The AIPLA's
2017-2018 Giles Sutherland Rich Memorial
Moot Court Competition Problem

This year's problem involves a dispute between the University of Neptune School of Medicine ("UNSM") and a company called HeadSpace over a United States Patent, referred to as the '873 Patent. Two issues are on appeal to the United States Court of Appeals for the Federal Circuit:

(1) Whether the '873 Patent is obvious under 35 U.S.C. § 103.

(2) Whether Federal Courts have jurisdiction to hear the dispute under 28 U.S.C. § 1338(a).

Oceania is a fictional state in the continental United States, located in the fictional Thirteenth Circuit. The University of Neptune is located in the town of Atlantis. Atlantis is a small town and the University is its largest employer. The University has a number of initiatives to support the town of Atlantis and it is well respected among Atlantis' residents.

HeadSpace is a social media app company that focuses on text-to-speech input to allow users to post messages on public profiles and engage in personal and group messaging conversations. Its headquarters is in the state of Oceania, in the large city of El Dorado on the opposite side of the state from Atlantis.

The dispute stems from the UNSM's Advanced Neuro Technologies Laboratory (the "ANT Lab") and a HeadSpace product called the Chat Hat.

The ANT Lab

The ANT Lab's goal is to investigate brain-machine interface technologies and to help develop thought-to-text and thought-to-thought enabled communication devices through medical neuroscience research. HeadSpace partnered with the UNSM and launched several initiatives to support the ANT Lab.

Under the partnership agreement between the UNSM and HeadSpace, HeadSpace has a right to license and commercially develop any patent that is developed at the ANT Lab arising from the partnership. The royalty rate of 4% is favorable for HeadSpace and the terms are pre-negotiated. In return, HeadSpace must: "Fund a UNSM-led study to investigate the social and economic impact that the development of devices covered by each valid ANT Lab patent has had on both the United States and the world as a whole." ("Study Clause"). The UNSM maintains the right to enforce ANT Lab patents, and HeadSpace agrees to join as a co-plaintiff in enforcement actions if necessary for standing purposes. The agreement provides that it "shall be interpreted exclusively in accordance with Oceania law."

The University of Neptune is a private institution. Its mission requires it to pursue the public interest and greater global good. It relies heavily on donations and grants for financial support. The Study Clause is designed to help the ANT Lab stay true to the University's mission, and to help produce evidence of results that will lead to donations and other financial support in the future.

The '873 Patent

On January 15, 2012, the '873 Patent issued to the UNSM. The application that led to the '873 Patent was filed on October 12, 2009. No claims were made during prosecution to an earlier priority date. The technology underlying the '873 Patent was developed at the ANT Lab. Claim 1, the only independent claim in the '873 Patent, reads:

1. A method for translating human thoughts into text comprising:

    receiving unique user calibration brainwave data collected by a plurality of brainwave sensors during performance of a predetermined customization protocol;

    customizing a thought-to-text translation algorithm based on the received calibration brainwave data using a machine learning model;

triggering collection of the user's triggered brainwave data to be translated after repetition of a predetermined trigger word by the user;

filtering non-thought brainwave data from the collected triggered brainwave data; and

translating the filtered data into text using the customized translation algorithm.

The specification of the '873 Patent describes: A device that is a portable collection of sensors coupled with a small but powerful computer processor, transceiver, and memory. The device builds on the fundamental fact that the human brain produces electrical signals when a person "thinks." In a laboratory setting, the brain's various electrical signals, or brain waves, can be measured by sensors using electroencephalography (EEG). The device also builds on basic principles of technology-assisted mind-to-mind communication. Mind-to-mind communication works by collecting the signals produced by a sender's brain using EEG and using those signals to stimulate a response in a receiver's brain using Transcranial Magnetic Stimulation (TMS). More specifically, the electrical impulses detected by the sender's device may be converted into transmittable data packets that are received by the device, which converts the data packets into corresponding electrical pulses and delivers those pulses to the recipient's brain in the form of electrical stimuli. In this way, the receiving person receives the "thought" created by the sender. These signals may be transmitted over a wide range of distances, via a local or closed communication network, or even the Internet.

The device sensors measure a specific subset of the brainwaves produced by a user's brain. This discrete subset of brainwaves was identified following the discovery by the ANT Lab inventors that, unlike a human recipient, a computer only needs a subset of the signals produced by a human brain to produce a translation of "thoughts of speech, characters, or text" into text with acceptable

accuracy. Because of this discovery, the device requires fewer sensors than a laboratory-scale EEG, which requires a large machine that measures all the brain's electrical signals. The device thus provides a portable, lower cost alternative to the larger and more cumbersome laboratory EEG machines.

Before the device can be used, however, it must be "trained" to a particular user. The full translation algorithm and database are too large to store on a small device. Instead, the full database is stored on a remote server. The device utilizes a sophisticated machine learning model that optimizes the device and the translation algorithm for that user, which reduces the amount of memory required such that the device may be used without a permanent Internet connection. To "train" the device, the user must wear the device and perform a standardized series of steps that the machine learning model can use to isolate specific patterns from the user's brainwaves that correspond to certain sensory inputs. During training, the device may also identify brainwave patterns that are unique to an individual user. The training exercises include steps such as singing nursery rhymes printed in the user's manual; inhaling a variety of scents provided on a scratch and sniff page of the user's manual appendices; and viewing a series of short video clips taken from well-known films and television shows. The device collects brainwaves from the user during this calibration procedure and transmits them over the Internet to the remote server. A machine learning model stored on and implemented by the remote server analyzes the user's brainwaves, optimizes the translation algorithm, and returns the optimized algorithm to the user's device.

Even with the training procedure, it is difficult for the device's processor to isolate brainwaves that correspond to conscious thoughts, because a user's brain produces a chaotic collection of signals. In order for the processor to successfully isolate the signals produced by an individual's conscious thoughts, a user of the device must repeatedly "think" a specific keyword before he or she "thinks" the message to be translated. The keyword must be something fanciful

that a user is unlikely to think casually. Repetition of the keyword prevents accidental triggering of the device's translation algorithm by random thoughts, and also provides the device multiple chances to recognize and verify the keyword amongst the complex collection of brainwaves. The current version of the device requires the user to "think" the word "xylophone" three times.

If all training procedures are precisely followed, the device can translate a user's thoughts into text with greater than 95% accuracy. If training is not properly completed or the user does not think the designated initialization word three times before beginning to think a message, the accuracy of the device's translation may drop dramatically.

The Chat Hat

HeadSpace exercised its right to license the '873 Patent and developed a device called the Chat Hat using the underlying technology. The Chat Hat embodies the '873 Patent as described above.

The License Agreement

The UNSM has multiple licensing agreements with other entities for various ANT Lab technologies; however, the UNSM believes the most exciting technology is the '873 Patent's technology, which is implemented in the Chat Hat. HeadSpace was thrilled when the '873 Patent issued, and HeadSpace immediately expressed its desire to enter into a licensing agreement with the UNSM for this technology. HeadSpace did not have an immediate commercial plan for the Chat Hat but strongly believed in the technology. In fact, HeadSpace was so excited that prior to signing the licensing agreement with the UNSM it did not look at the '873 Patent. When asked if he wanted to discuss the patent, HeadSpace's Chief Executive Officer sent an email to the Agreement Specialist at the UNSM saying that he was "sure the patent is valid because it had been granted and that means the claims must be valid." HeadSpace and the UNSM quickly and readily entered into the agreement on February 5, 2012.

HeadSpace is currently the only licensee of the '873 Patent. The UNSM, however, plans to license the '873 Patent to other entities in the future to generate additional revenue. The UNSM plans to pursue these agreements once the Chat Hat generates enough publicity for the UNSM to be confident that the Chat Hat will be an immediate commercial success in the United States. The UNSM believes the study performed under the Study Clause will be instrumental in eventually marketing the Chat Hat in the United States.

After entering into the licensing agreement, HeadSpace manufactured and provided the Chat Hat for free to doctors, UNSM students, and UNSM staff working in foreign aid medical clinics in remote areas of the world. In such areas, properly sterilized gloves are a precious commodity due to supply limitations, and the Chat Hat allows the staff to communicate about patients as well as to update patient records, without requiring the staff to remove their gloves to use the associated computing device, or risk contaminating their gloves by using the computing device directly.

HeadSpace is certain that the Chat Hat is making a difference in the lives of clinic workers and patients. Everyone who uses the Chat Hat has told HeadSpace how they "could not live without it" and how it has dramatically reduced the number of patient infections due to contamination. There has been one complaint of an alleged glitch in the Chat Hat software. Reportedly, the Chat Hat shut down in the middle of surgery. HeadSpace knows there will be irreparable harm to the reputation of the Chat Hat if this allegation is true or if it leaks out to the public. After a two-hour investigation, HeadSpace determined that the shutdown was caused by user error and it was not an error with the function of the Chat Hat itself.

At this time, HeadSpace is only interested in providing the Chat Hat for the charitable purpose of assisting foreign aid workers in their daily activities. HeadSpace's founders, who are already very wealthy, have found enjoyment building a side of their company that is committed to public service. The Chat Hat is also outside what they view as their core business and they are not

yet ready to commercialize it as a product in the United States. HeadSpace is not even interested in distributing the Chat Hats in the United States for the same charitable purposes because it believes the United States already has relatively good standards of cleanliness in its medical facilities.

HeadSpace is fortunate to be able to manufacture and provide the Chat Hats without receiving compensation because of a sizeable donation from an anonymous donor. The donor sent a note with the donation describing how much he or she appreciates HeadSpace's newfound commitment to public service and how the money should be used to further establish HeadSpace's charitable causes. The UNSM has not diligently monitored any licensing revenue it may be owed by HeadSpace for the Chat Hat, since it is aware that HeadSpace uses the Chat Hat for charitable purposes and assumes that little, if any, licensing revenue is due. There are no lump sum, milestone, or other payments due under the agreement.

The UNSM and HeadSpace both have headquarters about ninety-five miles apart in the state of Oceania. The state's economy thrives on innovation. To promote and retain innovation within the state, the state has appointed a patent agent to a state-created (and state-funded) position to seek opportunities to file patent applications and to prosecute and maintain the patents worldwide.

More importantly in the eyes of the public institutions, the state also provides yearly funding to public institutions based on the number of and potential economic impact of valid patents each institution owns. While the UNSM does not receive such funding, it benefits from collaborations with other state-funded institutions.

The Sandcastle Technology Institute and the Continuation Patent

The Sandcastle Technology Institute (the "STI") is a public institution located in a neighboring city of the UNSM. The STI has the most granted patents of any entity within the state, and its success as a worldwide leader in technological advances in cardiac devices, among other devices, makes it one of the largest generators of revenue for the state. The UNSM and the STI

have had a successful working relationship for over two decades and are oftentimes co-owners of patents with shared technologies. Although the parties are not co-owners of the '873 patent, the UNSM assigned to the STI its rights to a second patent which was originally filed as a continuation of the '873 patent. UNSM's assignment of rights to this continuation patent occurred after the continuation issued, and there are no other issued or pending patent applications claiming priority to either the '873 patent or the continuation patent. The UNSM and the STI both independently believe it is likely that the patent claims of the continuation are an obvious variation of the claims in the '873 patent, although during prosecution the continuation patent never received an obviousness type double patenting rejection and the UNSM never filed a terminal disclaimer.

The state has provided a significant amount of funding to the STI for the continuation patent because it believes the technology could be a game-changer in the field of medicine. The STI has used the bulk of this funding to rapidly develop the next-generation Chat Hat (called the "Convo. Cap"). Both the state and the STI anticipate the Convo. Cap to eventually be a blockbuster worldwide, including in the United States. STI's long-term planning anticipates that the Convo. Cap will bring in one of the highest revenues in the history of medical advances. STI plans to out-license the technology to the highest bidder.

The UNSM's Demand for a Study

HeadSpace had been distributing the Chat Hat to foreign countries for approximately 3 years when trouble first began. The Study Clause in the licensing agreement dictates that HeadSpace must fund a "UNSM-led study to investigate the social and economic impact that the development of devices covered by each valid ANT Lab patent has had on both the United States and the world as a whole." The UNSM relies on such studies to promote its research and public interests policy, with the end-goal of receiving donations and grants in return. Doctors enjoy using the Chat Hat and the UNSM is sure that the Chat Hat actually leads to better patient outcomes. Accordingly, the UNSM

began developing the study that will analyze the safety of the Chat Hat and the net socio-economic impact of Chat Hat compared to more "archaic" communication methods. In particular, the study will involve the doctors, students, and staff that used the Chat Hat, as well as patients exposed to the Chat Hat during treatment. It will be a first-of-a-kind study design that could have significant ramifications not only for the UNSM but for the town of Atlantis and the state.

Recently, word has spread throughout the town of Atlantis, where the UNSM is located, that the Chat Hat has been saving lives in remote foreign clinics and that the utility of the Chat Hat could potentially be broadened to non-clinical uses such as use in gaming systems and in virtual meetings. The ANT Lab has modeled a Chat Hat statue that is 100 times the size of an actual Chat Hat, and has mounted the statue in the main entryway of the UNSM. There has been an influx of visitors from outside Atlantis, and even outside the state, to see this newly emerging and mysterious technology. In fact, a large café opened one month ago in downtown Atlantis, and it was appropriately named the Chat Hat Café. To support the increasing number of out-of-state visitors, the town of Atlantis also saw an increase in the number of boutique hotels in the area. These hotels were also named in honor of the Chat Hat (Chat Hotel, Chat Hat Inn, and Chat Hat B&B). The town also recently passed a proposal to increase its local tax, and the increased revenue is slated to be used to construct walking trails and bike paths and to repair all of the roads' potholes. Before the town becomes too much more reliant on the revenue the Chat Hat visitors bring in, the state is urging the UNSM to complete the study and confirm that the Chat Hat is indeed safe and beneficial within one year.

The study itself will be challenging to fully develop and to implement within the given timeframe. The study protocol will have to be modified at various junctures based on relatively fluid criteria, which will lead to uncertainty for the study completion date. In order to expedite the study, the UNSM plans on using study funds, to be provided by HeadSpace, to add three additional study

coordinators (each paid more than customary and usual because of the remote location and potential hardships).

Further, the study also is likely to be very expensive. The location of the clinic chosen for the study is in a remote and developing part of the world. Neither the UNSM nor HeadSpace have any other operations in the area, and as such, HeadSpace would have to fund, and the UNSM build, a temporary living quarters for the study coordinators. In addition, there is no local market for food or essential items, and so extra resources would be needed to fly in food, water, and other required items on a weekly basis. These items would be obtained from a village approximately fifty kilometers south of the study location and flown in by a helicopter rented with funds to be provided by HeadSpace.

The UNSM is almost finished planning the study and has sent a request to HeadSpace for $1.2 million dollars to provide the required funding under the licensing agreement. Two days after HeadSpace received the request, HeadSpace's CEO sent a reply letter to the UNSM stating that "HeadSpace will not fund the study because the '873 patent is not valid and therefore the Study Clause is not applicable." To further support its position of non-payment, HeadSpace's reply letter further emphasized that HeadSpace has not profited from the Chat Hat and only distributes it in a charitable capacity.

The UNSM responded that the patent is valid and emphasized that the United States Patent and Trademark Office granted the patent without issuing any rejections. The UNSM further explained that according to an Oceania statute enacted in 1973, "a patent licensee cannot challenge the validity of the underlying patent to the license agreement." According to the state legislative history associated with this statute, the public policy and rationale behind the implementation of the state statute is fairly straightforward. This policy is that a licensee should not enter into a licensing agreement that contains a provision(s) dependent upon a patent's validity, wherein the licensee

either has not obtained legal advice regarding the validity of the patent or the licensee determines the patent to be valid at the time of signing the agreement and later changes its mind to avoid fulfilling a contractual obligation.

The state has suffered economically in the past from validity attacks on patents owned by state-sponsored institutions and high-profile companies in the context of licensing agreements. The number of attacks on patent validity has been reduced since the implementation of this statute, since the majority of the patented technologies are out-licensed. Consequently, more institutions and entities within the state are filing more patent applications and entering into an increased number of licensing agreements. The result has been economic growth within the state.

There is no such statute in Oceania that protects a patent outside the context of a licensing agreement. Recently, an *ex parte reexamination* was ordered for the '873 patent. The *ex parte reexamination* was ordered before UNSM filed its complaint against HeadSpace. The decision from the *ex parte reexamination* is expected to be reached soon. The STI is anticipating an *ex parte reexamination* order for its continuation patent based on the similarity between the claimed subject matter.

The UNSM Sues

The UNSM sued HeadSpace for breach of contract in Oceania Superior Court in Atlantis. The UNSM strongly prefers that the case be tried in Atlantis with a local jury. It sought damages for HeadSpace's breach of the Study Clause.

HeadSpace timely removed the suit under 28 U.S.C. § 1446 to the United States District Court for the District of Oceania. The parties do not dispute that the Chat Hat is an embodiment of the '873 Patent. HeadSpace's only defense is that the '873 Patent is invalid as obvious and, accordingly, it had no obligation to fund a study pursuant to the Study Clause. Through negotiations the parties have agreed the validity of the entire patent rises and falls with the validity of claim 1.

HeadSpace's Obviousness Contention

HeadSpace relied on two references to support its position that the '873 patent was invalid for obviousness in the District Court. The primary reference was HeadSpace's own speech-to-text interface, the main features of which are now ubiquitously available. The second reference was a lecture by Dr. Stefan Kohlbehr who was in charge of the ANT research that lead to the development of the Chat Hat and is named as an inventor on the '873 Patent. Dr. Kohlbehr's lecture was recorded and posted on YouTube on April 7, 2008.

HeadSpace's speech-to-text interface translates spoken words into printed text using a computer coupled to a microphone input device. Since its development, the interface has been incorporated into computers and mobile devices worldwide. The HeadSpace speech-to-text interface receives the electrical signal produced by a microphone and uses computer software to filter out non-speech noise. The HeadSpace interface then translates the filtered signal into text using complex software that compensates for dialect, accent, and other individualities in human speech.

HeadSpace's speech-to-text interface does not require large amounts of processor resources to compensate for differences in individual speech, making it ideal for mobile devices. HeadSpace's speech-to-text technology uses an advanced machine learning model that "learns" a specific individual's particular style of speaking to optimize the translation algorithm and reduce translation time and consumption of processing resources. Before using the interface, a user reads a prepared text (most new versions use the Gettysburg Address) into the device, which the machine learning model analyzes to adjust for the user's individual speech patterns. HeadSpace's interface also improves the more the user speaks into the device, but the pre-optimized translation algorithm saves processor time and, therefore, battery life. As a result, HeadSpace's technology is superior to other

speech-to-text translation technologies and has been incorporated into many devices, especially portable devices like smartphones.

Dr. Kohlbehr's lecture presented the combination of his two great passions, neuroscience and transcendental meditation. Dr. Kohlbehr revealed that two sufficiently trained practitioners of transcendental meditation can share complete thoughts across substantial distances using technology-assisted mind-to-mind communication. Technology-assisted mind-to-mind communication is generally limited to extremely simple messages and required the messages to be pre-translated into binary code. Technology-assisted mind-to-mind communication was limited to on-off/one-zero messages. Dr. Kohlbehr discovered that this limitation stemmed from the fact that that the human brain is too distracted by random thoughts and sensory inputs to receive anything but the most rudimentary signals that can pierce through the noise. Dr. Kohlbehr discovered that if the sender and receiver could both enter the same mental state using transcendental meditation, full sentences could be transmitted from mind to mind without resorting to binary code. Dr. Kohlbehr called the mental state shared by the sender and receiver the Kohlbehr Rapport.

The Kohlbehr Rapport requires the two users to meditate on the same mantra so that each achieves a similar mental state. Using Dr. Kohlbehr's technique, a sender connected to an EEG meditates on a particular mantra until he or she reaches a meditative state. Then the sender "thinks" the message to be delivered. The EEG records continuously throughout the session and the electrical signal can be transmitted in real time to the receiver or electronically stored. The receiver meditates on the same mantra as the sender, while receiving the sender's electrical signal through Transcranial Magnetic Stimulation (TMS). The combination of meditation and TMS creates a sympathetic response in the receiver so that the receiver achieves the same mental state as the sender—the Kohlbehr Rapport. At this point, the receiver's mind is sufficiently aligned with the sender's thoughts that the receiver "thinks" the same thoughts the sender sends. The mantra acts as

a sort of carrier wave to keep the two minds synchronized long enough for the sender's thoughts to be received.

In his lecture, Dr. Kohlbehr noted that a computer would not suffer from the mental distractions of a human receiver and hypothesized that a computer would not require meditation to receive the electrical signals produced by the sender. Dr. Kohlbehr also said that no computer would be sophisticated enough to translate anything but the most rudimentary messages because the electrical signals produced by a sender's brain were too complex to be translated by any computer less sophisticated than a human brain. According to Dr. Kohlbehr, a person's brainwaves include too much "noise" produced by sensory input and everyday distractions. Furthermore, the signals differ substantially from person to person, even when those individuals think the same thoughts.

Nevertheless, to prove the concept, Dr. Kohlbehr presented preliminary results translating by computer some simple messages using the electrical signals produced by a sender's brain. In a first experiment, Dr. Kohlbehr recorded the electrical signals produced by a volunteer who repeatedly "thought" the same word twenty-five times while connected to an EEG. Using the combined signals from all twenty-five repetitions, Dr. Kohlbehr produced a software program that successfully translated the one-word "thought" 60% of the time when the same volunteer had the same "thought" again during a test reading. Dr. Kohlbehr was able to reproduce this result with three different, single word "thoughts." However, the translation accuracy fell below 5% when a different volunteer repeated the same single-word "thought." The computer was unable to distinguish a second individual's "thought" unless it was pre-programmed with twenty-five repetitions of each single-word.

Dr. Kohlbehr performed a second experiment having a volunteer meditate on a specific mantra for five minutes while connected to an EEG. Using the data collected from the meditation, Dr. Kohlbehr created a computer program that could identify the signals produced by the mantra

when the volunteer meditated a second time on the same mantra while attached to the EEG. In this way, Dr. Kohlbehr speculated, a computer might be able to filter out the non-conscious thoughts from the user's conscious thoughts.

Combining aspects of the first two experiments, Dr. Kohlbehr performed a third experiment. Using the repeated one-word thoughts from the first experiment and the data collected from the meditation in the second experiment, Dr. Kohlbehr produced a new translation program. In the third experiment, a volunteer meditated for five minutes on the same mantra used to create the computer program and then projected the one-word "thought" from the first experiment. In the third experiment, the computer could translate the "thoughts" with greater than 95% accuracy.

Dr. Kohlbehr provided two possible explanations for the improved result. Dr. Kohlbehr explained that the result improved because the computer was better able to identify the patterns in the user's brainwaves that corresponded to the user's "thought." One explanation, Dr. Kohlbehr said, was that meditation reduced the distracting brain activity that made the "thought" difficult for the computer to identify. Alternatively, the meditative mantra could act as a carrier wave that the computer could identify and isolate from the noise of distracting brain activity. Dr. Kohlbehr was unable to test which mechanism was responsible, and acknowledged that the result could be a combination of both.

When a second volunteer meditated on the same mantra for five minutes prior to projecting the same thought, the computer was able to successfully translate the one-word thought 50% of the time. Again, Dr. Kohlbehr offered two possible explanations. Dr. Kohlbehr explained that the meditation allowed the second volunteer to produce a similar pattern of signals as the first volunteer. As a result, the computer was better able to identify the pattern produced by the second volunteer that corresponded to the "thought" to be translated. Alternatively, or possibly in combination, the

mantra placed the two individuals in a sufficiently similar mental state that the computer was able to overcome the individual differences between the two volunteers.

Dr. Kohlbehr performed a final experiment attempting to compensate for individual differences between users. Dr. Kohlbehr collected data from twenty volunteers who, while meditating, repeated the same one-word "thought" twenty-five times, while connected into an EEG. Using the combined data from all twenty-five repetitions from all twenty volunteers, Dr. Kohlbehr created an improved translation algorithm. Using the improved algorithm, the computer successfully translated the same one-word "thought" used to create the algorithm with 75% accuracy from ten different test subjects who had not participated in the creation of the algorithm. However, the improved algorithm only worked when the subjects meditated on the same mantra used to create the algorithm. If a test subject did not meditate or meditated on a different mantra, however, the accuracy fell to 15%. Dr. Kohlbehr explained that the input from twenty original volunteers provided enough data to compensate, in part, for individual differences between the test subjects and the original volunteers. Dr. Kohlbehr speculated that using data from more volunteers to produce the algorithm might improve the accuracy further, but said he ran out of volunteers sufficiently practiced in transcendental meditation to produce more data and still have enough practitioners left to test the new algorithm.

After presenting these experimental results, and the evolution of the Kohlbehr Rapport, a member of the Lecture audience asked Dr. Kohlbehr if his discovery could ever be used by average people who were not practitioners of transcendental meditation. Dr. Kohlbehr answered that the technique would probably work with any mental discipline that allowed two different people to achieve a similar mental state. From his experiments, Dr. Kohlbehr concluded that a user probably needed to be able to achieve a similar mental state as the individuals used to create the translation algorithm, or else a computer could not identify the signals created by conscious thoughts from the

background noise. An "average" person might, Dr. Kohlbehr said, be able to achieve the necessary mental state by repeating a specific word or phrase in their mind enough times that a sophisticated computer program would be able to recognize the word in the user's thought patterns and therefore separate the signals produced by that person's conscious thoughts from the background noise. But Dr. Kohlbehr stated that such an idea was "pure speculation based on theory" and that he had no data upon which to support his hypothesis.

At the conclusion of his presentation, Dr. Kohlbehr lamented that mind-to-computer communication was probably impractical because the amount of data necessary to produce a translation for anything but the most rudimentary messages would be staggering. Even using meditation, a one-word 'thought' would require data from more than twenty different people repeating the 'thought' twenty-five times. Because individuals do not think in one-word increments, multi-word phrases have different signals than the individual words that make up the phrase. "It might work," Dr. Kohlbehr said, "if a person could be forced to think individual words instead of entire thoughts or sentences." "But the only time that happens" Dr. Kohlbehr said, "is when a person separates every word with a counter, like 'One Mississippi, two Mississippi' or when a novice translates words into a foreign language."

The District Court Verdict

The case was tried to a jury. The UNSM argued that that the '873 Patent is valid and that HeadSpace breached the Study Clause. It sought $1.2 million in damages—the amount required to fund the study. HeadSpace argued that it had no obligations under the Study Clause because the '873 Patent was invalid as obvious.

The jury found the patent not invalid, found that HeadSpace breached the Study Clause, and awarded damages to the UNSM. However, the jury only awarded $20,000 in damages and the UNSM is disappointed. It will not be able to fund the '873 Patent study with the award.

The Appeal

HeadSpace appealed the jury's verdict to the United States Court of Appeals for the Federal Circuit, challenging its finding that the '873 Patent is not obvious. Even though the damages award is small, its founders are very sensitive to the optics of the adverse verdict and are highly motivated to have it overturned. The UNSM cross-appealed, challenging for the first time the district court's subject matter jurisdiction under to hear the case under 28 U.S.C. § 1338, *Gunn v. Minton*, 568 U.S. 251 (2013), and its progeny. Given the small damages award, it would rather have the District Court verdict thrown out and have a chance to re-try the case in Superior Court in Atlantis.

The parties have stipulated that only two issues will be presented on appeal: the obviousness of the '873 patent and the district court's subject matter jurisdiction under 28 U.S.C. § 1338. The parties further stipulated to proceeding under standard, unilateral appeal rules and foregoing cross-appeal procedures of Fed. Cir. Rule 28.1, with HeadSpace proceeding in all respects as the appellant and the UNSM as appellee. The Federal Circuit Clerk captioned the appeal "HeadSpace, Inc. v. University of Neptune School of Medicine."

No. 18-GSR-6549

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

HeadSpace, Inc.,
Appellant,

v.

University of Neptune School of Medicine,
Appellee.

APPEAL FROM THE UNITED STATES COURT OF THE DISTRICT OF OCEANIA

BRIEF OF APPELLANT HEADSPACE, INC.

THOMAS LEMENS
JOHN WILLIAMS
Attorneys for Appellant

February 5, 2018

CERTIFICATE OF INTEREST

Counsel for Appellant, HeadSpace, Inc., certifies the following:

1. The full name of every party or amicus represented by me is:

   HeadSpace, Inc.

2. The name of the real party in interest represented by me is:

   HeadSpace, Inc.

3. All parent corporations and any publicly held companies that own 10 percent or more of the stock of the party or amicus curiae represented by me are:

   None.

4. The names of all law firms and the partners or associates that appeared for the party or amicus now represented by me in the trial court or agency or are expected to appear in this court are:

   N/A.

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STATEMENT OF RELATED CASES

Pursuant to Fed. Cir. R. 47.5, appellant provides as follows:

(a) There have been no previous appeals in this case.

(b) It is aware of an ex parte reexamination of the '873 patent that may be directly affected by this Court's decision in this case.

JURISDICTIONAL STATEMENT

The University of Neptune School of Medicine ("UNSM") filed this breach-of-contract suit in Oceania Superior Court. Because this suit implicated an issue of federal patent law, HeadSpace, Inc. ("HeadSpace") removed this suit to the United States District Court for the District of Oceania pursuant to 28 U.S.C. § 1446. UNSM contests the District Court's subject matter jurisdiction under 28 U.S.C. § 1338(a). HeadSpace appeals from the district court's denial of HeadSpace's motion for judgment as a matter of law. The jury rendered a verdict that UNSM's '873 patent ("Patent") was not invalid and that HeadSpace breached the contract. The jury awarded $20,000 in damages to UNSM. This Court has jurisdiction to hear HeadSpace's appeal under 28 U.S.C. § 1295(a)(1). This appeal was timely filed in accordance with 28 U.S.C. § 2107 and Fed. R. App. P. 4(a).

STATEMENT OF THE ISSUES

1. The District Court properly exercised federal subject matter jurisdiction under 28 U.S.C. § 1338(a) because the '873 patent's invalidity was a dispositive issue on the breach-of-contract claim.
2. The District Court erred by concluding that the '873 patent was not obvious because an ordinarily skilled artisan had motivation to combine the Kohlbehr and HeadSpace references, which teach all of the '873 patent's elements if combined.

STATEMENT OF THE CASE

The University of Neptune School of Medicine ("UNSM") alleged that HeadSpace, Inc. ("HeadSpace") breached their partnership agreement. (R.11:17–19). UNSM claimed that HeadSpace's refusal to fund a $1.2 million study breached the "Study Clause" of the partnership agreement, which required HeadSpace to "fund a UNSM-led study" investigating the impact of "devices covered by each valid [UNSM] patent." (R.2:4–6). Relying on 28 U.S.C. § 1338(a), HeadSpace removed this suit pursuant to 28 U.S.C. § 1446 to the District Court for the District of Oceania. (R.11:20–21; 18:5–7). HeadSpace argued that it did not breach the agreement because the Study Clause only covered valid patents and the '873 patent ("Patent") was invalid as obvious under 35 U.S.C. § 103. (R.11:22–23; 17:20–21). UNSM argued that the Patent was not invalid and non-obvious. (R.17:18–20). The parties agreed that the only claim at issue was Claim 1. (R.11:23–24).

A jury found the Patent not invalid and that HeadSpace breached the partnership agreement. (R.17:22–23). The jury awarded UNSM $20,000 in damages. (R.17:23–24). HeadSpace appeals the denial of its motion for judgment as a matter of law, contesting the jury's finding that the Patent was not invalid. (R.18:2–3). UNSM cross-appealed the verdict, challenging—for the first time—the

district court's subject matter jurisdiction under 28 U.S.C. § 1338. (R.18:5–7). The parties stipulated to presenting only these issues on appeal. (R.18:9–10).

STATEMENT OF THE FACTS

1. The Parties

Defendant and appellant HeadSpace, Inc. ("HeadSpace") is a company that uses text-to-speech technology to enable messaging on users' social media profiles. (R.1:11–13). HeadSpace entered a partnership agreement with the University of Neptune School of Medicine ("UNSM"). (R.1:20–21). Under this agreement, HeadSpace could "license and commercially develop any patent . . . arising from the partnership." (R.2:1–3). HeadSpace exercised this right and licensed the '873 patent ("Patent"), which covers a method of translating encephalography ("EEG") signals from human thought into text format. (R.2:18, 3:10–14, 5:9). Under this license, HeadSpace produced the Chat Hat, a device that practices the Patent. (R.5:9–11). For several years, HeadSpace has charitably distributed the Chat Hat outside the U.S. (R.6:7–9).

Plaintiff and appellee UNSM owns the Patent. (R.2:14). In partnership with HeadSpace, UNSM operates the Advanced Neuro Technologies Laboratory ("ANT Lab"), which developed the Patent. (R.1:17–20). UNSM licenses the ANT Lab's patented technologies to third parties. (R.5:12–13). UNSM assigned a continuation of the Patent to the Sandcastle Technology Institute ("STI"). (R.8:2–4).

2. The '873 Patent

The ANT Lab discovered a method to translate human thoughts into text. (R.2:17–19). UNSM filed the '873 patent ("Patent") on this method on October 12, 2009. (R.2:15–17). The Patent's only independent claim, Claim 1, reads:

> 1. A method for translating human thoughts into text comprising:
> receiving unique user calibration brainwave data collected by a plurality of brainwave sensors during performance of a predetermined customization protocol;
> customizing a thought-to-text translation algorithm based on the received calibration brainwave data using a machine learning model;
> triggering collection of the user's triggered brainwave data to be translated after repetition of a predetermined trigger word by the user;
> filtering non-thought brainwave data from the collected triggered brainwave data; and
> translating the filtered data into text using the customized translation algorithm.
> (R.2:17–3:6).

The Patent issued on January 15, 2012. (R.2:15). The Patent's specification describes a device with sensors, a processor, a transceiver, and a memory unit. (R.3:7–8). When people think, their brains create electric "brainwaves" that electroencephalography ("EEG") can measure. (R.3:9–11). The '873 device uses EEG to collect a sender's brainwaves, uses a translation algorithm to convert those brainwaves to data, and transmits data to a recipient. (R.3:14–17). The recipient's '873 device uses an algorithm to convert that data into an electric signal, and then into the sender's message using Transcranial Magnetic Stimulation ("TMS"). (R.3:17–18). Because the '873 device only collects the brainwaves necessary to

translate human thoughts, it is smaller and cheaper than prior art EEG devices. (R.3:21–4:1).

Because translation algorithms and databases require too much memory, the '873 device uses a machine learning model to keep the device portable. (R.4:5–9). A user must train the '873 device by performing standard steps to isolate his individual brainwave patterns. (R.4:5, 4:10–13). During training, the '873 device transmits a user's brainwaves to a remote server, where a machine learning model optimizes that user's translation algorithm. (R.4:16–19). Example training methods include singing provided nursery rhymes, inhaling provided scents from scratch cards, and viewing short well-known video clips. (R.4:13–16). Once a user trains the '873 device, he repeats a fanciful keyword like "xylophone" three times to activate it. (R.4:20–5:4). If a user properly trains and activates the '873 device, it translates thoughts with over 95% percent accuracy. (R.5:5–8).

Before UNSM filed suit, an ex parte reexamination of the Patent was initiated, and is still ongoing. (R.11:11–13). UNSM also assigned a second patent, which was a continuation of the Patent, to the Sandcastle Technology Institute ("STI"), an Oceanian public institution. (R.7:21–8:6). STI anticipates that its Convo Cap product, a mind-to-mind communication device covered by the continuation, will "bring in one of the highest revenues in the history of medical

advances." (R.8:14–16). Both STI and UNSM believe the continuation is an obvious variation of the Patent. (R.8:6–9).

3. The Partnership and License Agreements

HeadSpace partnered with UNSM to support the ANT Lab. (R.1:20–21). The partnership agreement permitted HeadSpace to "license and commercially develop any patent" developed at the ANT Lab that "aris[es] from the partnership." (R.2:1–2; R.5:23–24). The partnership agreement also contained a "Study Clause" obligating HeadSpace to "fund a UNSM-led study to investigate the social and economic impact that the development of devices covered by each valid ANT Lab patent has had on both the United States and the world." (R.2:4–6). On February 5, 2012, HeadSpace agreed to license the Patent from UNSM. (R.5:23–24). The license is nonexclusive. (R.6:1–4).

4. HeadSpace's Post-License Usage

After licensing the Patent, HeadSpace began manufacturing and distributing the Chat Hat for free to doctors, UNSM students, and UNSM staff providing medical care in remote regions of the world. (R.6:7–9). The Chat Hat enables these medical aid workers to communicate without removing their sterilized gloves. (R.6:9–12). HeadSpace's charitable distribution of the Chat Hat has greatly reduced the number of patient infections caused by contamination. (R.6:14–16).

5. The Dispute

In early 2015, UNSM invoked the Study Clause, demanding $1.2 million to fund its proposed study. (R.10:7–8). HeadSpace declined to fund the proposed study, arguing that the Study Clause did not apply because the Patent was invalid as obvious. (R.10:12–15). UNSM claimed that the Patent was valid because the United States Patent and Trademark Office ("USPTO") issued it without objection. (R.10:18–19). Both parties agreed that the Patent's validity depends on Claim 1. (R.11:23–24). To support its obviousness argument, HeadSpace referred to two prior art references: HeadSpace's speech-to-text device ("HeadSpace reference") and a recorded presentation by Dr. Kohlbehr ("Kohlbehr reference"). (R.12:2–3).

6. The HeadSpace Reference

HeadSpace's first prior art reference was its own speech-to-text interface ("HeadSpace reference"), whose main features were "ubiquitously available" when the Patent was developed. (R.12:2–4). The HeadSpace reference uses a computer to translate spoken words from a microphone into text. (R.12:8–9). The HeadSpace reference uses computer software to filter out noise, translate electric signals into text, and compensate for human speech variations. (R.12:10–14). The reference uses a machine learning model to reduce processing and accelerate translation, allowing its use on mobile devices. (R.12:15–19). The reference instructs users to read a prepared text like the Gettysburg Address, which its machine learning model uses to adjust for individual speech patterns. (R.12:19–21).

7. The Kohlbehr Reference

The other prior art reference was a recorded lecture by Dr. Stefan Kohlbehr, UNSM's inventor of the Patent, published on YouTube eighteen months before UNSM filed for the Patent. (R.12:4–7). In that lecture, Kohlbehr reveals that two practitioners of transcendental meditation can engage in technology-assisted mind-to-mind communication across substantial distances. (R.13:4–9). Kohlbehr notes that sensory interference stops mind-to-mind communication technologies from transmitting complete thoughts, but claims users with synchronized mental states can transmit complete thoughts. (R.13:9–13). Kohlbehr instructs a sender to meditate on a mantra until the sender achieves a meditative state, and then to think a message into an EEG interface. (R.13:14–18). When the recipient meditates on the sender's mantra, applying Transcranial Magnetic Stimulation ("TMS") causes the recipient to replicate the sent thought. (R.13:19–24). Kohlbehr dubs this state of synchronized transmission the "Kohlbehr Rapport." (R.13:23).

Kohlbehr theorizes that computers could replace transcendental meditation in the Kohlbehr Rapport, since they would not suffer from human distractions. (R.14:3–5). He also claims that EEG signals are too complex for computers to translate, as they include sensory noise and differ substantially between users. (R.14:5–10). Kohlbehr then describes four experiments that he performed using computers to translate users' brainwaves into messages. (R.14:11–12).

In his first experiment, Kohlbehr used an EEG machine to record twenty-five repetitions of the same word by a volunteer, and achieved 60% accuracy in translating that same volunteer's same-word thought. (R.14:12–21). In his second experiment, Kohlbehr recorded a volunteer's brainwaves after that volunteer meditated on a control mantra for five minutes, and created software to identify the mantra's EEG signal. (R.14:22–15:3). In his third experiment, Kohlbehr instructed volunteers to meditate on a control mantra before repeating the first experiment's thought, and Kohlbehr translated the volunteer's thoughts using the second experiment's software to achieve over 95% accuracy. (R.15:4–9). In his fourth experiment, Kohlbehr developed a translation algorithm using the recorded EEG data from twenty volunteers' twenty-five repetitions of the same one-word thought. (R.16:5–7). This new algorithm achieved 75% accuracy with new users who mediated on the same control mantra as the twenty volunteers, but only 15% accuracy with volunteers who did not. (R.16:7–12).

Based on these experiments, Kohlbehr theorizes that users could allow computer programs to identify thought messages by repeatedly thinking a trigger word. (R.17:1–6). Kohlbehr states that he believes data complexity probably renders mind-to-computer communication impractical unless a user breaks messages down into single, discrete words for transmission. (R.17:7–16).

SUMMARY OF THE ARGUMENT

The district court properly exercised its subject matter jurisdiction over UNSM's breach-of-contract claim because all four requirements articulated by the Supreme Court in *Gunn v. Minton* are present. *Gunn* states that federal subject matter jurisdiction over a state law claim exists if a patent law issue is: (1) necessarily raised, (2) actually disputed, (3) substantial, and (4) can be resolved by a federal court without disrupting Congress's approved state-federal balance. A patent law issue is "necessarily raised" because HeadSpace only breached the Study Clause if the Patent was valid. A patent law issue was actually disputed since the validity of the Patent was the only issue at trial. Patent validity is substantial to the federal system because validity affects other parties and must be decided by a federal court to ensure uniformity in the patent system. Congress's approved state-federal balance weighs in favor of federal adjudication of patent law issues. Because all four required *Gunn* elements were satisfied, the district court properly exercised federal subject matter jurisdiction under 28 U.S.C. § 1338.

The district court erred by holding that UNSM's Patent was not obvious. Because obviousness is a legal determination, this Court owes no deference to the district court's holding. An ordinarily skilled artisan had a motivation to combine the Kohlbehr and HeadSpace references based on four factors. First, combining those references teaches all of Claim 1's elements. Second, an ordinarily skilled

artisan would look to the HeadSpace reference, as it is "reasonably pertinent" to the problem of data storage. Third, Kohlbehr did not "teach away" from the Patent, because he solved the problems in computer-assisted thought-to-text translation that he highlighted. Finally, combining HeadSpace's machine learning model with Kohlbehr's thought-to-text translation produced "predictable" advantages over prior art. Secondary considerations do not outweigh Claim 1's prima facie obviousness, as they lack a nexus with the Patent's claimed features. The Patent is therefore obvious, and the district court's contrary finding was erroneous.

ARGUMENT

I. THE DISTRICT COURT PROPERLY EXERCISED JURISDICTION OVER UNSM'S BREACH-OF-CONTRACT CLAIM BECAUSE ALL FOUR *GUNN* ELEMENTS WERE SATISFIED.

This Court reviews issues of jurisdiction de novo. *Forrester Envtl. Services, Inc. v. Wheelabrator Tech., Inc.*, 715 F.3d 1329, 1333 (Fed. Cir. 2013). Whether the district court had jurisdiction is a threshold issue that this Court has the power to decide. *C.R. Bard, Inc. v. Schwartz*, 716 F.2d 874, 877 (Fed. Cir. 1983).

The district court properly exercised jurisdiction over UNSM's breach-of-contract claim because 28 U.S.C. § 1338 grants the district courts "original jurisdiction of any civil action arising under any Act of Congress relating to patents . . . ." Furthermore, state courts have no concurrent jurisdiction over cases falling within 28 U.S.C. § 1338 because "[n]o State court shall have jurisdiction over any claim for relief arising under any Act of Congress relating to patents . . . ." In *Gunn v. Minton*, the Supreme Court declared that a state law claim arises under federal law "if a federal issue is: (1) necessarily raised, (2) actually disputed, (3) substantial, and (4) capable of resolution in federal court without disrupting the federal-state balance approved by Congress." *Gunn v. Minton*, 568 U.S. 251, 258 (2013); s*ee also Grable & Sons Metal Prod., Inc. v. Darue Eng'g & Mfg.* 545 U.S. 308, 313–14 (2005).

In *Gunn*, the Court decided that a legal malpractice claim did not arise under federal patent law because the patent law issue was not substantial to the federal system and could not be decided by a federal court without upsetting the balance of federalism. *Gunn*, 568 U.S. at 264. In this case, unlike in *Gunn*, all four elements required to support federal subject matter jurisdiction exist. In *Gunn*, the plaintiff's cause of action was legal malpractice, alleging that his former counsel's failure to raise an experimental use argument at trial resulted in the invalidation of his patent. *Id.* at 255. The patent law issue in *Gunn* was a hypothetical "case within a case" determination of whether the plaintiff would have succeeded in earlier infringement litigation had the lawyer not erred. *Id.* at 259. Resolution of the malpractice suit could not make the patent valid again. *Id.* at 261.

In this case, unlike in *Gunn*, the cause of action is not legal malpractice, which implicates state interests in regulating lawyers, but is merely breach-of-contract. *Id.* at 264. Furthermore, the federal issue before this Court is not a hypothetical determination of whether something would have happened had the past been different; rather, it is a determination of the invalidity of a patent that was issued by the USPTO and has not yet been invalidated. Because this case necessarily raised a disputed issue of federal patent law that was substantial and could be decided by a federal court without disrupting federalism, the district court properly exercised federal subject matter jurisdiction over this case.

A. UNSM's claim "necessarily raised" an issue of federal patent law that was "actually disputed" since UNSM was only entitled to relief if the '873 patent was not invalid.

The Study Clause obligated Headspace to fund a study for "each *valid* ANT Lab patent." (R.2:4–6) (emphasis added). Thus, if the Patent was invalid, HeadSpace had no duty to fund the study. If a party's right to relief on a breach-of-contract claim depends upon resolving an issue of federal law, then an issue of federal law is "necessarily raised." *Jang v. Boston Sci. Corp.* 767 F.3d 1334, 1336 (Fed. Cir. 2014). The cause of action in *Jang* was a breach-of-contract claim that depended upon resolving the patent law issue of whether the defendant's devices infringed the plaintiff's patent. *Id.* Just as *Jang's* plaintiff could only succeed on its breach-of-contract claim if the defendant's products infringed the patent, so too could UNSM only succeed on its breach-of-contract claim if the Patent was not invalid. Furthermore, the invalidity of the Patent was the only issue at trial, so it was "necessarily disputed" in this case. (R.18:9–10).

B. Patent validity is "substantial" to the federal system as a whole because it affects other parties and is crucial to the uniformity of patent law.

The invalidity of the Patent is substantial to the federal system as a whole because an invalidity determination will affect other parties and because the federal government has an interest in maintaining the uniformity of the patent system. An issue is not substantial merely because it is important to the parties in the suit, but

rather because it is important "to the federal system as a whole." *Gunn*, 568 U.S. at 260; s*ee also Grable*, 545 U.S. at 313.

1. Determining whether the '873 patent is obvious will affect other parties.

A determination regarding the Patent's validity will affect other parties in the federal system, making it a substantial issue. An invalidity issue that is purely "backward-looking" or "hypothetical," like in the malpractice claim in *Gunn*, is not substantial since such a determination will not change the validity of a patent. *Gunn*, 568 U.S. at 261. The public at large, and particularly those operating in this field, will be affected by a determination of the Patent's validity. Where the *Gunn* patent was already invalid, the invalidity determination here is not "hypothetical" but instead requires a forward-looking determination of invalidity that will affect both other licensees and the public at large.

It is important to the administrability of the patent system that the public have notice whether certain ideas or designs are in the public domain or are under patent protection. *Bonito Boats, Inc. v. Thunder Craft Boats, Inc.*, 489 U.S. 141, 161–62 (1989). For this reason, patent invalidity is not an issue that only affects the parties in the suit. Patents serve to demarcate the bounds of what is and is not in the public domain. *Id.* at 163. A determination of the invalidity of the Patent will shape the content of the public domain and give notice to the public at large whether the technology of the Patent is freely available for use.

This Court, in *Jang*, also explained how other licensees of the Patent will be affected by a determination of the Patent's validity. In *Jang*, the plaintiff claimed the defendant breached a license agreement by failing to pay compensation for products sold that infringed the patent. *Id.* at 1336. This Court reasoned that the infringement issue underlying *Jang's* breach-of-contract claim was substantial because "[c]ontract claims based on underlying ongoing royalty obligations" would "raise the real world potential for subsequently arising infringement suits affecting other parties." *Id.* at 1337. This concern with ongoing contractual obligations is also relevant to this case. Because the license of the Patent is nonexclusive, a determination of the Patent's invalidity will affect subsequent infringement suits and the rights and obligations of other licensees. (R.6:1–4). An invalidity determination in this case will affect not only current licensees of the Patent, but also any future licensees of the Patent.

2. The federal government has an interest in having patent validity resolved in a federal forum to ensure the uniformity of patent law.

To determine if an issue is substantial, this Court must consider "whether allowing state courts to resolve these cases undermines 'the development of a uniform body of [patent] law.'" *Vermont v. MPHJ Tech. Inv., L.L.C.*, 803 F.3d 635, 646 (Fed. Cir. 2015); (quoting *Gunn*, 568 U.S. at 261); (quoting *Bonito Boats*, 489 U.S. at 162). Allowing state courts to determine patent invalidity would disrupt the uniformity of the patent system.

Unlike *Gunn*, this case is forward-looking and could disrupt the uniformity of the patent system. Whereas the patent issue in *Gunn* was purely hypothetical, asking what would have happened, the obviousness issue in this case asks whether an issued patent is invalid. *Gunn*, 568 U.S. at 262. A state court deciding the invalidity of an issued patent will create inconsistency and uncertainty in the patent system. Permitting state courts to make final determinations of patent validity creates the risk of collaterally estopping federal courts. While the *Gunn* Court provides dicta on this point suggesting that such estoppel would probably not occur, *Gunn*, 568 U.S. at 262–63, that dicta was offered when confronted with a malpractice case where the patent would remain invalid regardless of the outcome of the suit. In contrast, the present case involved deciding if an issued patent is invalid. Congress gave federal courts exclusive jurisdiction over patent issues to ensure a uniform body of law. *BonitoBoats*, 489 U.S. at 162. Even the possibility of such collateral estoppel could disrupt the patent system by undermining public certainty about the bounds of the public domain.

C. Congress's approved state-federal balance favors federal adjudication of obviousness.

Congress explicitly sought to remove patent cases from the jurisdiction of state courts. The America Invents Act amended 28 U.S.C. § 1338 by adding the sentence: "No State court shall have jurisdiction over any claim for relief arising under any Act of Congress relating to patents . . . ." Leahy-Smith America Invents

Act, 125 Stat. 284, 331 (2011). This change in the statutory language served to specifically remove such cases from the potential jurisdiction of state courts. *Vermont*, 803 F.3d at 643–44. Obviousness is a question of federal patent law that Congress intended to be resolved by a federal court.

"The ultimate judgment of obviousness is a legal determination." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 427 (2007). Determining the differences between prior art and the claims of the patent is a crucial step in an obviousness analysis. *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17 (1966). This necessarily requires determining the scope of the claims, and claim construction is a question of law reserved for judges. *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 390 (1996). The *Markman* Court explained that one reason for obviousness being a legal determination is that uniformity in the treatment of individual patents is crucial to the purposes of the patent system. *Id*. Because all four elements required by *Gunn* were met, the district court properly exercised federal subject matter jurisdiction over this case.

II. THE DISTRICT COURT ERRED BY HOLDING THAT CLAIM 1 OF THE PATENT WAS NOT OBVIOUS.

A patent claim is invalid if it "would have been obvious before [its] effective filing date . . . to a person having ordinary skill in the art to which [it] pertains." 35 U.S.C. § 103. Courts analyze claim obviousness by examining prior art's scope, the claim's differences from prior art, and the claim's ordinary skill level. *Graham*, 383 U.S. at 17. A claim is obvious if an ordinarily skilled artisan had "an apparent reason to combine the known elements" of a claim. *KSR*, 550 U.S. at 418. Factors affecting a "motivation to combine" include: claim elements' presence in prior art, prior art's "teaching away" from the claim, the presence of analogous problems to the claim, and the claim's "predictable results." *Id.* at 416, 420–21. Secondary considerations may show a claim is not obvious. *Graham*, 383 U.S. at 17–18.

Claim 1 of the Patent is obvious because an ordinarily skilled artisan had motivation to combine the Kohlbehr and HeadSpace references. (R.12:2–7, 2:14–16). First, these references teach all of Claim 1's elements. Second, an ordinarily skilled artisan would look to the HeadSpace reference, which teaches the data storage techniques that Kohlbehr requires. Third, prior art does not "teach away" from Claim 1, as the prior art addresses Kohlbehr's concerns about Claim 1's method. Finally, the Patent's reduction of data storage needs is predictable from the prior art. Since secondary considerations do not overcome the prima facie case that Claim 1 is obvious, the district court erred by finding Claim 1 non-obvious.

Obviousness is a conclusion of law, which this Court examines de novo. *Arctic Cat Inc. v. Bombardier Rec. Prods*., 873 F.3d 1350, 1358 (Fed. Cir. 2017). That conclusion is based on the underlying *Graham* factors, which are questions of fact. *Id.* When reviewing a jury verdict, this Court presumes the jury resolved underlying factual disputes in favor of the winner and leaves those findings undisturbed if supported by substantial evidence. *Id*.

A. An ordinarily skilled artisan had motivation to combine the HeadSpace and Kohlbehr references.

1. Combining the HeadSpace and Kohlbehr references teaches all the elements of Claim 1.

A claim is likely to be obvious if it arranges known elements to perform their standard functions and yields predictable results. *KSR*, 550 U.S. at 417. This Court reads a patent's claims in view of its specification, which can define terms used in those claims. *Markman v. Westview Instruments, Inc*., 52 F.3d 967, 979 (Fed. Cir. 1995). Claim 1 describes "a method for translating human thoughts into text" comprising five elements. (R.2:18–3:6). As Kohlbehr manually programs each new volunteer's translation algorithm, his experiments are impractical for mass usage. (R.14:22–15:3). HeadSpace's machine learning model removes Kohlbehr's need for manual adjustment by automatically customizing users' algorithms from calibration data. (R.12:10–12, 16–19). The combination of the HeadSpace and Kohlbehr references teaches all five of Claim 1's elements. The

combination's mass-processing ability would motivate an ordinarily skilled artisan to combine those references.

i. Receiving user brainwave data from brainwave sensors during setup

Claim 1's first element is "receiving unique user calibration brainwave data collected by a plurality of brainwave sensors during performance of a predetermined customization protocol." (R.2:18–19). The first half of this element is "receiving unique user calibration brainwave data," which Claim 1 performs by collecting a user's brainwave data using an EEG interface. (R.3:14–18). Kohlbehr teaches this component by using an EEG interface to "receive unique user calibration brainwave data" from brainwave sensors. (R.13:15–19).

The second half of this step is performing a "predetermined customization protocol," which Claim 1 does not define. (R.2:18–19). The Patent's specification illustrates this "customization protocol" in the Patent's "training" process, where a user sings provided nursery rhymes so that Patent-practicing devices can isolate his thoughts. (R.4:13–16). The HeadSpace reference teaches a similar protocol, since it analyzes an electrical signal from a "user read[ing] a prepared text" to adjust for individual speech variations. (R.12:7–8, 15–17). The combination of "brainwave collection" and "predetermined customization protocols" allows thought-to-text translation devices to automatically adjust new users' translation algorithms based on individual brainwave differences. Because Kohlbehr teaches "brainwave

collection," and HeadSpace teaches "predetermined customization protocols," an ordinarily skilled artisan would combine those references to achieve that result.

ii. Customizing thought-to-text translation algorithm using brainwave data

Claim 1's second step is "customizing a thought-to-text translation algorithm based on the received calibration brainwave data using a machine learning model." (R.2:20–21). The first half of this step involves "customizing" a thought-to-text translation algorithm. *Id.* While Claim 1 does not define "customizing," the Patent's specification "optimizes" a user's thought-to-text translation algorithm to identify thoughts with over 95% accuracy. (R.4:16–19; 5:5–6). Kohlbehr teaches this "optimization" in his third experiment, using a volunteer's "calibration brainwave data" to create a thought-to-text translation algorithm with over 95% translation accuracy. (R.16:3–7).

The second half of this step is "using a machine learning model" to perform customization. (R.2:20–21). The HeadSpace reference sends calibration data to a machine learning model to "learn" a user's speech style and optimize that user's translation algorithm. (R.12:15–17). While the HeadSpace reference applies machine learning models to speech data, an ordinarily skilled artisan would apply those models to "learn" a user's thought style based on HeadSpace's teachings. An ordinarily skilled artisan would combine the Kohlbehr and HeadSpace references because HeadSpace's model automatically customizes users' thought-to-text

translation algorithms, eliminating Kohlbehr's need to manually customize those algorithms.

iii. Triggering brainwave data collection after user repeats trigger word

Claim 1's third step is "triggering collection of the user's triggered brainwave data to be translated after repetition of a predetermined trigger word by the user." (R.3:1–2). The Patent's specification collects thoughts via EEG after users think trigger words like "xylophone" three times. (R.4:22–5:4). Because Claim 1 recites the term "comprising," it is open-ended, and is "well understood to mean 'including but not limited to'" its precise wording. *Cias, Inc. v. Alliance Gaming Corp.*, 504 F.3d 1356, 1360 (Fed. Cir. 2007). Thus, Claim 1's third step includes multi-word phrases that contain "a predetermined trigger word," such as control mantras. Kohlbehr's third experiment teaches this step by triggering EEG collection after volunteers meditate on control mantras. (R.14:12–14, 15:4–9).

iv. Filtering out non-thought brainwave data

Claim 1's fourth step is "filtering non-thought brainwave data from the collected triggered brainwave data." (R.3:3–4). The Patent's specification uses a personalized learning model to isolate a user's thought brainwaves from non-thought brainwaves. (R.4:20–23). Kohlbehr teaches "filtering non-thought brainwave data" by instructing multiple users to synchronize their mental states by meditating on the same control mantra. (R.13:15–16). Users with synchronized mental states "think the same thoughts," so computers can filter a recipient's

identical non-brainwave thought data from a sender's incoming thoughts. (R.13:21–23). The Kohlbehr reference thus teaches the Patent's fourth step.

v. Translating filtered data to text using custom translation algorithms

Claim 1's fifth step is "translating the filtered data into text using the customized translation algorithm." (R.3:5–6). The Patent's specification performs this step by converting a sender's EEG signal into text format. (R.3:14–22). The HeadSpace reference also "translates the filtered signal into text using complex software" to adjust for speech variations. (R.12:11–13). An ordinarily skilled artisan may combine references based on "the nature of the problem to be solved." *Ruiz v. A.B. Chance Co.*, 357 F.3d 1270, 1276 (Fed. Cir. 2004). Here, the "nature" of thought-to-text translation would motivate an ordinarily skilled artisan to apply HeadSpace's speech-to-text translation to Kohlbehr's brainwave data. Since the HeadSpace reference "translates" Kohlbehr's provided data, combining these references teaches Claim 1's fifth step. When combined by an ordinarily skilled artisan, the HeadSpace and Kohlbehr references teach all of Claim 1's elements.

2. The HeadSpace reference is analogous prior art to the Patent.

An ordinarily skilled artisan has motivation to combine prior art if "a known problem" with "an obvious solution encompassed by the patent's claims" existed when the patent was invented. *KSR*, 550 U.S. at 418. Where a "known problem" is not unique to an invention's field, an ordinarily skilled artisan considers solutions from other "sufficiently close" fields. *Sci. Plastic Prods. v. Biotage AB*, 766 F.3d

1355, 1360 (Fed. Cir. 2014). This Court found that toothbrushes were analogous art to hairbrushes because both brushes had similar structures and functions. *In re Bigio*, 381 F.3d 1320, 1326–27 (Fed. Cir. 2004). Here, the Patent converts an electric signal to text, a problem the Patent's field of thought-to-text translation shares with the HeadSpace reference's field of speech-to-text translation. Both fields have similar structures: an input device connects to a computer that records input data. *Compare* (R.12:7–8) *with* (R.3:7–8). Both speech-to-text translation and thought-to-text translation serve the same function: converting a human-generated electric signal into data. *Compare* (R.12:11–13) *with* (R.13:16–19). As these fields have similar structures and functions, the HeadSpace reference is analogous.

Prior art from a sufficiently close field is "analogous" if that prior art is "reasonably pertinent" to the invention's problem. *In re Bigio*, 381 F.3d 1320, 1325 (Fed. Cir. 2004). Prior art is "reasonably pertinent" if it "logically would have commended itself to an inventor's attention." *In re Clay*, 966 F.2d 656, 659 (Fed. Cir. 1992). This Court found that electronic games and games with immobile key pieces were "reasonably pertinent" to physical games with movable key pieces because all three solved the problem of "designing a winnable yet entertaining strategy game." *Innovention Toys, LLC v. MGA Entm't, Inc*., 637 F.3d 1314, 1321–23 (Fed. Cir. 2011). Here, Kohlbehr identifies processing power as a problem in computer-assisted thought-to-text translation. (R.17:7–9). HeadSpace's reference

solves that problem in speech-to-text translation by using a machine learning model to reduce processing needs. *See* (R.12:14–18). Like the invention in *Innovention Toys*, the HeadSpace reference is "reasonably pertinent" to the Patent because it solves the Patent's problem. This pertinence would motivate an ordinarily skilled artisan to combine the HeadSpace and Kohlbehr references, which teach all of Claim 1's elements.

3. Prior art does not "teach away" from the Patent.

Where prior art references contain all of a patent's claims, the factfinder must determine whether those references teach away from the claimed invention. *Dystar Textilfarben GmbH v. C.H. Patrick Co*., 464 F.3d 1356, 1360 (Fed. Cir. 2006). "When the prior art teaches away from combining certain known elements, discovery of a successful means of combining them is more likely to be nonobvious." *KSR*, 550 U.S. at 416. A reference teaches away from a patent if it leads an ordinarily skilled artisan away from the patent. *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994). However, "when prior art contains apparently conflicting references," courts must consider whether one reference discredits another. *In re Young*, 927 F.2d 588, 591 (Fed. Cir. 1991). Thus, where some prior art taught a combination and other prior art taught away from a combination, this Court found the prior art "as a whole" did not teach away. *Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1167–68 (Fed. Cir. 2006). The combination of the Kohlbehr and

HeadSpace references addresses Kohlbehr's concerns with using computers in thought-to-text translation, so the prior art "as a whole" does not teach away from the Patent.

a. Complexity

Kohlbehr teaches that brainwaves "were too complex to be translated by any computer less sophisticated than a human brain," and offers two explanations for this complexity. (R.14:4–10). Kohlbehr notes that "brainwaves include too much 'noise' produced by sensory input and everyday distractions" for computers to interpret. (R.14:8–9). However, Kohlbehr solves this problem experimentally: by synchronizing users' mental states via TMS, he enables thought transmission despite sensory noise. (R.13:21–24). Kohlbehr also suggests that users could repeat trigger words until computer programs recognized them as signals to filter out sensory noise. (R.17:1–4). Since Kohlbehr suggests multiple ways to reduce sensory noise, he does not "teach away" from the Patent by noting the problem.

Kohlbehr also teaches that "the signals [for words] differ substantially from person to person, even when those individuals think the same thoughts." (R.14:9–10). However, Kohlbehr's fourth experiment mitigates this problem, using a database of volunteers' recorded thoughts to translate new users' thoughts with 75% accuracy. (R.16:3–8). Kohlbehr also suggests that larger sampling "provided enough data to compensate" for individual differences, and that increasing sample

size would further increase accuracy. (R.16:12–17). Because Kohlbehr suggests ways to standardize thoughts across individuals, he does not "teach away" from the Patent by noting that standardization is necessary.

b. Data storage requirements

Kohlbehr teaches that "mind-to-computer communication was probably impractical because the amount of data necessary . . . would be staggering." (R.17:7–9). The HeadSpace reference solves this data storage problem by using machine learning models to analyze users' collected data. (R.12:14–20). These models reduce the amount of data that the HeadSpace reference must collect. (R.12:14–18). The HeadSpace reference therefore addresses Kohlbehr's concerns about data storage that allegedly "teach away" from the Patent.

c. Breaking phrases into individual words

Because the human brain uses different signals for multi-word phrases and their components, Kohlbehr states that converting complete thoughts to text is impractical. (R.17:11–12). However, Kohlbehr also explains that the technique could work "if a person could be forced to think individual words instead of entire thoughts." (R.17:12–14). Since Kohlbehr achieves over 95% accuracy in translating users' single-word thoughts, an ordinarily skilled artisan would expect this process to work. (R.15:7–9). Thus, Kohlbehr addresses his own concerns about applying his techniques to complete thoughts. Since the prior art "as a whole" addresses Kohlbehr's concerns, that art does not teach away from the Patent.

4. The Patent produces predictable results.

"The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." *KSR*, 550 U.S. at 416. An ordinarily skilled artisan has motivation to combine prior art references where the combination produces advantages over the prior art. *Dystar*, 464 F.3d at 1368. Here, HeadSpace's reference "does not require large amounts of processor resources to compensate for differences in individual speech, making it ideal for mobile devices." (R.12:14–15). The HeadSpace reference's machine learning model also "reduces translation time," where Kohlbehr's transcendental meditation takes five minutes before users can send a message. (R.12:17–18; 14:22–15:1). These advantages would motivate an ordinarily skilled artisan to combine the Kohlbehr and HeadSpace references.

This Court has also found results "predictable" where an ordinary observer would expect the combination to work. *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc*., 567 F.3d 1314, 1326 (Fed. Cir. 2009). Combining adjustable sleeves with barbell pins to fit differently-sized trailer hitches was obvious because the combination was "simply a matter of common sense." *Wyers v. Master Lock Co.*, 616 F.3d 1231, 1241 (Fed. Cir. 2010). Likewise, combining mechanical reading devices with electronic speakers to play sounds when children pressed buttons was obvious because that combination was "commonplace." *Leapfrog Enters. v.*

Fisher-Price, Inc., 485 F.3d 1157, 1161 (Fed. Cir. 2007). Kohlbehr theorizes that meditation "reduce[s] distracting brain activity" that interferes with thought-to-text translation. (R.15:12–14). Kohlbehr notes that computers could replace meditation in thought-to-text translation because "a computer would not suffer from the mental distractions of a human receiver." (R.14:3–5). Since Kohlbehr achieves over 95% accuracy by using a computer in thought-to-text translation, he supports this hypothesis with data. (R.15:7–9). Given Kohlbehr's work, an ordinarily skilled artisan would consider adding HeadSpace's machine learning model to Kohlbehr's thought-to-text translation "a matter of common sense." *Wyers*, 616 F.3d at 1241.

B. Secondary considerations indicate the Patent is obvious.

After analyzing the primary *Graham* factors, courts may examine secondary considerations. *Graham*, 383 U.S. at 17–18. This Court examines secondary considerations if the patentee "establish[es] a nexus between the evidence and the merits of the claimed invention." *In re GPAC*, 57 F.3d 1573, 1579 (Fed. Cir. 1995). Here, no nexus exists between Claim 1's features and the Patent's public praise or commercial success. Since no secondary considerations affect the strong prima facie case that Claim 1 is obvious, this Court should find Claim 1 obvious.

Praise of an invention by a patentee's industry competitors may indicate the invention is not obvious. *Power-One, Inc. v. Artesyn Techs., Inc.*, 599 F.3d 1343, 1352 (Fed. Cir. 2010). However, researchers' self-praising statements do not

indicate that a claim is not obvious. *In re Cree, Inc.*, 818 F.3d 694, 702 (Fed. Cir. 2016). Though visitors tour Atlantis to see the Chat Hat, and Atlantis taxes those visitors, neither action has a nexus with the Patent's claimed features. (R.9:6–17). STI's expected licensing revenue from the Patent's continuation likewise lacks a nexus with the Patent's features. (R.8:4–8, 12–14). Oceania's investment in the Patent's continuation is self-serving, since STI is an Oceanian public institution that generates revenue for Oceania. (R.7:21–24). Thus, the Patent's praise lacks a nexus with Claim 1's features.

Commercial success may indicate that a patented invention is not obvious. *Graham*, 383 U.S. at 17. Two potentially commercial uses of the Patent exist: HeadSpace's licensing of the Patent from UNSM, and HeadSpace's charitable distribution of the Chat Hat, which practices the Patent, to UNSM doctors and staff abroad. (R.2:1–3; R. 6:7–9). Since the partnership agreement between HeadSpace and UNSM covers all ANT Lab patents, its terms lack a nexus with Claim 1's features. (R.2:1–3). HeadSpace's distribution of the Chat Hat to UNSM doctors and staff working in "remote areas of the world" is not commercial because that distribution was unpaid. (R.6:7–9). As UNSM employs these doctors and staff, their usage of the Chat Hat is self-serving and does not create a nexus with Claim 1's features. *See In Re Cree*, 818 F.3d at 702. Since no secondary considerations affect the strong prima facie case that Claim 1 is obvious, Claim 1 is obvious.

CONCLUSION

The District Court properly exercised jurisdiction over this case but incorrectly held that the Patent was not obvious. Therefore, this Court should reverse the District Court's determination that the Patent was not obvious, and hold as a matter of law that HeadSpace did not breach its contract with UNSM.

CERTIFICATE OF SERVICE

We certify that on the 5th day of February, 2018, a true and correct copy of this document was served on counsel of record for all parties in compliance with Fed. R. App. P. 25(b).

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THOMAS LEMENS

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JOHN WILLIAMS

Attorneys for Appellant

CERTIFICATE OF COMPLIANCE

We certify that the foregoing brief meets the technical rules promulgated by the Federal Circuit Court of Appeals. This brief is in double-spaced 14-point font with a one-inch margin on all sides. This 33-page, 7,101-word brief complies with the limitations set by this Court in Fed. R. App. P. 32(a)(7), given the exemptions in Fed. R. App. P. 32(f).

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THOMAS LEMENS

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JOHN WILLIAMS

Attorneys for Appellant

No. 18-GSR-6549

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

HeadSpace, Inc.,
Appellant,

v.

University of Neptune School of Medicine,
Appellee.

APPEAL FROM THE UNITED STATES COURT OF THE DISTRICT OF OCEANIA

BRIEF OF APPELLEE UNIVERSITY OF NEPTUNE SCHOOL OF MEDICINE

THOMAS LEMENS
JOHN WILLIAMS
Attorneys for Appellee

February 5, 2018

CERTIFICATE OF INTEREST

Counsel for Appellee, University of Neptune School of Medicine ("UNSM"), certifies the following:

1. The full name of every party or amicus represented by me is:

   University of Neptune School of Medicine

2. The name of the real party in interest represented by me is:

   University of Neptune School of Medicine

3. All parent corporations and any publicly held companies that own 10 percent or more of the stock of the party or amicus curiae represented by me are:

   None.

4. The names of all law firms and the partners or associates that appeared for the party or amicus now represented by me in the trial court or agency or are expected to appear in this court are:

   N/A.

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STATEMENT OF RELATED CASES

Pursuant to Fed. Cir. R. 47.5, appellee provides as follows:

(a) There have been no previous appeals in this case.

(b) It is aware of a pending ex parte reexamination of the ‘873 patent.

JURISDICTIONAL STATEMENT

The University of Neptune School of Medicine ("UNSM") filed this breach-of-contract suit in Oceania Superior Court. Claiming that this suit implicated an issue of federal patent law, HeadSpace, Inc. ("HeadSpace") removed this suit to the District Court of Oceania pursuant to 28 U.S.C. § 1446. UNSM contests the District Court's subject matter jurisdiction under 28 U.S.C. § 1338(a). UNSM cross-appeals from a denial of its motion for judgment as a matter of law. A jury found that HeadSpace breached its contract with UNSM because UNSM's '873 patent ("Patent") was valid. The jury awarded $20,000 in damages to UNSM. This Court has jurisdiction to hear UNSM's cross-appeal under 28 U.S.C. § 1295(a)(1). This appeal was timely filed in accordance with 28 U.S.C. § 2107 and Fed. R. App. P. 4(a).

STATEMENT OF THE ISSUES

1. The District Court improperly exercised federal subject matter jurisdiction over UNSM's breach-of-contract case under 28 U.S.C. § 1338(a) because not all four elements required by *Gunn v. Minton* were satisfied.
2. The District Court properly concluded that the '873 patent was non-obvious because the jury had substantial evidence that an ordinarily skilled artisan lacked motivation to combine the patent's prior art references.

STATEMENT OF THE CASE

The University of Neptune School of Medicine ("UNSM") and HeadSpace, Inc. ("HeadSpace") signed a partnership agreement. (R.2:1). This agreement's "Study Clause" required HeadSpace to "fund a UNSM-led study" on "devices covered by each valid [UNSM] patent." (R.2:1–6). Under this agreement, HeadSpace later licensed the '873 patent ("Patent") to create the Chat Hat. (R.5:9–10). When UNSM requested $1.2 million in funding under the Study Clause, HeadSpace refused. (R.10:11–12). HeadSpace claimed it need not fund UNSM's study because the Patent was not valid. (R.10:12–15).

UNSM sued HeadSpace for breach-of-contract in Oceania state court. (R.11:17–19; 17:19–20). Relying on 28 U.S.C. § 1446, HeadSpace removed this suit to the District Court of Oceania. (R.11:19–20). The parties agreed that the Patent's validity depends on Claim 1. (R.11:22–23). UNSM argued that HeadSpace must fund UNSM's study because the Patent was valid. (R.17:17–19). Because the Study Clause applied only to "valid" patents, HeadSpace's only defense was that the Patent was not valid under 35 U.S.C. § 103. (R.17:19–20).

A jury found the Patent valid and non-obvious and that HeadSpace breached its agreement with UNSM. (R.17:21). HeadSpace appealed the jury verdict of non-obviousness to this Court. (R.18:1–2). The jury awarded UNSM only $20,000 in damages, insufficient for UNSM's $1.2 million study. (R.17:22–23). Thus, UNSM

cross-appealed, challenging the district court's jurisdiction under 28 U.S.C. § 1338. (R.18:5–7). The parties stipulated to presenting only these issues on appeal. (R.18:9–10).

STATEMENT OF THE FACTS

1. The Parties

The University of Neptune School of Medicine ("UNSM") is a private institution whose mission "requires it to pursue the public interest and greater global good." (R.2:10–11). UNSM runs the Advanced Neuro Technologies Lab ("ANT Lab"), which develops medically useful inventions. (R.1:18–20). UNSM licenses these inventions to other entities. (R.5:12–13). To attract donations and grants, UNSM conducts studies on the socioeconomic impact of ANT Lab inventions. (R.8:20–23). UNSM depends on these donations and grants for financial support. (R.2:11).

UNSM is located in the state of Oceania and is the largest employer in Atlantis. (R.1:7–10, 7:12). Since Oceania depends on invention for economic growth, it funds public institutions' patent prosecution, maintenance, and development. (R.7:13–18). UNSM collaborates with recipients of this funding, such as the Sandcastle Technical Institute ("STI"). (R.7:18–23).

HeadSpace, Inc. ("HeadSpace") is a company that uses text-to-speech technology to enable messaging on users' social media profiles. (R.1:11–13). Like UNSM, HeadSpace is headquartered in Oceania. (R.1:13–14). HeadSpace is UNSM's partner in operating the ANT Lab. (R.1:19–20). HeadSpace also produces the Chat Hat, a device that practices the method of the '873 patent ("Patent"). (R.5:9–12).

2. The '873 Patent

The ANT Lab discovered a method to translate human thoughts into text. (R.2:17–19). On October 12, 2009, UNSM filed the Patent on this method. (R.2:15–17). The Patent's only independent claim, Claim 1, reads:

> 1. A method for translating human thoughts into text comprising:
> receiving unique user calibration brainwave data collected by a plurality of brainwave sensors during performance of a predetermined customization protocol;
> customizing a thought-to-text translation algorithm based on the received calibration brainwave data using a machine learning model;
> triggering collection of the user's triggered brainwave data to be translated after repetition of a predetermined trigger word by the user;
> filtering non-thought brainwave data from the collected triggered brainwave data; and
> translating the filtered data into text using the customized translation algorithm.
> (R.2:17–3:6).

The Patent's specification describes a device with sensors, a processor, a transceiver, and a memory unit. (R.3:7–8). When people think, their brains create electric "brainwaves" that electroencephalography ("EEG") can measure. (R.3:9–

11). The ‘873 device uses EEG to collect a sender’s brainwaves, uses a translation algorithm to convert those brainwaves to data, and transmits data to a recipient. (R.3:14–17). The recipient’s device then converts that data into the sender’s message using Transcranial Magnetic Stimulation (“TMS”). (R.3:17–18). Because the ‘873 device only collects the brainwaves necessary to translate human thoughts, it is smaller and cheaper than prior art EEG devices. (R.3:21–4:1).

A user trains the ‘873 device by performing standard steps to isolate his brainwave patterns. (R.4:5, 4:10–13). During training, the ‘873 device transmits a user’s brainwaves to a remote server, where a machine learning model optimizes that user’s translation algorithm. (R.4:16–19). Example training methods include singing nursery rhymes, inhaling scents from scratch cards, and viewing short well-known video clips. (R.4:13–16). A user activates the ‘873 device by repeating a keyword like “xylophone” three times. (R.4:20–5:4). If a user properly trains and activates the ‘873 device, it translates thoughts with over 95% accuracy. (R.5:5–8).

3. The HeadSpace-UNSM Partnership

Before the Patent issued, UNSM agreed that HeadSpace could “license and commercially develop any [ANT Lab] patent arising from the partnership.” (R.2:1–2; R.5:23–24). In addition to a 4% royalty on licensed patents, the agreement also included a “Study Clause,” which required HeadSpace to “fund a UNSM-led study” examining the socioeconomic impact of “devices covered by

each valid ANT Lab patent." (R.2:3–6). The agreement was to "be interpreted exclusively in accordance with Oceania law." (R.2:8–9). The Patent issued on January 15, 2012, and HeadSpace licensed the Patent on February 5, 2012. (R.2:14; 5:22–23). HeadSpace declined UNSM's offer to examine the Patent because HeadSpace was "sure the patent is valid because it had been granted." (R.5:19–23).

4. HeadSpace's Post-License Usage and the Subsequent Dispute

After licensing the Patent, HeadSpace distributed the Chat Hat to doctors, UNSM students, and UNSM staff. (R.6:7–9, 8:18–19). These recipients provided medical care abroad, communicating via Chat Hat to avoid touching contaminated computing devices. (R.6:8–12). HeadSpace neither distributed nor planned to distribute the Chat Hat in the United States. (R.6:21–22; R.7:1–3). UNSM received no compensation from HeadSpace's distribution of the Chat Hat. (R.7:8–10).

UNSM later requested $1.2 million for its study pursuant to the Study Clause. (R.10:11–12). HeadSpace refused to fund UNSM's study, claiming that the Patent was invalid and the Study Clause was "inapplicable." (R.10:12–15). This was the first time that HeadSpace claimed the Patent was invalid in the three years it had licensed the Patent. *Id*. UNSM argued that HeadSpace was obligated to fund UNSM's study because the Patent was valid. (R.17:17–20). Because the Study Clause applied to "valid" patents, HeadSpace's only defense was that the Patent

was not valid under 35 U.S.C. § 103. (R.17:19–20). The parties agreed that the Patent's validity depended on Claim 1. (R.11:23–24).

5. The HeadSpace Reference

HeadSpace cited its own speech-to-text interface ("HeadSpace reference") as a reference to contest the Patent's non-obviousness. (R.12:2–4). The HeadSpace reference uses software to filter out noise, translate microphone signals into text, and compensate for human speech variations. (R.12:8–14). Like the '873 device, the HeadSpace reference uses a machine learning model to reduce processing burdens, allowing the reference to function on mobile devices. (R.12:15–19). Users train the HeadSpace reference by reading a prepared text, which the reference's machine learning model scans for individual speech variations. (R.12:19–21).

6. The Kohlbehr Reference

HeadSpace also cited a lecture by Dr. Kohlbehr, the inventor of the Patent, to contest the Patent's non-obviousness. (R.12:4–6). Kohlbehr published this lecture on April 7, 2008, over a year before filing the Patent on October 12, 2009. (R.2:15–17, 12:4). In his lecture, Kohlbehr explains how to transmit full thoughts over long distances using transcendental meditation. (R.13:4–13). Mind-to-mind communication collects a sender's brainwaves with EEG, transmits the sender's EEG signal to a recipient, and translates that signal in the recipient's brain using TMS. (R.3:12–14). However, mind-to-mind communication only lets users

transmit binary code, as sensory noise and random thoughts prevent computers from isolating complex signals, like conscious thoughts. (R.13:7–11). Kohlbehr discovered that transcendental meditation enabled users to transmit complete thoughts, achieving a state he called the "Kohlbehr Rapport." (R.13:11–14).

Kohlbehr describes a method of transcendental meditation to achieve the Kohlbehr Rapport, instructing a sender and a recipient to meditate on the same mantra until both achieved meditative states. (R.13:14–16). Kohlbehr then instructs the sender to think a message into a continuously recording EEG. (R.13:17–18). When the recipient meditates on the sender's mantra, applying TMS causes the recipient to receive the sent thought. (R.13:19–24).

7. The Kohlbehr Experiments

Kohlbehr then describes four experiments that he performed using software to translate each experiment's data. In the first experiment, Kohlbehr recorded volunteers' one-word EEG signals twenty-five times, and obtained 60% accuracy in translating identical thoughts, but only 5% if the volunteer or word changed. (R.14:12–21). In the second experiment, Kohlbehr recorded volunteers' EEG signals after they meditated on a control mantra for five minutes. (R.14:22–15:3). In the third experiment, Kohlbehr had volunteers meditate on the control mantra for five minutes then project the first experiment's thoughts. (R.15:4–9). This process achieved 95% accuracy with volunteers who previously contributed data to

the translation algorithm, but only 50% accuracy with new volunteers. (R.15:9, 15:18–16:2). In the fourth experiment, Kohlbehr collected twenty volunteers' EEG data from twenty-five repetitions of the same one-word thought–a total of five hundred repetitions–and made a new algorithm from that data. (R.16:3–7). Kohlbehr's program achieved 75% accuracy if new volunteers meditated on the algorithm's control mantra, but only 15% accuracy if they did not. (R.16:7–12).

All four of Kohlbehr's experiments relied on transcendental meditation. Kohlbehr believes that such meditation enables his software to identify thoughts by reducing distracting brain activity or serving as a carrier wave. (R.15:10–17). Kohlbehr also believes that meditation enables mind-to-mind communication by synchronizing volunteers' mental states or improving thought recognition. (R.15:18–16:2).

The Patent's discovery is identifying and measuring the "discrete subset of brainwaves" that computers require for thought-to-text translation, making such translation feasible for individual use. (R.3:21–4:1). While Kohlbehr considers using computers instead of transcendental meditation, he feels that computers are too unsophisticated to translate complex messages. (R.14:3–8). Kohlbehr also notes that sensory noise and differences between individual users can prevent a computer from accurately translating thoughts. (R.14:8–10). Kohlbehr theorized that computer programs could identify thoughts if users repeatedly thought a

trigger word, but does not support this hypothesis with data. (R.17:1–6). Kohlbehr concludes that computers could not practically communicate complex brainwaves unless users divided thoughts into single words. (R.17:7–16).

SUMMARY OF THE ARGUMENT

The district court erred by exercising subject matter jurisdiction over this breach-of-contract case. No federal jurisdiction existed because the case did not "arise under" federal patent law since the Supreme Court's four element test from *Gunn v. Minton* was not satisfied. *Gunn* states that federal subject matter jurisdiction over a state law claim only exists if a patent law issue is: (1) necessarily raised, (2) actually disputed, (3) substantial to the federal system as a whole, and (4) can be resolved by a federal court without disrupting the balance of federalism. First, the only issue necessarily raised by UNSM's complaint was whether HeadSpace breached the partnership agreement. The validity of the Patent was an issue solely raised by HeadSpace's defense. Second, this breach-of-contract case is not substantial to the "federal system as a whole" because state courts are capable of properly applying federal law to particularized sets of facts and because a state court validity finding will not bind federal courts or the United States Patent and Trademark Office ("USPTO"). Finally, the balance of federalism favors state court adjudication of state contract claims where any federal issues are

insubstantial to the federal system. Because not all four *Gunn* elements are satisfied in this case, the district court lacked subject matter jurisdiction.

The district court correctly concluded the Patent was not obvious. Though obviousness is a legal determination reviewed without deference, the jury's factual findings underlying that determination are reviewed for substantial evidence. Multiple factors indicate an ordinarily skilled artisan had no motivation to combine the HeadSpace and Kohlbehr references. First, Kohlbehr teaches away from Claim 1 of the Patent by highlighting the complexity and data storage difficulties of computer-assisted mind-to-mind communication. Second, the HeadSpace reference is non-analogous art that an ordinarily skilled artisan would not consider. Third, combining the HeadSpace and Kohlbehr references does not disclose all of Claim 1's elements, since those references omit its first, third, and fourth steps. Finally, Kohlbehr's experiments do not describe one procedure that an ordinarily skilled artisan could combine with HeadSpace's machine learning model with a "reasonable likelihood of success." Secondary considerations also support the jury's non-obviousness verdict, since the Patent achieved commercial success and public praise. Thus, this Court should affirm the jury verdict that the Patent is non-obvious and that HeadSpace breached its contract with UNSM.

ARGUMENT

I. THE DISTRICT COURT LACKED JURISDICTION OVER UNSM'S BREACH-OF-CONTRACT CLAIM BECAUSE NOT ALL FOUR *GUNN* ELEMENTS WERE MET.

This Court reviews issues of jurisdiction de novo. *Forrester Envtl. Services, Inc. v. Wheelabrator Tech., Inc.*, 715 F.3d 1329, 1333 (Fed. Cir. 2013). Whether the district court had jurisdiction is a threshold issue that this Court has the power to decide. *C.R. Bard, Inc. v. Schwartz*, 716 F.2d 874, 877 (Fed. Cir. 1983).

The district court lacked subject matter jurisdiction over this breach-of-contract case under 28 U.S.C. § 1338, which provides federal courts with "original jurisdiction of any civil action arising under any Act of Congress relating to patents . . . ." A claim can only "aris[e] under" federal law if federal law created the cause of action or if it falls into the "special and small category" of cases where a state law claim is within federal subject matter jurisdiction. *Gunn v. Minton*, 568 U.S. 251, 257–58 (2013) (internal citation omitted). Federal law did not create UNSM's breach-of-contract claim, so federal jurisdiction only exists if this case falls into the "special and small category" described in *Gunn*. The Supreme Court held that federal subject matter jurisdiction over a state law claim only exists "if a federal issue is: (1) necessarily raised, (2) actually disputed, (3) substantial, and (4) capable of resolution in federal court without disrupting the federal-state balance

approved by Congress." *Gunn*, 568 U.S. at 258. All four of these elements must be present for the case to arise under federal law. *Id.*

In *Gunn*, the Court held that federal courts lacked subject matter jurisdiction over the plaintiff's legal malpractice claim because the underlying patent issue was neither substantial nor capable of federal resolution without disrupting federalism. *Id.* at 264. The cause of action in *Gunn* was a state law claim of legal malpractice where the plaintiff alleged that his former counsel's failure to make an experimental-use argument at trial resulted in the invalidation of his patent. *Id.* at 255. In the present case, the breach-of-contract cause of action similarly arose from state, not federal, law and will not affect other parties or patents. One difference from *Gunn* is that this case does not "necessarily raise" a patent law issue. The plaintiff in *Gunn* had the burden to plead that the patent would have been valid and infringed had the lawyer not erred. *Id.* at 259. UNSM had no burden of pleading that the Patent was valid due to the statutory presumption of validity. The issue of the Patent's validity only arose as part of HeadSpace's affirmative defense. Because UNSM's claim did not raise a federal law issue, this breach-of-contract case is not substantial to the federal system, and federalism requires that a state court handle this case, the district court lacked federal subject matter jurisdiction.

A. No disputed issue of patent law is "necessarily raised" by UNSM's breach-of-contract claim because of the well pleaded complaint rule.

The well-pleaded complaint rule applies to determining whether a case "arises under" patent law for purposes of 28 U.S.C. § 1338. *Christianson v. Colt Indus. Operating Corp.*, 486 U.S. 800, 809 (1988). Only "what necessarily appears in the plaintiff's statement of his own claim" determines if a case arises under patent law. *Id.* "A case raising a federal patent-law defense does not, for that reason alone, 'arise under' patent law . . . even if both parties admit that the defense is the only question truly at issue in the case." *Id.* UNSM's cause of action was breach-of-contract under Oceania state law. The issue of the Patent's validity only became part of this case when it was challenged by HeadSpace as a defense.

35 U.S.C. § 282(a) provides that patents are presumed to be valid, and the burden of establishing invalidity rests on the party challenging the patent. Because of this presumption, UNSM only had to plead in its complaint that it possessed an issued patent. Federal subject matter jurisdiction only existed if the *Gunn* elements were met at the time of filing. *Jang v. Boston Sci. Corp.*, 767 F.3d 1334, 1338 (Fed. Cir. 2014). HeadSpace could not create federal subject matter jurisdiction after the time of filing simply by raising a patent law defense to a breach-of-contract claim. While this Court has held that some breach-of-contract claims may raise issues of patent law, *see Jang*, 767 F.3d at 1336 (holding a breach-of-contract claim raised a patent law issue because the plaintiff had the burden to plead

infringement), this case is different because UNSM had no burden to plead a patent law issue. Unlike the plaintiff in *Jang*, who had the burden of showing infringement, UNSM had no burden to show in its pleadings that the Patent was valid.

UNSM's breach-of-contract claim does not "necessarily" implicate patent law because the presumption of patent validity means the only issue on the face of the complaint was whether HeadSpace breached the agreement. HeadSpace's own CEO reinforced this presumption of validity by stating that he was "sure the patent is valid because it had been granted and that means the claims must be valid," prior to the agreement. (R.5:20–23). Only when called upon to fulfill contractual obligations did HeadSpace challenge the Patent's validity. *See* (R.10:11–15).

B. This breach-of-contract case is not "substantial" to the federal system because it can be decided by a state court without disrupting federal patent law.

This breach-of-contract case is not substantial to the federal system because state courts can properly apply federal law to specific facts and because its resolution will not bind the federal courts or the USPTO. An issue is not substantial merely because it is important to the parties in the suit; rather, the "substantiality inquiry under *Grable* looks instead to the importance of the issue to the federal system as a whole." *Gunn*, 568 U.S. at 260; s*ee also Grable & Sons*

Metal Prods., Inc. v. Darue Eng'g & Mfg., 545 U.S. 308, 313 (2005). This is a breach-of-contract case that an Oceania state court can readily resolve.

1. *State courts are capable of properly applying federal obviousness precedent to particular facts.*

While the ultimate determination of validity is a question of law, a 35 U.S.C. § 103 obviousness inquiry requires making underlying factual determinations. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). While a "pure issue of law" that could be "settled once and for all" by federal adjudication may be a sufficiently substantial issue, a "fact-bound" and "situation-specific" issue is much less likely to be substantial. *Empire Healthchoice Assur., Inc. v. McVeigh*, 547 U.S. 677, 700 (2006). This is not a case presenting a novel or unsettled question of federal law. This case merely requires the application of federal obviousness precedent to a narrow and specific set of facts. State courts are capable of applying federal obviousness precedent to the facts of this case.

The *Gunn* Court expressed no concern about the ability of state courts to properly decide patent issues, explaining that "state courts can be expected to hew closely to the pertinent federal precedents." *Gunn*, 568 U.S. at 262. The Court analogized to the fact that state courts are capable of adjudicating federal RICO claims with the guidance of federal precedent. *Id; see also Tafflin v. Levitt*, 493 U.S. 455, 465–66 (1990). Similarly, state courts are capable of relying on federal obviousness precedent to decide patent validity without disrupting the uniformity

of the patent system. *Gunn*, 568 U.S. at 261–62. State courts are fully capable of applying federal precedent to particular sets of facts.

2. Federal courts and the USPTO will not be bound by state court validity holdings.

Even if state court adjudications of validity occasionally results in error, those determinations of validity will be insubstantial to the federal system because they will not limit the ability of federal courts or the USPTO to act independently. As pointed out by the *Gunn* Court, the USPTO's guidelines state that res judicata is only grounds for rejecting a patent if the prior decision was made by the Board of Appeals or certain federal courts. *Gunn*, 568 U.S. at 263. Thus, the pending ex parte reexamination of the Patent will likely be unaffected by the breach-of-contract suit, as the USPTO will make an independent determination of validity, regardless of the conclusion reached by an Oceania state court.

A "backward-looking" and "hypothetical" patent issue that is only important to the parties in the suit is not substantial to the federal system. *Gunn*, 568 U.S. at 261. Like *Gunn*, this case is not substantial because it is only important to the immediate parties, not to other parties in the federal system. An ex parte reexamination of the Patent is currently pending and was initiated before this suit was filed. (R.11:11–12). The result of this reexamination is "expected to be reached soon." (R.11:12–13). Because the USPTO will soon reach an independent

decision of validity, the impact of any state court determination would be limited and not "forward-looking."

The *Gunn* Court also strongly suggested that state court adjudication of patent law issues would have no preclusive effect on federal courts. *See Gunn*, 568 U.S. at 263. Even assuming state court determination of a patent issue could have a preclusive effect, it "would be limited to the parties and patents that had been before the state court." *Id.* Because the substantiality element is about the "federal system as a whole" and not about the issue's importance to the immediate parties, any preclusive effect that is limited to the immediate parties and patent is not substantial. *Id.* at 260.

Furthermore, any novel or unresolved issues of federal law will be finally determined by a federal court. If an issue of federal law arises frequently, then it will quickly be resolved in the federal system, "laying to rest any contrary state court precedent." *Id.* at 262. If the issue does not come up repeatedly, then it is "unlikely to implicate substantial federal interests." *Id.* State court resolution of federal RICO claims does not undermine the uniformity of federal law because federal courts have the ability to review and correct any error. *Tafflin*, 493 U.S. at 465. Similarly, the ability of federal courts and the USPTO to act without being constrained by state court determinations ensures that the resolution of the Patent's validity will not disrupt the federal patent system.

C. Federalism favors resolution of breach-of-contract claims in state, not federal, court.

To determine whether federal adjudication of a case disrupts the balance of federalism, the substantiality of the federal issue is balanced against the state's interest in exercising its own judicial authority. *See Gunn*, 568 U.S. at 264. Oceania has an interest in overseeing its own state contract law. Treating breach-of-contract cases as arising under patent law could "upset the 'Congressionally approved balance of federal and state judicial responsibilities.'" *MDS (Canada), Inc. v. Rad Source Tech., Inc.*, 720 F.3d 833, 843 (11th Cir. 2013); *quoting Grable*, 545 U.S. at 314.

There is no compelling federal interest in having the non-obviousness of the Patent resolved in a federal forum that offsets Oceania's interest in applying its own laws. The argument that the federal government has an interest in always determining validity in a federal forum to maintain a "uniform body of [patent] law" ignores the guidance provided by the Court in *Gunn*. *Bonito Boats, Inc. v. Thunder Craft Boats, Inc.*, 489 U.S. 141, 162 (1989). As the *Gunn* Court explained, state courts are capable of resolving patent validity in a way consistent with federal precedent, and subsequent federal suits will remedy any mistakes made by a state court. *Gunn*, 568 U.S. at 262–63. The balance of federalism weighs heavily in favor of this state law claim being resolved in a state court rather

than a federal forum because there is no compelling federal interest in this state law claim.

II. THE DISTRICT COURT CORRECTLY FOUND UNSM'S PATENT NON-OBVIOUS.

A patent claim is invalid if it "would have been obvious before [its] effective filing date . . . to a person having ordinary skill in the art to which [it] pertains." 35 U.S.C. § 103. Courts analyze claim obviousness by examining prior art's scope, the claim's differences from prior art, and the claim's ordinary skill level. *Graham*, 383 U.S. at 17. If an ordinarily skilled artisan had "an apparent reason to combine the known elements" of a patent's claim, that claim may be obvious. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007). Factors for analyzing such "motivations to combine" include the prior art's "teaching away" from the claim, solving analogous problems using the claim, and claim elements' presence in prior art. *Id.*at 416, 420–21. Secondary considerations may show that a claim is non-obvious. *Graham,* 383 U.S. at 17–18.

The district court properly concluded that Claim 1 of the Patent was non-obvious. Multiple factors show that an ordinarily skilled artisan had no motivation to combine the Patent's prior art. First, Kohlbehr teaches away from Claim 1's method by pointing to the disadvantages of that method. Second, HeadSpace's reference is non-analogous, since it solves a problem outside the Patent's field of thought-to-text translation. Third, combining Kohlbehr and HeadSpace does not

teach all of Claim 1's elements. Finally, the Kohlbehr reference does not teach the Patent's method with a reasonable likelihood of success. Objective considerations of commercial success, public praise, and unexpected results also show that Claim 1 is non-obvious.

Obviousness is a conclusion of law, which this Court examines de novo. *Arctic Cat Inc. v. Bombardier Rec. Prods*., 873 F.3d 1350, 1358 (Fed. Cir. 2017). That conclusion is based on the underlying *Graham* factors, which are questions of fact. *Id.* When reviewing a jury verdict, this Court presumes the jury resolved underlying factual disputes in favor of the winner and leave those findings undisturbed if supported by substantial evidence. *Id*.

A. The Patent is not obvious because an ordinarily skilled artisan had no motivation to combine the Patent's prior art references.

1. Kohlbehr teaches away from the Patent.

"When the prior art teaches away from combining certain known elements, discovery of a successful means of combining them is more likely to be nonobvious." *KSR*, 550 U.S. at 416. A reference teaches away from a patent if an ordinarily skilled artisan "would be led in a direction divergent from the [patented] path" after reading it. *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994). If a reference teaches away from a patent, it will generally not render the patent obvious. *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc*., 567 F.3d 1314, 1326 (Fed. Cir. 2009). This Court found that a patent on foam shoe straps was not

obvious because prior art taught away from the invention. *Crocs v. Int'l Trade Comm'n*, 598 F.3d 1294, 1308–09 (Fed. Cir. 2010). In *Crocs*, prior art taught that shoe straps should be made of elastic material and stretch as feet moved within shoes. *Id*. at 1308. The *Crocs* patent used inelastic foam, thought to "cause abrasions" when stretched and deemed "unsuitable" for shoe straps due to its short lifespan. *Id*. As "prior art references rendered the material out of place for use as a strap," the *Crocs* court found "the [factfinder] could not properly conclude that a person of ordinary skill would use foam" in shoe straps. *Id*. at 1309.

Like the prior art in *Crocs*, Kohlbehr highlights material deficiencies that teach away from computer use in thought-to-text translation. Kohlbehr teaches that brainwaves "[are] too complex to be translated by any computer less sophisticated than a human brain." (R.14:4–8). Kohlbehr suggests using more complex computers to solve this problem, but Claim 1 takes the opposite approach and simplifies data by analyzing a subset of brainwaves. (R.3:22–4:2). Kohlbehr also teaches that "mind-to-computer communication [is] probably impractical because the amount of data necessary . . . would be staggering." (R.17:7–9). While Kohlbehr offers no solution to this problem, Claim 1 reduces data storage needs by remotely storing a machine learning model to optimize translation algorithms. (R.4:5–9). Since Kohlbehr teaches away from Claim 1, an ordinarily skilled artisan

would have less motivation to combine Kohlbehr with the HeadSpace reference to achieve Claim 1's method.

2. The HeadSpace reference is non-analogous prior art.

An ordinarily skilled artisan will consider prior art from the invention's field of endeavor. *In re Clay*, 966 F.2d 656, 657 (Fed. Cir. 1992). This Court considers an invention and prior art to be within the same field where they share the same structure and function. *See In re Deminski*, 796 F.2d 436, 442 (Fed. Cir. 1986) (finding pump within compressor's field because both had the same structure and function). Here, the Patent and the HeadSpace reference are from different fields because they have different structures and functions. The Patent has a different structure from the HeadSpace reference: the Patent uses "brainwave sensors" to detect thought input, while the HeadSpace reference uses a microphone to detect speech input. (R.2:19–20, 12:7–8). Claim 1 also functions differently from the HeadSpace reference: Claim 1 "filter[s] non-thought brainwave data" and "translate[s] [that] filtered data into text," while the HeadSpace reference "compensates for dialect, accent, and other individualities in human speech." (R.3:3–6, 12:8–9). Thus, the HeadSpace reference is not "analogous" to Claim 1.

Even if prior art is not from an invention's field, an ordinarily skilled artisan may consider that art if the art is "reasonably pertinent" to the invention's problem. *In re Bigio*, 381 F.3d 1320, 1325 (Fed. Cir. 2004). Prior art is "reasonably

pertinent" if it "logically would have commended itself to an inventor's attention." *Clay*, 966 F.2d at 659. In *Clay*, prior art used gel to move oil in a desired direction, while the invention used gel to fill the space between the output valve and floor of an oil tank. *Id.* at 657. The USPTO found the prior art was "reasonably pertinent" to the invention, as both "maximiz[ed] withdrawal of petroleum stored in petroleum reservoirs." *Id*. at 659. This Court disagreed because the prior art and invention solved different problems: the former withdrew oil from underground porous rock, while the latter prevented oil loss in storage tanks. *Id*. at 659–60.

Here, the HeadSpace reference was not "reasonably pertinent" to the Patent because the two inventions solved different problems. Claim 1 exclusively handles "brainwave data," which must be "collected," "filtered," and "measured" before use. (R.3:1–6). The collection process ordinarily requires a laboratory-scale EEG machine, which is too bulky for portable devices to use. (R.4:1–4). The "filtering" process is unique to brainwave data, which includes both useful thought-bearing "triggered brainwave data" and useless "non-thought brainwave data." (R.3:3–4). By contrast, the HeadSpace reference "compensates for dialect, accent, and other individualities in human speech." (R.12:11–13). These speech-specific qualities have no equivalent in thought data: EEG signals for thoughts "differ substantially from person to person," but a single user's EEG signals remain constant. (R.14:9–10). Because the Patent's Claim 1 and the HeadSpace reference solve different

problems, that reference is not "reasonably pertinent" to Claim 1. This further suggests an ordinarily skilled artisan would not combine the Patent's references.

3. Prior art does not teach all steps of the Patent.

A claim is more likely to be obvious if it arranges known elements to perform their standard functions and yields predictable results. *KSR*, 550 U.S. at 417. Claim 1 describes "a method for translating human thoughts into text" comprising five steps. (R.2:18–3:6). This Court reads a patent's claims in view of its specification, which can define terms used in those claims. *Markman v. Westview Instruments, Inc*., 52 F.3d 967, 979 (Fed. Cir. 1995). In view of the Patent's specification, Claim 1's alleged references do not teach its first, third, and fourth steps. Since the alleged prior art does not teach all five of Claim 1's steps, an ordinarily skilled artisan likely lacked a motivation to combine that art.

i. Receiving user brainwave data from brainwave sensors during setup

Claim 1's first step is "receiving unique user calibration brainwave data collected by a plurality of brainwave sensors during performance of a predetermined customization protocol." (R.2:18–19). The Kohlbehr reference "requires the two users to meditate on the same mantra so that each achieves a similar mental state." (R.13:15–16). Because Kohlbehr's approach makes two users' data identical rather than isolating a single user's data, it does not "receive *unique* user calibration data." (R.2:18–19) (emphasis added). Meanwhile, the HeadSpace reference "receives the electrical signal produced by a microphone,"

and does not deal with "data collected by a plurality of brainwave sensors." (R.12:10–14). The alleged prior art therefore does not teach Claim 1's first step.

ii. Collecting user brainwave data only after user triggers device

Claim 1's third step is "triggering collection of the user's triggered brainwave data to be translated after repetition of a predetermined trigger word by the user." (R.3:1–2). The HeadSpace reference did not use a "predetermined" trigger word, but translated data to text whenever a user spoke. (R.12:7–11). Kohlbehr did not "trigger" collection, since users "meditated" on a "mantra" before Kohlbehr manually collected their EEG signals. (R.15:4–9). Thus, the alleged prior art does not teach Claim 1's third step.

iii. Filtering out non-thought brainwave data

Claim 1's fourth step is "filtering non-thought brainwave data from the collected triggered brainwave data." (R.3:3–4). The Patent's specification discloses that "filtering" involves isolating EEG signals from a user's conscious thoughts. (R.4:19–23). Kohlbehr does not "filter" data: he synchronizes a sender's and a recipient's mental states, translating conscious thoughts without isolating them. (R.13:15–16). Meanwhile, the HeadSpace reference filters speech data, and cannot isolate the EEG signals of conscious thoughts from Claim 1's "non-thought brainwave data." (R.12:10–14). Thus, the Kohlbehr and HeadSpace references do not teach Claim 1's fourth step. Since the Kohlbehr and HeadSpace references

omit multiple steps of Claim 1, an ordinarily skilled artisan likely lacked motivation to combine those references.

4. Kohlbehr's experiments did not create a "reasonable expectation of success."

"When there is a design need or market pressure to solve a problem . . . a person of ordinary skill has good reason to pursue the known options within his or her technical grasp." *KSR*, 550 U.S. at 421. Conversely, an ordinarily skilled artisan lacks motivation to combine prior art references if he could not combine them with a "reasonable expectation of success." *Arctic Cat*, 873 F.3d at 1360–61. Prior art creates a "reasonable expectation of success" if it discloses a method that an ordinarily skilled artisan would apply to achieve the invention's results. *See Noelle v. Lederman*, 355 F.3d 1343, 1352–53 (Fed. Cir. 2004) (no reasonable likelihood of success because all disclosed methods required extraordinary skill or were ineffective). The Patent specified that an '873 device should achieve over 95% accuracy when properly trained and activated. (R.5:5–6). Kohlbehr did not consistently achieve this accuracy: he achieved 60% accuracy in his first experiment, over 95% in his third experiment, and 75% in his fourth experiment. (R.14:15–17, 15:9, 16:7–9). Furthermore, Kohlbehr's single instance of over 95% accuracy only occurred with a single volunteer, dropping to 50% if the volunteer changed. (R.15:18–20). As one mistake by a Patent-practicing device could cause

irreparable harm, this does not create a "reasonable likelihood of success." *See* (R.6:16–20) (patients may die if Patent-practicing device fails during operation).

Prior art that gives "general guidance as to the particular form of the claimed invention or how to achieve it" also does not create a "reasonable likelihood of success." *Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006). Here, Kohlbehr's experiments varied sufficiently that they only provided "general guidance." Kohlbehr's procedure varied between experiments: he did not use a control mantra in his first experiment, but used a control mantra in his third and fourth experiments. (R.14:12–14, 15:7–8, 16:4–5). Kohlbehr also used differing numbers of volunteers between experiments, collecting data from one volunteer in his first and third experiments and from twenty volunteers in his fourth experiment. *Id*. Finally, Kohlbehr's experiments tested different types of volunteers: the third experiment tested volunteers who previously contributed to a translation algorithm, the fourth experiment tested volunteers who did not, and the first experiment tested both types. (R.14:15–19, 15:7–9, 16:7–11). Thus, the Kohlbehr reference did not show that Claim 1's method had a "reasonable likelihood of success." In light of the remaining *KSR* factors, the district court properly concluded Claim 1 was non-obvious.

B. Secondary considerations indicate the Patent is non-obvious.

Secondary considerations such as commercial success are relevant objective indicators of an invention's non-obviousness. *Graham*, 383 U.S. at 17–18. This Court weighs secondary considerations if a patentee establishes a prima facie case of nexus, as they "may often be the most probative and cogent evidence in the record." *Demaco Corp. v. F. von Langsdorff Licensing, Ltd.*, 851 F.2d 1387, 1393 (Fed. Cir. 1988). A nexus exists when a secondary consideration relates to an invention's claimed features. *In re GPAC*, 57 F.3d 1573, 1580 (Fed. Cir. 1995). Nexuses between Claim 1, the Chat Hat's commercial success, and the Chat Hat's public praise show Claim 1's non-obviousness.

1. The Patent is commercially successful.

Commercial success of devices practicing Claim 1 suggests that Claim 1 is not obvious. *See Graham*, 383 U.S. at 17. A device has "commercial success" if it makes "significant sales in a relevant market." *J.T. Eaton & Co. v. Atl. Paste & Glue Co.*, 106 F.3d 1563, 1571 (Fed. Cir. 1997). Here, HeadSpace distributed the Patent-practicing Chat Hat to UNSM foreign aid workers. (R.6:7–9). Users report that they "could not live without [the device]" because the Chat Hat's thought-to-text translation eliminated contamination caused by removing gloves to type. (R.6:14–16). Thus, the Patent's claimed features have a nexus with this commercial success.

HeadSpace's distribution of the Chat Hat to UNSM workers outside the U.S. may be "commercial activity" under § 103. This Court allows certain categories of extraterritorial activity to infringe under § 271(a). *See Akamai Techs., Inc. v. Limelight Networks, Inc*., 797 F.3d 1020, 1022 (Fed. Cir. 2015) (finding infringement despite extraterritoriality where all infringing acts attributable to service provider). Furthermore, the Supreme Court recently granted certiorari to decide whether "profits arising from prohibited combinations occurring outside of the United States are categorically unavailable" in § 271(f) patent infringement cases. Brief for Appellant at (i), *WesternGeco LLC v. ION Geophys. Corp.*, No. 16-1001, 86 U.S.L.W. 3356 (Jan. 12, 2018). These cases suggest "commercial activity" for § 103 non-obviousness may occur extraterritorially. Here, HeadSpace's headquarters is located in the U.S. state of Oceania, and HeadSpace entered into a U.S. partnership covering the Patent. (R.1:13–14; 2:1–3). However, HeadSpace has since refused to distribute its Patent-practicing Chat Hat within the U.S. (R.6:21–7:3). Allowing patent licensees to distribute patented devices abroad while hiding behind extraterritoriality to ignore license conditions would undermine patentees' ability to police patents. *See Impression Prods. v. Lexmark Int'l, Inc.*, 137 S. Ct. 1523, 1534–35 (2017) (patent exhaustion relies on patentee's ability to license, rather than sell, its patents). Given this extraterritorial commercial activity, this Court should find the Patent non-obvious.

2. The Patent has received public praise.

Praise of the patented invention by other members of an industry suggests that the invention is non-obvious. *Power-One, Inc. v. Artesyn Techs., Inc*., 599 F.3d 1343, 1352 (Fed. Cir. 2010). This Court has found that industry publications' recommendations and industry group awards are "industry praise." *Transocean Offshore Deepwater Drilling v. Maersk Contractors USA, Inc.*, 699 F.3d 1340, 1351–52 (Fed. Cir. 2012); *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1329–30 (Fed. Cir. 2016). Even praise from non-industry publications may support non-obviousness. *See Apple Inc. v. Int'l Trade Comm'n*, 725 F.3d 1356, 1365–66 (Fed. Cir. 2013). Here, STI expects to obtain massive licensing revenues from a continuation of the Patent assigned to STI. (R.8:4–8, 12–14). The state of Oceania has funded this research, believing the Patent could be a "game-changer" in the medical field. (R.8:9–12). These investments in the Patent suggest that the Patent is non-obvious.

CONCLUSION

Because the district court improperly exercised jurisdiction over this case, this Court should vacate the lower court's judgment and dismiss this case for want of jurisdiction. Alternatively, if this Court finds it has jurisdiction, this Court should affirm the jury verdict that the Patent was non-obvious.

CERTIFICATE OF SERVICE

We certify that on the 5th day of February, 2018, a true and correct copy of this document was served on counsel of record for all parties in compliance with Fed. R. App. P. 25(b).

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CERTIFICATE OF COMPLIANCE

We certify that the foregoing brief meets the technical rules promulgated by the Federal Circuit Court of Appeals. This brief is in double-spaced 14-point font with a one-inch margin on all sides. This 32-page, 7,181-word brief complies with the limitations set by this Court in Fed. R. App. P. 32(a)(7), given the exemptions in Fed. R. App. P. 32(f).

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