IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

Shenzhen Shokz Co., Ltd., *Plaintiff,* v. Shenzhen Wenming Technology Co., Ltd, guizhoushengxinhongshengshangmaoyouxiangongsi, Shenzhen Youbo Technology Co., Ltd, Shanghai Kushi Information Technology Co., Ltd., Suzhou Mojawa Intelligent Electronic Co., Ltd, MRNEIO LLC *Defendants*.	Case No. 1:24-CV-06717 **JURY TRIAL DEMANDED**

DEFENDANT SUZHOU MOJAWA INTELLIGENT ELECTRONIC CO., LTD'S
FINAL UNENFORCEABILITY AND INVALIDITY CONTENTIONS

Shokz, Ex. 2012
Mojawa v. Shokz, IPR2025-00842

TABLE OF CONTENTS

Page

I. ALLEGED PRIORITY DATES 4
A. ’084 Patent Priority Date 5
B. ’582 Patent Priority Date 5
II. STATE OF THE ART 6
III. IDENTIFICATION OF PRIOR ART 9
A. Prior Art Patents / Patent Applications 10
1. ’582 Patent 10
2. ’084 Patent 12
B. Prior Art Publications 13
1. ’582 Patent 13
2. ’084 Patent 14
C. Prior Art Uses, Sales, and/or Offers for Sale 14
1. ’582 Patent 14
2. ’084 Patent 14
IV. *INTER PARTES* REVIEW 15
V. PRIOR ART INVALIDITY GROUNDS 15
A. ’582 Patent Grounds Under 35 U.S.C. §§ 102 and/or 103 18
B. ’084 Patent Grounds Under 35 U.S.C. §§ 102 and/or 103 20
C. Obviousness of Plug Ends and Sockets in Headphone Prior Art 22
VI. MOTIVATION TO COMBINE 24
A. ’582 Patent 26
1. Li ’492 in Combination with Liao ’222 26
2. Li ’492-Liao ’222 in Combination with Numata ’872 28
3. Li ’492-Liao ’222 in Combination with Harte ’838 31
4. Li ’492-Liao ’222 in Combination with Wang ’672 and/or Xu ’577 32
B. ’084 Patent 33
1. Li ’492 in Combination with Fujita ’666 34
2. Li ’492-Liao ’222 in Combination with Numata ’872 35
3. Li ’492-Fujita ’666 in Combination with Harte ’838 35
4. Li ’492-Fujita ’666 in Combination with Fukuda ’563 37
5. AfterShokz AS600 in Combination with Fujita ’666 40
VII. INVALIDITY UNDER 35 U.S.C. § 112 41

Shokz, Ex. 2012
Mojawa v. Shokz, IPR2025-00842

A. Lack of Written Description (35 U.S.C. § 112 ¶ 1) 42
1. ’084 Patent 42
2. ’582 Patent 44
B. Enablement (35 U.S.C. § 112 ¶ 1) 45
1. ’084 Patent 45
2. ’582 Patent 46
C. Indefiniteness (35 U.S.C. § 112 ¶ 2) 48
1. ’084 Patent 48
2. ’582 Patent 50
VIII. INVALIDITY UNDER 35 U.S.C. § 101 52
A. Inventorship 52
1. Failure to Name Xudong Wang as an Inventor 52
2. No Common Inventors Between the ’582 and ’751 Patents 53
IX. DOCUMENT PRODUCTION UNDER LPR 3.3 54

Defendant Suzhou Mojawa Intelligent Electronic Co., Ltd ("Mojawa") provides these Final Unenforceability and Invalidity Contentions ("Contentions") concerning U.S. Patent Nos. 11,197,084 ("'084 Patent") and 11,310,582 ("'582 Patent") (collectively, "Asserted Patents") pursuant to the Court's Local Patent Rules.

Mojawa's Contentions reflect its current knowledge. Mojawa reserves the right, to the extent permitted by the Court under LPR 3.4 and the applicable statutes and rules, to modify and/or supplement these Contentions in response to becoming aware of additional information regarding additional prior art or other information regarding invalidity or unenforceability, any modification or supplementation of Plaintiff's Infringement Contentions, any claim construction by the Court, or as otherwise may be appropriate.

The Court's Local Patent Rules contemplate these Final Unenforceability and Invalidity Contentions being prepared and served in response to Plaintiff's Initial Infringement Contentions and the allegations therein regarding Plaintiff's theory of infringement with respect to each Accused Instrumentality. *See* LPR 2.2, 3.1(b). Plaintiff's Initial Infringement Contentions, however, failed to provide full, fair, and timely disclosure as to how Mojawa allegedly infringes each element of each asserted claim of the Asserted Patents ("Asserted Claims"). Mojawa also reserves the right to seek leave to amend these Contentions in light of positions that Plaintiff or its expert witnesses may assert concerning claim construction, infringement, validity, and/or subject-matter eligibility issues.

Mojawa's exhibits attached hereto (Exhibits A1-A8, and B1-B7) cite to particular teachings and disclosures of the prior art as applied to limitations or features of the Asserted Claims. However, persons having ordinary skill in the art may view an item of prior art in the context of other publications, literature, products, and understanding. Thus, the cited portions of

Shokz, Ex. 2012
Mojawa v. Shokz, IPR2025-00842

prior art identified herein are only exemplary. Mojawa may rely on the entirety of the prior art included in Mojawa's exhibits, including uncited portions of those items, and on other publications and expert testimony shedding light on those items, including as aids in understanding, interpreting, or providing context for the cited portions, and as further evidence that the prior art discloses a claim limitation or feature.

Mojawa may rely upon documents, products, testimony, and other evidence to establish bases for, and motivations to make, combinations of cited prior art that render the Asserted Claims obvious. Mojawa may also rely upon corroborating documents, products, testimony, and other evidence, including materials obtained through further investigation and third-party discovery of cited prior art, that describes the invalidating aspects identified in these Contentions; evidence of the state of the art in the relevant time period (irrespective of whether such prior art qualifies as prior art to the Asserted Patents), including prior art listed on the face of the Asserted Patents and/or disclosed in the specifications ("Admitted Prior Art"); and/or expert testimony to provide context to or aid in understanding the cited prior art.

The prior art references discussed in the exhibits attached hereto disclose the elements of the Asserted Claims explicitly or inherently, and they may be relied upon to show the state of the art in the relevant time frame. To the extent the attached claim charts cite to a reference for each element or limitation of an Asserted Claim, Mojawa contends that such reference anticipates that claim. In addition, Mojawa contends in the alternative that each Asserted Claim is rendered obvious for the reasons set forth herein and in the attached charts. To the extent obviousness combinations are included herein and/or in the attached claim charts, they are exemplary and not inclusive of all possible combinations, are provided in the alternative to Mojawa's anticipation contentions, and should not be construed to suggest that any reference included in the

combinations is not by itself anticipatory. For purposes of these Contentions, Mojawa identifies prior art references and provides element-by-element claim charts based, in part, on Mojawa's understanding of the apparent claim constructions advanced by Plaintiff in its Initial Infringement Contentions. The citation of prior art herein and the accompanying exhibits is not necessarily intended to reflect Mojawa's claim construction contentions, and may instead reflect Mojawa's understanding of Plaintiff's apparent (and potentially erroneous) claim constructions implied by its Initial Infringement Contentions. Nothing stated herein should be treated as an admission or suggestion that Mojawa agrees with Plaintiff regarding either the scope of any of the Asserted Claims or the claim constructions apparently being advanced in Plaintiff's Initial Infringement Contentions. Moreover, nothing in these Contentions constitutes an admission or acquiescence that any of Mojawa's accused products, features, or technology meets any limitation of the Asserted Claims.

Pursuant to the Court's Local Patent Rules, Mojawa has provided disclosures and related documents pertaining to the Asserted Claims as identified by Plaintiff in its Initial Infringement Contentions. Mojawa will further supplement its document productions should it later find additional, responsive documents, such as documents produced by third-parties in response to discovery requests. Much of the prior art identified below reflects common knowledge and the state of the art before the alleged priority date(s) of the Asserted Patents.

Each of the Asserted Claims is invalid for being anticipated by and/or obvious in view of one or more items of prior art identified herein, alone or in combination. Specific examples of this anticipation and obviousness, along with the motivation to combine the identified prior art, are set forth in Sections V and VI, *infra*. *See* Exhibits A1-A8, B1-B7.

In addition to the prior art identified below and the accompanying invalidity claim charts, Mojawa also incorporates by reference any prior art disclosed at any time during the prosecution of the Asserted Patents or related patents, by parties in the present litigation, or by any party during any past, present, or future litigation or U.S. Patent and Trademark Office proceeding involving the Asserted Patents or related patents.

I. ALLEGED PRIORITY DATES

In its Initial Infringement Contentions, Plaintiff contends that each of the Asserted Claims of the Asserted Patents is entitled to an earliest priority date of the filing date of Chinese Application No. 201910009927.4 (the "CN '927 Application"):

- '084 Patent: January 5, 2019
- '582 Patent: January 5, 2019

In its February 13, 2025, Initial Response to Defendant's Non-Infringement and Invalidity Contentions ("Plaintiff's Response"), Plaintiff argued that both the CN '927 Application and PCT/CN2019/102397 support the Asserted Claims of the Asserted Patents. *See* Plaintiff's Response at 6-29. However, Plaintiff's Response shows the discrepancy of the disclosure of the CN '927 Application; most notably, as shown in Plaintiff's side-by-side comparison charts of the CN '927 Application and PCT/CN2019/102397, the CN '927 Application does not support the Asserted Claims of the Asserted Patents. *Id.* at 7-29. Plaintiff is not entitled to its claimed priority dates for at least the reasons set forth below. To the extent that Plaintiff is later permitted to modify, and in fact modifies in any manner, the alleged priority date for the Asserted Claims of the Asserted Patents, Mojawa reserves the right to respond and challenge that date. Mojawa further reserves the right to amend and/or supplement these Contentions in response to any modification of the alleged priority date.

A. ’084 Patent Priority Date

Mojawa contends that the ’084 Patent is entitled to a priority date of no earlier than December 30, 2020. Key limitations of asserted independent claim 1 of the ’084 patent, were not disclosed in the Chinese priority application CN109788386A (Application No. 201910009927.4), including at least the limitations “elastic *waterproof* material” and “the control circuit or the battery driving the earphone core to vibrate, the vibration of the earphone core generating a driving force to drive a housing panel of the core housing to vibrate, the driving force being not parallel to a normal line of the housing panel.” Rather, those claim elements were disclosed for the first time in the U.S. application of the ’084 patent filed on Dec. 30, 2020. Therefore, the ’084 Patent is entitled to a priority date of no earlier than December 30, 2020.

B. ’582 Patent Priority Date

Mojawa contends that the ’582 Patent is entitled to a priority date of no earlier than December 30, 2020. Key limitations of asserted independent claim 1 of the ’582 patent, were not disclosed in the Chinese priority application CN109788386A (Application No. 201910009927.4), including at least the limitations “elastic *waterproof* material,” “the core housing including a housing panel facing human body and a housing back panel opposite to the housing panel,” “the vibration of the earphone core drives the housing panel and the housing back panel to vibrate, the vibration of the housing panel having a first phase, the vibration of the housing back panel having a second phase, wherein when the vibration frequencies of the housing panel and the housing back panel is within a range of 2000 Hz to 3000 Hz, an absolute value of a difference between the first phase and the second phase is less than 60 degrees,” and “the control circuit or the battery driving the earphone core to vibrate to generate a sound.” Rather, those claim elements were disclosed for the first time in the U.S. application of the ’582

patent filed on Dec. 30, 2020. Therefore, the ’582 Patent is entitled to a priority date of no earlier than December 30, 2020.

II. STATE OF THE ART

The prior art identified herein and discussed in the exhibits attached hereto may be relied on to show the state of the art prior to Plaintiff’s alleged priority dates for the Asserted Patents. This prior art identification is only exemplary and is not in any way intended to limit the scope of what one of ordinary skill in the art would have understood, or the breadth of the state of the art, at this time period. Mojawa reserves the right to rely upon additional prior art, information, testimony, and/or knowledge to demonstrate what one of ordinary skill in the art would have understood prior to Plaintiff’s alleged priority dates for the Asserted Claims of the Asserted Patents.

For example, modular audio portions of headsets, including speakers, control circuits, and batteries, were well-known as of the priority date of the Asserted Patents. The speakers were modular for various reasons, including sound quality, ease of use, aesthetics, user comfort (*see* US 2008/0279409 (“Hupkes”) at [0007]), component replacements and removability, upgrades, changes, shape simplification, reducing manufacturing and production costs due to the simple shape of components (*see* US 7,672,469 (“Dyer”) at 2:4-15, US 2016/0080853 (“Chen”) at [0004], US 9,866,966 (“Lott”) at 2:6-17, US 2018/0316999 (“Bellas”) at [0056], [0079], [0085], [0096]), comfort, safety, wearing stability (*see* US 8,515,103 (“Mei”) at 11:5-8), allowing for different uses, and configurations other than listening to music or speech (*see* Lott at 2:6-17). The control circuit and/or battery portions were modular for various reasons, such as circuit and power module configuration options (*see* Chen at [0017]), and removable batteries for replacement or charging (*see* Lott at 5:19-6:17). Modular electrical connections were achieved

through various connectors, including plugs, jacks, and pins. *See* Dyer at 3:21-35; US 2014/0126742 ("Eggebraaten") at Figs. 1-15, [0009]-[0015], [0035], [0045].

It was also known for bone conduction speakers to generate sounds in the 2000 Hz to 3000 Hz range. *See* US 2016/0329041 ("Qi '041"), [0075]; CN 106937222A ("Liao '222"), [0078].[1]

Furthermore, a Person of Ordinary Skill in the Art ("POSITA") would be familiar with the "coronal axis of the human body" and the "sagittal axis of the human body" ('084 Patent, Claim 15) through his or her work in acoustic technology. *See, e.g.,* Stanley A Gelfand, *Hearing: An Introduction to Psychological and Physiological Acoustics* (2010).

Mojawa may further rely upon the Admitted Prior Art disclosed in the Asserted Patents, including but not limited to the concepts discussed therein, and the following exemplary admissions:

- "Generally, people can hear the sound because air transmits vibration to the eardrum through the external ear canal, and the vibration formed by the eardrum drives the human auditory nerve, thereby perceiving the sound. At present, earphones are widely used in people's lives. For example, users can use earphones to play music, answer calls, etc. Earphones have become an important item in people's daily life. Ordinary earphones can no longer meet the normal use of users in some special scenes (e.g., swimming, rainy days, etc.). Thus, earphones with waterproof function and better sound quality are more popular with consumers. Therefore, it may be necessary to provide a loudspeaker apparatus with waterproof function and easy to produce and assemble." '582 at 1:20-32; '084 at 1:20-32.

- "The storage device may include but is not limited to common types of storage devices such as a solid-state storage device (a solid-state drive, a solid-state hybrid hard drive, etc.), a mechanical hard drive, a USB flash drive, a memory stick, a storage card (e.g., CF, SD, etc.), and other drives (e.g., CD, DVD, HD DVD, Blu-ray, etc.), a random access memory (RAM), a read-only memory (ROM), etc. The RAM may include but is not limited to a decimal counter, a selection tube, a delay line memory, a Williams tube, a dynamic random access memory (DRAM), a static random access memory (SRAM), a thyristor random access memory (T-RAM), a zero capacitive random access memory (Z-

[1] Certified English translations of non-English references are cited throughout Mojawa's Final Invalidity Contentions, unless otherwise noted.

RAM), etc. The ROM may include but is not limited to a magnetic bubble memory, a magnetic button line memory, a thin film memory, a magnetic plating line memory, a magnetic core memory, a drum memory, an optical disk driver, a hard disk, a magnetic tape, an early non-volatile memory (NVRAM), a phase change memory, a magneto-resistive random access memory, a ferroelectric random access memory, a non-volatile SRAM, a flash memory, an electronically erasable rewritable read-only memory, an erasable programmable read-only memory, a programmable read-only memory, a shielded heap read memory, a floating connection gate random access memory, a nano random access memory, a racetrack memory, a variable resistance memory, a programmable metallization unit, etc." '582 at 6:44-7:5; '084 at 6:53-7:14.

Mojawa may also rely on certain prior art technologies and/or prior art systems and references as describing or indicating the state of the art, as known to a person of skill in the art, at the time of Plaintiff's alleged priority dates for the Asserted Claims of the Asserted Patents. These include all technologies, systems, and references cited in the Asserted Patents and related patent applications and/or raised during any proceedings before the U.S. Patent and Trademark Office. Mojawa may rely on articles, publications, textbooks and/or physical devices to establish the state of the art at the time of Plaintiff's alleged priority dates for the Asserted Claims of the Asserted Patents. At a minimum, the following technologies and references were part of the state of the art, and would have been known to a person of skill in the art, at the time of the alleged priority dates for the Asserted Claims of the Asserted Patents:

- Earphones, including earphones with waterproof function and better sound quality, *see*, *e.g.*, '582 at 1:20-32; '084 at 1:20-32;
- Wearable bone conduction earphones, *see*, *e.g.*, Shokz's AS800 product;
- Storage devices, including solid-state storage devices, mechanical hard drives, a USB flash drive, a memory stick, a storage card (e.g., CF, SD, etc.), and other drives (e.g., CD, DVD, HD DVD, Blu-ray, etc.), a random access memory (RAM), a read-only memory (ROM), etc., *see*, *e.g.*, '582 at 6:44-7:5; '084 at 6:53-7:14.

Mojawa may also rely on patents and/or publications that encompass the state of the art at the time of Plaintiff's alleged priority dates.

III. IDENTIFICATION OF PRIOR ART

In addition to the prior art identified in the Asserted Patents and their prosecution history, Mojawa intends to rely upon the prior art identified below. Mojawa provides the full identity of each item of prior art, including each patent or published application by its patent or publication number, country of origin, and date of issue or publication. Mojawa identifies each item of prior art based on currently available information and reserves the right to amend the information provided and/or provide further information as it becomes known to Mojawa.

Mojawa's identification of patents and publications as prior art herein and in the exhibits attached hereto under 35 U.S.C. §§ 102 and 103 includes the patents and publications themselves as well as the use, sale, and/or offer for sale of the products, devices, and/or systems described therein. Although Mojawa's investigation continues, information available to date indicates that such products, devices, and/or systems were known or used before Plaintiff's alleged priority date for the Asserted Claims. Upon information and belief, these prior art products, devices, and/or systems and their associated references anticipate and/or render obvious each of the Asserted Claims. Mojawa further intends to rely on inventor admissions concerning the scope of the prior art relevant to the Asserted Patents found in, inter alia, the prosecution history of the Asserted Patents and any related patents, patent applications, and/or re-examinations; any past deposition testimony of the named inventor of the Asserted Patents and/or of any omitted inventors; and the papers filed and any evidence submitted by Plaintiff in conjunction with this litigation.

Mojawa reserves the right to supplement these Contentions to incorporate discovery regarding prior art systems that may be related to the Asserted Patents, as necessary. Mojawa reserves the right to rely upon additional evidence of invalidity obtained from third-parties in the

future. Mojawa also reserves the right to advance a contention that the Asserted Patents are invalid under 35 U.S.C. § 115 in the event that Mojawa obtains further evidence to assert that the alleged invention in the Asserted Patents, or any part of it, derived from any other individual besides the listed inventor on the face of the Asserted Patents.

A. Prior Art Patents / Patent Applications

Mojawa contends that the following prior art patents and published patent applications anticipate or render obvious one or more Asserted Claims of the Asserted Patents under 35 U.S.C. § 102 and/or 103, or show the state of the art as of the alleged priority date for the Asserted Claims.

1. ’582 Patent

Country	Patent/Publication No.	Filing/Publication/Issue Date	Inventor (et al.)
CN	107454492A	Filing Date: 2017-08-18 Publication Date: 2017-12-08	Li ’492
CN	106937222A	Filing Date: 2015-08-13 Publication Date: 2017-07-07	Liao ’222
US	2016/0329041	Filing Date: 2014-12-17 Publication Date: 2016-11-10	Qi ’041
CN	104023288A	Filing Date: 2014-05-23 Publication Date: 2014-09-03	Du ’288
JP	2008294872A	Filing Date: 2007-05-26 Publication Date: 2008-12-04	Numata ’872
US	2016/0269838	Filing Date: 2016-05-25 Publication Date: 2016-09-15	Harte ’838
CN	205356672U	Filing Date: 2015-12-24 Publication Date: 2016-06-29	Wang ’672

Country	Patent/Publication No.	Filing/Publication/Issue Date	Inventor (et al.)
CN	205017577U	Filing Date: 2015-10-19 Publication Date: 2016-02-03	Xu ’577
US	2008/0279409	Filing Date: 2007-05-11 Publication Date: 2008-11-13	Hupkes
US	7,672,469	Filing Date: 2005-11-17 Issue Date: 2010-03-02	Dyer
US	2016/0080853	Filing Date: 2014-09-17 Publication Date: 2016-03-17	Chen
US	9,866,966	Filing Date: 2016-05-20 Issue Date: 2018-01-09	Lott
US	2018/0316999	Filing Date: 2017-04-26 Publication Date: 2018-11-01	Bellas
US	8,515,103	Filing Date: 2010-11-22 Issue Date: 2013-08-20	Mei
US	2014/0126742	Filing Date: 2013-11-05 Publication Date: 2014-05-08	Eggebraaten
US	5,987,147	Filing Date: 1998-07-29 Issue Date: 1999-11-16	Nishimoto
US	8,223,997	Filing Date: 2008-08-06 Issue Date: 2012-07-17	Wilson, II
US	8,111,860	Filing Date: 2007-10-29 Issue Date: 2012-02-07	Retchin
CN	202931524U	Filing Date: 2012-05-16 Publication Date: 2013-05-08	Asaka

Country	Patent/Publication No.	Filing/Publication/Issue Date	Inventor (et al.)
WO	2009/086838	Filing Date: 2009-01-06 Publication Date: 2009-07-16	Nielsen
JP	2007189269A	Filing Date: 2005-12-22 Publication Date: 2007-07-26	Nakada

2. ’084 Patent

Country	Patent/Publication No.	Filing/Publication/Issue Date	Inventor (et al.)
CN	107454492A	Filing Date: 2017-08-18 Publication Date: 2017-12-08	Li ’492
WIPO	WO 2008/007666	Filing Date: 2007-07-10 Publication Date: 2008-01-17	Fujita ’666
US	10,778,824	Filing Date: 2017-01-12 § 371(c)(1), (2) Date: 2018-07-18	Hosoi ’824
CN	106937222A	Filing Date: 2015-08-13 Publication Date: 2017-07-07	Liao ’222
US	2016/0329041	Filing Date: 2014-12-17 Publication Date: 2016-11-10	Qi ’041
CN	104023288A	Filing Date: 2014-05-23 Publication Date: 2014-09-03	Du ’288
JP	2008294872A	Filing Date: 2007-05-26 Publication Date: 2008-12-04	Numata ’872
US	2016/0269838	Filing Date: 2016-05-25 Publication Date: 2016-09-15	Harte ’838
US	9,253,563	Filing Date: 2013-10-25 Publication Date: 2016-02-02	Fukuda ’563
US	2008/0279409	Filing Date: 2007-05-11 Publication Date: 2008-11-13	Hupkes
US	7,672,469	Filing Date: 2005-11-17 Issue Date: 2010-03-02	Dyer
US	2016/0080853	Filing Date: 2014-09-17 Publication Date: 2016-03-17	Chen
US	9,866,966	Filing Date: 2016-05-20 Issue Date: 2018-01-09	Lott

Country	Patent/Publication No.	Filing/Publication/Issue Date	Inventor (et al.)
US	2018/0316999	Filing Date: 2017-04-26 Publication Date: 2018-11-01	Bellas
US	8,515,103	Filing Date: 2010-11-22 Issue Date: 2013-08-20	Mei
US	2014/0126742	Filing Date: 2013-11-05 Publication Date: 2014-05-08	Eggebraaten
US	8,223,997	Filing Date: 2008-08-06 Issue Date: 2012-07-17	Wilson, II
US	8,111,860	Filing Date: 2007-10-29 Issue Date: 2012-02-07	Retchin
CN	202931524U	Filing Date: 2012-05-16 Publication Date: 2013-05-08	Asaka
US	4,564,955	Filing Date: 1983-10-19 Issue Date: 1986-01-14	Birch
US	2014/0334658	Filing Date: 2013-08-07 Publication Date: 2014-11-13	Wang
US	2016/0241689	Filing Date: 2014-10-30 Publication Date: 2016-08-18	Watanabe

B. Prior Art Publications

Mojawa contends the following prior art publication renders obvious one or more of the Asserted Claims under 35 U.S.C. § 103 or shows the state of the art as of the alleged priority date for the Asserted Claims.

1. ’582 Patent

Publication Title	Date	Publisher	Author (et al.)
Master Handbook of Acoustics, Fifth Edition	2009	McGraw-Hill	Everest
Physics, Eighth Edition	2009	John Wiley & Sons, Inc.	Cutnell

2. ’084 Patent

Publication Title	Date	Publisher	Author (et al.)
Hearing: An Introduction to Psychological and Physiological Acoustics	2010	Informa Healthcare	Gelfand

C. Prior Art Uses, Sales, and/or Offers for Sale[2]

Mojawa contends the following prior art uses, sales, and/or offers for sale anticipate or render obvious one or more of the Asserted Claims under 35 U.S.C. § 102 and/or 103, or show the state of the art as of the alleged priority date for the Asserted Claims.

1. ’582 Patent

Item	Date	Identity of Entities/Persons
AfterShokz AS800 Aeropex Open-Ear Wireless Bone Conduction Headphones	July 2019	Shokz
AfterShokz AS600	June 13, 2017	Shokz

2. ’084 Patent

Item	Date	Identity of Entities/Persons
AfterShokz AS800 Aeropex Open-Ear Wireless Bone Conduction Headphones	July 2019	Shokz
AfterShokz AS600	June 13, 2017	Shokz

[2] Mojawa’s discovery into Shokz’s prior on sale products is ongoing and Mojawa reserves the right to amend these contentions.

IV. *INTER PARTES* REVIEW

Both of the Asserted Patents—the ’582 and ’084—are the subject of *inter partes* review (“IPR”) proceedings before the U.S. Patent and Trademark Board. The petitions and all associated filings are hereby incorporated herein by reference in their entirety, as are any future petitions for *inter partes* review filed later against the ’582 or ’084 Patent.

- IPR2025-00843 against the ’582 Patent, filed by Mojawa (produced in this litigation at Shokz_0005077-Shokz_0005944);
- PR2025-00842 against the ’084 Patent, filed by Mojawa (produced herewith to Shokz by Mojawa at MOJAWA0008887-MOJAWA0009863).

V. PRIOR ART INVALIDITY GROUNDS

The Asserted Claims of the Asserted Patents are directed to obvious combinations of old and familiar steps or elements, each performing the same function it has long been known to perform, which yield nothing more than predictable results. Put another way, the claimed subject matter is obvious because it is nothing more than (i) combinations of prior art elements according to known methods to yield predictable results, (ii) simple substitutions of one known element for another to yield predictable results, (iii) applications of known techniques to known devices ready for improvement to yield predictable results, and/or (iv) obvious to try. One of skill in the art would have been motivated to either modify the prior art identified herein or to combine the prior art in a manner indicated by, for example, their background knowledge, design incentives, effects of demands known to the design community, or other market forces, in particular the desire to improve technology related to speakers and/or acoustics. Further, the prior art discussed in this section addresses many of the same, as well as different, design features of apparatuses, systems, and/or methods for technology related to speakers and/or

acoustics. This would have further motivated one of skill in the art to combine the cited prior art. In view of the simplicity of the claimed subject matter and its use of well-known components with recognized benefits, the common sense of those skilled in the art also would have served as a motivation to combine any of the identified references, and demonstrates that the Asserted Claims of the Asserted Patents would have been obvious.

Mojawa has attached exhibits containing claim charts identifying examples of prior art that anticipate and/or render obvious each Asserted Claim of the Asserted Patents. Specifically, to the extent the attached claim charts cite to a reference for each element or limitation of an Asserted Claim, Mojawa contends that such reference anticipates that claim. In addition, Mojawa contends in the alternative that each Asserted Claim is rendered obvious for the reasons set forth in this document. Finally, in each of the attached claim charts, where Mojawa cites to a particular figure in a prior art reference, the citation encompasses the caption and description of the figure, and any text relating to the figure and the invention disclosed therein. Likewise, where Mojawa cites to particular text regarding a figure, the citation encompasses the corresponding figure, any text relating to the figure, and the invention disclosed therein.

Prior Art Charts

U.S. Patent No. 11,310,582	**U.S. Patent No. 11,197,084**
A1 – Li ’492	B1 – Li ’492
A2 – Liao ’222	B2 – Fujita ’666
A3 – Numata ’872	B3 – Numata ’872
A4 – Harte ’838	B4 – Harte ’838
A5 – Wang ’672	B5 – Fukuda ’563
A6 – Xu ’577	B6 – AfterShokz AS800

U.S. Patent No. 11,310,582	U.S. Patent No. 11,197,084
A7 – AfterShokz AS800	B7 – AfterShokz AS600
A8 – AfterShokz AS600	

To the extent that Plaintiff contends that any one of the prior art references in the attached claim charts does not disclose one or more elements of the Asserted Claims, it would have been obvious to combine each such reference with one or more other prior art references, as discussed more fully below.

As detailed in the attached claim charts and in this document, the Asserted Claims of the Asserted Patents are obvious in view of the state of the prior art alone and/or in combination with the references described in Exhibits A1-A8 and B1-B7, as well as other items of prior art described herein. The alleged "inventions" claimed in the Asserted Claims of the Asserted Patents would have been obvious because the prior art, common knowledge, and the nature of the problems, viewed through the eyes of a person ordinarily skilled in the art, suggested the claimed elements. A person of ordinary skill in the relevant fields would have possessed knowledge and skills rendering him or her capable of combining the prior art references with knowledge in the field and common sense. Moreover, the Asserted Claims represent well-known combinations of familiar and pre-existing elements, yielding only predictable results.

The obviousness combinations set forth in these Contentions reflect Mojawa's present understanding of the potential scope of the claims that Plaintiff appears to be advocating and should not be seen as Mojawa's acquiescence to Plaintiff's interpretation of the patent claims. Mojawa reserves the right to seek leave to amend these Contentions in light of positions that Plaintiff or its expert witnesses may assert concerning claim construction, infringement, validity, and/or subject-matter eligibility issues.

In addition, persons of ordinary skill in the art generally understand a prior art reference as a whole and in the context of other publications and literature. Thus, to understand and interpret any specific statement or disclosure within a prior art reference, such persons would rely on other information within that reference, along with other publications, and on their general scientific knowledge. As noted above, Mojawa will rely upon the prior art items identified herein in their entirety, including un-cited portions.

Additionally, any reference, or combination of references, that anticipates or renders obvious an independent Asserted Claim, also renders obvious any Asserted Claim dependent on that independent Asserted Claim because every element of each dependent Asserted Claim was known by a person of ordinary skill at the time of Plaintiff's alleged priority dates, and it would have been obvious to combine those known elements with the independent Asserted Claims at least as a matter of common sense and routine innovation.

A. '582 Patent Grounds Under 35 U.S.C. §§ 102 and/or 103

Mojawa asserts that the following prior art grounds invalidate the Asserted Claims of the '582 Patent under 35 U.S.C. §§ 102 and/or 103:

Claim	Grounds
1	1. CN 107454492A ("Li '492") in combination with CN 106937222A ("Liao '222") renders obvious this claim. 2. AfterShokz AS800 anticipates this claim. 3. AfterShokz AS600 anticipates this claim.
7	1. Li '492 in combination with Liao '222 renders obvious this claim. 2. Li '492 in combination with Liao '222 and JP 2008294872A ("Numata '872") renders obvious this claim.

8	1. Li ’492 in combination with Liao ’222 and Numata ’872 renders obvious this claim.
9	1. Li ’492 in combination with Liao ’222 and Numata ’872 renders obvious this claim.
10	1. Li ’492 in combination with Liao ’222 and Numata ’872 renders obvious this claim.
11	1. Li ’492 in combination with Liao ’222 and Numata ’872 renders obvious this claim.
13	1. Li ’492 in combination with Liao ’222 renders obvious this claim. 2. Li ’492 in combination with Liao ’222 and US 2016/0269838 (“Harte ’838”) renders obvious this claim. 3. AfterShokz AS800 anticipates this claim. 4. AfterShokz AS600 anticipates this claim.
14	1. Li ’492 in combination with Liao ’222 renders obvious this claim. 2. AfterShokz AS800 anticipates this claim. 3. AfterShokz AS600 anticipates this claim.
15	1. Li ’492 in combination with Liao ’222 renders obvious this claim. 2. AfterShokz AS800 anticipates this claim. 3. AfterShokz AS600 anticipates this claim.
19	1. Li ’492 in combination with Liao ’222, Xu ’577, and Wang ’672 renders obvious this claim. 2. AfterShokz AS800 anticipates this claim. 3. AfterShokz AS600 anticipates this claim.

B. ’084 Patent Grounds Under 35 U.S.C. §§ 102 and/or 103

Mojawa asserts that the following prior art grounds invalidate the Asserted Claims of the ’084 Patent under 35 U.S.C. §§ 102 and/or 103:

Claim	Grounds
1	1. Li ’492 in combination with WO 2008/007666 (“Fujita ’666”) renders obvious this claim. 2. AfterShokz AS800 anticipates this claim. 3. AfterShokz AS600 in combination with Fujita ’666 renders obvious this claim.
7	1. Li ’492 in combination with Fujita ’666 renders obvious this claim. 2. Li ’492 in combination with Fujita ’666 and Numata ’872 renders obvious this claim.
8	1. Li ’492 in combination with Fujita ’666 and Numata ’872 renders obvious this claim.
9	1. Li ’492 in combination with Fujita ’666 and Numata ’872 renders obvious this claim.
10	1. Li ’492 in combination with Fujita ’666 and Numata ’872 renders obvious this claim.
11	1. Li ’492 in combination with Fujita ’666 renders obvious this claim. 2. Li ’492 in combination with Fujita ’666 and Harte ’838 renders obvious this claim. 3. AfterShokz AS800 anticipates this claim.

	4. AfterShokz AS600 in combination with Fujita ’666 renders obvious this claim.
12	1. Li ’492 in combination with Fujita ’666 renders obvious this claim. 2. Li ’492 in combination with Fujita ’666 and US 9,253,563 (“Fukuda ’563) renders obvious this claim. 3. AfterShokz AS800 anticipates this claim. 4. AfterShokz AS600 in combination with Fujita ’666 renders obvious this claim.
13	1. Li ’492 in combination with Fujita ’666 renders obvious this claim. 2. AfterShokz AS800 anticipates this claim. 3. AfterShokz AS600 in combination with Fujita ’666 renders obvious this claim.
14	1. Li ’492 in combination with Fujita ’666 and Fukuda ’563 renders obvious this claim.
15	1. Li ’492 in combination with Fujita ’666 renders obvious this claim. 2. Li ’492 in combination with Fujita ’666 and Fukuda ’563 renders obvious this claim. 3. AfterShokz AS800 anticipates this claim. 4. AfterShokz AS600 in combination with Fujita ’666 renders obvious this claim.

C. Obviousness of Plug Ends and Sockets in Headphone Prior Art

To the extent any prior art reference does not explicitly disclose a "first plug end" "second plug end," "first socket," and/or "second socket" as claimed in the '582 and '084 Patents, these elements were well-known in the headphone prior art to a POSITA at the time of the '582 and '084 Patents. § II (State of the Art evidencing interchangeable audio headset prior art). Modular portions, such as speaker portions and control circuit housing portions, of headsets were well-known as of the priority date of the Asserted Patents. § II.

For example, a POSITA would have found it obvious to include a "first plug end" in Li '492's ear hook using the same general design of its plug-in portions 123. While Li '492 does not disclose a method for the second wire set 124 in plug-in portions 123 to electrically "connect the components inside the two ear hook assemblies 11, such as the battery and the control circuit assembly 14," Li '492, [0069], a POSITA would have found it obvious to configure the plug-in portions 123 with known modular electrical connections such as pins and contacts commonly found in jacks, and plugs, and to include mating pins and contacts in corresponding sockets of the speaker housing and control circuit housing for electrically connecting the ear hook to those housings. Dyer, 3:21-35; Eggebraaten, Figs. 1-15, [0009]-[0015], [0035], [0045]. A POSITA would have been motivated to use such known modular electrical connections for the additional benefit of reducing manufacturing costs and complexity. Eggebraaten, [0031] ("inexpensive to manufacture"), Fig. 13.

Accordingly, it would have been obvious for a POSITA to add an ear hook including a "first plug end" to Li '492 between the ear hook and earphone core given that modular speaker portions of headsets were well-known as of the priority date of the Asserted Patents. Providing the "first plug end" would have achieved the well-known benefits of a modular speaker. For example, the '582 Patent mentions reducing manufacturing cost and adjusting for design changes

as a benefit of its modular design, which modular designs were known to do. ’582 Patent, 11:58-12:3, 16:21-32.

Li ’492 similarly renders obvious the “second plug end.” The prior art teaches the benefits of detachable components in a modular headphone design similar, for example, to the ’582 Patent’s circuit housing for accommodating a control circuit or a battery. Chen, [0015], [0017], Figs. 1, 3 (detachable “power module...adapted for providing the circuit module (3) and the earphone modules with the necessary working power supply”); Lott, 4:2-5, Fig. 3 (in-ear monitor with a removable battery); 5:19-6:17; Mei, 22:23-23:2, 23:64-24:8, Figs. 17, 19 (headphones with a removable wireless carrier with battery unit). The prior art also teaches various electrical connectors for connecting modular pieces electrically. Dyer, 3:21-35; Eggebraaten, Figs. 1-15. Accordingly, it would have been obvious for a POSITA to add an ear hook including a “second plug end” to Li ’492 between the ear hook and circuit housing given that modular speaker portions of headsets were well-known as of the priority date of the Asserted Patents. This design in Li ’492 would achieve well-known modular earphone benefits, including simplifying the structure and reducing costs, especially when it comes to replacing the housing containing the earphone’s battery or control circuit. *See* Li ’492, [0059]; *see also* Dyer, 2:4-15; Chen, [0004]; Lott, 2:6-17, Bellas, [0056], [0079], [0085], [0096]. Such a design would involve structures already used in Li ’492 and slight modifications to where they appear in the device.

Further, Li ’492 teaches that “[b]y connecting the plug-in portion 123 of the rear hook assembly 12 with the first housing 111 of the two ear hook assemblies 11, the issue of large earphone size caused by screw fixation in existing bone conduction earphones are improved, simplifying the structure, reducing the weight of bone conduction earphones, facilitating later wiring, and reducing costs.” Li ’492, [0059]. Li ’492 further teaches that the rear suspension

assembly 12 contains wires "to connect the components inside the two ear hook assemblies 11, such as the battery and the control circuit assembly 14." *Id.*, [0069], Fig. 12. It therefore would have been obvious to a POSITA to modify the ear hook assembly 11 of Li '492 to include a "first plug end" and "second plug end" on either side of connecting component 113 to connect the first housing 111 and second housing 112. Li '492, [0023]. Li '492 already discloses plug ends in its design and recognizes their benefits in a modular earphone design, including reducing earphone size, simplifying the structure, facilitating later wiring, and reducing manufacturing costs and complexity. *Id.*, [0059]. A POSITA would have recognized these benefits would be further realized by adding plug ends to other components of the earphones, including on either end of connecting component 113. The design would require nothing more than adding Li '492's already designed plug ends to that portion of the device. The first housing 111 in Li '492 is already designed to receive and connect such plug ends. A POSITA would have found it obvious in Li '492 to locate sockets that mate with plug-in portions 123 on the corresponding end of connecting component 113 at the other end of first housing 111 for the same reasons it would have been obvious to add sockets to the bone conduction speaker housing corresponding to the plug ends added to connecting component 113 proximate the bone conduction speaker housing.

VI. MOTIVATION TO COMBINE

Generally, it would have been obvious to one of ordinary skill in the art to combine any of these references to arrive at the claimed invention. The combination of familiar elements according to known methods is obvious here because it yielded predictable results. Motivation to combine any two or more of the identified references comes from the fact that all of the systems and references relate to speaker technology. A person of ordinary skill in the art would have been

motivated to combine the various teachings by considerations of efficiency, effectiveness, convenience, cost-savings, and accessibility.

The Asserted Claims are directed to obvious combinations of old and familiar steps or elements, each performing the same function it has long been known to perform, which yield nothing more than predictable results. Put another way, the claimed subject matter is obvious because it is nothing more than (i) combinations of prior art elements according to known methods to yield predictable results, (ii) simple substitutions of one known element for another to yield predictable results, (iii) applications of known techniques to known devices ready for improvement to yield predictable results, and/or (iv) obvious to try. One of skill in the art would have been motivated to either modify the prior art identified herein or to combine the prior art in a manner indicated by, for example, their background knowledge, design incentives, effects of demands known to the design community, or other market forces. In view of the simplicity of the claimed subject matter and its use of well-known components with recognized benefits, the common sense of those skilled in the art also would have served as a motivation to combine any of the identified references, and demonstrates that the Asserted Claims would have been obvious.

The obviousness combinations set forth in these Contentions reflect Mojawa's present understanding of the potential scope of the claims that Plaintiff appears to be advocating and should not be seen as Mojawa's acquiescence to Plaintiff's interpretation of the patent claims. Mojawa reserves the right to amend or supplement these Contentions regarding anticipation and/or obviousness of the Asserted Claim as appropriate, including in response to further information from Plaintiff or information obtained through discovery.

In addition, persons of ordinary skill in the art generally understand a prior art system and/or reference as a whole and in the context of other publications and literature. Thus, to understand and interpret any specific statement or disclosure within a prior art system and/or reference, such persons would rely on other information within that system and/or reference, along with other publications, and on their general scientific knowledge. As noted above, Mojawa will rely upon the prior art items identified herein in their entirety, including un-cited portions.

A. ’582 Patent

Mojawa contends that the Asserted Claims of the ’582 Patent are invalid for being anticipated by, or obvious in view of, at least the prior art references below for at least the following reasons.

1. Li ’492 in Combination with Liao ’222

At the time of the ’582 Patent, a POSITA would have found it obvious to combine Li ’492 and Liao ’222 by using bone conduction speakers as taught by Liao ’222 in bone conduction earphones as taught by Li ’492 because, although Li ’492 describes most of the earphone device structure, it lacks details on the bone conduction speaker design, including their vibration mechanism. These contemporaneous references are within the same field: bone conduction earphones. Li ’492, [0002]-[0005], [0024], [0040]; Liao ’222, Figs. 4, 12, 14-A, 14-B, 15, 16-A, [0117]-[0118]. Liao ’222 acknowledges that bone conduction speakers were known. Liao ’222, [0002]. A POSITA would, therefore, have been motivated to look to known designs such as Liao ’222’s and to use Liao ’222’s bone conduction speaker design in a bone conduction earphones such as those described in Li ’492, and understood that a Li ’492-Liao ’222 combination was practical.

A POSITA would have recognized the benefit of using Liao ’222’s bone conduction speaker in Li ’492 because Liao ’222 teaches a bone conduction speaker with “improve[d] sound quality.” Liao ’222, [0003], [0053], [0054], [0070], [0074]-[0075]. A POSITA would have understood, for example, that the design and preferred materials of Liao ’222’s bone conduction speaker would enhance Li ’492’s sound quality. That improvement would have motivated a POSITA to make the combination.

Combining Li ’492 with Liao ’222 would involve applying known techniques (Liao ’222’s bone conduction speaker) to a known device ready for improvement (Li ’492’s bone conduction earphones) to yield predictable results (operating bone conduction earphones with improved sound quality). A POSITA would have had a reasonable expectation of success in the combination because Li ’492’s earphones are explicitly designed to be worn over the ear to transfer vibrations to the side of the user’s head, which matches Liao ’222’s design. Liao ’222, Figs. 14-A, 14-B, 15; Li ’492 , Fig. 2. A POSITA would have had a reasonable expectation that the Li ’492-Liao ’222 modification would be successful because the teachings of Li ’492 and Liao ’222 would have been predictably combined due to the predictability of the bone conduction speaker art and known interchangeability elements including vibration mechanisms and housing.

A POSITA would have been motivated to combine Li ’492 and Liao ’222 because they have a common assignee (Shenzhen Shokz Co., Ltd.), a common inventor (Qi Xin), and the open-ear with ear-hook headset designs are similar, as shown in Li ’492 Figure 2 and Liao ’222 Figure 14-B. Li ’492 , (71), (72), Fig. 2; Liao ’222, (73), (72), Fig. 14-B.

A POSITA would have further been motivated to select Liao ’222’s embodiment without the connection members 240 and the rigid connection between panel 210 and housing 220 in order to simplify the design and manufacture of the speaker and therefore reduce costs.

If Shokz argues the portions of Li ’492 and Liao ’222 cited in Mojawa’s invalidity contentions relate to different, incompatible embodiments (they do not), a POSITA would have found it obvious to combine such embodiments into a single device at least because such embodiments are described in the same prior art reference, are fully compatible with each other, and could be combined with minimal effort to achieve predictable results. Moreover, Mojawa does not assert that Li ’492 and Liao ’222 can be bodily incorporated, and establishing obviousness does not require demonstrating that the references were capable of bodily incorporation. *In re Mouttet*, 686 F.3d 1322, 1332 (Fed. Cir. 2012).

2. Li ’492-Liao ’222 in Combination with Numata ’872

A POSITA would have found it obvious to modify Li ’492-Liao ’222 with Numata ’872, including Numata ’872’s insertion part 47 on the plug ends in Li ’492-Liao ’222, Numata ’872’s hollow cylinder 65 design for the sockets in Li ’492-Liao ’222, and the U-shaped fastener to connect a claimed “second plug end” in Li ’492 (*see* element [1a]) to Li ’492’s “circuit housing” (third housing 114 and first housing 111). Numata ’872, Fig. 1. A POSITA would have been motivated to do so because Li ’492-Liao ’222 and Numata ’872 are within the same field (wearable speaker headsets) requiring tightly fitting components. Li ’492, [0062]-[0064], [0036]; Liao ’222, [0177]-[0178]; Numata ’872, [0011], [0020].

Numata ’872 discloses a wireless headset connecting an earhook via a plug on the earhook (insertion part 47) and socket (hollow cylinder 65). Numata ’872, Figure 8. A POSITA would have looked to Numata ’872 as being in the same field as Li ’492 and Liao ’222 and sharing a similar design: tightly connecting headset components with earhooks. Numata ’872

teaches that insertion part 47 can be connected "no matter in which direction" it is inserted in hollow cylinder 65. Numata '872, [0034]. A POSITA would have recognized the connection between the insertion part 47 and hollow cylinder 65 as a secure fit operating snugly on a user's head. Numata '872, Fig. 8.

Similarly, Li '492's plug ends need a secure "tight fit" between components and "wear resistance" for head friction from active use. Li '492, [0062]-[0064], [0036]. A POSITA would have looked to Numata '872 to improve the plugs and sockets of the Li '492-Liao '222 earphones, including to improve wear-resistance and add Numata '872's convenient bi-directional plugging. A POSITA would have recognized the benefit of Numata '872's insertion part 47 and hollow cylinder 65 in the Li '492-Liao '222 earphones, including as the plug and socket connecting the ear hook to the core housing and locating the Numata '872 socket on the core housing. This benefit would have motivated the combination.

Numata '872 discloses a U-shaped fastening mechanism where a U-shaped cross-sectional elastic piece 45 is inserted into a through hole (square hole 44) to firmly fix a plug (shaft part 22) into a socket (hole 41). Numata '872, [0023]-[0024], Figs. 4-5, 8-9. The mechanism connects the earhook to the rest of the headset. Numata '872, Figs. 4-5.

Similarly, Li '492 needs its disclosed plugs and sockets to have a "tight fit," Li '492, [0062]-[0064], [0036], and includes a fastener ("locking piece") placed in a through hole (opening 1112) to fix plug-in portion 123 to plug-in hole 1111. Li '492, [0060]-[0061], Figs. 9-10. But Li '492's locking piece is not shown in Figures 9-10. *Id.*, [0060].

A POSITA would therefore have looked to Numata '872 for a specific, effective fastener design to construct Li '492's locking piece and facilitate the tight connection of the plugs and sockets of the Li '492-Liao '222 earphones—for example, the second plug end and the circuit

housing socket. A POSITA would have been motivated to do so to achieve wear-resistance of the Li ’492-Liao ’222 device and the tight fitting of its components. A POSITA would have recognized the benefit of using Numata ’872’s U-shaped fastening mechanism in the Li ’492-Liao ’222 earphones for these reasons. The benefit of providing such improvement would have motivated the POSITA to make the combination.

Combining Numata ’872 with Li ’492-Liao ’222 would apply known techniques (ear hook/speaker headset construction) to a known device ready for improvement (Li ’492-Liao ’222’s earphones) to yield predictable results (ear hook speakers with improved plugs and sockets). A POSITA would have had a reasonable expectation of success in the combination because Li ’492-Liao ’222 has plugs and sockets, including a socket in the circuit housing, which is similar to Numata ’872’s improved ear hook-headset connection. A POSITA would have had a reasonable expectation of modification success because the references’ teachings were predictably combinable due to the predictability of ear hook speaker art and manufacturing, and known component interchangeability.

Furthermore, regarding for example the ’582 patent claim 10, it would have been obvious to a POSITA to have Li ’492’s “protective sleeve” extend to the side of Numata ’872’s “annular table surface” because Li ’492 already has an analogous “protective sleeve” (second elastic coating layer 122) form an annular table surface shape proximate Li ’492’s plug-in portion 123, as shown in Li ’492 Figures 2 and 9.

Also, regarding for example the ’582 patent claim 7, a POSITA also would have been motivated to combine Numata ’872’s “first socket” to “the outer end surface of the core housing” in Li ’492 for the reasons discussed above, including in a smaller size to allow for use with the Li ’492 invention.

If Shokz argues the portions of Numata ’872 cited in Mojawa’s invalidity contentions relate to different, incompatible embodiments (they do not), a POSITA would have found it obvious to combine such embodiments into a single device because such embodiments are described in the same prior art reference, are fully compatible with each other, and could be combined with minimal effort to achieve predictable results.

3. Li ’492-Liao ’222 in Combination with Harte ’838

A POSITA would have found it obvious to modify Li ’492-Liao ’222 with Harte ’838’s “protective sleeve.” Harte ’838, FIGS. 1C, 2A, 2B, [0006], [0008], [0041], [0044], [0050]-[0055], [0061]. A POSITA would have been motivated to do so because Li ’492-Liao ’222 and Harte ’838 are within the same field of bone conduction speakers.

Harte ’838 discloses “a protective sleeve for a hearing prosthesis sound processor” that is “a shell formed from a substantially flexible material.” Harte ’838 at [0008]. The invention “substantially prevent[s] the ingress of water, dust, and other contaminants that could potentially damage the electrical elements of the sound processor.” *Id.*, [0051]-[0055]. It is waterproof and dustproof, such as a “soft silicone material.” *Id.*

A POSITA would have looked to Harte ’838 as being in the same field as Li ’492 and Liao ’222 and to Harte ’838’s protective sleeve as sharing a similar design to Li’s elastic coating layers. *E.g.*, Li ’492 at [0023], [0030]-[0034], [0036], Figs. 1-3. It therefore would have been obvious to a POSITA to add Harte ’838’s protective sleeve to “wrap[] around periphery of the circuit housing” (Li ’492’s third housing 114 and first housing 111) as claimed in ’582 claim 13 and ’084 claim 11 in order to achieve the protective benefits of the sleeve as disclosed in Harte ’838. A POSITA would have looked to Harte ’838 to improve the Li ’492-Liao ’222 earphones, including to improve wear-resistance. *See* Li ’492 at [0036]-[0037], [0056], [0071]. The benefits of Harte ’838 would have motivated the combination.

Combining Harte ’838 with Li ’492-Liao ’222 would apply known techniques (bone conduction speaker device construction) to a known device ready for improvement (Li ’492-Liao ’222’s earphones) to yield predictable results (ear hook speakers with improved wear resistance). A POSITA would have had a reasonable expectation of success in the combination because Li ’492-Liao ’222 already discloses protective elastic coatings similar to Harte ’838’s protective sleeve. A POSITA would have had a reasonable expectation of modification success because the references’ teachings were predictably combinable due to the predictability of the wearable speaker art and manufacturing, and known component interchangeability.

If Shokz argues the portions of Harte ’838 cited in Mojawa’s invalidity contentions relate to different, incompatible embodiments (they do not), a POSITA would have found it obvious to combine such embodiments into a single device because such embodiments are described in the same prior art reference, are fully compatible with each other, and could be combined with minimal effort to achieve predictable results.

4. Li ’492-Liao ’222 in Combination with Wang ’672 and/or Xu ’577

A POSITA would have found it obvious and been motivated to modify Li ’492-Liao ’222 with Wang ’672 and/or Xu ’577 and to use the Wang ’672 and Xu ’577 components and orientations amongst each other.

Liao ’222 discloses a bone conduction speaker “magnetic circuit system.” Liao ’222, [0052], [0053], [0143], [0145], [0148]-[0152], [0171], Figs. 11, 18-A, 18-B, 22-A. Wang ’672 and Xu ’577 offer improved loudspeaker magnetic circuit systems. Wang ’672, Abstract; Xu ’577, Abstract, [0005]. Wang ’672 improves magnetic circuit efficiency. Wang ’672, [0005]. Xu ’577 improves the magnetic circuit system structure, addressing low loudspeaker magnetic flux density and smaller magnetic field force against the voice coil. Xu ’577, [0002]-[0003].

A POSITA would have looked to Wang ’672 and Xu ’577 to improve the Li ’492-Liao ’222 earphone magnetic circuit system with a strong, efficient magnetic field. The references are in the same field of magnetic circuit system speakers. A POSITA would have found the magnetic speaker system components and orientations in Wang ’672 and Xu ’577 interoperable, and recognized the benefit of their improvements, motivating the combinations.

Combining Li ’492-Liao ’222 and Wang ’672 and Xu ’577 involved applying known techniques (magnetic circuit speaker design and construction) to a known device ready for improvement (Li ’492-Liao ’222’s earphone magnetic circuit system) to yield predictable results (improved magnetic circuit system). A POSITA would have had a reasonable expectation of success in the combinations because the references disclose speaker magnetic circuit systems. A POSITA would have found that the teachings of Li ’492-Liao ’222 with Wang ’672 and Xu ’577 would have been predictably combined due to the predictability of the magnetic circuit system speaker art and known component interchangeability.

If Shokz argues the portions of Wang ’672 and Xu ’577 cited in Mojawa’s invalidity contentions relate to different, incompatible embodiments (they do not), a POSITA would have found it obvious to combine such embodiments into a single device at least because such embodiments are described in the same prior art reference, are fully compatible with each other, and could be combined with minimal effort to achieve predictable results.

B. ’084 Patent

Mojawa contends that the Asserted Claims of the ’084 Patent are invalid for being anticipated by, or obvious in view of, at least the prior art references below for at least the following reasons.

1. Li ’492 in Combination with Fujita ’666

At the time of the ’084 Patent, a POSITA would have found it obvious to combine Li ’492 and Fujita ’666 by using bone conduction speakers of the type taught by Fujita ’666 in bone conduction earphones of the type taught by Li ’492 because, although Li ’492 describes most of the earphone structure, it lacks details on the bone conduction speaker design, including the design of the vibration mechanism, and therefore a POSITA would have looked to other references in the field for details of such design. These contemporaneous references are within the same field: bone conduction speaker devices. Li ’492, [0002]-[0005], [0024], [0040]; Fujita ’666, [0001]-[0002]. Fujita ’666 acknowledges bone conduction speakers were known. Fujita ’666, [0002]. A POSITA would, therefore, have been motivated to use Fujita ’666’s construction of the bone conduction speakers and would have been capable of combining the disclosures of Li ’492 and Fujita ’666 to do so.

A POSITA would have recognized the benefit of using Fujita ’666’s bone conduction speaker in Li ’492 because Fujita ’666 teaches a bone conduction speaker that “efficiently transmit[s] the output vibration” due to the speaker’s design making “accurate contact with the face.” Fujita ’666, [0007]-[0017]. A POSITA would have understood, for example, that the design of Fujita ’666’s bone conduction speaker would enhance the efficiency of transmitting sound using the Li ’492 earphones. The benefit of providing such improvement would have motivated the POSITA to make the combination.

Combining Li ’492 with Fujita ’666 would simply involve applying known techniques (Fujita ’666’s bone conduction speaker) to a known device ready for improvement (Li ’492’s bone conduction earphones) to yield predictable results (operating bone conduction earphones with improved sound efficiency). A POSITA would have had a reasonable expectation of success in the combination because Li ’492’s earphones are designed to be worn over the ear

with the bone conduction speaker touching the side of the user's head to transfer vibrations and generate sound, which is the same orientation in which Fujita '666's bone conduction speaker is designed to be used. Li '492, Figs. 1-2; Fujita '666, Figs. 1, 6, 8. A POSITA would have had a reasonable expectation that the modification would be successful because the teachings of Li '492 and Fujita '666 would have been predictably combined due to the predictability of the bone conduction speaker art and the known interchangeability of elements including vibration mechanisms and housing.

If Shokz argues the portions of Li '492 and Fujita '666 cited in Mojawa's invalidity contentions relate to different, incompatible embodiments (which they do not), it would have been obvious to a POSITA to combine such embodiments into a single device at least because such embodiments are described in the same prior art reference, are fully compatible with each other, and could be combined with minimal effort to achieve predictable results. Moreover, Mojawa does not assert that Li '492 and Fujita '666 can be bodily incorporated, and establishing obviousness does not require demonstrating that the references were capable of bodily incorporation. *In re Mouttet*, 686 F.3d 1322, 1332 (Fed. Cir. 2012).

2. Li '492-Liao '222 in Combination with Numata '872

See above ('582 Patent Motivations to Combine).

3. Li '492-Fujita '666 in Combination with Harte '838

A POSITA would have found it obvious to modify Li '492- Fujita '666 with Harte '838's "protective sleeve." Harte '838, FIGS. 1C, 2A, 2B, [0006], [0008], [0041], [0044], [0050]-[0055], [0061]. A POSITA would have been motivated to do so because Li '492- Fujita '666 and Harte '838 are within the same field of bone conduction speakers.

Harte '838 discloses "a protective sleeve for a hearing prosthesis sound processor" that is "a shell formed from a substantially flexible material." Harte '838 at [0008]. The invention

"substantially prevent[s] the ingress of water, dust, and other contaminants that could potentially damage the electrical elements of the sound processor." *Id.*, [0051]-[0055]. It is waterproof and dustproof, such as a "soft silicone material." *Id.*

A POSITA would have looked to Harte '838 as being in the same field as Li '492 and Fujita '666 and to Harte '838's protective sleeve as sharing a similar design to Li's elastic coating layers. *E.g.*, Li '492 at [0023], [0030]-[0034], [0036], Figs. 1-3. It therefore would have been obvious to a POSITA to add Harte '838's protective sleeve to "wrap[] around periphery of the circuit housing" (Li '492's third housing 114 and first housing 111) as claimed in '582 claim 13 and '084 claim 11 in order to achieve the protective benefits of the sleeve as disclosed in Harte '838. A POSITA would have looked to Harte '838 to improve the Li '492- Fujita '666 earphones, including to improve wear-resistance. *See* Li '492 at [0036]-[0037], [0056], [0071]. The benefits of Harte '838 would have motivated the combination.

Combining Harte '838 with Li '492- Fujita '666 would apply known techniques (bone conduction speaker device construction) to a known device ready for improvement (Li '492-Fujita '666's earphones) to yield predictable results (ear hook speakers with improved wear resistance). A POSITA would have had a reasonable expectation of success in the combination because Li '492- Fujita '666 already discloses protective elastic coatings similar to Harte '838's protective sleeve. A POSITA would have had a reasonable expectation of modification success because the references' teachings were predictably combinable due to the predictability of the wearable speaker art and manufacturing, and known component interchangeability.

If Shokz argues the portions of Harte '838 cited in Mojawa's invalidity contentions relate to different, incompatible embodiments (they do not), a POSITA would have found it obvious to combine such embodiments into a single device because such embodiments are described in the

same prior art reference, are fully compatible with each other, and could be combined with minimal effort to achieve predictable results.

4. Li ’492-Fujita ’666 in Combination with Fukuda ’563

At the time of the ’084 Patent, it would have been obvious to a POSITA to combine Li ’492-Fujita ’666 with Fukuda ’563, specifically Fukuda ’563’s magnetic circuit system vibration mechanism in place of Fujita ’666’s piezoelectric mechanism in its bone conduction speaker, and a POSITA would have been motivated to do so.

Magnetic circuit systems were commonly found in speakers at the time of Li ’492 and Fujita ’666, including bone conduction speakers at the time of Li ’492, in order to provide efficient, high-quality sound. Liao ’222, [0052], [0053] (“high-density permanent magnets” in bone conduction speaker achieve “better sound quality”), [0143], [0145], [0148]-[0152], [0171], Figures 11, 18-A, 18-B, 22-A; Wang ’672, [0005], [0013] (“magnetic steels in the middle of the voice coil” in a loudspeaker “significantly improv[es] the electromechanical conversion efficiency”); Xu ’577, [0002]-[0003]; Nielsen, 4:1-12; Nakada, Abstract, Fig. 2(b), [0016]-[0029]. Fukuda ’563 offers an improved bone conduction speaker with a magnetic circuit system that is “simple in construction, allowing the manufacturing cost to be held at a minimum, and yet is completed as an independent unit with minimized sound leakage,” allowing it to be incorporated in devices. Fukuda ’563, 3:6-28.

A POSITA at the time would understand that the sound quality of a magnetic speaker driver like Fukuda ’563’s is generally higher than that of a piezoelectric driver, and that it is easier to fine tune the frequency response of a magnetic driver like Fukuda ’563’s to achieve desired performance. Therefore, a POSITA would have looked to Fukuda ’563 to improve the speaker in the Li ’492-Fujita ’666 earphones with a magnetic circuit system vibration mechanism in place of Fujita ’666’s piezoelectric mechanism including the multilayer columnar

piezoelectric element 12 and base weight 13, in order to provide the benefits of a magnetic circuit system, such as efficient, high-quality sound, and simple construction. Regarding, for example, the ’084 patent claim 14, it would have been obvious to a POSITA to add Fukuda ’563’s “coil” (voice coil 13) and “magnetic circuit system” (center pole 12, yoke 11, rod-shaped magnets 14) from the Fukuda ’563 “earphone core” to the Fujita ’666 “earphone core” in place of Fujita ’666’s piezoelectric mechanism. It furthermore would be obvious to a POSITA that in the Li ’492-Fujita ’666-Fukuda ’563 combination, “the housing panel and the earphone core” would remain “in a transmission connection” because that is how both Fujita ’666 and Fukuda ’563 are constructed. The type of vibration mechanism would merely be changed from piezoelectric to magnetic. A POSITA would look to Fukuda ’563 for inspiration and improvement of the Li ’492-Fujita ’666 earphone speakers.

Combining Li ’492-Fujita ’666 with Fukuda ’563 would simply involve applying known techniques (*i.e.*, magnetic circuit speaker design and construction) to a known device ready for improvement (Li ’492-Fujita ’666’s bone conduction speaker) to yield predictable results (bone conduction speaker with a magnetic circuit system). A POSITA would have had a reasonable expectation of success in the combination because the Li ’492-Fujita ’666 earphones already disclose bone conduction speakers, and Fukuda ’563 discloses the use of a magnetic circuit system in such speakers. A POSITA thus would have had a reasonable expectation that modifying Li ’492-Fujita ’666 with Fukuda ’563 would be successful due to the predictability of the art of bone conduction speakers with magnetic circuit systems and the known interchangeability of the various elements, including the components of manufacture.

Furthermore, regarding for example the ’084 patent claim 14, a POSITA would find it obvious that in adding Fukuda ’563’s magnetic circuit system “earphone core” in place of Fujita

’666’s piezoelectric mechanism “earphone core” in the Li ’492-Fujita ’666-Fukuda ’563 combination, “an axis of” Fukuda ’593’s “coil or the magnetic circuit system” would not be “parallel to the normal line” in Fujita ’666, “the axis being perpendicular to a radial plane of the coil or the magnetic circuit system,” because the normal line of Fujita ’666 is angled and would therefore not be parallel to “the radial plane of the coil or the magnetic circuit system.” Fujita ’666, Figure 2.

It would have been obvious to a POSITA to use the bone conduction speaker of Fujita ’666 with the Li ’492 earphones for the reasons discussed above. A POSITA would have further found it obvious to angle the bone conduction speaker in Fujita ’666 with the “component” in the “third quadrant” or “first quadrant” (’084 Patent, Claim 15) when used in the Li ’492 earphones because Fujita ’666 teaches that is the optimal positioning of its bone conduction speaker when used: “As shown in Figure 7A, the ***ideal usage posture*** of the bone conduction receiver 1 of the embodiment is to be arranged substantially parallel to the face 52a.” Fujita ’666, [0038], Figs. 6, 7A, 8.

If Shokz argues the portions of Fukuda ’563 cited in Mojawa’s invalidity contentions relate to different, incompatible embodiments (which they do not), it would have been obvious to a POSITA to combine such embodiments into a single device at least because such embodiments are described in the same prior art reference, are fully compatible with each other, and could be combined with minimal effort to achieve predictable results.

Therefore, a POSITA would have considered it obvious to modify the Li ’492-Fujita ’666 earphones with Fukuda ’563’s magnetic circuit system for use in the Fujita ’666 bone conduction speaker for the benefits described above.

5. AfterShokz AS600 in Combination with Fujita ’666

At the time of the ’084 Patent, a POSITA would have found it obvious to combine AfterShokz AS600 and Fujita ’666 by using bone conduction speakers of the type taught by Fujita ’666 in bone conduction earphones of the type taught by AfterShokz AS600. A POSITA would have recognized the benefit of using Fujita ’666’s bone conduction speaker in AfterShokz AS600 because Fujita ’666 teaches a bone conduction speaker that “efficiently transmit[s] the output vibration” due to the speaker’s design making “accurate contact with the face.” Fujita ’666, [0007]-[0017]. A POSITA would have understood, for example, that the design of Fujita ’666’s bone conduction speaker would enhance the efficiency of transmitting sound using the AfterShokz AS600 earphones. Indeed, Shokz moved to an angled housing panel design similar to that in Fujita ’666 just two years later after the release of the AS600 in its subsequent model, the AS800. *Compare* Fujita ’666, Abstract, [0027], [0030], [0037], Fig. 2 *with* AfterShokz AS800 User Guide 1, 4. The benefit of providing such improvement would have motivated the POSITA to make the combination.

These references are within the same field: bone conduction speaker devices. AfterShokz AS600 User Guide; Fujita ’666, [0001]-[0002]. Fujita ’666 acknowledges bone conduction speakers were known long before the AfterShokz AS600. Fujita ’666, [0002]. A POSITA would, therefore, have been motivated to use Fujita ’666’s construction of the bone conduction speakers and would have been capable of combining the disclosures of AfterShokz AS600 and Fujita ’666 to do so.

Combining AfterShokz AS600 with Fujita ’666 would simply involve applying known techniques (Fujita ’666’s bone conduction speaker) to a known device ready for improvement (AfterShokz AS600’s bone conduction earphones) to yield predictable results (operating bone conduction earphones with improved sound efficiency). A POSITA would have had a reasonable

expectation of success in the combination because AfterShokz AS600's earphones are designed to be worn over the ear with the bone conduction speaker touching the side of the user's head to transfer vibrations and generate sound, which is the same orientation in which Fujita '666's bone conduction speaker is designed to be used. AfterShokz AS600 User Guide, 1, 2, 4; Fujita '666, Figs. 1, 6, 8. A POSITA would have had a reasonable expectation that the modification would be successful because the teachings of AfterShokz AS600 and Fujita '666 would have been predictably combined due to the predictability of the bone conduction speaker art and the known interchangeability of elements including vibration mechanisms and housing.

If Shokz argues the portions of AfterShokz AS600 and Fujita '666 cited in Mojawa's invalidity contentions relate to different, incompatible embodiments (which they do not), it would have been obvious to a POSITA to combine such embodiments into a single device at least because such embodiments are described in the same prior art reference, are fully compatible with each other, and could be combined with minimal effort to achieve predictable results. Moreover, Mojawa does not assert that AfterShokz AS600 and Fujita '666 can be bodily incorporated, and establishing obviousness does not require demonstrating that the references were capable of bodily incorporation. *In re Mouttet*, 686 F.3d 1322, 1332 (Fed. Cir. 2012).

VII. INVALIDITY UNDER 35 U.S.C. § 112

In addition to the other grounds of invalidity set forth herein, Mojawa contends that the Asserted Claims of the Asserted Patents are invalid under 35 U.S.C. § 112 for lack of written description, lack of enablement, and indefiniteness. These Contentions shall not be construed as an admission that any claim construction advanced by Mojawa in this case is in any way inconsistent, flawed, or erroneous. Nor should these Contentions prevent Mojawa from advancing claim construction and/or non-infringement positions in lieu of, or in addition to,

invalidity positions. Further, these Contentions shall not be construed as an admission of or acquiescence to Plaintiff's purported construction of the claim language or of other positions advanced by Plaintiff during the course of this litigation. Mojawa's Invalidity Contentions under 35 U.S.C. § 112 may depend, in part, on the Court's claim construction, as well as Plaintiff's alleged scope of the Asserted Claims of the Asserted Patents. As such, Mojawa only identifies the issues under 35 U.S.C. § 112 of which they are presently aware and reserves the right to challenge any additional claim terms under 35 U.S.C. § 112 and reserves the right to revise, amend, and/or supplement the information provided herein.

A. Lack of Written Description (35 U.S.C. § 112 ¶ 1)

The Asserted Claims of the Asserted Patents are invalid because they fail to meet the "written description" requirement of 35 U.S.C. § 112 ¶ 1. *See e.g. Ariad v. Lilly*, 598 F.3d 1336 (Fed. Cir. 2010) (en banc); *LizardTech Inc. v. Earth Resource Mapping, Inc.*, 424 F.3d 1336, 1345 (Fed. Cir. 2005) (finding claims invalid under 35 U.S.C. § 112 where the specification failed to include a written description of the full scope of the claimed invention); *In re Katz Interactive Call Processing Pat. Litig.*, 639 F.3d 1303, 1320 (Fed. Cir. 2011) ("[W]hen analyzing whether a patent meets the written description requirement, one cannot 'bootstrap' the knowledge of a person of ordinary skill in the art ('POSITA') into the analysis and fill the gap in the disclosure through obviousness.").

1. '084 Patent

Mojawa contends that the Asserted Claims of the '084 patent are invalid under 35 U.S.C. § 112 ¶ 1 because the '084 specification lacks adequate written description of at least the following claim limitations:

Patent/Claim	Term
’084 Patent, Claim 1	“the driving force being not parallel to a normal line of the housing panel”
’084 Patent, Claim 13	“wherein when a straight line of the driving force has a positive direction”
’084 Patent, Claim 15	“wherein the driving force has a component in a first quadrant or a third quadrant of an XOY plane coordinate system”
’084 Patent, Claim 15	“an origin O of the XOY plane coordinate system is on a contact surface between the loudspeaker apparatus and a human body, an X-axis of the XOY plane coordinate system is parallel to a coronal axis of the human body, a Y-axis of the XOY plane coordinate system is parallel to a sagittal axis of the human body, a positive direction of the X-axis faces outside of the human body, and a positive direction of the Y-axis faces front of the human body”

For example, the ’084 patent describes its XOY plane coordinate system by means of four different quadrants, but it is unclear what those four quadrants are. For instance, the patent defines two of those quadrants in the same way. ’084 Patent, 18:36-19:28 (“the lower left region (***the region enclosed by the positive half axis of the X axis and the negative half axis of the Y axis***) is the third quadrant, and the lower right region (***the region enclosed by the positive half axis of the X axis and the negative half axis of the Y axis***) is the fourth quadrant”). Accordingly, claim 15 of the ’084 patent lacks adequate written description.

To the extent other Asserted Claims contain one or more of these terms or phrases, either directly or through being a dependent claim of a claim that does, those Asserted Claims of the ’084 Patent are invalid under 35 U.S.C. § 112 ¶ 1.

2. ’582 Patent

Mojawa contends that the Asserted Claims of the ’582 patent are invalid under 35 U.S.C. § 112 ¶ 1 because the ’582 specification lacks adequate written description of at least the following claim limitations:

Patent/Claim	Term
’582 Patent, Claim 1	“the vibration of the earphone core drives the housing panel and the housing back panel to vibrate, the vibration of the housing panel having a first phase, the vibration of the housing back panel having a second phase, wherein when the vibration frequencies of the housing panel and the housing back panel is within a range of 2000 Hz to 3000 Hz, an absolute value of a difference between the first phase and the second phase is less than 60 degrees”
’582 Patent, Claim 15	“wherein the vibration of the housing panel generates a first leaked sound wave, the vibration of the housing back panel generates a second leaked sound wave, wherein the first leaked sound wave and the second leaked sound wave are superimposed on each other, which reduces an amplitude of the first leaked sound wave”

For example, the ’582 Patent does not define its claimed “leaked sound waves,” nor explain how the leaked sound waves—generated by panels vibrating nearly in-phase (“an absolute value of a difference between the first phase and the second phase is less than 60 degrees”) would result in a ***reduction*** of amplitude of the first leaked sound wave, not an ***increase*** in amplitude of the first leaked sound wave. Claim 15 is internally contradictory with claim 1 from which claim 15 depends. Claim 1 requires the vibrations of the housing panel and housing back panel to be nearly in-phase. ’582 Patent, claim 1 (“an absolute value of a difference between the first phase and the second phase is less than 60 degrees”). Claim 15 requires that when the housing panel’s leaked soundwave and the housing back panel’s leaked soundwave are “superimposed on each other,” the amplitude of the first leaked sound wave is “***reduce[d]***.” ’582 Patent, claim 15 (emphasis added). The “leaked soundwaves” are not defined by the patent.

Nonetheless, superimposed, in-phase soundwaves would necessarily result in an ***increase*** in amplitude of the first leaked sound wave, not a reduction. John D. Cutnell & Kenneth W. Johnson, *Physics* 508-11 (8th ed. 2009); F. Alton Everest & Ken C. Pohlmann, *Master Handbook of Acoustics* 135-49 (5th ed. 2009). Accordingly, claim 15 of the ’582 patent lacks adequate written description.

To the extent other Asserted Claims contain one or more of these terms or phrases, either directly or through being a dependent claim of a claim that does, those Asserted Claims of the ’582 Patent are invalid under 35 U.S.C. § 112 ¶ 1.

B. Enablement (35 U.S.C. § 112 ¶ 1)

The Asserted Claims of the Asserted Patents are invalid because the Asserted Patents do not enable one of ordinary skill in the art to make and/or use the full scope of certain recited elements of the Asserted Claims without undue experimentation. *See, e.g., United States v. Telectronics, Inc.*, 857 F.2d 778, 785, 8 USPQ2d 1217, 1223 (Fed. Cir. 1988) (“The test of enablement is whether one reasonably skilled in the art could make or use the invention from the disclosures in the patent coupled with information known in the art without undue experimentation.”); *Trustees of Bos. Univ. v. Everlight Elecs. Co.*, 896 F.3d 1357, 1362 (Fed. Cir. 2018) (“to be enabling, the specification of a patent must teach those skilled in the art how to make and use the full scope of the claimed invention without ‘undue experimentation.’”).

1. ’084 Patent

The following terms render one of more of the claims of the ’084 Patent invalid for lack of enablement under 35 U.S.C. § 112, as the claims, specification, and prosecution histories would not enable one of skill in the art to practice the claimed invention(s) without undue experimentation:

Patent/Claim	Term
’084 Patent, Claim 1	“the driving force being not parallel to a normal line of the housing panel”
’084 Patent, Claim 13	“wherein when a straight line of the driving force has a positive direction”
’084 Patent, Claim 15	“wherein the driving force has a component in a first quadrant or a third quadrant of an XOY plane coordinate system”
’084 Patent, Claim 15	“an origin O of the XOY plane coordinate system is on a contact surface between the loudspeaker apparatus and a human body, an X-axis of the XOY plane coordinate system is parallel to a coronal axis of the human body, a Y-axis of the XOY plane coordinate system is parallel to a sagittal axis of the human body, a positive direction of the X-axis faces outside of the human body, and a positive direction of the Y-axis faces front of the human body”

For example, the ’084 patent describes its XOY plane coordinate system by means of four different quadrants, but it is unclear what those four quadrants are. For instance, the patent defines two of those quadrants in the same way. ’084 Patent, 18:36-19:28 (“the lower left region (***the region enclosed by the positive half axis of the X axis and the negative half axis of the Y axis***) is the third quadrant, and the lower right region (***the region enclosed by the positive half axis of the X axis and the negative half axis of the Y axis***) is the fourth quadrant”). Accordingly, claim 15 of the ’084 patent lacks enablement.

To the extent other Asserted Claims contain one or more of these terms or phrases, either directly or through being a dependent claim of a claim that does, those Asserted Claims of the ’084 Patent are invalid under 35 U.S.C. § 112 ¶ 1.

2. ’582 Patent

The following terms render one of more of the claims of the ’582 Patent invalid for lack of enablement under 35 U.S.C. § 112, as the claims, specification, and prosecution histories

would not enable one of skill in the art to practice the claimed invention(s) without undue experimentation:

Patent/Claim	Term
’582 Patent, Claim 1	“the vibration of the earphone core drives the housing panel and the housing back panel to vibrate, the vibration of the housing panel having a first phase, the vibration of the housing back panel having a second phase, wherein when the vibration frequencies of the housing panel and the housing back panel is within a range of 2000 Hz to 3000 Hz, an absolute value of a difference between the first phase and the second phase is less than 60 degrees”
’582 Patent, Claim 15	“wherein the vibration of the housing panel generates a first leaked sound wave, the vibration of the housing back panel generates a second leaked sound wave, wherein the first leaked sound wave and the second leaked sound wave are superimposed on each other, which reduces an amplitude of the first leaked sound wave”

For example, the ’582 Patent does not define its claimed “leaked sound waves,” nor explain how the leaked sound waves—generated by panels vibrating nearly in-phase (“an absolute value of a difference between the first phase and the second phase is less than 60 degrees”) would result in a ***reduction*** of amplitude of the first leaked sound wave, not an ***increase*** in amplitude of the first leaked sound wave. Claim 15 is internally contradictory with claim 1 from which claim 15 depends. Claim 1 requires the vibrations of the housing panel and housing back panel to be nearly in-phase. ’582 Patent, claim 1 (“an absolute value of a difference between the first phase and the second phase is less than 60 degrees”). Claim 15 requires that when the housing panel’s leaked soundwave and the housing back panel’s leaked soundwave are “superimposed on each other,” the amplitude of the first leaked sound wave is “***reduce[d]***.” ’582 Patent, claim 15 (emphasis added). The “leaked soundwaves” are not defined by the patent. Nonetheless, superimposed, in-phase soundwaves would necessarily result in an ***increase*** in

amplitude of the first leaked sound wave, not a reduction. John D. Cutnell & Kenneth W. Johnson, *Physics* 508-11 (8th ed. 2009); F. Alton Everest & Ken C. Pohlmann, *Master Handbook of Acoustics* 135-49 (5th ed. 2009). Accordingly, claim 15 of the ’582 patent lacks enablement.

To the extent other Asserted Claims contain one or more of these terms or phrases, either directly or through being a dependent claim of a claim that does, those Asserted Claims of the ’582 Patent are invalid under 35 U.S.C. § 112 ¶ 1.

C. Indefiniteness (35 U.S.C. § 112 ¶ 2)

The Asserted Claims of the Asserted Patents are invalid because they fail to meet the definiteness requirement of 35 U.S.C. § 112 ¶ 2, for failing to particularly point out and distinctly claim the subject matter the applicants regard as their alleged invention. *See, e.g.*, *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901, (2014) (“a patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention.”). In particular, the Asserted Claims of the Asserted Patents are indefinite because of at least the terms or phrases listed in the Table below. Further, Mojawa incorporates by reference the arguments on indefiniteness that will be included in their Markman briefing.

1. ’084 Patent

The following terms render one or more claims of the ’084 Patent indefinite under 35 U.S.C. § 112:

Patent/Claim	Term
’084 Patent, Claims 1, 13 ,15	“driving force”
’084 Patent, Claim 11	“integrally formed”

’084 Patent, Claim 15	“wherein the driving force has a component in a first quadrant or a third quadrant of an XOY plane coordinate system”
’084 Patent, Claim 15	“an origin O of the XOY plane coordinate system is on a contact surface between the loudspeaker apparatus and a human body, an X-axis of the XOY plane coordinate system is parallel to a coronal axis of the human body, a Y-axis of the XOY plane coordinate system is parallel to a sagittal axis of the human body, a positive direction of the X-axis faces outside of the human body, and a positive direction of the Y-axis faces front of the human body”

For example, the ’084 patent describes its XOY plane coordinate system by means of four different quadrants, but it is unclear what those four quadrants are. For instance, the patent defines two of those quadrants in the same way. ’084 Patent, 18:36-19:28 (“the lower left region (***the region enclosed by the positive half axis of the X axis and the negative half axis of the Y axis***) is the third quadrant, and the lower right region (***the region enclosed by the positive half axis of the X axis and the negative half axis of the Y axis***) is the fourth quadrant”). Accordingly, claim 15 of the ’084 patent is indefinite and invalid.

To the extent other Asserted Claims contain one or more of these terms or phrases, either directly or through being a dependent claim of a claim that does, those Asserted Claims of the ’084 Patent are invalid under 35 U.S.C. § 112 ¶ 2.

The Asserted Claims of the ’084 Patent are further indefinite because they fail to inform, with reasonable certainty, those skilled in the art about the scope of the alleged invention.

2. ’582 Patent

The following terms render one or more claims of the ’582 Patent indefinite under 35 U.S.C. § 112:

Patent/Claim	Term
’582 Patent, Claim 1	“a first phase”
’582 Patent, Claim 1	“a second phase”
’582 Patent, Claim 13	“integrally formed”
’582 Patent, Claim 14	“the vibration signal”
’582 Patent, Claim 15	“first leaked soundwave”
’582 Patent, Claim 15	“second leaked soundwave”
’582 Patent, Claim 15	“wherein the first leaked sound wave and the second leaked sound wave are superimposed on each other, which reduces an amplitude of the first leaked sound wave”

For example, the ’582 Patent does not define its claimed “leaked sound waves,” nor explain how the leaked sound waves—generated by panels vibrating nearly in-phase (“an absolute value of a difference between the first phase and the second phase is less than 60 degrees”) would result in a ***reduction*** of amplitude of the first leaked sound wave, not an ***increase*** in amplitude of the first leaked sound wave. Claim 15 is internally contradictory with claim 1 from which claim 15 depends. Claim 1 requires the vibrations of the housing panel and housing back panel to be nearly in-phase. ’582 Patent, claim 1 (“an absolute value of a difference between the first phase and the second phase is less than 60 degrees”). Claim 15 requires that when the housing panel’s leaked soundwave and the housing back panel’s leaked soundwave are “superimposed on each other,” the amplitude of the first leaked sound wave is “***reduce[d]***.” ’582 Patent, claim 15 (emphasis added). The “leaked soundwaves” are not defined by the patent. Nonetheless, superimposed, in-phase soundwaves would necessarily result in an ***increase*** in amplitude of the first leaked sound wave, not a reduction. John D. Cutnell & Kenneth W. Johnson, *Physics* 508-11 (8th ed. 2009); F. Alton Everest & Ken C. Pohlmann, *Master Handbook of Acoustics* 135-49 (5th ed. 2009). Accordingly, claim 15 of the ’582 patent is indefinite and invalid.

To the extent other Asserted Claims contain one or more of these terms or phrases, either directly or through being a dependent claim of a claim that does, those Asserted Claims of the ’582 Patent are invalid under 35 U.S.C. § 112 ¶ 2.

The Asserted Claims of the ’582 Patent are further indefinite because they fail to inform, with reasonable certainty, those skilled in the art about the scope of the alleged invention.

VIII. INVALIDITY UNDER 35 U.S.C. § 101

A. Inventorship

A patent must name the correct inventors. 35 U.S.C. § 101 (post-AIA) ("Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title."); *see also* 35 U.S.C. § 115; *BCI Acrylic, Inc. v. Milestone Bath Prods.*, No. 23-CV-908-JPS-JPS, 2024 U.S. Dist. LEXIS 22137, at *13-14 (E.D. Wis. Feb. 8, 2024) (explaining that 35 U.S.C. § 101 should be used post-AIA for inventorship invalidity challenges). Failing to name the correct inventor(s) on a patent renders the patent invalid or unenforceable. *See Bd. of Educ. ex rel. Bd. of Trustees of Fla. State U. v. Am. Bioscience, Inc.*, 333 F.3d 1330, 1344 (Fed. Cir. 2003) ("patents have in the past been held unenforceable for failure to correctly name inventors in cases where the named inventors acted in bad faith or with deceptive intent"). A patent can also be held invalid for naming a non-inventor. *See Pannu v. Iolab Corp.*, 155 F.3d 1344, 1349 (Fed. Cir. 1998) ("Accordingly, if nonjoinder of an actual inventor is proved by clear and convincing evidence . . . a patent is rendered invalid."). To prove that a person is not an inventor, one need not prove who is the true inventor, just that the named inventor contributed nothing to the claimed invention. *Belcher Pharms., LLC v. Hospira, Inc.*, No. 17-CV0775-LPS, 2019 U.S. Dist. LEXIS 103012, at *3 n.1 (D. Del. June 5, 2019) ("A patent may be invalid simply because it names the wrong inventors.").

1. Failure to Name Xudong Wang as an Inventor

The Asserted Patents' listed inventors are the same: "Chaowu Li, Shenzhen (CN); Yongjian Li, Shenzhen (CN)." '084 Patent at (72); '582 Patent at (72). The Asserted Patents both claim priority to Chinese Patent Application Number 201910009927.4 (the "'927 CN Application"). '084 Patent at (30); '582 Patent at (30). The '927 CN Application lists three

inventors: Chaowu Li, Yongjian Li, and Xudong Wang. ’927 CN Application at (72). Thus, to the extent the ’927 CN Application support the claims of the Asserted Patents, the Asserted Patents are invalid and/or unenforceable for failing to name Xudong Wang as an inventor.

2. No Common Inventors Between the ’582 and ’751 Patents

As noted above, the ’582 Patent’s listed inventors are as follows: “Chaowu Li, Shenzhen (CN); Yongjian Li, Shenzhen (CN).” ’582 Patent at (72). U.S. Patent No. 11,115,751 (the “’751 Patent”) lists the following inventors: “Jinbo Zheng, Shenzhen (CN); Fengyun Liao, Shenzhen (CN); Lei Zhang, Shenzhen (CN); Xin Qi, Shenzhen (CN).” ’751 Patent at (72). Even though the ’582 and ’751 Patents have no common inventors, they share nearly identical claim limitations as shown in the tables below.

Patent	Claim No.	Limitation	Patent	Claim No.	Limitation
’751	1	a case comprising a case panel facing a human body side and a case back opposite to the case panel, wherein the case accommodates the vibration component, and the vibration component causes the case panel and the case back to vibrate, a vibration of the case panel having a first phase, a vibration of the case back having a second phase, wherein, when a frequency of the vibration of the case panel and a frequency of the vibration of the case back are within a range of 2000 Hz to 3000 Hz, an absolute value of a difference between the first phase and the second phase is less than 60 degrees	’582	1	a core housing for accommodating an earphone core, the core housing being fixed to the first plug end and elastically abutted against the protective sleeve, wherein the core housing including a housing panel facing human body and a housing back panel opposite to the housing panel, and the vibration of the earphone core drives the housing panel and the housing back panel to vibrate, the vibration of the housing panel having a first phase, the vibration of the housing back panel having a second phase, wherein when the vibration frequencies of the housing panel and the housing back panel is within a range of 2000 Hz to 3000 Hz, an

Patent	Claim No.	Limitation	Patent	Claim No.	Limitation
					absolute value of a difference between the first phase and the second phase is less than 60 degrees
’751	2	the vibration of the case panel has a first amplitude and the vibration of the case back has a second amplitude, and wherein a ratio of the first amplitude to the second amplitude is within a range of 0.5 to 1.5	’582	14	the vibration signal of the housing panel has a first amplitude, the vibration signal of the housing back panel has a second amplitude, and a ratio of the first amplitude to the second amplitude is within a range of 0.5 to 1.5
’751	3	the vibration of the case panel generates a first sound leakage wave and the vibration of the case back generates a second sound leakage wave, and wherein the first sound leakage wave and the second sound leakage wave have an overlapping that reduces the amplitude of the first sound leakage wave	’582	15	the vibration of the housing panel generates a first leaked sound wave, the vibration of the housing back panel generates a second leaked sound wave, wherein the first leaked sound wave and the second leaked sound wave are superimposed on each other, which reduces an amplitude of the first leaked sound wave

Accordingly, the ’582 Patent is invalid and/or unenforceable for failing to name the proper inventors.

* * *

Discovery is ongoing, including for inventorship, and Mojawa reserves the right to supplement its inventorship defense.

IX. DOCUMENT PRODUCTION UNDER LPR 3.3

Herewith with its Final Invalidity Contentions, Mojawa produces documents Bates stamped MOJAWA0008887-MOJAWA0010483 and MOJAWA0010526-MOJAWA0010602 as prior art identified pursuant to LPR 3.1(b) and related documents.

Dated: June 12, 2025

Respectfully submitted,

By: */s/ Shaobin Zhu*

Matthew Satchwell (Bar No. 6290672)
matthew.satchwell@us.dlapiper.com
Benjamin Mueller
benjamin.mueller@us.dlapiper.com
Farris Matariyeh
farris.matariyeh@us.dlapiper.com
DLA PIPER LLP (US)
444 West Lake Street, Suite 900
Chicago, IL 60606-0089
Telephone: 312.368.4000
Facsimile: 312.236.7516

Shaobin Zhu (WA-59747)
shaobin.zhu@us.dlapiper.com
DLA PIPER LLP (US)
701 Fifth Avenue, Suite 6900
Seattle, WA 98104
Tel: (206) 839 4894
Fax: (206) 494 1794

Michael L. Burns
michael.burns@us.dlapiper.com
DLA PIPER LLP (US)
One Liberty Place
1650 Market Street, Suite 5000
Philadelphia, PA 19103-7300
Tel: (215) 656 2443

Attorneys for Defendant SUZHOU MOJAWA INTELLIGENT ELECTRONIC CO., LTD

CERTIFICATE OF SERVICE

I, Shaobin Zhu, hereby certify that on June 12, 2025, a copy of the foregoing was served on all counsel of record via electronic mail.

/s/ Shaobin Zhu
Shaobin Zhu