UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

THERABODY, INC.
Petitioner

v.

DATAFEEL INC.
Patent Owner.

Case No. PGR2025-00026
U.S. Patent No. 12,036,174

**DECLARATION OF MORTEN O. JENSEN, PhD, DrMed
IN SUPPORT OF PETITION FOR POST GRANT REVIEW
OF U.S. PATENT NO. 12,036,174**

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I. INTRODUCTION

1. I have been retained as an expert witness by the law firm of O'Melveny & Myers LLP, counsel for Petitioner Therabody, Inc. ("Therabody" or "Petitioner"), as an independent expert in this proceeding before the Patent Trial and Appeal Board ("PTAB" or "Board").

2. I understand that Therabody is requesting that the Board institute a post grant review ("PGR") proceeding of Claims 1-19 of U.S. Patent No. 12,036,174 ("the '174 Patent") (Ex-1001), currently assigned to DataFeel Inc. ("PO").

3. I am not and have never been an employee of Therabody. WIT Legal, LLC is being compensated at my usual and customary rate of $850 per hour. No part of my compensation depends on the outcome of this proceeding, and I have no other interest in this proceeding.

4. I have been asked to provide my independent analysis of Claims 1-19 of the '174 Patent in light of the prior art publications cited below. I have also been asked to provide my independent analysis of Claims 1-19 of the '174 Patent and whether they satisfy the requirements of 35 U.S.C. §§ 112. I have also been asked to consider the state of the art and prior art available as of October 23, 2017. It is my opinion that Claims 1-19 of the '174 Patent are unpatentable for the reasons provided below.

5. This declaration summarizes the opinions I have formed to date. I reserve the right to modify my opinions, if necessary, based on further review and analysis of information that I receive subsequent to the filing of this declaration, including in response to positions taken by Hyper Ice, Inc., or its expert that I have not yet seen.

A. Qualifications and Experience

6. A copy of my curriculum vitae (CV) including a list of my publications is attached hereto as Ex-1003.

7. I graduated with honors from The Engineering College of Aarhus in Denmark in July 1997 with a B.Sc. (bachelor's) degree in electrical and computer engineering with a focus in biomedical engineering. Biomedical based system automation, signal processing, data acquisition, and control was a large part of my early education. I graduated from the Georgia Institute of Technology and Emory University School of Medicine (joint program) in May 2000 with a M.Sc. (master's) degree in biomedical engineering. I graduated from the University of Aarhus School of Medicine in Denmark in November 2008 with a Ph.D (doctorate) in medicine. In March 2015, I was granted a Dr.Med (or dr.med.) in medical science from the University of Aarhus School of Medicine in Denmark. The Dr.Med degree is a higher-level doctorate degree that is awarded at certain universities in Northern Europe in the field of medicine. Dr. Med. is by law a higher degree than the Ph.D

(https://en.wikipedia.org/wiki/Doctor_Medicinae_(Danish_and_Norwegian_degree)). The Dr.Med degree is awarded after a candidate's research and publications have proven to make a significant difference in the advancement of science. Historically, the Dr.Med degree has been given only to medical doctors, with rare exceptions. I was the third engineer in Denmark since 1479 to receive this degree.

8. From 2000 to 2005 I worked in industry with a company based in Austin, Texas called National Instruments. Most of my activities with the company were with the consulting services department. The company makes sophisticated engineering tools for signal measurement, automation and processing + controls systems to a large variety of industries. These systems are typically sensor measurements and physical output, electrically controlled by software, embedded into a microcontroller or based on a computer. The systems often control mechanical systems and actuators that are interfacing with the human body.

9. I am currently employed as Associate Professor of Biomedical Engineering at the University of Arkansas in Fayetteville, Arkansas. I have held this position since August 2015. I am also a Scholar of the Arkansas Research Alliance, a public-private partnership dedicated to elevating a fundamental belief that "research matters." This Alliance provides financial support for my research at the university in the field of increasing the understanding of the tissue and fluid

mechanics of disease and intervention while creating solutions and dedicated devices.

10. My opinions in this declaration are mine as an individual and an independent expert and not those of the University of Arkansas.

11. I also hold Adjunct Associate Professorships at the University of Arkansas for Medical Sciences (UAMS) and the University Hospital of Aarhus in Denmark where I teach biomedical engineering to MD/PhD students and advise on research projects. I have held these positions since July 2009 (DK) and June 2023 (UAMS) . In 2013-2014, I was an Honorary Clinical Fellow and Senior Lecturer at University College in London, England.

12. Over the past two decades, I have developed and taught numerous courses at both the undergraduate and graduate level, as well as in medical schools, in the field of biomedical engineering, including biomechanics, sensors, actuators, signals, pressure measurements, biodynamics and biomechanical modeling, including processing of signals, and control of actuators and systems. As set forth on my CV (Ex-1003 attached hereto), I have published numerous articles relating to aspects of device interactions with the soft tissues of the human body, including device design, performance and specific features that allow them to function optimally. I have also received numerous awards for my research work, both nationally and internationally.

13. Observation and participation during clinical procedures and treatment is part of my biomedical research work directed to medical device design and development. Understanding the biomechanical and device related activities surrounding these procedures and treatments has given me a first-hand experience that would only be relevant after obtaining a deep knowledge of the involved physics and physiologies interacting during the procedures. I consider these experiences highly relevant, and hence, I have extensive knowledge of the human anatomy at large, and how tissues, nerves, and blood interact with devices and fluids, both implanted and externally operated devices through or on the skin.

14. I have also served on various committees and boards and am still serving on many of them. This includes review panels such as the National Institutes of Health (NIH) RO1 Bioengineering, Technology and Surgical Sciences Study Section panel, Center for Scientific Review (CSR), as well as the National Science Foundation (NSF) Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Medical Devices programs review panel member in the "Implantables & General Medical Devices" section, panel subsections including Implantables and Procedures, General Devices, Rehabilitation, Diagnostics, Instrumentation, Externals, Wearables, Sensors, Medical Technology (materials, manufacturing).

15. In total, I have been awarded more than $4.7M in funding for my research from the NIH, NSF, DoD, and non-federal state and private foundations.

16. As a result of my research work, thus far, I have published 102 peer reviewed publications (hereof 75 journal papers), 20 magazine articles, 11 books/book chapters, 7 conference keynote addresses, and given more than 170 presentations at conferences and seminars. Some of these publications are with the FDA, as outlined in my CV. I am also an inventor and/or co-inventor of 9 patents / patent application publications / trade secrets. Communicating my work to the public is important, and I also have more than 120 Public Media Appearances.

17. I should note that one of my research partners at my laboratory at the University of Arkansas is my wife, Dr. Hanna Jensen, who is a Medical Doctor (MD) with Ph.D and Dr.Med degrees. Dr. Hanna Jensen has practiced surgery in multiple countries in Europe for more than half a decade. She was also performing general practice in her hometown in Finland, as well as clinical research at the Great Ormond Street Hospital for Children in London, UK and the Emory University in Atlanta, GA. She is currently serving as the Associate Director of Clinical Research at the Departments of Surgery and Radiology at the University of Arkansas for Medical Sciences.

18. As a result of my background, education, experience, and network connections and exposure, I believe that I am qualified to provide opinions from the

standpoint of the person of skill in the art relating to the design and performance of the technology described in the '174 patent and the prior art references that I discuss in this Declaration.

B. MATERIALS CONSIDERED

19. In forming my opinions, I reviewed the following documents, in addition to others I have cited in my declaration. I also relied on my own knowledge of and experience in the field of biomedical engineering.

Ex. No.	Description
Ex-1001	U.S. Patent No. 12,036,174 ("the '174 Patent")
Ex-1002	Declaration for Morten O. Jensen
Ex-1003	Curriculum Vitae of Morten O. Jensen
Ex-1004	Prosecution History of the '174 Patent (Application No. 18/526,980)
Ex-1005	Korean Unexamined Application Publication No. 10-2001-0008111 ("Lee")
Ex-1006	Certified Translation of Korean Unexamined Application Publication No. 10-2001-0008111 ("Lee")
Ex-1007	U.S. Patent Application Publication No. 2016/0310353 ("Barasch")
Ex-1008	Korean Patent No.10-1123926 ("Choi")
Ex-1009	Certified Translation of Korean Patent No.10-1123926 ("Choi")
Ex-1010	U.S. Patent No. 7,384,405 ("Rhoades")
Ex-1011	U.S. Patent Application Publication No. 2015/0305969 ("Giraud")
Ex-1012	Chunpeng Jiang et al., *A Wearable Braille Recognition System Based on High Density Tactile Sensors*, 2020 IEEE 33rd Int'l Conf. on Micro Electro Mech. Sys. (MEMS) 28-31 (2020)

Ex. No.	Description
Ex-1013	*The Cadence Tablet*, Tactile Engineering, https://www.tactile-engineering.com/cadence (last visited Jan. 16, 2025)
Ex-1014	Devin Thorpe, *These 6 Women Undergrads at MIT Invented a Game-Changer for the Blind*, Forbes, https://www.forbes.com/sites/devinthorpe/2016/12/20/these-6-women-undergrads-at-mit-invented-a-game-changer-for-the-blind/ (Dec. 20, 2016)
Ex-1015	*O-Rejuv Facial Device*, O Cosmedics, https://www.ocosmedics.com/o-rejuv-facial-device.html (last visited Jan. 16, 2025)
Ex-1016	*ZAQ Facial Rejuvenation Device*, ZAQ, https://zaq.com/products/zaq-facial-rejuvenation-7-color-led-device-rf-ems-sonic-vibration-hot-massager (last visited Jan. 16, 2025)
Ex-1017	Sooyeon Choi et al., *Efficacy and Safety of a Home-Use Handheld Multi-Energy-Based Device for Skin Rejuvenation: Clinical, Ex Vivo, and Histological Studies*, 39 Lasers Med. Sci. 38 (2024)
Ex-1018	*Ergonomics and Handheld Medical Devices: Five Vital Elements for Design Success*, Medical Design Briefs, https://www.medicaldesignbriefs.com/component/content/article/%2029108-ergonomics-and-handheld-medical-devices-five-vital-elements-for-design-success (lasted visited Jan. 16, 2025)
Ex-1019	*Finding a Percussion Massager for Effective Muscle Recovery*, Pulse Therapy Hub, https://pulsetherapyhub.com/the-difference-between-a-percussion-massager-and-a-vibration-massager (lasted visited Jan. 16, 2025)
Ex-1020	Claim Correlation Chart
Ex-1021	*Percussion Massage v. Vibration Massage*, Dr. Graeme, https://www.drgraeme.com/articles/2021/06/percussion-massager-vs-vibration-massage (lasted visited Jan. 16, 2025)
Ex-1022	*Vibration vs. Percussion Massagers: Which One is the Best?*, The Fitness Tribe, https://thefitnesstribe.com/vibration-vs-percussion-massagers (lasted visited Jan. 16, 2025)

Ex. No.	Description
Ex-1023	*Vibrational Massagers vs. Percussive Massagers*, Fit Body Factory, https://thefitbodyfactory.com/blogs/news/vibrational-massagers-vs-percussive-massagers (lasted visited Jan. 16, 2025)
Ex-1024	U.S. Patent No. 10,940,081 ("Nazarian")
Ex-1025	*How to Implement In-Sensor Vibration Monitoring with ISM330IS*, ST Community, https://community.st.com/t5/mems-and-sensors/how-to-implement-in-sensor-vibration-monitoring-with-ism330is/ta-p/572988 (lasted visited Jan. 16, 2025)
Ex-1026	U.S. Patent Application Publication No. 2020/0276079 ("Cheng")
Ex-1027	*EMS Gua Sha Massager | Cooling & Heating for Lymphatic Drainage Massage, Contouring, Oil & Acne Control | LED Therapy & Microcurrent*, Arte Reverie, https://artereverie.com/products/gua-sha-ems-massager (lasted visited Jan. 16, 2025)
Ex-1028	*MG 600 | Massage Gun with Hot & Cold Function*, Medisana, https://www.medisana.com/en/Wellness/Massage-devices/MG-600-Massage-Gun-with-hot-cold-function.html (lasted visited Jan. 16, 2025)
Ex-1029	*What's the Difference Between TENS and EMS Units*, Healthline, https://www.healthline.com/health/tens-vs-ems (lasted visited Jan. 16, 2025)
Ex-1030	*Digital EMS & TENS Device, EM49*, Beurer, https://www.shop-beurer.com/products/digital-ems-tens-device-em49 (lasted visited Jan. 16, 2025)
Ex-1031	*Understanding E-Stim Devices: A Guide to Electrical Muscle Stimulation*, Optimal Wellness Center, https://www.owchealth.com/blog/2024/10/15/understanding-e-stim-devices-a-guide-to-electrical-muscle-stimulation (lasted visited Jan. 16, 2025)
Ex-1032	Claim Chart for Theragun Prime Plus

II. RELEVANT LEGAL STANDARDS

20. In forming my opinions and considering the subject matter of the '174 Patent and its claims, I am relying on certain legal principles that counsel in this case explained to me. My understanding of these concepts is summarized below.

A. Anticipation

21. I understand that earlier publications and patents may act to render a patent unpatentable for one of two reasons: (1) anticipation, and (2) obviousness.

22. It is my understanding that the claims of a patent are anticipated by a prior art reference if each and every element of the claim is found either explicitly or inherently in the reference. I understand that inherency requires a showing that the missing descriptive matter in the claim is necessarily present in the allegedly anticipating reference, and that it would have been so recognized by a person of ordinary skill in the art ("POSITA").

23. I understand that when a challenged claim covers several structures, either generically or as alternatives, the claim is deemed anticipated if any of the structures within the scope of the claim is found in the prior art reference.

24. Although anticipation typically involves the analysis of a single prior art reference, I understand that additional references may be used to show that the prior art reference has enabling disclosure (i.e., allows a POSITA to make the invention without undue experimentation), to explain the meaning of a term used in

the prior art reference, and/or to show that a characteristic is inherent in the prior art reference.

B. Obviousness

25. I understand that a claim is invalid as obvious if it would have been obvious to a person of ordinary skill in the art at the time the alleged invention was made. This means that even if all of the elements of the claim cannot be found in a single prior art reference that would anticipate the claim, a person of ordinary skill in the art who was aware of the prior art would have been able to come up with the claimed invention. This may be the case, for example, where the missing element represents only an insubstantial different over the prior art or a reconfiguration of a known system. I understand that in an obviousness determination, the person of ordinary skill in the art is presumed to have knowledge of all material prior art.

26. I understand that an obviousness analysis requires an understanding of the scope and content of the prior art, any differences between the alleged invention and the prior art, and the level of ordinary skill in evaluating the pertinent art.

27. I understand that when a product is available, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill in the art can implement a predictable variation, obviousness likely bars its patentability. For the same reason, if a technique has been used to improve one device and a person of ordinary skill in the art would recognize

that it would improve similar devices in the same way, using the technique would have been obvious.

28. I understand that whether a prior art reference renders a patent claim unpatentable as obvious is determined from the perspective of a person of ordinary skill in the art at the time of the alleged invention. I have been told that there is no requirement that the prior art contain an express suggestion to combine known elements to achieve the claimed invention, but a suggestion to combine known elements to achieve the claimed invention may come from the prior art, as filtered through the knowledge of one skilled in the art. In addition, I have been told that the inferences and creative steps a person of ordinary skill in the art would employ are relevant to the determination of obviousness.

29. I understand that one may consider, e.g., whether (1) the change was merely the predictable result of using prior art elements according to their known functions, or whether it was the result of true inventiveness; (2) there is some teaching or suggestion in the prior art to make the modification or combination of elements claimed in the patent; (3) the claimed innovation applies a known technique that had been used to improve a similar device or method in a similar way; (4) the claimed invention would have been obvious to try, meaning that the claimed innovation was one of a relatively small number of possible approaches to the problem with a reasonable expectation of success by those skilled in the art; (5) the

invention merely substituted one known element for another known element in order to obtain predictable results; (6) the invention merely applies a known technique to a known device, method, or product to yield predictable results; or (7) known work in one field of endeavor may have prompted variations of it for use in either the same field or a different one based on design incentives or other market forces that would have been predictable to a person of ordinary skill in the art.

30. I further understand that certain factors may support or rebut the obviousness of a claim. I understand that such secondary considerations include, among other things, commercial success of the patented invention, skepticism of those having ordinary skill in the art at the time of the invention, unexpected results of the invention, any long-felt but unsolved need in the art that was satisfied by the alleged invention, the failure of others to make the alleged invention, praise of the alleged invention by those having ordinary skill in the art, and copying of the alleged invention by others in the field. I understand that there must be a nexus—that is, a connection—between any such secondary considerations and the alleged invention. I also understand that contemporaneous and independent invention by others is a secondary consideration tending to show obviousness.

31. I am not aware of any allegations by the named inventors of the ’174 Patent or any assignee of the ’174 Patent that any secondary considerations tend to rebut the obviousness of the ’174 Patent.

32. Additionally, I understand that in considering obviousness, it is important not to use the benefit of hindsight derived from the patent under consideration.

C. Written Description

33. I understand a patent claim is invalid if the patent fails to provide adequate description of the alleged inventions. I am informed that this standard is set forth in 35 U.S.C. § 112(a), which has been reproduced below:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor or joint inventor of carrying out the invention.

34. I am informed that to satisfy the written description requirement, the specification must convey with reasonable clarity to those skilled in the art that, as of the priority date sought, the inventor was in possession of the invention. I understand that the invention is, for purposes of the written description inquiry, whatever is claimed. I further understand that the description must do more than merely disclose that which would render the claimed invention obvious. I understand that an applicant shows possession of invention by describing the claimed invention with all of its limitations using such descriptive means as words, structures, figures, diagrams, and formulas that fully set forth the claimed invention. A mere wish or plan for obtaining the claimed invention is not an adequate written

description. I am informed that the subject matter of the claim need not be described using language identical to that in the claim in order for the disclosure to satisfy the description requirement.

D. Enablement

35. I understand a patent claim does not satisfy the enablement requirement of 35 U.S.C. § 112(a), unless the patent's specification describes its invention so as to "enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same." To meet this requirement, I understand that the specification must provide sufficient guidance and direction to enable a person of ordinary skill in the art (POSITA) to practice the full scope of the claimed invention without undue experimentation.

E. Indefiniteness

36. I have been informed and understand that a patent claim is indefinite and therefore invalid if the claim, read in light of the patent specification and the prosecution history, fails to inform, with reasonable certainty, those skilled in the art about the scope of the invention. I understand that claims must particularly and distinctly set out what is claimed so that the public has fair notice of the claimed invention. I also understand that each term in a claim must find clear support or antecedent basis in the specification

F. Level of Ordinary Skill in the Art

37. When interpreting a patent, I understand that it is important to identify the relevant art pertaining to that patent, as well as the level of ordinary skill in that art at the time of the claimed invention. The "art" is the field of technology to which the patent is related.

38. I am informed and understand that the POSITA is a hypothetical person who is presumed to know the relevant prior art. I understand that the actual inventor's skill is not determinative of the level of ordinary skill. I further understand that factors that may be considered in determining level of skill include: (i) the types of problems encountered in the art; (ii) prior art solutions to those problems; (iii) the rapidity with which innovations are made; (iv) the sophistication of the technology; and (v) the educational level of active workers in the field. I understand that not all such factors may be present in every case, and one or more of them may predominate.

39. I understand that a POSITA is one who is presumed to be aware of all pertinent art, thinks along conventional wisdom in the art, and is a person of ordinary creativity.

40. A person of ordinary skill in the art at the relevant time, which I have been told to consider as October 23, 2017 ("POSITA") would have had a bachelor's degree in biomedical engineering, or a related field, and two-to-three years of

experience in the research, design, development, or testing of electromechanical treatment devices, with additional education substituting for experience and vice versa. A higher level of education or skill might make up for less experience, and vice versa.

41. Based on my knowledge, skill, and experience, I have at least the capabilities of a person of ordinary skill in the relevant art and an understanding of the capabilities of a person of ordinary skill in the relevant art. For example, as described above in the "Qualifications and Experience" section, after my undergraduate and graduate education in electrical and biomedical engineering, I worked in the measurement and automation industry with a focus on biomedical and sensor / actuation applications during the year 2000 – year 2006 timeframe. I continued my professional degrees of PhD and DrMed with a focus on medical instrumentation, measurements, and data analysis, and hence by October 23, 2017 I was at least a POSITA as defined above. Furthermore, I would have, at least, met the criteria for a POSITA on October 23, 2017, and I still exceed it today

G. Claim Construction

42. I understand that the United States Patent and Trademark Office interprets claim terms in a post grant review proceeding under the same claim construction standard that is used in a United States federal court. I understand that

under this standard, the meaning of claim terms is considered from the viewpoint of a POSITA at the time of the alleged invention.

43. I have been informed that claim terms are generally given their ordinary and customary meaning as understood by one of ordinary skill in the art in light of the specification and the prosecution history pertaining to the patent. I understand, however, that claims terms are generally not limited by the embodiments described in the specification.

44. I understand that in addition to the claims, specification, and prosecution history, other evidence may be considered to ascertain the meaning of claim terms, including textbooks, encyclopedias, articles, and dictionaries. I have been informed that this other evidence is often less significant and less reliable than the claims, specification, and prosecution history.

45. I have reviewed both Petitioner's and Patent Owner's identification of preliminary claim constructions for the "quick-connect system" and "substantially cylindrical" limitations in the challenged claims. Ex-1015, 1016. The prior art discussed in Sections V and VI of my declaration would render the claims obvious under any of the proposed constructions.

III. SUMMARY OF GROUNDS

Ground	Summary
1	Claims 1-3, 5-6, 8-19 are unpatentable under 35 U.S.C. § 103 as obvious over Korean Unexamined Application Publication No. 10-2001-0008111 ("Lee") (Ex-1005) in view of U.S. Patent Application Publication No. 2016/0310353 ("Barasch") (Ex-1007).
2	Claim 4 is unpatentable under 35 U.S.C. § 103 as obvious over Lee in view of Barasch and, further in view of Korean Patent No. 10-1123926 ("Choi") (Ex-1008).
3	Claim 7 is unpatentable under 35 U.S.C. § 103 as obvious over Lee in view of Barasch and, further in view of U.S. Patent No. 7,384,405 ("Rhoades") (Ex-1010).
4	Claims 1-7 and 17-18 Are Unpatentable Under 35 U.S.C. § 103 As Obvious Over Giraud in View of Choi
5	Claims 1-19 are unpatentable under 35 U.S.C. § 112 based on lack of written description support.
6	Claims 1-19 are unpatentable under 35 U.S.C. § 112 as based on lack of enablement.

IV. THE '174 PATENT

A. Overview of the '174 Patent

46. The '174 Patent is titled "Communication Devices, Methods, and Systems." Ex-1001, Cover. As reflected in the title, the application from which it stems focuses on describes various embodiments of a communication device designed to interact with the skin of a user through a plurality of energy generators. The energy generators convert electricity into different types of energy, which are then transmitted to the skin to communicate data through non-visual means. *Id.*, Abstract, 1:59-65. The patent explains that "a processing unit" is "configured to communicate with the nerves associated with the skin by receiving input data from a data source and causing the plurality of energy generators to output an energy

signal" toward the skin. *Id.*, 1:68-2:4. As described further below, however, the claims of the '174 Patent are directed to a far broader alleged invention that ignores the critical "communication" aspect of the specification in favor of claims that can also read on a variety of other "treatment" devices including percussive massaging devices. Indeed, although the word "treatment" appears 20 times in the claims of the '174 Patent, it appears in only three times in the specification itself and is never used to describe the "device" of the claimed invention, which is instead referred to repeatedly as a "communication device" or a "patient monitoring device."

47. The patent describes several embodiments of the communication device, each with distinct configurations and applications. *Id.*,1:59-2:4. The embodiments are designed to be allow communication from energy generators to various parts of the body and in various contexts, including, for example, a nurse monitoring patients, a person shooting a gun, and a person exercising. In each instance the focus of the embodiment relates to ensuring communication through the skin. *Id.*, 2:5-21. The energy generators in the devices described in the different embodiments can output different types of energy, such as impact, heat, electrical, and pressure energy, to convey information.

48. For example, in the first embodiment, the communication device comprises a body with a distal surface compatible with the skin, a tissue interface with multiple energy generators, an attachment element to maintain the interface

against the skin, and a processing unit. *Id.*, 1:59-2:4. The energy generators are arranged in a grid pattern and can output energy signals in a specific direction towards the skin, as shown below. *Id.*, 2:35-47.

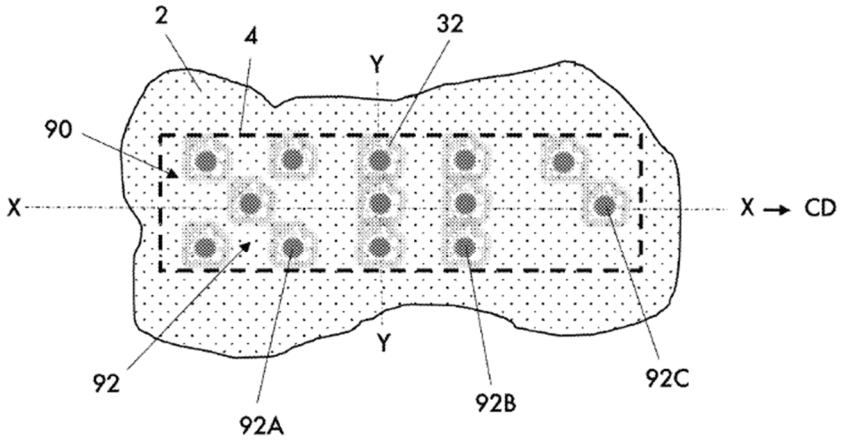


FIG. 1A

49. The body is flexible and can be wrapped around a limb or other body parts, similar to a bandage, as shown below. *Id.*, 2:5-21. The attachment elements in these embodiments are designed to maintain the tissue interface against or adjacent to the skin. *Id.*, 2:5-34. They can include adhesives, elastic bands, compression garments, and other fastening mechanisms. *Id.*, 2:22-34, 3:45-59. The attachment elements ensure that the energy signals are effectively transmitted to the skin, providing reliable communication to the user. *Id.*, 2:23-40.

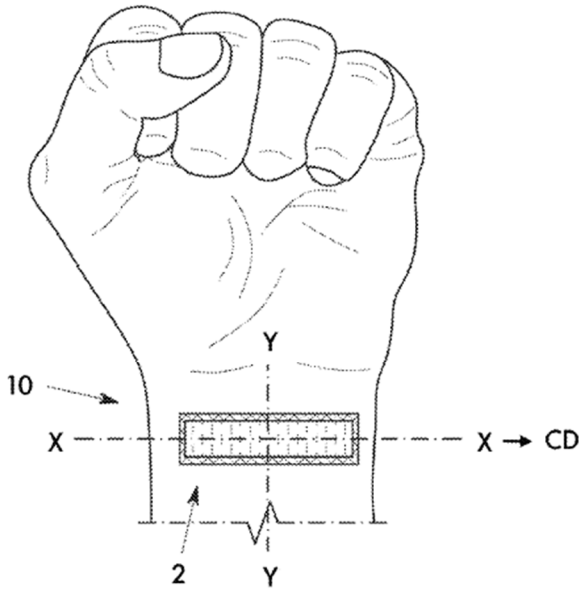


FIG. 1B

50. The device includes a processing unit that receives input data from various data sources and controls the energy generators to output energy signals based on the data. *Id.*, 2:62-3:7, 3:28-44 The data sources can include local sensors, remote sensors, patient monitoring devices, and servers. *Id.*, 2:62-3:7, 3:28-44. The processing unit can generate control signals based on the input data and modify the energy signals accordingly. *Id.*, 2:48-3:7.

51. The energy signals are provided by energy generators. The energy generators in these embodiments are designed to output different types of energy to communicate information through the skin. *Id.*, 42:12-32. The types of energy include:

Impact Energy: Generated by a mechanical actuator to create a physical movement recognizable by touch receptors in the skin, in some cases by moving a piston. *Id.*, 17:66-18:17.

Heat Energy: Produced by an electrical resistor that converts electricity into heat, which is then transmitted to the skin. *Id.*, 18:33-47.

Electrical Energy: Created by an electroshock generator that outputs an electrical shock recognizable by electricity-sensitive receptors in the skin. *Id.*, 18:62-19:12.

Pressure Energy: Generated by an electroacoustic transducer that converts electricity into sound waves, which are then transmitted to the skin. *Id.*, 19:25-36.

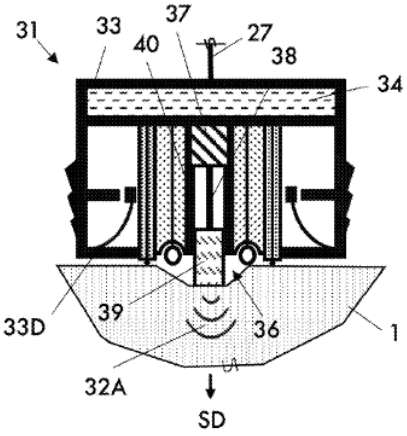


FIG. 4A

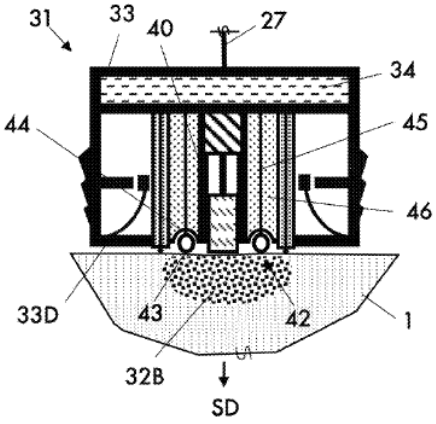


FIG. 4B

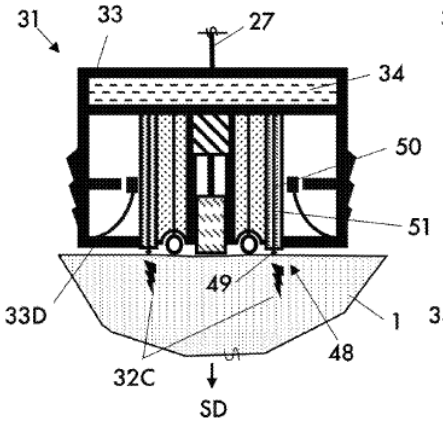


FIG. 4C

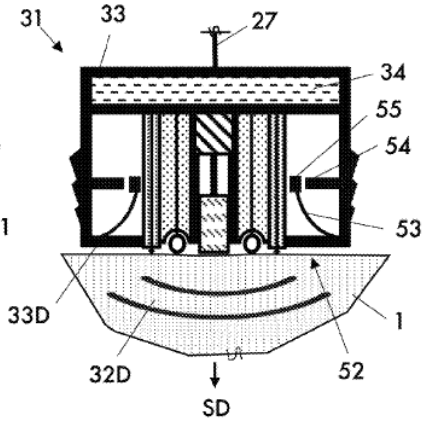


FIG. 4D

52. Each energy generator is independently operable and can be controlled by the processing unit to output energy signals based on input data. *Id.*, 3:8-16. The energy signals can be modified in terms of intensity, duration, and scroll rate to convey different types of information. *Id.*, 2:48-61. For example, in a healthcare setting, the processing unit can receive vital signs from patient monitoring devices

and output energy signals to communicate the patient's status to a caregiver. *Id.*, 2:48-61, 14:35-39. The energy signals can be scrolled across the skin to provide continuous updates, allowing the caregiver to monitor multiple patients simultaneously without relying on visual displays. *Id.*, 2:35-47, 4:12-30. The energy signals can be scrolled across the skin in a communication direction transverse to the signal direction, allowing the user to receive information through tactile sensations. *Id.*, 2:35-47.

53. In addition to a bandage-like device, the patent also describes wearable devices such as bands, caps, socks, and compression garments that can communicate information to users through energy signals directed toward the skin. *Id.*, 3:45-59. These devices are designed to wrap around specific body parts, such as the forearm, head, leg, or torso, and maintain the tissue interface against the skin using elastic or non-elastic attachment elements. *Id.*, 4:12-30.

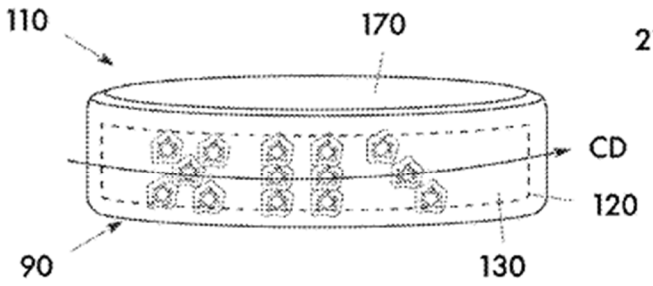


FIG. 6A

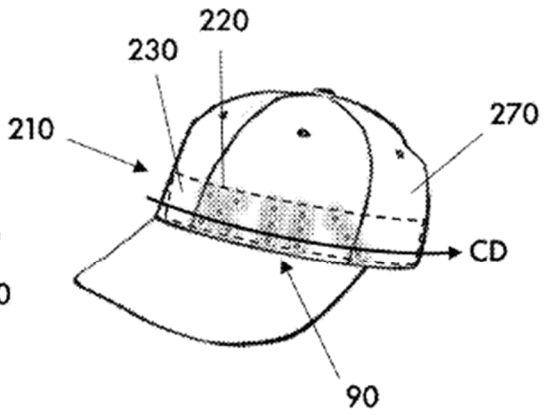


FIG. 6B

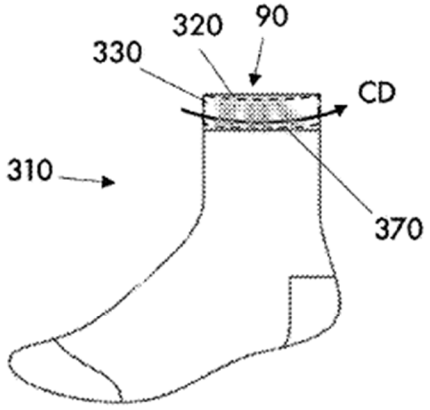


FIG. 6C

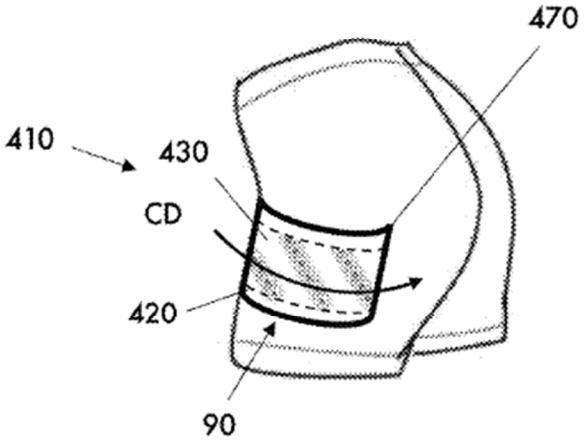


FIG. 6D

54. For example, a sweatband can be used to wrap around the forearm, with the tissue interface positioned on the distal surface of the band. *Id.*, 24:54-25:4 The

energy signals can be scrolled around the circular portion of the skin, providing continuous communication to the user. *Id.*, 25:5-19.

55. In another embodiment, the communication device is integrated into footwear or grips, such as shoes or gun grips. *Id.*, 3:45-59. The tissue interface is positioned on the distal surface of the footwear or grip, allowing the energy signals to be transmitted to the skin through the contact maintained by the user's weight or grip force. *Id.*, 29:29-45.

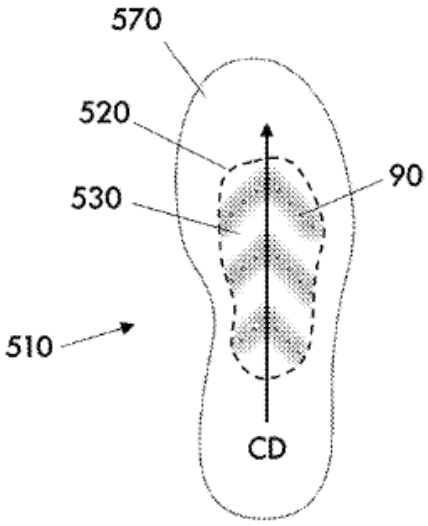


FIG. 7A

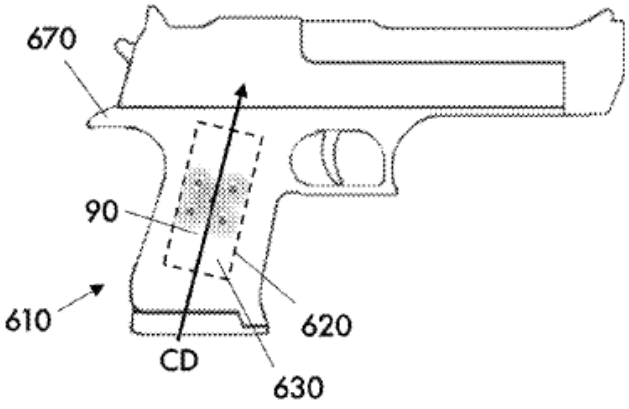


FIG. 7B

56. For instance, a shoe insert can have a tissue interface embedded in the sole, transmitting energy signals to the underside of the foot. *Id.*, 27:57-28:2. Similarly, a gun grip can have a tissue interface on the grip panel, communicating information to the user's hand through the energy generators. *Id.*, 28:42-58. The gun

embodiment depicted in Figure 7B is the only embodiment in which a grip emulating the grip of a gun is used to communicate information through energy generators. Notably, in this configuration, the communication between the device and the user occurs through energy generators found in the grip, not elsewhere on the gun. The grip is designed to be grasped by the user's hand, applying a gripping force to maintain the energy generators on or adjacent to the skin. *Id.*, 40:47-67.

57. Yet another embodiment describes implantable devices where the tissue interface is positioned under the skin, such as on a bone plate. *Id.*, 4:6-11. The energy signals are transmitted to the underside of the skin, allowing for more direct communication with the nerves associated with the skin. *Id.*, 4:6-11. The implantable device can be attached to a bone using adhesives, screws, or wires, with the tissue interface positioned on the skin-facing surface of the bone plate. *Id.*, 4:6-11. This configuration ensures that the energy signals are effectively transmitted to the skin without interference from external factors. *Id.*, 22:23-40.

58. In some embodiments, communication devices described by the patent can output multiple energy signals simultaneously. *Id.*, 6:33-46. These devices have a body with multiple bands or divided areas, each containing a set of energy generators. *Id.*, 5:45-61. The processing unit controls the energy generators to output different energy signals in each band based on input data from various sources. *Id.*,

2:62-3:7. For example, a device wrapped around the forearm can have multiple bands, each outputting a different energy signal.

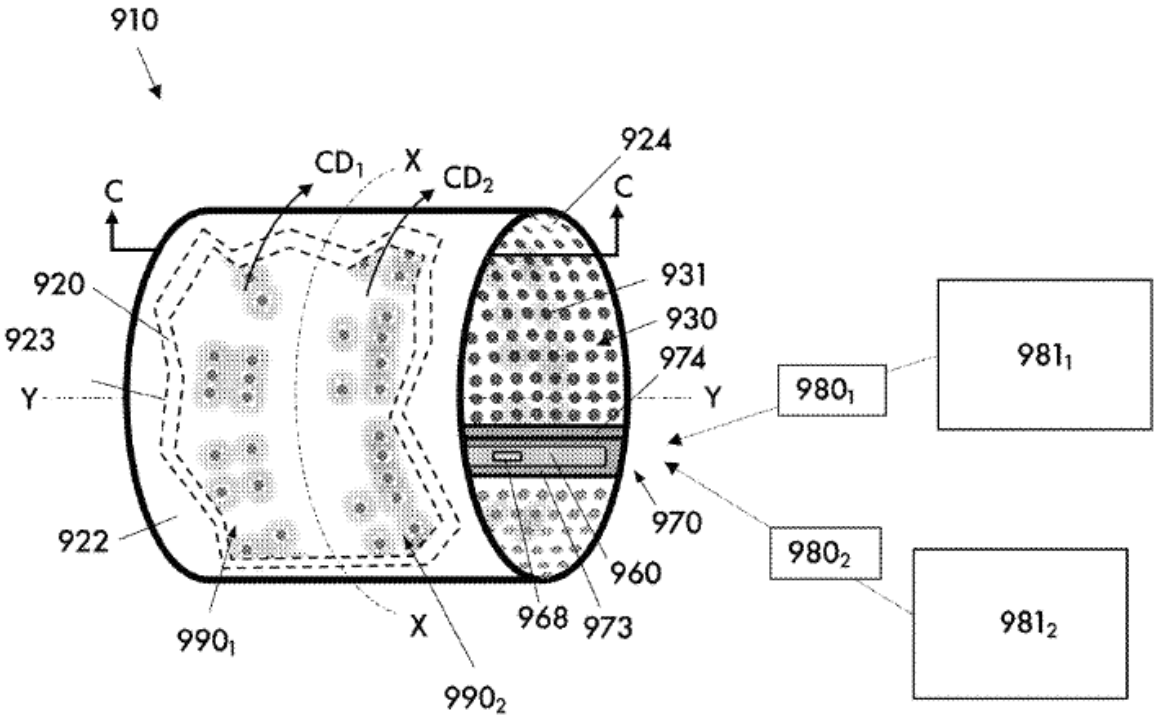


FIG. 8A

Id. at 7:9-14.

B. The Priority Date for the '174 Patent

59. I understand that the application that issued as the '174 Patent was filed as Application No. 18/526,980 ("the '980 application") on December 1, 2023. Ex-1001, Cover. The '980 application claims priority several related applications and to provisional application Nos. 62/676,949 and 62/575,951, filed on May 26, 2018 and October 23, 2017, respectively. Ex-1001, Cover.

60. I have been asked to consider October 23, 2017, as the priority date for the ’174 Patent.

C. Prosecution History of the ’174 Patent

61. I have reviewed the prosecution history of the application that led to the ’174 Patent. *See* Ex-1004.

62. During prosecution, the Examiner did not reject any of the challenged claims based on prior art references. Instead, the Examiner allowed all 30 pending claims presented in the applicant’s February 5, 2024 Preliminary Amendment. Ex-1004, 865-73, 876-883. In the Notice of Allowance, the examiner cited a single reference US 2016/0129248 to Creasey provided by the applicant and explained briefly why the alleged invention was not disclosed by Creasey. *Id.* 876-883. The examiner provided no explanation regarding the hundreds of other references cited by the applicant in Information Disclosure Sheets, nor did the examiner explain why Creasey was selected among all of these references. *Id*. After allowance, the applicant requested withdrawal from issue under 37 CFR § 1.313 for further action by the applicant. *Id.* at 1475. The applicant proceeded to amend the specification to update priority information and further made numerous amendments to the claims. *Id.* at 1477-1485. The examiner again allowed these claims without any rejections, again discussing only the Creasey reference. *Id.*

D. The State of the Art

1. Alternate Communication Devices

63. At the time the ’174 Patent was filed, convert electrical energy into various forms—such as mechanical, electrical, and thermal stimuli—for transmitting information through the skin had seen significant advancements, for example in aiding visually impaired individuals. These devices facilitate tactile communication by rendering Braille and other tactile feedback, enhancing accessibility to textual and graphical information.

64. In the area of wearable technology, the TouchReader system integrates a high-density tactile sensor array into a “finger-worn” device. This system enables real-time Braille recognition, facilitating seamless interaction with Braille text and enhancing the learning and communication experiences for visually impaired users. Ex-1012.

65. Another notable development is the Cadence tablet by Tactile Engineering, a pocket-sized device featuring a 384-dot refreshable screen capable of displaying multi-line electronic Braille and real-time updating graphics. An example of this device is shown in the picture below.

Cadence tablet by Tactile Engineering. Ex-1013.

66. This device allows users to read Braille text, view tactile graphics, and interact with dynamic content, thereby broadening access to information and improving communication for the visually impaired. Ex-1013.

67. Another tactile device, developed by a team at the Massachusetts Institute of Technology, offers real-time text-to-Braille translation. Ex-1014. By sliding the handheld device over printed text, an integrated camera captures images, which are then converted into Braille via a refreshable display. This innovation aims to provide an affordable and portable solution for accessing printed materials.

68. These Braille devices are converting electric energy into mechanical energy, that in turn is transferred onto the skin of a user that is holding the device. Any conversion of electrical energy into mechanical energy includes generation of

heat, and whether that heat generated is considered a loss or intentional to improve upon the sensation of the device, the mechanical and heat energies are two different forms of energy generated from the electrical source energy.

69. Handheld devices that convert electrical energy into multiple energy forms for skin application were also prevalent prior to the filing date of the '174 patent, in both consumer skincare and medical devices. As will be briefly demonstrated below, these multifunctional tools often combine modalities such as low-level light therapy (LLLT), radiofrequency (RF) energy, microcurrent stimulation, and ultrasonic waves to address various skin concerns, including aging, acne, and laxity. The ergonomic design of these devices allows users to apply a gripping force to maintain the energy-emitting elements in contact with the skin, ensuring precise and effective treatment.

70. A notable example is the O-Rejuv Facial Device, which integrates thermal massage, low-level EMS (Electrical Muscle Stimulation), and LED therapy. This combination aims to stimulate microcirculation, enhance collagen production, and improve overall skin texture. Ex-1015.

71. Similarly, the ZAQ Facial Rejuvenation Device offers 7-color LED light therapy alongside RF, EMS, sonic vibration, and heat massage to provide comprehensive skincare benefits. Ex-1016.

72. On the scientific side, clinical studies have evaluated the efficacy and safety of these multifunctional devices. For instance, a randomized, split-face clinical trial involving a home-use handheld device emitting low-level light, low-dose RF, low-energy microcurrent, and low-intensity ultrasonic waves demonstrated significant improvements in skin hydration, elasticity, and wrinkle reduction after eight weeks of use, with no adverse effects reported. Ex-1017.

73. It has been clear, before Dec. 1, 2023, that ergonomic considerations are crucial in the design of these devices to ensure user comfort and effective energy delivery. Designs that facilitate a natural grip and allow for precise control enhance the user's ability to maintain consistent contact with the skin, optimizing treatment outcomes. Incorporating features such as contoured shapes and appropriate weight distribution can significantly improve usability. Ex-1018.

74. These advancements described above reflect a broader trend towards integrating multiple energy modalities into handheld devices, enhancing tactile communication through the skin. By combining mechanical actuation, electrical stimulation, and thermal feedback, these devices offer dynamic and versatile platforms for conveying information, improving accessibility and communication for individuals, as well as treatment of skin conditions.

75. In summary, the convergence of multiple energy modalities in handheld devices prior to the filing date of the ‘174 patent represents significant advancement

in non-invasive skin treatments and manipulations. By combining therapies like LED light, RF energy, microcurrent stimulation, and mechanical energies, these devices offer synergistic effects that can lead to more pronounced improvements in communication, skin appearance and health.

2. Massage Treatment Devices

76. The ’174 Patent does not discuss “treatment devices” or “treatment methods,” but I note that the claims are directed to such devices and methods and accordingly the prior art applied below is also directed to such devices and methods.

77. Percussive and vibration massage devices are both popular tools for muscle recovery and relaxation, each employing distinct mechanisms to achieve therapeutic effects. Percussive massagers deliver rapid, concentrated pulses that penetrate deep into muscle tissues, akin to a “mini jackhammer” working through knots and tension points. This deep tissue stimulation enhances blood flow, reduces muscle soreness, and accelerates recovery, making them particularly beneficial for athletes or individuals with chronic muscle tightnessEx.1019

78. In contrast, vibration massagers provide a gentler approach by emitting high-speed vibrations that primarily affect surface-level tissues. These devices are effective in relaxing muscles, improving circulation, and alleviating mild muscle soreness. Vibration therapy has been shown to aid in muscle relaxation and increase

blood flow, which can be beneficial for general muscle recovery and stress relief. Ex-1021.

79. While both types of devices aim to relieve muscle discomfort, their operational differences lead to varied applications. Percussive massagers, with their deeper penetration, are more suitable for targeting specific muscle groups and addressing deep-seated tension. Vibration massagers, offering a broader and more superficial effect, are ideal for overall muscle relaxation and for individuals with sensitive muscles or those new to massage therapy Ex-1022. The interchangeability of these devices depends on individual needs and tolerance levels. For those requiring deep tissue relief, percussive massagers are preferable due to their intensity and depth of action. Conversely, for gentle muscle stimulation and relaxation, vibration massagers are more appropriate. It's important to consider personal comfort and the specific therapeutic outcomes desired when choosing between the two Ex-1023.

80. In terms of operation, percussive massagers typically feature adjustable speed settings and interchangeable heads to customize the depth and intensity of the massage, allowing users to target specific areas with precision. Vibration massagers also often come with various speed levels and attachments designed for different body parts, providing a versatile and user-friendly experience suitable for a wide range of applications Ex-1019.

81. Percussive and vibration massage devices utilize embedded processors to interpret user inputs from their interfaces, enabling precise control over their operation. These processors receive commands through various input methods, such as buttons, touchscreens, or mobile applications, allowing users to adjust settings like speed, intensity, and massage patterns. The processor interprets these inputs and modulates the device's motor functions accordingly, ensuring that the massage parameters align with user preferences. For instance, in percussive massage devices, the processor may adjust the frequency and amplitude of the percussive action to provide a customized massage experience. Ex-1024, Ex-1025.

82. Advanced models incorporate additional sensors and feedback mechanisms to enhance user interaction and device performance. Some percussive massage devices feature force meters that monitor the applied pressure during use. The processor analyzes data from these sensors to provide real-time feedback to the user, often displayed through integrated LEDs or screens, indicating whether the applied force is within optimal ranges. This integration of user input interpretation and sensor data processing allows for a more tailored and effective massage session, adapting to the user's specific needs and ensuring safe operation Ex-1024, Ex-1026.

83. Modern massage devices are increasingly integrating multiple therapeutic modalities into a single unit, offering users a comprehensive treatment experience. For instance, the Gua Sha EMS Massager combines massage with

heating, cooling, electrical muscle stimulation (EMS), and LED light therapy to enhance facial contouring and skin rejuvenation. Ex-1027, Ex-1028.

84. Similarly, the Beurer EM49 device incorporates Transcutaneous Electrical Nerve Stimulation (TENS), EMS, massage, and heat functions, providing versatile options for pain relief and muscle recovery. Ex-1029, Ex-1030.

85. These modern, multifunctional devices allow users to customize treatments according to their specific needs, enhancing the effectiveness and customization of home-based therapy Ex-1031.

3. Biometric Sensors

86. A range of biometric sensors have long been employed in treatment and performance devices to monitor physiological response to various stimuli. For example: As further outlined below, adding heart rate to these devices can serve as a crucial indicator of physiological states such as stress, relaxation, or exertion, enabling the device to tailor its intensity and techniques for optimal use. By monitoring heart rate, the device can, for example, detect when the user is experiencing stress or transitioning into relaxation, automatically adjusting its settings to achieve the desired effect. This might include gentle vibrations to promote stress relief or deeper, more intense pressure for effective post-exercise recovery. Furthermore, heart rate data provides personalized feedback and tracking, enhancing the overall user experience and allowing for more targeted therapeutic outcomes.

E. The Challenged Claims

87. Claim 1 recites:

[pre] A treatment device, comprising:

[a] a body provided with a processing unit and a power source; and

[b] a plurality of energy generator elements being independently operable to convert electricity from the power source into a plurality of different energy types transmittable towards an area of skin of a user, the plurality of energy generator elements being arranged coaxially about an axis,

[c] wherein the body includes a grip arranged to be grasped by a hand of the user applying a gripping force to maintain the plurality of energy generator elements on or adjacent the area of skin,

[d] wherein the plurality of energy generator elements includes a first energy generator element and a second energy generator element, and wherein the first energy generator element is an impact generator element having a tissue contact surface that is linearly actuatable along the axis to contact and cause corresponding physical movement of the area of skin.

Ex-1001, 40:48-68. Challenged dependent Claim 2 recites that the impact generator element includes "a drive mechanism and a piston, wherein the drive mechanism is operably coupled to a controller that directs electricity to the drive mechanism to move the piston and the tissue contact surface along the axis." Dependent Claims 3-5 recite various aspects of the second energy generator element. Dependent Claim 6 relates to the first and second energy types. And dependent Claim 7 recites that at least one of the plurality of energy generator elements is contained at least partially

within a housing that is removably securable to the body." *Id*., 41:1-27. Independent Claims 8, and 17 and their respective dependent claims recite similar limitations and requirements, as described further below.

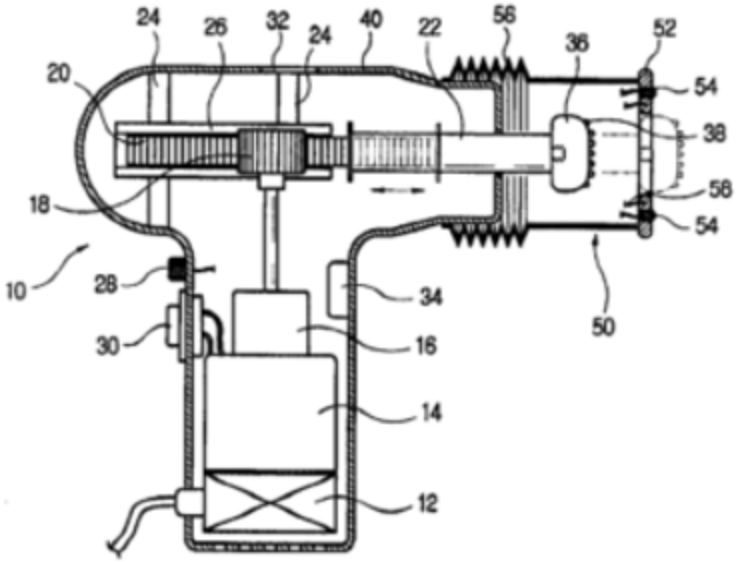
V. OVERVIEW OF PRIOR ART

A. Korean Unexamined Application Publication No. 10-2001-0008111 ("Lee") (Ex-1005)[1]

88. Korean Unexamined Application Publication No. 10-2001-0008111 ("Lee") was published on February 5, 2001 and was filed on November 8, 2000. Ex-1006 at Cover. Lee therefore qualifies as prior art to the claims of the '174 Patent at least under AIA 35 U.S.C. § 102(a)(1).

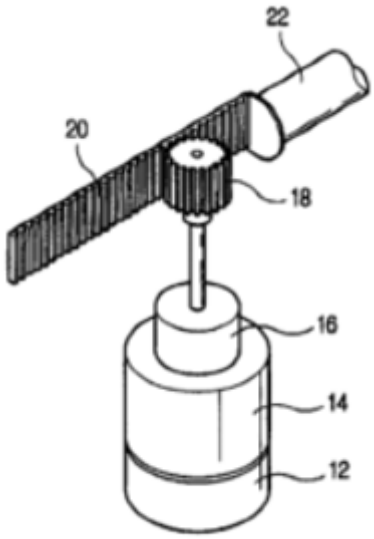
89. Lee describes a massage device designed to provide effective massage therapy by applying controlled pressure and heat to the human body. Ex-1006, Abstract. Lee's massaging device, a cross section of which is shown in Figure 1, below, includes a power supply unit (12) converts rated power into suitable operating power, which is then supplied to the motor (14), which is activated by an on/off switch (30). *Id.*, ¶¶8, 12.

[1]I understand that the certified translation of Lee is provided as Ex-1006. I have cited exclusively to the certified translation throughout this declaration.



Ex-1006, Fig. 1

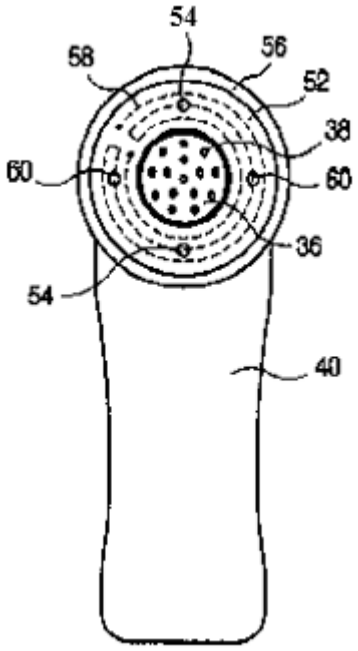
90. The motor's rotational force is converted into a reverse direction by a gearbox (16), which then drives a rotating gear (18). *Id*., ¶8. This rotating gear meshes with a linear gear (20), causing it to reciprocate in a linear motion along a guide (26). *Id.* The linear gear is integrally connected to a massage rod (22), which moves in and out of the device's case (40). *Id.* This conversion from rotational force to the linear motion of the massage rod is shown by Figure 2, below.



Ex-1006, Fig. 2

91. The massager features a cylindrical protective cover (50) that houses the massage rod (22) and a contact member (52) designed to be in planar contact with the human body. *Id.*, ¶8. The contact member includes a wrinkled section (56) that allows for adjustable length, ensuring the device can be tailored to different body parts and user preferences. *Id.*, ¶8. Additionally, the contact member is equipped with a heat wire (58) whose temperature is regulated by a thermostatic control switch (28). *Id.*, ¶8. The heat wire (58) embedded in the contact member (52) provides a compressive heat to the body part being massaged. *Id.*, ¶18. The temperature of the heat wire is adjustable via the thermostatic control switch (28), and the temperature sensor (60) ensures that the heat is maintained at a safe and effective level. *Id.*, ¶18.

92. Moreover, Lee teaches a body fat sensor (54) integrated into the contact member (52) measures the body fat of the area being massaged. *Id.*, ¶¶8, 19. The control device (34) processes this data and displays the body fat value on the display (32), allowing users to track their body fat levels and adjust their massage routines for optimal results. *Id.*, ¶¶8, 19. As shown in Figure 3, below, the contact member is arranged so that the heat wire and various sensors surround the massage ball portion of the contact member.



Ex-1006, Fig. 3

93. The automatic percussion massager is designed to provide a more effective massage compared to traditional handheld devices. *Id.*, ¶¶5-8. By using a combination of pressure and heat, the device improves blood circulation and

facilitates the decomposition of body fat. *Id.* The massage bumps (38) on the massage ball (36) are made of soft material to prevent severe impact on the body, and their varying thickness allows users to select the most comfortable option. *Id.*, ¶15.

94. Lee's massaging device is compact and can be easily carried and used by the user to massage any part of the body. *Id.*, ¶21. The on/off switch (30) allows for simple operation, and the adjustable length of the protective cover (50) ensures that the massager can be customized to fit different body parts. *Id.*, ¶17.

95. The inclusion of a display (32) that shows body fat measurements provides users with valuable feedback, allowing them to monitor their progress and adjust their massage routines accordingly. *Id.*, ¶¶8, 19. The control device (34) ensures that the data from the body fat sensor (54) is accurately processed and displayed, enhancing the overall user experience. *Id.*

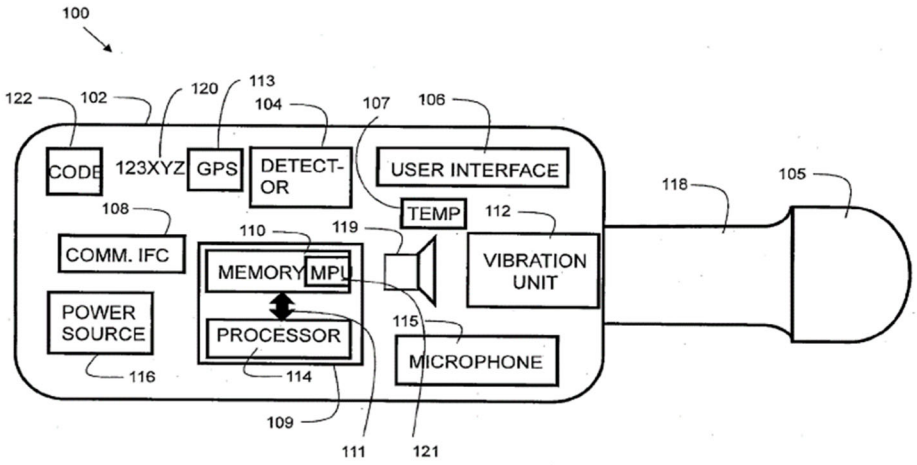
B. U.S. Patent Application Publication No. 2016/0310353 ("Barasch") (Ex-1007)

96. U.S. Patent Application Publication No. 2016/0310353 ("Barasch") was published on October 27, 2016, and was filed on December 23, 2014. Ex-1007, Cover. Barasch therefore qualifies as prior art to the claims of the '174 Patent at least under AIA 35 U.S.C. § 102(a)(1) and (a)(2).

97. Barasch discloses a massager device that can communicate user feedback messages based on user preferences and events detected during its use.

Ex-1007, ¶29. The user feedback messages can be of various types, such as text, voice, video, or multimedia, and can be sent to one or more targets, such as email addresses, phone numbers, social media accounts, or may be displayed by the device itself. *Id.*, ¶¶ 34, 56, 59. The user feedback messages can include customizations, such as recipient name, sender name, time of day, geographic location, weather, or automated purchase information. *Id.*, ¶93.

98. The massager device, as shown in Figure 1, comprises a housing, a vibration unit, a power source, a user interface, a communication interface, a computing device, and a massaging shaft with a tip that can move in various patterns, such as oscillation, rotation, or pulsation.



Ex-1007, Fig. 1

99. The computing device includes a processor, a memory, and a message processing unit. *Id.*, ¶48. The massage shaft can be heated using a resistive heat process or a thermoelectric cooler (Peltier cooler) to provide warmth during use. *Id.*,

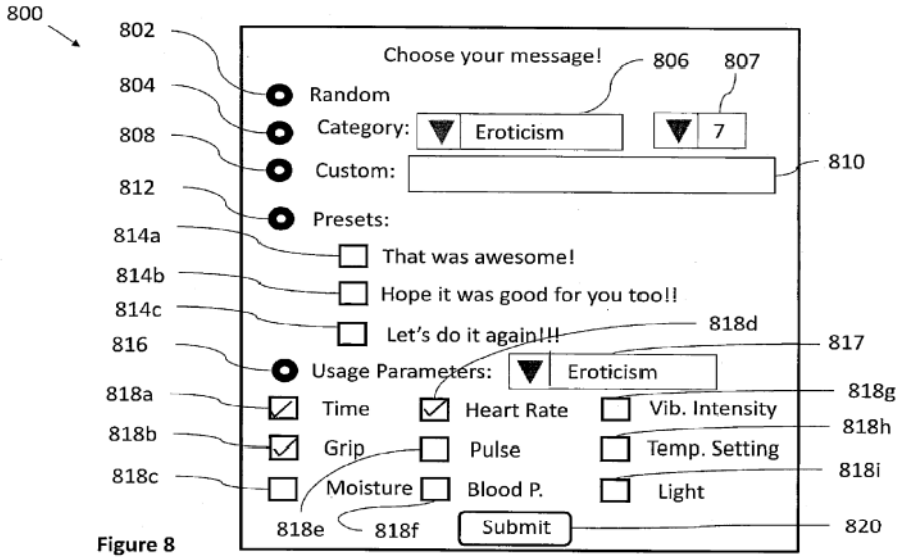
¶46. The memory stores instructions that enable the computing device to perform various functions, such as receiving user input, analyzing usage data, determining events, and communicating user feedback messages. *Id.*, ¶4. The message processing unit can be implemented by the computing device itself, or by a remote device or an application server that communicates with the computing device over a network. *Id.*, ¶48.

100. The user interface can include various mechanisms for receiving user input and presenting feedback, such as buttons, switches, screens, speakers, microphones, or touch screens. *Id.*, ¶46. The user input can include user preferences, such as message medium type, target, event, content selection method, and other customizations. *Id.*, ¶46.

101. The communication interface can include various mechanisms for transmitting and receiving data, such as Bluetooth, Wi-Fi, cellular, or other wireless or wired protocols. *Id.*, ¶¶49, 103. The communication interface can enable the massager device to communicate with a remote device or an application server, or to access updates, software, or content repositories. *Id.*, ¶50.

102. The usage parameter detector can include various mechanisms for monitoring usage data, such as biometric sensors, timers, encoders, or GPS. *Id.*, ¶¶40, 56, 82. The usage data can include information such as duration of usage, time of day, biometric readings, user settings, and geographic location. *Id.*, ¶¶56, 57,

78. The usage data can be used to generate user feedback messages based on usage parameter detection, or to provide feedback to the user or the application server, as shown in Figure 8. *Id.*, ¶¶83, 84.



Ex-1007, Fig. 8

103. One particular biometric parameter discussed by Barasch, and shown in Figure 8, is heart rate, which is measured by a heart rate sensor is typically located on the handle of the massager, where the user's hand or fingers make contact. *Id.*, ¶¶56, 85 The heart rate is measured and can be displayed on the user interface or included in the user feedback message. *Id.*, ¶¶56, 59, Cl. 6.

104. The massager device can be configured for various applications, such as muscle relaxation, pain relief, or stimulation of body parts. *Id.*, ¶29. The massager device can have different shapes, sizes, textures, or features, such as a shaft, a bulbous head, a tube, a bullet, an egg, a ring, a sphere, beads, rotation, illumination,

or heating/cooling. *Id.*, ¶40. The massager device can be used as a standalone system, or in conjunction with a remote device or an application server. *Id.*, ¶52.

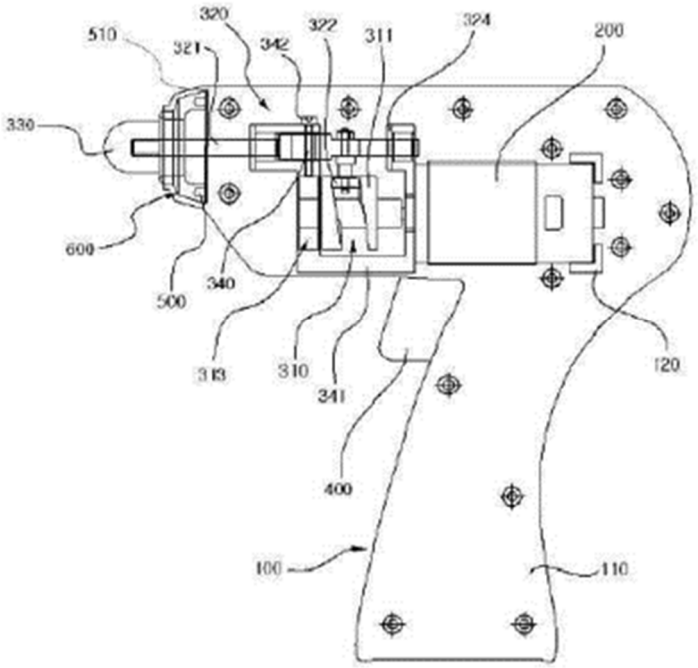
C. C. Korean Patent No.10-1123926 ("Choi") (Ex-1008)[2]

105. Korean Patent No. 10-1123926 ("Choi") issued on February 28, 2012, published on April 13, 2012, and was filed on August 24, 2011. Ex-1009, Cover. Choi therefore qualifies as prior art to the claims of the '174 Patent at least under AIA 35 U.S.C. § 102(a)(1) and (a)(2).

106. Choi relates to a muscle vibration massage device that is configured as a gun type for convenient use by holding it in the hand. Ex-1009, ¶1. The device comprises a main body with a handle part, a motor for generating vibration, a vibration generating means for converting the rotational force of the motor into horizontal reciprocating motion, a motor control means for controlling the operation of the motor, a gun switch for providing user operation instructions, and an infrared lamp for providing an infrared warming function. *Id.*, ¶10.

107. Figure 2 shows the upper part of the main body and the vibration generating means. *Id.*, ¶15.

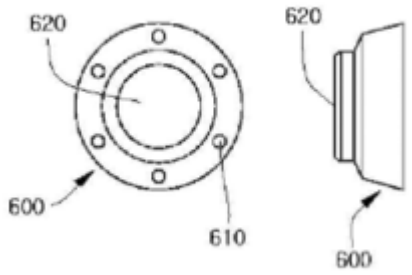
[2] I understand that the certified translation of Choi is provided as Ex-1009. I have cited exclusively to the certified translation throughout this declaration.



Ex-1009, Fig. 2

108. The vibration generating means comprises a vibration rotation part, a vibration slide part, a vibration stimulation part, and an anti-dislodgement part. *Id.*, ¶¶10-12. The vibration rotation part is coupled to the rotation shaft of the motor and has a helical groove on its outer surface. *Id.* The vibration slide part is coupled to the groove and moves back and forth horizontally as the vibration rotation part rotates. *Id.* The vibration stimulation part is coupled to the front end of the vibration slide part and exposed to the outside of the main body to provide vibration stimulation to the user's muscles. *Id.* The anti-dislodgement part is fixed to the motor and prevents the vibration slide part from dislodging to the left or right during the horizontal reciprocating movement. *Id.*, ¶23.

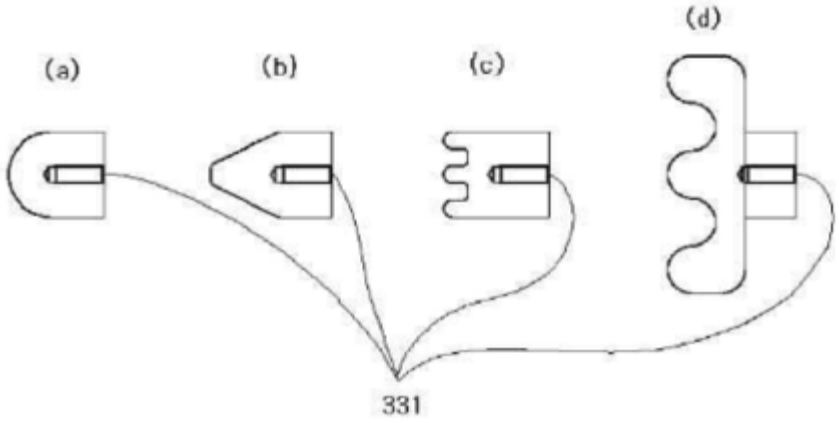
109. Figure 5 shows the structure of the infrared lamp housing, which holds the infrared LED lamp and guides the infrared light to irradiate the skin of the user. *Id.*, ¶15.



Ex-1009, Fig. 5

110. The infrared lamp housing is configured in a circular shape corresponding to the inner surface shape of the main body and is coupled from within the opening of the main body. *Id.*, ¶¶45-49. The infrared lamp housing has a plurality of infrared lamp fixing parts spaced at regular intervals along the outer periphery of the circular panel to which the infrared LED lamp is fitted and coupled, and a shaft pass-through hole in the center for passing the slide shaft. *Id.*

111. Figure 7 shows several examples of the vibration stimulation part, which is replaceable, on the slide shaft and can take various forms depending on the massage application. *Id.*, ¶15.

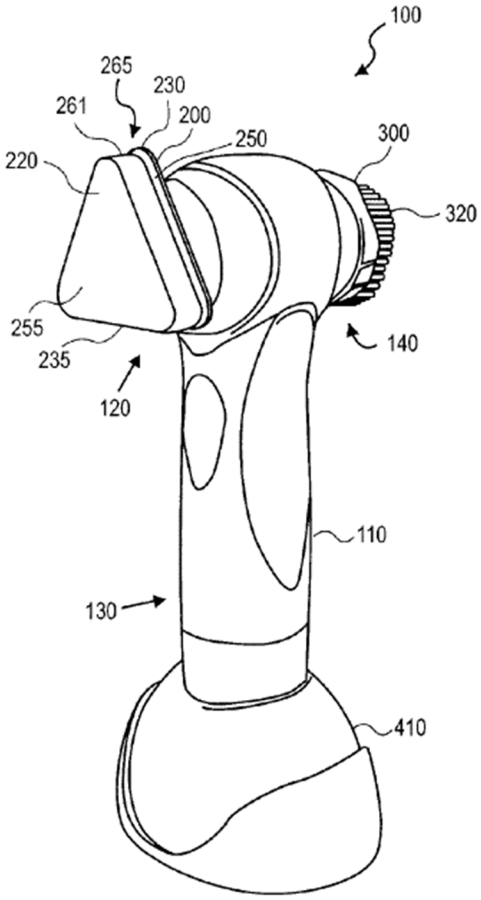


Ex-1009, Fig. 7

D. U.S. Patent No. 7,384,405 ("Rhoades") (Ex-1010)

112. U.S. Patent No. 7,384,405 ("Rhoades") issued on June 10, 2008 and was filed on September 10, 2004. Ex-1010 at Cover. Rhoades therefore qualifies as prior art to the claims of the '174 Patent at least under AIA 35 U.S.C. § 102(a)(1) and (a)(2).

113. Rhoades discloses an apparatus and a method for treating human skin and body parts with attachments that can perform functions, such as abrasion, cleaning, polishing, oxygenation, heating, cooling, and lighting. As shown in Figure 4A, the apparatus comprises a handle with a motion generator and one or more head portions that can be coupled to different types of treatment attachments. The treatment attachments can be interchanged, removed, and cleaned according to the user's preference and the desired treatment.



Ex-1010, Fig. 4A

114. A motion generator moves the head portions by vibrating, spinning, oscillating, or propagating sonic waves through them. *Id.*, 7:38-62. The treatment attachments can be snapped, screwed, or adhered to the head portions. *Id.*, 11:50-12:7. Thus, Rhoades explains that the various treatment attachments may be removably attached or temporarily secured to and removed from the head portion, for example when a user wants to provide a different type of treatment to the skin. *Id.*, 15:33-55.

115. The patent describes various examples of treatment attachments, such as applicator attachments with abrasive surfaces or pads, brush attachments with abrasive or soft bristles, oxygenating attachments with porous materials or openings, thermal attachments with heating or cooling units, and light source attachments with light emitting or conducting elements. *Id.*, 11:6-34. For example, Rhoades teaches that heat treatment may be provided with a specific thermal energy providing attachment wherein the heat is generated by a source on or within the thermal energy providing attachment itself. *Id.*, 17:39-18:3. Cooling can similarly be provided by utilizing a cooling attachment. *Id.*, 18:4-18:40. The treatment attachments can be used to improve the appearance and texture of the skin and body parts by removing, exfoliating, cleaning, polishing, rejuvenating, soothing, or stimulating the skin or body parts. *Id.*, 4:59-5:10.

116. The patent also discloses a method of manipulating the treatment attachments over the skin or body parts by using the handle and the motion generator of the apparatus. *Id.*, 23:24-35. The method can involve applying pressure and moving the treatment attachments in circular, back and forth, random, or other motions. *Id.* The method can also involve applying and/or using heat, cold, light, composition, or solution to the skin or body parts during or after the treatment. 15:56-16:3.

E. U.S. Patent Application Publication No. 2015/0305969 ("Giraud") (Ex-1011)

117. U.S. Patent No. 2015/0305969 ("Giraud") was published on October 29, 2015 and was filed on October 17, 2013. Ex-1011 at Cover. Giraud therefore qualifies as prior art to the claims of the '174 Patent at least under AIA 35 U.S.C. § 102(a)(1) and (a)(2).

118. Giraud discloses a massaging appliance that comprises a body with a driving means, a control means, and a distinguishing means, and various types of massaging heads that can be removably attached to the body and have different massaging elements and functions, as shown in Figure 1, below. Ex-1011, ¶4. The distinguishing means can detect the type of massaging head attached to the body and transmit information to the control means, which can then adjust the operation of the driving means and other features of the massaging appliance according to the type of massaging head. Ex-1011, ¶¶18-19. The massaging appliance can also include a system for emitting waves, such as light or sound waves, a system for dispensing cosmetic products, and a system for applying transcutaneous iontophoresis treatment. Ex-1011, ¶¶11, 21, 38.

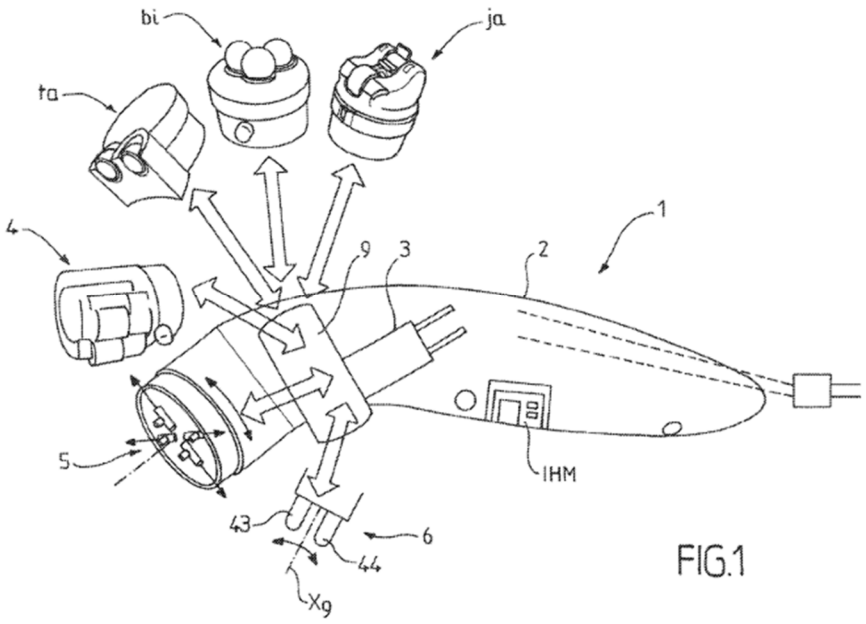


FIG.1

Ex-1011, Fig. 1

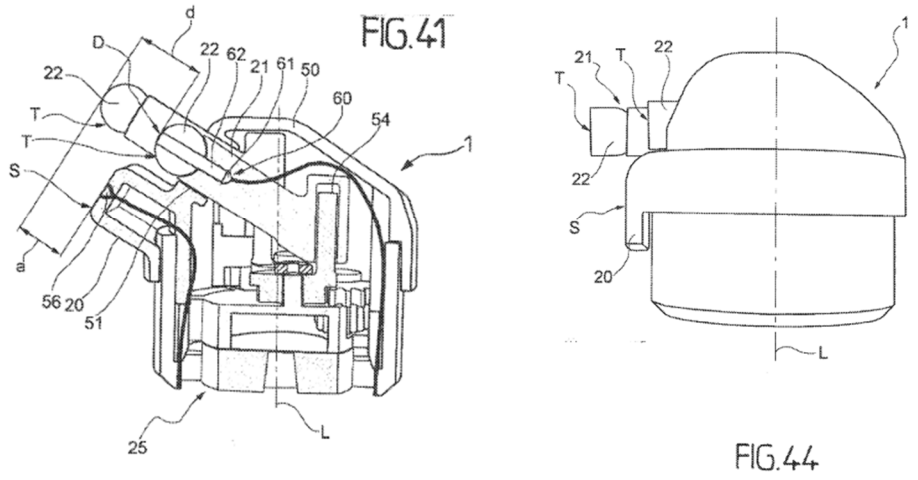
119. The patent application describes several embodiments of the massaging heads and the corresponding massaging techniques and effects. For example, some of the massaging heads have massaging tips or "fingers" that can move laterally, spin, oscillate, or tap on the skin, performing actions such as pinching, sculpting, firming, or stimulating the skin. Ex-1011, ¶¶8, 27-28, 35. Other massaging heads have massaging rollers that can spin in the same or opposite directions, performing actions such as folding, kneading, or releasing the skin. Ex-1011, ¶33. Still other embodiments disclose massaging heads that have a pressure element that defines a pressure surface and a work zone, and a work head that protrudes from the pressure surface and spins around an offset axis, performing a deep kneading action. Ex-1011,

¶34. And others have a crown that can spin or oscillate around a perpendicular axis, enhancing the grip and movement of the massaging elements on the skin. ¶31.

120. The patent application also describes various embodiments of the distinguishing means and the control means. The distinguishing means can consist of mechanical, magnetic, or optical sensors that are located on the massaging heads and the body, and that can transmit information to the control means based on the presence or absence of protuberances, notches, contacts, magnets, or light signals on the massaging heads. Ex-1011, ¶123. The control means can consist of an electronic unit that can control the activation, speed, direction, frequency, and coordination of the driving means and the massaging elements, depending on the type of massaging head detected. Ex-1011, ¶10. The control means can also control the emission of waves, such as visible or infrared light waves or ultrasound waves, from the body or the massaging heads, depending on the type of massaging head and the desired skin treatment effect. Ex-1011, ¶206, cl. 8.

121. Giraud discloses that its massager includes a means of transmission that allows the movement of the driving means to be transmitted to the massaging elements. In particular, Giraud describes this means of transmission as including a gear system, a sprocket system, a cam system, or a shaft system. Ex-1011, ¶¶88-91, 102, 130. These transmission means allow Giraud to disclose distinct types of movement for the fingers of its massager. For example, Figure 41 shows a massaging

head with two massaging fingers (21) that move laterally in a direction perpendicular to the longitudinal axis of the drive unit, while Figure 44 shows a massaging head with two massaging fingers (21) that move laterally in a direction parallel to the longitudinal axis of the drive unit. Ex-1011, ¶¶138-139, 148.



Ex-1011, Figs. 41, 44

122. Giraud also describes various programs and modes of operation of the massaging appliance, depending on the type of massaging head and the desired skin treatment effect. The programs and modes of operation can be selected and adjusted by the user via a user interface on the body or can be semi-automatically directed by the control means based on the distinguishing means. Ex-1011, ¶88. The programs and modes of operation can include different phases, durations, intensities, frequencies, and combinations of the massaging elements, such as the wave-emitting means and driving means operating simultaneously. Ex-1011, cl. 11.

VI. INVALIDITY OF THE '174 PATENT IN VIEW OF PRIOR ART

A. Ground 1: Claims 1-3, 5-6, 8-19 Are Unpatentable Under 35 U.S.C. § 103 As Obvious Over Lee in View of Barasch.

123. For the reasons discussed below, it is my opinion that Claims 1-19 are unpatentable as obvious over Lee in view of Barasch.

1. A POSITA Would Have Been Motivated to Combine Lee's Teachings With Barasch and Would Have Had a Reasonable Expectation of Success.

124. A POSITA would have been motivated to combine Lee and Barasch, and would have had a reasonable expectation of success in doing so.

125. A POSITA would have recognized that both references are directed to the same field of invention, namely, massage devices, and that both references aim to provide stimulation and relaxation to the user. For example, both references disclose massagers that include massaging and heating functionalities and both disclose massagers that can measure and display certain parameters related to the user's body or the massaged area. A POSITA would have realized that Barasch discloses additional features that would enhance the performance and functionality of Lee, such as a computer (including at least a processor and a message processing unit), a biometric sensor, and a cooling mechanism.

126. For example, a POSITA would have been motivated to add the computer (including the processor and message processing unit) of Barasch to the

massager of Lee, because the computer would enable the massager to operate the massage unit, including the massaging function, the heating function, controlling the intensity of those functions, gathering and using inputs, and generating control signals based on the input data. Ex-1007, ¶4. A POSITA would have recognized that the Lee's massager would need some type of processing unit or controller to allow the user to select various functions and intensities. *See supra* Section IV.D.2. In addition, Lee discusses a "control device for processing", which indicates to a POSITA that processing and controlling would be a natural part of Lee's device. The computer system of Barasch would be a convenient way to accomplish this and would also enable the massager to communicate user feedback messages to a target, such as a remote device or a user interface, based on user preferences and events detected during its use. Ex-1007, ¶¶46-48. The computer would also enable the massager to generate the content of the user feedback messages based on inputs such as biometrics, massager settings, and temporal data. Ex-1007, ¶29. Additional, the computer would enhance the capabilities of the massager by enabling it to access updates, software, or other services from a network or an application server. Ex-1007, ¶52. Thus, a POSITA would have recognized that adding the computer to the massager of Lee would improve the massager by providing more functionality, flexibility, interactivity, and personalization to the user. As described above, the fact that Lee discusses a "control device for processing" indicates to a POSITA that

computing, processing and controlling would be a natural part of Lee's device. And certainly by 2017, a POSITA would recognize that computation of signals and controls as embedded systems would be benefiting the user experience of the device. *See supra* Section IV.D.2.

127. A POSITA would have also been motivated to add the biometric sensor and in particular the heart rate sensor of Barasch to the massager of Lee, because such a sensor would enable the massager to measure the user's heart rate and other vital signs during the use of the massager, providing the user with valuable feedback and information about their physiological state. *See supra* Sections IV.D.2; IV.D.3. Heart rate is a key indicator of physiological stress, relaxation, or exertion, allowing the device to adapt its intensity and techniques to provide optimal usage. By monitoring heart rate, the device can for example identify when the user is stressed or entering a state of rest, adjusting its settings to support the desired outcome, such as calming vibrations for stress reduction or deeper pressure for post-exercise recovery. Additionally, heart rate data enables personalized feedback and tracking. Such a sensor would also allow the massager to use the heart rate as an input for the massaging and heating functions, user feedback messages, and for tracking purposes. Ex-1007, ¶56. For example, the biometric sensor would enable the massager to provide feedback or warnings to the user based on the heart rate, such as to indicate the level of stimulation, relaxation, or health risk. Ex-1007, ¶56. Thus,

adding the biometric sensor to the massager of Lee would improve the massager by providing more information, feedback, and safety to the user. *See supra* Section IV.D.3.

128. A POSITA would have further been motivated to add the cooling mechanism of Barasch to the massager of Lee, because the cooling mechanism would enable the massager to provide cooling to the massaged area, in addition to or instead of heating. Ex-1007, ¶46. The cooling mechanism would allow the massager to adjust the temperature of the massaged area according to the user's preference, the usage parameter, or the content of the user feedback message. Ex-1007, ¶46. The cooling mechanism would also enable the massager to provide a contrast or a variation of temperature to the massaged area, which may enhance the stimulation and relaxation effects. A cooling mechanism in a massage device can enhance its therapeutic benefits by reducing inflammation and soothing sore muscles, especially after intense physical activity. It can also help numb localized pain and provide relief for conditions like sprains or minor injuries, complementing the effects of the massage. Additionally, the cooling effect can stimulate blood flow by encouraging vasoconstriction, improving recovery and overall relaxation. Thus, adding the cooling mechanism to the massager of Lee would improve the massager by providing more options, comfort, and enjoyment to the user.

129. A POSITA would have had a reasonable expectation of success in combining the teachings of Lee and Barasch because they teach compatible systems—namely, massage devices with multiple different types of energy generation such as massage and heating. *See supra* Section IV.D.2. Furthermore, because Lee and Barasch provide massage devices that operate in similar ways, a POSITA would have understood that their teachings could be combined with little to no change in their respective functions. For example, Lee discloses an automatic percussion massager that includes a motor, a rotating gear, a linear gear, a massage rod, a protective cover, a display, a body fat sensor, a heat wire, and a temperature sensor. Ex-1006, Abstract. Similarly, Barasch discloses a massager that includes a vibration unit, a computer, a user interface, a biometric sensor, and a heating/cooling mechanism. Ex-1007, ¶29. Moreover, a POSITA would have had a reasonable expectation of success in combining the teachings of Lee with the teachings of Barasch because the combination would not require undue experimentation or modification of the existing components and because the combination would not introduce any incompatibility or contradiction between the references. As described above, the biometric sensor and cooling mechanism described in Barasch have many benefits that would be obvious to add to Lee's device.

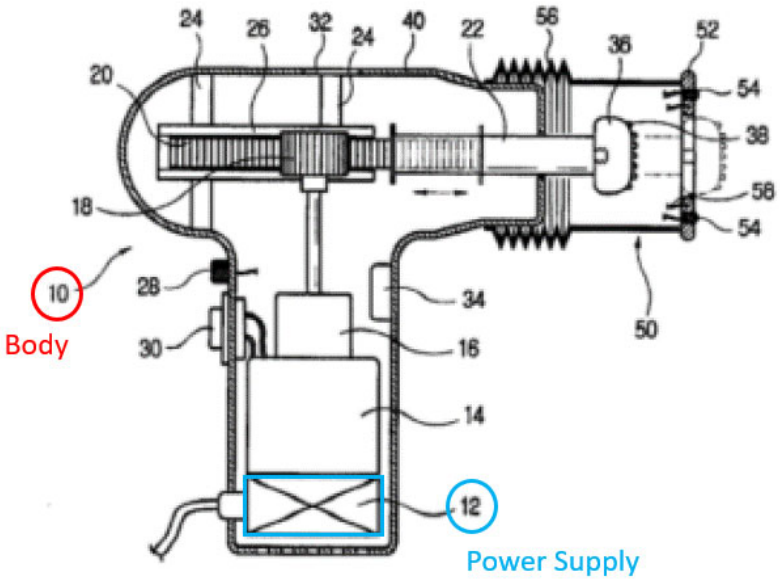
2. Independent Claim 1

a. Element 1[pre]: "A treatment device, comprising:"

130. To the extent the preamble is limiting, Lee combined with Barasch teaches or suggests Element 1[pre]. For example, Lee discloses that it "relates to an automatic percussion massager" and that the massager "can be used to facilitate fatigue recovery or body fat decomposition by applying pressure to the human body with a certain amount of impact." Ex-1006, ¶2, 5.

b. Element 1[a]: "a body provided with a processing unit and a power source; and"

131. Lee combined with Barasch teaches or suggests Element 1[a]. For example, Lee discloses the basic structure of a massage gun including that its "invention comprises a body 10 and a protective cover 50," as shown in Figure 1 below. Ex-1006, ¶10. Moreover, Lee explains that the body "has a case 40 having a 'T' shape, and a power supply unit 12 mounted on the lower part of the case." Lee., ¶12.



Ex-1006, Fig. 1 – illustrating the "power supply" (blue) and "body" (red) of Lee's massage gun.

132. Although Lee does not disclose how its massager controls the operation of the massage head or other features (other than its body fat sensor, whose data is processed by "control device (34)"), a POSITA would have understood that one advantageous options would be to use a processing unit to do so. As described in Section VI.A.1 above, a POSITA would have been motivated to combine Lee and Barasch and, in particular would have been motivated to apply Barasch's teachings about a computing device to Lee's massaging device.

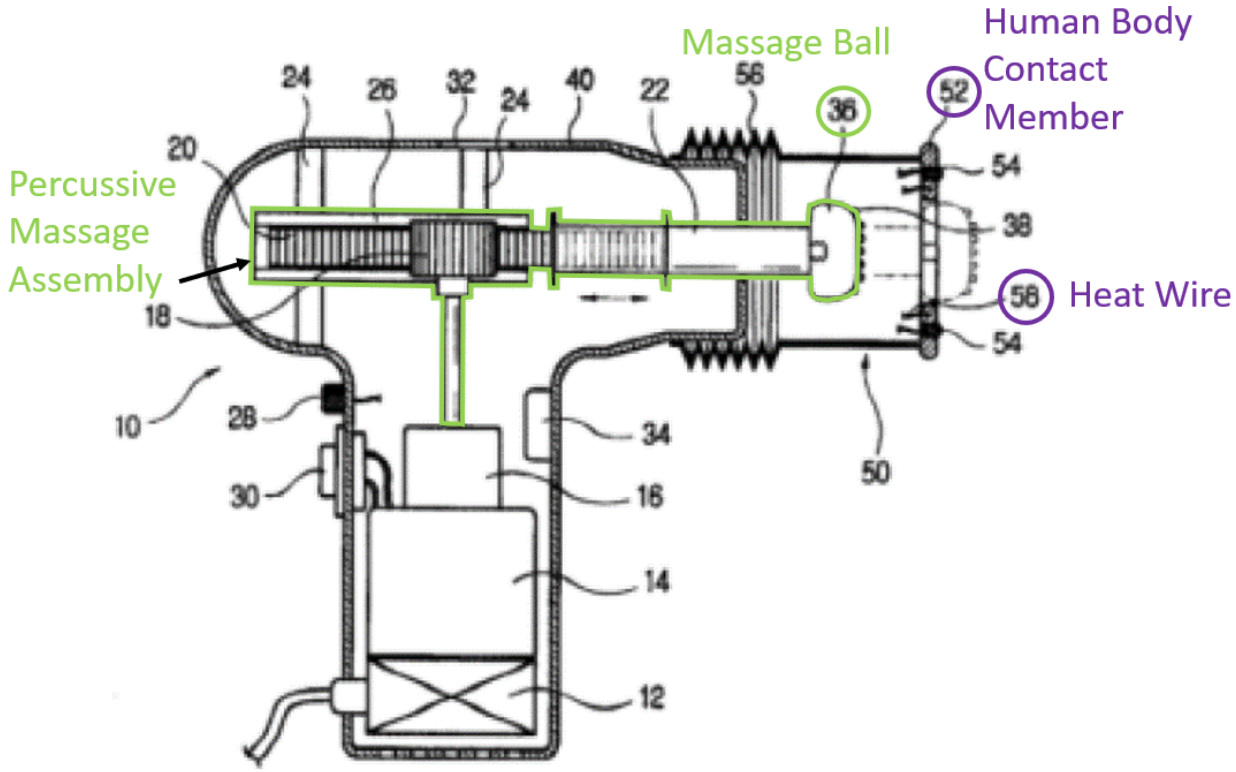
133. Barasch discloses that its massager comprises "at least one computing device comprising a processor and memory" an that the computing device to perform tasks such as "receive user input," "analyze usage data for the massager," "determine

that an event has occurred," and "communicate [a] user feedback message." Ex-1007, ¶4.

c. Element 1[b]: "a plurality of energy generator elements being independently operable to convert electricity from the power source into a plurality of different energy types transmittable towards an area of skin of a user, the plurality of energy generator elements being arranged coaxially about an axis,"

134. Lee combined with Barasch teaches or suggests element 1[b]. Lee discloses a percussive massage element to massage the skin, which acts as the first energy generator element and a heat wire to warm the skin, which acts as a second energy generator element. *See* Ex-1006, ¶7-8. Both the percussive massage element an the heat wire convert electricity from the power source into different energy types (kinetic energy and heat energy) that are transmittable toward and area of skin of the user. For example, regarding the percussive massage element, Lee discloses that the "rotational force of the motor 14, which operates as the operating power is supplied, is slowed down to a suitable speed by the gearbox 16 and transmitted to the rotating gear 18, and the rotational force of the rotating gear 18 is transmitted to the engaged linear gear 20 to cause the massage rod 22 formed integrally with the linear gear 20 to reciprocate in a linear line." Ex-1006, ¶12. As this linear reciprocation occurs, a massage ball reciprocates outward to contact the user and transmit energy toward the area of skin of the user contacted by "a human body contact member 52 … in direct contact with the human body." Ex-1006, ¶16. Similarly, the human body

contact member comprises the second energy generator because it is "configured to enhance the massage effect … by applying a predetermined heat to the body part to be massaged by installing a heat wire (58) that emits a predetermined heat by a power supplied by the power supply part (12)." Ex-1006, ¶18. Accordingly, a POSITA would have understood that the second energy type, heat" is transmitted to the skin of the user through the heat wire included in the human body contact member. These two energy generators are illustrated in Figure 1, annotated below.



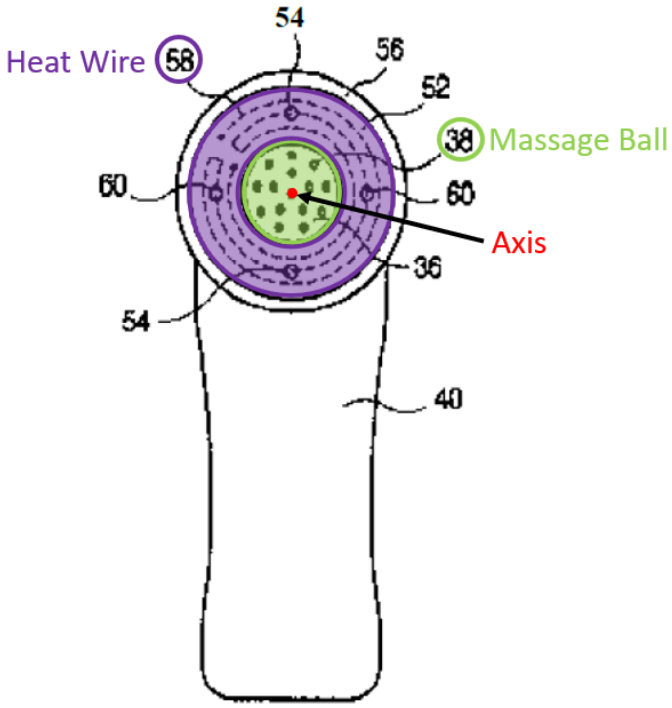
Ex-1006, Fig. 1 – illustrating the "first energy generator element" (green) and the "second energy generator element" (purple) of Lee's massage gun.

135. Moreover, a POSITA would have understood that the percussive massage and heat wire elements are independently operable because Lee refers to to an on/off switch (30) that operates the motor (Lee, Abstract), and a separate

temperature control switch (28) that adjusts the temperature of the heat wire (Lee, ¶18). Further, Lee refers to the heat wire as enhancing the massage effect "by applying a predetermined heat to the body part ***to be massaged***." Ex-1006, ¶18. In other words, a POSITA would have understood that the heat compress is applied first to prepare the area of skin of massage and that the percussive massage is applied afterwards, indicating that both energy generators are independently operable.

136. Finally, Lee discloses that the massage ball portion of the percussive massage energy generator is arranged to reciprocate through the center of the human body contact portion, where the heat wire is located.

137. Accordingly, as shown in Figure 2, annotated below, a POSITA would have understood that the energy generator elements are arranged coaxially around an axis, where the axis goes through the center of the massage ball (i.e., into the page in the Figure below).



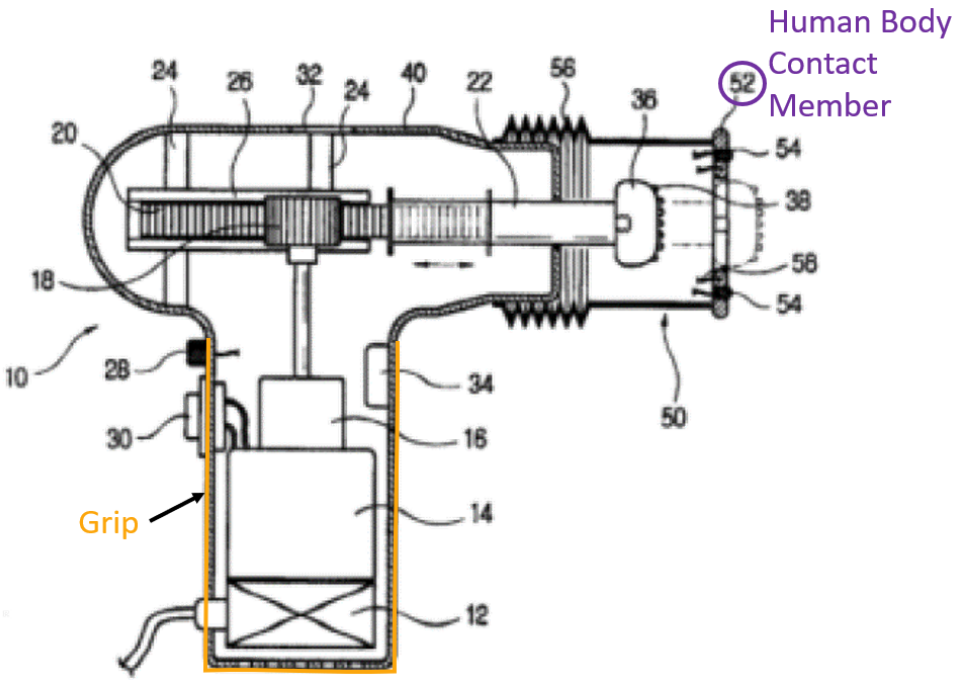
Ex-1006, Fig. 3– illustrating the "first energy generator element" (green) and the "second energy generator element" (purple) of Lee's massage gun surrounding an "axis" (red).

138. Accordingly, Lee combined with Barasch teaches the plurality of energy generator elements being arranged coaxially about an axis.

d. Element 1[c]: "wherein the body includes a grip arranged to be grasped by a hand of the user applying a gripping force to maintain the plurality of energy generator elements on or adjacent the area of skin,"

139. Lee combined with Barasch teaches or suggests Element 1[c]. Lee discloses a massager that includes a grip that is grasped by the hand of the user in order to massage an area of skin. For example, Lee discloses that its invention is directed to "an automatic percussion massager that ***can be carried*** by a user and ***held in the hand*** for easy massage or acupressure on any part of the body." Ex-1006, ¶21.

Given that Lee describes handheld massagers as "designed to be used by the practitioner to massage or acupressure the desired area," a POSITA would understand that the grip of Lee's massager is grasped by the user in order to maintain the human contact portion against the area of the skin that the user desires to massage, which in turn maintains the heat wire and percussive massage assembly (i.e., plurality of energy generator elements) on or adjacent to the area of skin.



Ex-1006, Fig. 1 – illustrating the "grip" (orange) and the portion to "maintain the plurality of energy generator elements on or adjacent the area of skin" (purple) of Lee's massage gun.

e. Element 1[d]: "wherein the plurality of energy generator elements includes a first energy generator element and a second energy generator element, and wherein the first energy generator element is an impact generator element having a tissue contact surface that is linearly actuatable along the axis to contact and cause corresponding physical movement of the area of skin."

140. Lee combined with Barasch teaches or suggests Element 1[d]. As discussed above with reference to element 1[b], Lee discloses a plurality of energy generators, including a percussive massage element and a heat wire, which constitute the first and second energy generator elements respectively. Specifically, Lee's percussive massage element is the claimed impact generator. For example, Lee discloses that the "automatic percussion massager … appl[lies] pressure to the human body with a certain amount of ***impact***." Ex-1006, ¶5. Lee explains that this impact massage is accomplished by utilizing "a linear gear which meshes with the rotor and reciprocates in a linear line along a guide; a massaging rod integrally formed with the rotor and linear gear to reciprocate in and out of the case." Ex-1006, ¶8. Lee further discloses that a "massage ball 36 is fixedly or removably attached to the end of the massage rod 22," such that "the massage ball 36 [] reciprocates in a linear line outwardly of the body 40." Ex-1006, ¶¶14, 16. From this disclosure, a POSITA would have understood that the impact generator element included a tissue contact surface (i.e., massage ball) that is linearly actuatable along the axis to contact (as it reciprocates into and out of the body of the massager). This aspect of the device

is generic and not novel because linear actuation along an axis to cause physical movement of the skin is a fundamental mechanism widely used in massage devices, medical tools, and other tactile stimulation technologies existing prior to 2017. The concept relies on basic mechanical principles that are well-documented and do not represent a unique or inventive step beyond conventional implementations. Moreover, a POSITA would have understood that as the massage ball made contact with the area of skin during operation that corresponding physical movement would occur at the skin.

141. Accordingly, a POSITA would have found this claim obvious.

3. Claim 2: "The treatment device of claim 1, wherein the impact generator element further includes a drive mechanism and a piston, wherein the drive mechanism is operably coupled to a controller that directs electricity to the drive mechanism to move the piston and the tissue contact surface along the axis."

142. Lee combined with Barasch teaches or suggests Claim 2. Lee discloses a massager with an impact generator as described above with reference to element 1[d]. Further, Lee discloses that the impact generator includes a drive mechanism and a piston. For example, Lee discloses that the "automatic percussion massager … comprises ***a motor***," which acts as the claimed drive mechanism in conjunction with the rotating gear, gearbox, and linear gear. Ex-1006, ¶8. Lee discloses that these elements act together to convert the rotational force of the motor into linear reciprocation. Ex-1006, ¶¶8, 12. Moreover, Lee discloses that a "massaging rod" is

"integrally formed with the rotor and linear gear to reciprocate in and out of the case." Ex-1006, ¶8. A POSITA would have understood that this reciprocating massage rod is a piston that is moved as the drive mechanism (i.e., motor and gears) convert the operating power into rotational force and then into linear reciprocation. In addition for claim 2, linear actuation along an axis to cause physical movement of the skin is a fundamental mechanism widely used in massage devices, medical tools, and other tactile stimulation technologies existing prior to 2017. The concept relies on basic electro-mechanical principles that are well-documented and do not represent a unique or inventive step beyond conventional implementations.

143. Although Lee does not disclose how its massager controls the operation of the motor, gears, or massage rod beyond indicating that operating power is supplied to the motor "as the user operates the on/off switch 30 for selecting or deselecting the massage function," it would have been obvious to combine Lee with Barasch in order to take advantage of Barasch's teaching that a processor is utilized to control the functionalities of the massager. The reason for adding processing and control to Lee's device is obvious to a POSITA in 2017. As described in Section VI.A.1 above, a POSITA would have been motivated to combine Lee and Barasch and, in particular would have been motivated to apply Barasch's teachings about a processing unit to Lee's massaging device.

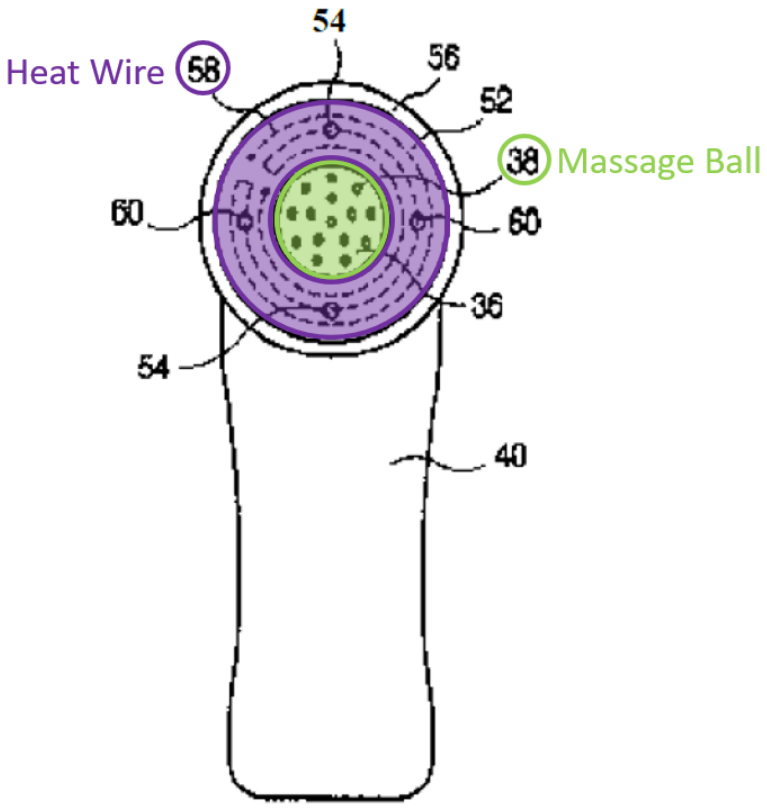
144. Barasch discloses that its massager comprises "at least one computing device comprising a processor and memory." Ex-1007, ¶4. In particular, Barasch teaches that "[p]rocessor 114 is configured and disposed to access instructions stored in memory 110 and execute them to provide one or more of the various functionalities of massager 100." Ex-1007, ¶47. A POSITA would have understood that one of the functionalities of Lee's massager is directing the electricity to the drive mechanism to move the piston, which is part of the basic functionality of electro-mechanical actuated massage devices. For example, Lee teaches that the operating power is supplied by the power supply unit to the motor 14, and a user operates there are various massage functions. Ex-1006, cl. 1 ("operation of an on/off switch … [is] for selecting or de-selecting a massage function"). A POSITA would find it additional advantageous because different massage functions would include reciprocating the piston at different speeds and with different amounts of force and that in the combination of Lee and Barasch, this functionality would be controlled by the processor of Lee, which is the claimed "controller."

145. Accordingly, a POSITA would have found this claim obvious.

4. Claim 3: "The treatment device of claim 1, wherein the second energy generator element is substantially ring shaped and arranged coaxially about the first energy generator element."

146. Lee combined with Barasch teaches or suggests Claim 3. As discussed with reference to element 1[b], Lee discloses a heat wire that is the second energy

generator element and a massage ball that is part of the first energy generator element. *See supra* Section VI.A.2.c. As shown in Figure 3, annotated below, Lee discloses that the heat wire is substantially ring shaped and arranged coaxially about the massage ball portion of the impact generator.



Ex-1006, Fig. 3– illustrating the "second energy generator element" (purple) arranged coaxially around the "first energy generator element" (green) of Lee's massage gun.

147. Accordingly, a POSITA would have found this claim obvious.

5. Claim 5: "The treatment device of claim 1, wherein the second energy generator element includes a heat generator element."

148. Lee combined with Barasch teaches or suggests Claim 5. As discussed with reference to element 1[b], Lee discloses a heat wire, which is a heat generator

element and constitutes the claimed second energy generator element. *See supra* Section VI.A.2.c.

149. Accordingly, a POSITA would have found this claim obvious.

6. Claim 6: "The treatment device of claim 1, wherein a first one of the plurality of different energy types is an impact force applied against a surface of the area of skin and a second one of the plurality of different energy types is a heat flux directed toward the area of skin."

150. Lee combined with Barasch teaches or suggests Claim 6. As discussed with reference to elements 1[b] and 1[d], Lee discloses percussive massage elements, including a massage ball that acts as the first energy generator element and a heat wire that acts as the second energy generator element. *See supra* Sections VI.A.2.c and VI.A.2.e. A POSITA would have recognized that the energy type delivered by the percussive massage elements of Lee's massager is an impact force applied against a surface of the skin. For example, Lee discloses that its "percussion massager" operates "by applying pressure to the human body with a certain amount of ***impact***." Ex-1006, ¶5. Similarly, a POSITA would have understood that a heat wire directs a heat flux toward the area of skin. It is obvious and well understood by 2017 that a heat wire directs heat flux toward the skin in a massage device because the purpose of a heat wire is inherently to generate and transfer thermal energy to its surroundings. This principle is well-established in various heating applications, including electric blankets and heated pads, where heat wires are used to deliver

warmth efficiently to targeted areas. In the context of a massage device, directing heat toward the skin enhances relaxation and muscle relief, making this application a straightforward and expected use of the technology. For example, Lee discloses that the heat wire enables "the massaged area to be steamed to a predetermined temperature" and that the "heat wire (58) emits a predetermined heat by a power supplied by the power supply part." Ex-1006, ¶¶7, 18. A POSITA would have understood that a heat wire generates heat through resistance, physically heating the wire and then radiating heat in a heat flux towards the area of skin. Moreover, a POSITA would have understood that "steaming" as used in the context of Lee simply refers to heating through use of Lee's heat wire.

151. Accordingly, a POSITA would have found this claim obvious.

7. Independent Claim 8

a. Element 8[pre]: "A treatment device, comprising:"

152. To the extent the preamble is limiting, Lee combined with Barasch teaches or suggests Element 8[pre] for the reasons described with respect to Element 1[pre]. *Supra* Section VI.A.2.a; Ex-1020.

b. Element 8[a]: "a body provided with a sensor, a power source, and a processing unit configured to receive input data and generate a control signal based on the input data, the body further including a skin contacting surface maintainable against skin of a user by a force applied by a hand of the user when gripping the body; and"

153. Lee combined with Barasch teaches or suggests Element 8[a]. For the reasons described with respect to element 1[a], Lee discloses a body provided with a power source and a processing unit. *Supra* Section VI.A.2.b; Ex-1020. Similarly, for the reasons described with reference to element 1[c], Lee also discloses that the body further includes a skin contacting surface (e.g., a grip) that is maintainable against the skin of a user by a force applied by a hand of the user when gripping the body. *Supra* Section VI.A.2.d; Ex-1020.

154. Further, Lee combined with Barasch also discloses that the body is provided with a sensor. For example, Barasch discloses that "massager 300 includes at least one detector 308 for monitoring one or more usage parameters." Ex-1007, ¶56. Barasch goes on to explain that the "[d]etector may include, for example, a sensor," including "at least one of a heart rate sensor, a blood pressure sensor, a body temperature sensor, [and] a pulse sensor," among others. Ex-1007, ¶56. As described above in Section VI.A.1, a POSITA would have been motivated to combine Lee and Barasch and would have found it obvious to utilize Barasch's teachings related to biometric sensors in the context of Lee's massaging device, which also discloses

other types of sensors, such as temperature sensors and body fat sensors. Ex-1006 ¶8,.

155. Additionally, Lee combined with Barasch discloses "a processing unit configured to receive input data and generate a control signal based on the input data." For example, Barasch discloses that "[u]ser interface 106 comprises a mechanism for massager 100 to receive input from a user (and in some embodiments, to present feedback to the user." Ex-1007, ¶46. Barasch explains that the input may be a selection of the power setting or various massage settings within the device. Ex-1007, ¶46. Barasch goes on to explain that the massager includes an on-board "computer 109 including a processor 114," which is "configured to access instructions stored in memory 110 and execute them to provide one or more of the various functionalities of massager 100." Ex-1007, ¶47. From this disclosure, a POSTIA would have understood, or it would have at least been obvious, that the user's input is received by the computer 109, which acts as a processing unit. Moreover, Barasch teaches that the user interface may be an LED or LCD display or "any other suitable display mechanism" and that it may be used to present information to the user and allow the selection of settings. Ex-1007, ¶46. In order to present this information to a user, including in order to update the user interface to reflect the user input (e.g., the selection of a particular mode), it would have been obvious to a POSITA to utilize a control signal based on the user input data. It is

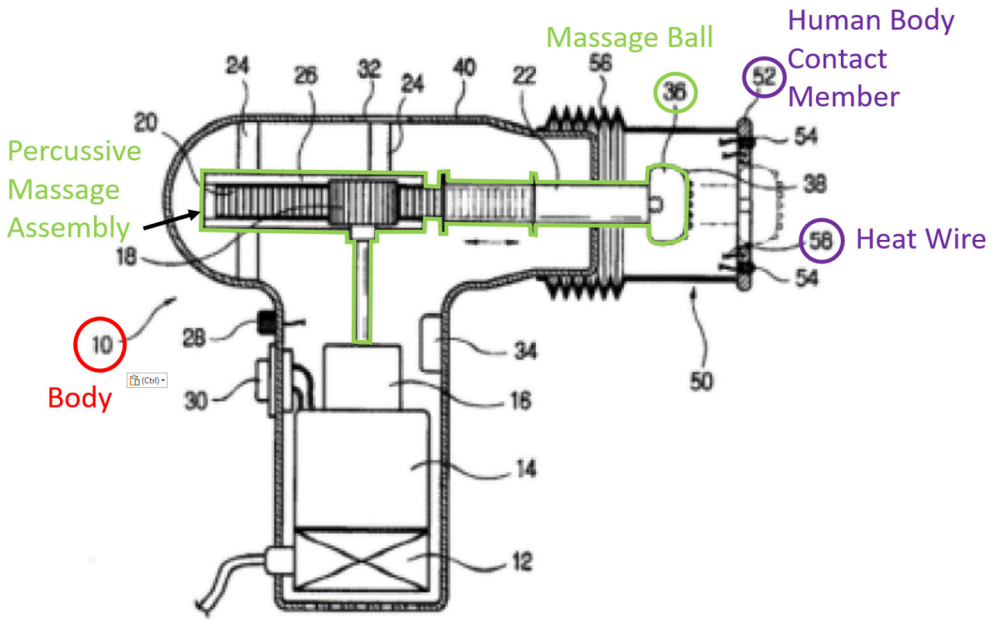
obvious to include an LED or LCD display or other suitable display mechanism in a massage device to present information and allow the selection of settings because such interfaces are commonly used in consumer devices for user interaction and control. Displaying information like selected modes, intensity levels, or timers is standard practice to enhance usability and provide feedback, ensuring users can easily operate the device. Utilizing a control signal to update the interface based on user input is also a well-understood principle, as it ensures real-time communication between the device, the display, and the user, which is a widely applied method in user controlled electronic device design. Indeed, using such a control signal would have been one of a limited number of options for reflecting the user input on the display.

c. Element 8[b]: "a first energy generator element and a second energy generator element coupled to the body, the first and second energy generator elements being independently operable to convert electricity from the power source into a first energy type and a second energy type, respectively, and direct the first and second energy types toward an area of skin, the first energy generator element including an impact generator element having a tissue contact surface that is linearly actuatable along an axis to contact and cause corresponding physical movement of the area of skin,"

156. Lee combined with Barasch teaches or suggests Element 8[b]. For the reasons described with respect to element 1[b], Lee discloses "the first and second energy generator elements being independently operable to convert electricity from

the power source into a first energy type and a second energy type, respectively, and direct the first and second energy types toward an area of skin." *Supra* Section VI.A.2.c; Ex-1020. Similarly, for the reasons described with reference to element 1[d], Lee also discloses that "the first energy generator element includ[es] an impact generator element having a tissue contact surface that is linearly actuatable along an axis to contact and cause corresponding physical movement of the area of skin." *Supra* Section VI.A.2.e; Ex-1020.

157. To the extent the disclosures in elements 1[b] and 1[d] do not disclose "a first energy generator element and a second energy generator element coupled to the body," Lee also discloses that the first and second energy generator elements are coupled to the body. For example, Lee discloses that "The protective cover 50 is for protecting the massage ball 36 that reciprocates in a linear line outwardly of the body 40, and ***comprises a human body contact member 52*** that is restrained by the body 40 on one side, and a human body contact member 56 that is formed on the other side in direct contact with the human body." Ex-1006, ¶16. Moreover, the human body contact member also comprises a "heat wire (58)," which is the second energy generator element. Figure 1, annotated below illustrates that both energy generators are coupled to the body.



Ex-1006, Fig. 1 – illustrating the "body" (red), the "first energy generator element" (green), and the "second energy generator element" (purple) of Lee's massage gun.

d. Element 8[c]: "wherein the sensor is configured to detect additional input data based on a vital sign of the user and transmit the input data for display"

158. Lee combined with Barasch teaches or suggests Element 8[c]. For example, Barasch discloses that "massager 300 includes at least one detector 308 for monitoring one or more usage parameters." Ex-1007, ¶56. Barasch goes on to explain that the "[d]etector may include, for example, a sensor," including "at least one of a heart rate sensor, a blood pressure sensor, a body temperature sensor, [and] a pulse sensor," among others. Ex-1007, ¶56. Thus, a POSITA would have understood that the detector in Barasch is a sensor that detects input based on a vital sign of the user, such as the user's heart rate. As described above in Section VI.A.1, a POSITA would have been motivated to combine Lee and Barasch and would have

found it obvious to utilize Barasch's teachings related to biometric sensors in the context of Lee's massaging device.

159. In addition, Barasch discloses transmitting the vital sign input for display. For example, Barasch discloses generating a "user data message," (also called a "user feedback message") which is a "message/data structure containing information about the user and/or usage of the massager." Ex-1007, ¶¶35, 82. "The usage data may include … ***biometric readings, such as heart rate or pulse***." Ex-1007, ¶35. Barasch explains that these biometric parameters are additional input data:

> "During use of massager 300, the user's hand or fingers may make contact with biometric sensor 306, such that one or more such physiological parameters can be measured. Physiological parameters, which may be measured, include, but are not limited to: heart rate, pulse, blood pressure, body temperature, skin conductivity, moisture, grip pressure, usage pressure, and any other suitable parameters. For example, the biometric sensor 306 may include a strain gauge (which serves as a grip pressure sensor). The biometric sensor 306 may include electrodes for contact with the user's skin to measure the heart rate, blood pressure, body temperature (thermometer), and/or pulse."

160. Ex-1007, ¶56.

161. Figure 10c provides an example flow chart of how the user's heart rate may be included in the message to the user:

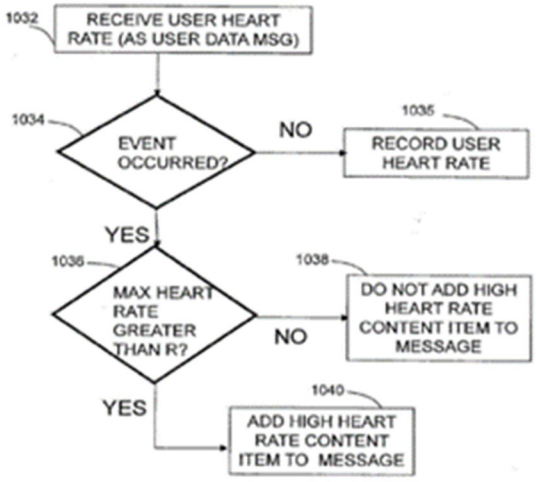


Figure 10C

Ex-1007, Fig. 10C – illustrating a flow chart for recording and outputting the user's heart rate.

162. Moreover, Barasch makes it clear and a POSITA would have understood that the "user feedback message" may be provided to the user directly on the display of the massager. Providing a "user feedback message" directly on the display of a massage device is obvious because it aligns with common practices in electronic devices to enhance usability and user experience. Displays are frequently used to communicate essential information, such as operational status, errors, or progress updates, ensuring users can effectively interact with the device. Incorporating feedback messages directly on the device display eliminates the need for external interfaces, streamlining communication and making the device more intuitive and user-friendly. For example, Barasch discloses that the "user interface 1500 [is] for displaying content of a user feedback message" and can be "displayed

on any suitable interface" including the "massager user interface screen." Ex-1007, ¶100. *See also* Ex-1007, ¶46 ("User interface 106 comprises a mechanism for massager 100 to receive input from a user (and in some embodiments, to present feedback to the user).").

163. Accordingly, a POSITA would have found this claim obvious.

8. Claim 9: "The treatment device of claim 8, wherein the additional input data corresponds to a heart rate of the user."

164. Lee combined with Barasch teaches or suggests Claim 9. As described above with reference to element 8[c], one of the biometric parameters that may be detected by the detector as an additional input may be a user's heart rate. *Supra* Section VI.A.7.d; Ex-1007, ¶¶35, 56, 82.

165. Accordingly, a POSITA would have found this claim obvious.

9. Claim 10: "The treatment device of claim 8, further comprising a controller configured to modify intensity of the first energy type and the second energy type."

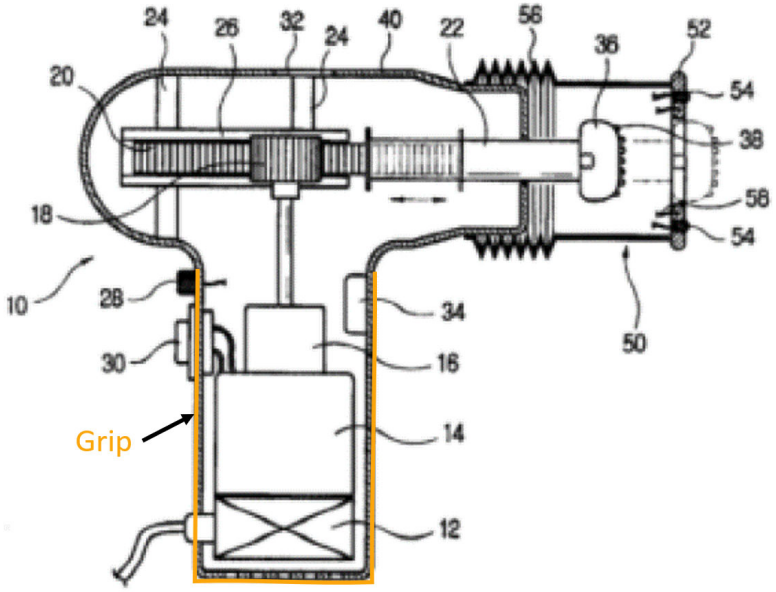
166. Lee combined with Barasch teaches or suggests Claim 10. Barasch discloses that a user may select the massage intensity through the user interface: "[T]he input may be … selection of vibration settings (e.g., high, medium, or low intensity, or a particular pattern, etc.) and/or selection of other settings such as, for example, a temperature of a heating/cooling mechanism within the massager 100, etc." Ex-1007, ¶46. *See also* Ex-1007, ¶55 ("Controls 304 may include vibration

settings. Additional, controls 304 may include temperature settings…"). Barasch then explains that the massager functionalities (which a POSITA would understand include the massager and heating/cooling functionalities) are controlled by a processor (i.e., "controller") in computer 109: "Processor 114 is configured and disposed to access instructions stored in memory 110 and execute them to provide one or more of the various functionalities of massager 100." Ex-1007, ¶47. Note that although Barasch refers to the massage function as "vibration," a POSITA would understand that as applied to Lee, Barasch's processor would control the intensity of the percussive massage functionality. For a mechanical massage device, the type of actuation varies, and control thereof can be reused across different types of actuation.

167. Accordingly, a POSITA would have found this claim obvious.

10. Claim 11: "The treatment device of claim 8, wherein a portion of the body configured to be gripped by the hand of the user is configured to emulate a grip of a gun."

168. Lee combined with Barasch teaches or suggests Claim 11. Specifically, as shown in Lee's Fig. 1, below, a POSITA would understand that Lee's massager is configured such that the portion of the body configured to be gripped by the hand of the user is configured to emulate a grip of a gun because it is shaped similarly to a gun with a "T-shape." Ex-1006, ¶12 ("The body 10 has a case 40 having a "T" shape.").



Ex-1006, Fig. 1 – illustrating the "grip" (orange) of Lee's massage gun.

169. Accordingly, a POSITA would have found this claim obvious.

11. Claim 12: "The treatment device of claim 8, wherein the impact generator element further includes a drive mechanism and a piston, wherein the drive mechanism is operably coupled to a controller to direct electricity to the drive mechanism and move the piston and the tissue contacting surface along the axis."

170. Lee combined with Barasch teaches or suggests Claim 12 for the reasons described with respect to Claim 2. *Supra* Section VI.A.3; Ex-1020.

171. Accordingly, a POSITA would have found this claim obvious.

12. Claim 13: "The treatment device of claim 12, wherein the second energy generator element is a heat generator element configured to output the second energy type including a heat flux toward the area of skin."

172. Lee combined with Barasch teaches or suggests Claim 13. For the reasons described with respect to Claim 5, Lee discloses "the second energy

generator element is a heat generator element." *Supra* Section VI.A.6; Ex-1020. Similarly, for the reasons described with reference to Claim 6, Lee also discloses that "the second energy generator element is … configured to output the second energy type including a heat flux toward the area of skin." *Supra* Section VI.A.7; Ex-1020.

173. Accordingly, a POSITA would have found this claim obvious.

13. Claim 14: "The treatment device of claim 13, wherein the heat generator element is arranged coaxially about the axis and at least a portion of the heat generator element extends about at least portion of the piston."

174. Lee combined with Barasch teaches or suggests Claim 14. For the reasons described with respect to element 1[b], Lee discloses "the heat generator element is arranged coaxially about the axis." *Supra* Section VI.A.2.c; Ex-1020. Similarly, for the reasons described with reference to Claim 3, Lee also discloses that "at least a portion of the heat generator element extends about at least portion of the piston." *Supra* Section VI.A.4; Ex-1020. To the extent Claim 14's requirement that the "heat energy generator element extends about at least a portion of the piston" is not disclosed as discussed above, Lee discloses that the piston portion of the first energy generator extends through the heat wire, which is arranged coaxially around the axis traversed by the piston. For example, Lee discloses "a massaging rod integrally formed with the rotor and linear gear to reciprocate in and out of the case." Ex-1006, ¶8. Moreover, a POSITA would have recognized that the piston is located

in the same axis as the massage ball 36 reference in Claim 3. Any other off-axis location would unnecessarily complicate the mechanical design and stability of the device, as well as its electrical control.

175. Accordingly, a POSITA would have found this claim obvious.

14. Claim 15: "The treatment device of claim 13, further comprising a third energy generator element independently operable of the first and second energy generator elements to output a third energy type toward the area of skin."

176. Lee combined with Barasch teaches or suggests Claim 15. For example, in addition to disclosing massaging and heating, Barasch also discloses a third energy generator element that provides cooling. Barasch explains that "[t]he heating/cooling mechanism 107 may be configured and disposed to provide heat and/or cooling to the external shaft 118" and that "cooling "be accomplished using a thermoelectric component, such as a thermoelectric cooler (Peltier cooler) disposed within shaft 118." As described above in Section VI.A.1, a POSITA would have been motivated to combine Lee with Barasch in order to take advantage of this cooling mechanism and it would have been obvious to do so. Moreover, cooling mechanisms, such as Peltier coolers were well-known at the time and it would have been well within the skillset of a POSITA to add such a cooling mechanism to Lee's massager and doing so would not have required any undue experimentation.

177. Accordingly, a POSITA would have found this claim obvious.

15. Claim 16: "The treatment device of claim 15, further comprising a controller configured to modify an intensity of the first, second, and third energy types."

178. Lee combined with Barasch teaches or suggests Claim 16. For the reasons described with respect Claim 10, Barasch discloses "a controller configured to modify an intensity of the first [and] second … energy types" (e.g., massage intensity and heating). *Supra* Section VI.A.12; Ex-1020. Similarly, Barasch discloses that the user may input selection of "other settings such as, for example, a temperature of a heating/***cooling mechanism*** within the massager 100." Ex-1007. ¶46. And, like the other energy types, the cooling mechanism would be controlled by processor 114, which "is configured and disposed to access instructions stored in memory 110 and execute them to provide one or more of the various functionalities of massager 100," which a POSITA would have understood would include the cooling functionality. Ex-1007, ¶47.

179. Accordingly, a POSITA would have found this claim obvious.

16. Independent Claim 17

a. Element 17[pre]: "A treatment device, comprising:"

180. To the extent the preamble is limiting, Lee combined with Barasch teaches or suggests Element 8[pre] for the reasons described with respect to Element 1[pre]. *Supra* Section VI.A.7.a; Ex-1020.

b. Element 17[a]: "a body provided with a power source and a processing unit configured to receive input data and generate a control signal based on the input data, the body including a skin contacting surface maintainable against skin of a user by a force applied by a hand of the user when gripping the body; and"

181. Lee combined with Barasch teaches or suggests Element 17[a]. For the reasons described with respect to element 1[a], Lee discloses a body provided with a power source and a processing unit. *Supra* Section VI.A.2.b; Ex-1020. Similarly, for the reasons described with reference to element 1[c], Lee also discloses that the body further includes a skin contacting surface (e.g., a grip) that is maintainable against the skin of a user by a force applied by a hand of the user when gripping the body. *Supra* Section VI.A.2.d; Ex-1020. Moreover, for the reasons described with reference to element 8[a], Barasch discloses "a processing unit configured to receive input data and generate a control signal based on the input data." *Supra* Section VI.A.7.b; Ex-1020

c. Element 17[b]: "a first energy generator element and a second energy generator element coupled to the body, the first and second energy generator elements being independently operable to convert electricity from the power source into a first energy type and a second energy type, respectively, and direct the first and second energy types toward an area of skin, the first energy generator element including an impact generator element having a tissue contact surface that is linearly actuatable along an axis to contact and cause corresponding physical movement of the area of skin;"

182. Lee combined with Barasch teaches or suggests Element 8[a]. For the reasons described with respect to element 1[b], Lee discloses "the first and second energy generator elements being independently operable to convert electricity from the power source into a first energy type and a second energy type, respectively, and direct the first and second energy types toward an area of skin." *Supra* Section VI.A.2.c; Ex-1020. Similarly, for the reasons described with reference to element 1[d], Lee also discloses that "the first energy generator element includ[es] an impact generator element having a tissue contact surface that is linearly actuatable along an axis to contact and cause corresponding physical movement of the area of skin." *Supra* Section VI.A.2.e; Ex-1020.

183. To the extent the disclosures in elements 1[b] and 1[d] do not disclose "a first energy generator element and a second energy generator element coupled to the body," Lee also discloses that the first and second energy generator elements are

coupled to the body for the reasons described with reference to element 8[b]. *Supra* Section VI.A.7.c; Ex-1020.

d. Element 17[c]: "wherein the processing unit is operable to output an optical signal on a display that is observable by eyes of the user, the output corresponding to the control signal."

184. Lee combined with Barasch teaches or suggests Element 1[c]. For example, Barasch discloses that "[u]ser interface 106 comprises a mechanism for massager 100 to receive input from a user (and in some embodiments, to present feedback to the user)." Ex-1007, ¶46. Barasch teaches that the user interface may be an LED or LCD display or "any other suitable display mechanism" and that it may be used to present information to the user and allow the selection of settings. Ex-1007, ¶46. Thus, a POSITA would have understood that the user interface includes a display that outputs an optical signal that is observable by the eyes of the user.

185. This optical signal would correspond to the control signal generated upon the user's input, such as a selection of the power setting or various massage settings within the device. Ex-1007, ¶46. Barasch explains that the massager includes an on-board "computer 109 including a processor 114," which is "configured to access instructions stored in memory 110 and execute them to provide one or more of the various functionalities of massager 100." Ex-1007, ¶47. From this disclosure, a POSTIA would have understood, or it would have at least been obvious, that the user's input is received by the computer 109 and, to present this

information to a user, including in order to update the user interface to reflect the user input (e.g., the selection of a particular mode), it would have been obvious to a POSITA to utilize a control signal based on the user input data. Indeed, using such a control signal would have been one of a limited number of options for reflecting the user input on the display.

186. Accordingly, a POSITA would have found this claim obvious.

17. Claim 18: "The treatment device of claim 17, wherein a portion of the body configured to be gripped by the hand of the user is configured to emulate a grip of a gun."

187. Lee combined with Barasch teaches or suggests Claim 18. For the reasons described with respect to Claim 11. *Supra* Section VI.A.10; Ex-1020.

188. Accordingly, a POSITA would have found this claim obvious.

18. Claim 19: "The treatment device of claim 17, further comprising a sensor to detect additional input data based on a vital sign of the user, the additional input data corresponding to a heart rate of the user."

189. Lee combined with Barasch teaches or suggests Claim 19. For the reasons described with respect to Claim 9. *Supra* Section VI.A.8; Ex-1020.

190. Accordingly, a POSITA would have found this claim obvious.

B. Ground 2: Claim 4 is Unpatentable Under 35 U.S.C. § 103 As Obvious Over Lee in View of Barasch and further in view of Choi.

191. For the reasons discussed below, it is my opinion that Claim 4 is unpatentable as obvious over Lee in view of Barasch and further in view of Choi.

1. A POSITA Would Have Been Motivated to Combine Choi's Teachings with the Combination of Lee and Barasch and Would Have Had a Reasonable Expectation of Success.

192. Lee discloses a patent application for an automatic percussion massager, which comprises a motor, a rotating gear, a linear gear, a massage rod, and a cylindrical protective cover. Ex-1006, Abstract. The protective cover includes a contact member that has a heat wire embedded therein, a body fat sensor, and a temperature sensor. Ex-1006, ¶¶16-18. The contact member can provide heat and measure body fat and temperature of the massaged area. Ex-1006, ¶¶18-19. Barasch similarly discloses a massager device that includes a massaging head with integrated heating and cooling functionality, a user interface, a communication interface, and a computer. Ex-1007, ¶¶4-6, 46. The computer can receive user input, analyze usage data, determine an event, and communicate a user feedback message to a target. Ex-1007, ¶¶4, 46-48. The user feedback message can include content based on various user preferences and usage parameters, such as biometric, temporal, and massager settings data. Ex-1007, ¶29.

193. Likewise, Choi discloses a massage device, which comprises a main body with a gun-shaped handle, a motor, a massager, a motor control means, and an infrared lamp to provide heat directed toward the skin. Ex-1009, ¶¶10, 20. The infrared lamp comprises an infrared LED lamp and an infrared lamp housing. Ex-1009, ¶¶20, 45-49. The infrared lamp housing is configured to fix the infrared LED

lamp and to guide the infrared light generated by the infrared LED lamp to irradiate the skin of the user. Ex-1009, ¶¶20, 46. The infrared lamp can provide an infrared heating function by operating under the control of the motor control means upon switching of a switch used to provide user operation instructions. Ex-1009, ¶¶17, 51.

194. A POSITA would have been motivated to combine the teachings of Lee and Barasch with those of Choi because Choi teaches an advantageous way of providing heat using an infrared LED lamp, rather than a heat wire as in Lee. A POSITA would have understood that an infrared LED lamp would have several benefits over a heat wire, such as lower power consumption, longer lifespan, more uniform heating, less risk of overheating or burning, and easier integration with the massager. It is obvious that an infrared LED lamp offers several advantages over a heat wire in a massage device due to the inherent properties of LED technology. Infrared LEDs are highly efficient, consuming less power while providing targeted heat, which translates to lower energy costs and extended device usage. Additionally, LEDs have a longer lifespan, produce more uniform heating, reduce risks of overheating or burns due to precise thermal management, and are compact and lightweight, making them easier to integrate into a massage device's design without compromising portability or ergonomics. In order to maximize the benefit of utilizing an LED light, a POSITA would have been motivated to use the housing as described by Choi to guide the energy of the LED to the skin, as this would

enhance the efficiency and effectiveness of the heating function and prevent the loss or dispersion of infrared light. Ex-1009, ¶¶20, 46. It would further have been obvious to a POSITA by 2017 that using the housing of a massage device to guide the energy of an LED light to the skin would maximize its benefits, as this ensures the infrared light is directed precisely to the target area for optimal heating efficiency and therapeutic effect. This approach minimizes energy loss or dispersion, enhancing the effectiveness of the heating function while maintaining a compact and functional device design.

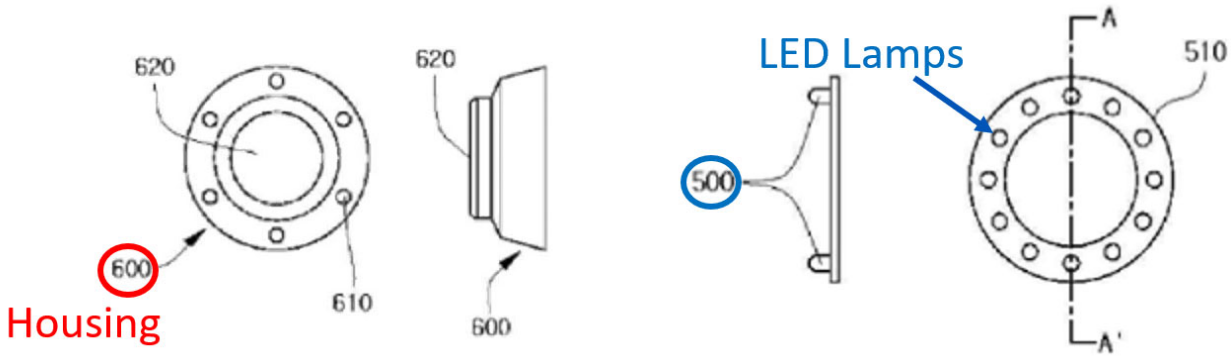
195. A POSITA would have expected that such a combination would improve the Lee-Barasch combination by providing a more reliable, durable, and user-friendly heating function that would complement the existing functionality of that massager. Given the similarities between Choi, Lee, and Barasch—all three relate to massage devices that can provide massage and heat to the user's body for relaxation, pain relief, or stimulation—a POSITA would have expected the combination to be successful. Moreover, replacing the heat wire in Lee with the infrared LED lamp and housing in Choi would not require undue experimentation or modification, as both components are well-known and compatible with the massager structure and operation.

2. Claim 4: "The treatment device of claim 1, wherein the second energy generator element includes a reflecting groove circumferentially arranged about the axis, the reflecting groove defining a concave shape arranged to reflect energy generated from the second energy generator element towards the area of skin."

196. Lee combined with Barasch and further combined with Choi teaches or suggests Claim 4. For example, like Lee, Choi discloses a heating element, which acts as a second energy generator element. Ex-1008, ¶49 ("The infrared LED lamp 500 is a means for generating infrared light to provide an infrared heating function.") Choi further explains that an "infrared housing, 600" is "configured in a circular shape" and is used to "guide the infrared light generated by the infrared LED lamp 500 to irradiate the skin of the user." Ex-1008, ¶20. *See* also, Ex-1008, ¶46 ("The infrared lamp housing 600 holds the infrared LED lamp 500 and is a means for directing infrared light generated by the infrared LED lamp 500 to irradiate the skin of a user"). Figure 5, annotated below, illustrates the circular shape of the housing.

197. Moreover, Choi explains that the housing "is tubular in shape, comprising at least one or more infrared lamp fixing parts … spaced along a circular outer periphery to which the infrared LED lamp is fitted." Ex-1008, ¶48. Thus a POSITA would have understood that the housing is circumferentially arranged around the central axis and is a concave (inner circular) shape that fits the LED lamp. Although Choi does not disclose what the housing is made of, given Choi's explanation of the housing's purpose—to guide the LED light toward the skin, a

POSITA would have been motivated to utilize a reflective surface as a convenient and easy to implement type of material effective a directing infrared light. At least by 2017, guiding LED light toward the skin using a reflective surface was obvious because reflective materials were a well-known and widely used method to direct and concentrate light energy efficiently. Reflective surfaces can enhance the focus and intensity of infrared light by minimizing scattering and ensuring that more energy reaches the targeted area, making them an effective solution for improving the performance of a massage device. Additionally, reflective materials are inexpensive, easy to integrate into the device design, and require minimal maintenance, making them a practical and convenient choice for this application. In any case, utilizing a reflective material would have been obvious to try as one of a limited number of options and a POSITA would have had a strong expectation of success given the widespread use of reflective surfaces to guide light from LED light sources.



Ex-1009, Figs. 5 and 6– illustrating the "reflecting groove" (red) and "second energy generator element" (blue) of Choi's massage gun.

198. Accordingly, a POSITA would have found this claim obvious.

C. Ground 3: Claim 7 is Unpatentable Under 35 U.S.C. § 103 As Obvious Over Lee in View of Barasch and further in view of Rhoades.

199. For the reasons discussed below, it is my opinion that Claim4 is unpatentable as obvious over Lee in view of Barasch and further in view of Choi.

1. A POSITA Would Have Been Motivated to Combine Lee's and Barasch's Teachings With Rhoades and Would Have Had a Reasonable Expectation of Success.

200. A POSITA would have been motivated to combine the teachings of Rhoades with the Lee-Barasch massager. All three references focus on enhancing the functionality and versatility of massage devices for skin and body treatment. Lee emphasizes the integration of various massage techniques and user feedback mechanisms (Ex-1006, 3:15-25), Barasch highlights the use of biometric data and user preferences to customize massage experiences (Ex-1007, ¶4]), and Rhoades

describes the use of interchangeable heads for different treatments such as heating, massaging, exfoliation, cleaning, and oxygenation (Ex-1010, 2:10-20). Specifically, a POSITA would have been motivated to modify the massager device of Lee and Barasch to include the features of Rhoades, such as the use of interchangeable heads and integrated heating units. *See, e.g.*, Ex-1010, 15:33-55, 17:54-56.

201. A POSITA would have been motivated to incorporate these features of Rhoades into the Lee-Barasch massager device because a POSITA would have recognized that the use of removable and swappable heads on the massager would provide greater versatility, convenience, and customization for the user, as well as reduce the cost and complexity of the device. Using removable and swappable heads on a massager was obvious by 2017 because it allows users to customize their experience by selecting attachments tailored to specific needs, such as deep tissue massage or relaxation. In fact, Lee itself suggests the use of removable and swappable heads, as Lee discloses that massage ball 36 is removably attached to the end of the massage rod 22. Lee, ¶14. This design enhances versatility and convenience, enabling one device to perform multiple functions without requiring entirely separate units. Additionally, it reduces the overall cost and complexity of the device by centralizing the core mechanisms while offering interchangeable components for varied use cases, making it a practical and user-friendly solution. Moreover, a POSITA would have also appreciated that the use of removable and

swappable heads would allow the user to easily change the treatment attachments without requiring additional tools or devices, as well as to clean and replace the attachments as needed.

202. In conjunction with incorporating Rhodes's teaching related to swappable heads, a POSITA would have also been motivated to modify the Lee-Barasch massager to have the heating unit disposed within a treatment attachment itself, as taught by Rhoades. Ex-1010, 17:54-56. A POSITA would have understood that having the heating unit within the treatment attachment would provide more direct and efficient heat transfer to the skin and body parts, as well as more precise and adjustable temperature control, as described above. A POSITA would have also recognized that having the heating unit within the treatment attachment would simplify the design and operation of the massager device, as well as reduce the size and weight of the device.

203. A POSITA would have expected the combination of Lee, Barasch, and Rhoades to be successful as the references are in the same or analogous fields of invention, namely, massage devices for skin and body treatment. *See, e.g.*, Ex-1006, Abstract, ¶¶5-8; Ex-1007, ¶¶2, 4-6; Ex-1010, 1:7-8, 2:18-27. The combination of Lee, Barasch, and Rhoades would have improved the Lee-Barasch massager by providing more features and functionalities, more versatility and convenience, more efficiency and precision, and more simplicity and compactness. Improved

efficiency, precision, simplicity, and compactness make the massage device easier to use, more effective in delivering results, and appealing for everyday use, ensuring practicality without sacrificing performance.

2. Claim 7: "The treatment device of claim 1, wherein at least one of the plurality of energy generator elements is contained at least partially within a housing that is removably securable to the body."

204. Lee combined with Barasch and further combined with Rhoades teaches or suggests Claim 7. For example, Rhoades discloses that "a treatment attachment may be replaced by switching the treatment attachment with a similar or different type of treatment attachment." *See, e.g.*, Ex-1010, 15:33-55. Rhoades additionally discloses that the heating element (i.e., the second energy generator element) is at least partially contained within the removable head: "a heating unit may also be disposed … within a treatment attachment." Ex-1010, 17:54-56. Thus, a POSITA would have understood that the removeable head constitutes the claimed housing that is removably securable to the body and that, because the heating element is disclosed as being disposed within the attachment, that at least one of the energy generator elements is contained within the housing, as required by Claim 7.

205. Accordingly, a POSITA would have found this claim obvious.

D. Ground 4: Claims 1-7 and 17-18 Are Unpatentable Under 35 U.S.C. § 103 As Obvious Over Giraud in View of Choi.

206. For the reasons discussed below, it is my opinion that Claims 1-7 and 17-18 are is unpatentable as obvious over Giraud in view of Choi.

1. A POSITA Would Have Been Motivated to Combine Giraud's and Choi's Teachings and Would Have Had a Reasonable Expectation of Success.

207. A POSITA would have been motivated to combine Giraud and Choi and would have had a reasonable expectation of success in doing so. A POSITA would have recognized that both references are directed to the same field of invention, namely, massage devices that include massage and heating functionalities. *See, e.g.*, Ex-1011, ¶¶1, 21; Ex-1009, ¶¶10-12; *supra* Section IV.D.2.. A POSITA would have realized that Choi discloses additional features that would enhance the performance and functionality of Giraud, such as the design of the heating element taught by Choi, including the housing for the LED lamp and a gun-shaped grip for the massager.

208. For example, a POSITA would have been motivated to use an LED lamp for providing infrared heat arranged in a circular shape to enhance the skin treatment functions of Giraud's massaging appliance. Ex-1009, ¶¶45-48. This is further supported by Giraud itself, which discloses light diodes capable of heating and arranged in a circular configuration. Ex-1011, ¶¶ 108, 206 and FIG. 11. As Choi teaches, infrared heat can improve blood flow, relax contracted muscle tissue, aid in

the rehabilitation of damaged muscle tissue, provide pain relief, decompose fat, reduce blood pressure, and stimulate the production of skin elements. Ex-1009, ¶3. A POSITA would have recognized that these benefits would complement the massage effects of Giraud's massaging heads. Ex-1011, ¶¶4-5, 165.

209. Moreover, a POSITA would have appreciated that arranging the LED lamp in a circular shape, as taught by Choi, would allow for a uniform and efficient irradiation of the skin over a large area, as well as a simple and compact integration of the LED lamp with the massaging head. Ex-1009, ¶20. This configuration ensures consistent exposure to all areas of the skin within the circle, minimizing shadows and hot spots, and enhancing the therapeutic effects of the light. Additionally, the circular design aligns naturally with the contours of most massaging heads, enabling seamless and compact integration. This reduces the overall size and complexity of the device, making it ergonomic, user-friendly, and aesthetically pleasing while maximizing functionality.

210. Similarly, a POSITA would have been motivated to use the housing for the LED lamp that guides the light toward the skin to improve the performance and durability of the LED lamp. Ex-1009, ¶¶45-48. as this would enhance the efficiency and effectiveness of the heating function and prevent the loss or dispersion of infrared light. Ex-1009, ¶¶20, 46. It would further have been obvious to a POSITA by 2017 that using the housing of a massage device to guide the energy of an LED

light to the skin would maximize its benefits, as this ensures the infrared light is directed precisely to the target area for optimal heating efficiency and therapeutic effect. This approach minimizes energy loss or dispersion, enhancing the effectiveness of the heating function while maintaining a compact and functional device design. As Choi teaches, the housing is configured in a shape corresponding to the inner surface of the main body and coupled from within the opening of the main body, so that the front part is exposed to the outside and fixedly holds the LED lamp. Ex-1009, ¶20. A POSITA would have understood that this configuration would protect the LED lamp from mechanical damage, prevent light loss due to reflection or scattering. A POSITA would have also recognized that this configuration would be compatible with Giraud's massaging appliance, as Giraud also discloses a main body with an opening for attaching the massaging head and a transmission mechanism with a shaft for activating the massaging elements.

211. A POSITA would have also been motivated to shape the grip of the massager like a gun, as taught by Choi to improve the ergonomics and convenience of Giraud's massaging appliance. As Choi teaches, the gun-shaped handle allows the user to easily hold and operate the massager by placing the finger on a gun switch that provides user operation instructions to the motor control means. Ex-1009, ¶¶10, 17, 41-43. A POSITA would have appreciated that this design would provide a comfortable and intuitive way to control the massaging appliance, as well as a better

maneuverability and stability of the massaging head over the skin. A POSITA would have also recognized that this design would be compatible with Giraud's massaging appliance, as Giraud also discloses a body with a handle, a motor control means, and a user interface.

212. A POSITA would have expected the combination of Giraud and Choi to be successful, as both references relate to the field of skin treatment appliances, and particularly facial skin. Both references disclose massaging devices that can perform various massage techniques and include heating functions. Both references also disclose similar components and structures, such as a body with a handle, a motor, a transmission mechanism, a massaging head, and a user interface. A POSITA would have been able to apply the teachings of Choi to Giraud using routine skill and knowledge in the art, without encountering any technical difficulties or unexpected results. Indeed, modifying external components such as the housing of the heat lamp or the grip is easily accomplished and such modifications are regularly made to existing devices to accommodate different uses, preferences, or enhancements.

2. Independent Claim 1

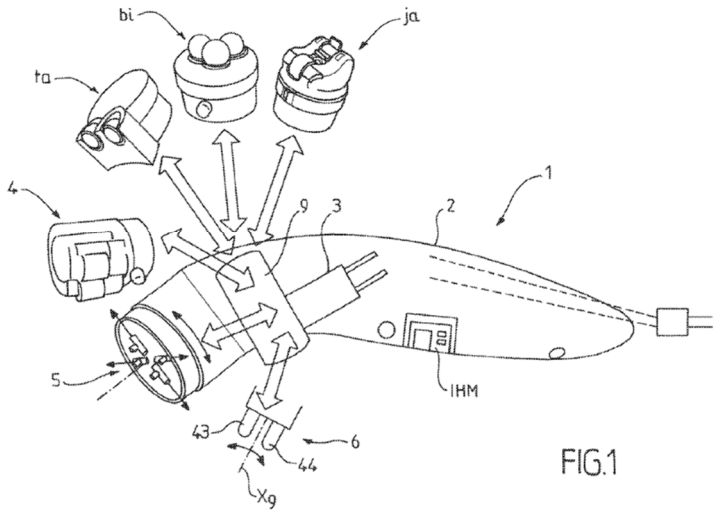
a. Element 1[pre]: "A treatment device, comprising:"

213. To the extent the preamble is limiting, Giraud combined with Choi teaches or suggests Element 1[pre]. For example, Giraud's "invention pertains to the

field of skin treatment appliances" and describes treatment through massage, light, heat, and other means. Ex-1011, ¶¶1, 7, 12.

b. Element 1[a]: "a body provided with a processing unit and a power source; and"

214. Giraud combined with Choi teaches or suggests Element 1[a]. For example, Giraud illustrates in Figure 1, shown below, that its "massaging appliance (1) has ***a body*** (2) inside of which there is a motor (3) electrically powered by a connection either to an ***external source of electricity*** … or to an ***internal source of electricity***." Ex-1011, ¶88.



Ex-1011, Fig. 1– illustrating the "body" (2) and "power source" (3) of Giraud's massage gun.

215. Moreover, Giraud discloses control unit(10) that controls the electric motor (6) and other functionality of the device. For example, Giraud discloses "[t]he electric motor (6) is operated by a control unit (10) powered by a battery pack (B)

positioned inside the body (3)." Ex-1011, ¶122; *see also id*., ¶¶154-55. A POSITA would have recognized, or it would have at least been obvious, that the control unit (10) described by Giraud includes a processor based on the functionality of Giraud's massaging appliance and the role the control unit (10) plays in operating the device. Ex-1011, ¶¶122, 154-155.

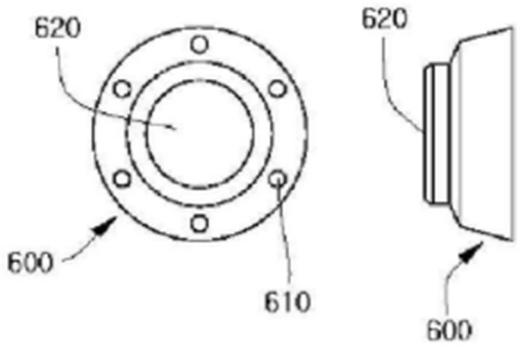
c. Element 1[b]: "a plurality of energy generator elements being independently operable to convert electricity from the power source into a plurality of different energy types transmittable towards an area of skin of a user, the plurality of energy generator elements being arranged coaxially about an axis,"

216. Giraud combined with Choi teaches or suggests element 1[b]. Giraud discloses a massager with multiple treatment functionalities, including embodiments that provide a percussive (or tapping) massage, which acts as the first energy generator element, and a LED that also provides infrared radiation to heat the area to be massaged, acting as the second energy generator element. For example, Giraud explains that "the massaging head (1) is designed to exert a mechanical action on the skin of the user's face via massaging elements (M) propelled by an electric motor. Ex-1011, ¶119. *See also, id.*, ¶133 ("massaging fingers (21) then begin to move in oscillation, which imitates the act of massage that would be performed using two fingers such as the index and middle fingers alternately tapping the skin of the face."). Giraud teaches that the operation of the massage fingers converts electricity from the power source to operate by coordinating with a maneuvering means and

the driving means "so as to transmit and transform the rotation movement of the electric motor (6) into an alternating movement of the massaging fingers." Ex-1011, ¶129.

217. Similarly, Giraud discloses that its "wave-emitting means may contain electroluminescent diodes," including "infrared diodes that can produce heat to achieve an 'instant radiance' effect" and can be part of the massaging head. Ex-1011, ¶15. Giraud explains that this heating portion of the treatment can be performed in preparation for the massage portion. Ex-1011, ¶206 ("the session may consist of a series of different massages before or after the application of warm, intense light."). Thus, a POSITA would have understood that each energy generator operates independently and can be operated either in sequence or in parallel.

218. Although Giraud does not disclose the arrangement of the "between 2 and 20 [LED] diodes" used on the massage head to produce the heating effect to be arranged coaxially about an axis, a POSITA would have been motivated to combine Giraud with Choi for the reasons described above in Section VI.D.1. Choi explains that the LED lamp is held within an infrared lamp housing and that the housing is "configured in a circular shape" and includes "a shaft pass-through hole 620 in the center for passing the slide shaft 321." This circular arrangement is shown in Figure 5, below:



Ex-1009, Fig. 5– illustrating the "energy generator elements being arranged coaxially about an axis."

219. As applied to Giraud, a POSITA would have understood that the LED diodes would be arrange around the outside of the massage head and that the massaging fingers would oscillate through the pass-through hold, resulting in both energy generators fitted together being arranged coaxially around an axis drawn through the center of the massage head. This also is an optimal arrangement for optimizing energy loss.

d. Element 1[c]: "wherein the body includes a grip arranged to be grasped by a hand of the user applying a gripping force to maintain the plurality of energy generator elements on or adjacent the area of skin,"

220. Giraud combined with Choi teaches or suggests Element 1[c]. Giraud discloses a massager that is intended to be held in the hand of a user to against their facial skin to allow the various massaging heads to come into contact with their skin. Ex-1011, ¶¶1, 15-17. Figure 1 illustrates the handheld nature of Giraud's massager.

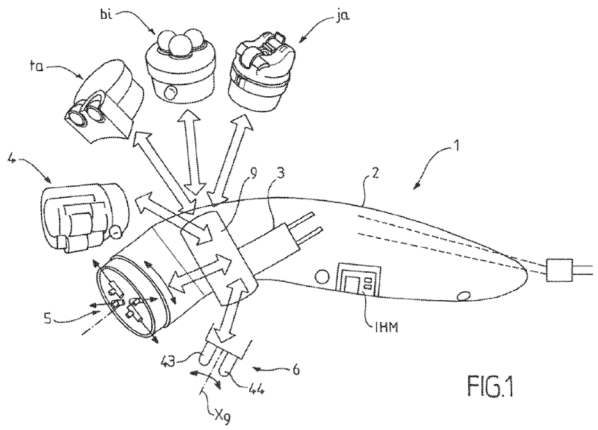


FIG.1

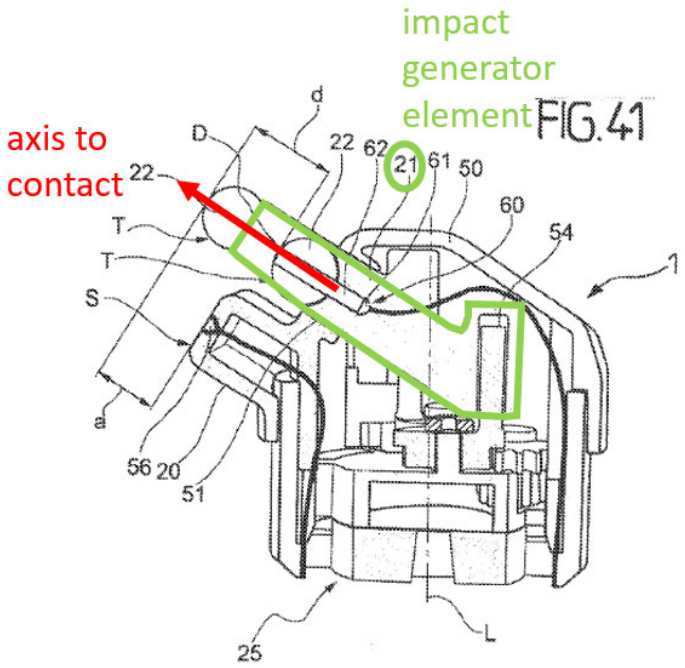
Ex-1011, Fig. 1– illustrating a handheld device including "a grip arranged to be grasped by a hand of the user."

221. To the extent Giraud does not disclose this element, it would have been obvious to use the body shape and grip taught by Choi for the reasons described above in Section VI.D.1. Choi teaches that "muscle vibration massage device that is configured as a gun type for convenient use by holding it in the hand." Ex-1009, ¶1. Moreover, Choi explains that by holding the grip, a user is able to "contact[] vibration slide part 320 to the muscles of the user." Ex-1009, ¶19.

e. Element 1[d]: "wherein the plurality of energy generator elements includes a first energy generator element and a second energy generator element, and wherein the first energy generator element is an impact generator element having a tissue contact surface that is linearly actuatable along the axis to contact and cause corresponding physical movement of the area of skin."

222. Giraud combined with Choi teaches or suggests Element 1[d]. As discussed above with reference to element 1[b], Giraud teaches a plurality of energy

generators, including a massage element and an LED heating lamp, which constitute the first and second energy generator elements, respectively. Giraud teaches that its massage element may be an impact generator. For example, Giraud discloses an embodiment in which "each massaging finger (21) is constructed in the shape of a sort of rectilinear piston" and where the rotation of the motor "is transformed into a lateral movement of the corresponding massaging finger" by a maneuvering means, as shown in Figure 41, below. Ex-1011, ¶139.



Ex-1011, Fig. 41– illustrating the "impact generator element" (green) having a tissue contact surface that is linearly actuatable along the "axis to contact" (red)

223. From this disclosure, a POSITA would have understood that the impact generator element included a tissue contact surfaces (i.e., massage "fingers") that are

linearly actuatable along the axis to contact (as it reciprocates into and out of the body of the massager). Moreover, a POSITA would have understood that as the massage "fingers" contacted the area of skin during operation that corresponding physical movement would occur at the level of the skin. For example, as the massage fingers tap and move on the skin, a reactionary movement would occur on the surface of the skin.

224. Accordingly, a POSITA would have found this claim obvious.

3. Claim 2: "The treatment device of claim 1, wherein the impact generator element further includes a drive mechanism and a piston, wherein the drive mechanism is operably coupled to a controller that directs electricity to the drive mechanism to move the piston and the tissue contact surface along the axis."

225. Giraud combined with Choi renders obvious Claim 2. Giraud discloses a massager with an impact generator as described above with reference to element 1[d]. Further, Giraud discloses that the impact generator includes a drive mechanism and a piston. For example, Giraud discloses that the massager is "on a drive unit" and that "the massaging head (1) is designed to exert a mechanical action on the skin of the user's face via massaging elements (M) propelled by an electric motor. Ex-1011, ¶119. Moreover, Giraud discloses that "each massaging finger (21) is constructed in the shape of a sort of rectilinear piston that extends at least partially to the exterior of a hollow body…[and] guided laterally by a bore (51) placed in the hollow body (50)." Ex-1011, ¶139. A POSITA would have understood that this

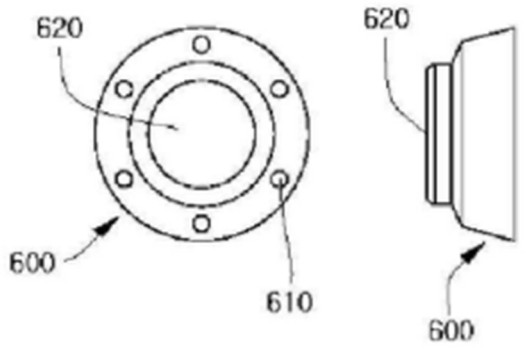
piston is moved as the drive mechanism (i.e., motor and gears) convert the operating power into rotational force and then into linear reciprocation. Ex-1011, ¶139. Rotational mechanics can be converted into linear movement through mechanisms that translate rotational force into straight-line motion. One common method is using a screw and nut system, where the rotational motion of the screw causes the nut to move linearly along its threads. Another approach is employing cams, where a rotating cam pushes a follower in a linear path. Gears and rack-and-pinion systems also achieve this, with the rotation of a gear driving a linear rack. These systems rely on mechanical coupling to transform angular displacement into precise, controlled linear motion, which is widely used in machinery, robotics, and everyday devices such as massage devices. My research with biomechanics and medical devices have used these concepts for more than 25 years.

226. Moreover, Giraud teaches that the motor "is operated by a control unit (10)," which is "connected to a manual control interface (11) that is accessible from the exterior of the body." Ex-1011, ¶122. The portion of the control unit that directs electricity to the motor is the claimed controller.

227. Accordingly, a POSITA would have found this claim obvious.

4. Claim 3: "The treatment device of claim 1, wherein the second energy generator element is substantially ring shaped and arranged coaxially about the first energy generator element."

228. Giraud combined with Choi renders obvious Claim 3. Like Giraud, Choi discloses an infrared LED for providing an infrared heat function. Ex-1009, ¶20. Choi explains that its LED lamp is held within an infrared lamp housing and that the housing is "configured in a circular shape" and includes "a shaft pass-through hole 620 in the center for passing the slide shaft 321." This circular arrangement is shown in Figure 5, below:



Ex-1009, Fig. 5– illustrating the "second energy generator element" being "arranged coaxially about the first energy generator element."

229. As applied to Giraud, a POSITA would have understood that the LED diodes would be arrange around the outside of the massage head and that the massaging fingers would oscillate through the pass-through hold, resulting in the LEDs (second energy generator elements) being arranged coaxially around the massaging element (first energy generator element). Moreover, this arrangement is

consistent with Giraud, which teaches that "light diodes (106) will be positioned, for example, on the outer edge (107) of the appliance … outside the trajectories of the massaging elements." Ex-1011 ¶ 108 and Fig. 26.

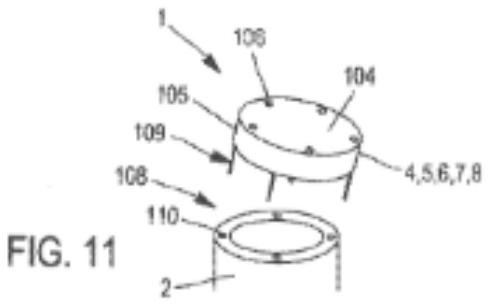


FIG. 11

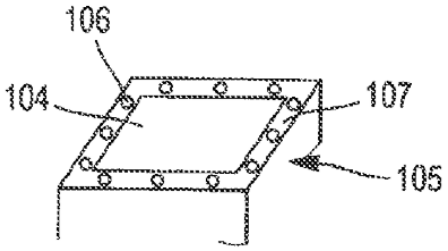


FIG. 26

Ex-1011, Figs. 11 and 26– illustrating the light diodes 106 arranged on the periphery of the application surface.

230. A POSITA would have been motivated to apply this teaching from Choi to Giraud for the reasons described in Section VI.D.1.

231. Accordingly, a POSITA would have found this claim obvious.

5. Claim 4: "The treatment device of claim 1, wherein the second energy generator element includes a reflecting groove circumferentially arranged about the axis, the reflecting groove defining a concave shape arranged to reflect energy generated from the second energy generator element towards the area of skin."

232. Giraud combined with Choi renders obvious Claim 4 for the same reasons explained in Ground 2, which also relies on Choi for this Claim.

233. Accordingly, a POSITA would have found this claim obvious.

6. Claim 5: "The treatment device of claim 1, wherein the second energy generator element includes a heat generator element."

234. Giraud combined with Choi renders obvious Claim 5. Giraud discloses a massager with multiple treatment functionalities, including embodiments that provide an LED to provide infrared radiation to heat the area to be massaged, acting as the second energy generator element. For example, Giraud discloses that its "wave-emitting means may contain electroluminescent diodes," including "infrared diodes that can produce heat to achieve an 'instant radiance' effect" and can be part of the massaging head. Ex-1011, ¶15.

235. Accordingly, a POSITA would have found this claim obvious.

7. Claim 6: "The treatment device of claim 1, wherein a first one of the plurality of different energy types is an impact force applied against a surface of the area of skin and a second one of the plurality of different energy types is a heat flux directed toward the area of skin."

236. Giraud combined with Choi renders obvious Claim 6. As discussed with reference to elements 1[b] and 1[d], Giraud discloses percussive massage elements, including massage fingers that function as the first energy generator element and a heating element that acts as the second energy generator element. *See supra* Sections VI.D.2.c and VI.D.2.e. Giraud discloses that the heating element can be any type of heating element: "The heat can be produced by infrared LEDs, by LED radiators or by one or more flat heating elements (ILO channel), by resistance

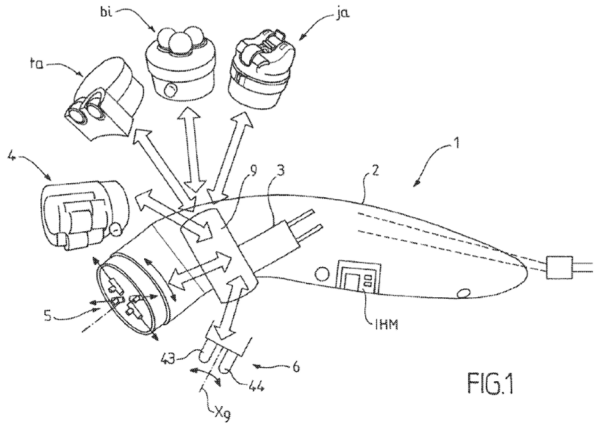
with mechanical conduction elements." A POSITA would have recognized that the energy type delivered by the percussive massage fingers of Giraud's massager is an impact force applied against a surface of the skin. Similarly, a POSITA would have understood that a flat heating element operating by resistance with mechanical conduction elements would have generated a heat flux directed toward the area of the skin. A flat heating element operating by resistance inherently generates heat through electrical energy dissipation, and when paired with mechanical conduction elements, it is designed to transfer this heat efficiently to the skin. The flat surface of the heating element ensures maximum contact with the conduction elements, minimizing thermal resistance, avoiding hot-spots, and focusing the heat flux direction. These conduction elements, typically made of highly thermally conductive materials, act as a bridge to channel the generated heat directly toward the skin. This arrangement ensures that heat energy is not dispersed unnecessarily and is directed purposefully to the target area, maximizing thermal efficiency and therapeutic effectiveness.

237. Accordingly, a POSITA would have found this claim obvious.

8. Claim 7: "The treatment device of claim 1, wherein at least one of the plurality of energy generator elements is contained at least partially within a housing that is removably securable to the body."

238. Giraud combined with Choi renders obvious Claim 7. For example, Giraud discloses that its massaging appliance "consists of a massaging head (1),

designed to be removeable" Ex-1011, ¶119. Figure 1 below illustrates various heads that can be attached to the massaging appliance.



Ex-1011, Fig. 1– illustrating the "housing that is removable securable to the body" and at least partial contains "one of the plurality of energy generator elements."

239. Giraud additionally discloses that "means (60) of diffusing light in the direction of the face" (i.e., the second energy generator element) is "located in a massaging finger (21) and includes a light source (61) such as an electroluminescent diode." Ex-1011, ¶143; *see also id.*, ¶15 (explaining that the "electroluminescent diodes "may contain infrared diodes that can produce heat to achieve an 'instant radiance' effect"). Thus, a POSITA would have understood that the removeable head constitutes the claimed housing that is removably securable to the body and that, because the heating element is disclosed as being disposed within the attachment, that at least one of the energy generator elements is contained within the housing, as required by Claim 7.

240. Accordingly, a POSITA would have found this claim obvious.

9. Independent Claim 17

a. Element 17[pre]: "A treatment device, comprising:"

241. To the extent the preamble is limiting, Giraud combined with Choi teaches or suggests Element 17[pre] for the reasons described with respect to Element 1[pre]. *Supra* Section VI.D.2.a; Ex-1020.

b. Element 17[a]: "a body provided with a power source and a processing unit configured to receive input data and generate a control signal based on the input data, the body including a skin contacting surface maintainable against skin of a user by a force applied by a hand of the user when gripping the body; and"

242. Giraud combined with Choi teaches or suggests Element 17[a]. For the reasons described with respect to element 1[a], Giraud discloses a body provided with a power source and a processing unit. *Supra* Section VI.D.2.b; Ex-1020. Similarly, for the reasons described with reference to element 1[c], Giraud and Choi also disclose that the body further includes a skin contacting surface (e.g., a grip) that is maintainable against the skin of a user by a force applied by a hand of the user when gripping the body. *Supra* Section VI.D.2.d; Ex-1020. Moreover, Giraud discloses a control unit (10) that acts as "a processing unit configured to receive input data and generate a control signal based on the input data." Ex-1011, ¶155. For example, Giraud explains that adjusteduser input to start/stop the massager or select a particular program are received and processed by the control unit: "The control

unit (10) is also connected to a manual control interface (14) accessible from the exterior of the body. The manual control interface (14) can, for example, include a start/stop switch and/or a means of manually selecting the operating programs." Giraud, ¶154. The control unit also controls the operation of the massaging appliance "depending on the massaging heat (1)." Ex-1011, ¶155. A POSITA would have understood that to adjust the operation of the massage appliance based on these inputs, the control unit would generate a control signal that would instruct the various energy generator elements as to how to operate. It would have been obvious that adjusting massage parameters, such as motor speed and light intensity, requires precise and dynamic control, which is efficiently managed by a processor such as controller 10. The controller acts as the "brain" of the system, responding to inputs by generating control signals that are sent to the parameter generation elements, instructing them on how to operate, such as adjusting speeds or modulating light output.

c. Element 17[b]: "a first energy generator element and a second energy generator element coupled to the body, the first and second energy generator elements being independently operable to convert electricity from the power source into a first energy type and a second energy type, respectively, and direct the first and second energy types toward an area of skin, the first energy generator element including an impact generator element having a tissue contact surface that is linearly actuatable along an axis to contact and cause corresponding physical movement of the area of skin;"

243. Giraud combined with Choi teaches or suggests Element 17[b]. For the reasons described with respect to element 1[b], Giraud discloses "the first and second energy generator elements being independently operable to convert electricity from the power source into a first energy type and a second energy type, respectively, and direct the first and second energy types toward an area of skin." *Supra* Section VI.D.2.c; Ex-1020. Similarly, for the reasons described with reference to element 1[d], Giraud also discloses that "the first energy generator element includ[es] an impact generator element having a tissue contact surface that is linearly actuatable along an axis to contact and cause corresponding physical movement of the area of skin." *Supra* Section VI.D.2.e; Ex-1020. To the extent the disclosures in elements 1[b] and 1[d] do not disclose "a first energy generator element and a second energy generator element coupled to the body," Giraud also discloses that the first and second energy generator elements are coupled to the body because both the massaging fingers and the infrared LED diodes are located on the removeable

attachments. For example, Giraud discloses that both the electroluminescent diodes and the massaging finger are both found on a massaging head. Ex-1011, ¶143.

d. Element 17[c]: "wherein the processing unit is operable to output an optical signal on a display that is observable by eyes of the user, the output corresponding to the control signal."

244. Giraud combined with Choi teaches or suggests Element 17[c]. For example, Giraud discloses a user interface to display metrics related to treatment information such as treatment duration, treatment phase, and the name of the massage head being used:

> The massaging appliance also has on its body, a user interface (UI) with a screen to display at least one of the following kinds of data: treatment duration (total, elapsed, remaining), treatment phase and the name of the head distinguished. The UI may also have control buttons (on the screen or mechanical on the casing) so the user can set and select one of the offered programs, to adjust the treatment as the user wishes (within the limits defined by the automatic distinguishing feature)

Ex-1011, ¶88. Because the controller recognizes and adjusts the massaging based on the head, as described with reference to element 17[a], a POSITA would understand that it communicates with the user interface to display the particular massage head, treatment phase, and treatment duration that corresponds to the control signal so that those could be reflected on the user interface. Ex-1011, ¶154-155. For example, Giraud teaches that "[t]he control unit (10) is thus adapted to control the operation of the massaging appliance (A) depending on the massaging head (1) as

distinguished after the identification means." Ex-1011, ¶123. And the control unit (10) outputs the identified message head to the UI. Ex-1011, ¶40. Based on this functionality of the control unit (10), and because the device includes a UI for a user to select among different programs, a POSITA would have understood that control unit (10) includes a processor as claimed in this element. Ex-1011, ¶42. Moreover, Giraud discloses the control unit controlling the "manual control interface (14)," which a POSITA would have understood could be part of the user interface described above, particularly in view of the fact that Figure 1 shows only a single interface. *See* Ex-1011, ¶154, Fig. 1.

245. Accordingly, a POSITA would have found this claim obvious.

10. Claim 18: "The treatment device of claim 17, wherein a portion of the body configured to be gripped by the hand of the user is configured to emulate a grip of a gun."

246. Giraud combined with Choi renders obvious Claim 18. Choi discloses that "muscle vibration massage device that is configured as a gun type for convenient use by holding it in the hand." Ex-1009, ¶1. It would have been obvious to use the body shape and grip taught by Choi for the reasons described above in Section VI.D.1.

VII. INVALIDITY OF THE '174 PATENT CLAIMS UNDER 35 U.S.C. § 112

A. Ground 5: Claims 1-19 Are Unpatentable Under 35 U.S.C. § 112 For Lack of Written Description Support in the Specification.

247. Here, the specification fails to demonstrate possession of the claimed invention of a treatment device with energy generator elements. The specification discloses only communication devices that use energy generator elements to transmit information, such as biometric data, location data, or commands, to a receiver device. Ex-1001, 1:59-2:61 The specification does not disclose any treatment device that uses energy generator elements to output energy for treating a condition, such as a disease, a disorder, or an injury. Indeed, the specification does not disclose any examples, embodiments, or descriptions of how energy generator elements could be used for treatment purposes, what types of energy could be output, what types of conditions could be treated, or what types of effects could be achieved. *Id*. The specification does not disclose any correlation between the output energy and the treatment effect, or any parameters, criteria, or methods for selecting, controlling, or adjusting the output energy for treatment purposes. *Id*. The specification does not disclose any variety of materials, structures, or features that could constitute the claimed genus of treatment devices with energy generator elements. *Id*. The specification does not disclose any advantages, benefits, or objectives of using energy generator elements in a treatment device. *Id*.

248. The few instances where the specification mentions "treatment" are not in the context of a treatment device, but rather in the context of a communication device that transmits information related to treatment. For example, the specification is referring to affixing the communication device to a patient in a semi-permanent way so that information about the patient may be communicated throughout the duration of a prolonged treatment:

> One or both adhesives also may be configured for semi-permanent contact with skin 2, such as ***during the entirety of a multi-month or multi-year treatment period***. For example, at least the second adhesive material may include medicinal coatings and/or compositions that promote prolonged or semi-permanent contact with skin 2 ***by time-releasing treatments configured to prevent or minimize contact-based injuries***.

Ex-1001, 22:15-22. Note that the second reference to "treatment" has nothing to do with energy generators but rather is simply a medicinal coating to prevent injuries to the individual wearing the communication device that may result from having the communication device attached to their skin over a long period of time.

249. The only other time that the specification uses the word "treatment" is again in the context of communication and specifically whether such communication signals should be output toward a bone: "Alternatively, all or portion of the energies 32 may be output toward the bone-facing surface of element 770 ***to communicate signals*** and/or apply treatments to the bone." Ex-1001, 30:3-5. Although it is not entirely clear what the specification envisions by "applying treatment to the bone,"

the context of this embodiment makes clear that it is entirely directed to communication. *See, e.g.*, 29:46-65, 30:29-33; 30:39-42. In any case, this description of treatment certainly would not have indicated to a POSITA that the inventor was in possession of a treatment device that used energy generators in the way claimed in the '174 Patent. These statements do not disclose or suggest that the communication device itself is a treatment device, or that the energy generator elements output energy for treating a condition. Rather, they disclose or suggest that the communication device transmits information that may be useful for treatment by another device or method. *Id*.

250. I understand that in the parallel district court case, plaintiff has alleged infringement of the '174 Patent on the basis that certain massage gun devices infringe. Ex-1032. To the extent the patent claims are interpreted broadly enough to read on these types I disagree that the '174 Patent contains written description sufficient to justify such a read. Note that my opinion does not hinge on a determination that the preambles are limiting. Indeed, even if the preambles are not limiting, a POSITA would still look to them to provide context for the interpretation of the claims and the understanding of the invention. The preambles indicate that the claimed invention is directed to a treatment device, not a communication device. *Id*. Thus, a POSITA would expect the specification to disclose at least one embodiment, example, or description of a treatment device that uses energy generator elements to

output energy for treating a condition, not just a communication device that uses energy generator elements to transmit information. *Id*. The absence of such disclosure in the specification would not reasonably convey to a POSITA that the inventor had possession of the claimed invention of a treatment device with energy generator elements. *Id*.

B. Ground 6: Claims 1-19 Are Unpatentable Under 35 U.S.C. § 112 Based on Lack of Enablement.

251. In my opinion, the specification does not provide sufficient guidance and direction on how to utilize energy generator elements as part of a treatment device. Indeed, the only portion of the specification that alludes to treatment related to energy generators merely recites that energies "may be output toward the bone-facing surface element 770 to communicate signals and/or apply treatments to the bone." Ex-1001, 30:3-5. The specification does not disclose any details or examples of how such outputting of energies for treatments to the bone would be achieved, what types of energies would be suitable for bone treatment, what types of input data and control signals would be used, what types of bone conditions or diseases would be targeted, or what types of attachment elements would be compatible with such outputting of energies. The specification does not provide any working examples, experimental data, or comparative analysis to support the feasibility and operability of such outputting of energies. Nor does the specification cite any prior art references or teachings that would enable a POSITA to fill in the gaps and omissions in the

disclosure. Thus, the specification does not provide any objective criteria or parameters to guide a POSITA in practicing the full scope of the claimed treatment device without undue experimentation. For at least these reasons, Claims 1-19 are invalid for lack of enablement.

VIII. CONCLUSION

252. For the reasons set forth above, I believe that Claims 1-19 are unpatentable in view of the prior art and are also unpatentable under 35 U.S.C. § 112(a).

253. In signing this declaration, I recognize that it will be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I also recognize that I may be subject to cross-examination in the case and that cross-examination will take place in the United States. If cross-examination is required of me, I will appear for cross-examination within the United States during the time allotted for cross-examination.

254. I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

By: 

Morten O. Jensen, PhD, DrMed
Date: January 17, 2025