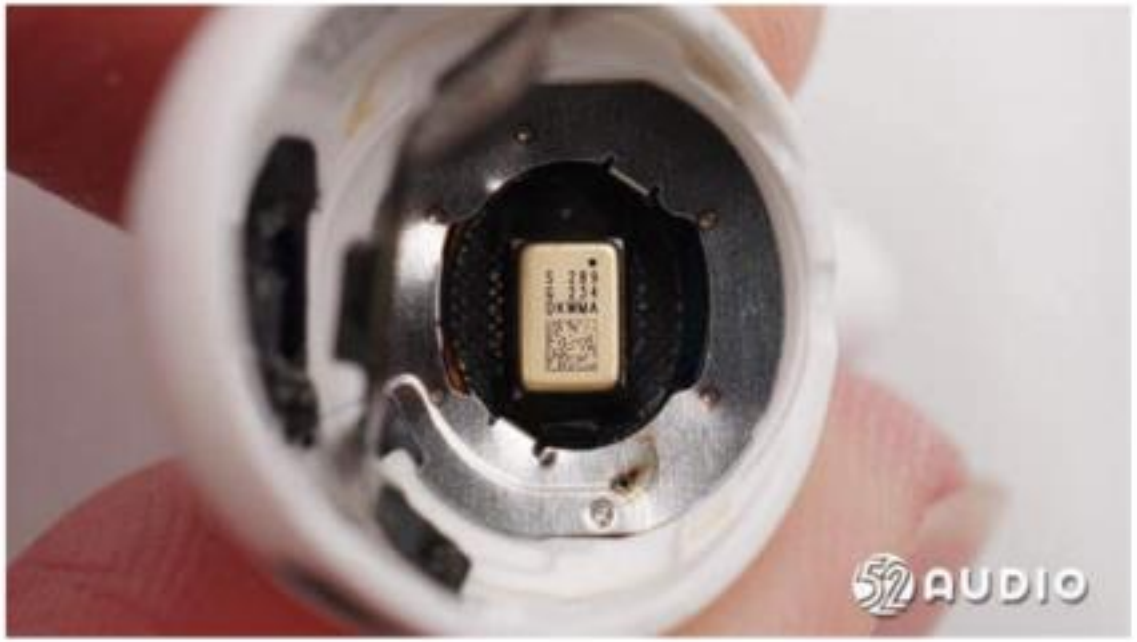
			available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;
		Beats Fit Pro	Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458; Teardown Report: Beats Fit Pro, available from https://www.52audio.com/archives/98994.html. *See* INGENIOSPEC-014407-014463;
		Beats Solo Pro	Replacement Parts List, available from https://www.joesge.com/products/beats-solo-pro-wireless-headphones-repair-parts?srsltid=AfmBOoohkWL6z6LfgJ6-r9iZYIxup4uhO-LU6DQhzGFOFk4vPOj3vouM. *See* INGENIOSPEC-013836-013844; Solo Pro Press Release, available from https://www.beatsbydre.com/content/dam/beats/web/press/solo-pro/solo-pro-press-kit.zip. *See* INGENIOSPEC-014313-014314;
		Powerbeats Pro	Best Buy -- Powerbeats Pro Features, available from https://www.bestbuy.com/product/beats-powerbeats-pro-totally-wireless-earbuds-black/JJ8XJS3FXY. *See* INGENIOSPEC-013883-013883; Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289;

	Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	
40b. and a second microphone configured to receive audio picked-up outward away from the user,	Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises a second microphone configured to receive audio picked-up outward away from the user.	



Source: Noise-Cancelling Microphones Image from AirPods Pro2 (INGENIOSPEC-014019-014019) (available from https://www.apple.com/airpods-pro/).

	 **Source**: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).



A metal protective cover is arranged above the noise cancellation microphone.

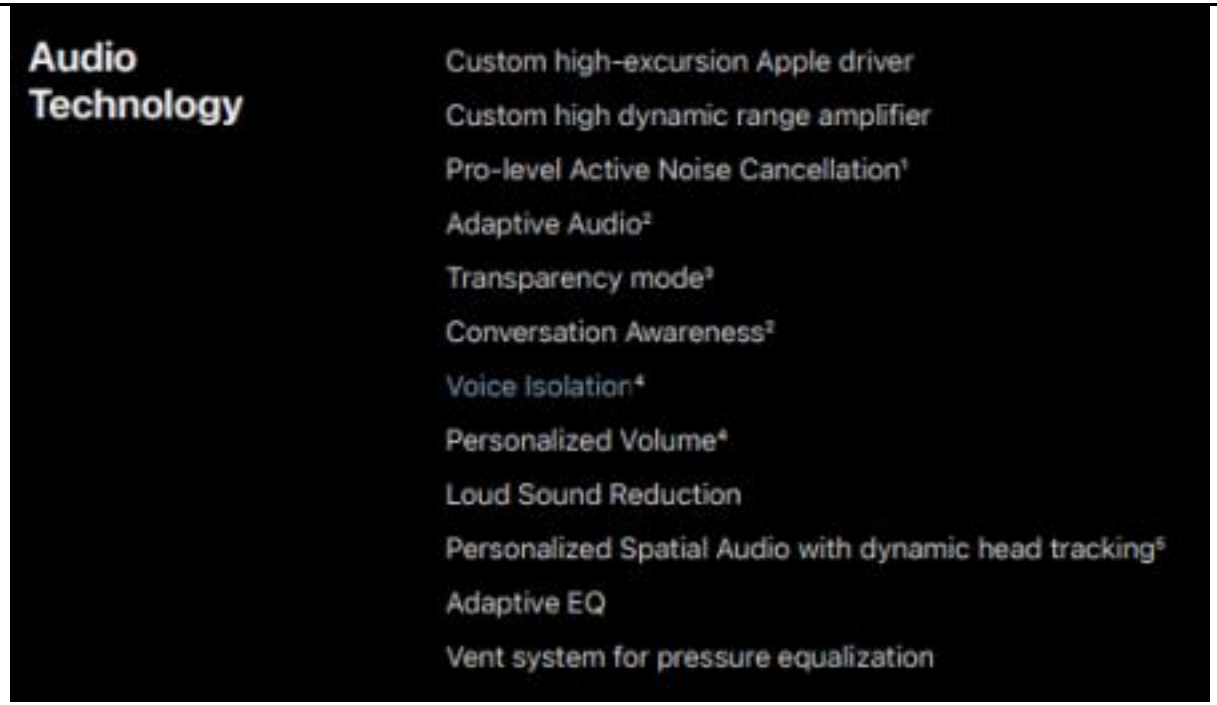
Source: Apple AirPods Pro 2 Teardown: Upgrade Materials and Design (INGENIOSPEC-013701-013760) (available from https://www.qucox.com/apple-airpods-pro-2-teardown/).

Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

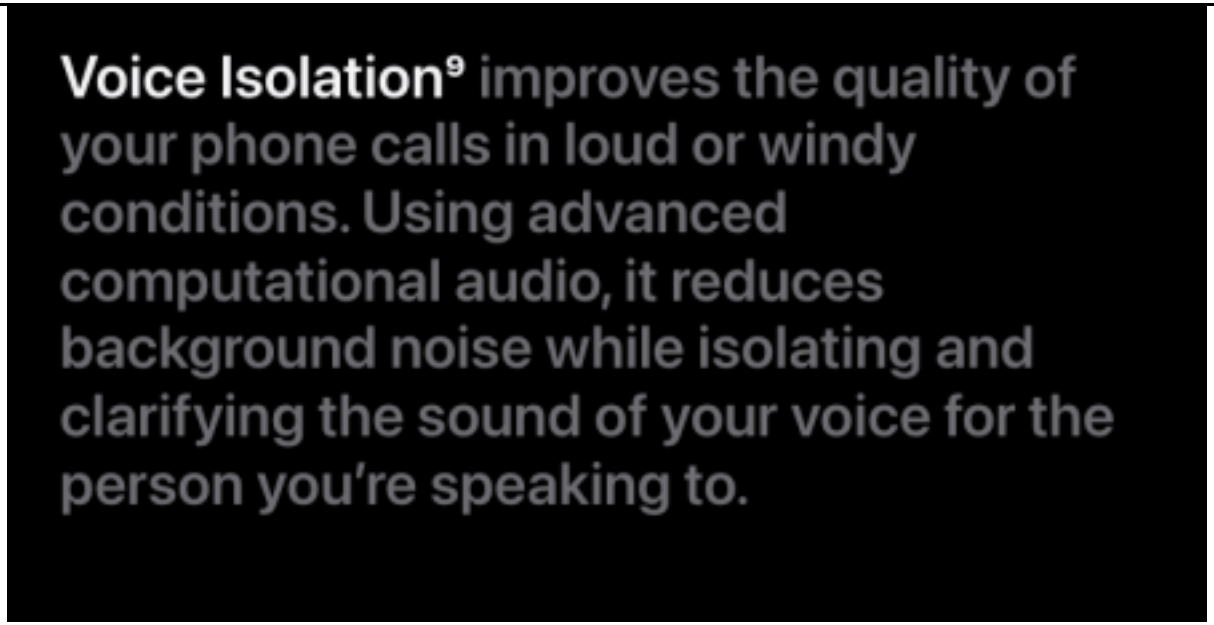
		Device	Citations
		Apple AirPods 2	AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286; AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932; Apple AirPods 2 In-Depth Teardown Review by 52AUDIO, available from https://www.chargerlab.com/apple-airpod-2-in-depth-teardown-review/. *See* INGENIOSPEC-013937-014004;
		Apple AirPods 3	Apple AirPods 3 true wireless earphones teardown, available from https://www.qucox.com/apple-airpods-3-teardown/. *See* INGENIOSPEC-014163-014238; Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150; AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158;
		Apple AirPods 4	Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. *See* INGENIOSPEC-013664-013691; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
		Apple AirPods 4 with Active Noise Cancellation	Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;

		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;
		Beats Fit Pro	Teardown Report: Beats Fit Pro, available from https://www.52audio.com/archives/98994.html. *See* INGENIOSPEC-014407-014463; Beats Fit Pro True Wireless Earbuds — Beats Black, available from https://www.apple.com/shop/product/MK2F3LL/A/beats-fit-pro-true-wireless-earbuds-beats-black. *See* INGENIOSPEC-013302-013309;
		Beats Solo Pro	Beats-Solo-Pro-Wireless-Headphones-User-Guide, available from https://manuals.plus/wp-content/uploads/2023/05/Beats-Solo-Pro-Wireless-Headphones-User-Guide.pdf. *See* INGENIOSPEC-013808-013835; Solo Pro - Beats by Dre Archive 2, available from https://web.archive.org/web/20200602034251/https://www.beatsbydre.com/headphones/solo-pro. *See* INGENIOSPEC-013312-013323; Solo Pro Press Release, available from https://www.beatsbydre.com/content/dam/beats/web/press/solo-pro/solo-pro-press-kit.zip. *See* INGENIOSPEC-014313-014314;

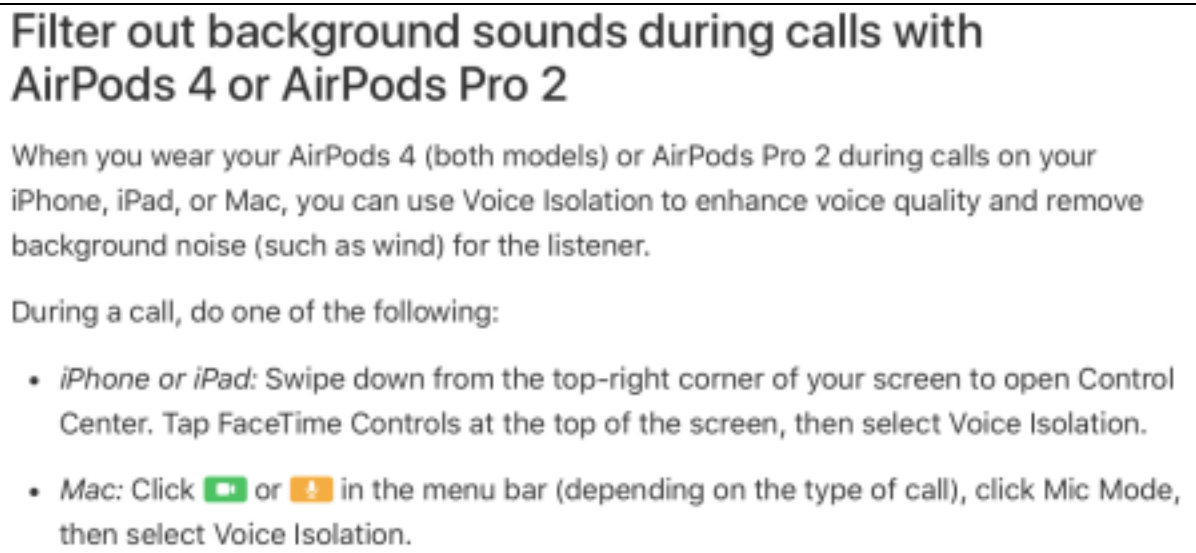
	<table><tr><td>Powerbeats Pro</td><td>Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289;</td></tr><tr><td>Powerbeats Pro 2</td><td>Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616;</td></tr></table> Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
40c. wherein the audio picked-up from at least the second microphone is used at least for noise cancelation, and at least a portion of the audio picked-up from the second microphone is subtracted from the audio picked-up from the first microphone.	The audio picked-up from at least the second microphone of the Accused Instrumentalities is used at least for noise cancelation. At least a portion of the audio picked-up from the second microphone is subtracted from the audio picked-up from the first microphone. By removing the ambient noise picked-up outward away from the user, the Accused Instrumentalities can focus on the audio input picked up from the user using the first microphone. For example, Apple's Voice Isolation uses the first microphone to capture at least the user's speech, while the second microphone captures at least the ambient noise. The apparatus then processes these inputs together to remove or suppress at least a portion of the ambient noise picked up by the second microphone, so the user's speech less interfered with by the ambient noise.



Source: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).



Source: AirPods Pro 2 - Apple (INGENIOSPEC-013541-013563) (available from https://web.archive.org/web/20250904180656/https:/www.apple.com/airpods-pro/).



Source: Make and answer calls - Apple Support (INGENIOSPEC-014036-014038) (available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0).

Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

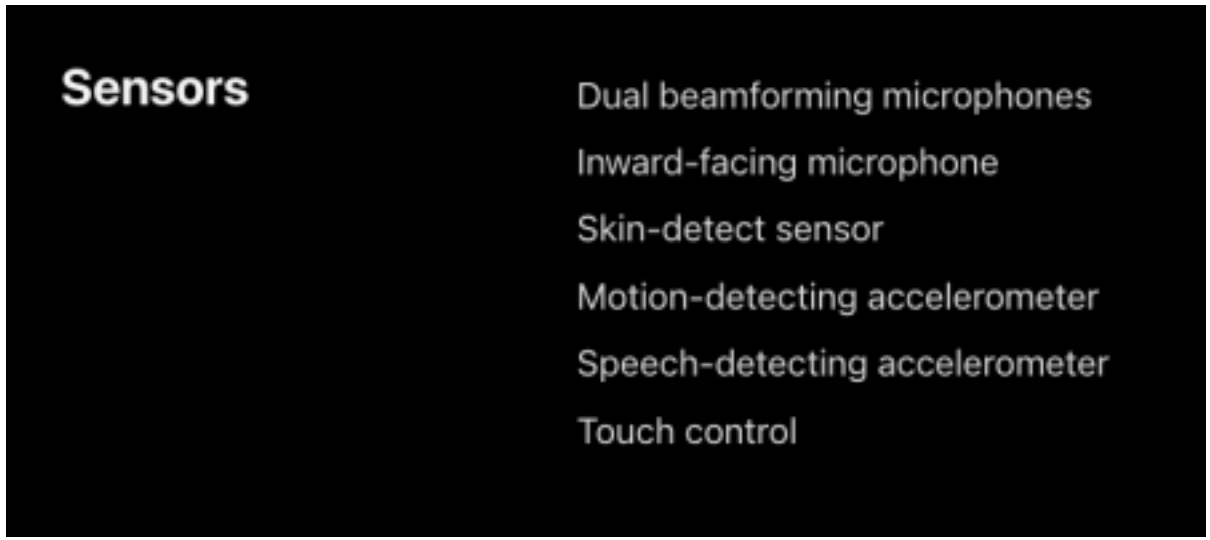
Device	**Citations**
Apple AirPods 2	AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286; AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932; Apple AirPods 2 In-Depth Teardown Review by 52AUDIO, available from

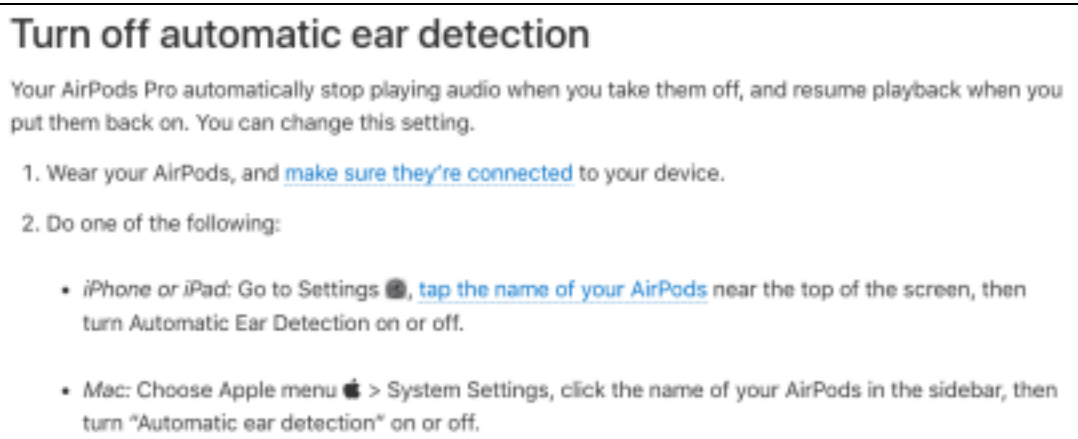
			https://www.chargerlab.com/apple-airpod-2-in-depth-teardown-review/. *See* INGENIOSPEC-013937-014004;
		Apple AirPods 3	Apple AirPods 3 true wireless earphones teardown, available from https://www.qucox.com/apple-airpods-3-teardown/. *See* INGENIOSPEC-014163-014238; Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150; AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158; Which AirPods model should you buy?, available from https://www.theverge.com/2021/10/19/22733797/airpods-2-3-pro-max-which-to-buy. *See* INGENIOSPEC-013410-013429;
		Apple AirPods 4	Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. *See* INGENIOSPEC-013664-013691; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-014260-014276;
		Apple AirPods 4 with Active Noise Cancellation	Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-

			devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501;
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117; How To Enable Voice Isolation On AirPods - YouTube, available from https://www.youtube.com/watch?v=_gpVEHX7WOw. *See* INGENIOSPEC-014672-014674;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;
		Beats Fit Pro	Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458; Teardown Report: Beats Fit Pro, available from https://www.52audio.com/archives/98994.html. *See* INGENIOSPEC-014407-014463; Beats Fit Pro True Wireless Earbuds — Beats Black, available from https://www.apple.com/shop/product/MK2F3LL/A/beats-fit-pro-true-wireless-earbuds-beats-black. *See* INGENIOSPEC-013302-013309;
		Beats Solo Pro	Replacement Parts List, available from https://www.joesge.com/products/beats-solo-pro-wireless-headphones-repair-parts?srsltid=AfmBOoohkWL6z6LfgJ6-r9iZYIxup4uhO-LU6DQhzGFOFk4vPOj3vouM. *See* INGENIOSPEC-013836-013844; Solo Pro Press Release, available from

		https://www.beatsbydre.com/content/dam/beats/web/press/solo-pro/solo-pro-press-kit.zip. *See* INGENIOSPEC-014313-014314; Beats-Solo-Pro-Wireless-Headphones-User-Guide, available from https://manuals.plus/wp-content/uploads/2023/05/Beats-Solo-Pro-Wireless-Headphones-User-Guide.pdf. *See* INGENIOSPEC-013808-013835; Solo Pro - Beats by Dre Archive 2, available from https://web.archive.org/web/20200602034251/https://www.beatsbydre.com/headphones/solo-pro. *See* INGENIOSPEC-013312-013323;
	Powerbeats Pro	Best Buy -- Powerbeats Pro Features, available from https://www.bestbuy.com/product/beats-powerbeats-pro-totally-wireless-earbuds-black/JJ8XJS3FXY. *See* INGENIOSPEC-013883-013883; Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289;
	Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	

11,921,355 Claim 41	**Evidence**
41. A head-worn personal electronic apparatus as recited in claim 17, wherein the head-worn personal	Every claim limitation of claim 17 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.

electronic apparatus comprises:	
41a. a radiation emitter at least partially contained within the head-worn personal electronic apparatus and configured to at least direct radiation towards the user when at least the head-worn personal electronic apparatus of the head-worn personal electronic apparatus is being worn;	Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprise a radiation emitter at least partially contained within the head-worn personal electronic apparatus. The radiation emitter is an infrared light emitter. The radiation emitter is configured to at least direct radiation towards the user when the device is being worn. The radiation emitter and radiation detector (*see* Claim 41b, *infra*) are used to determine if and when the device is being worn.  **Source**: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).



Turn off automatic ear detection

Your AirPods Pro automatically stop playing audio when you take them off, and resume playback when you put them back on. You can change this setting.

1. Wear your AirPods, and make sure they're connected to your device.
2. Do one of the following:
   - *iPhone or iPad*: Go to Settings, tap the name of your AirPods near the top of the screen, then turn Automatic Ear Detection on or off.
   - *Mac*: Choose Apple menu > System Settings, click the name of your AirPods in the sidebar, then turn "Automatic ear detection" on or off.

Source: Change settings for AirPods Pro 1 and 2 (INGENIOSPEC-014030-014032) (available from https://support.apple.com/guide/airpods/change-settings-for-airpods-pro-1-and-2-dev6cbd13615/1.0/web/1.0#devc07789cad).

Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

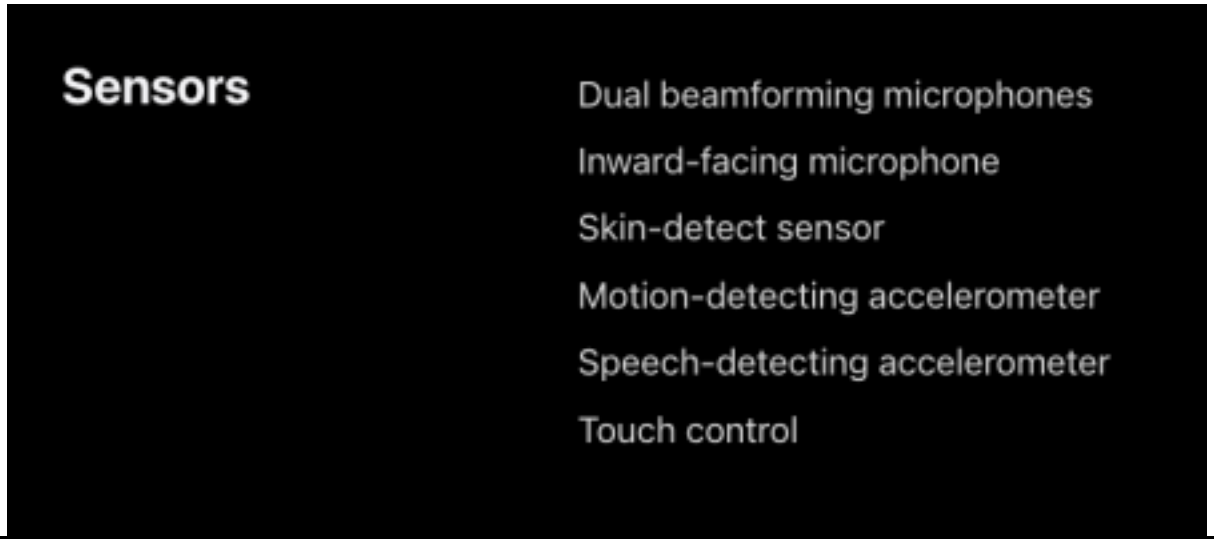
Device	**Citations**
Apple AirPods 2	AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286; AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932;

		Apple AirPods 3	Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150; AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158;
		Apple AirPods 4	Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. *See* INGENIOSPEC-013664-013691; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Change the settings of your AirPods and AirPods Pro - Apple Support, available from https://support.apple.com/en-us/108764. *See* INGENIOSPEC-013692-013694;
		Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; Change the settings of your AirPods and AirPods Pro - Apple Support, available from https://support.apple.com/en-us/108764. *See* INGENIOSPEC-013692-013694;
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort,

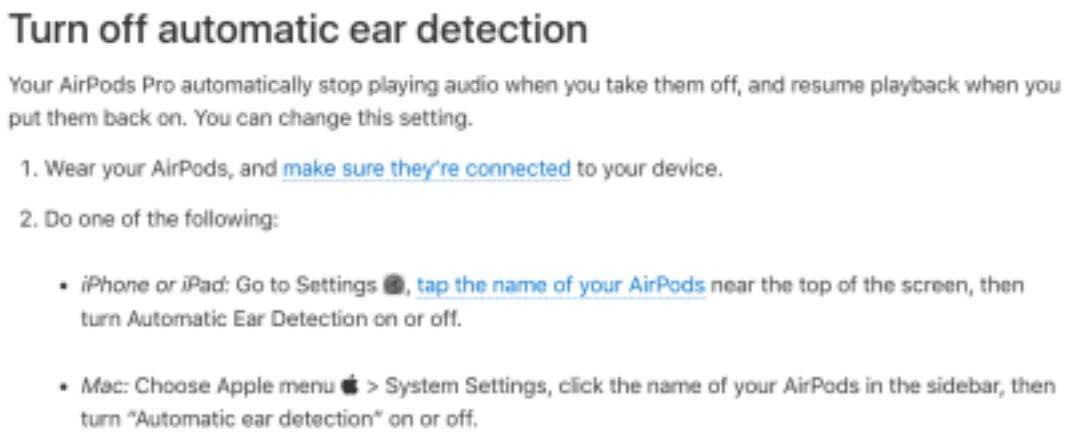
			available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Change settings for AirPods Pro 1 and 2, available from https://support.apple.com/guide/airpods/change-settings-for-airpods-pro-1-and-2-dev6cbd13615/1.0/web/1.0#devc07789cad. *See* INGENIOSPEC-014030-014032;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;
		Beats Fit Pro	Beats User Guide - Turn Beats Automatic Ear Detection On or Off, available from https://support.apple.com/guide/beats/turn-automatic-ear-detection-on-or-off-dev82c456e13/1.0/web/1.0. *See* INGENIOSPEC-013657-013657; Customize controls on your Beats, available from https://support.apple.com/guide/beats/customize-beats-controls-dev9eeff2d7b/web. *See* INGENIOSPEC-013658-013658; Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458;
		Powerbeats Pro	Powerbeats Pro Unboxing & Hands On, available from https://www.youtube.com/watch?v=QmfiANjNV4Y How to Turn Off Automatic Ear Detection on Your Powerbeats Pro Earbuds - MacRumors, available from https://www.macrumors.com/how-to/turn-off-automatic-ear-detection-powerbeats-pro/. *See* INGENIOSPEC-013884-013890; Beats Unveils Powerbeats Pro, available from

		https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289;
	Powerbeats Pro 2	Powerbeats Pro 2, available from https://www.beatsbydre.com/earbuds/powerbeats-pro-2/MX743/electric-orange. *See* INGENIOSPEC-013371-013387;

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.

41b. and a radiation detector at least partially contained within the head-worn personal electronic apparatus and configured to detect radiation reflected back from the user when at least the head-worn personal electronic apparatus of the head-worn personal electronic apparatus is being worn,	Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprise a radiation detector at least partially contained within the head-worn personal electronic apparatus. The radiation detector is an infrared light detector. The radiation detector is configured to detect radiation from the radiation emitter (*see* Claim 41a, *supra*) that is reflected back from the user when at least the head-worn personal electronic apparatus is being worn. The radiation emitter (*see* Claim 41a, *supra*) and radiation detector are used to determine if and when the device is being worn. 

Source: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).



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2. Do one of the following:
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   - *Mac:* Choose Apple menu > System Settings, click the name of your AirPods in the sidebar, then turn "Automatic ear detection" on or off.

Source: Change settings for AirPods Pro 1 and 2 (INGENIOSPEC-014030-014032) (available from https://support.apple.com/guide/airpods/change-settings-for-airpods-pro-1-and-2-dev6cbd13615/1.0/web/1.0#devc07789cad).

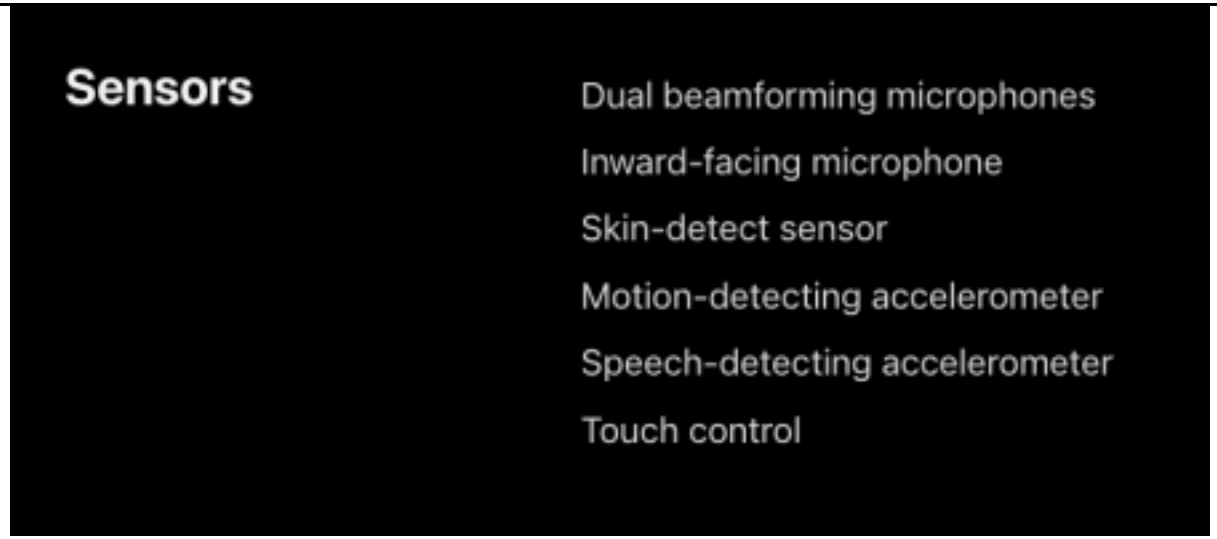
Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 2	AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286; AirPods 2 - Tech Specs - Apple Support, available from

			https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932;
		Apple AirPods 3	Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150; AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158;
		Apple AirPods 4	Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. *See* INGENIOSPEC-013664-013691; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Change the settings of your AirPods and AirPods Pro - Apple Support, available from https://support.apple.com/en-us/108764. *See* INGENIOSPEC-013692-013694;
		Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; Change the settings of your AirPods and AirPods Pro - Apple Support, available from https://support.apple.com/en-us/108764. *See* INGENIOSPEC-013692-013694;

		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Change settings for AirPods Pro 1 and 2, available from https://support.apple.com/guide/airpods/change-settings-for-airpods-pro-1-and-2-dev6cbd13615/1.0/web/1.0#devc07789cad. *See* INGENIOSPEC-014030-014032;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;
		Beats Fit Pro	Beats User Guide - Turn Beats Automatic Ear Detection On or Off, available from https://support.apple.com/guide/beats/turn-automatic-ear-detection-on-or-off-dev82c456e13/1.0/web/1.0. *See* INGENIOSPEC-013657-013657; Customize controls on your Beats, available from https://support.apple.com/guide/beats/customize-beats-controls-dev9eeff2d7b/web. *See* INGENIOSPEC-013658-013658; Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458;
		Powerbeats Pro	Powerbeats Pro Unboxing & Hands On, available from https://www.youtube.com/watch?v=QmfiANjNV4Y How to Turn Off Automatic Ear Detection on Your Powerbeats Pro Earbuds - MacRumors, available from

		https://www.macrumors.com/how-to/turn-off-automatic-ear-detection-powerbeats-pro/. *See* INGENIOSPEC-013884-013890; Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289;
	Powerbeats Pro 2	Powerbeats Pro 2, available from https://www.beatsbydre.com/earbuds/powerbeats-pro-2/MX743/electric-orange. *See* INGENIOSPEC-013371-013387;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	
41c. and wherein the radiation detector is operatively connected to the electronic circuitry, and wherein electronic circuitry within the head-worn personal electronic apparatus is configured to facilitate determining whether the head-worn personal electronic apparatus of the head-worn personal electronic	Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises electronic circuitry including at least an integrated circuit. *See* Claim 17c, *supra*. The radiation detector is operatively connected to the electronic circuitry. For example, in order to operate, the radiation detector requires power from the device's battery circuitry. The electronic circuitry of the Accused Instrumentalities, such as Apple AirPods Pro 2, is configured to facilitate determining whether the head-worn personal electronic apparatus is being worn by the user based on at least the detected radiation. For example, if the sensor "sees" darkness or absorption consistent with skin, it facilitates in determining whether the device is being worn.	

apparatus is being worn by the user based on at least the detected radiation.	 **Source**: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/). **Turn off automatic ear detection** Your AirPods Pro automatically stop playing audio when you take them off, and resume playback when you put them back on. You can change this setting. 1. Wear your AirPods, and make sure they're connected to your device. 2. Do one of the following: • *iPhone or iPad:* Go to Settings, tap the name of your AirPods near the top of the screen, then turn Automatic Ear Detection on or off. • *Mac:* Choose Apple menu > System Settings, click the name of your AirPods in the sidebar, then turn "Automatic ear detection" on or off.

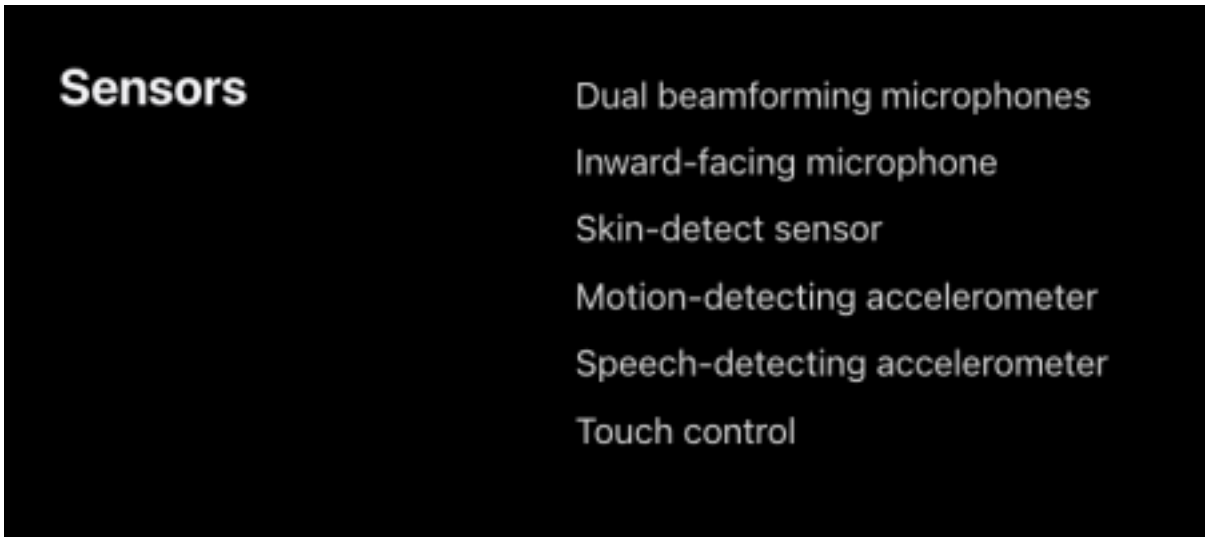
Source: Change settings for AirPods Pro 1 and 2 (INGENIOSPEC-014030-014032) (available from https://support.apple.com/guide/airpods/change-settings-for-airpods-pro-1-and-2-dev6cbd13615/1.0/web/1.0#devc07789cad).

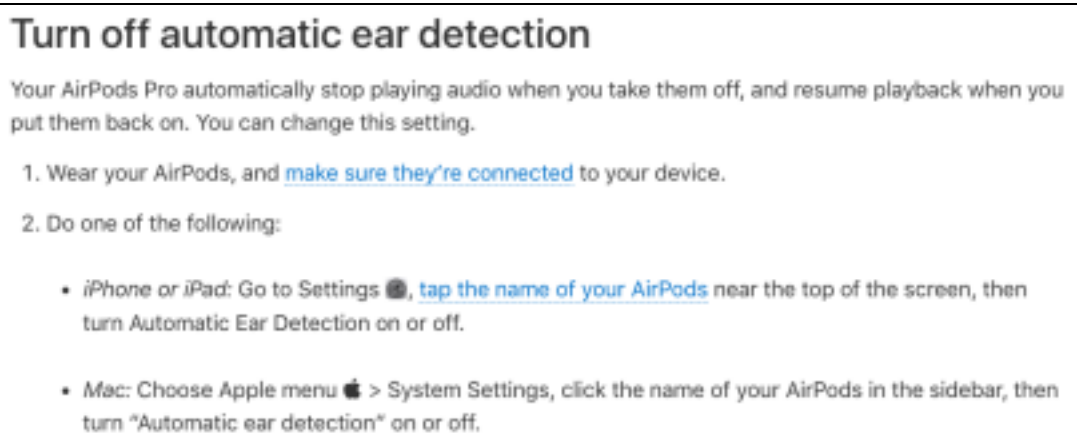
Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 2	AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286; AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932;
Apple AirPods 3	Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150; AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158;
Apple AirPods 4	Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. *See* INGENIOSPEC-013664-013691; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-

			014686; Change the settings of your AirPods and AirPods Pro - Apple Support, available from https://support.apple.com/en-us/108764. *See* INGENIOSPEC-013692-013694;
		Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; Change the settings of your AirPods and AirPods Pro - Apple Support, available from https://support.apple.com/en-us/108764. *See* INGENIOSPEC-013692-013694;
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Change settings for AirPods Pro 1 and 2, available from https://support.apple.com/guide/airpods/change-settings-for-airpods-pro-1-and-2-dev6cbd13615/1.0/web/1.0#devc07789cad. *See* INGENIOSPEC-014030-014032;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;

	Beats Fit Pro	Beats User Guide - Turn Beats Automatic Ear Detection On or Off, available from https://support.apple.com/guide/beats/turn-automatic-ear-detection-on-or-off-dev82c456e13/1.0/web/1.0. *See* INGENIOSPEC-013657-013657; Customize controls on your Beats, available from https://support.apple.com/guide/beats/customize-beats-controls-dev9eeff2d7b/web. *See* INGENIOSPEC-013658-013658; Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458;
	Powerbeats Pro	Powerbeats Pro Unboxing & Hands On, available from https://www.youtube.com/watch?v=QmfiANjNV4Y How to Turn Off Automatic Ear Detection on Your Powerbeats Pro Earbuds - MacRumors, available from https://www.macrumors.com/how-to/turn-off-automatic-ear-detection-powerbeats-pro/. *See* INGENIOSPEC-013884-013890; Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289;
	Powerbeats Pro 2	Powerbeats Pro 2, available from https://www.beatsbydre.com/earbuds/powerbeats-pro-2/MX743/electric-orange. *See* INGENIOSPEC-013371-013387;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	

11,921,355 Claim 42	Evidence
42. A head-worn personal electronic apparatus as recited in claim 41, wherein the detected radiation is at least infrared radiation.	Every claim limitation of claim 41 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises a radiation detector configured to detect radiation reflected back from the user when the device is being worn. *See* Claim 41b, *supra*. The detected radiation is at least infrared radiation. For example, the Accused Instrumentalities, such as Apple AirPods Pro 2, comprise an infrared radiation emitter configured to direct radiation towards the user to subsequently be detected. *See* Claim 41, *supra*. Based upon the detected infrared radiation, the device can facilitate determining whether the device is being worn by the user.  **Source**: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).



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   - *Mac:* Choose Apple menu > System Settings, click the name of your AirPods in the sidebar, then turn "Automatic ear detection" on or off.

Source: Change settings for AirPods Pro 1 and 2 (INGENIOSPEC-014030-014032) (available from https://support.apple.com/guide/airpods/change-settings-for-airpods-pro-1-and-2-dev6cbd13615/1.0/web/1.0#devc07789cad).

Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 2	AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286; AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932;

		Apple AirPods 3	Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150; AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158;
		Apple AirPods 4	Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. *See* INGENIOSPEC-013664-013691; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Change the settings of your AirPods and AirPods Pro - Apple Support, available from https://support.apple.com/en-us/108764. *See* INGENIOSPEC-013692-013694;
		Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; Change the settings of your AirPods and AirPods Pro - Apple Support, available from https://support.apple.com/en-us/108764. *See* INGENIOSPEC-013692-013694;
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort,

			available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Change settings for AirPods Pro 1 and 2, available from https://support.apple.com/guide/airpods/change-settings-for-airpods-pro-1-and-2-dev6cbd13615/1.0/web/1.0#devc07789cad. *See* INGENIOSPEC-014030-014032;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;
		Beats Fit Pro	Beats User Guide - Turn Beats Automatic Ear Detection On or Off, available from https://support.apple.com/guide/beats/turn-automatic-ear-detection-on-or-off-dev82c456e13/1.0/web/1.0. *See* INGENIOSPEC-013657-013657; Customize controls on your Beats, available from https://support.apple.com/guide/beats/customize-beats-controls-dev9eeff2d7b/web. *See* INGENIOSPEC-013658-013658; Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458;
		Powerbeats Pro	Powerbeats Pro Unboxing & Hands On, available from https://www.youtube.com/watch?v=QmfiANjNV4Y How to Turn Off Automatic Ear Detection on Your Powerbeats Pro Earbuds - MacRumors, available from https://www.macrumors.com/how-to/turn-off-automatic-ear-detection-powerbeats-pro/. *See* INGENIOSPEC-013884-013890; Beats Unveils Powerbeats Pro, available from

		https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289;
	Powerbeats Pro 2	Powerbeats Pro 2, available from https://www.beatsbydre.com/earbuds/powerbeats-pro-2/MX743/electric-orange. *See* INGENIOSPEC-013371-013387;

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.

11,921,355 Claim 43	**Evidence**
43. A head-worn personal electronic apparatus as recited in claim 17, wherein the head-worn personal electronic apparatus comprises:	Every claim limitation of claim 17 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
43a. a radiation detector configured to capture radiation data,	*See* Claim 13a, *supra*. Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**

		Apple AirPods 2	AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286; AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932;
		Apple AirPods 3	Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150; AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158;
		Apple AirPods 4	Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. *See* INGENIOSPEC-013664-013691; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Change the settings of your AirPods and AirPods Pro - Apple Support, available from https://support.apple.com/en-us/108764. *See* INGENIOSPEC-013692-013694;
		Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; Change the settings of your AirPods and AirPods Pro - Apple Support,

			available from https://support.apple.com/en-us/108764. *See* INGENIOSPEC-013692-013694;
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Change settings for AirPods Pro 1 and 2, available from https://support.apple.com/guide/airpods/change-settings-for-airpods-pro-1-and-2-dev6cbd13615/1.0/web/1.0#devc07789cad. *See* INGENIOSPEC-014030-014032;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;
		Beats Fit Pro	Beats User Guide - Turn Beats Automatic Ear Detection On or Off, available from https://support.apple.com/guide/beats/turn-automatic-ear-detection-on-or-off-dev82c456e13/1.0/web/1.0. *See* INGENIOSPEC-013657-013657; Customize controls on your Beats, available from https://support.apple.com/guide/beats/customize-beats-controls-dev9eeff2d7b/web. *See* INGENIOSPEC-013658-013658; Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458;

	Powerbeats Pro	Powerbeats Pro Unboxing & Hands On, available from https://www.youtube.com/watch?v=QmfiANjNV4Y How to Turn Off Automatic Ear Detection on Your Powerbeats Pro Earbuds - MacRumors, available from https://www.macrumors.com/how-to/turn-off-automatic-ear-detection-powerbeats-pro/. *See* INGENIOSPEC-013884-013890; Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289;
	Powerbeats Pro 2	Powerbeats Pro 2, available from https://www.beatsbydre.com/earbuds/powerbeats-pro-2/MX743/electric-orange. *See* INGENIOSPEC-013371-013387;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	
43b. wherein the electronic circuitry is configured to process at least the radiation data captured by the radiation detector.	*See* Claim 13b, *supra*. Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.	
	Device	**Citations**
	Apple AirPods 2	AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286; AirPods 2 - Tech Specs - Apple Support, available from

			https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932;
		Apple AirPods 3	Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150; AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158;
		Apple AirPods 4	Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. *See* INGENIOSPEC-013664-013691; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Change the settings of your AirPods and AirPods Pro - Apple Support, available from https://support.apple.com/en-us/108764. *See* INGENIOSPEC-013692-013694;
		Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; Change the settings of your AirPods and AirPods Pro - Apple Support, available from https://support.apple.com/en-us/108764. *See* INGENIOSPEC-013692-013694;

		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Change settings for AirPods Pro 1 and 2, available from https://support.apple.com/guide/airpods/change-settings-for-airpods-pro-1-and-2-dev6cbd13615/1.0/web/1.0#devc07789cad. *See* INGENIOSPEC-014030-014032;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;
		Beats Fit Pro	Beats User Guide - Turn Beats Automatic Ear Detection On or Off, available from https://support.apple.com/guide/beats/turn-automatic-ear-detection-on-or-off-dev82c456e13/1.0/web/1.0. *See* INGENIOSPEC-013657-013657; Customize controls on your Beats, available from https://support.apple.com/guide/beats/customize-beats-controls-dev9eeff2d7b/web. *See* INGENIOSPEC-013658-013658; Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458;
		Powerbeats Pro	Powerbeats Pro Unboxing & Hands On, available from https://www.youtube.com/watch?v=QmfiANjNV4Y How to Turn Off Automatic Ear Detection on Your Powerbeats Pro Earbuds - MacRumors, available from

		https://www.macrumors.com/how-to/turn-off-automatic-ear-detection-powerbeats-pro/. *See* INGENIOSPEC-013884-013890; Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289;
	Powerbeats Pro 2	Powerbeats Pro 2, available from https://www.beatsbydre.com/earbuds/powerbeats-pro-2/MX743/electric-orange. *See* INGENIOSPEC-013371-013387;

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.

11,921,355 Claim 44	**Evidence**
44. A head-worn personal electronic apparatus as recited in claim 43, wherein the electronic circuitry is configured to determine whether the head-worn personal electronic apparatus is being worn by a user based on at least the processed radiation data.	Every claim limitation of claim 43 is present in the Accused Instrumentalities as described above and incorporated herein by reference. *See* Claim 13, *supra*. Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 2	AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286;

			AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932;
		Apple AirPods 3	Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150; AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158;
		Apple AirPods 4	Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. *See* INGENIOSPEC-013664-013691; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Change the settings of your AirPods and AirPods Pro - Apple Support, available from https://support.apple.com/en-us/108764. *See* INGENIOSPEC-013692-013694;
		Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; Change the settings of your AirPods and AirPods Pro - Apple Support, available from https://support.apple.com/en-us/108764. *See* INGENIOSPEC-013692-013694;

		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Change settings for AirPods Pro 1 and 2, available from https://support.apple.com/guide/airpods/change-settings-for-airpods-pro-1-and-2-dev6cbd13615/1.0/web/1.0#devc07789cad. *See* INGENIOSPEC-014030-014032;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;
		Beats Fit Pro	Beats User Guide - Turn Beats Automatic Ear Detection On or Off, available from https://support.apple.com/guide/beats/turn-automatic-ear-detection-on-or-off-dev82c456e13/1.0/web/1.0. *See* INGENIOSPEC-013657-013657; Customize controls on your Beats, available from https://support.apple.com/guide/beats/customize-beats-controls-dev9eeff2d7b/web. *See* INGENIOSPEC-013658-013658; Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458;
		Powerbeats Pro	Powerbeats Pro Unboxing & Hands On, available from https://www.youtube.com/watch?v=QmfiANjNV4Y How to Turn Off Automatic Ear Detection on Your Powerbeats Pro Earbuds - MacRumors, available from

		https://www.macrumors.com/how-to/turn-off-automatic-ear-detection-powerbeats-pro/. *See* INGENIOSPEC-013884-013890; Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289;
	Powerbeats Pro 2	Powerbeats Pro 2, available from https://www.beatsbydre.com/earbuds/powerbeats-pro-2/MX743/electric-orange. *See* INGENIOSPEC-013371-013387;

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.

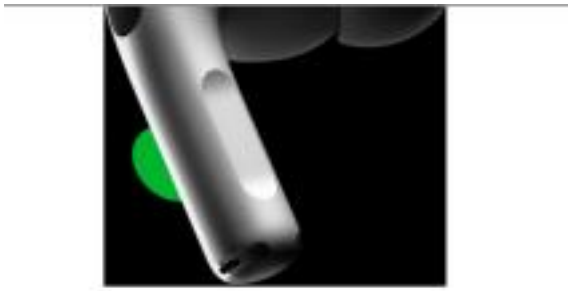
11,921,355 Claim 45	**Evidence**
45. A head-worn personal electronic apparatus as recited in claim 44, wherein the radiation detector comprises a photodetector.	Every claim limitation of claim 44 is present in the Accused Instrumentalities as described above and incorporated herein by reference. The Accused Instrumentalities, such as Apple AirPods Pro 2, comprise a radiation detector configured to capture radiation data. *See* Claim 43a, *supra*. The radiation detector of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises a photodetector. For example, the radiation detector comprises an infrared detector configured to sense infrared light using a photodetector. *See* Claim 13, *supra*. Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

	Device	Citations
	Apple AirPods 2	AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286; AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932;
	Apple AirPods 3	Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150; AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158;
	Apple AirPods 4	Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. *See* INGENIOSPEC-013664-013691; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Change the settings of your AirPods and AirPods Pro - Apple Support, available from https://support.apple.com/en-us/108764. *See* INGENIOSPEC-013692-013694;
	Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Apple AirPods 4 ANC Earbuds Teardown, available from

			https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; Change the settings of your AirPods and AirPods Pro - Apple Support, available from https://support.apple.com/en-us/108764. *See* INGENIOSPEC-013692-013694;
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Change settings for AirPods Pro 1 and 2, available from https://support.apple.com/guide/airpods/change-settings-for-airpods-pro-1-and-2-dev6cbd13615/1.0/web/1.0#devc07789cad. *See* INGENIOSPEC-014030-014032;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;
		Beats Fit Pro	Beats User Guide - Turn Beats Automatic Ear Detection On or Off, available from https://support.apple.com/guide/beats/turn-automatic-ear-detection-on-or-off-dev82c456e13/1.0/web/1.0. *See* INGENIOSPEC-013657-013657; Customize controls on your Beats, available from https://support.apple.com/guide/beats/customize-beats-controls-dev9eeff2d7b/web. *See* INGENIOSPEC-013658-013658; Beats Fit Pro, available from

		https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458;
	Powerbeats Pro	Powerbeats Pro Unboxing & Hands On, available from https://www.youtube.com/watch?v=QmfiANjNV4Y How to Turn Off Automatic Ear Detection on Your Powerbeats Pro Earbuds - MacRumors, available from https://www.macrumors.com/how-to/turn-off-automatic-ear-detection-powerbeats-pro/. *See* INGENIOSPEC-013884-013890; Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289;
	Powerbeats Pro 2	Powerbeats Pro 2, available from https://www.beatsbydre.com/earbuds/powerbeats-pro-2/MX743/electric-orange. *See* INGENIOSPEC-013371-013387;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	

11,921,355 Claim 46	**Evidence**
46. A head-worn personal electronic apparatus as recited in claim 17, wherein the head-worn personal electronic apparatus comprises a force sensor configured to	Every claim limitation of claim 17 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises a force sensor. The force sensor is configured to receive a user input based at least on sensing force applied to the force sensor (e.g., when a user squeezes the force sensor). As such, the force sensor is configured to detect the user input, and the detected user input alters at least an operation of the head-worn wearable electronic device.

receive a user input based at least on sensing force applied to the force sensor.	For example, based upon input to the pressure sensor (e.g., a squeeze), the Apple AirPods Pro 2 may play or pause audio, skip to the next or previous track in a playlist, answer a phone call, or activate Siri, among other actions.  Just touch to adjust. Touch control lets you manage playback functions from the stem. Swipe up or down to adjust volume, press to play and pause music or mute and unmute yourself on calls, and press twice to end a call. You can also hold the stem to switch between listening modes. **Source**: AirPods Pro 2 - Apple (INGENIOSPEC-013541-013563) (available from https://web.archive.org/web/20250904180656/https:/www.apple.com/airpods-pro/).

AirPods Pro 2 controls and gestures



With the Touch control on the stem of both AirPods Pro 2, you can do any of the following:

- *Play and pause audio:* Press the stem. To resume playback, press it again.
- *Play the next track:* Double-press the stem.
- *Play the previous track:* Triple-press the stem.
- *Answer a call:* When you receive a call, press the stem.
- *Adjust volume:* Lightly swipe up or down on the stem.

  You can also turn on Personalized Volume to automatically adjust the volume based on listening preferences and your environment. See Use Conversation Awareness or Personalized Volume.
- *Switch between Active Noise Cancellation, Transparency mode, and Adaptive Audio:* You can set either of your AirPods to perform this action when you press and hold the stem. See Change what the force sensor or Touch control does.
- *Activate Siri:* You can set either of your AirPods to perform this action when you press and hold the stem. See Use Siri with AirPods.

Use head gestures to respond to Siri

- *Accept a call or reply to notifications and messages:* Nod your head up and down.
- *Decline a call or dismiss notifications and messages:* Shake your head side to side.

Note: To use head gestures to respond to Siri, Announce Calls and Announce Notifications must be on. See Use Siri to announce calls or notifications.

Source: Use controls and gestures with your AirPods - Apple Support (INGENIOSPEC-014024-014029) (available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/1.0/web/1.0).

Make and answer calls

1. Wear your AirPods and make sure they're connected to your iPhone, iPad, or Apple Watch (with cellular or Wi-Fi).
2. Do one of the following:
   - *Make a call:* Say "Hey Siri," or press and hold the force sensor, then say something like "Call Eliza's mobile." On an iPad without cellular, say something like "Make a FaceTime call."

     You can also make a call on your device, such as in the FaceTime app or Phone app.
   - *Answer a call:* Press the stem once on either of your AirPods.

Source: Make and answer calls - Apple Support (INGENIOSPEC-014036-014038) (available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0).

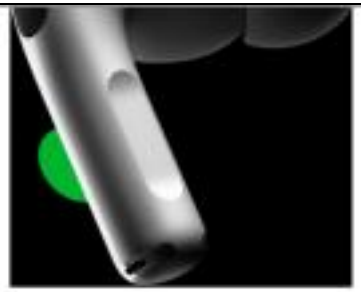
Each of Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1 and Apple AirPods Pro 3 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 3	AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158; Use controls and gestures with your AirPods - Apple Support, available from

			https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/1.0/web/1.0. *See* INGENIOSPEC-014024-014029; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038;
		Apple AirPods 4	Pause, skip, and adjust volume with your AirPods and AirPods Pro, available from https://support.apple.com/en-us/102628. *See* INGENIOSPEC-013298-013301; Use controls and gestures with your AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/1.0/web/1.0. *See* INGENIOSPEC-014024-014029; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
		Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Pause, skip, and adjust volume with your AirPods and AirPods Pro, available from https://support.apple.com/en-us/102628. *See* INGENIOSPEC-013298-013301; Use controls and gestures with your AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-controls-and-

		gestures-with-your-airpods-devb2c431317/1.0/web/1.0. *See* INGENIOSPEC-014024-014029;
	Apple AirPods Pro 1	Use controls and gestures with your AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/1.0/web/1.0. *See* INGENIOSPEC-014024-014029; Pause, skip, and adjust volume with your AirPods and AirPods Pro, available from https://support.apple.com/en-us/102628. *See* INGENIOSPEC-013298-013301; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075;
	Apple AirPods Pro 3	Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533; Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	

11,921,355 Claim 47	Evidence
47. A head-worn personal electronic apparatus as recited in claim 46, wherein the force sensor is configured to detect the user input, the detected user input operating to alter at least an operation of the head-worn wearable electronic device.	Every claim limitation of claim 46 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises a force sensor configured to receive a user input based at least on sensing force applied to the force sensor. *See* Claim 46, *supra*. The force sensor is configured to receive a user input based at least on sensing force applied to the force sensor (e.g., when a user squeezes the force sensor). As such, the force sensor is configured to detect the user input, and the detected user input alters at least an operation of the head-worn wearable electronic device. For example, based upon input to the pressure sensor (e.g., a squeeze), the Apple AirPods Pro 2 may play or pause audio, skip to the next or previous track in a playlist, answer a phone call, or activate Siri, among other actions.



Just touch
to adjust.

Touch control lets you manage playback functions from the stem. Swipe up or down to adjust volume, press to play and pause music or mute and unmute yourself on calls, and press twice to end a call. You can also hold the stem to switch between listening modes.

Source: AirPods Pro 2 - Apple (INGENIOSPEC-013541-013563) (available from https://web.archive.org/web/20250904180656/https:/www.apple.com/airpods-pro/).

AirPods Pro 2 controls and gestures



With the Touch control on the stem of both AirPods Pro 2, you can do any of the following:

- *Play and pause audio:* Press the stem. To resume playback, press it again.
- *Play the next track:* Double-press the stem.
- *Play the previous track:* Triple-press the stem.
- *Answer a call:* When you receive a call, press the stem.
- *Adjust volume:* Lightly swipe up or down on the stem.

  You can also turn on Personalized Volume to automatically adjust the volume based on listening preferences and your environment. See Use Conversation Awareness or Personalized Volume.
- *Switch between Active Noise Cancellation, Transparency mode, and Adaptive Audio:* You can set either of your AirPods to perform this action when you press and hold the stem. See Change what the force sensor or Touch control does.
- *Activate Siri:* You can set either of your AirPods to perform this action when you press and hold the stem. See Use Siri with AirPods.

Use head gestures to respond to Siri

- *Accept a call or reply to notifications and messages:* Nod your head up and down.
- *Decline a call or dismiss notifications and messages:* Shake your head side to side.

Note: To use head gestures to respond to Siri, Announce Calls and Announce Notifications must be on. See Use Siri to announce calls or notifications.

Source: Use controls and gestures with your AirPods - Apple Support (INGENIOSPEC-014024-014029) (available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/1.0/web/1.0).

Make and answer calls

1. Wear your AirPods and make sure they're connected to your iPhone, iPad, or Apple Watch (with cellular or Wi-Fi).
2. Do one of the following:
   - *Make a call:* Say "Hey Siri," or press and hold the force sensor, then say something like "Call Eliza's mobile." On an iPad without cellular, say something like "Make a FaceTime call."

     You can also make a call on your device, such as in the FaceTime app or Phone app.
   - *Answer a call:* Press the stem once on either of your AirPods.

Source: Make and answer calls - Apple Support (INGENIOSPEC-014036-014038) (available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0).

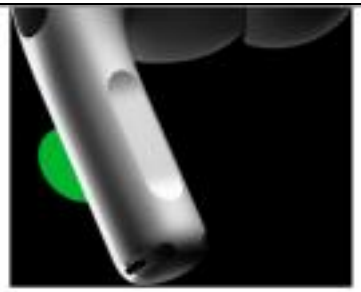
Each of Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1 and Apple AirPods Pro 3 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 3	AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158; Use controls and gestures with your AirPods - Apple Support, available from

			https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/1.0/web/1.0. *See* INGENIOSPEC-014024-014029; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038;
		Apple AirPods 4	Pause, skip, and adjust volume with your AirPods and AirPods Pro, available from https://support.apple.com/en-us/102628. *See* INGENIOSPEC-013298-013301; Use controls and gestures with your AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/1.0/web/1.0. *See* INGENIOSPEC-014024-014029; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
		Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Pause, skip, and adjust volume with your AirPods and AirPods Pro, available from https://support.apple.com/en-us/102628. *See* INGENIOSPEC-013298-013301; Use controls and gestures with your AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-controls-and-

		gestures-with-your-airpods-devb2c431317/1.0/web/1.0. *See* INGENIOSPEC-014024-014029;
	Apple AirPods Pro 1	Use controls and gestures with your AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/1.0/web/1.0. *See* INGENIOSPEC-014024-014029; Pause, skip, and adjust volume with your AirPods and AirPods Pro, available from https://support.apple.com/en-us/102628. *See* INGENIOSPEC-013298-013301; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075;
	Apple AirPods Pro 3	Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533; Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	

11,921,355 Claim 48	Evidence
48. A head-worn personal electronic apparatus as recited in claim 47, wherein the at least one operation of the head-worn personal electronic apparatus being altered concerns control of the audio output being provided to the user.	Every claim limitation of claim 47 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises a force sensor configured to receive a user input based at least on sensing force applied to the force sensor. *See* Claim 46, *supra*. The force sensor is configured to detect the user input, the detected user input operating to alter at least an operation of the head-worn wearable electronic device. *See* Claim 47, *supra*. The at least one operation of the Accused Instrumentalities being altered concerns control of the audio output being provided to the user. For example, based upon input to the pressure sensor (e.g., a squeeze), the Apple AirPods Pro 2 may play or pause audio, skip to the next or previous track in a playlist, answer a phone call, or activate Siri, among other actions.



Just touch
to adjust.

Touch control lets you manage playback functions from the stem. Swipe up or down to adjust volume, press to play and pause music or mute and unmute yourself on calls, and press twice to end a call. You can also hold the stem to switch between listening modes.

Source: AirPods Pro 2 - Apple (INGENIOSPEC-013541-013563) (available from https://web.archive.org/web/20250904180656/https:/www.apple.com/airpods-pro/).

AirPods Pro 2 controls and gestures



With the Touch control on the stem of both AirPods Pro 2, you can do any of the following:

- *Play and pause audio:* Press the stem. To resume playback, press it again.
- *Play the next track:* Double-press the stem.
- *Play the previous track:* Triple-press the stem.
- *Answer a call:* When you receive a call, press the stem.
- *Adjust volume:* Lightly swipe up or down on the stem.

  You can also turn on Personalized Volume to automatically adjust the volume based on listening preferences and your environment. See Use Conversation Awareness or Personalized Volume.
- *Switch between Active Noise Cancellation, Transparency mode, and Adaptive Audio:* You can set either of your AirPods to perform this action when you press and hold the stem. See Change what the force sensor or Touch control does.
- *Activate Siri:* You can set either of your AirPods to perform this action when you press and hold the stem. See Use Siri with AirPods.

Use head gestures to respond to Siri

- *Accept a call or reply to notifications and messages:* Nod your head up and down.
- *Decline a call or dismiss notifications and messages:* Shake your head side to side.

Note: To use head gestures to respond to Siri, Announce Calls and Announce Notifications must be on. See Use Siri to announce calls or notifications.

Source: Use controls and gestures with your AirPods - Apple Support (INGENIOSPEC-014024-014029) (available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/1.0/web/1.0).

Make and answer calls

1. Wear your AirPods and make sure they're connected to your iPhone, iPad, or Apple Watch (with cellular or Wi-Fi).
2. Do one of the following:
   - *Make a call:* Say "Hey Siri," or press and hold the force sensor, then say something like "Call Eliza's mobile." On an iPad without cellular, say something like "Make a FaceTime call."

     You can also make a call on your device, such as in the FaceTime app or Phone app.
   - *Answer a call:* Press the stem once on either of your AirPods.

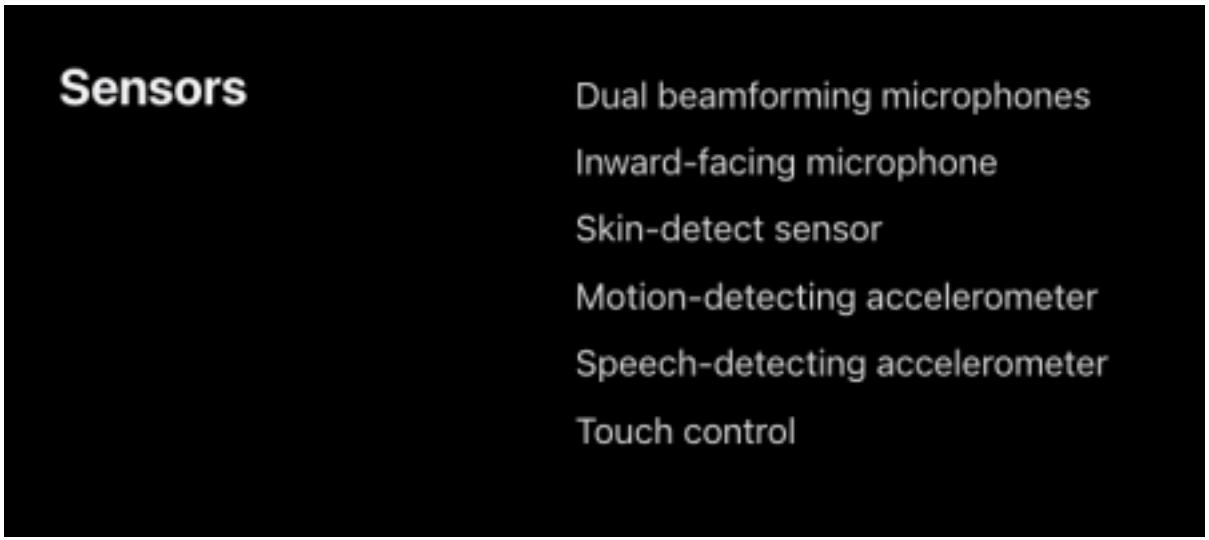
Source: Make and answer calls - Apple Support (INGENIOSPEC-014036-014038) (available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0).

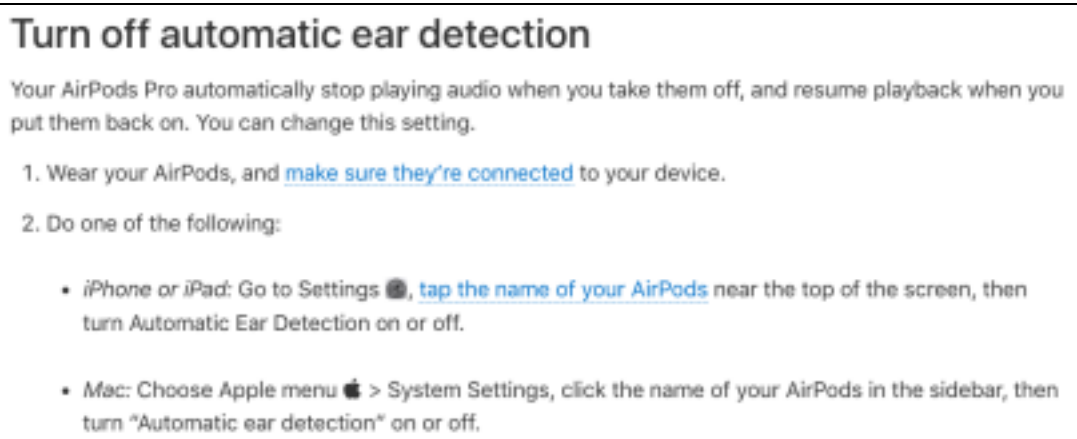
Each of Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1 and Apple AirPods Pro 3 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 3	AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158; Use controls and gestures with your AirPods - Apple Support, available from

			https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/1.0/web/1.0. *See* INGENIOSPEC-014024-014029; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038;
		Apple AirPods 4	Pause, skip, and adjust volume with your AirPods and AirPods Pro, available from https://support.apple.com/en-us/102628. *See* INGENIOSPEC-013298-013301; Use controls and gestures with your AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/1.0/web/1.0. *See* INGENIOSPEC-014024-014029; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
		Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Pause, skip, and adjust volume with your AirPods and AirPods Pro, available from https://support.apple.com/en-us/102628. *See* INGENIOSPEC-013298-013301; Use controls and gestures with your AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-controls-and-

		gestures-with-your-airpods-devb2c431317/1.0/web/1.0. *See* INGENIOSPEC-014024-014029;
	Apple AirPods Pro 1	Use controls and gestures with your AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/1.0/web/1.0. *See* INGENIOSPEC-014024-014029; Pause, skip, and adjust volume with your AirPods and AirPods Pro, available from https://support.apple.com/en-us/102628. *See* INGENIOSPEC-013298-013301; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075;
	Apple AirPods Pro 3	Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533; Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	

11,921,355 Claim 49	Evidence
49. A head-worn personal electronic apparatus as recited in claim 17, wherein the head-worn personal electronic apparatus comprises:	Every claim limitation of claim 17 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
49a. a light detector configured to capture light data,	Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprise a light detector configured to capture light data. The light detector is used to detect the presence of light (e.g., infrared and/or visible light), in order to determine if the device is being worn.  **Source**: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).



Turn off automatic ear detection

Your AirPods Pro automatically stop playing audio when you take them off, and resume playback when you put them back on. You can change this setting.

1. Wear your AirPods, and make sure they're connected to your device.
2. Do one of the following:
   - *iPhone or iPad:* Go to Settings, tap the name of your AirPods near the top of the screen, then turn Automatic Ear Detection on or off.
   - *Mac:* Choose Apple menu > System Settings, click the name of your AirPods in the sidebar, then turn "Automatic ear detection" on or off.

Source: Change settings for AirPods Pro 1 and 2 (INGENIOSPEC-014030-014032) (available from https://support.apple.com/guide/airpods/change-settings-for-airpods-pro-1-and-2-dev6cbd13615/1.0/web/1.0#devc07789cad).

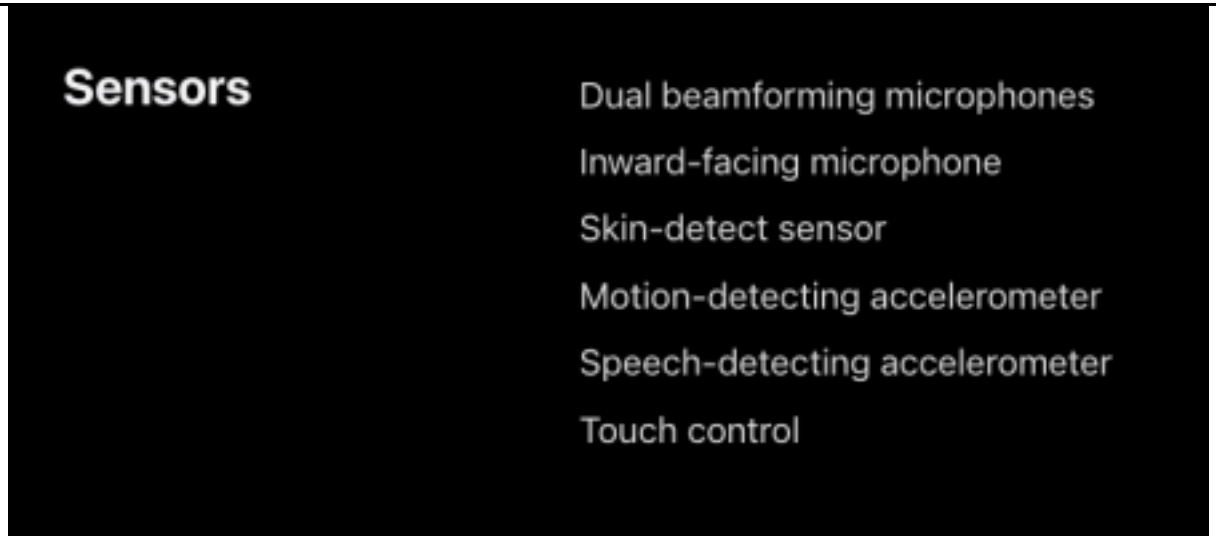
Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 2	AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286; AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932;

		Apple AirPods 3	Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150; AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158;
		Apple AirPods 4	Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. *See* INGENIOSPEC-013664-013691; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Change the settings of your AirPods and AirPods Pro - Apple Support, available from https://support.apple.com/en-us/108764. *See* INGENIOSPEC-013692-013694;
		Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; Change the settings of your AirPods and AirPods Pro - Apple Support, available from https://support.apple.com/en-us/108764. *See* INGENIOSPEC-013692-013694;
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort,

			available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Change settings for AirPods Pro 1 and 2, available from https://support.apple.com/guide/airpods/change-settings-for-airpods-pro-1-and-2-dev6cbd13615/1.0/web/1.0#devc07789cad. *See* INGENIOSPEC-014030-014032;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;
		Beats Fit Pro	Beats User Guide - Turn Beats Automatic Ear Detection On or Off, available from https://support.apple.com/guide/beats/turn-automatic-ear-detection-on-or-off-dev82c456e13/1.0/web/1.0. *See* INGENIOSPEC-013657-013657; Customize controls on your Beats, available from https://support.apple.com/guide/beats/customize-beats-controls-dev9eeff2d7b/web. *See* INGENIOSPEC-013658-013658; Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458;
		Powerbeats Pro	Powerbeats Pro Unboxing & Hands On, available from https://www.youtube.com/watch?v=QmfiANjNV4Y How to Turn Off Automatic Ear Detection on Your Powerbeats Pro Earbuds - MacRumors, available from https://www.macrumors.com/how-to/turn-off-automatic-ear-detection-powerbeats-pro/. *See* INGENIOSPEC-013884-013890; Beats Unveils Powerbeats Pro, available from

		https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289;
	Powerbeats Pro 2	Powerbeats Pro 2, available from https://www.beatsbydre.com/earbuds/powerbeats-pro-2/MX743/electric-orange. *See* INGENIOSPEC-013371-013387;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	
49b. the light detector being electrically connected to the electronic circuitry, and the electronic circuitry being configured to process at least the light data captured by the light detector.	Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises electronic circuitry including at least an integrated circuit. *See* Claim 17c, *supra*. The light detector of each of the Accused Instrumentalities, such as Apple AirPods Pro 2, is electrically connected to the electronic circuitry. The electronic circuitry provides power to the light detector for operation. The light detector provides data to the electronic circuitry regarding its operation so that the electronic circuitry can process the light data captured by the detector. The captured light data is used in order to determine if the device is being worn.	



Source: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).

Turn off automatic ear detection

Your AirPods Pro automatically stop playing audio when you take them off, and resume playback when you put them back on. You can change this setting.

1. Wear your AirPods, and make sure they're connected to your device.
2. Do one of the following:
   - *iPhone or iPad*: Go to Settings, tap the name of your AirPods near the top of the screen, then turn Automatic Ear Detection on or off.
   - *Mac*: Choose Apple menu > System Settings, click the name of your AirPods in the sidebar, then turn "Automatic ear detection" on or off.

Source: Change settings for AirPods Pro 1 and 2 (INGENIOSPEC-014030-014032) (available from https://support.apple.com/guide/airpods/change-settings-for-airpods-pro-1-and-2-dev6cbd13615/1.0/web/1.0#devc07789cad).

Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 2	AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286; AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932;
Apple AirPods 3	Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150; AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158;
Apple AirPods 4	Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. *See* INGENIOSPEC-013664-013691; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-

			014686; Change the settings of your AirPods and AirPods Pro - Apple Support, available from https://support.apple.com/en-us/108764. *See* INGENIOSPEC-013692-013694;
		Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; Change the settings of your AirPods and AirPods Pro - Apple Support, available from https://support.apple.com/en-us/108764. *See* INGENIOSPEC-013692-013694;
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Change settings for AirPods Pro 1 and 2, available from https://support.apple.com/guide/airpods/change-settings-for-airpods-pro-1-and-2-dev6cbd13615/1.0/web/1.0#devc07789cad. *See* INGENIOSPEC-014030-014032;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;

	Beats Fit Pro	Beats User Guide - Turn Beats Automatic Ear Detection On or Off, available from https://support.apple.com/guide/beats/turn-automatic-ear-detection-on-or-off-dev82c456e13/1.0/web/1.0. *See* INGENIOSPEC-013657-013657; Customize controls on your Beats, available from https://support.apple.com/guide/beats/customize-beats-controls-dev9eeff2d7b/web. *See* INGENIOSPEC-013658-013658; Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458;
	Powerbeats Pro	Powerbeats Pro Unboxing & Hands On, available from https://www.youtube.com/watch?v=QmfiANjNV4Y How to Turn Off Automatic Ear Detection on Your Powerbeats Pro Earbuds - MacRumors, available from https://www.macrumors.com/how-to/turn-off-automatic-ear-detection-powerbeats-pro/. *See* INGENIOSPEC-013884-013890; Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289;
	Powerbeats Pro 2	Powerbeats Pro 2, available from https://www.beatsbydre.com/earbuds/powerbeats-pro-2/MX743/electric-orange. *See* INGENIOSPEC-013371-013387;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	

<table>
<tr><th>11,921,355
Claim 50</th><th>Evidence</th></tr>
<tr><td>50. A head-worn personal electronic apparatus as recited in claim 49, wherein the light detector comprises a photodetector.</td><td>Every claim limitation of claim 49 is present in the Accused Instrumentalities as described above and incorporated herein by reference.

The Accused Instrumentalities, such as Apple AirPods Pro 2, comprise a light detector configured to capture light data. See Claim 49a, supra.

The light detector of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises a photodetector. For example, the light detector comprises an infrared detector configured to sense infrared light using a photodetector.

See Claim 13, supra.

Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Powerbeats Pro and Powerbeats Pro 2 also meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

<table>
<tr><th>Device</th><th>Citations</th></tr>
<tr><td>Apple AirPods 2</td><td>AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. See INGENIOSPEC-014277-014286;
AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. See INGENIOSPEC-013926-013932;</td></tr>
<tr><td>Apple AirPods 3</td><td>Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. See INGENIOSPEC-014141-014150;</td></tr>
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			AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158;
		Apple AirPods 4	Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. *See* INGENIOSPEC-013664-013691; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Change the settings of your AirPods and AirPods Pro - Apple Support, available from https://support.apple.com/en-us/108764. *See* INGENIOSPEC-013692-013694;
		Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; Change the settings of your AirPods and AirPods Pro - Apple Support, available from https://support.apple.com/en-us/108764. *See* INGENIOSPEC-013692-013694;
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Change settings for AirPods Pro 1 and 2, available from

			https://support.apple.com/guide/airpods/change-settings-for-airpods-pro-1-and-2-dev6cbd13615/1.0/web/1.0#devc07789cad. *See* INGENIOSPEC-014030-014032;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;
		Beats Fit Pro	Beats User Guide - Turn Beats Automatic Ear Detection On or Off, available from https://support.apple.com/guide/beats/turn-automatic-ear-detection-on-or-off-dev82c456e13/1.0/web/1.0. *See* INGENIOSPEC-013657-013657; Customize controls on your Beats, available from https://support.apple.com/guide/beats/customize-beats-controls-dev9eeff2d7b/web. *See* INGENIOSPEC-013658-013658; Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458;
		Powerbeats Pro	Powerbeats Pro Unboxing & Hands On, available from https://www.youtube.com/watch?v=QmfiANjNV4Y How to Turn Off Automatic Ear Detection on Your Powerbeats Pro Earbuds - MacRumors, available from https://www.macrumors.com/how-to/turn-off-automatic-ear-detection-powerbeats-pro/. *See* INGENIOSPEC-013884-013890; Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289;

	<table><tr><td>Powerbeats Pro 2</td><td>Powerbeats Pro 2, available from https://www.beatsbydre.com/earbuds/powerbeats-pro-2/MX743/electric-orange. *See* INGENIOSPEC-013371-013387;</td></tr></table> Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
11,921,355 Claim 51	**Evidence**
51. A head-worn personal electronic apparatus as recited in claim 17, wherein the head-worn personal electronic apparatus is configured to provide audio alerts to the user via the at least one speaker.	Every claim limitation of claim 17 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises at least one speaker. *See* Claim 17a, *supra*. Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, is configured to provide audio alerts to the user via a speaker.

Announce Notifications with Siri on AirPods or Beats

When you're wearing compatible AirPods or Beats headphones, Siri can announce incoming notifications, which you can then reply to instantly, hands-free.

With AirPods Pro 2 and AirPods 4 (both models), you can use head gestures alongside Announce Notifications to accept or decline calls and more without using your voice.

Turn Announce Notifications on or off

To use Announce Notifications, your compatible headphones* need to be paired with an iPhone or iPad running iOS 15 or iPadOS 15 or later, you're wearing the headphones, and your device is locked.

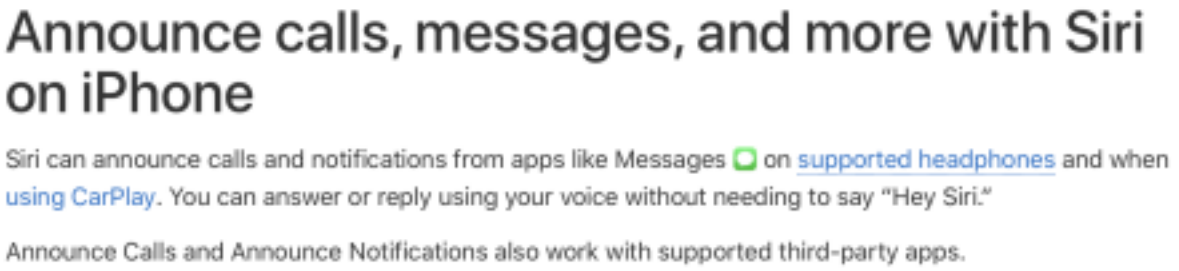
1. Open the Settings app.
2. Tap Notifications.
3. Tap Announce Notifications.
4. Turn Announce Notifications on or off.

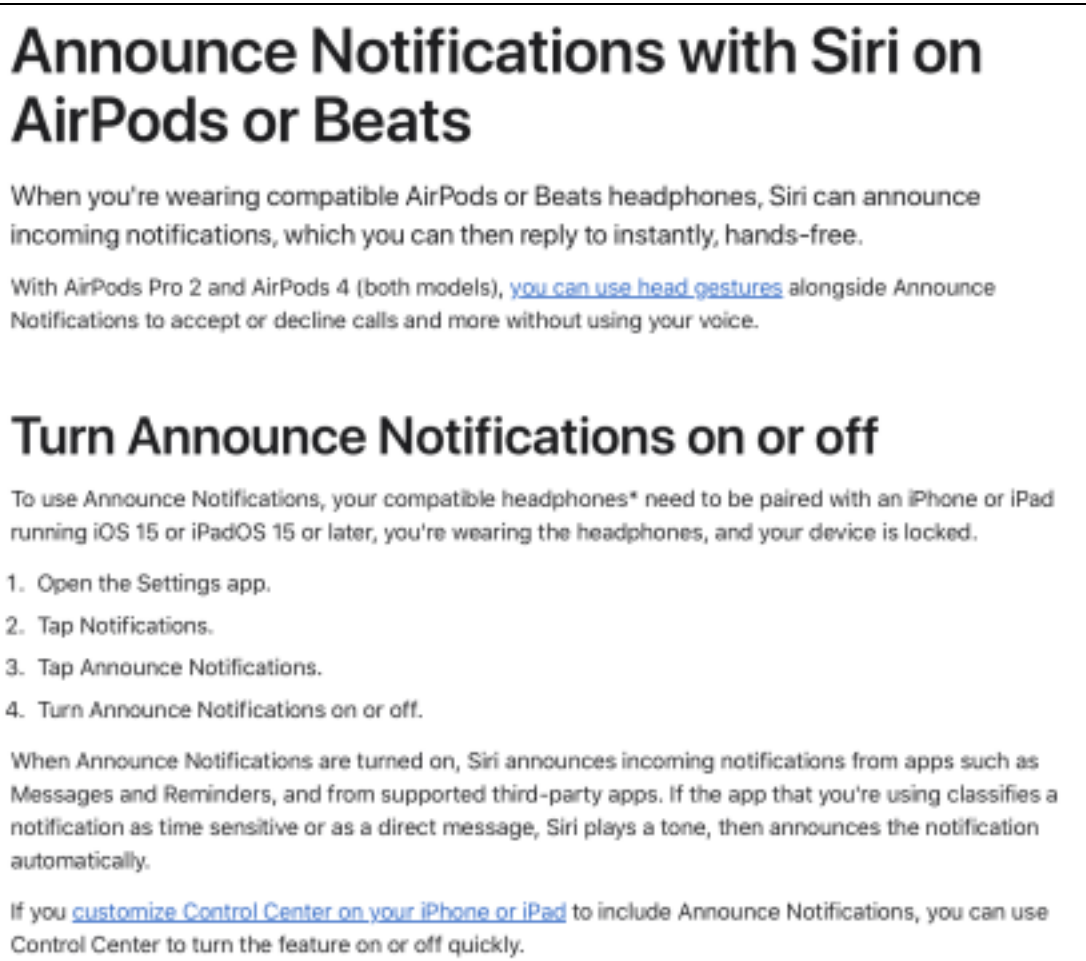
When Announce Notifications are turned on, Siri announces incoming notifications from apps such as Messages and Reminders, and from supported third-party apps. If the app that you're using classifies a notification as time sensitive or as a direct message, Siri plays a tone, then announces the notification automatically.

If you customize Control Center on your iPhone or iPad to include Announce Notifications, you can use Control Center to turn the feature on or off quickly.

Source: https://support.apple.com/en-us/102536 (INGENIOSPEC-011216 to INGENIOSPEC-011218)

Furthermore, Apple's Siri is able to provide alerts to a user.

	 **Source**: https://support.apple.com/guide/iphone/have-siri-announce-calls-and-notifications-iph838fd6fd4/ios (INGENIOSPEC-011214 to INGENIOSPEC-011215) Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
11,921,355 Claim 52	**Evidence**
52. A head-worn personal electronic apparatus as recited in claim 51, wherein the audio alerts are dependent on one or more user preference settings.	Every claim limitation of claim 51 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, is configured to provide audio alerts to the user via the at least one speaker. *See* Claim 52, *supra*. The audio alerts provided to the user via a speaker are dependent on one or more user preference settings. The user preference settings include, but are not necessarily limited to, **Announce Messages with Siri** (enabled/disabled, including which contacts are allowed), **Announce Notifications with Siri** (including which apps are allowed to announce), **Do Not Disturb / Focus modes** (e.g., Work, Sleep, Driving — can suppress notifications/alerts), and other settings.



Announce Notifications with Siri on AirPods or Beats

When you're wearing compatible AirPods or Beats headphones, Siri can announce incoming notifications, which you can then reply to instantly, hands-free.

With AirPods Pro 2 and AirPods 4 (both models), you can use head gestures alongside Announce Notifications to accept or decline calls and more without using your voice.

Turn Announce Notifications on or off

To use Announce Notifications, your compatible headphones* need to be paired with an iPhone or iPad running iOS 15 or iPadOS 15 or later, you're wearing the headphones, and your device is locked.

1. Open the Settings app.
2. Tap Notifications.
3. Tap Announce Notifications.
4. Turn Announce Notifications on or off.

When Announce Notifications are turned on, Siri announces incoming notifications from apps such as Messages and Reminders, and from supported third-party apps. If the app that you're using classifies a notification as time sensitive or as a direct message, Siri plays a tone, then announces the notification automatically.

If you customize Control Center on your iPhone or iPad to include Announce Notifications, you can use Control Center to turn the feature on or off quickly.

Source: https://support.apple.com/en-us/102536 (INGENIOSPEC-011216 to INGENIOSPEC-011218)

Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons.

	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
11,921,355 Claim 53	**Evidence**
53. A head-worn personal electronic apparatus as recited in claim 17, wherein the at least one speaker is configured to be at least partially inserted into an ear of the user.	Every claim limitation of claim 17 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises at least one speaker. *See* Claim 17a, *supra*. The at least one speaker of each of the Accused Instrumentalities, such as Apple AirPods Pro 2, is configured to be partially inserted into an ear of the user. For example, each earbud's speaker is located in a portion of the earbud configured to be at least partially inserted into an ear of the user.

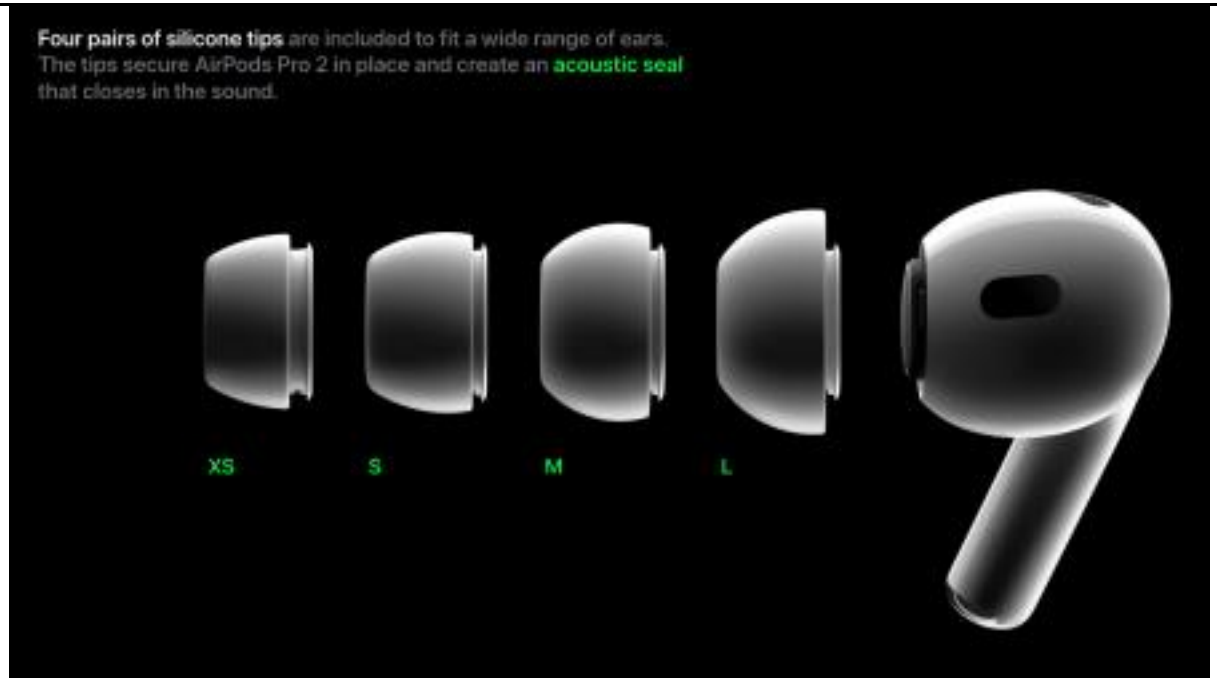


Source: Speaker Image from AirPods Pro 2 webpage (INGENIOSPEC-014044-014044) (available from https://www.apple.com/airpods-pro/).

	 The front of the speaker unit is a black diaphragm. **Source**: Apple AirPods Pro 2 Teardown: Upgrade Materials and Design (INGENIOSPEC-013701-013760) (available from https://www.qucox.com/apple-airpods-pro-2-teardown/).



Source: Teardown of Apple AirPods Pro 2 (INGENIOSPEC-013264, INGENIOSPEC-013265-013270) (available from https://www.youtube.com/watch?v=NfzRzb3NI0U).

	 **Source**: AirPods Pro 2 - Apple (INGENIOSPEC-013541-013563) (available from https://web.archive.org/web/20250904180656/https:/www.apple.com/airpods-pro/).



Source: AirPods Pro 2 - Apple (INGENIOSPEC-013541-013563) (available from https://web.archive.org/web/20250904180656/https:/www.apple.com/airpods-pro/).

Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the

claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

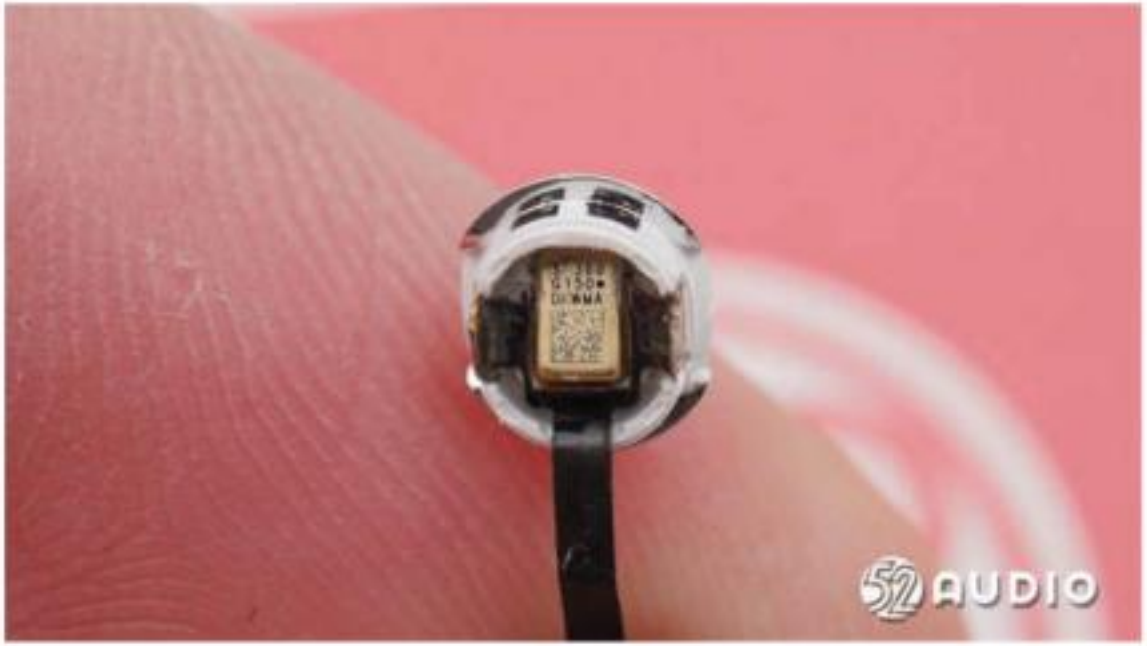
Device	**Citations**
Apple AirPods 2	If your left or right AirPod is not working, available from https://support.apple.com/en-us/100494. *See* INGENIOSPEC-013923-013925; Apple AirPods 2 In-Depth Teardown Review by 52AUDIO, available from https://www.chargerlab.com/apple-airpod-2-in-depth-teardown-review/. *See* INGENIOSPEC-013937-014004; AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286;
Apple AirPods 3	Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150; Apple AirPods 3 true wireless earphones teardown, available from https://www.qucox.com/apple-airpods-3-teardown/. *See* INGENIOSPEC-014163-014238;
Apple AirPods 4	Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. *See* INGENIOSPEC-013664-013691; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-014260-014276;
Apple AirPods 4 with Active Noise Cancellation	Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797;

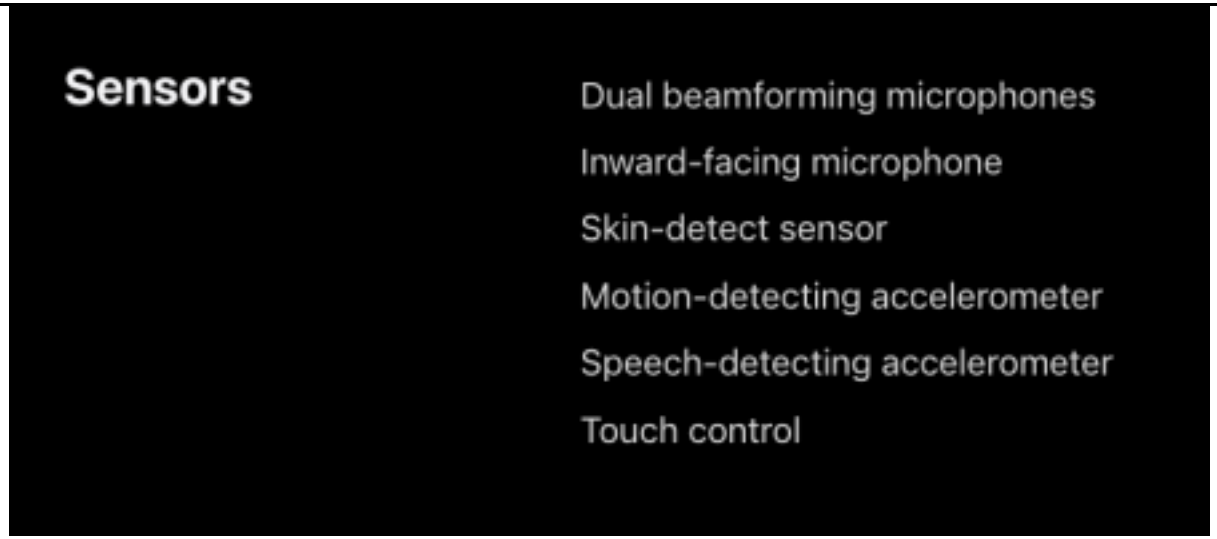
			Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501;
		Apple AirPods Pro 1	AirPods Pro Teardown - iFixit, available from https://www.ifixit.com/Teardown/AirPods+Pro+Teardown/127551. *See* INGENIOSPEC-014076-014096; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533; Introducing AirPods Pro 3, the ultimate audio experience, available from https://www.apple.com/in/newsroom/2025/09/airpods-pro-3-introduce-the-ultimate-audio-experience/. *See* INGENIOSPEC-014239-014248;
		Beats Fit Pro	Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458; Teardown Report: Beats Fit Pro, available from https://www.52audio.com/archives/98994.html. *See* INGENIOSPEC-014407-014463;
		Powerbeats Pro	Powerbeats Pro Teardown, available from https://www.youtube.com/watch?v=vEHwL59jOPg. *See* INGENIOSPEC-013271, INGENIOSPEC-013272-013277; Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289; Wearing your AirPods, EarPods, or Beats device, available from https://support.apple.com/en-us/101598. *See* INGENIOSPEC-014301-014302;

		How to get the best fit and sound with your Powerbeats Pro | Comfort, available from https://www.youtube.com/watch?v=I9t6YW3o-xc. *See* INGENIOSPEC-013232, INGENIOSPEC-013233-013237;
	Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds with video transcript, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013617-013632; Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616;

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.

11,921,355 Claim 54	**Evidence**
54. A head-worn personal electronic apparatus as recited in claim 17, wherein the head-worn personal electronic apparatus comprises:	Every claim limitation of claim 17 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
54a. a microphone at least partially internal to the head-worn personal electronic apparatus, wherein the head-worn	Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises a microphone at least partially internal to the head-worn personal electronic apparatus.

personal electronic device is configured to receive a voice input via the microphone, determine a requested operation from the voice input using voice recognition, and control an operation by the head-worn personal electronic device based on the requested operation.	 Bottom pickup microphone. **Source**: Apple AirPods Pro 2 Teardown: Upgrade Materials and Design (INGENIOSPEC-013701-013760) (available from https://www.qucox.com/apple-airpods-pro-2-teardown/).



Source: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).

Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, is configured to receive a voice input via the first microphone. For example, a user can say the wake-words "Hey Siri!" in order to then state a voice command, using voice recognition. In response, the Accused Instrumentalities are configured to determine a requested operation from the voice input using voice recognition (e.g., to dictate and send a text message), and control an operation by the device based on the requested operation (e.g., transcribing the spoken message into text, and sending it).

Other examples of voice commands that control the operation of the Accused Instrumentalities include, but are not necessarily limited to, "Play music," "Pause," "Skip this song," "Go back," "Volume up," "Volume down," "Mute," "What's playing?," "Turn on noise cancellation," "Turn on transparency mode," "Turn off noise control," "Battery status," "Set a timer," "What's the weather?". *See* https://support.apple.com/guide/airpods/use-siri-devc2c0f438a/web (INGENIOSPEC-011554 to INGENIOSPEC-011556); https://support.apple.com/guide/beats/use-siri-devc97d4f096/web (INGENIOSPEC-011557 to INGENIOSPEC-011559).

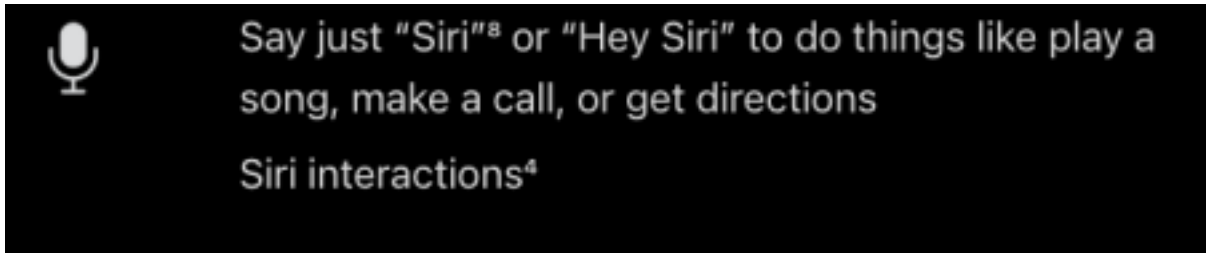
	As another example, the Accused Instrumentalities, such as Apple AirPods Pro 2, are able to make and receive phone calls using voice commands. **Make and answer calls** 1. Wear your AirPods and make sure they're connected to your iPhone, iPad, or Apple Watch (with cellular or Wi-Fi). 2. Do one of the following: • *Make a call:* Say "Hey Siri," or press and hold the force sensor, then say something like "Call Eliza's mobile." On an iPad without cellular, say something like "Make a FaceTime call." You can also make a call on your device, such as in the FaceTime app or Phone app. • *Answer a call:* Press the stem once on either of your AirPods. **Source**: Make and answer calls - Apple Support (INGENIOSPEC-014036-014038) (available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0).

Use Siri with AirPods

When AirPods are connected to iPhone, iPad, Mac, or Apple Watch, you can use Siri to find information, play music, accept or decline incoming phone and FaceTime calls, announce notifications from apps, and more.

If Announce Calls and Announce Notifications are turned on, you can also use head gestures on AirPods 4 (both models) or AirPods Pro 2 to privately respond to Siri without speaking. For example, nod your head to answer a call, or shake your head to dismiss a notification. See Use controls and gestures with your AirPods.

Source: Use Siri with AirPods - Apple Support (INGENIOSPEC-014033-014035) (available from https://support.apple.com/guide/airpods/use-siri-devc2c0f438a/1.0/web/1.0).



Source: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).

Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**

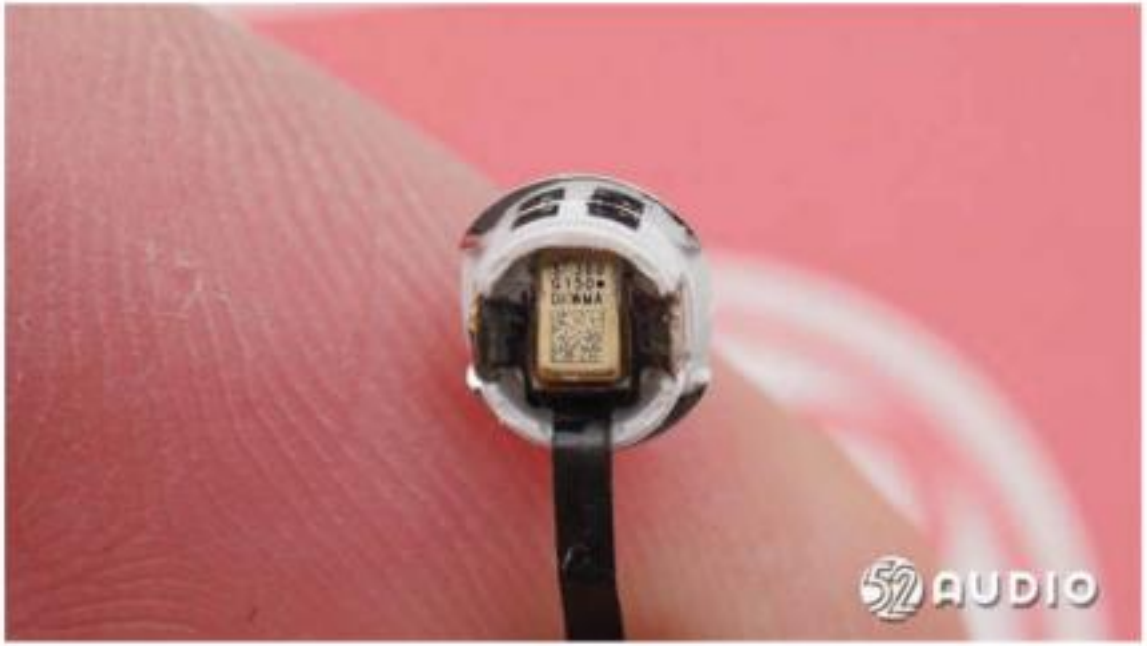
		Apple AirPods 2	AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286; AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932; Apple AirPods 2 In-Depth Teardown Review by 52AUDIO, available from https://www.chargerlab.com/apple-airpod-2-in-depth-teardown-review/. *See* INGENIOSPEC-013937-014004; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/make-and-answer-calls-with-airpods-1-or-2-dev0d85dbd4e/1.0/web/1.0. *See* INGENIOSPEC-013933-013934;
		Apple AirPods 3	Apple AirPods 3 true wireless earphones teardown, available from https://www.qucox.com/apple-airpods-3-teardown/. *See* INGENIOSPEC-014163-014238; Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150; AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038; Use Siri with AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-siri-devc2c0f438a/1.0/web/1.0. *See* INGENIOSPEC-014033-014035;

		Apple AirPods 4	Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. *See* INGENIOSPEC-013664-013691; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038; Use Siri with AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-siri-devc2c0f438a/1.0/web/1.0. *See* INGENIOSPEC-014033-014035;
		Apple AirPods 4 with Active Noise Cancellation	Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038; Use Siri with AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-siri-devc2c0f438a/1.0/web/1.0. *See* INGENIOSPEC-014033-014035;
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-

			3/. *See* INGENIOSPEC-014057-014075; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038; Use Siri with AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-siri-devc2c0f438a/1.0/web/1.0. *See* INGENIOSPEC-014033-014035; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;
		Beats Fit Pro	Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458; Teardown Report: Beats Fit Pro, available from https://www.52audio.com/archives/98994.html. *See* INGENIOSPEC-014407-014463; Use your Beats Fit Pro - Apple Support, available from https://support.apple.com/guide/beats/use-beats-fit-pro-dev6f7b5266d/web. *See* INGENIOSPEC-013661-013663;
		Beats Solo Pro	Replacement Parts List, available from https://www.joesge.com/products/beats-solo-pro-wireless-headphones-

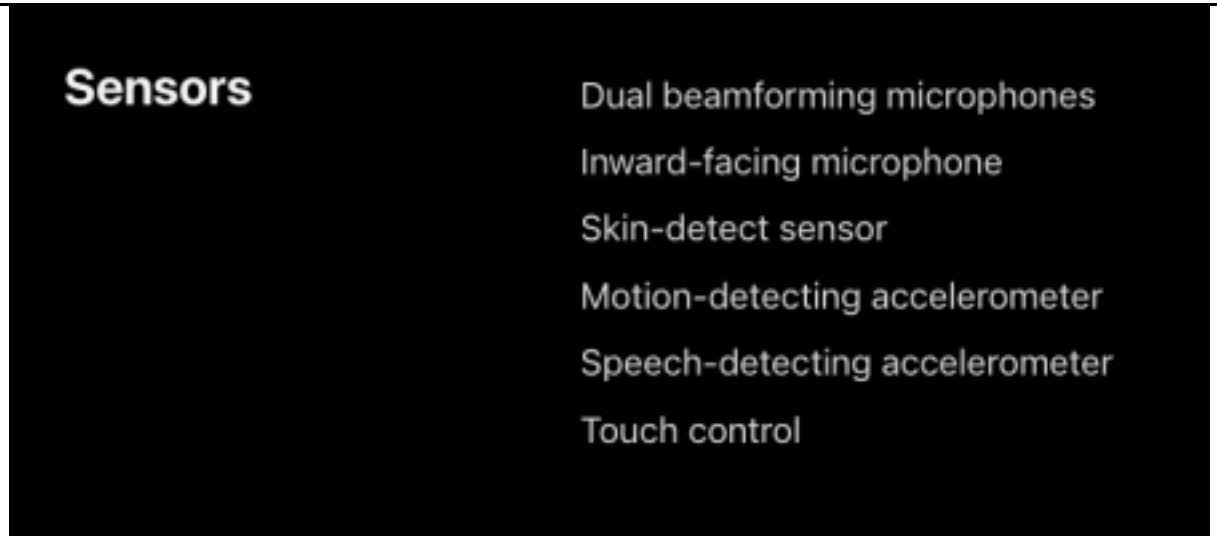
			repair-parts?srsltid=AfmBOoohkWL6z6LfgJ6-r9iZYIxup4uhO-LU6DQhzGFOFk4vPOj3vouM. *See* INGENIOSPEC-013836-013844; Solo Pro Press Release, available from https://www.beatsbydre.com/content/dam/beats/web/press/solo-pro/solo-pro-press-kit.zip. *See* INGENIOSPEC-014313-014314; Beats-Solo-Pro-Wireless-Headphones-User-Guide, available from https://manuals.plus/wp-content/uploads/2023/05/Beats-Solo-Pro-Wireless-Headphones-User-Guide.pdf. *See* INGENIOSPEC-013808-013835; Announce calls-- compatible devices, available from https://support.apple.com/en-au/guide/iphone/iph838fd6fd4/ios. *See* INGENIOSPEC-013430-013432; Announce calls base, available from https://support.apple.com/en-au/guide/iphone/iph838fd6fd4/ios. *See* INGENIOSPEC-013324-013325;
		Powerbeats Pro	Best Buy -- Powerbeats Pro Features, available from https://www.bestbuy.com/product/beats-powerbeats-pro-totally-wireless-earbuds-black/JJ8XJS3FXY. *See* INGENIOSPEC-013883-013883; Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289;
		Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616; Use your Powerbeats Pro 2 - Apple Support, available from

	https://support.apple.com/guide/beats/use-powerbeats-pro-2-dev1b2a821db/web. *See* INGENIOSPEC-014007-014010;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
11,921,355 Claim 57	**Evidence**
57. A head-worn personal electronic apparatus as recited in claim 17, wherein the head-worn personal electronic apparatus comprises:	Every claim limitation of claim 17 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
57a. an array of microphones configured for directional audio pickup.	Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprise an array of microphones configured for directional audio pickup. For example, each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises a first microphone configured to pick up at least audio input from at least the user.



Bottom pickup microphone.

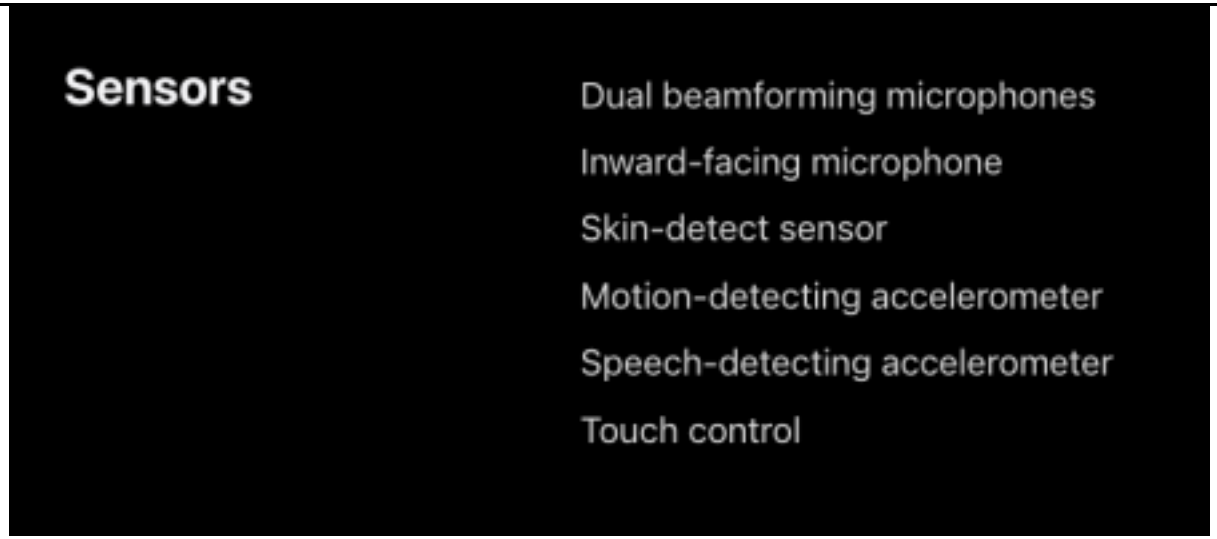
Source: Apple AirPods Pro 2 Teardown: Upgrade Materials and Design (INGENIOSPEC-013701-013760) (available from https://www.qucox.com/apple-airpods-pro-2-teardown/).

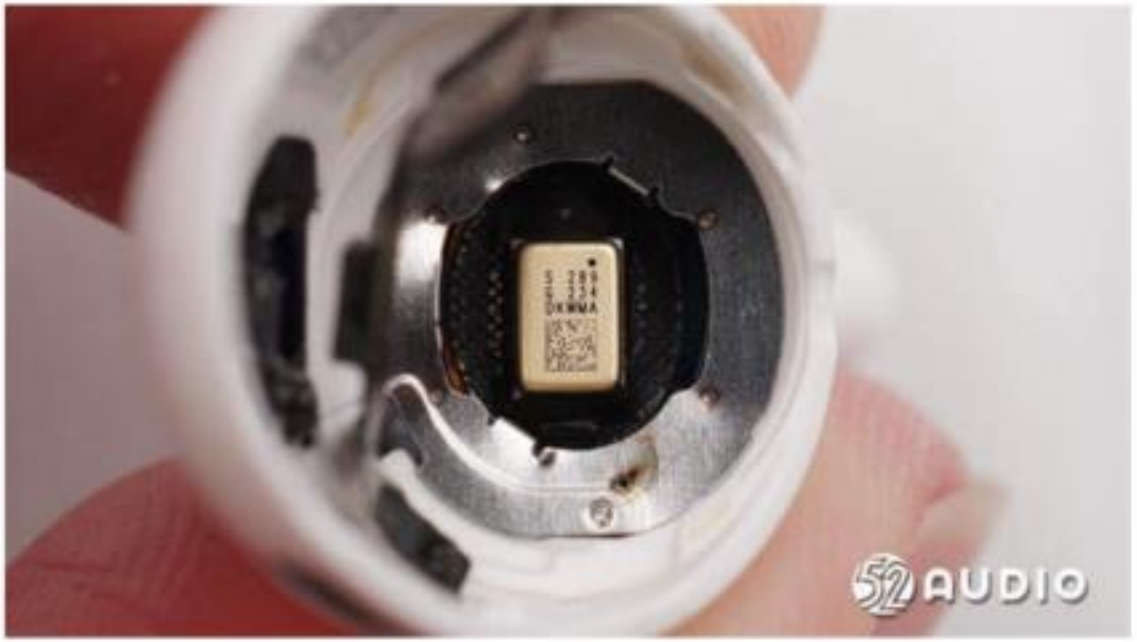


Source: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).

Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, *also* comprise a second microphone configured to pick up at least ambient sound input associated with an environment in the vicinity of the head-worn personal electronic apparatus.

	 **Source**: Noise-Cancelling Microphones Image from AirPods Pro2 (INGENIOSPEC-014019-014019) (available from https://www.apple.com/airpods-pro/).

	 **Source**: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).



A metal protective cover is arranged above the noise cancellation microphone.

Source: Apple AirPods Pro 2 Teardown: Upgrade Materials and Design (INGENIOSPEC-013701-013760) (available from https://www.qucox.com/apple-airpods-pro-2-teardown/).

The Accused Instrumentalities use the microphones in combination as an array of microphones for directional audio pickup. As such, the Accused Instrumentalities comprise an array of microphones configured for directional audio pickup.

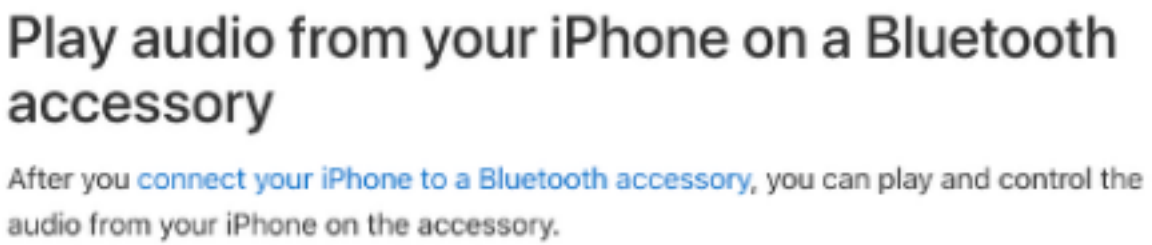
Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 2	AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286; AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932; Apple AirPods 2 In-Depth Teardown Review by 52AUDIO, available from https://www.chargerlab.com/apple-airpod-2-in-depth-teardown-review/. *See* INGENIOSPEC-013937-014004;
Apple AirPods 3	Apple AirPods 3 true wireless earphones teardown, available from https://www.qucox.com/apple-airpods-3-teardown/. *See* INGENIOSPEC-014163-014238; Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150; AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158;
Apple AirPods 4	Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. *See* INGENIOSPEC-013664-013691; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;

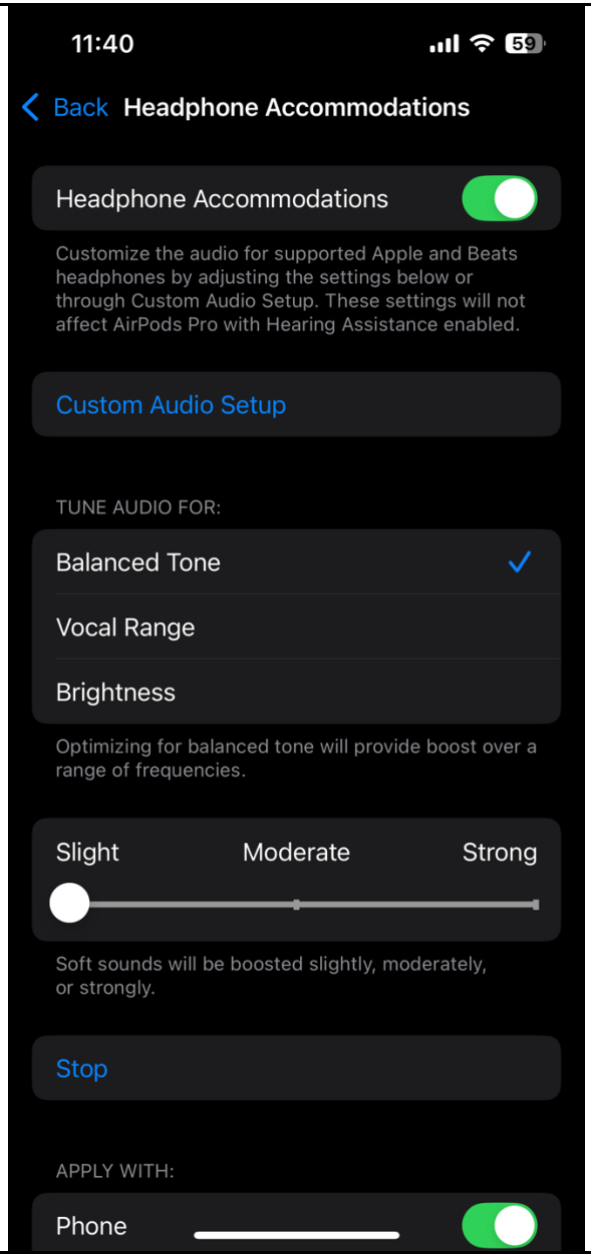
		Apple AirPods 4 with Active Noise Cancellation	Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;
		Beats Fit Pro	Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458; Teardown Report: Beats Fit Pro, available from https://www.52audio.com/archives/98994.html. *See* INGENIOSPEC-014407-014463; Beats Fit Pro True Wireless Earbuds — Beats Black, available from https://www.apple.com/shop/product/MK2F3LL/A/beats-fit-pro-true-wireless-earbuds-beats-black. *See* INGENIOSPEC-013302-013309;
		Beats Solo Pro	Replacement Parts List, available from https://www.joesge.com/products/beats-solo-pro-wireless-headphones-repair-parts?srsltid=AfmBOoohkWL6z6LfgJ6-r9iZYIxup4uhO-LU6DQhzGFOFk4vPOj3vouM. *See* INGENIOSPEC-013836-013844; Solo Pro Press Release, available from

		https://www.beatsbydre.com/content/dam/beats/web/press/solo-pro/solo-pro-press-kit.zip. *See* INGENIOSPEC-014313-014314; Beats-Solo-Pro-Wireless-Headphones-User-Guide, available from https://manuals.plus/wp-content/uploads/2023/05/Beats-Solo-Pro-Wireless-Headphones-User-Guide.pdf. *See* INGENIOSPEC-013808-013835; Solo Pro - Beats by Dre Archive 2, available from https://web.archive.org/web/20200602034251/https://www.beatsbydre.com/headphones/solo-pro. *See* INGENIOSPEC-013312-013323;
	Powerbeats Pro	Best Buy -- Powerbeats Pro Features, available from https://www.bestbuy.com/product/beats-powerbeats-pro-totally-wireless-earbuds-black/JJ8XJS3FXY. *See* INGENIOSPEC-013883-013883; Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289;
	Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	

11,921,355 Claim 58	**Evidence**
58. A head-worn personal electronic apparatus as recited in claim 17, wherein the customized audio	Every claim limitation of claim 17 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises a wireless Bluetooth receiver configured to wirelessly receive customized audio output signals for the user. *See* Claim 1b, *supra*.

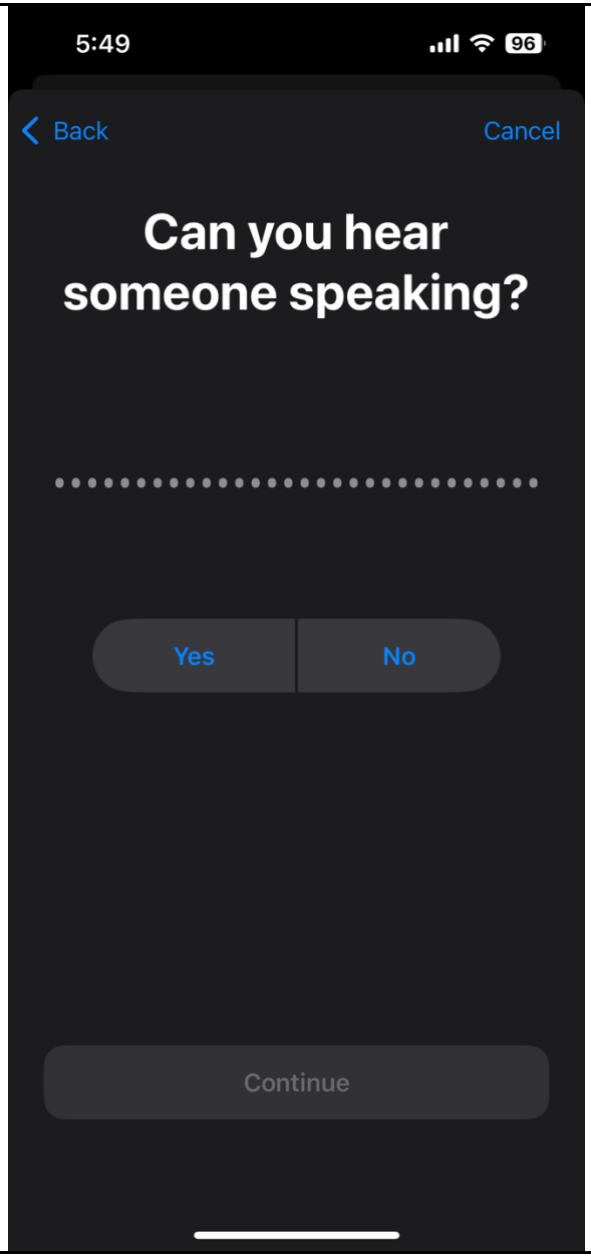
output includes music that was wirelessly received via the wireless receiver.	The customized audio output received by the Bluetooth wireless receiver can include music (e.g., audio music files, music videos, or other song or music audio media). For example, the Accused Instrumentalities allow users to listen to music streamed by Apple Music, Spotify, YouTube, Pandora, Amazon Music, SoundCloud, and other websites and applications that stream music and music videos, as well as audio files stored locally on the user's device.  **Source**: https://support.apple.com/guide/iphone/play-audio-iphone-a-bluetooth-accessory-iph01b6ea9a3/ios (INGENIOSPEC-011416 to INGENIOSPEC-011417) Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
11,921,355 Claim 59	**Evidence**
59. A head-worn personal electronic apparatus as recited in claim 17, wherein the customized audio output signals result	Every claim limitation of claim 17 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises a wireless receiver configured to wirelessly receive customized audio output signals for the user. *See* Claim 17b, *supra*.

from amplifying or attenuating different frequency bands differently according to at least the predetermined hearing characteristics associated with the user.	The customized audio output signals result from amplifying or attenuating different frequency bands differently according to at least the predetermined hearing characteristics associated with the user. For example, the Accused Instrumentalities, when paired with an iPhone or iPad via Bluetooth, can be used to customize headphone audio levels. By customizing headphone audio levels, the iPhone or iPad is configured to customize audio output signals to "amplify soft sounds and adjust certain frequencies for [a user's] hearing needs [using] Headphone Accommodations." *See* https://support.apple.com/en-us/102663 (INGENIOSPEC-011302 to INGENIOSPEC-011304). To set up "Headphone Accommodations" a user goes to **Settings > Accessibility > Audio & Visual** then taps **Headphone Accommodations**. The user then taps on **Custom Audio Setup** and follows the instructions on the screen. *See Id.*


11:40
59
Back
Headphone Accommodations
Headphone Accommodations
Customize the audio for supported Apple and Beats headphones by adjusting the settings below or through Custom Audio Setup. These settings will not affect AirPods Pro with Hearing Assistance enabled.
Custom Audio Setup
TUNE AUDIO FOR:
Balanced Tone
Vocal Range
Brightness
Optimizing for balanced tone will provide boost over a range of frequencies.
Slight
Moderate
Strong
Soft sounds will be boosted slightly, moderately, or strongly.
Stop
APPLY WITH:
Phone

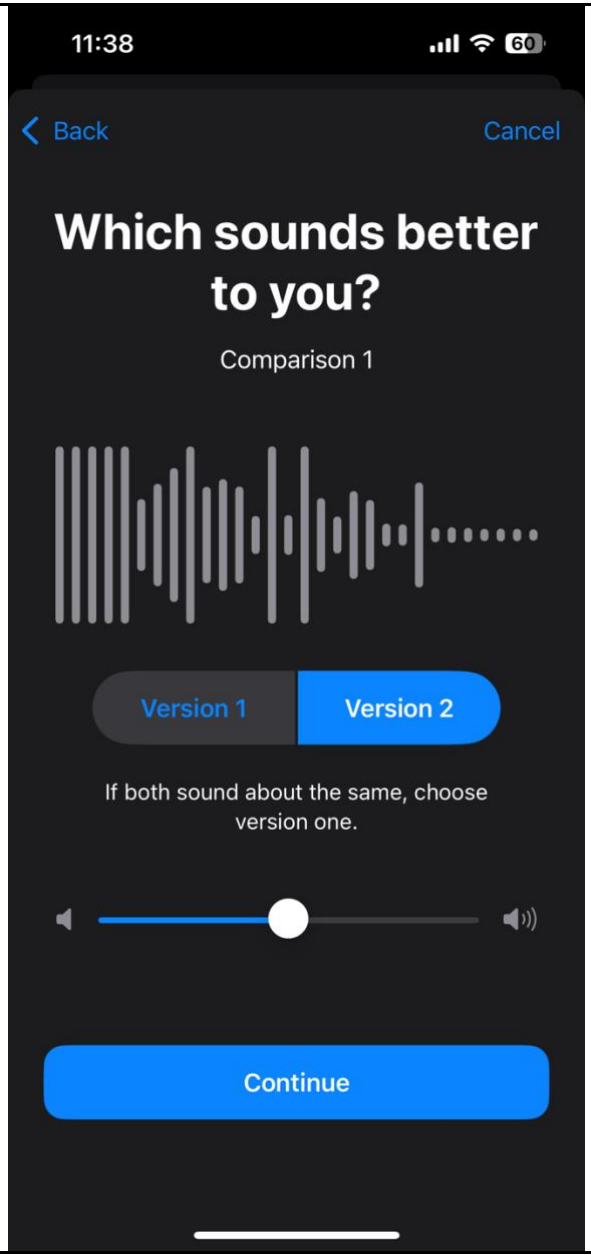
	Source: Screenshot from iPhone configuring "Headphone Accommodations," including "Custom Audio Setup"

Apple Inc. Exhibit 1024 Page 420

		 5:49 96 Back Cancel Can you hear someone speaking? Yes No Continue	

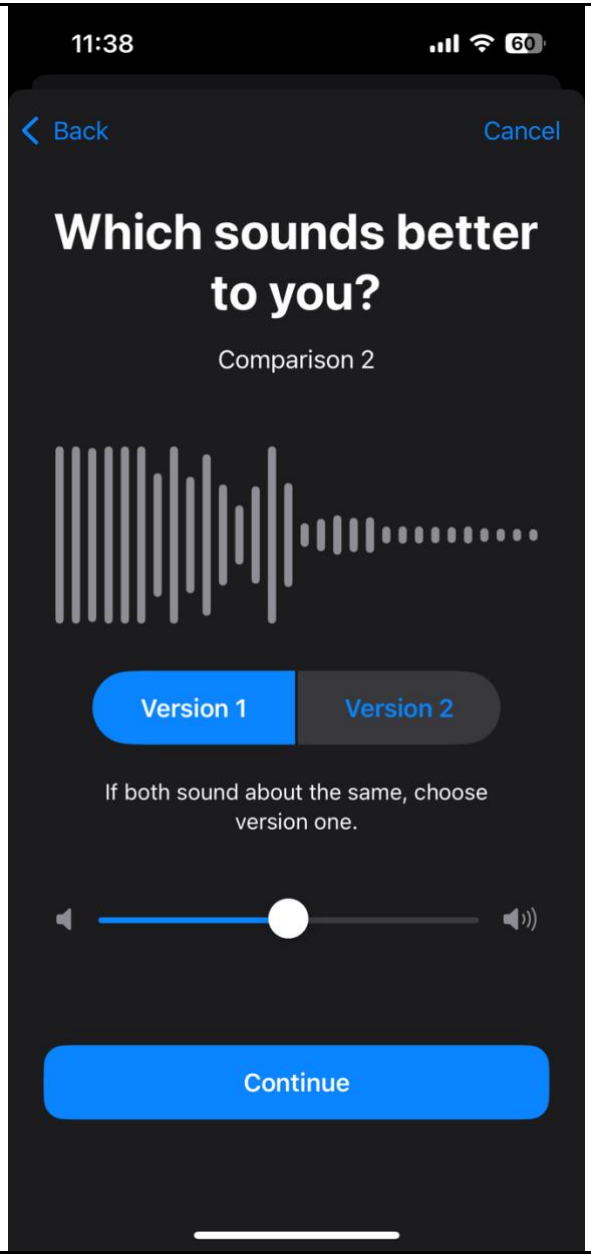
	Source: Screenshot from iPhone configuring "Custom Audio Setup," Can you hear someone speaking?

Apple Inc. Exhibit 1024 Page 422

		 11:38 Back Cancel Which sounds better to you? Comparison 1 Version 1 Version 2 If both sound about the same, choose version one. Continue	

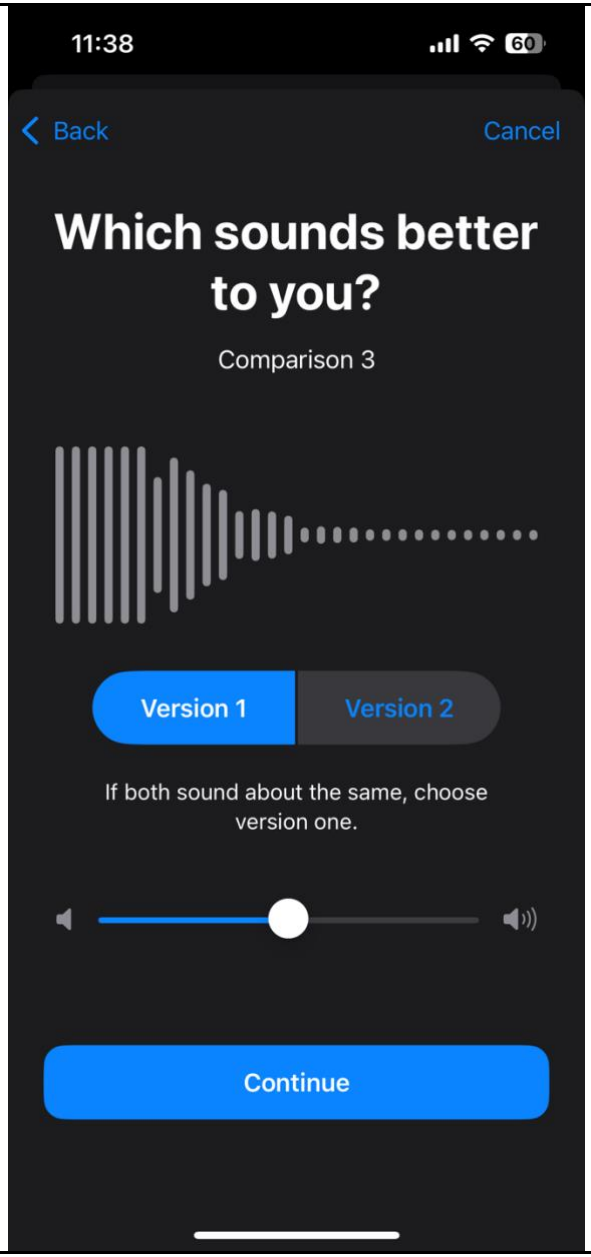
	Source: Screenshot from iPhone configuring "Custom Audio Setup," Comparison 1

Apple Inc. Exhibit 1024 Page 424

		 11:38 60 Back Cancel Which sounds better to you? Comparison 2 Version 1 Version 2 If both sound about the same, choose version one. Continue	

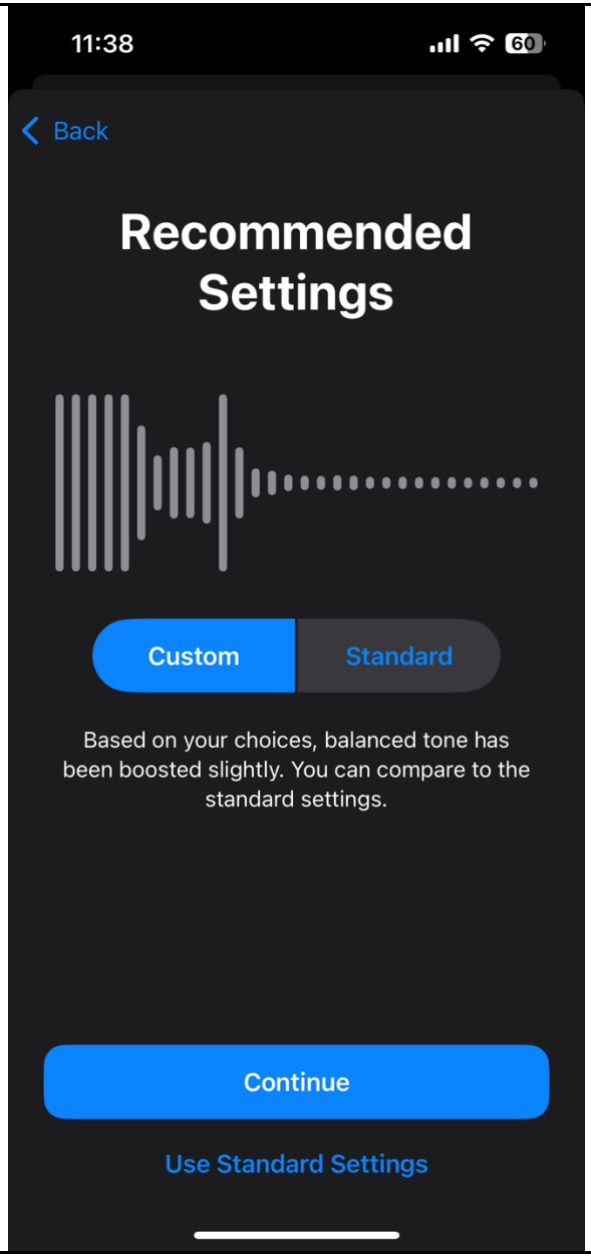
	Source: Screenshot from iPhone configuring "Custom Audio Setup," Comparison 2

Apple Inc. Exhibit 1024 Page 426

		 11:38 60 Back Cancel Which sounds better to you? Comparison 3 Version 1 Version 2 If both sound about the same, choose version one. Continue	

	Source: Screenshot from iPhone configuring "Custom Audio Setup," Comparison 3

Apple Inc. Exhibit 1024 Page 428

		 11:38 60 Back Recommended Settings Custom Standard Based on your choices, balanced tone has been boosted slightly. You can compare to the standard settings. Continue Use Standard Settings	

	Source: Screenshot from iPhone configuring "Custom Audio Setup," Recommended Settings In response to the settings discussed above, audio signals pertaining to audio files, songs, podcasts, videos, phone calls, and other audio formats, are customized by the paired iPhone or iPad prior to being wirelessly transmitted to the Accused Instrumentalities. The customized audio output signals received by the Accused Instrumentalities Bluetooth wireless receiver are the result of amplifying or attenuating different frequency bands differently according to the preferences and settings selected during Custom Audio Setup, and other manual adjustment of audio settings. *See* Claim 17b, *supra*. Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
11,921,355 Claim 60	**Evidence**
60. A head-worn personal electronic apparatus as recited in claim 59, wherein the head-worn personal electronic apparatus comprises:	Every claim limitation of claim 59 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
60a. a first microphone at least partially contained within the head-worn personal electronic	*See* Claim 15a, *supra*. Each of Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

apparatus, the first microphone being positioned to pick up at least audio input from at least the user;		**Device**	**Citations**
		Apple AirPods 4 with Active Noise Cancellation	Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;
		Beats Fit Pro	Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458; Teardown Report: Beats Fit Pro, available from https://www.52audio.com/archives/98994.html. *See* INGENIOSPEC-014407-014463;
		Beats Solo Pro	Replacement Parts List, available from https://www.joesge.com/products/beats-solo-pro-wireless-

<table>
<tr><td></td><td>
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<tr><td></td><td>headphones-repair-parts?srsltid=AfmBOoohkWL6z6LfgJ6-r9iZYIxup4uhO-LU6DQhzGFOFk4vPOj3vouM. See INGENIOSPEC-013836-013844;
Solo Pro Press Release, available from https://www.beatsbydre.com/content/dam/beats/web/press/solo-pro/solo-pro-press-kit.zip. See INGENIOSPEC-014313-014314;</td></tr>
<tr><td>Powerbeats Pro 2</td><td>Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. See INGENIOSPEC-013602-013616;</td></tr>
</table>

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
</td></tr>
<tr><td>60b. and a second microphone at least partially contained within the head-worn personal electronic apparatus, the second microphone being positioned to pick up at least environmental audio input associated with an environment around the head-worn</td><td>
See Claim 15b, supra.

Each of Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro and Powerbeats Pro 2 also meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.
<table>
<tr><th>Device</th><th>Citations</th></tr>
<tr><td>Apple AirPods 4 with Active Noise Cancellation</td><td>Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. See INGENIOSPEC-013761-013797;
AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. See INGENIOSPEC-014675-014686;</td></tr>
</table>
</td></tr>
</table>

personal electronic apparatus,		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;
		Beats Fit Pro	Teardown Report: Beats Fit Pro, available from https://www.52audio.com/archives/98994.html. *See* INGENIOSPEC-014407-014463; Beats Fit Pro True Wireless Earbuds — Beats Black, available from https://www.apple.com/shop/product/MK2F3LL/A/beats-fit-pro-true-wireless-earbuds-beats-black. *See* INGENIOSPEC-013302-013309;
		Beats Solo Pro	Beats-Solo-Pro-Wireless-Headphones-User-Guide, available from https://manuals.plus/wp-content/uploads/2023/05/Beats-Solo-Pro-Wireless-Headphones-User-Guide.pdf. *See* INGENIOSPEC-013808-013835; Solo Pro - Beats by Dre Archive 2, available from https://web.archive.org/web/20200602034251/https://www.beatsbydre.com/headphones/solo-pro. *See* INGENIOSPEC-013312-013323; Solo Pro Press Release, available from https://www.beatsbydre.com/content/dam/beats/web/press/solo-pro/solo-pro-press-kit.zip. *See* INGENIOSPEC-014313-014314;

	<table><tr><td>Powerbeats Pro 2</td><td>Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616;</td></tr></table> Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
60c. wherein the electronic circuitry is configured to modify the customized audio output signals to be output to the user via the at least one speaker to cancel at least a portion of noise associated with the environment, the modification of the customized audio output signals being dependent at least in part on the environmental audio input picked-up via the second microphone.	*See* Claim 15c, *supra*. Each of Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Beats Solo Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device. <table><tr><th>**Device**</th><th>**Citations**</th></tr><tr><td>Apple AirPods 4 with Active Noise Cancellation</td><td>AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501;</td></tr><tr><td>Apple AirPods Pro 1</td><td>Switch between noise control modes - Apple Support, available from https://support.apple.com/guide/airpods/switch-between-noise-control-modes-dev9812f5cc3/1.0/web/1.0. *See* INGENIOSPEC-014039-014043; AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117;</td></tr></table>

	Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Introducing AirPods Pro 3, the ultimate audio experience, available from https://www.apple.com/in/newsroom/2025/09/airpods-pro-3-introduce-the-ultimate-audio-experience/. *See* INGENIOSPEC-014239-014248;
	Beats Fit Pro	Use your Beats Fit Pro - Apple Support, available from https://support.apple.com/guide/beats/use-beats-fit-pro-dev6f7b5266d/web. *See* INGENIOSPEC-013661-013663; Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458;
	Beats Solo Pro	Solo Pro Press Release, available from https://www.beatsbydre.com/content/dam/beats/web/press/solo-pro/solo-pro-press-kit.zip. *See* INGENIOSPEC-014313-014314; Beats Solo Pro Unboxing and Hands-On, available from https://www.youtube.com/watch?v=PqQkg8FHGdU&t=3s. *See* INGENIOSPEC-013191, INGENIOSPEC-013192-013197; Solo Pro - Beats by Dre Archive 2, available from https://web.archive.org/web/20200602034251/https://www.beatsbydre.com/headphones/solo-pro. *See* INGENIOSPEC-013312-013323;
	Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds with video transcript, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013617-013632; Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616;

	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
11,921,355 Claim 61	**Evidence**
61. A head-worn personal electronic apparatus as recited in claim 60, wherein the head-worn personal electronic apparatus comprises:	Every claim limitation of claim 60 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
61a. a user input device supported by the head-worn personal electronic apparatus,	Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises a user input device supported by the head-worn personal electronic apparatus. The user input device is a touch sensitive surface configured to sense a touch input associated with the user. For example, Apple AirPods Pro 2 comprises a touch sensitive surface on its stem.

AirPods Pro 2 controls and gestures



With the Touch control on the stem of both AirPods Pro 2, you can do any of the following:

- *Play and pause audio:* Press the stem. To resume playback, press it again.
- *Play the next track:* Double-press the stem.
- *Play the previous track:* Triple-press the stem.
- *Answer a call:* When you receive a call, press the stem.
- *Adjust volume:* Lightly swipe up or down on the stem.

  You can also turn on Personalized Volume to automatically adjust the volume based on listening preferences and your environment. See Use Conversation Awareness or Personalized Volume.
- *Switch between Active Noise Cancellation, Transparency mode, and Adaptive Audio:* You can set either of your AirPods to perform this action when you press and hold the stem. See Change what the force sensor or Touch control does.
- *Activate Siri:* You can set either of your AirPods to perform this action when you press and hold the stem. See Use Siri with AirPods.

Use head gestures to respond to Siri

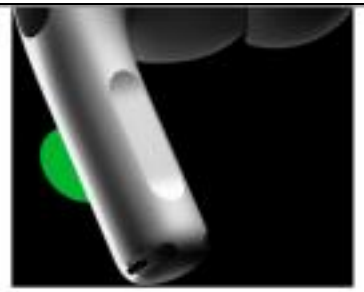
- *Accept a call or reply to notifications and messages:* Nod your head up and down.
- *Decline a call or dismiss notifications and messages:* Shake your head side to side.

Note: To use head gestures to respond to Siri, Announce Calls and Announce Notifications must be on. See Use Siri to announce calls or notifications.

Source: Use controls and gestures with your AirPods - Apple Support (INGENIOSPEC-014024-014029) (available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/1.0/web/1.0).

Apple AirPods Pro 3 *also* meets the claimed limitation for the same reasons. Refer to the table below for corresponding evidence to Apple AirPods Pro 3.

	<table><tr><th>Device</th><th>Citations</th></tr><tr><td>Apple AirPods Pro 3</td><td>Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533; Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;</td></tr></table> Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
61b. the user input device being configured to receive a user input,	The user input device (i.e., the touch sensitive surface) is configured to receive a user input. For example, the touch sensitive surface is configured to sense a touch input associated with the user. For example, each of the Accused Instrumentalities, such as Apple AirPods Pro 2, alters its operation upon sensing a touch input. For example, the Apple AirPods Pro 2 is configured to increase or decrease volume based upon a slide of a finger on the touch sensitive surface.



Just touch
to adjust.

Touch control lets you manage playback functions from the stem. Swipe up or down to adjust volume, press to play and pause music or mute and unmute yourself on calls, and press twice to end a call. You can also hold the stem to switch between listening modes.

Source: AirPods Pro 2 - Apple (INGENIOSPEC-013541-013563) (available from https://web.archive.org/web/20250904180656/https:/www.apple.com/airpods-pro/).

AirPods Pro 2 controls and gestures



With the Touch control on the stem of both AirPods Pro 2, you can do any of the following:

- *Play and pause audio:* Press the stem. To resume playback, press it again.
- *Play the next track:* Double-press the stem.
- *Play the previous track:* Triple-press the stem.
- *Answer a call:* When you receive a call, press the stem.
- *Adjust volume:* Lightly swipe up or down on the stem.

  You can also turn on Personalized Volume to automatically adjust the volume based on listening preferences and your environment. See Use Conversation Awareness or Personalized Volume.
- *Switch between Active Noise Cancellation, Transparency mode, and Adaptive Audio:* You can set either of your AirPods to perform this action when you press and hold the stem. See Change what the force sensor or Touch control does.
- *Activate Siri:* You can set either of your AirPods to perform this action when you press and hold the stem. See Use Siri with AirPods.

Use head gestures to respond to Siri

- *Accept a call or reply to notifications and messages:* Nod your head up and down.
- *Decline a call or dismiss notifications and messages:* Shake your head side to side.

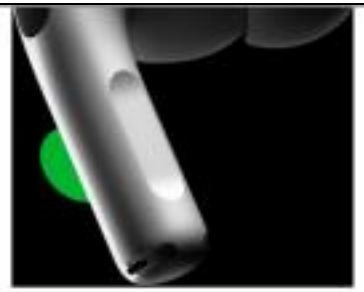
Note: To use head gestures to respond to Siri, Announce Calls and Announce Notifications must be on. See Use Siri to announce calls or notifications.

Source: Use controls and gestures with your AirPods - Apple Support (INGENIOSPEC-014024-014029) (available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/1.0/web/1.0).

Apple AirPods Pro 3 *also* meets the claimed limitation for the same reasons. Refer to the table below for corresponding evidence to Apple AirPods Pro 3.

<table>
<tr><td></td><td>
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<tr><th>Device</th><th>Citations</th></tr>
<tr><td>Apple AirPods Pro 3</td><td>Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. See INGENIOSPEC-013511-013533; Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. See INGENIOSPEC-014249-014255;</td></tr>
</table>
Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
</td></tr>
<tr><td>61c. the user input device is based on at least capacitive effect, wherein the user input being received induces at least a capacitive change to produce at least an electrical response.</td><td>The user input device (i.e., the touch sensitive surface) is based on at least capacitive effect. For example, based upon a change in capacitance detected when the user’s finger makes contact with the surface, the circuitry determines the occurrence and type of user input.

The user input being received (e.g., sliding a finger up the stem, or down the stem) induces at least a capacitive change to produce at least an electrical response. The electrical response is how the Apple AirPods Pro 2 know to increase or decrease volume based upon a slide of a finger on the touch sensitive surface.</td></tr>
</table>



Just touch
to adjust.

Touch control lets you manage playback functions from the stem. Swipe up or down to adjust volume, press to play and pause music or mute and unmute yourself on calls, and press twice to end a call. You can also hold the stem to switch between listening modes.

Source: AirPods Pro 2 - Apple (INGENIOSPEC-013541-013563) (available from https://web.archive.org/web/20250904180656/https:/www.apple.com/airpods-pro/).

AirPods Pro 2 controls and gestures



With the Touch control on the stem of both AirPods Pro 2, you can do any of the following:

- *Play and pause audio:* Press the stem. To resume playback, press it again.
- *Play the next track:* Double-press the stem.
- *Play the previous track:* Triple-press the stem.
- *Answer a call:* When you receive a call, press the stem.
- *Adjust volume:* Lightly swipe up or down on the stem.

  You can also turn on Personalized Volume to automatically adjust the volume based on listening preferences and your environment. See Use Conversation Awareness or Personalized Volume.
- *Switch between Active Noise Cancellation, Transparency mode, and Adaptive Audio:* You can set either of your AirPods to perform this action when you press and hold the stem. See Change what the force sensor or Touch control does.
- *Activate Siri:* You can set either of your AirPods to perform this action when you press and hold the stem. See Use Siri with AirPods.

Use head gestures to respond to Siri

- *Accept a call or reply to notifications and messages:* Nod your head up and down.
- *Decline a call or dismiss notifications and messages:* Shake your head side to side.

Note: To use head gestures to respond to Siri, Announce Calls and Announce Notifications must be on. See Use Siri to announce calls or notifications.

Source: Use controls and gestures with your AirPods - Apple Support (INGENIOSPEC-014024-014029) (available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/1.0/web/1.0).

Apple AirPods Pro 3 *also* meets the claimed limitation for the same reasons. Refer to the table below for corresponding evidence to Apple AirPods Pro 3.

	<table><tr><th>Device</th><th>Citations</th></tr><tr><td>Apple AirPods Pro 3</td><td>Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533; Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;</td></tr></table> Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
11,921,355 Claim 62	**Evidence**
62. A head-worn personal electronic apparatus as recited in claim 61, wherein the electronic circuitry is electrically connected to the user input device to receive user input data from the user input device, and wherein the head-worn personal electronic apparatus is configured to distinguish at least whether the user	Every claim limitation of claim 61 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises electronic circuitry including at least an integrated circuit. *See* Claim 17c, *supra*. Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, *also* comprises a touch sensitive surface used as a user input device. *See* Claim 61a, *supra*. The electronic circuitry of each of the Accused Instrumentalities, such as Apple AirPods Pro 2, is electrically connected to the user input device (touch sensitive surface) to receive user input data from the user input device. For example, each of the Accused Instrumentalities, such as Apple AirPods Pro 2, is configured to distinguish at least whether the user input pertains to a forward sliding action or a backward sliding action when the user swipes the touch-sensitive stem of the Apple AirPods Pro 2. Depending on the direction of the user's input the volume can be increased or decreased. A forward sliding action (sliding the finger up the stem) increases volume; whereas a backward sliding action (sliding the figure down the stem) decreases volume.

input pertains to a forward sliding action or a backward sliding action with respect to the user input device using at least the electronic circuitry and the user input data.	 **Source**: AirPods Pro 2 - Apple (INGENIOSPEC-013541-013563) (available from https://web.archive.org/web/20250904180656/https:/www.apple.com/airpods-pro/).

AirPods Pro 2 controls and gestures



With the Touch control on the stem of both AirPods Pro 2, you can do any of the following:

- *Play and pause audio:* Press the stem. To resume playback, press it again.
- *Play the next track:* Double-press the stem.
- *Play the previous track:* Triple-press the stem.
- *Answer a call:* When you receive a call, press the stem.
- *Adjust volume:* Lightly swipe up or down on the stem.

  You can also turn on Personalized Volume to automatically adjust the volume based on listening preferences and your environment. See Use Conversation Awareness or Personalized Volume.
- *Switch between Active Noise Cancellation, Transparency mode, and Adaptive Audio:* You can set either of your AirPods to perform this action when you press and hold the stem. See Change what the force sensor or Touch control does.
- *Activate Siri:* You can set either of your AirPods to perform this action when you press and hold the stem. See Use Siri with AirPods.

Use head gestures to respond to Siri

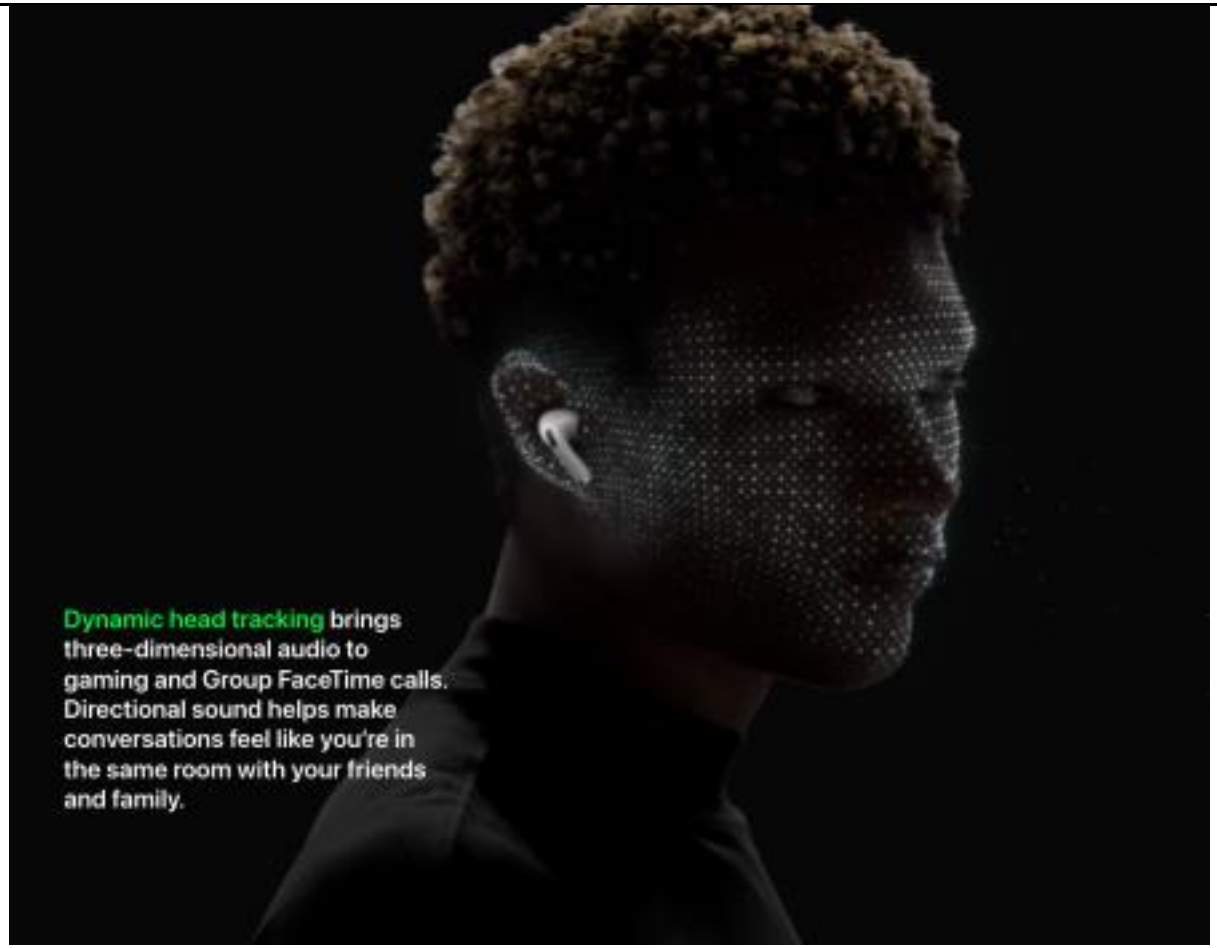
- *Accept a call or reply to notifications and messages:* Nod your head up and down.
- *Decline a call or dismiss notifications and messages:* Shake your head side to side.

Note: To use head gestures to respond to Siri, Announce Calls and Announce Notifications must be on. See Use Siri to announce calls or notifications.

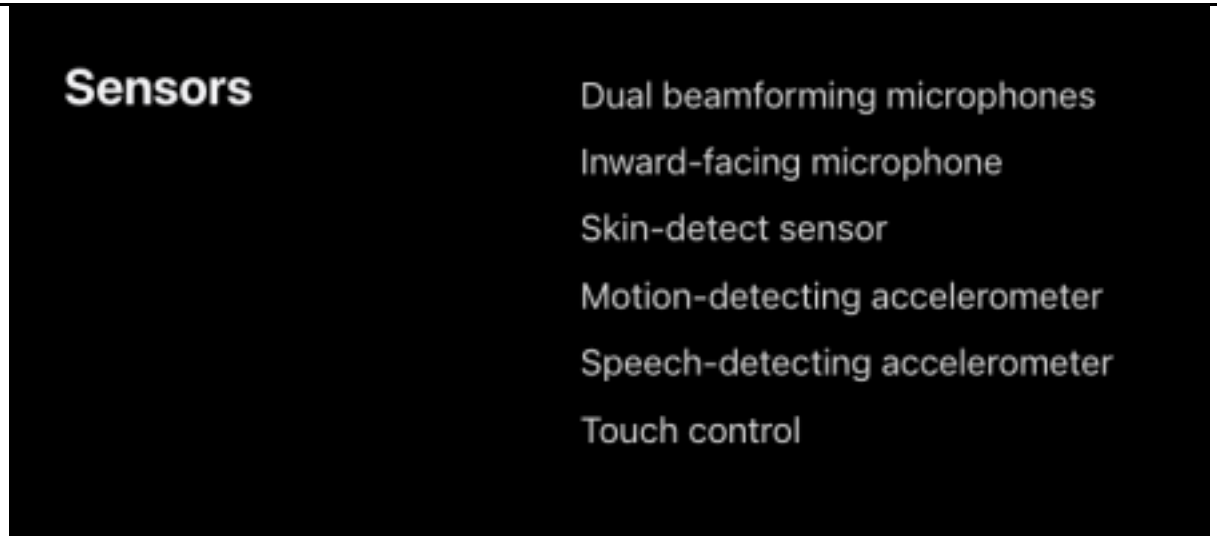
Source: Use controls and gestures with your AirPods - Apple Support (INGENIOSPEC-014024-014029) (available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/1.0/web/1.0).

Apple AirPods Pro 3 *also* meets the claimed limitation for the same reasons. Refer to the table below for corresponding evidence to Apple AirPods Pro 3.

	<table><tr><th>Device</th><th>Citations</th></tr><tr><td>Apple AirPods Pro 3</td><td>Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533; Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;</td></tr></table> Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
11,921,355 Claim 63	**Evidence**
63. A head-worn personal electronic apparatus as recited in claim 61, wherein the head-worn wearable electronic device includes an accelerometer.	Every claim limitation of claim 61 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Each earbud of the Accused Instrumentalities, such as the Apple AirPods Pro 2's earbuds, includes an accelerometer. For example, Apple AirPods Pro 2 earbuds include one or more accelerometers. These sensors are located at least partially in the head-worn wearable electronic device.



Source: Head Tracking Image from AirPods Pro 2 Webpage (INGENIOSPEC-014018-014018) (available from https://www.apple.com/airpods-pro/).

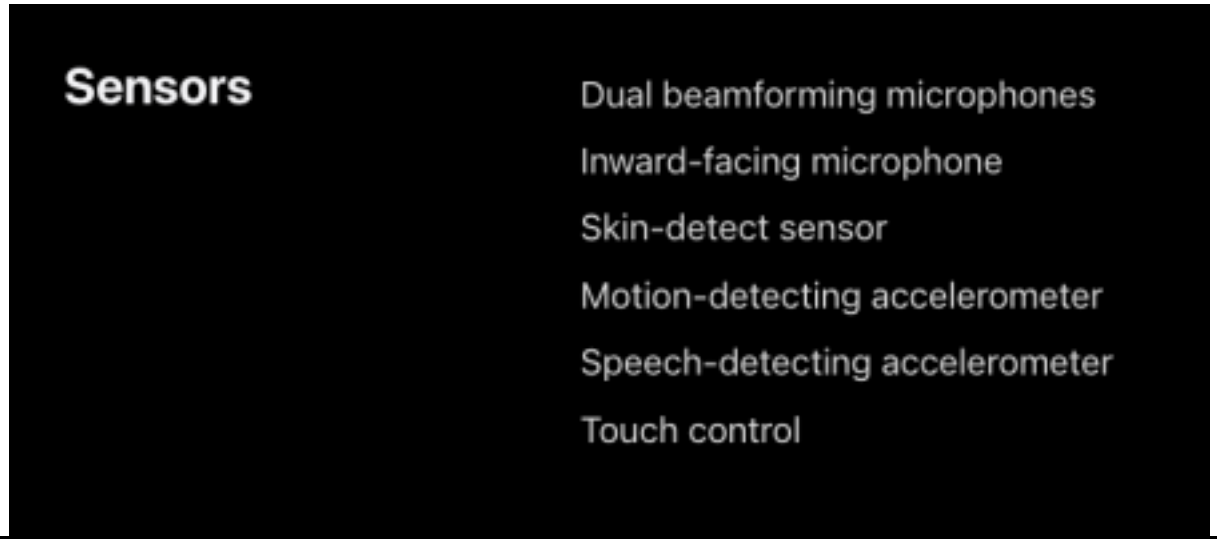


Source: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).

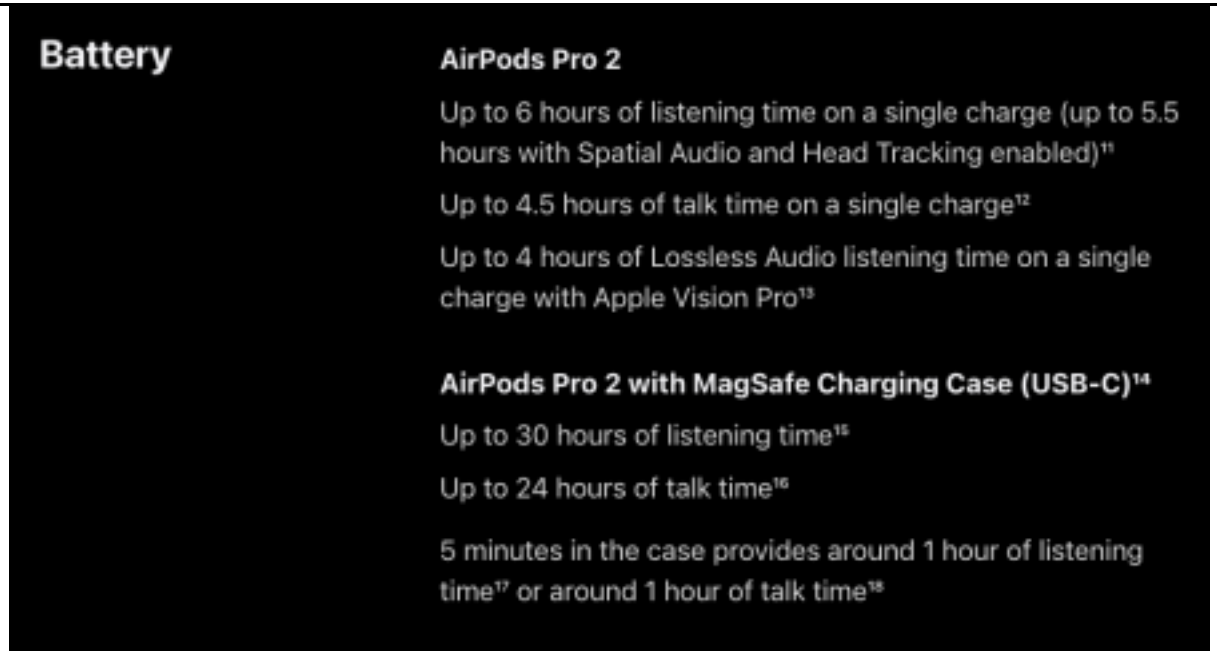
Apple AirPods Pro 3 *also* meets the claimed limitation for the same reasons. Refer to the table below for corresponding evidence to Apple AirPods Pro 3.

Device	**Citations**
Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.

11,921,355 Claim 64	Evidence
64. A head-worn personal electronic apparatus as recited in claim 63, wherein the head-worn personal electronic apparatus comprises:	Every claim limitation of claim 63 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
64a. a radiation sensor, operatively connected to the rechargeable battery, at least partially contained within the head-worn personal electronic apparatus and configured to sense radiation.	Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises a radiation sensor configured to capture radiation data. The radiation sensor is an infrared light detector. The radiation detector is configured to detect radiation from an infrared light emitter. The radiation detector is at least partially contained within the head-worn personal electronic apparatus and configured to sense radiation. The sensor is used to help determine if the device is being worn based upon the detected infrared light. 

	Source: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/). **Turn off automatic ear detection** Your AirPods Pro automatically stop playing audio when you take them off, and resume playback when you put them back on. You can change this setting. 1. Wear your AirPods, and make sure they're connected to your device. 2. Do one of the following: • *iPhone or iPad:* Go to Settings, tap the name of your AirPods near the top of the screen, then turn Automatic Ear Detection on or off. • *Mac:* Choose Apple menu > System Settings, click the name of your AirPods in the sidebar, then turn "Automatic ear detection" on or off. **Source**: Change settings for AirPods Pro 1 and 2 (INGENIOSPEC-014030-014032) (available from https://support.apple.com/guide/airpods/change-settings-for-airpods-pro-1-and-2-dev6cbd13615/1.0/web/1.0#devc07789cad). The radiation sensor of each of the Accused Instrumentalities, such as Apple AirPods Pro 2, is operatively connected to the rechargeable battery. For example, in order to provide power to the radiation sensor, the radiation sensor must be connected to the circuitry of the rechargeable battery in order to operate.



Source: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).



Remove the H2 system package (System in Package) cable, and separate the earphone head cover. The inside of the head cover includes the battery, earphone unit, feedback microphone and other sensor components.

Source: Apple AirPods Pro 2 Teardown: Upgrade Materials and Design (INGENIOSPEC-013701-013760) (available from https://www.qucox.com/apple-airpods-pro-2-teardown/).



The coin cell battery is from Samsung SDI, model number A2731. The rated capacity is 49.7mAh/0.182Wh, and the rated voltage is 3.66V.

Source: Apple AirPods Pro 2 Teardown: Upgrade Materials and Design (INGENIOSPEC-013701-013760) (available from https://www.qucox.com/apple-airpods-pro-2-teardown/).

The Apple AirPods Pro 2's battery is rechargeable.

	 **Source**: MagSafe Charging Case (USB-C) for AirPods Pro (2nd generation) (INGENIOSPEC-013698-013700) (available from https://www.apple.com/shop/product/MUYG3AM/A/magsafe-charging-case-usb%E2%80%91c-for-airpods-pro-2nd-generation).

	 **Source**: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).



Source: Apple AirPods Pro 2 with USB C case_ What's new _ Macworld (INGENIOSPEC-013695-013697) (available from https://www.macworld.com/article/2065533/airpods-pro-2-case-usb-c-iphone-15-charging.html).

Apple AirPods Pro 3 *also* meets the claimed limitation for the same reasons. Refer to the table below for corresponding evidence to Apple AirPods Pro 3.

Device	**Citations**

	Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.

11,921,355 Claim 65	**Evidence**
65. A head-worn personal electronic apparatus operable to at least output customized audio output, comprising:	*See* Claim 1-preamble, *supra*. Each of Apple AirPods 2 and Apple AirPods Pro 3 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 2	AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932; AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286; If your left or right AirPod is not working, available from https://support.apple.com/en-us/100494. *See* INGENIOSPEC-013923-013925; Apple AirPods 2 In-Depth Teardown Review by 52AUDIO, available from https://www.chargerlab.com/apple-airpod-2-in-depth-teardown-review/. *See* INGENIOSPEC-013937-014004;
Apple AirPods Pro 3	Introducing AirPods Pro 3, the ultimate audio experience, available from https://www.apple.com/in/newsroom/2025/09/airpods-pro-3-introduce-the-ultimate-audio-experience/. *See* INGENIOSPEC-014239-014248;

		Use the Hearing Aid feature on your AirPods Pro 2 or AirPods Pro 3, available from https://support.apple.com/en-us/120992. *See* INGENIOSPEC-013442-013448; Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.

65a. at least one speaker, the at least one speaker being configured to be wearable proximate to an ear of a user;

See Claim 1a, *supra*.

Each of Apple AirPods 2 and Apple AirPods Pro 3 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 2	If your left or right AirPod is not working, available from https://support.apple.com/en-us/100494. *See* INGENIOSPEC-013923-013925; Apple AirPods 2 In-Depth Teardown Review by 52AUDIO, available from https://www.chargerlab.com/apple-airpod-2-in-depth-teardown-review/. *See* INGENIOSPEC-013937-014004; AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286;
Apple AirPods Pro 3	Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;

		Introducing AirPods Pro 3, the ultimate audio experience, available from https://www.apple.com/in/newsroom/2025/09/airpods-pro-3-introduce-the-ultimate-audio-experience/. *See* INGENIOSPEC-014239-014248;

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.

65b. a wireless receiver configured to wirelessly receive customized audio output signals for the user, the customized audio output signals having been customized based on at least predetermined hearing characteristics associated with the user such that the customized audio output signals at least compensate for the hearing impairment regarding the user's ability to hear;

See Claim 17b, *supra*.

Each of Apple AirPods 2 and Apple AirPods Pro 3 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 2	AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932; Customize headphone audio levels on your iPhone or iPad, available from https://support.apple.com/en-us/102663. *See* INGENIOSPEC-014699-014701; AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286;
Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Use the Hearing Aid feature on your AirPods Pro 2 or AirPods Pro 3, available from https://support.apple.com/en-us/120992. *See* INGENIOSPEC-013442-013448; AirPods Pro 3 - Hearing Health, available from https://www.apple.com/airpods-pro/hearing-health/. *See* INGENIOSPEC-

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Set Headphone Accommodations for AirPods, available from https://support.apple.com/guide/airpods/set-headphone-accommodations-devcd05671ab/web. See INGENIOSPEC-013296-013297;
Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. See INGENIOSPEC-013511-013533;</td></tr>
</table></td></tr>
<tr><td>65c. electronic circuitry including at least an integrated circuit, the electronic circuitry being configured to output the customized audio output signals to the at least one speaker;</td><td>See Claim 17c, supra.

Each of Apple AirPods 2 and Apple AirPods Pro 3 also meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

<table>
<tr><td>Device</td><td>Citations</td></tr>
<tr><td>Apple AirPods 2</td><td>If your left or right AirPod is not working, available from https://support.apple.com/en-us/100494. See INGENIOSPEC-013923-013925;
Apple AirPods 2 In-Depth Teardown Review by 52AUDIO, available from https://www.chargerlab.com/apple-airpod-2-in-depth-teardown-review/. See INGENIOSPEC-013937-014004;
AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. See INGENIOSPEC-014277-014286;</td></tr>
<tr><td>Apple AirPods Pro 3</td><td>Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. See INGENIOSPEC-013511-013533;</td></tr>
</table>
Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.</td></tr>
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<tr>
<td>65d. a touch sensitive surface at least partially contained within the head-worn personal electronic apparatus and configured to sense a touch input associated with the user, wherein the sensed touch input operating to at least alter operation of the head-worn electronic personal audio apparatus;</td>
<td>Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, is able to receive touch input from a user. For example, the Apple AirPods Pro 2's operation is changed depending on the sensed touch input.

See Claim 3, supra.

Each of Apple AirPods 2 and Apple AirPods Pro 3 also meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

<table>
<tr><th>Device</th><th>Citations</th></tr>
<tr><td>Apple AirPods 2</td><td>Use controls and gestures with your AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/web. See INGENIOSPEC-014548-014553;</td></tr>
<tr><td>Apple AirPods Pro 3</td><td>Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. See INGENIOSPEC-013511-013533; Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. See INGENIOSPEC-014249-014255;</td></tr>
</table>

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.</td>
</tr>
<tr>
<td>65e. a sensor at least partially contained within the head-worn personal electronic structure and configured to sense data indicative of</td>
<td>See Claim 25, supra.

Each of Apple AirPods 2 and Apple AirPods Pro 3 also meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

<table>
<tr><th>Device</th><th>Citations</th></tr>
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<tr><td>whether the head-worn personal electronic apparatus is being worn by the user, the head-worn personal electronic apparatus is configured to at least alter operation of the head-worn personal electronic apparatus based at least in part on the sensed data from the sensor;</td><td>
<table>
<tr><td>Apple AirPods 2</td><td>AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. See INGENIOSPEC-014277-014286;
AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. See INGENIOSPEC-013926-013932;</td></tr>
<tr><td>Apple AirPods Pro 3</td><td>Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. See INGENIOSPEC-014249-014255;</td></tr>
</table>
Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
</td></tr>
<tr><td>65f. a first microphone configured to pick up at least audio input from at least the user, the first microphone being at least partially in the head-worn personal electronic apparatus and is positioned to be directed towards the user when the head-worn personal electronic apparatus</td><td>See Claim 7a, supra.

Each of Apple AirPods 2 and Apple AirPods Pro 3 also meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.
<table>
<tr><th>Device</th><th>Citations</th></tr>
<tr><td>Apple AirPods 2</td><td>AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. See INGENIOSPEC-014277-014286;
AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. See INGENIOSPEC-013926-013932;
Apple AirPods 2 In-Depth Teardown Review by 52AUDIO, available from https://www.chargerlab.com/apple-airpod-2-in-depth-teardown-review/. See INGENIOSPEC-013937-014004;</td></tr>
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<tr><td>is being worn by the user;</td><td>
<table>
<tr><td>Apple AirPods Pro 3</td><td>Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. See INGENIOSPEC-014249-014255;</td></tr>
</table>
Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
</td></tr>
<tr><td>65g. and a second microphone configured to pick up at least ambient sound input associated with an environment in the vicinity of the head-worn personal electronic apparatus, the second microphone being positioned to be directed away from the user when the head-worn wearable electronic device is being worn by the user,</td><td>
See Claim 7b, supra.

Each of Apple AirPods 2 and Apple AirPods Pro 3 also meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.
<table>
<tr><th>Device</th><th>Citations</th></tr>
<tr><td>Apple AirPods 2</td><td>AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. See INGENIOSPEC-014277-014286;
AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. See INGENIOSPEC-013926-013932;
Apple AirPods 2 In-Depth Teardown Review by 52AUDIO, available from https://www.chargerlab.com/apple-airpod-2-in-depth-teardown-review/. See INGENIOSPEC-013937-014004;</td></tr>
<tr><td>Apple AirPods Pro 3</td><td>Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. See INGENIOSPEC-014249-014255;
Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. See INGENIOSPEC-013511-013533;</td></tr>
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<table>
<tr><td></td><td>Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.</td></tr>
<tr><td>65h. wherein the at least one speaker is configured to generate at least a portion of the customized audio output for the user in accordance with at least the portion of the customized audio output signals.</td><td>See Claim 17c, supra.

Each of Apple AirPods 2 and Apple AirPods Pro 3 also meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

<table><tr><th>Device</th><th>Citations</th></tr><tr><td>Apple AirPods 2</td><td>If your left or right AirPod is not working, available from https://support.apple.com/en-us/100494. See INGENIOSPEC-013923-013925;
Apple AirPods 2 In-Depth Teardown Review by 52AUDIO, available from https://www.chargerlab.com/apple-airpod-2-in-depth-teardown-review/. See INGENIOSPEC-013937-014004;
AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. See INGENIOSPEC-014277-014286;</td></tr><tr><td>Apple AirPods Pro 3</td><td>Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. See INGENIOSPEC-013511-013533;</td></tr></table>
Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.</td></tr>
<tr><th>11,921,355
Claim 66</th><th>Evidence</th></tr>
<tr><td>66. A head-worn personal electronic apparatus as recited in claim 65, wherein</td><td>Every claim limitation of claim 65 is present in the Accused Instrumentalities as described above and incorporated herein by reference.</td></tr>
</table>

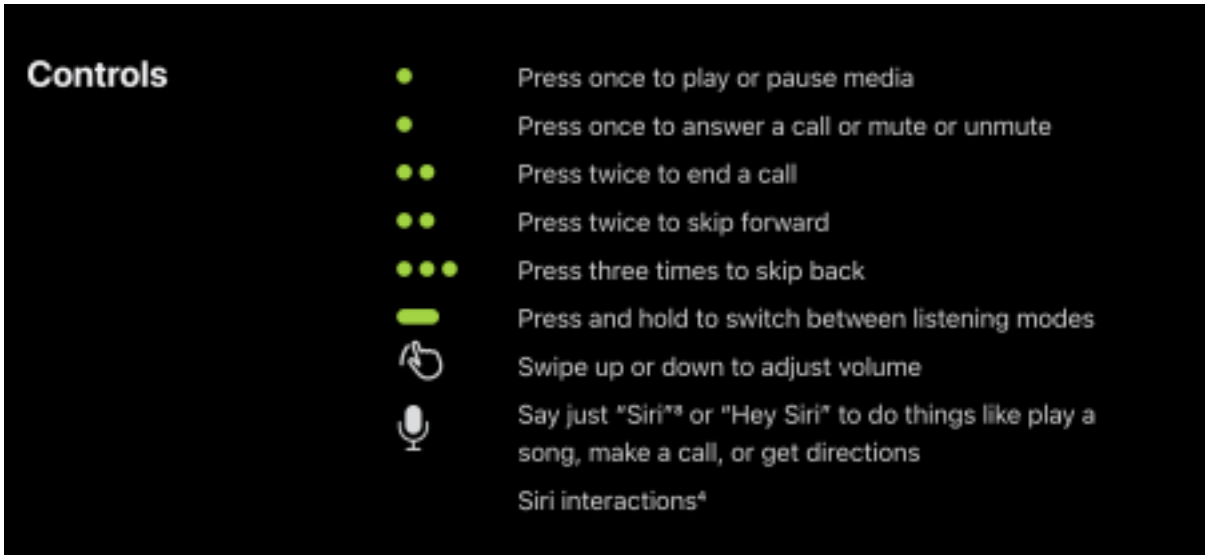
<table>
<tr><td>the sensor comprises a radiation detector configured to capture radiation data, and wherein the electronic circuitry is configured to process at least the radiation data captured by the radiation detector, and configured to determine whether the head-worn personal electronic apparatus is being worn by a user based on at least the processed radiation data.</td><td>See Claim 13, supra.

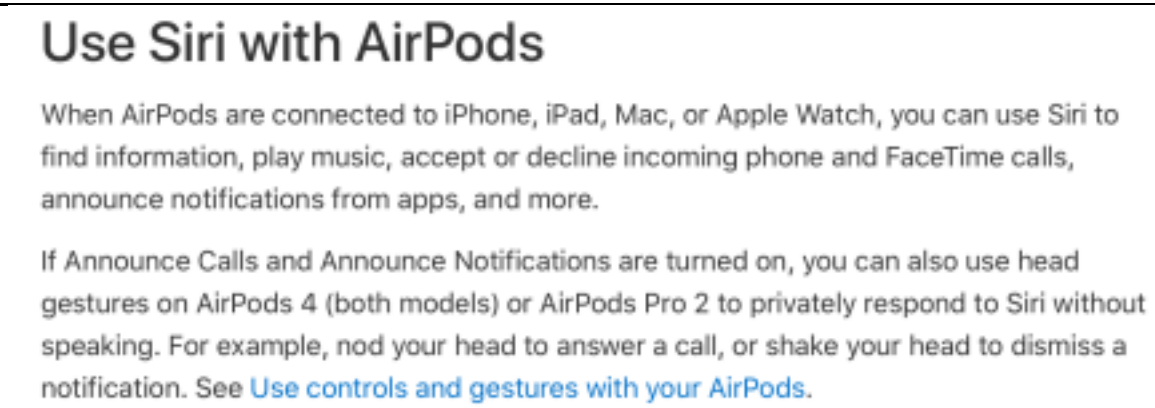
Each of Apple AirPods 2 and Apple AirPods Pro 3 also meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

<table><tr><th>Device</th><th>Citations</th></tr><tr><td>Apple AirPods 2</td><td>AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. See INGENIOSPEC-014277-014286;
AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. See INGENIOSPEC-013926-013932;</td></tr><tr><td>Apple AirPods Pro 3</td><td>Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. See INGENIOSPEC-014249-014255;</td></tr></table>
Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.</td></tr>
<tr><th>11,921,355
Claim 67</th><th>Evidence</th></tr>
<tr><td>67. A head-worn personal electronic apparatus as recited in claim 65, wherein the head-worn personal electronic apparatus wherein the head-worn</td><td>Every claim limitation of claim 65 is present in the Accused Instrumentalities as described above and incorporated herein by reference.

Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises a first microphone configured to pick up at least audio input from at least the user. See Claim 65f, supra.

Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, is configured to receive a voice input via the first microphone. For example, a user can say the wake-words "Hey Siri!" in order to then state a voice command, using voice recognition. In response, the Accused Instrumentalities are configured to determine a</td></tr>
</table>

personal electronic device is configured to receive a voice input via the first microphone, determine a requested operation from the voice input using voice recognition, and control an operation by the head-worn personal electronic device based on the requested operation.	requested operation from the voice input using voice recognition (e.g., to dictate and send a text message), and control an operation by the device based on the requested operation (e.g., transcribing the spoken message into text, and sending it).  **Source**: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).



Source: Use Siri with AirPods - Apple Support (INGENIOSPEC-014033-014035) (available from https://support.apple.com/guide/airpods/use-siri-devc2c0f438a/1.0/web/1.0).

Other examples of voice commands that control the operation of the Accused Instrumentalities include, but are not necessarily limited to, "Play music," "Pause," "Skip this song," "Go back," "Volume up," "Volume down," "Mute," "What's playing?," "Turn on noise cancellation," "Turn on transparency mode," "Turn off noise control," "Battery status," "Set a timer," "What's the weather?". *See* https://support.apple.com/guide/airpods/use-siri-devc2c0f438a/web (INGENIOSPEC-011554 to INGENIOSPEC-011556); https://support.apple.com/guide/beats/use-siri-devc97d4f096/web (INGENIOSPEC-011557 to INGENIOSPEC-011559).

As another example, the Accused Instrumentalities, such as Apple AirPods Pro 2, are able to make and receive phone calls using voice commands.

Make and answer calls

1. Wear your AirPods and make sure they're connected to your iPhone, iPad, or Apple Watch (with cellular or Wi-Fi).
2. Do one of the following:

   - *Make a call:* Say "Hey Siri," or press and hold the force sensor, then say something like "Call Eliza's mobile." On an iPad without cellular, say something like "Make a FaceTime call."

     You can also make a call on your device, such as in the FaceTime app or Phone app.

   - *Answer a call:* Press the stem once on either of your AirPods.

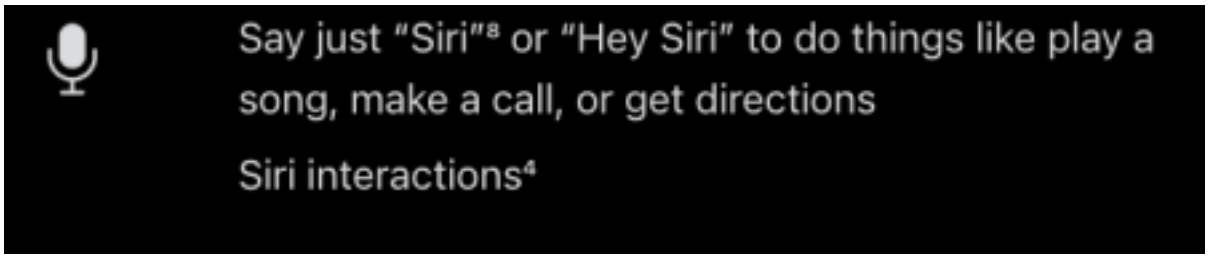
Source: Make and answer calls - Apple Support (INGENIOSPEC-014036-014038) (available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0).

Use Siri with AirPods

When AirPods are connected to iPhone, iPad, Mac, or Apple Watch, you can use Siri to find information, play music, accept or decline incoming phone and FaceTime calls, announce notifications from apps, and more.

If Announce Calls and Announce Notifications are turned on, you can also use head gestures on AirPods 4 (both models) or AirPods Pro 2 to privately respond to Siri without speaking. For example, nod your head to answer a call, or shake your head to dismiss a notification. See Use controls and gestures with your AirPods.

Source: Use Siri with AirPods - Apple Support (INGENIOSPEC-014033-014035) (available from https://support.apple.com/guide/airpods/use-siri-devc2c0f438a/1.0/web/1.0).

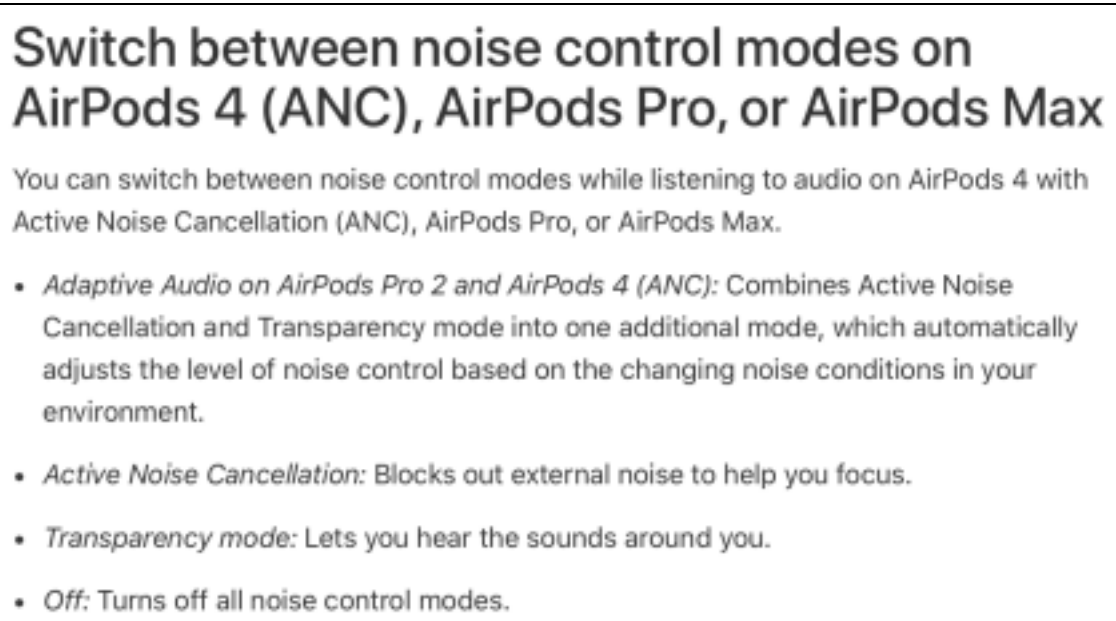


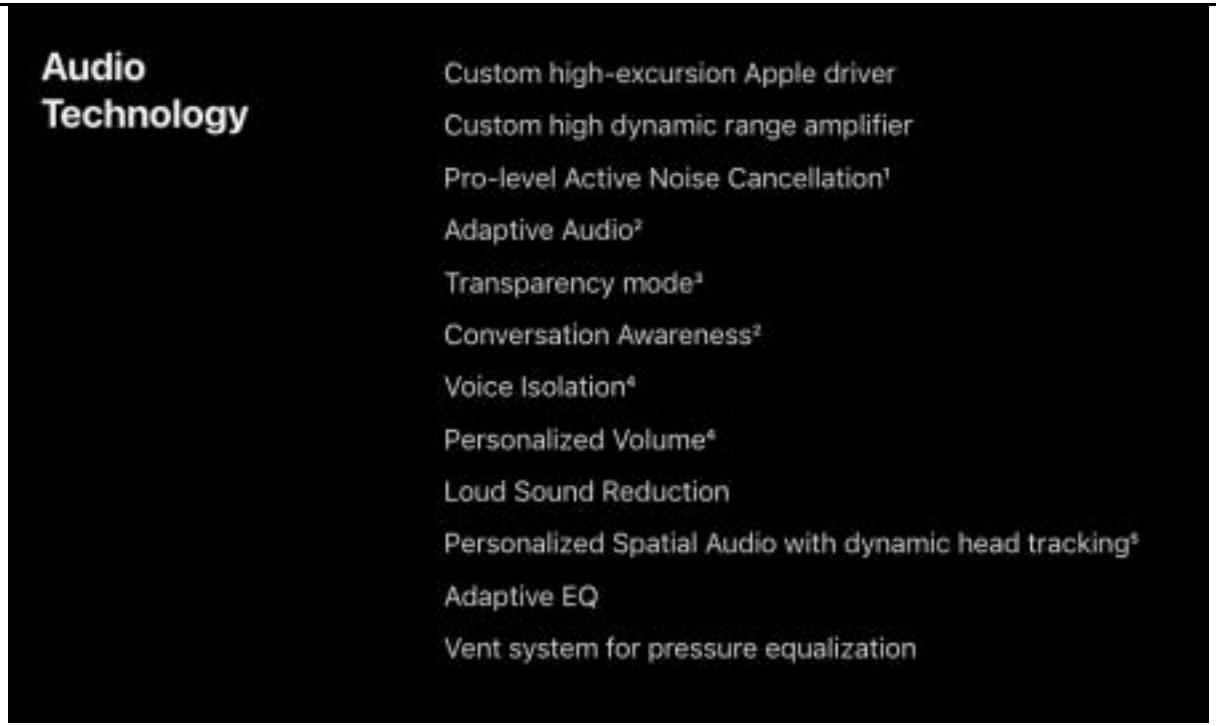
Source: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).

Each of Apple AirPods 2 and Apple AirPods Pro 3 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 2	AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932; Use Siri with AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-siri-devc2c0f438a/1.0/web/1.0. *See* INGENIOSPEC-014033-014035; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/make-and-answer-calls-with-airpods-1-or-2-dev0d85dbd4e/1.0/web/1.0. *See* INGENIOSPEC-013933-013934;
Apple AirPods Pro 3	Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533; Apple AirPods Pro 3 - Technical Specs, available from

		https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	
11,921,355 Claim 68	**Evidence**	
68. A head-worn personal electronic apparatus as recited in claim 65, wherein the electronic circuitry is configured to modify the customized audio output signals to be output to the user via the at least one speaker to cancel at least a portion of noise associated with the environment, the modification of the customized audio output signals being dependent at least in part on the ambient sound input picked-	Every claim limitation of claim 65 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises electronic circuitry including at least an integrated circuit, the electronic circuitry being configured to output the customized audio output signals to the at least one speaker. *See* Claim 65c, *supra*. The electronic circuitry is further configured to modify the customized audio output signals to be output to the user via the at least one speaker to cancel at least a portion of noise associated with the environment. This ability is referred to as active noise cancellation. The modification of the customized audio output signals received by the Accused Instrumentalities is dependent at least in part on the ambient sound input picked-up via the second microphone of the device. Noise-cancelling mode cancels out the sound surrounding the user, by removing the noise picked up by the second microphone of the device.	

up via the second microphone.	 **Source**: Switch between noise control modes - Apple Support (INGENIOSPEC-014039-014043) (available from https://support.apple.com/guide/airpods/switch-between-noise-control-modes-dev9812f5cc3/1.0/web/1.0).

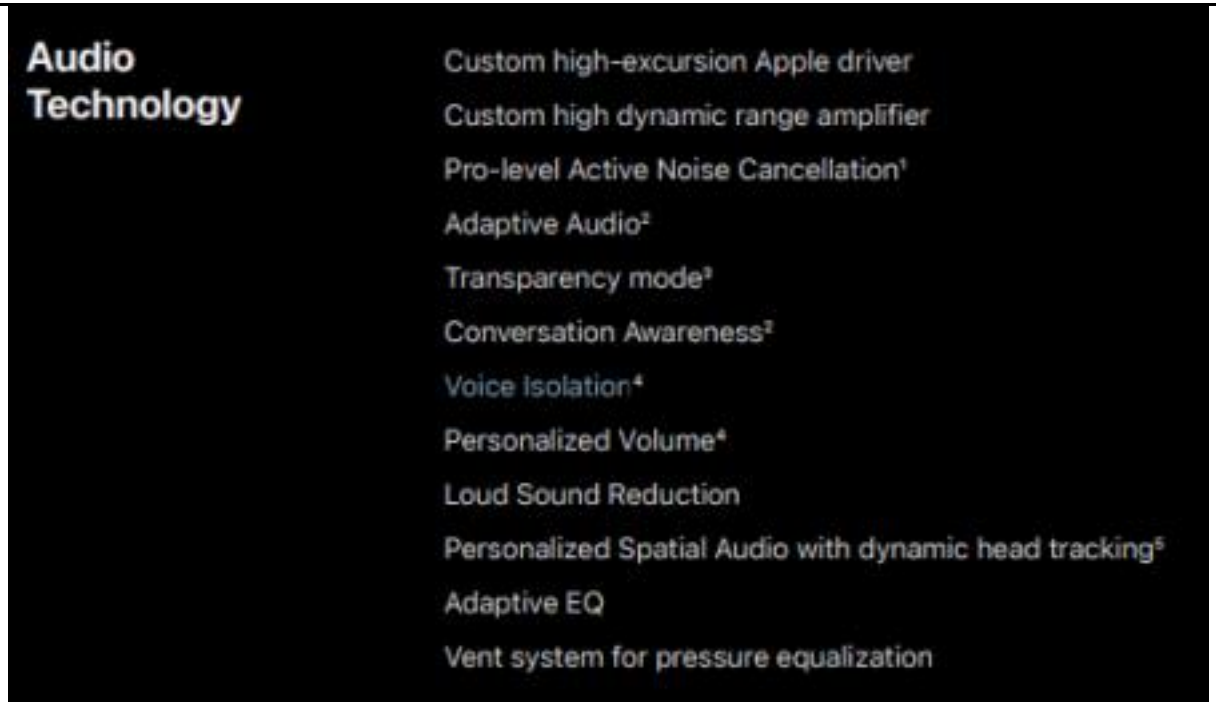


Source: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).

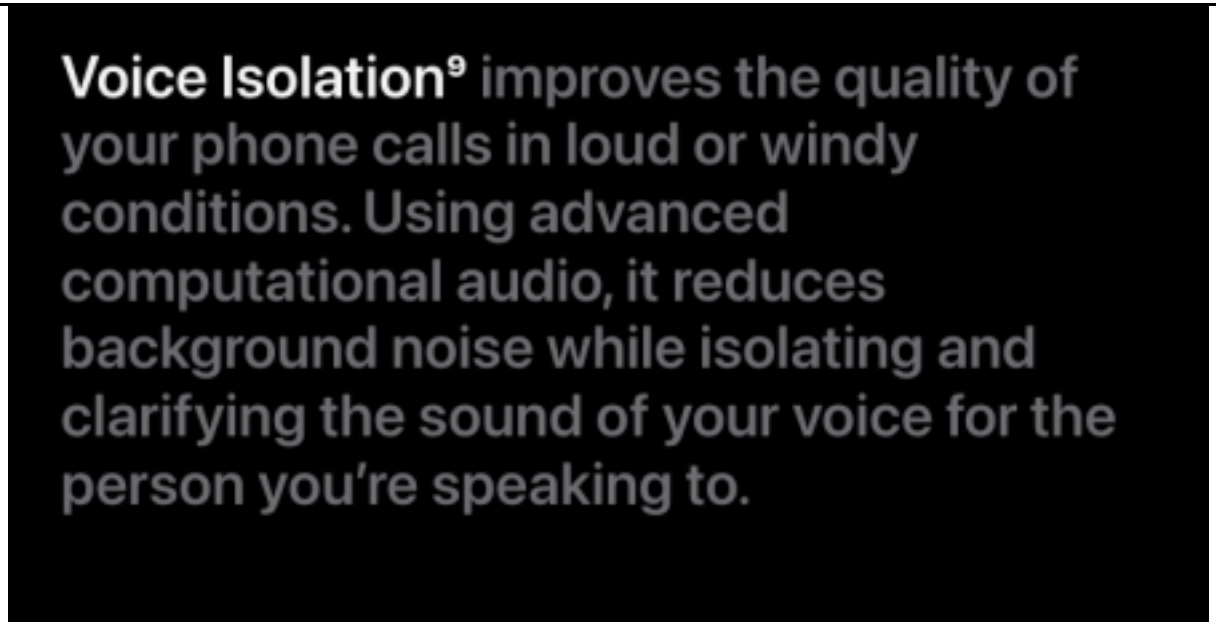
Apple AirPods Pro 3 *also* meets the claimed limitation for the same reasons. Refer to the table below for corresponding evidence to Apple AirPods Pro 3.

Device	**Citations**
Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Introducing AirPods Pro 3, the ultimate audio experience, available from

		https://www.apple.com/in/newsroom/2025/09/airpods-pro-3-introduce-the-ultimate-audio-experience/. *See* INGENIOSPEC-014239-014248;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	
11,921,355 Claim 69	**Evidence**	
69. A head-worn personal electronic apparatus as recited in claim 65, wherein the ambient sound picked-up from at least the second microphone is used at least for noise cancelation, and at least a portion of the ambient sound picked-up from the second microphone is subtracted from the audio picked-up from the first microphone.	Every claim limitation of claim 65 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises a second microphone configured to pick up at least ambient sound input associated with an environment in the vicinity of the head-worn personal electronic apparatus. *See* Claim 65g, *supra*. The ambient sound picked-up from at least the second microphone of the Accused Instrumentalities, such as Apple AirPods Pro 2, is used at least for noise cancelation. For example, noise-cancelling mode cancels out the sound surrounding the user by removing the ambient sound picked-up from at least the second microphone. As such, at least a portion of the ambient sound picked-up from the second microphone is subtracted from the audio picked-up from the first microphone. For example, Apple's Voice Isolation uses the first microphone to capture at least the user's speech, while the second microphone captures at least the ambient noise. The apparatus then processes these inputs together to remove or suppress at least a portion of the ambient noise picked up by the second microphone, so the user's speech less interfered with by the ambient noise.	



Source: AirPods Pro 2 - Technical Specifications (INGENIOSPEC-014687-014693) (available from https://web.archive.org/web/20250910061302/https://www.apple.com/airpods-pro/specs/).

	 **Source**: AirPods Pro 2 - Apple (INGENIOSPEC-013541-013563) (available from https://web.archive.org/web/20250904180656/https:/www.apple.com/airpods-pro/).

Filter out background sounds during calls with AirPods 4 or AirPods Pro 2

When you wear your AirPods 4 (both models) or AirPods Pro 2 during calls on your iPhone, iPad, or Mac, you can use Voice Isolation to enhance voice quality and remove background noise (such as wind) for the listener.

During a call, do one of the following:

- *iPhone or iPad:* Swipe down from the top-right corner of your screen to open Control Center. Tap FaceTime Controls at the top of the screen, then select Voice Isolation.
- *Mac:* Click  or  in the menu bar (depending on the type of call), click Mic Mode, then select Voice Isolation.

Source: Make and answer calls - Apple Support (INGENIOSPEC-014036-014038) (available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0).

Each of Apple AirPods 2 and Apple AirPods Pro 3 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 2	AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286; AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932; Apple AirPods 2 In-Depth Teardown Review by 52AUDIO, available from

		https://www.chargerlab.com/apple-airpod-2-in-depth-teardown-review/. *See* INGENIOSPEC-013937-014004;
	Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.

11,921,355 Claim 70	**Evidence**
70. A head-worn personal electronic apparatus as recited in claim 65, wherein the electronic circuitry is configured to:	Every claim limitation of claim 65 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
70a. determine an ambient noise level based on at least the ambient sound input; and modify at least a portion of the audio sound picked-up via the first microphone, with the modification	*See* Claim 12a, *supra*. Each of Apple AirPods 2 and Apple AirPods Pro 3 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**

being at least in part dependent on the ambient noise level.	Apple AirPods 2	AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932;
	Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	

11,921,355 Claim 72	**Evidence**
72. A head-worn personal electronic apparatus recited in claim 65, wherein the at least one operation of the head-worn personal electronic apparatus being altered concerns control of the customized audio output being provided to the user.	Every claim limitation of claim 65 is present in the Accused Instrumentalities as described above and incorporated herein by reference. *See* Claim 5, *supra*. Each of Apple AirPods 2 and Apple AirPods Pro 3 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 2	Use controls and gestures with your AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/web. *See* INGENIOSPEC-014548-014553;

	Apple AirPods Pro 3	Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533; Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.

11,921,355 Claim 75	**Evidence**
75. A head-worn personal electronic apparatus as recited in claim 65, wherein the electronic circuitry is configured to:	Every claim limitation of claim 65 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
75a. produce an ambient audio output signal based on at least the ambient sound input; and provide at least the ambient audio output signal to the at least one speaker.	*See* Claim 9a, *supra*. Apple AirPods Pro 3 *also* meets the claimed limitation for the same reasons. Refer to the table below for corresponding evidence to Apple AirPods Pro 3.

Device	**Citations**
Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Introducing AirPods Pro 3, the ultimate audio experience, available from

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<tr><td></td><td>
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<tr><td></td><td>https://www.apple.com/in/newsroom/2025/09/airpods-pro-3-introduce-the-ultimate-audio-experience/. See INGENIOSPEC-014239-014248;</td></tr>
</table>

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.</td></tr>
<tr><th>11,921,355
Claim 76</th><th>Evidence</th></tr>
<tr><td>76. A head-worn personal electronic apparatus as recited in claim 75,</td><td>Every claim limitation of claim 75 is present in the Accused Instrumentalities as described above and incorporated herein by reference.

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.</td></tr>
<tr><td>76a. wherein the electronic circuitry is configured to: determine an ambient noise level based on at least the ambient sound input, wherein the ambient audio output signal is dependent on the ambient noise level.</td><td>See Claim 10a, supra.

Apple AirPods Pro 3 also meets the claimed limitation for the same reasons. Refer to the table below for corresponding evidence to Apple AirPods Pro 3.
<table>
<tr><th>Device</th><th>Citations</th></tr>
<tr><td>Apple AirPods Pro 3</td><td>Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. See INGENIOSPEC-014249-014255;
Introducing AirPods Pro 3, the ultimate audio experience, available from https://www.apple.com/in/newsroom/2025/09/airpods-pro-3-introduce-the-ultimate-audio-experience/. See INGENIOSPEC-014239-014248;</td></tr>
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<table>
<tr><td></td><td>Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.</td></tr>
<tr><th>11,921,355
Claim 77</th><th>Evidence</th></tr>
<tr><td>77. A head-worn personal electronic apparatus operable to at least output customized audio output, comprising:</td><td>
See Claim 1-preamble, supra.

Each of Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1 and Apple AirPods Pro 3 also meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.
<table>
<tr><th>Device</th><th>Citations</th></tr>
<tr><td>Apple AirPods 3</td><td>Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. See INGENIOSPEC-014141-014150;
Apple AirPods 3 true wireless earphones teardown, available from https://www.qucox.com/apple-airpods-3-teardown/. See INGENIOSPEC-014163-014238;</td></tr>
<tr><td>Apple AirPods 4</td><td>AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. See INGENIOSPEC-014675-014686;
Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. See INGENIOSPEC-014260-014276;
Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. See INGENIOSPEC-013664-013691;</td></tr>
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		Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501; Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797;
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117; Switch between noise control modes - Apple Support, available from https://support.apple.com/guide/airpods/switch-between-noise-control-modes-dev9812f5cc3/1.0/web/1.0. *See* INGENIOSPEC-014039-014043; Customize Transparency mode and turn on Conversation Boost for AirPods Pro, available from https://support.apple.com/guide/airpods/customize-transparency-mode-turn-conversation-dev966f5f818/web. *See* INGENIOSPEC-014702-014703; AirPods Pro Teardown - iFixit, available from https://www.ifixit.com/Teardown/AirPods+Pro+Teardown/127551. *See* INGENIOSPEC-014076-014096; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075;
		Apple AirPods Pro 3	Introducing AirPods Pro 3, the ultimate audio experience, available from https://www.apple.com/in/newsroom/2025/09/airpods-pro-3-introduce-the-ultimate-audio-experience/. *See* INGENIOSPEC-014239-014248; Use the Hearing Aid feature on your AirPods Pro 2 or AirPods Pro 3, available from https://support.apple.com/en-us/120992. *See* INGENIOSPEC-013442-013448; Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;

		Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.

77a. at least one speaker, the at least one speaker being configured to be wearable proximate to an ear of a user;

See Claim 1a, *supra*.

Each of Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1 and Apple AirPods Pro 3 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 3	Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150; Apple AirPods 3 true wireless earphones teardown, available from https://www.qucox.com/apple-airpods-3-teardown/. *See* INGENIOSPEC-014163-014238;
Apple AirPods 4	Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. *See* INGENIOSPEC-013664-013691; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-014260-014276;

	Apple AirPods 4 with Active Noise Cancellation	Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501;
	Apple AirPods Pro 1	AirPods Pro Teardown - iFixit, available from https://www.ifixit.com/Teardown/AirPods+Pro+Teardown/127551. *See* INGENIOSPEC-014076-014096; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117;
	Apple AirPods Pro 3	Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533; Introducing AirPods Pro 3, the ultimate audio experience, available from https://www.apple.com/in/newsroom/2025/09/airpods-pro-3-introduce-the-ultimate-audio-experience/. *See* INGENIOSPEC-014239-014248;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	
77b. a wireless receiver configured to wirelessly receive customized audio output signals for the user, the customized audio output signals	*See* Claim 17b, *supra*. Each of Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1 and Apple AirPods Pro 3 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.	

having been customized based on at least predetermined hearing characteristics associated with the user such that the customized audio output signals at least compensate for the hearing impairment regarding the user's ability to hear;		**Device**	**Citations**
		Apple AirPods 3	AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158; Customize headphone audio levels on your iPhone or iPad, available from https://support.apple.com/en-us/102663. *See* INGENIOSPEC-014699-014701; Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150;
		Apple AirPods 4	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Customize headphone audio levels on your iPhone or iPad, available from https://support.apple.com/en-us/102663. *See* INGENIOSPEC-014699-014701; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-014260-014276;
		Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Customize headphone audio levels on your iPhone or iPad, available from https://support.apple.com/en-us/102663. *See* INGENIOSPEC-014699-014701; Apple AirPods 4 - Overview, available from

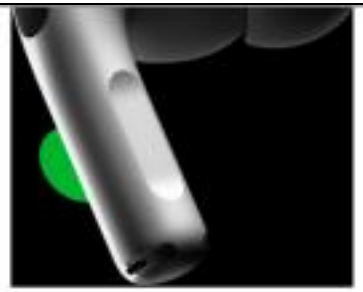
			https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501;
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Customize headphone audio levels on your iPhone or iPad, available from https://support.apple.com/en-us/102663. *See* INGENIOSPEC-014699-014701; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Use the Hearing Aid feature on your AirPods Pro 2 or AirPods Pro 3, available from https://support.apple.com/en-us/120992. *See* INGENIOSPEC-013442-013448; AirPods Pro 3 - Hearing Health, available from https://www.apple.com/airpods-pro/hearing-health/. *See* INGENIOSPEC-013502-013510; Set Headphone Accommodations for AirPods, available from https://support.apple.com/guide/airpods/set-headphone-accommodations-devcd05671ab/web. *See* INGENIOSPEC-013296-013297; Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;

<table>
<tr><td></td><td>Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.</td></tr>
<tr><td>77c. electronic circuitry including at least an integrated circuit, the electronic circuitry being configured to output the customized audio output signals to the at least one speaker;</td><td>See Claim 17c, supra.

Each of Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1 and Apple AirPods Pro 3 also meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

<table>
<tr><th>Device</th><th>Citations</th></tr>
<tr><td>Apple AirPods 3</td><td>Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. See INGENIOSPEC-014141-014150;
Apple AirPods 3 true wireless earphones teardown, available from https://www.qucox.com/apple-airpods-3-teardown/. See INGENIOSPEC-014163-014238;</td></tr>
<tr><td>Apple AirPods 4</td><td>Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. See INGENIOSPEC-013664-013691;
Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. See INGENIOSPEC-014260-014276;
AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. See INGENIOSPEC-014675-014686;</td></tr>
<tr><td>Apple AirPods 4 with Active Noise Cancellation</td><td>Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. See INGENIOSPEC-013761-013797;
Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. See INGENIOSPEC-013484-013501;</td></tr>
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		AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
	Apple AirPods Pro 1	AirPods Pro Teardown - iFixit, available from https://www.ifixit.com/Teardown/AirPods+Pro+Teardown/127551. *See* INGENIOSPEC-014076-014096; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117;
	Apple AirPods Pro 3	Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	
77d. a force sensor at least partially contained within the head-worn personal electronic apparatus and configured to receive a user input based at least on sensing force applied to the force sensor, the force sensor is configured to detect the user	The Accused Instrumentalities, such as Apple AirPods Pro 2, comprise a force sensor at least partially contained within the head-worn personal electronic apparatus.	

input, the detected user input operating to alter at least an operation of the head-worn wearable electronic device;	 **Source**: AirPods Pro 2 - Apple (INGENIOSPEC-013541-013563) (available from https://web.archive.org/web/20250904180656/https:/www.apple.com/airpods-pro/).

AirPods Pro 2 controls and gestures



With the Touch control on the stem of both AirPods Pro 2, you can do any of the following:

- *Play and pause audio:* Press the stem. To resume playback, press it again.
- *Play the next track:* Double-press the stem.
- *Play the previous track:* Triple-press the stem.
- *Answer a call:* When you receive a call, press the stem.
- *Adjust volume:* Lightly swipe up or down on the stem.

  You can also turn on Personalized Volume to automatically adjust the volume based on listening preferences and your environment. See Use Conversation Awareness or Personalized Volume.
- *Switch between Active Noise Cancellation, Transparency mode, and Adaptive Audio:* You can set either of your AirPods to perform this action when you press and hold the stem. See Change what the force sensor or Touch control does.
- *Activate Siri:* You can set either of your AirPods to perform this action when you press and hold the stem. See Use Siri with AirPods.

Use head gestures to respond to Siri

- *Accept a call or reply to notifications and messages:* Nod your head up and down.
- *Decline a call or dismiss notifications and messages:* Shake your head side to side.

Note: To use head gestures to respond to Siri, Announce Calls and Announce Notifications must be on. See Use Siri to announce calls or notifications.

Source: Use controls and gestures with your AirPods - Apple Support (INGENIOSPEC-014024-014029) (available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/1.0/web/1.0).

Make and answer calls

1. Wear your AirPods and make sure they're connected to your iPhone, iPad, or Apple Watch (with cellular or Wi-Fi).
2. Do one of the following:
   - *Make a call:* Say "Hey Siri," or press and hold the force sensor, then say something like "Call Eliza's mobile." On an iPad without cellular, say something like "Make a FaceTime call."

     You can also make a call on your device, such as in the FaceTime app or Phone app.
   - *Answer a call:* Press the stem once on either of your AirPods.

Source: Make and answer calls - Apple Support (INGENIOSPEC-014036-014038) (available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0).

The force sensor is configured to receive a user input based at least on sensing force applied to the force sensor. *See* Claim 14a, *supra*.

The force sensor is configured to detect the user input, the detected user input operating to alter at least an operation of the head-worn wearable electronic device. *See* Claim 14b, *supra*.

Each of Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1 and Apple AirPods Pro 3 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**

		Apple AirPods 3	AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158; Use controls and gestures with your AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/1.0/web/1.0. *See* INGENIOSPEC-014024-014029; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038;
		Apple AirPods 4	Pause, skip, and adjust volume with your AirPods and AirPods Pro, available from https://support.apple.com/en-us/102628. *See* INGENIOSPEC-013298-013301; Use controls and gestures with your AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/1.0/web/1.0. *See* INGENIOSPEC-014024-014029; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
		Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;

			Pause, skip, and adjust volume with your AirPods and AirPods Pro, available from https://support.apple.com/en-us/102628. *See* INGENIOSPEC-013298-013301; Use controls and gestures with your AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/1.0/web/1.0. *See* INGENIOSPEC-014024-014029;
		Apple AirPods Pro 1	Use controls and gestures with your AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/1.0/web/1.0. *See* INGENIOSPEC-014024-014029; Pause, skip, and adjust volume with your AirPods and AirPods Pro, available from https://support.apple.com/en-us/102628. *See* INGENIOSPEC-013298-013301; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533; Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;

<table>
<tr><td></td><td>Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.</td></tr>
<tr><td>77e. a first microphone configured to pick up at least audio input from at least the user, the first microphone being at least partially in the head-worn personal electronic apparatus and is positioned to be directed towards the user when the head-worn personal electronic apparatus is being worn by the user;</td><td>See Claim 7a, supra.

Each of Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1 and Apple AirPods Pro 3 also meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

<table>
<tr><th>Device</th><th>Citations</th></tr>
<tr><td>Apple AirPods 3</td><td>Apple AirPods 3 true wireless earphones teardown, available from https://www.qucox.com/apple-airpods-3-teardown/. See INGENIOSPEC-014163-014238;
Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. See INGENIOSPEC-014141-014150;
AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. See INGENIOSPEC-014151-014158;</td></tr>
<tr><td>Apple AirPods 4</td><td>Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. See INGENIOSPEC-013664-013691;
AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. See INGENIOSPEC-014675-014686;</td></tr>
<tr><td>Apple AirPods 4 with Active Noise Cancellation</td><td>Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-</td></tr>
</table></td></tr>
</table>

		teardown/. *See* INGENIOSPEC-013761-013797; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
	Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075;
	Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.

77f. and a second microphone configured to pick up at least ambient sound input associated with an environment in the vicinity of the head-worn personal electronic apparatus, the second microphone being

See Claim 7b, *supra*.

Each of Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1 and Apple AirPods Pro 3 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 3	Apple AirPods 3 true wireless earphones teardown, available from https://www.qucox.com/apple-airpods-3-teardown/. *See* INGENIOSPEC-014163-014238;

positioned to be directed away from the user when the head-worn wearable electronic device is being worn by the user, wherein the at least one speaker is configured to generate at least a portion of the customized audio output for the user in accordance with at least the portion of the customized audio output signals.			Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150; AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158;
		Apple AirPods 4	Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. *See* INGENIOSPEC-013664-013691; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
		Apple AirPods 4 with Active Noise Cancellation	Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-

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<tr><td></td><td>new-airpods-pro-available-october-30/. See INGENIOSPEC-014108-014117;</td></tr>
<tr><td>Apple AirPods Pro 3</td><td>Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. See INGENIOSPEC-014249-014255;
Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. See INGENIOSPEC-013511-013533;</td></tr>
</table>
Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
</td></tr>
<tr><td>77g. wherein the at least one speaker is configured to generate at least a portion of the customized audio output for the user in accordance with at least the portion of the customized audio output signals.</td><td>
See Claim 17c, supra.

Each of Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1 and Apple AirPods Pro 3 also meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.
<table>
<tr><th>Device</th><th>Citations</th></tr>
<tr><td>Apple AirPods 3</td><td>Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. See INGENIOSPEC-014141-014150;
Apple AirPods 3 true wireless earphones teardown, available from https://www.qucox.com/apple-airpods-3-teardown/. See INGENIOSPEC-014163-014238;</td></tr>
<tr><td>Apple AirPods 4</td><td>Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. See INGENIOSPEC-013664-</td></tr>
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	013691; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-014260-014276; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
Apple AirPods 4 with Active Noise Cancellation	Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
Apple AirPods Pro 1	AirPods Pro Teardown - iFixit, available from https://www.ifixit.com/Teardown/AirPods+Pro+Teardown/127551. *See* INGENIOSPEC-014076-014096; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117;
Apple AirPods Pro 3	Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.

<table>
<tr><th>11,921,355
Claim 78</th><th>Evidence</th></tr>
<tr><td>78. A head-worn personal electronic apparatus as recited in claim 77, wherein the head-worn personal electronic apparatus comprises:</td><td>Every claim limitation of claim 77 is present in the Accused Instrumentalities as described above and incorporated herein by reference.

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.</td></tr>
<tr><td>78a. a radiation detector configured to capture radiation data,</td><td>See Claim 13a, supra.

Each of Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1 and Apple AirPods Pro 3 also meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

<table>
<tr><th>Device</th><th>Citations</th></tr>
<tr><td>Apple AirPods 3</td><td>Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. See INGENIOSPEC-014141-014150;
AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. See INGENIOSPEC-014151-014158;</td></tr>
<tr><td>Apple AirPods 4</td><td>Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. See INGENIOSPEC-013664-013691;
AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. See INGENIOSPEC-014675-014686;</td></tr>
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		Change the settings of your AirPods and AirPods Pro - Apple Support, available from https://support.apple.com/en-us/108764. *See* INGENIOSPEC-013692-013694;
	Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; Change the settings of your AirPods and AirPods Pro - Apple Support, available from https://support.apple.com/en-us/108764. *See* INGENIOSPEC-013692-013694;
	Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Change settings for AirPods Pro 1 and 2, available from https://support.apple.com/guide/airpods/change-settings-for-airpods-pro-1-and-2-dev6cbd13615/1.0/web/1.0#devc07789cad. *See* INGENIOSPEC-014030-014032;
	Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;

<table>
<tr><td></td><td>Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.</td></tr>
<tr><td>78b. wherein the electronic circuitry is configured to process at least the radiation data captured by the radiation detector, and configured to determine whether the head-worn personal electronic apparatus is being worn by a user based on at least the processed radiation data.</td><td>See Claim 13b, supra.

Each of Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1 and Apple AirPods Pro 3 also meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

<table>
<tr><th>Device</th><th>Citations</th></tr>
<tr><td>Apple AirPods 3</td><td>Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. See INGENIOSPEC-014141-014150;
AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. See INGENIOSPEC-014151-014158;</td></tr>
<tr><td>Apple AirPods 4</td><td>Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. See INGENIOSPEC-013664-013691;
AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. See INGENIOSPEC-014675-014686;
Change the settings of your AirPods and AirPods Pro - Apple Support, available from https://support.apple.com/en-us/108764. See INGENIOSPEC-013692-013694;</td></tr>
<tr><td>Apple AirPods 4 with Active Noise Cancellation</td><td>AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. See INGENIOSPEC-014675-014686;</td></tr>
</table></td></tr>
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		Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; Change the settings of your AirPods and AirPods Pro - Apple Support, available from https://support.apple.com/en-us/108764. *See* INGENIOSPEC-013692-013694;
	Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Change settings for AirPods Pro 1 and 2, available from https://support.apple.com/guide/airpods/change-settings-for-airpods-pro-1-and-2-dev6cbd13615/1.0/web/1.0#devc07789cad. *See* INGENIOSPEC-014030-014032;
	Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	

11,921,355 Claim 79	**Evidence**
79. A head-worn personal electronic apparatus as recited	Every claim limitation of claim 77 is present in the Accused Instrumentalities as described above and incorporated herein by reference.

<table>
<tr>
<td>in claim 77, wherein the head-worn personal electronic apparatus wherein the head-worn personal electronic device is configured to receive a voice input via the first microphone, determine a requested operation from the voice input using voice recognition, and control an operation by the head-worn personal electronic device based on the requested operation.</td>
<td>See Claim 67, supra.

Each of Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1 and Apple AirPods Pro 3 also meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.
<table>
<tr><th>Device</th><th>Citations</th></tr>
<tr><td>Apple AirPods 3</td><td>Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. See INGENIOSPEC-014141-014150;
Use Siri with AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-siri-devc2c0f438a/1.0/web/1.0. See INGENIOSPEC-014033-014035;
Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0. See INGENIOSPEC-014036-014038;</td></tr>
<tr><td>Apple AirPods 4</td><td>Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. See INGENIOSPEC-014260-014276;
Use Siri with AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-siri-devc2c0f438a/1.0/web/1.0. See INGENIOSPEC-014033-014035;
Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-</td></tr>
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			airpods-3-4-pro-devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038;
		Apple AirPods 4 with Active Noise Cancellation	Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501; Use Siri with AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-siri-devc2c0f438a/1.0/web/1.0. *See* INGENIOSPEC-014033-014035; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038;
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Use Siri with AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-siri-devc2c0f438a/1.0/web/1.0. *See* INGENIOSPEC-014033-014035; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-

		devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038;
	Apple AirPods Pro 3	Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533; Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.

11,921,355 Claim 80	**Evidence**
80. A head-worn personal electronic apparatus as recited in claim 77, wherein the electronic circuitry is configured to modify the customized audio output signals to be output to the user via the at least one speaker to cancel at least a portion of noise associated with the environment, the	Every claim limitation of claim 77 is present in the Accused Instrumentalities as described above and incorporated herein by reference. *See* Claim 68, *supra*. Each of Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1 and Apple AirPods Pro 3 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Apple AirPods 4 - Overview, available from

<table>
<tr><td rowspan="4">modification of the customized audio output signals being dependent at least in part on the ambient sound input picked-up via the second microphone.</td><td></td><td>https://www.apple.com/airpods-4/. See INGENIOSPEC-013484-013501;</td></tr>
<tr><td>Apple AirPods Pro 1</td><td>Switch between noise control modes - Apple Support, available from https://support.apple.com/guide/airpods/switch-between-noise-control-modes-dev9812f5cc3/1.0/web/1.0. See INGENIOSPEC-014039-014043;
AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. See INGENIOSPEC-014050-014056;
Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. See INGENIOSPEC-014108-014117;</td></tr>
<tr><td>Apple AirPods Pro 3</td><td>Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. See INGENIOSPEC-014249-014255;
Introducing AirPods Pro 3, the ultimate audio experience, available from https://www.apple.com/in/newsroom/2025/09/airpods-pro-3-introduce-the-ultimate-audio-experience/. See INGENIOSPEC-014239-014248;</td></tr>
<tr><td colspan="2">Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.</td></tr>
</table>

<table>
<tr><th>11,921,355
Claim 81</th><th>Evidence</th></tr>
<tr><td>81. A head-worn personal electronic apparatus as recited in claim 77, wherein the ambient sound input picked-up from at least the second microphone is used at least for noise cancelation, and at least a portion of the ambient sound input picked-up from the second microphone is subtracted from the audio picked-up from the first microphone.</td><td>Every claim limitation of claim 77 is present in the Accused Instrumentalities as described above and incorporated herein by reference.

See Claim 69, supra.

Each of Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1 and Apple AirPods Pro 3 also meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

<table>
<tr><th>Device</th><th>Citations</th></tr>
<tr><td>Apple AirPods 3</td><td>Apple AirPods 3 true wireless earphones teardown, available from https://www.qucox.com/apple-airpods-3-teardown/. See INGENIOSPEC-014163-014238;
Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. See INGENIOSPEC-014141-014150;
AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. See INGENIOSPEC-014151-014158;
Which AirPods model should you buy?, available from https://www.theverge.com/2021/10/19/22733797/airpods-2-3-pro-max-which-to-buy. See INGENIOSPEC-013410-013429;</td></tr>
<tr><td>Apple AirPods 4</td><td>Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. See INGENIOSPEC-013664-013691;
AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. See INGENIOSPEC-014675-</td></tr>
</table>
</td></tr>
</table>

			014686; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-014260-014276;
		Apple AirPods 4 with Active Noise Cancellation	Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501;
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117; How To Enable Voice Isolation On AirPods - YouTube, available from https://www.youtube.com/watch?v=_gpVEHX7WOw. *See* INGENIOSPEC-014672-014674;

	Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.

11,921,355 Claim 82	**Evidence**
82. A head-worn personal electronic apparatus as recited in claim 77, wherein the electronic circuitry is configured to:	Every claim limitation of claim 77 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
82a. determine an ambient noise level based on at least the ambient sound input; and modify at least a portion of the audio sound picked-up via the first microphone, with the modification being at least in part	*See* Claim 12a, *supra*. Each of Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1 and Apple AirPods Pro 3 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 3	Which AirPods model should you buy?, available from https://www.theverge.com/2021/10/19/22733797/airpods-2-3-pro-max-which-to-buy. *See* INGENIOSPEC-013410-013429;

dependent on the ambient noise level.			Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150;
		Apple AirPods 4	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-014260-014276;
		Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501;
		Apple AirPods Pro 1	How To Enable Voice Isolation On AirPods - YouTube, available from https://www.youtube.com/watch?v=_gpVEHX7WOw. *See* INGENIOSPEC-014672-014674; AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;

		Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	
11,921,355 Claim 85	**Evidence**	
85. A head-worn personal electronic apparatus as recited in claim 77, wherein the electronic circuitry is configured to:	Every claim limitation of claim 77 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	
85a. produce an ambient audio output signal based on at least the ambient sound input; and provide at least the ambient audio output signal to the at least one speaker.	*See* Claim 9a, *supra*. Each of Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1 and Apple AirPods Pro 3 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.	
	Device	**Citations**
	Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501;

	Apple AirPods Pro 1	Switch between noise control modes - Apple Support, available from https://support.apple.com/guide/airpods/switch-between-noise-control-modes-dev9812f5cc3/1.0/web/1.0. *See* INGENIOSPEC-014039-014043; AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117;
	Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Introducing AirPods Pro 3, the ultimate audio experience, available from https://www.apple.com/in/newsroom/2025/09/airpods-pro-3-introduce-the-ultimate-audio-experience/. *See* INGENIOSPEC-014239-014248;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	

<table>
<tr><th>11,921,355
Claim 86</th><th>Evidence</th></tr>
<tr><td>86. A head-worn personal electronic apparatus as recited in claim 85,</td><td>Every claim limitation of claim 85 is present in the Accused Instrumentalities as described above and incorporated herein by reference.

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.</td></tr>
<tr><td>86a. wherein the electronic circuitry is configured to: determine an ambient noise level based on at least the ambient sound input, wherein the ambient audio output signal is dependent on the ambient noise level.</td><td>See Claim 10a, supra.

Each of Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1 and Apple AirPods Pro 3 also meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.
<table>
<tr><th>Device</th><th>Citations</th></tr>
<tr><td>Apple AirPods 4 with Active Noise Cancellation</td><td>AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. See INGENIOSPEC-014675-014686;
Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. See INGENIOSPEC-013484-013501;</td></tr>
<tr><td>Apple AirPods Pro 1</td><td>Switch between noise control modes - Apple Support, available from https://support.apple.com/guide/airpods/switch-between-noise-control-modes-dev9812f5cc3/1.0/web/1.0. See INGENIOSPEC-014039-014043;
AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-</td></tr>
</table></td></tr>
</table>

		us/111861. *See* INGENIOSPEC-014050-014056; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117;
	Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Introducing AirPods Pro 3, the ultimate audio experience, available from https://www.apple.com/in/newsroom/2025/09/airpods-pro-3-introduce-the-ultimate-audio-experience/. *See* INGENIOSPEC-014239-014248;

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.

11,921,355 Claim 87	**Evidence**
87. A head-worn personal electronic apparatus operable to at least output customized audio output, comprising:	*See* Claim 1, *supra*. Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**

		Apple AirPods 2	AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932; AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286; If your left or right AirPod is not working, available from https://support.apple.com/en-us/100494. *See* INGENIOSPEC-013923-013925; Apple AirPods 2 In-Depth Teardown Review by 52AUDIO, available from https://www.chargerlab.com/apple-airpod-2-in-depth-teardown-review/. *See* INGENIOSPEC-013937-014004;
		Apple AirPods 3	Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150; Apple AirPods 3 true wireless earphones teardown, available from https://www.qucox.com/apple-airpods-3-teardown/. *See* INGENIOSPEC-014163-014238;
		Apple AirPods 4	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-014260-014276; Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. *See* INGENIOSPEC-013664-013691;
		Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501;

			Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797;
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117; Switch between noise control modes - Apple Support, available from https://support.apple.com/guide/airpods/switch-between-noise-control-modes-dev9812f5cc3/1.0/web/1.0. *See* INGENIOSPEC-014039-014043; Customize Transparency mode and turn on Conversation Boost for AirPods Pro, available from https://support.apple.com/guide/airpods/customize-transparency-mode-turn-conversation-dev966f5f818/web. *See* INGENIOSPEC-014702-014703; AirPods Pro Teardown - iFixit, available from https://www.ifixit.com/Teardown/AirPods+Pro+Teardown/127551. *See* INGENIOSPEC-014076-014096; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075;
		Apple AirPods Pro 3	Introducing AirPods Pro 3, the ultimate audio experience, available from https://www.apple.com/in/newsroom/2025/09/airpods-pro-3-introduce-the-ultimate-audio-experience/. *See* INGENIOSPEC-014239-014248; Use the Hearing Aid feature on your AirPods Pro 2 or AirPods Pro 3, available from https://support.apple.com/en-us/120992. *See* INGENIOSPEC-013442-013448; Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;

		Beats Fit Pro	Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458; Use your Beats Fit Pro - Apple Support, available from https://support.apple.com/guide/beats/use-beats-fit-pro-dev6f7b5266d/web. *See* INGENIOSPEC-013661-013663; Teardown Report: Beats Fit Pro, available from https://www.52audio.com/archives/98994.html. *See* INGENIOSPEC-014407-014463;
		Powerbeats Pro	Beats Global Press Room, available from https://www.beatsbydre.com/company/press. *See* INGENIOSPEC-014290-014297; Powerbeats Pro - Apples Sporty AirPods Alternative - MacRumors, available from https://www.macrumors.com/guide/powerbeats-pro/. *See* INGENIOSPEC-013854-013882; Wearing your AirPods, EarPods, or Beats device, available from https://support.apple.com/en-us/101598. *See* INGENIOSPEC-014301-014302; How to get the best fit and sound with your Powerbeats Pro | Comfort, available from https://www.youtube.com/watch?v=I9t6YW3o-xc. *See* INGENIOSPEC-013232, INGENIOSPEC-013233-013237; Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289; Powerbeats Pro Teardown, available from https://www.youtube.com/watch?v=vEHwL59jOPg. *See* INGENIOSPEC-013271, INGENIOSPEC-013272-013277;
		Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616; Powerbeats Pro 2 - High Performance Earbuds with video transcript, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013617-013632;

<table>
<tr><td></td><td>Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.</td></tr>
<tr><td>87a. at least one speaker, the at least one speaker being configured to be wearable proximate to an ear of a user;</td><td>See Claim 1a, supra.

Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Powerbeats Pro and Powerbeats Pro 2 also meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

<table>
<tr><th>Device</th><th>Citations</th></tr>
<tr><td>Apple AirPods 2</td><td>If your left or right AirPod is not working, available from https://support.apple.com/en-us/100494. See INGENIOSPEC-013923-013925;
Apple AirPods 2 In-Depth Teardown Review by 52AUDIO, available from https://www.chargerlab.com/apple-airpod-2-in-depth-teardown-review/. See INGENIOSPEC-013937-014004;
AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. See INGENIOSPEC-014277-014286;</td></tr>
<tr><td>Apple AirPods 3</td><td>Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. See INGENIOSPEC-014141-014150;
Apple AirPods 3 true wireless earphones teardown, available from https://www.qucox.com/apple-airpods-3-teardown/. See INGENIOSPEC-014163-014238;</td></tr>
<tr><td>Apple AirPods 4</td><td>Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. See INGENIOSPEC-013664-013691;</td></tr>
</table></td></tr>
</table>

			Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-014260-014276;
		Apple AirPods 4 with Active Noise Cancellation	Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501;
		Apple AirPods Pro 1	AirPods Pro Teardown - iFixit, available from https://www.ifixit.com/Teardown/AirPods+Pro+Teardown/127551. *See* INGENIOSPEC-014076-014096; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533; Introducing AirPods Pro 3, the ultimate audio experience, available from https://www.apple.com/in/newsroom/2025/09/airpods-pro-3-introduce-the-ultimate-audio-experience/. *See* INGENIOSPEC-014239-014248;
		Beats Fit Pro	Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458; Teardown Report: Beats Fit Pro, available from https://www.52audio.com/archives/98994.html. *See* INGENIOSPEC-014407-014463;
		Powerbeats Pro	Powerbeats Pro Teardown, available from https://www.youtube.com/watch?v=vEHwL59jOPg. *See* INGENIOSPEC-013271,

		INGENIOSPEC-013272-013277; Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289; Wearing your AirPods, EarPods, or Beats device, available from https://support.apple.com/en-us/101598. *See* INGENIOSPEC-014301-014302; How to get the best fit and sound with your Powerbeats Pro | Comfort, available from https://www.youtube.com/watch?v=I9t6YW3o-xc. *See* INGENIOSPEC-013232, INGENIOSPEC-013233-013237;
	Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds with video transcript, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013617-013632; Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616;

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.

87b. a wireless receiver configured to wirelessly receive customized audio output signals for the user, the customized audio output signals having been customized based on at least predetermined

See Claim 17b, *supra*.

Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**

hearing characteristics associated with the user such that the customized audio output signals at least compensate for the hearing impairment regarding the user's ability to hear;		Apple AirPods 2	AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932; Customize headphone audio levels on your iPhone or iPad, available from https://support.apple.com/en-us/102663. *See* INGENIOSPEC-014699-014701; AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286;
		Apple AirPods 3	AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158; Customize headphone audio levels on your iPhone or iPad, available from https://support.apple.com/en-us/102663. *See* INGENIOSPEC-014699-014701; Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150;
		Apple AirPods 4	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Customize headphone audio levels on your iPhone or iPad, available from https://support.apple.com/en-us/102663. *See* INGENIOSPEC-014699-014701; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-014260-014276;

		Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Customize headphone audio levels on your iPhone or iPad, available from https://support.apple.com/en-us/102663. *See* INGENIOSPEC-014699-014701; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501;
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Customize headphone audio levels on your iPhone or iPad, available from https://support.apple.com/en-us/102663. *See* INGENIOSPEC-014699-014701; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Use the Hearing Aid feature on your AirPods Pro 2 or AirPods Pro 3, available from https://support.apple.com/en-us/120992. *See* INGENIOSPEC-013442-013448; AirPods Pro 3 - Hearing Health, available from https://www.apple.com/airpods-pro/hearing-health/. *See* INGENIOSPEC-013502-013510; Set Headphone Accommodations for AirPods, available from https://support.apple.com/guide/airpods/set-headphone-accommodations-devcd05671ab/web. *See* INGENIOSPEC-013296-013297; Apple AirPods Pro 3 - Overview, available from

			https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;
		Beats Fit Pro	Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458; Customize headphone audio levels on your iPhone or iPad, available from https://support.apple.com/en-us/102663. *See* INGENIOSPEC-014699-014701;
		Powerbeats Pro	Powerbeats Pro Teardown, available from https://www.youtube.com/watch?v=vEHwL59jOPg. *See* INGENIOSPEC-013271, INGENIOSPEC-013272-013277; Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289; Customize headphone audio levels on your iPhone or iPad, available from https://support.apple.com/en-us/102663. *See* INGENIOSPEC-014699-014701;
		Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616; Customize headphone audio levels on your iPhone or iPad, available from https://support.apple.com/en-us/102663. *See* INGENIOSPEC-014699-014701; Powerbeats Pro 2 - High Performance Earbuds with video transcript, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013617-013632;

<table>
<tr><td></td><td>Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.</td></tr>
<tr><td>87c. electronic circuitry including at least an integrated circuit, the electronic circuitry being configured to output the customized audio output signals to the at least one speaker;</td><td>See Claim 17c, supra.

Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Powerbeats Pro and Powerbeats Pro 2 also meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

<table>
<tr><th>Device</th><th>Citations</th></tr>
<tr><td>Apple AirPods 2</td><td>If your left or right AirPod is not working, available from https://support.apple.com/en-us/100494. See INGENIOSPEC-013923-013925;
Apple AirPods 2 In-Depth Teardown Review by 52AUDIO, available from https://www.chargerlab.com/apple-airpod-2-in-depth-teardown-review/. See INGENIOSPEC-013937-014004;
AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. See INGENIOSPEC-014277-014286;</td></tr>
<tr><td>Apple AirPods 3</td><td>Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. See INGENIOSPEC-014141-014150;
Apple AirPods 3 true wireless earphones teardown, available from https://www.qucox.com/apple-airpods-3-teardown/. See INGENIOSPEC-014163-014238;</td></tr>
<tr><td>Apple AirPods 4</td><td>Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. See INGENIOSPEC-013664-013691;</td></tr>
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			Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-014260-014276; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
		Apple AirPods 4 with Active Noise Cancellation	Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
		Apple AirPods Pro 1	AirPods Pro Teardown - iFixit, available from https://www.ifixit.com/Teardown/AirPods+Pro+Teardown/127551. *See* INGENIOSPEC-014076-014096; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;
		Beats Fit Pro	Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458; Teardown Report: Beats Fit Pro, available from https://www.52audio.com/archives/98994.html. *See* INGENIOSPEC-014407-014463;

	<table><tr><td>Powerbeats Pro</td><td>Powerbeats Pro Teardown, available from https://www.youtube.com/watch?v=vEHwL59jOPg. *See* INGENIOSPEC-013271, INGENIOSPEC-013272-013277; Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289;</td></tr><tr><td>Powerbeats Pro 2</td><td>Powerbeats Pro 2 - High Performance Earbuds with video transcript, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013617-013632;</td></tr></table> Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
87d. a user input device at least partially contained within the head-worn personal electronic apparatus and configured to receive a user input, the user input operating to alter at least an operation of the head-worn wearable electronic device;	The Accused Instrumentalities, such as Apple AirPods Pro 2, comprise a user input device at least partially contained within the head-worn personal electronic apparatus. The user input device includes a touch-sensitive surface. The touch-sensitive surface is at least partially contained within the head-worn personal electronic apparatus and configured to sense a touch input associated with the user, wherein the sensed touch input operating to at least alter operation of the head-worn electronic personal audio apparatus. *See* Claim 3, *supra*. The user input device also includes a force sensor at least partially contained within the head-worn personal electronic apparatus. The force sensor is configured to receive a user input based at least on sensing force applied to the force sensor. The detected user input operating to alter at least an operation of the head-worn wearable electronic device. *See* Claim 77d, *supra*. The user input device also includes microphone at least partially internal to the head-worn personal electronic apparatus. The device is configured to receive a voice input via the microphone, determine a requested operation from the voice input using voice recognition, and control an operation by the head-worn personal electronic device based on the requested operation. *See* Claim 54, *supra*.

Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 2	Use controls and gestures with your AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/web. *See* INGENIOSPEC-014548-014553; AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286; AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932; Apple AirPods 2 In-Depth Teardown Review by 52AUDIO, available from https://www.chargerlab.com/apple-airpod-2-in-depth-teardown-review/. *See* INGENIOSPEC-013937-014004; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/make-and-answer-calls-with-airpods-1-or-2-dev0d85dbd4e/1.0/web/1.0. *See* INGENIOSPEC-013933-013934;
Apple AirPods 3	AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158; Use controls and gestures with your AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-

			devb2c431317/1.0/web/1.0. *See* INGENIOSPEC-014024-014029; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038; Apple AirPods 3 true wireless earphones teardown, available from https://www.qucox.com/apple-airpods-3-teardown/. *See* INGENIOSPEC-014163-014238; Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150; Use Siri with AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-siri-devc2c0f438a/1.0/web/1.0. *See* INGENIOSPEC-014033-014035;
		Apple AirPods 4	Pause, skip, and adjust volume with your AirPods and AirPods Pro, available from https://support.apple.com/en-us/102628. *See* INGENIOSPEC-013298-013301; Use controls and gestures with your AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/1.0/web/1.0. *See* INGENIOSPEC-014024-014029; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. *See* INGENIOSPEC-013664-013691; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038; Use Siri with AirPods - Apple Support, available from

			https://support.apple.com/guide/airpods/use-siri-devc2c0f438a/1.0/web/1.0. *See* INGENIOSPEC-014033-014035;
		Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Pause, skip, and adjust volume with your AirPods and AirPods Pro, available from https://support.apple.com/en-us/102628. *See* INGENIOSPEC-013298-013301; Use controls and gestures with your AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/1.0/web/1.0. *See* INGENIOSPEC-014024-014029; Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038; Use Siri with AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-siri-devc2c0f438a/1.0/web/1.0. *See* INGENIOSPEC-014033-014035;
		Apple AirPods Pro 1	Use controls and gestures with your AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/1.0/web/1.0. *See* INGENIOSPEC-014024-014029; Pause, skip, and adjust volume with your AirPods and AirPods Pro, available from https://support.apple.com/en-us/102628. *See* INGENIOSPEC-013298-013301; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-

			3/. *See* INGENIOSPEC-014057-014075; AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038; Use Siri with AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-siri-devc2c0f438a/1.0/web/1.0. *See* INGENIOSPEC-014033-014035; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533; Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;
		Beats Fit Pro	Customize controls on your Beats, available from https://support.apple.com/guide/beats/customize-beats-controls-dev9eeff2d7b/web. *See* INGENIOSPEC-013658-013658; Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458; Teardown Report: Beats Fit Pro, available from https://www.52audio.com/archives/98994.html. *See* INGENIOSPEC-014407-014463; Use your Beats Fit Pro - Apple Support, available from

		https://support.apple.com/guide/beats/use-beats-fit-pro-dev6f7b5266d/web. *See* INGENIOSPEC-013661-013663;
	Powerbeats Pro	Powerbeats Pro Unboxing & Hands On, available from https://www.youtube.com/watch?v=QmfiANjNV4Y Best Buy -- Powerbeats Pro Features, available from https://www.bestbuy.com/product/beats-powerbeats-pro-totally-wireless-earbuds-black/JJ8XJS3FXY. *See* INGENIOSPEC-013883-013883; Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289;
	Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616; Use your Powerbeats Pro 2 - Apple Support, available from https://support.apple.com/guide/beats/use-powerbeats-pro-2-dev1b2a821db/web. *See* INGENIOSPEC-014007-014010;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	
87e. a radiation detector at least partially contained within the head-worn personal electronic structure and configured to	*See* Claim 25, Claim 65e, and Claim 66, *supra*. Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.	

configured to capture radiation data indicative of whether the head-worn personal electronic apparatus is being worn by the user, the head-worn personal electronic apparatus is configured to at least alter operation of the head-worn personal electronic apparatus based at least in part on the captured radiation data;		**Device**	**Citations**
		Apple AirPods 2	AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286; AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932;
		Apple AirPods 3	Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150; AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158;
		Apple AirPods 4	Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. *See* INGENIOSPEC-013664-013691; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Change the settings of your AirPods and AirPods Pro - Apple Support, available from https://support.apple.com/en-us/108764. *See* INGENIOSPEC-013692-013694;
		Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Apple AirPods 4 ANC Earbuds Teardown, available from

			https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; Change the settings of your AirPods and AirPods Pro - Apple Support, available from https://support.apple.com/en-us/108764. *See* INGENIOSPEC-013692-013694;
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Change settings for AirPods Pro 1 and 2, available from https://support.apple.com/guide/airpods/change-settings-for-airpods-pro-1-and-2-dev6cbd13615/1.0/web/1.0#devc07789cad. *See* INGENIOSPEC-014030-014032;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;
		Beats Fit Pro	Beats User Guide - Turn Beats Automatic Ear Detection On or Off, available from https://support.apple.com/guide/beats/turn-automatic-ear-detection-on-or-off-dev82c456e13/1.0/web/1.0. *See* INGENIOSPEC-013657-013657; Customize controls on your Beats, available from https://support.apple.com/guide/beats/customize-beats-controls-dev9eeff2d7b/web. *See* INGENIOSPEC-013658-013658; Beats Fit Pro, available from

		https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458;
	Powerbeats Pro	Powerbeats Pro Unboxing & Hands On, available from https://www.youtube.com/watch?v=QmfiANjNV4Y How to Turn Off Automatic Ear Detection on Your Powerbeats Pro Earbuds - MacRumors, available from https://www.macrumors.com/how-to/turn-off-automatic-ear-detection-powerbeats-pro/. *See* INGENIOSPEC-013884-013890; Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289;
	Powerbeats Pro 2	Powerbeats Pro 2, available from https://www.beatsbydre.com/earbuds/powerbeats-pro-2/MX743/electric-orange. *See* INGENIOSPEC-013371-013387;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	
87f. a first microphone at least partially contained within the head-worn personal electronic apparatus, the first microphone being positioned to pick up at least audio input from at least the user;	*See* Claim 15a, *supra*. Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.	
	Device	**Citations**

		Apple AirPods 2	AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286; AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932; Apple AirPods 2 In-Depth Teardown Review by 52AUDIO, available from https://www.chargerlab.com/apple-airpod-2-in-depth-teardown-review/. *See* INGENIOSPEC-013937-014004;
		Apple AirPods 3	Apple AirPods 3 true wireless earphones teardown, available from https://www.qucox.com/apple-airpods-3-teardown/. *See* INGENIOSPEC-014163-014238; Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150; AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158;
		Apple AirPods 4	Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. *See* INGENIOSPEC-013664-013691; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
		Apple AirPods 4 with Active Noise Cancellation	Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; AirPods 4 - Technical Specifications, available from

			https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;
		Beats Fit Pro	Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458; Teardown Report: Beats Fit Pro, available from https://www.52audio.com/archives/98994.html. *See* INGENIOSPEC-014407-014463;
		Powerbeats Pro	Best Buy -- Powerbeats Pro Features, available from https://www.bestbuy.com/product/beats-powerbeats-pro-totally-wireless-earbuds-black/JJ8XJS3FXY. *See* INGENIOSPEC-013883-013883; Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289;

	Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616;

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.

87g. and a second microphone at least partially contained within the head-worn personal electronic apparatus, the second microphone being positioned to pick up at least environmental audio input associated with an environment around the head-worn personal electronic apparatus,

See Claim 15b, *supra*.

Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 2	AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286; AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932; Apple AirPods 2 In-Depth Teardown Review by 52AUDIO, available from https://www.chargerlab.com/apple-airpod-2-in-depth-teardown-review/. *See* INGENIOSPEC-013937-014004;
Apple AirPods 3	Apple AirPods 3 true wireless earphones teardown, available from https://www.qucox.com/apple-airpods-3-teardown/. *See* INGENIOSPEC-014163-014238;

			Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150; AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158;
		Apple AirPods 4	Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. *See* INGENIOSPEC-013664-013691; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
		Apple AirPods 4 with Active Noise Cancellation	Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117;

	Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;
	Beats Fit Pro	Teardown Report: Beats Fit Pro, available from https://www.52audio.com/archives/98994.html. *See* INGENIOSPEC-014407-014463; Beats Fit Pro True Wireless Earbuds — Beats Black, available from https://www.apple.com/shop/product/MK2F3LL/A/beats-fit-pro-true-wireless-earbuds-beats-black. *See* INGENIOSPEC-013302-013309;
	Powerbeats Pro	Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289;
	Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	
87h. wherein the at least one speaker is configured to generate at least a	*See* Claim 17c, *supra*. Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the	

<table>
<tr>
<td>portion of the customized audio output for the user in accordance with at least the portion of the customized audio output signals.</td>
<td>claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.
<table>
<tr><th>Device</th><th>Citations</th></tr>
<tr><td>Apple AirPods 2</td><td>If your left or right AirPod is not working, available from https://support.apple.com/en-us/100494. See INGENIOSPEC-013923-013925;
Apple AirPods 2 In-Depth Teardown Review by 52AUDIO, available from https://www.chargerlab.com/apple-airpod-2-in-depth-teardown-review/. See INGENIOSPEC-013937-014004;
AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. See INGENIOSPEC-014277-014286;</td></tr>
<tr><td>Apple AirPods 3</td><td>Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. See INGENIOSPEC-014141-014150;
Apple AirPods 3 true wireless earphones teardown, available from https://www.qucox.com/apple-airpods-3-teardown/. See INGENIOSPEC-014163-014238;</td></tr>
<tr><td>Apple AirPods 4</td><td>Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. See INGENIOSPEC-013664-013691;
Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. See INGENIOSPEC-014260-014276;
AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. See INGENIOSPEC-014675-014686;</td></tr>
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		Apple AirPods 4 with Active Noise Cancellation	Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686;
		Apple AirPods Pro 1	AirPods Pro Teardown - iFixit, available from https://www.ifixit.com/Teardown/AirPods+Pro+Teardown/127551. *See* INGENIOSPEC-014076-014096; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;
		Beats Fit Pro	Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458; Teardown Report: Beats Fit Pro, available from https://www.52audio.com/archives/98994.html. *See* INGENIOSPEC-014407-014463;
		Powerbeats Pro	Powerbeats Pro Teardown, available from https://www.youtube.com/watch?v=vEHwL59jOPg. *See* INGENIOSPEC-013271, INGENIOSPEC-013272-013277; Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289;

	Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds with video transcript, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013617-013632;

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.

11,921,355 Claim 88	**Evidence**
88. A head-worn personal electronic apparatus as recited in claim 87, wherein the head-worn personal electronic apparatus wherein the head-worn personal electronic device is configured to receive a voice input via the first microphone, determine a requested operation from the voice input using voice recognition, and control an operation by the head-worn personal electronic	Every claim limitation of claim 87 is present in the Accused Instrumentalities as described above and incorporated herein by reference. *See* Claim 67, *supra*. Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 2	AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932; Use Siri with AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-siri-devc2c0f438a/1.0/web/1.0. *See* INGENIOSPEC-014033-014035; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/make-and-answer-calls-with-

device based on the requested operation.			airpods-1-or-2-dev0d85dbd4e/1.0/web/1.0. *See* INGENIOSPEC-013933-013934;
		Apple AirPods 3	Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150; Use Siri with AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-siri-devc2c0f438a/1.0/web/1.0. *See* INGENIOSPEC-014033-014035; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038;
		Apple AirPods 4	Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-014260-014276; Use Siri with AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-siri-devc2c0f438a/1.0/web/1.0. *See* INGENIOSPEC-014033-014035; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038;
		Apple AirPods 4 with Active Noise Cancellation	Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501; Use Siri with AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-siri-devc2c0f438a/1.0/web/1.0. *See* INGENIOSPEC-014033-014035; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038;

		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Use Siri with AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-siri-devc2c0f438a/1.0/web/1.0. *See* INGENIOSPEC-014033-014035; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533; Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;
		Beats Fit Pro	Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458; Beats Fit Pro True Wireless Earbuds — Beats Black, available from https://www.apple.com/shop/product/MK2F3LL/A/beats-fit-pro-true-wireless-earbuds-beats-black. *See* INGENIOSPEC-013302-013309; Use your Beats Fit Pro - Apple Support, available from https://support.apple.com/guide/beats/use-beats-fit-pro-dev6f7b5266d/web. *See* INGENIOSPEC-013661-013663;
		Powerbeats Pro	Powerbeats Pro Unboxing & Hands On, available from https://www.youtube.com/watch?v=QmfiANjNV4Y Powerbeats Pro Teardown, available from

		https://www.youtube.com/watch?v=vEHwL59jOPg. *See* INGENIOSPEC-013271, INGENIOSPEC-013272-013277; Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289; Best Buy -- Powerbeats Pro Features, available from https://www.bestbuy.com/product/beats-powerbeats-pro-totally-wireless-earbuds-black/JJ8XJS3FXY. *See* INGENIOSPEC-013883-013883;
	Powerbeats Pro 2	Use your Powerbeats Pro 2 - Apple Support, available from https://support.apple.com/guide/beats/use-powerbeats-pro-2-dev1b2a821db/web. *See* INGENIOSPEC-014007-014010;

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.

11,921,355 Claim 89	**Evidence**
89. A head-worn personal electronic apparatus as recited in claim 87, wherein the electronic circuitry is configured to modify the customized audio output signals to be output to the user via the at least one speaker to cancel at least a portion of	Every claim limitation of claim 87 is present in the Accused Instrumentalities as described above and incorporated herein by reference. *See* Claim 68, *supra*. Each of Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**

noise associated with the environment, the modification of the customized audio output signals being dependent at least in part on the ambient sound input picked-up via the second microphone.		Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501;
		Apple AirPods Pro 1	Switch between noise control modes - Apple Support, available from https://support.apple.com/guide/airpods/switch-between-noise-control-modes-dev9812f5cc3/1.0/web/1.0. *See* INGENIOSPEC-014039-014043; AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Introducing AirPods Pro 3, the ultimate audio experience, available from https://www.apple.com/in/newsroom/2025/09/airpods-pro-3-introduce-the-ultimate-audio-experience/. *See* INGENIOSPEC-014239-014248;

	Beats Fit Pro	Use your Beats Fit Pro - Apple Support, available from https://support.apple.com/guide/beats/use-beats-fit-pro-dev6f7b5266d/web. *See* INGENIOSPEC-013661-013663; Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458;
	Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds with video transcript, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013617-013632; Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	

11,921,355 Claim 90	**Evidence**
90. A head-worn personal electronic apparatus as recited in claim 87, wherein the ambient sound input picked-up from at least the second microphone is used at least for noise	Every claim limitation of claim 87 is present in the Accused Instrumentalities as described above and incorporated herein by reference. *See* Claim 69, *supra*. Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

cancelation, and at least a portion of the ambient sound input picked-up from the second microphone is subtracted from the audio picked-up from the first microphone.		**Device**	**Citations**
		Apple AirPods 2	AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286; AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932; Apple AirPods 2 In-Depth Teardown Review by 52AUDIO, available from https://www.chargerlab.com/apple-airpod-2-in-depth-teardown-review/. *See* INGENIOSPEC-013937-014004;
		Apple AirPods 3	Apple AirPods 3 true wireless earphones teardown, available from https://www.qucox.com/apple-airpods-3-teardown/. *See* INGENIOSPEC-014163-014238; Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150; AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158; Which AirPods model should you buy?, available from https://www.theverge.com/2021/10/19/22733797/airpods-2-3-pro-max-which-to-buy. *See* INGENIOSPEC-013410-013429;
		Apple AirPods 4	Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. *See* INGENIOSPEC-013664-013691; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-

			014686; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-014260-014276;
		Apple AirPods 4 with Active Noise Cancellation	Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501;
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117; How To Enable Voice Isolation On AirPods - YouTube, available from https://www.youtube.com/watch?v=_gpVEHX7WOw. *See* INGENIOSPEC-014672-014674;

	Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;
	Beats Fit Pro	Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458; Teardown Report: Beats Fit Pro, available from https://www.52audio.com/archives/98994.html. *See* INGENIOSPEC-014407-014463; Beats Fit Pro True Wireless Earbuds — Beats Black, available from https://www.apple.com/shop/product/MK2F3LL/A/beats-fit-pro-true-wireless-earbuds-beats-black. *See* INGENIOSPEC-013302-013309;
	Powerbeats Pro	Best Buy -- Powerbeats Pro Features, available from https://www.bestbuy.com/product/beats-powerbeats-pro-totally-wireless-earbuds-black/JJ8XJS3FXY. *See* INGENIOSPEC-013883-013883; Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289;
	Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	

<table>
<tr><th>11,921,355
Claim 91</th><th>Evidence</th></tr>
<tr><td>91. A head-worn personal electronic apparatus as recited in claim 87, wherein the electronic circuitry is configured to:</td><td>Every claim limitation of claim 87 is present in the Accused Instrumentalities as described above and incorporated herein by reference.

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.</td></tr>
<tr><td>91a. determine an ambient noise level based on at least the ambient sound input; and modify at least a portion of the audio sound picked-up via the first microphone, with the modification being at least in part dependent on the ambient noise level.</td><td>See Claim 12a, supra.

Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Powerbeats Pro and Powerbeats Pro 2 also meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.
<table>
<tr><th>Device</th><th>Citations</th></tr>
<tr><td>Apple AirPods 2</td><td>AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. See INGENIOSPEC-013926-013932;</td></tr>
<tr><td>Apple AirPods 3</td><td>Which AirPods model should you buy?, available from https://www.theverge.com/2021/10/19/22733797/airpods-2-3-pro-max-which-to-buy. See INGENIOSPEC-013410-013429;
Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. See INGENIOSPEC-014141-014150;</td></tr>
</table></td></tr>
</table>

		Apple AirPods 4	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-014260-014276;
		Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501;
		Apple AirPods Pro 1	How To Enable Voice Isolation On AirPods - YouTube, available from https://www.youtube.com/watch?v=_gpVEHX7WOw. *See* INGENIOSPEC-014672-014674; AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;

	Beats Fit Pro	Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458;
	Powerbeats Pro	Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289;
	Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616;

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.

11,921,355 Claim 92	**Evidence**
92. A head-worn personal electronic apparatus as recited in claim 87,	Every claim limitation of claim 87 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
92a. wherein the electronic circuitry is configured to: determine an environmental sound level based on at least the environmental audio input; and amplify at	*See* Claim 38c, *supra*. Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

least a portion of the audio input from the first microphone, with the amplification being at least in part dependent on the environmental sound level.		**Device**	**Citations**
		Apple AirPods 2	AirPods (2nd generation) Overview, available from https://www.apple.com/eg/airpods-2nd-generation/. *See* INGENIOSPEC-014277-014286; AirPods 2 - Tech Specs - Apple Support, available from https://support.apple.com/en-us/111856. *See* INGENIOSPEC-013926-013932; Apple AirPods 2 In-Depth Teardown Review by 52AUDIO, available from https://www.chargerlab.com/apple-airpod-2-in-depth-teardown-review/. *See* INGENIOSPEC-013937-014004;
		Apple AirPods 3	Apple AirPods 3 true wireless earphones teardown, available from https://www.qucox.com/apple-airpods-3-teardown/. *See* INGENIOSPEC-014163-014238; Introducing the next generation of AirPods, available from https://www.apple.com/newsroom/2021/10/introducing-the-next-generation-of-airpods/. *See* INGENIOSPEC-014141-014150; AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. *See* INGENIOSPEC-014151-014158; Which AirPods model should you buy?, available from https://www.theverge.com/2021/10/19/22733797/airpods-2-3-pro-max-which-to-buy. *See* INGENIOSPEC-013410-013429;
		Apple AirPods 4	Apple AirPods 4 Standard Edition Teardown, available from https://www.qucox.com/apple-airpods-4-teardown/. *See* INGENIOSPEC-013664-013691; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-

			014686; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-014260-014276;
		Apple AirPods 4 with Active Noise Cancellation	Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501;
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117; How To Enable Voice Isolation On AirPods - YouTube, available from https://www.youtube.com/watch?v=_gpVEHX7WOw. *See* INGENIOSPEC-014672-014674;

	Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;
	Beats Fit Pro	Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458; Teardown Report: Beats Fit Pro, available from https://www.52audio.com/archives/98994.html. *See* INGENIOSPEC-014407-014463; Beats Fit Pro True Wireless Earbuds — Beats Black, available from https://www.apple.com/shop/product/MK2F3LL/A/beats-fit-pro-true-wireless-earbuds-beats-black. *See* INGENIOSPEC-013302-013309;
	Powerbeats Pro	Best Buy -- Powerbeats Pro Features, available from https://www.bestbuy.com/product/beats-powerbeats-pro-totally-wireless-earbuds-black/JJ8XJS3FXY. *See* INGENIOSPEC-013883-013883; Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289;
	Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	

<table>
<tr><th>11,921,355
Claim 95</th><th>Evidence</th></tr>
<tr><td>95. A head-worn personal electronic apparatus as recited in claim 87, wherein the electronic circuitry is configured to:</td><td>Every claim limitation of claim 87 is present in the Accused Instrumentalities as described above and incorporated herein by reference.

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.</td></tr>
<tr><td>95a. produce an ambient audio output signal based on at least the ambient sound input; and provide at least the ambient audio output signal to the at least one speaker.</td><td>See Claim 9a, supra.

Each of Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro and Powerbeats Pro 2 also meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

<table>
<tr><th>Device</th><th>Citations</th></tr>
<tr><td>Apple AirPods 4 with Active Noise Cancellation</td><td>AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. See INGENIOSPEC-014675-014686;
Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. See INGENIOSPEC-013484-013501;</td></tr>
<tr><td>Apple AirPods Pro 1</td><td>Switch between noise control modes - Apple Support, available from https://support.apple.com/guide/airpods/switch-between-noise-control-modes-dev9812f5cc3/1.0/web/1.0. See INGENIOSPEC-014039-014043;
AirPods Pro 1 - Tech Specs, available from</td></tr>
</table></td></tr>
</table>

			https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Introducing AirPods Pro 3, the ultimate audio experience, available from https://www.apple.com/in/newsroom/2025/09/airpods-pro-3-introduce-the-ultimate-audio-experience/. *See* INGENIOSPEC-014239-014248;
		Beats Fit Pro	Use your Beats Fit Pro - Apple Support, available from https://support.apple.com/guide/beats/use-beats-fit-pro-dev6f7b5266d/web. *See* INGENIOSPEC-013661-013663; Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458;
		Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds with video transcript, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013617-013632; Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-

		pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616;

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.

11,921,355 Claim 96	**Evidence**
96. A head-worn personal electronic apparatus as recited in claim 95,	Every claim limitation of claim 95 is present in the Accused Instrumentalities as described above and incorporated herein by reference. Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.
96a. wherein the electronic circuitry is configured to: determine an ambient noise level based on at least the ambient sound input, wherein the ambient audio output signal is dependent on the ambient noise level.	*See* Claim 10a, *supra*. Each of Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

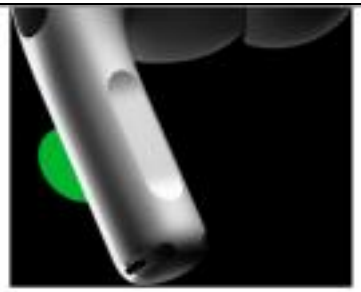
Device	**Citations**
Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501;

		Apple AirPods Pro 1	Switch between noise control modes - Apple Support, available from https://support.apple.com/guide/airpods/switch-between-noise-control-modes-dev9812f5cc3/1.0/web/1.0. *See* INGENIOSPEC-014039-014043; AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Introducing AirPods Pro 3, the ultimate audio experience, available from https://www.apple.com/in/newsroom/2025/09/airpods-pro-3-introduce-the-ultimate-audio-experience/. *See* INGENIOSPEC-014239-014248;
		Beats Fit Pro	Use your Beats Fit Pro - Apple Support, available from https://support.apple.com/guide/beats/use-beats-fit-pro-dev6f7b5266d/web. *See* INGENIOSPEC-013661-013663; Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458;

	Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds with video transcript, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013617-013632; Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616;

Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.

11,921,355 Claim 97	**Evidence**
97. A head-worn personal electronic apparatus as recited in claim 87, wherein head-worn personal electronic apparatus is configured to support voice calls to the user, and wherein the at least one operation of the head-worn personal electronic apparatus being altered concerns at least accepting or	Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, comprises a user input device surface at least partially contained within the head-worn personal electronic apparatus and configured to sense a user input associated with the user, wherein the sensed user input alters operation of the head-worn electronic personal audio apparatus. *See* Claim 87, supra. Each of the Accused Instrumentalities, such as Apple AirPods Pro 2, is a head-worn personal electronic apparatus as recited in Claim 87. Apple AirPods Pro 2 is configured to support voice calls to the user. For example, at least one operation of Apple AirPods Pro 2 being altered concerns at least accepting or declining a voice call to the user. A press of the user input device can answer or hang up a phone call. *See* https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/ (INGENIOSPEC-011535 to INGENIOSPEC-011540).

declining a voice call to the user.	 **Source**: AirPods Pro 2 - Apple (INGENIOSPEC-013541-013563) (available from https://web.archive.org/web/20250904180656/https:/www.apple.com/airpods-pro/).

AirPods Pro 2 controls and gestures



With the Touch control on the stem of both AirPods Pro 2, you can do any of the following:

- *Play and pause audio:* Press the stem. To resume playback, press it again.
- *Play the next track:* Double-press the stem.
- *Play the previous track:* Triple-press the stem.
- *Answer a call:* When you receive a call, press the stem.
- *Adjust volume:* Lightly swipe up or down on the stem.

  You can also turn on Personalized Volume to automatically adjust the volume based on listening preferences and your environment. See Use Conversation Awareness or Personalized Volume.
- *Switch between Active Noise Cancellation, Transparency mode, and Adaptive Audio:* You can set either of your AirPods to perform this action when you press and hold the stem. See Change what the force sensor or Touch control does.
- *Activate Siri:* You can set either of your AirPods to perform this action when you press and hold the stem. See Use Siri with AirPods.

Use head gestures to respond to Siri

- *Accept a call or reply to notifications and messages:* Nod your head up and down.
- *Decline a call or dismiss notifications and messages:* Shake your head side to side.

Note: To use head gestures to respond to Siri, Announce Calls and Announce Notifications must be on. See Use Siri to announce calls or notifications.

Source: Use controls and gestures with your AirPods - Apple Support (INGENIOSPEC-014024-014029) (available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/1.0/web/1.0).

Make and answer calls

1. Wear your AirPods and make sure they're connected to your iPhone, iPad, or Apple Watch (with cellular or Wi-Fi).
2. Do one of the following:
   - *Make a call:* Say "Hey Siri," or press and hold the force sensor, then say something like "Call Eliza's mobile." On an iPad without cellular, say something like "Make a FaceTime call."

     You can also make a call on your device, such as in the FaceTime app or Phone app.
   - *Answer a call:* Press the stem once on either of your AirPods.

Source: Make and answer calls - Apple Support (INGENIOSPEC-014036-014038) (available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0).

Each of Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1 and Apple AirPods Pro 3 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	**Citations**
Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Pause, skip, and adjust volume with your AirPods and AirPods Pro, available from https://support.apple.com/en-

		us/102628. *See* INGENIOSPEC-013298-013301; Use controls and gestures with your AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/1.0/web/1.0. *See* INGENIOSPEC-014024-014029;
	Apple AirPods Pro 1	Use controls and gestures with your AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/1.0/web/1.0. *See* INGENIOSPEC-014024-014029; Pause, skip, and adjust volume with your AirPods and AirPods Pro, available from https://support.apple.com/en-us/102628. *See* INGENIOSPEC-013298-013301; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075;
	Apple AirPods Pro 3	Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533; Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	

<table>
<tr><th>11,921,355
Claim 98</th><th>Evidence</th></tr>
<tr><td>98. A head-worn personal electronic apparatus recited in claim 87, wherein the at least one operation of the head-worn personal electronic apparatus being altered concerns control of the customized audio output being provided to the user.</td><td>Every claim limitation of claim 87 is present in the Accused Instrumentalities as described above and incorporated herein by reference.

See Claim 5 for Touch Sensor, Claim 48 for Force Sensor, and Claim 54 for Voice Commands, supra.

Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Powerbeats Pro and Powerbeats Pro 2 also meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

<table>
<tr><th>Device</th><th>Citations</th></tr>
<tr><td>Apple AirPods 2</td><td>Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/make-and-answer-calls-with-airpods-1-or-2-dev0d85dbd4e/1.0/web/1.0. See INGENIOSPEC-013933-013934;</td></tr>
<tr><td>Apple AirPods 3</td><td>AirPods (3rd Generation) - Technical Specs, available from https://www.apple.com/eg/airpods-3rd-generation/specs/. See INGENIOSPEC-014151-014158;
Use controls and gestures with your AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/1.0/web/1.0. See INGENIOSPEC-014024-014029;
Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0. See INGENIOSPEC-014036-014038;
Use Siri with AirPods - Apple Support, available from</td></tr>
</table>
</td></tr>
</table>

			https://support.apple.com/guide/airpods/use-siri-devc2c0f438a/1.0/web/1.0. *See* INGENIOSPEC-014033-014035;
		Apple AirPods 4	Pause, skip, and adjust volume with your AirPods and AirPods Pro, available from https://support.apple.com/en-us/102628. *See* INGENIOSPEC-013298-013301; Use controls and gestures with your AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/1.0/web/1.0. *See* INGENIOSPEC-014024-014029; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038; Use Siri with AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-siri-devc2c0f438a/1.0/web/1.0. *See* INGENIOSPEC-014033-014035;
		Apple AirPods 4 with Active Noise Cancellation	AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Pause, skip, and adjust volume with your AirPods and AirPods Pro, available from https://support.apple.com/en-us/102628. *See* INGENIOSPEC-013298-013301; Use controls and gestures with your AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/1.0/web/1.0. *See* INGENIOSPEC-014024-014029; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-

			devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038; Use Siri with AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-siri-devc2c0f438a/1.0/web/1.0. *See* INGENIOSPEC-014033-014035;
		Apple AirPods Pro 1	Use controls and gestures with your AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-controls-and-gestures-with-your-airpods-devb2c431317/1.0/web/1.0. *See* INGENIOSPEC-014024-014029; Pause, skip, and adjust volume with your AirPods and AirPods Pro, available from https://support.apple.com/en-us/102628. *See* INGENIOSPEC-013298-013301; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Make and answer calls - Apple Support, available from https://support.apple.com/guide/airpods/answer-calls-airpods-3-4-pro-devac96438de/1.0/web/1.0. *See* INGENIOSPEC-014036-014038; Use Siri with AirPods - Apple Support, available from https://support.apple.com/guide/airpods/use-siri-devc2c0f438a/1.0/web/1.0. *See* INGENIOSPEC-014033-014035; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533; Apple AirPods Pro 3 - Technical Specs, available from

		https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255;
	Beats Fit Pro	Customize controls on your Beats, available from https://support.apple.com/guide/beats/customize-beats-controls-dev9eeff2d7b/web. *See* INGENIOSPEC-013658-013658; Use your Beats Fit Pro - Apple Support, available from https://support.apple.com/guide/beats/use-beats-fit-pro-dev6f7b5266d/web. *See* INGENIOSPEC-013661-013663;
	Powerbeats Pro	Powerbeats Pro Unboxing & Hands On, available from https://www.youtube.com/watch?v=QmfiANjNV4Y Best Buy -- Powerbeats Pro Features, available from https://www.bestbuy.com/product/beats-powerbeats-pro-totally-wireless-earbuds-black/JJ8XJS3FXY. *See* INGENIOSPEC-013883-013883; Beats Unveils Powerbeats Pro, available from https://www.beatsbydre.com/content/dam/beats/web/press/powerbeats-pro/beats_powerbeats-pro.zip. *See* INGENIOSPEC-014287-014289;
	Powerbeats Pro 2	Use your Powerbeats Pro 2 - Apple Support, available from https://support.apple.com/guide/beats/use-powerbeats-pro-2-dev1b2a821db/web. *See* INGENIOSPEC-014007-014010;
	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.	

11,921,355 Claim 99	Evidence
99. A head-worn personal electronic apparatus as recited in claim 87, wherein the head-worn personal electronic apparatus is configured to provide audio alerts to the user via the at least one speaker, and wherein the audio alerts are dependent on one or more user preference settings.	Every claim limitation of claim 87 is present in the Accused Instrumentalities as described above and incorporated herein by reference. *See* Claim 51 and Claim 52, *supra*. Each of Apple AirPods 2, Apple AirPods 3, Apple AirPods 4, Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro, Powerbeats Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.

11,921,355 Claim 100	Evidence
100. A head-worn personal electronic apparatus as recited in claim 87, wherein the electronic circuitry is configured to modify the customized audio output signals to be output to the user via the at least one speaker to cancel at	Every claim limitation of claim 87 is present in the Accused Instrumentalities as described above and incorporated herein by reference. *See* Claim 15b, Claim 7a and Claim 7b, *supra*. Each of Apple AirPods 4 with Active Noise Cancellation, Apple AirPods Pro 1, Apple AirPods Pro 3, Beats Fit Pro and Powerbeats Pro 2 *also* meet the claimed limitation for the same reasons. Refer to the table below for corresponding evidence specific to each device.

Device	Citations

least a portion of noise associated with the environment, the modification of the customized audio output signals being dependent at least in part on the environmental audio input picked-up via the second microphone, wherein, when the head-worn personal electronic apparatus is being worn by the user, the first microphone is positioned to be directed more towards the user's mouth than is the second microphone, and wherein, when the head-worn personal electronic apparatus is being worn by the user, the second microphone is directed more away from the user's		Apple AirPods 4 with Active Noise Cancellation	Apple AirPods 4 ANC Earbuds Teardown, available from https://www.qucox.com/apple-airpods-4-anc-teardown/. *See* INGENIOSPEC-013761-013797; AirPods 4 - Technical Specifications, available from https://www.apple.com/airpods-4/specs/. *See* INGENIOSPEC-014675-014686; Apple AirPods 4 - Overview, available from https://www.apple.com/airpods-4/. *See* INGENIOSPEC-013484-013501;
		Apple AirPods Pro 1	AirPods Pro 1 - Tech Specs, available from https://support.apple.com/en-us/111861. *See* INGENIOSPEC-014050-014056; Apple AirPods Pro vs. AirPods 3 Teardown: ANC or Comfort, available from https://www.qucox.com/airpods-pro-vs-airpods-3/. *See* INGENIOSPEC-014057-014075; Apple Reveals New AirPods Pro, available October 30, available from https://www.apple.com/newsroom/2019/10/apple-reveals-new-airpods-pro-available-october-30/. *See* INGENIOSPEC-014108-014117; Switch between noise control modes - Apple Support, available from https://support.apple.com/guide/airpods/switch-between-noise-control-modes-dev9812f5cc3/1.0/web/1.0. *See* INGENIOSPEC-014039-014043;
		Apple AirPods Pro 3	Apple AirPods Pro 3 - Technical Specs, available from https://www.apple.com/airpods-pro/specs/. *See* INGENIOSPEC-014249-014255; Apple AirPods Pro 3 - Overview, available from https://www.apple.com/airpods-pro/. *See* INGENIOSPEC-013511-013533;

mouth than is the first microphone.		Introducing AirPods Pro 3, the ultimate audio experience, available from https://www.apple.com/in/newsroom/2025/09/airpods-pro-3-introduce-the-ultimate-audio-experience/. *See* INGENIOSPEC-014239-014248;
	Beats Fit Pro	Beats Fit Pro, available from https://www.beatsbydre.com/earbuds/beats-fit-pro. *See* INGENIOSPEC-013449-013458; Teardown Report: Beats Fit Pro, available from https://www.52audio.com/archives/98994.html. *See* INGENIOSPEC-014407-014463; Beats Fit Pro True Wireless Earbuds — Beats Black, available from https://www.apple.com/shop/product/MK2F3LL/A/beats-fit-pro-true-wireless-earbuds-beats-black. *See* INGENIOSPEC-013302-013309; Use your Beats Fit Pro - Apple Support, available from https://support.apple.com/guide/beats/use-beats-fit-pro-dev6f7b5266d/web. *See* INGENIOSPEC-013661-013663;
	Powerbeats Pro 2	Powerbeats Pro 2 - High Performance Earbuds, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013602-013616; Powerbeats Pro 2 - High Performance Earbuds with video transcript, available from https://www.apple.com/shop/product/MX743LL/A/powerbeats-pro-2-high-performance-earbuds-electric-orange. *See* INGENIOSPEC-013617-013632;

	Plaintiff reserves the right to supplement these infringement contentions once it has been afforded the opportunity to review and inspect the internal hardware, firmware and software of the Accused Instrumentalities.

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