

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

HYPER ICE INC.

Petitioner,

v.

THERABODY, INC.,

Patent Owner.

Case No. PGR2026-00051
U.S. Patent No. 12,396,919

**DECLARATION OF NATHAN MORRILL IN SUPPORT
OF PETITIONER'S PETITION FOR POST-GRANT REVIEW
OF U.S. PATENT NO. 12,396,919**

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I, Nathan Morrill, hereby declare as follows:

I. INTRODUCTION

1. I have been asked by the law firm of Womble Bond Dickinson (US) LLP, counsel for Petitioner Hyper Ice, Inc. (“Hyperice” or “Petitioner”) to act as an expert witness in the above-captioned Post-Grant Review (“PGR”) proceeding involving Therabody, Inc.’s (“Therabody” or “Patent Owner”) U.S. Patent No. 12,396,919 (“the ’919 Patent”) (Ex. 1001).

2. I have been asked to offer opinions regarding the ’919 Patent and Claims 1–20 (the “Challenged Claims”) of the ’919 Patent, as set forth in Petitioner’s Petition for PGR (“the Petition”).

3. This declaration contains statements of my opinions formed to date and the associated reasoning in support of my opinions. I reserve the right to offer additional opinions based on further review of the materials of this case, or any related proceedings, including opinions and/or testimony of other relevant witness, including other expert witnesses retained in this matter.

4. The statements contained herein and referenced in the Petition may include my opinion and the bases for my opinions.

5. For my work on this matter, I am employed by Alpine Engineering and Design from whom I draw a salary. I understand that Alpine Engineering and Design was retained by the law firm of Womble Bond Dickinson (US) LLP.

Alpine Engineering and Design bill my time at an hourly rate of \$500.00 per hour of time spent on this matter, with travel time being billed at \$250.00 per hour. My compensation is not contingent on the outcome of the PGR or on the substance of my opinions.

6. I have no financial interest in Petitioner or in the outcome of this proceeding.

A. Qualifications and Experience

7. My Curriculum Vitae, which outlines my educational and employment history, is being submitted concurrently with this declaration. I am a registered Professional Engineer in the States of Utah, Idaho, Texas, New York, and Florida. I am a Certified Safety Professional in comprehensive practice. I am also a certified operator trainer for hydraulic equipment such as Mobile Elevating Work Platforms including boom lifts and scissor lifts as well as forklifts and telehandlers.

8. I received my Bachelor of Science degree in Mechanical Engineering from the University of Utah in 2004. I have over 20 years of experience in the fields of mechanical engineering, structural design, mechanical design, design of equipment, safety in design, guarding, and manufacturing. I have also designed and analyzed aerial lifts, custom trailers, high thrill rides, ziplines, machine guarding, high energy guarding, hydraulic design, pneumatic design, and drilling equipment. In my role as a consultant, I have participated in the design and manufacture of

numerous products, as well as performed accident reconstructions. I am a named inventor on 12 patents, with other patents pending. A list of my patents is included in my Curriculum Vitae. I believe that my credentials as set forth herein, and in my Curriculum Vitae, demonstrate that I am an expert in the fields of mechanical design, structural design, safety, and accident reconstruction including in the field of consumer product design and human factors analysis.

9. Because of my background, training, and experience, I am qualified to provide the expert opinions within this declaration regarding the technology described and claimed in the '919 Patent.

B. Materials Considered

10. In forming my opinions, I have reviewed the '919 Patent and its prosecution history. I have also reviewed and considered the references cited by the Petitioner, the Petition itself, and other documents and information set forth in this declaration, along with the documents and things contained in the Table of Exhibits provided in the Petition.

11. In reaching my opinions, I have relied upon my experience in the field and also considered the viewpoint of a person of ordinary skill in the art ("POSITA") at the time of the earliest priority date of the subject matter claimed in the '919 Patent, which I understand to be May 7, 2020. However, my opinion would not change if the challenged claims are found to have a different priority date.

As explained below, I am familiar with the level of a person of ordinary skill in the art regarding the technology at issue as of that time, and I was at least a person of ordinary skill in the art at that time as well as to the present.

II. RELEVANT LEGAL STANDARDS

12. I am not a legal expert or an attorney, and I am not offering any opinions on the law. While I am not an attorney, I understand that in providing my opinions there are certain principles of patent law that I should apply.

13. I have been informed of and understand the legal standards that apply to patent validity and invalidity, identified below, which I have applied in arriving at my conclusions.

A. Presumption of Validity

14. I understand that patents that have been issued by the U.S. Patent and Trademark Office (“USPTO”) are presumed to be valid, and a party challenging the validity of claims of an issued U.S. patent before the USPTO bears the burden of proving invalidity by a preponderance of the evidence.

B. Claim Construction

15. I have been informed of and understand that claim terms must be properly construed prior to assessing patentability. I also understand that the words of a claim are generally given their plain and ordinary meaning, which is the meaning the words would have to a person of ordinary skill in the art (“POSITA”) at the time of the invention. However, I also understand that the claims do not stand alone and

that the plain and ordinary meaning should be harmonized, to the extent possible, with the patent specification and the prosecution history of the patent. I also understand that extrinsic sources, like dictionaries, handbooks, textbooks, etc., can “shed useful light” on the proper construction of a claim term.

16. I also understand that a POSITA is a hypothetical person who is presumed to have ordinary skill in the relevant art at the time of the invention. Factors that may be considered in determining the level of ordinary skill according to the Manual of Patent Examining Procedures (MPEP) in the art may include: (1) type of problems encountered in the art; (2) prior art solutions to those problems; (3) rapidity with which innovations are made; (4) sophistication of the technology; and (5) educational level of active workers in the field.

C. Anticipation Under 35 U.S.C. § 102

17. I understand that a patent claim is anticipated if, as of the critical date (i.e., the effective filing date according to the America Invents Act (AIA)), each and every limitation recited in the claim is found either expressly or inherently in a single prior art reference and arranged in the prior art in the same way as it is claimed, such that the disclosure effectively puts the public in possession of the invention. Finally, I understand that for a prior art reference to inherently disclose a claim limitation, that claim limitation must necessarily be present in the prior art reference.

18. I also understand that prior art is the body of knowledge publicly available to a person skilled in the particular art or field of the invention at the time the invention was made, or one year prior to the filing of the patent application for the asserted patent. More particularly, I have been informed that prior art is defined as a reference that satisfies (AIA) § 102(a) regardless of whether or not the reference was actually known to those skilled in the art.

D. Obviousness Under 35 U.S.C. § 103

19. I understand that even if all the elements of a patented invention cannot be found in a single piece of prior art, the patent may still be found to be invalid if the invention is found to be obvious as of the critical date (i.e., the effective filing date (AIA)) to a person having ordinary skill in the field of art to which the claimed subject matter belongs.

20. I also understand that the following factors should be considered in analyzing obviousness: (1) the scope and content of the prior art; (2) the differences between the prior art and the claims; (3) the level of ordinary skill in the pertinent art; and (4) the existence of “secondary considerations” of non-obviousness, when present.

21. I understand that “secondary considerations” are factors like commercial success, unexplained results, long felt but unsolved need, industry acclaim, simultaneous invention, copying by others, skepticism by experts in the

field, and failure of others. I also understand that secondary consideration may be utilized as indicia of non-obviousness. I understand, however, that any secondary considerations should be connected, or have a “nexus,” with the invention as a whole.

22. I understand that a reference qualifies as prior art for obviousness purposes when it is analogous to the claimed invention. The test for determining what art is analogous is: (1) whether the art is from the same field of endeavor, regardless of the problem addressed, and (2) if the reference is not within the field of the inventor’s endeavor, whether the reference still is reasonably pertinent to the particular problem with which the inventor is involved.

23. I understand that the theoretical POSITA is assumed to have knowledge of all prior art. I understand that one skilled in the art can combine various prior art references based on the teachings of those prior art references, the general knowledge present in the art, or common sense.

24. I understand that a motivation to combine references may be implicit in the prior art, and there is no requirement that there be an actual or explicit teaching to combine two references. Thus, one may take into account the inferences and creative steps that a POSITA would employ to combine the known elements in the prior art in the manner claimed by the patent at issue. I understand, however, that it is improper to use the claimed subject matter of the patent at issue as a template for

piecing together components (or steps) found in separate prior art references, or in other words, it is improper to use “hindsight” bias gleaned from the teachings of the patent to establish reasons to combine separate prior art references and elements.

25. I understand that when determining whether a patent claim is obvious in light of the prior art, neither the particular motivation for the patent nor the stated purpose of the patentee is controlling. The primary inquiry has to do with the objective reach of the claims, and that if those claims extend to something that is obvious, then the entire patent claim is *invalid*.

26. I understand that one way that a patent can be obvious is if there existed at the time of the invention a known problem for which there was an obvious solution encompassed by the patent’s claims. I understand that a motivation to combine various prior art references to solve a particular problem may come from a variety of sources, including market demand or scientific literature. I understand that a need or problem known in the field at the time of the invention can also provide a reason to combine prior art references and render a patent claim invalid for obviousness.

27. I understand that familiar items may have obvious uses beyond their primary purpose, and that a POSITA will be able to fit the teachings of multiple prior art references together like the pieces of a puzzle. I understand that a POSITA is also a person of at least ordinary creativity. I understand that when there is a design need or market pressure to solve a problem and there are a finite number of

identified, predictable solutions, a POSITA has good reason to pursue the known options within his or her technical grasp. If this finite number of predictable solutions leads to the anticipated success, I understand that the invention is likely the product of ordinary skill and common sense, and not of any sort of innovation. I understand that the fact that a combination was obvious to try might also show that it was obvious under the patent laws, and thus *invalid*. I understand that if a patent claims a combination of familiar elements according to known methods, the combination is likely to be obvious when it does not more than yield predictable results. Thus, if a POSITA can implement a predictable variation, an invention is likely obvious. I understand that combining embodiments disclosed near each other in a prior art reference would not ordinarily require a leap of inventiveness.

28. I understand that obviousness may be shown by demonstrating that it would have been obvious to modify what is taught in a single piece of prior art to create the patented invention. Obviousness may also be shown by demonstrating that it would have been obvious to combine the teachings of more than one item of prior art. I understand that a claimed invention may be obvious if some teaching, suggestion, or motivation exists that would have led a POSITA to combine the invalidating references. I also understand that this suggestion or motivation may come from the knowledge of a person having ordinary skill in the art, or from sources such as explicit statements in the prior art. I understand that when there is a design

need or market pressure, and there are a finite number of predictable solutions, a POSITA may be motivated to apply common sense and his or her skill to combine the known options in order to solve the problem.

29. I understand that the following examples of approaches and rationales may be considered in determining whether a piece of prior art could have been combined with other prior art or with other information within the knowledge of a person having ordinary skill in the art:

- (a) Some teaching, motivation, or suggestion in the prior art that would have led a person of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention;
- (b) Known work in one field of endeavor may prompt variations of it for use in the same field or a different field based on design incentives or other market forces if the variations would have been predictable to a person of ordinary skill in the art;
- (c) Combining prior art elements according to known methods to yield predictable results;
- (d) Applying a known technique to a known device, method, or product ready for improvement to yield predictable results;
- (e) Applying a technique or approach that would have been “obvious to try” (choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success);
- (f) Simple substitution of one known element for another to obtain predictable results; or

- (g) Use of a known technique to improve similar products, devices, or methods in the same way.

30. I understand that, when determining whether a claimed combination is obvious, the correct analysis is not whether one of ordinary skill in the art, writing on a blank slate, would have chosen the particular combination of elements described in the claim. Instead, I understand that the correct analysis considers whether one of ordinary skill, facing the wide range of needs created by developments in the field of endeavor, would have seen a benefit to selecting the combination claimed.

31. I understand that a claimed invention is non-obvious if the claimed invention, when viewed in light of all prior art, would not have been an apparent or predictable solution to a POSITA. I understand that the test for non-obviousness is not whether a POSITA could physically combine the references but whether a POSITA would have been motivated to combine the references to arrive at the claimed invention, in view of the teachings of the prior art as a whole.

E. Enablement, Written Description, and Indefiniteness
Under 35 U.S.C. § 112

1. Enablement

32. I understand that 35 U.S.C. § 112(a) requires that the patent specification provide the manner and process of making and using the claimed invention to allow a POSITA to actually make and use the invention.

33. I also understand that a patent is enabling if its disclosure is sufficient to enable a POSITA to make and use the claimed invention without undue experimentation. In considering whether the written description of a patent satisfies the enablement requirement, the specification is viewed from the perspective of a POSITA. I also understand that the patent need not teach, and preferably omits, what is well known in the art. Thus, a patent need not expressly state information that skilled persons would be likely to know or could obtain.

34. I also understand that to determine whether an “undue” level of experimentation is required to practice the invention, several factors—known as the Wands factors—are often considered in the analysis: (1) the quantity of experimentation necessary; (2) the amount of direction or guidance disclosed in the patent; (3) the presence or absence of working examples in the patent; (4) the nature of the invention; (5) the state of the prior art; (6) the relative skill of those in the art; (7) the predictability of the art; and (8) the breadth of the claims.

2. Written Description

35. I understand that 35 U.S.C. § 112(a) requires that a patent specification contain a written description of the invention. I also understand that the written description requirement is satisfied if a POSITA reading the patent application at the time it was filed would have recognized that the patent application described the invention as claimed, even though the description may not use the exact words found

in the claim. The written description requirement may be satisfied by the patentee's disclosure of such descriptive means—e.g., words, structures, figures, diagrams, tables—that fully set forth the claimed invention.

36. I understand that working examples are not necessary to satisfy the written description requirement. A requirement in a claim need not be specifically disclosed in the patent application as originally filed if a POSITA would understand that the missing requirement is necessarily implied in the patent application as originally filed. I also understand that the patent does not need to disclose what is well known in the art to provide a sufficient written description.

3. Indefiniteness

37. I understand that 35 U.S.C. § 112(b) requires that a patent specification must include claims that particularly point out and distinctly claim the subject matter that the inventor(s) regard as the invention. I also understand that a patent claim is invalid for indefiniteness only if its claims, read in light of the specification and the prosecution history, fail to inform, with reasonable certainty, a POSITA about the scope of the invention. In patents the certainty to which the law requires is not greater than is reasonable having regard to the subject matter.

III. THE '919 PATENT

A. Overview of the '919 Patent

38. The '919 Patent is titled “Percussive Therapy Device with Electronically Connected Attachment” but the claims are generally directed to

various mechanical and spatial relationships of parts of a percussive therapy device. For example, none of the claims of the '919 Patent mention an “electrically connected attachment.”

39. The '919 Patent generally describes a percussive massage device 400 including a housing 101, first, second, and third handle portions 143/145/147, and a motor 406 driving an output shaft 108. Ex. 1001 at 6:15–42; FIG. 19 (below).

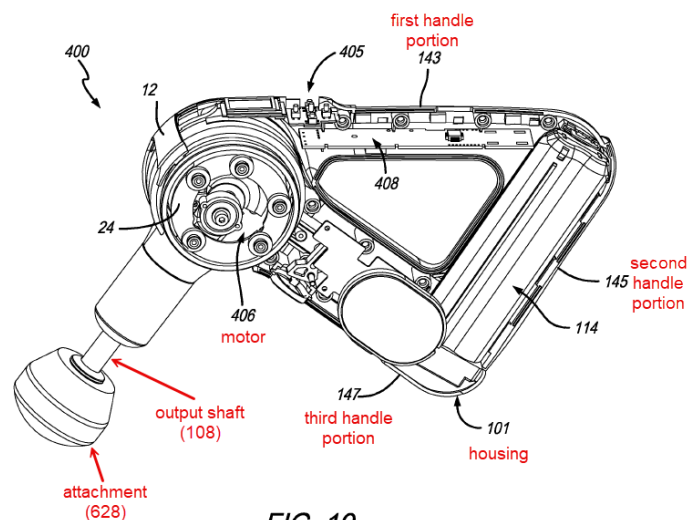


FIG. 19

40. The percussive massage device 400 features a drive system including the motor 406 having a motor shaft 21, a counterweight assembly 17 connected to the motor shaft 21 and including a counterweight 19 and a shaft 16, a push rod 14 connected to the counterweight assembly 17 via the shaft 16, and an output shaft 108 connected to the push rod 14. Ex. 1001 at 14:56–65. The end of the output shaft 108 includes a connector 110 that allows for the connection of an attachment 628. Ex. 1001 at 15:57–61.

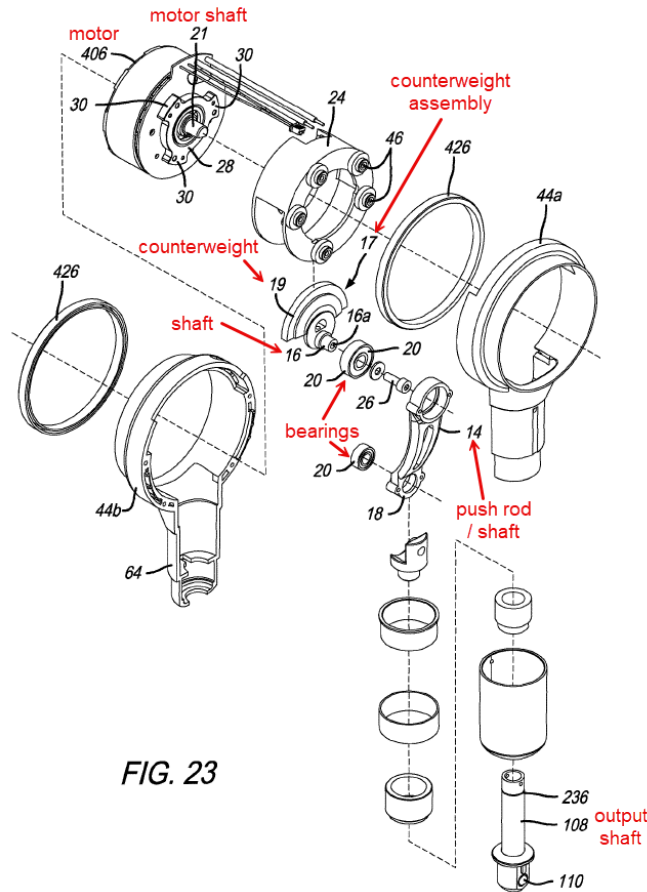
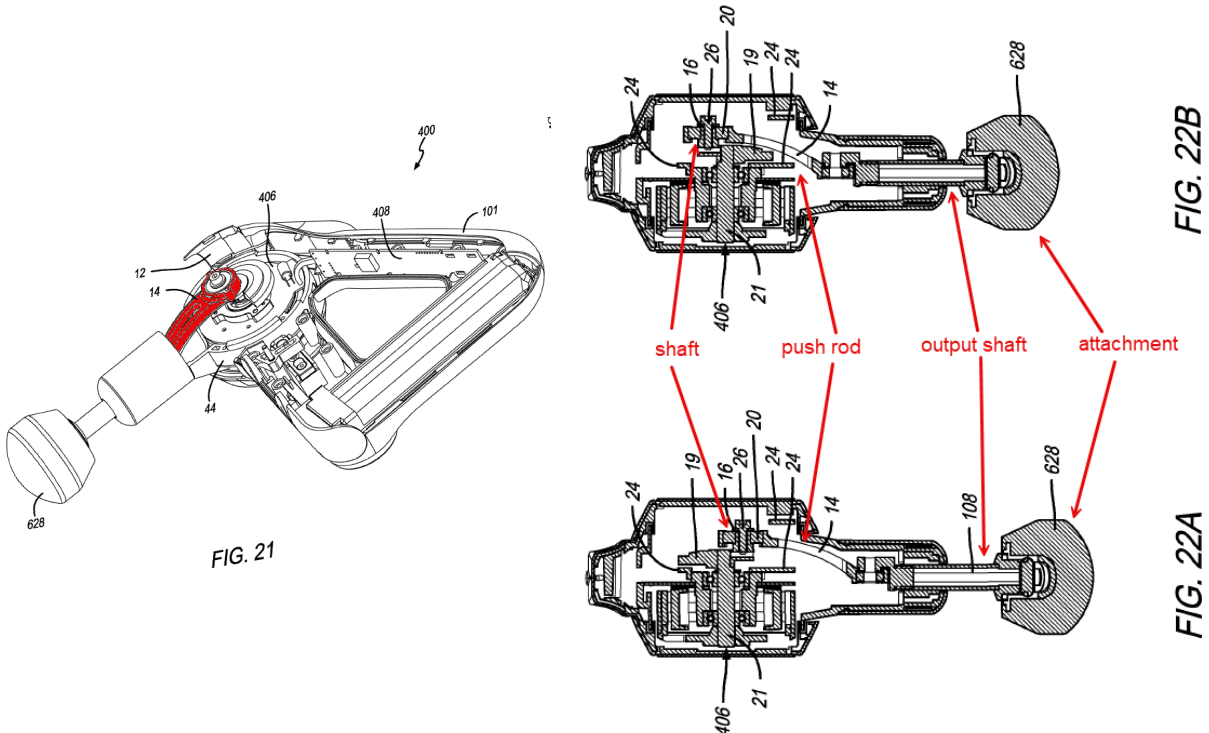
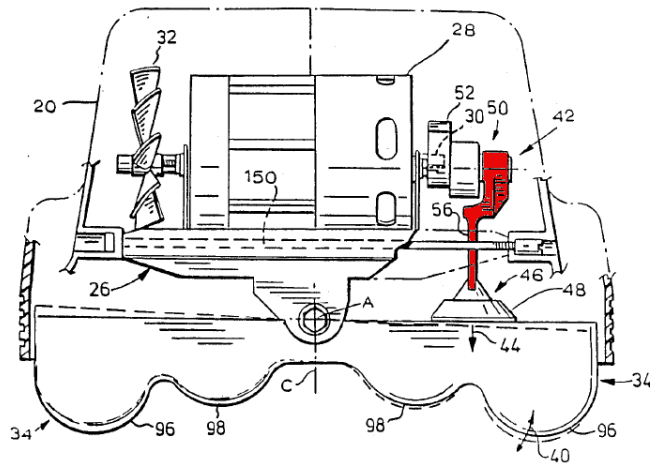


FIG. 23

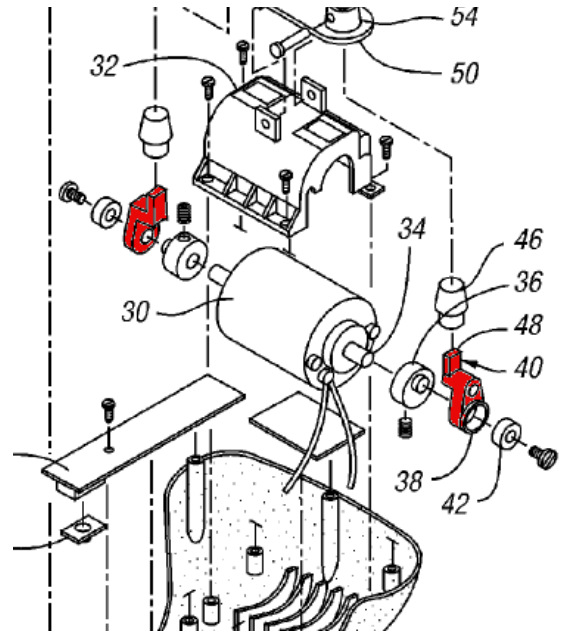
41. The claims of the '919 Patent are supported, if at all, by a small subset of the overall disclosure from column 14, line 49 to column 15, line 20 and Figures 21–23. This disclosure is directed to an eccentric drive system featuring an “L-shaped” or “arc shape” push rod (**red**, below), which allows for a more compact overall drive system. Ex. 1001 at 14:56–15:10, FIG. 21. The '919 Patent describes this as allowing the motor 406 to “be located at or near the middle of the device,” which avoids “a large protrusion ... necessary to keep the shaft in the center with the motor offset therefrom (and positioned in the protrusion).” Ex. 1001 at 14:65–15:10, FIGS. 22A and 22B (below).



42. As explained below in the grounds of unpatentability, eccentric drive systems featuring L-shaped or arc shape push rods have been known for decades. For example, US Patent 4,730,605 (Ex. 1009), filed in 1986, disclosed a percussive massager featuring an arc shaped connecting rod 56 (**red**), and US Publication 2001/0027280 (Ex. 1010), filed in 1999, disclosed a handheld percussive massager featuring L-shaped connecting rods 40 (**red**). Indeed, in reviewing these disclosures, the shape of the push rod was not a focus of the inventions, indicating that even as of these early filing dates L-shaped or arc shaped push rods were already unremarkable and well known to those skilled in the art.



Ex. 1009, FIG. 8



Ex. 1010, FIG. 4

B. Relevant Prosecution History of the '919 Patent

43. I reviewed the prosecution history of the application that eventually issued as the '919 Patent. For convenience, I will refer to the application that led to the '919 Patent simply as the '919 Patent. I also reviewed the parent patents¹ that predated the '919 Patent and the prosecution history of the pending child application of the '919 Patent, U.S. Application No. 19/295,322. The earliest parent patent that includes claims similar to the subject matter of the claims of the '919 Patent is U.S.

¹ For simplicity, I will refer to all patents that predate the '919 Patent in its priority chain as a "parent" patent rather than "parent," "grandparent," "great grandparent," etc.

Patent 12,064,387 (the “’387 Patent,” Ex. 1011), which was filed as U.S. Application No. 18/162,499.

1. The ’387 Patent

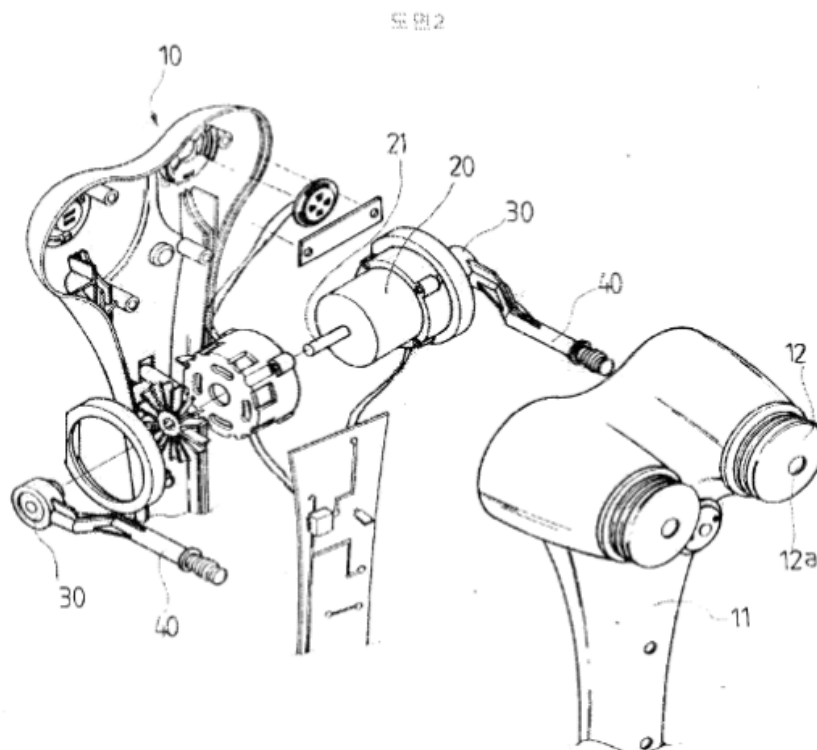
44. In the first Office Action dated June 29, 2023, the Examiner objected to the specification because it failed to provide antecedent basis for the claim term “eccentric shaft.” In the same Office Action, the Examiner rejected independent claims 2 and 13 as anticipated by U.S. Patent No. 11,478,400 to Marton et al. (“Marton ’400,” Ex. 1026). *See* Ex. 1012 at 138–41.

45. In response to the Examiner’s objection, the Applicant amended the specification to add the following disclosure: “Shaft 16 can be an eccentric shaft configured to travel in a circle about a motor axis in response to activation of the motor 406.” *Id.* at p. 155. In my opinion, this disclosure was added during prosecution to provide explicit support for the term “eccentric shaft,” which had not previously been described using that terminology.

46. In response to the Examiner’s anticipation rejection, the Applicant asserted that the pending independent claims were entitled to the May 7, 2019, priority date of U.S. Provisional Application No. 62/844,424 (the “’424 Provisional,” Ex. 1017) such that that Marton ’400 did not qualify as prior art. *See* Ex. 1012 at 162–63. A Notice of Allowance issued on October 26, 2023. *Id.* at 169–77. Based on my review of the record, the Examiner accepted the

Applicant's representation regarding entitlement to the priority date of the '424 Provisional without providing a substantive analysis of written description support in the provisional application or whether any supporting disclosure was carried through each of the intervening applications between the '424 Provisional and the '387 Patent in the chain of priority. *See* Ex. 1012 at 176.

47. Subsequently, on February 8, 2024, the Applicant submitted an Information Disclosure Statement identifying KR200345192 as a new prior art reference. Ex. 1012 at 185–86. Relevant to the '387 Patent, and to the '919 Patent, this prior art reference discloses an arc-shaped or L-shaped push rod (identified as element 40). *See* Ex. 1012 at 200. Figure 2 of KR200345192 (below), as submitted to the USPTO, illustrates this configuration. *See id.*



48. Following submission of this reference, on March 4, 2024, the Examiner initiated an interview with the Applicant's representative "to discuss proposed examiner's amendments to distinguish over the reference KR 200345192 Y1." *See* Ex. 1012 at 205. In my opinion, this indicates that the Examiner viewed KR200345192 as relevant to the patentability of the then-pending claims.

49. In the subsequent March 4, 2024 Notice of Allowance, the Examiner amended claim 13 to further distinguish over KR200345192, adding the limitation "wherein the handle portion axis extends on the reciprocation plane." *See* Ex. 1012 at 212. The application subsequently issued as the '387 Patent on August 20, 2024. Ex. 1011, code [45].

2. The '919 Patent

50. The '919 Patent was filed as a continuation of the '387 Patent on August 19, 2024. Ex. 1001, code [63]. The Applicant filed a preliminary amendment on October 7, 2024 introducing independent claims 1 and 2, which generally correspond to challenged claims 1 and 2 of the '919 Patent. *See* Ex. 1003 at 861–67.

51. In the first Office Action dated November 7, 2024, the Examiner included a section titled "Claim Interpretation," which set forth the Examiner's understanding of certain claim terms. *See* Ex. 1003 at 586 (below, with highlighting added). In my opinion, this Claim Interpretation section provides an insight into the Examiner's attempt to reconcile the Applicant's use of the terms "transverse" and

“obtuse” by implying that the claimed device included the ability to rotate the output shaft to enter different orientations between it and the handle portion/handle portion axis. However, in my opinion, the Examiner erred in making this assumption. First, the ’919 Patent discloses that “[t]he percussive massage device 400 can include a rotatable arm that is part of rotation housing 44,” the claims do not include any such limitation or ability, and the ’919 Patent does not explain how this rotation housing 44 operates or what alignment positions can be achieved. Second, in reviewing Patent Owner’s infringement contentions filed in the related lawsuit (Ex. 1049), Patent Owner asserts that the Hypervolt Go 2 infringes claim 1 of the ’919 Patent despite it having a fixed output shaft orientation. Thus, in my opinion, the Examiner fundamentally misunderstood the claims by interpreting them as including a rotatable output shaft when they do not require any such capability.

Claim Interpretation

4. The claim limitation “an interior angle defined between the handle portion and the output shaft is obtuse” (claim 1) and “the handle portion axis extends at an oblique angle to the reciprocation axis ...” (claim 2) is being interpreted in view of the disclosure, in particular, the rotation housing 44 (Fig. 21-23) which would allow the angular position between handle portion/axis and output shaft/reciprocation axis to be adjusted and to assume an obtuse/oblique angle.

52. In the same Office Action, the Examiner rejected claim 1 under 35 U.S.C. § 112(a) because “the motor ‘extends away from the handle portion’” lacked adequate written description support. *See* Ex. 1003 at 587. The Examiner also

rejected claim 2 as anticipated by U.S. Patent Application Publication No. 2021/0022951 to Hu (“Hu ’951”) (Ex. 1036) and separately by U.S. Patent No. 10,959,908 to Lee (“Lee”) (Ex. 1030).

53. In response to the § 112(a) rejection, the Applicant amended claim 1 to replace the phrase “extends away from” with “transverse to,” such that the claim recited “the motor extends transverse to the handle portion.” *See* Ex. 1003 at 562, 567–68. In my opinion, “transverse to” is generally understood in the field of mechanical engineering as meaning “at a right angle to,” which would narrow the scope of the claim from “extends away from.” However, as explained in the Claim Construction section below, the Applicant uses “transverse” in the ’919 Patent in a broader, informal sense as meaning, in essence, “non-parallel with.” In view of this understanding, the Applicant’s amendment changing “extends away from” to “extends transverse to” actually broadened the claim because “transverse,” as the Applicant uses that term, only requires a non-parallel relationship with the referenced component, which would allow for the motor to extend away from, extend at a right angle to, and extend toward the handle portion.

54. The Applicant also substantially amended claim 2 and argued that Hu ’951 does not disclose “the proximal end of the push rod is farther from the reciprocation axis than the distal end is.” *See id.* at 563, 569. Additionally, the Applicant amended claim 16 into independent form, which generally corresponds to

challenged claim 18. *See id.* at 565–66.

55. The Examiner issued a final Office Action on February 14, 2025, in which he reiterated the same “Claim Interpretation” statements and rejected, among other claims, independent claims 1, 2, and 16 as anticipated by Lee. *Id.* at 308–317. Notably, Lee discloses an output shaft 22 that is rotatable to enter at least five different orientations A3 to A3’''' as shown in Figure 8 of Lee (below). This confirms my earlier opinion that the Examiner was incorrectly focusing his search on prior art references that included a rotatable output shaft despite the claims not requiring any such structure or capability.

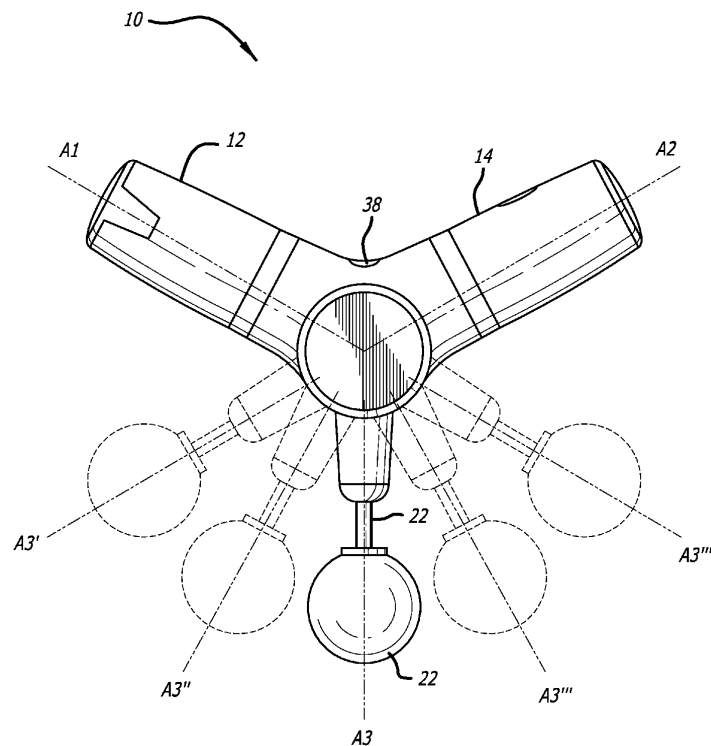


FIG. 8

Ex. 1030

56. In response, the Applicant argued that Lee does not disclose “an eccentric shaft configured to travel in a circle about the motor axis,” a limitation present in each independent claim. Ex. 1003 at 296. Specifically, the Applicant asserted that “[t]he path for Lee’s crank pin 46 does not travel in a circle about the longitudinal axis A2.” *See id.* Following these arguments, the Examiner allowed the application, which issued as the ’919 Patent.

57. On March 24, 2026, after the initiation of the underlying litigation, the Applicant filed a request for a certificate of correction to modify the dependency of claims 5, 6, and 13. *See id.* at 1–4. The Certificate of Correction issued on April 21, 2026. *See* Ex. 1001 at 78.

58. In my opinion, although I considered and addressed the corrected claims, the substance of my opinions applies equally to the original, uncorrected claims.

3. The ’322 Application

59. The Applicant filed U.S. Application No. 19/295,322 (the “’322 Application”) as a continuation of the ’919 Patent on August 8, 2025. Ex. 1014 at 596. The ’322 Application was assigned to Examiner Christopher Miller, who is different than Colin Stuart, who examined the ’919 and ’387 Patents. Ex. 1014 at 266; Ex. 1001 at cover page; Ex. 1011 at cover page. In the first Office Action dated October 21, 2025, the Examiner identified several claim terms, including

“transverse,” “a dividing plane,” and “interior angle” which are also used in the claims of the ’919 Patent as lacking antecedent basis in the specification. *See* Ex. 1014 at 264–283. In the same Office Action, the Examiner rejected independent claims 3, 14, and 18 as anticipated by U.S. Patent Application Publication No. 2015/0005682 to Danby et al. (“Danby”). *Id.*

60. The Examiner also included a section titled “Claim Interpretation,” setting forth the Examiner’s understanding of certain limitations in the pending claims. *See* Ex. 1014 at 265 (highlighting added).

Claim Interpretation

5. The claims recite “a handle portion” (Claim 3, line 4; Claim 14, line 2; Claim 18, line 2), “a reciprocation path (or axis) that is transverse to the handle portion” (Claim 3, lines 9-10; Claim 14, lines 7-8; Claim 18, lines 7-8), “the motor extends transverse to the handle portion” (Claim 3, line 15), and “an interior angle defined between the handle portion and the output shaft is obtuse” (Claim 4, lines 1-2; Claim 14, lines 16-17; Claim 18, lines 14-15).

Based upon the claim context and the disclosure, these references to being “transverse to the handle portion” and defining an “obtuse angle” between the handle portion only need to apply to *respective segments of the handle portion, rather than the entire handle portion*. For example, Applicant’s Figure 1 has one segment of a handle portion that is transverse to the output shaft (the segment along axis A3, Fig. 1), and a *different segment* that defines an obtuse angle between the handle portion and the output shaft (the segment along axis A1, Fig. 1). Thus, the prior art may similarly have a “handle portion” made of different segments and even if a part of a segment is transverse and another part is obtuse, this will read on the broadest reasonable interpretation of the claim language.

61. In my opinion, this Claim Interpretation section represents this Examiner's attempt to reconcile the Applicant's use of the terms "transverse" and "obtuse," like the previous Examiner assigned to the '919 Patent. However, rather than focus on a non-recited rotational output shaft as the previous Examiner did, this Examiner asserted that the "handle portion" could include multiple segments, such as the different handle portions A1, A2, and A3 in the '322 Application, with one being obtuse and one being transverse.

62. In response to the Examiner's antecedent basis and written description concerns, the Applicant amended the specification to add the following disclosure: "Output shaft 108 is configured to reciprocate on a reciprocation path that is transverse to first handle portion 143. The reciprocation path is on a dividing plane. An internal angle is defined between output shaft 108 and first handle portion 143." *See* Ex. 1014 at 230.

63. In response to the Examiner's "Claim Interpretation" section, the Applicant disagreed with the Examiner's interpretation and argued that "the specification refers to each of the so-called 'segments' as a distinct handle portion." *See id.* at 237.

64. The Examiner subsequently initiated an interview with the Applicant's representative on March 2, 2026. *See* Ex. 1014 at 40. According to the Interview Summary, the purpose of the interview was "to attempt to clarify which of the

‘handle portion(s)’ is both transverse to the output shaft/reciprocation axis, while also forming an interior angle between the handle portion and the output shaft that is obtuse.” *See id.* The Examiner further noted that “the first handle portion (143, Fig. 1) is obtuse to the output shaft/reciprocation axis, but did not appear to be transverse based upon the ordinary engineering meaning of ‘transverse’ to be forming a 90 degree angle.” *Id.*

65. Based on this record, it is my opinion that the Examiner viewed the claimed requirements of being “transverse” and forming an obtuse interior angle as inconsistent, at least under a conventional engineering understanding of those terms.

66. In a subsequent final Office Action dated March 10, 2026, the Examiner required cancellation of the previously added disclosure that the “output shaft 108 is configured to reciprocate on a reciprocation path that is transverse to first handle portion 143,” on the ground that this language “introduced new matter into the disclosure.” *See Ex. 1014 at 7.* The Examiner also rejected multiple claims based on their recitation of “transverse,” noting that this term “does not appear in the originally filed specification.” *See id.* at 10–11.

67. On May 6, 2026, the Applicant’s representative conducted a further interview with the Examiner. *See Ex. 1010 at 2.* The Interview Summary does not indicate that the meaning of the term “transverse” was discussed during that interview. *See id.*

68. Following that interview, the Examiner maintained the rejection under 35 U.S.C. § 103, explaining that the substitution of Danby’s “scotch yoke mechanism” for the reciprocating mechanisms disclosed in Huang or Noble “was a simple substitution of one known rotary-to-reciprocating motion mechanism for another known rotary-to-reciprocating mechanism to produce a predictable result.” *See id.*

IV. PERSON OF ORDINARY SKILL IN THE ART

69. I am informed and understand that, in the field of patent law, a POSITA is a hypothetical person who is presumed to have known the relevant art at the time of the invention. I understand that the facts that may be considered in determining the level of ordinary skill in the art include: (a) the types of problems encountered in the art; (b) prior art solutions to those problems; (c) the rapidity with which innovations are made; (d) the sophistication of the technology at issue; and (e) the educational level of active workers in the field.

70. I am informed that the “time of invention” I should use for the purpose of providing my opinions in this declaration is May 7, 2020. Although my opinion would not change if this date were to be changed by a few years in either direction.

71. It is my opinion that the relevant field of art is percussive therapy devices, also known as percussive massagers, with a particular focus on drive mechanisms and human interface/interaction. Ex. 1001 at Title, 1:49–61, 6:15–61,

14:56–15:20. For example, the claims of the '919 Patent generally focus on the drive mechanism, including the eccentric shaft and push rod assembly, and the handle angle with respect to the output shaft.

72. It is further my opinion that a person of ordinary skill in the art (“POSITA”) as of May 7, 2020, would have had a degree in mechanical engineering and/or industrial design, a working knowledge of consumer product design and human factors, and/or at least three to five years of experience in conceiving, designing, engineering, and/or modifying devices for human use and interaction. It is my opinion that I qualified (and continue to qualify) as a person of ordinary skill in the art under this definition as of at least 2007, and at all times until present.

73. In forming my opinions expressed in this declaration, I relied upon my knowledge, skill, experience, training, and education in the relevant field of the art, and all of my opinions presented herein are considered from the viewpoint of a POSITA at the time of invention. My opinions, therefore, represent the view of a POSITA as of May 2020.

V. CLAIM CONSTRUCTION

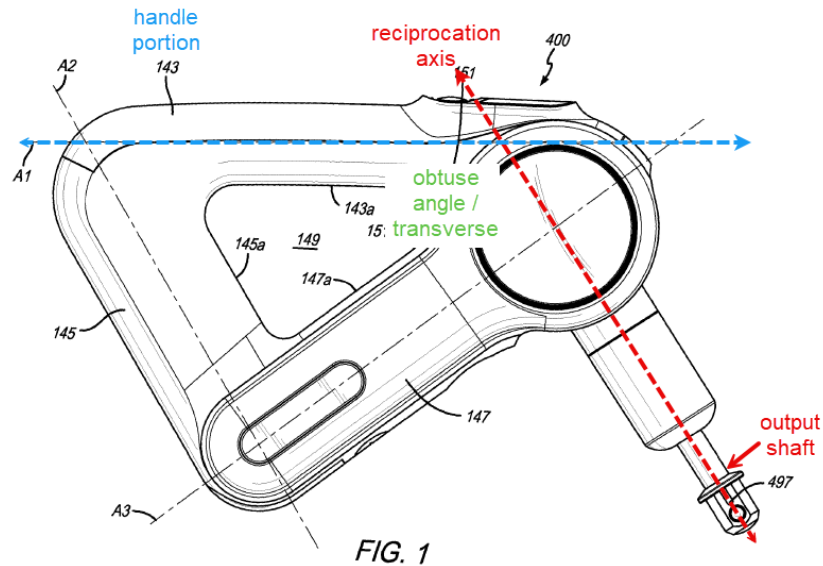
A. “Transverse”

74. Based on my review of the '919 Patent, the term “transverse” appears only in claim 1 of the '919 Patent. In other words, the term is not used in the specification of the '919 Patent. Thus, in my opinion, the specification of the '919 Patent does not provide any specialized definition or particular guidance as to the meaning of this term. I therefore looked to extrinsic evidence in addition to my understanding of this term based on my background in mechanical engineering and design.

75. In my opinion, “transverse,” in the engineering context, means set at a right angle (or very close to a right angle) with respect to a subject component. For example, component A being transverse to component B would be generally understood, in the engineering context, as meaning that component A is or extends at a right angle (90°) or substantially a right angle to component B, and vice versa. This is consistent with the definition of “transverse” as “made at right angles to the long axis of the body” in the Merriam-Website dictionary. Ex. 1018.

76. However, based on my review of claim 1 of the '919 Patent, this interpretation of “transverse” is untenable. In particular, and with reference to annotated Figure 1 of the '919 Patent (below), claim 1 requires: (1) an output shaft traveling along a reciprocation axis; (2) that the reciprocation axis extends

transverse to the handle portion; and (3) an interior angle between the handle portion and the output shaft (which travels along the reciprocation axis) is *obtuse*. An “obtuse” angle is an angle greater than 90° but less than 180°. Ex. 1019. It is, therefore, my opinion that for the reciprocation axis/output shaft to both: (1) be *transverse to* the handle portion; and (2) form an *obtuse angle* with the handle portion, the Applicant must have meant for “transverse” to be interpreted in its colloquial sense of “acting, lying, or being across” and not limited to “a right angle.” For convenience, this colloquial interpretation of “transverse” can be thought of as “non-parallel.” The narrower, engineering-specific interpretation of “transverse” is unworkable in the context of claim 1 because it would introduce in an internal inconsistency within the claim by requiring that the reciprocation axis/output shaft be both transverse to and form an obtuse angle with the handle portion. This is also how the Examiner assigned to the ’919 Patent interpreted “transverse.” Ex. 1003 at 310.



77. It is my further opinion that both the Examiner assigned to the '919 Patent and the new Examiner assigned to the '322 Application, the child of the '919 Patent, struggled to understand the Applicant's colloquial interpretation of "transverse." For example, the Examiner assigned to the '919 Patent attempted to reconcile the Applicant's use of "transverse" by giving the claimed device a rotational ability that is not recited in the claim to allow the output shaft to rotate into different angular positions with respect to the handle portion. *See* Ex. 1003 at 586. The Examiner assigned to the '322 Application was more direct, stating that "It is unclear what Applicant considers to be the meaning of the term 'transverse,' which does not appear in the originally filed specification." Ex. 1014 at 10. The relevant passage from the Examiner follows:

8. Claims 4, 14-19, and 21-23 are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor (or for applications subject to pre-AIA 35 U.S.C. 112, the applicant), regards as the invention.

Claim 4, lines 1-2 recite “an interior angle defined between the handle portion and the output shaft is obtuse” and it is confusing how a single handle portion is considered both obtuse to the output shaft (as required by claim 4) and the reciprocation path is transverse to the longitudinal direction of the handle portion (as required by claim 3). Based upon Applicant’s disclosure, it appears that the handle portion (143) forms an obtuse angle with the output shaft (see Fig. 1), but this longitudinal axis (along A1, Fig. 1) would not be transverse to the reciprocation axis. It is unclear what Applicant considers to be the meaning of the term “transverse”, which does not appear in the originally filed specification.

Ex. 1014 at 10 (highlighting added).

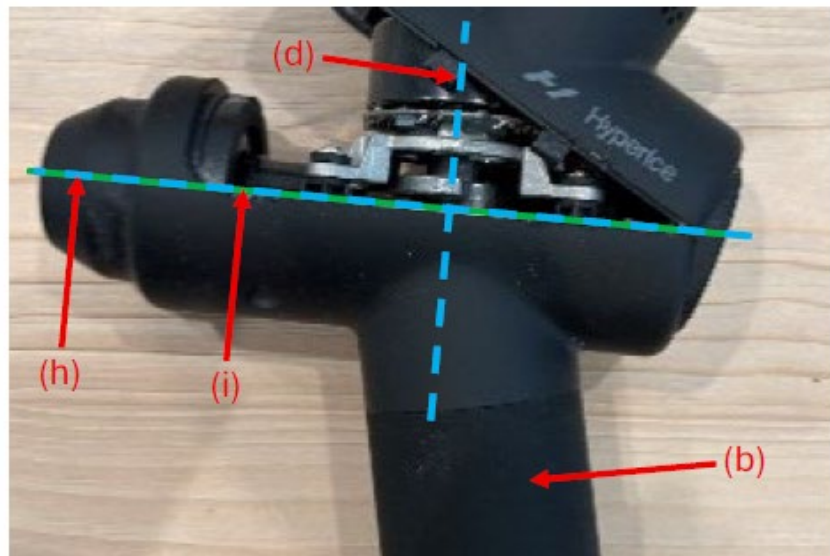
78. It is my further understanding that, according to an Examiner Interview Summary issued on March 10, 2026, the Examiner called the Applicant’s attorney “to attempt to clarify which of the ‘handle portion(s)’ is both transverse to the output shaft/reciprocation axis, while also forming an interior angle between the handle portion and the output shaft that is obtuse,” which Applicant’s representative “requested to clarify the meaning of ‘transverse’ in a subsequent response.” *Id.* at 40.

79. I understand that Patent Owner has applied the colloquial interpretation of “transverse” in accusing the Hypervolt Go 2 of infringing claim 1 of the ’919

Patent. For example, as shown in Patent Owner’s infringement contentions (below), the reciprocation axis (h) extends at an angle to, *i.e.*, is not perpendicular to / transverse to (as understood in the engineering sense), the handle portion (b) but is non-parallel with the handle portion (b).

the reciprocation axis extends transverse to the handle portion on a dividing plane normal to the motor axis,

The reciprocation axis (h) extends transverse to the handle portion (b) on a dividing plane (i) (green) normal to the motor axis (d).



Ex. 1049 at 7.

B. “Offset”

80. The term “offset” is used in the specification of the ’919 Patent in connection with “the point where the push rod 14 is connected to the shaft 16 is offset from the reciprocating path that the distal end 18 of the push rod 14 (and the massage attachment 628) travel.” Ex. 1001 at 14:62–65. In my opinion, the specification does not provide any particular or specialized definition of the term “offset” and uses it consistent with its plain and ordinary meaning in the mechanical

arts as a distance or positional displacement between the centerlines or centerpoints of two components. For example, Collins dictionary defines “offset” as being “off center.” Ex. 1020 at 4.

81. For example, Figure 22B of the '919 Patent is annotated below to illustrate my analysis. The point where the push rod 14 is connected to the shaft 16 is indicated by the **red** arrow, “the reciprocating path that the distal end 18 of the push rod 14 ... travel[s]” is shaded in **green**, and “the reciprocating path that ... the massage attachment 628[] travel[s]” is shaded in **blue**. As can be seen, the point of connection between the push rod 14 and the shaft 16, which is indicated by the **red** arrow, is offset (displaced or off center) with respect to the centers of the reciprocating paths of the distal end 18 of the push rod 14 and the reciprocating path of the massage attachment 628, which are aligned on the **red** double-ended arrow.

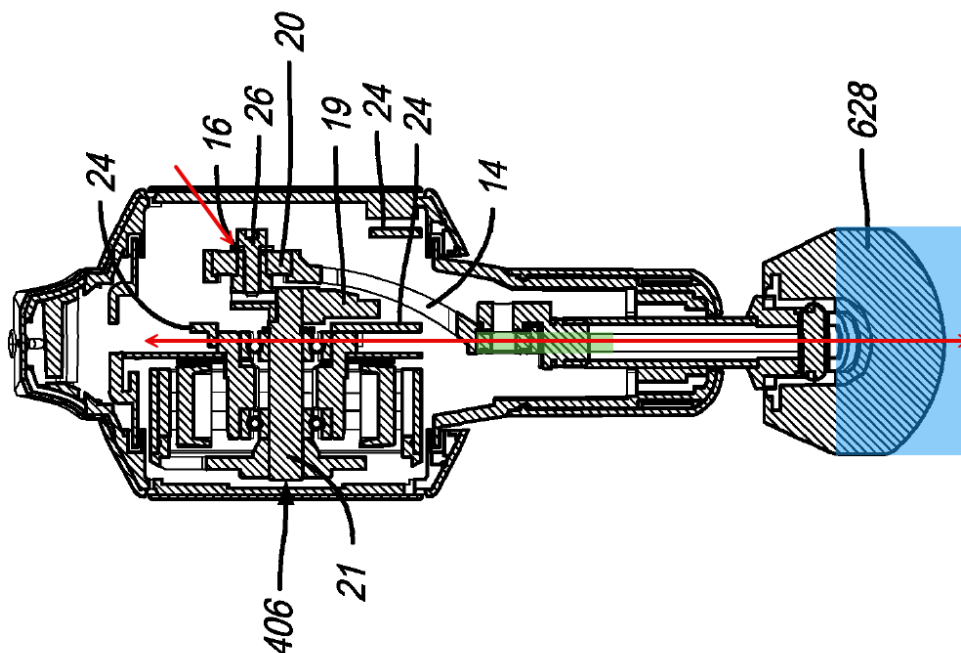


FIG. 22B

VI. EFFECTIVE FILING DATE

A. Non-Provisional Support

82. In my opinion, the challenged claims of the '919 Patent have an earliest effective filing date of May 7, 2020, based on great-great-grandparent U.S. Patent No. 10,857,064 (the "'064 Patent," Ex. 1015), filed as U.S. Application No. 16/869,402 on May 7, 2020. In particular, the '064 Patent includes, as Figures 33–35 and 41–43, what issued as Figures 18–23 in the '919 Patent. In examining the '919 Patent, the Examiner stated that aspects of claims 1 and 2 were “being interpreted in view of the disclosure, in particular, the rotation housing 44 (Fig. 21–23)” and stated that claim 1 “is directed towards the embodiment shown in Fig. 18–23, in particular shown in Figs. 22A and 22B.” Ex. 1003 at 586–87. I generally agree with the Examiner’s position that the claims of the '919 Patent are directed toward the embodiment shown in Figures 18–23, but I do not agree that the '919 Patent provides sufficient written description of certain claims as explained in Section VII, below.

83. More generally, each claim of the '919 Patent requires an eccentric shaft configured to travel in a circle about the motor axis. In prosecuting the '387 Patent, the Applicant stated that “paragraph [0129] of the specification is currently amended to provide verbatim support for the term ‘eccentric shaft’ as used in claims 1 and 18” and stated that:

Support for this amendment can be found at least in FIGS. 22A and 22B, which show the shaft 16 moving eccentrically about the axis of the motor 406, and in the associated description of the movement of the shaft 16 already presented in paragraph [0129].

Ex. 1012 at 155, 161. The Examiner similarly relied on Figures 22A and 22B for support, stating that “while not having explicit support for the term ‘eccentric,’ is being interpreted in light of the disclosure as referring to the shaft 16 in Fig. 22A and 22B for example. Wherein the shaft 16 is ‘eccentric’ in that it is located off center of the motor/motor axis.” Ex. 1012 at 139. As explained below, in my opinion, the parent patents to the ’064 Patent in the chain of priority do not include at least Figures 22A and 22B (or a differently numbered equivalent) as presented in the ’919 Patent or otherwise sufficiently describe an “eccentric shaft” as recited in all claims of the ’919 Patent.

84. The ’064 Patent is, according to its “cross-reference” paragraph, “a continuation-in-part of U.S. patent application Ser. No. 16/796,143, filed Feb. 20, 2020” and “is also a continuation-in-part of U.S. patent application Ser. No. 16/675,772, filed Nov. 6, 2019.” Ex. 1015 at 1:6–17. I reviewed both U.S. patent applications 16/796,143 and 16/675,772, which issued as U.S. Patent Nos. 10,940,081 (the “’081 Patent”) and 10,702,448 (the “’448 Patent”) (Exs. 1016 and 1013) respectively.

85. First, the ’081 Patent includes as Figures 17–19 generally what issued

as Figures 18–20 in the '919 Patent (with differences in reference numerals, etc.) but *omits* what issued as Figures 21–23A in the '919 Patent. Thus, consistent with the Examiner's reliance on "in particular ... [on] Figs. 22A and 22B" of the '919 Patent as providing support for the "eccentric shaft" limitation present in all claims of the '919 Patent, it is my opinion that the '081 Patent does not support the claims of the '919 Patent at least because it does not sufficiently disclose "an eccentric shaft" as recited in all claims of the '919 Patent. Moreover, independent claims 1, 2, and 18 of the '919 Patent each recite numerous spatial relationships between components that are, if at all, only disclosed in Figures 21–23 of the '919 Patent. Thus, the '081 Patent's omission of Figures 21–23 of the '919 Patent further supports my opinion that the '081 Patent does not sufficiently support the claims of the '919 Patent.

86. Second, the '448 Patent is limited to a gear-based drive mechanism unrelated to the gear-less mechanism disclosed in the '919 Patent. Ex. 1013. Moreover, while the '448 Patent discloses "an eccentric interface 306," it is not configured to travel in a circle about the motor axis but travels (or rotates) normal to the motor axis. Ex. 1013, FIGS. 8–11. Indeed, the '448 Patent discloses a gear-based drive mechanism strikingly similar to that disclosed in Lee (U.S. Patent No. 10,959,908, Ex. 1030), cited to reject the claims in the '919 Patent and which the Applicant overcame by arguing that it "lacks 'an eccentric shaft that is configured

to travel in a circle about the motor axis....” Ex. 1003 at 296–98. Thus, in my opinion, the ’448 Patent does not sufficiently support the claims of the ’991 Patent.

B. Alleged Provisional Support

87. During prosecution of the ’387 Patent, the Applicant argued that certain claims of that application were entitled to the May 7, 2019, filing date of U.S. Provisional Application No. 62/844,424 (the “’424 Provisional,” Ex. 1017), which the Examiner appeared to accept without any express analysis. Ex. 1012 at 162, 163, and 176.

88. First, I understand that claiming entitlement to an earlier priority or filing date requires a continuous disclosure of the relied-upon subject matter through all intervening applications. As explained above, the subject matter necessary to support the claims of the ’919 Patent extended to the ’064 Patent² but was not present in either parent of the ’064 Patent, i.e., the ’081 and ’448 Patents. The ’064 Patent, further, only claims priority to the ’424 Provisional indirectly via the ’081 Patent. Ex. 1015 at 1:7–15. Further, the Figures in the ’424 Provisional that the Applicant pointed to as supporting the claims in the ’387 Patent, namely Figures 28, 31, 32, and 35–38, were not included in the ’081 Patent. Ex. 1002 at 163; Ex. 1016. Thus,

² This should not be understood as a concession that the ’919 Patent sufficiently discloses all features of its claims.

in my opinion, even if the disclosure of the '424 Provisional is sufficient to support the claims of the '919 Patent, the '081 Patent is a break in continuity in of that disclosure between the '424 Provisional and the '064 Patent.

89. Second, apart from the break in continuity, it is my opinion that the '424 Provisional lacks sufficient disclosure to support the claims of the '919 Patent. In particular, the '424 Provisional discloses a narrower and materially different drive mechanism than is described and claimed in the '919 Patent. For reference, claim 1 recites that the “push rod assembly [is] operatively connected to the motor” and that “the push rod assembly is connected to the eccentric shaft” and claims 2 and 18 recite that the “the push rod is operatively connected to the motor by the eccentric shaft.” The '919 Patent, exclusively discloses an indirect connection between the push rod 14 and the motor 406 via a standalone counterweight assembly 17, which includes the shaft 16, which the Applicant identified as the “eccentric shaft.” Ex. 1001 at 14:56–60. Figures 22B and 23 of the '919 Patent are provided below and illustrate the counterweight assembly 17 [blue] is connected to the motor shaft 21 [green], and the shaft 16 [red] of the counterweight assembly 17 [blue] is connected to the push rod 14. Ex. 1001 at 14:59–60.

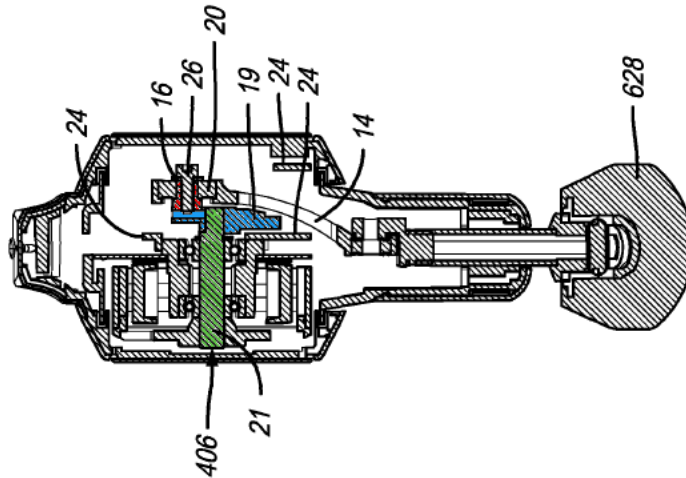


FIG. 22B of the '919 Patent

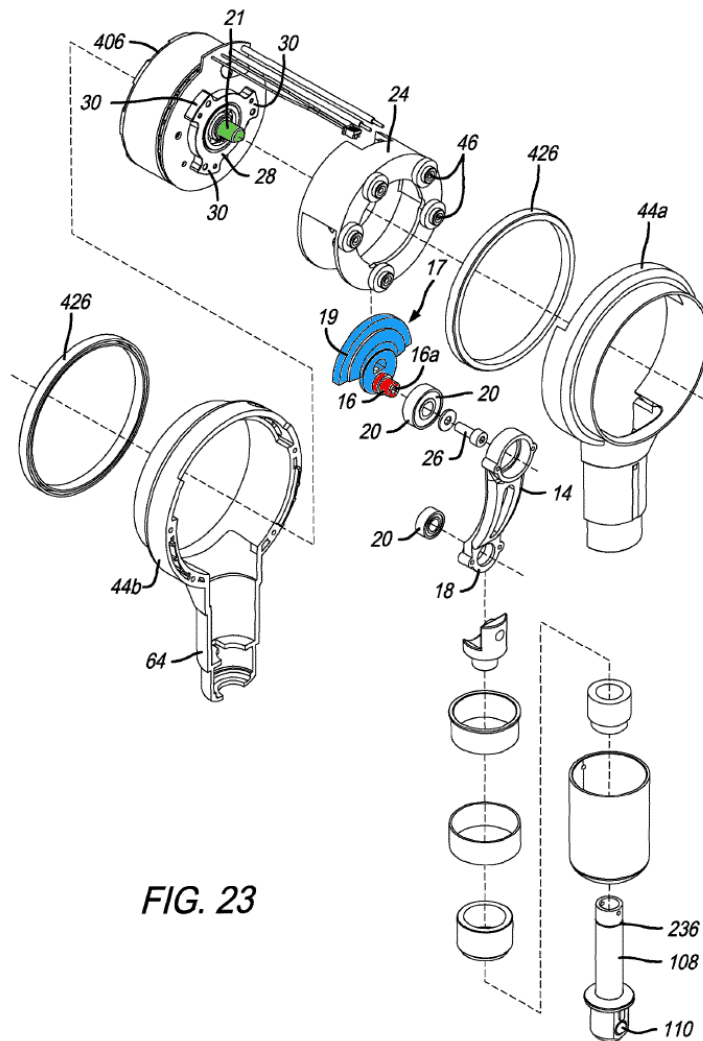


FIG. 23

90. The '424 Provisional exclusively discloses a *direct* connection between the push rod and the motor. The '424 Provisional discloses that “The device includes a push rod or shaft 404 that is connected *directly* to the motor 402 by a pin 406.” Ex. 1017 at ¶[00118] (*emphasis* added). Both the '919 Patent and the '424 Provisional include language distinguishing between direct and indirect connections such that, in my opinion, the use of “connected directly” in these documents is intentional by the Applicant to mean a connection lacking intermediate components. Ex. 1001 at 32:39–44; Ex. 1017 at ¶[00128]. Thus, in my opinion, the '424 Provisional discloses a direct connection between the push rod 404 and the motor 402 via *only* the pin 406 and no other intermediate elements. On the other hand, the claims of the '919 Patent allow for an essentially unlimited number of intermediate elements between the push rod and the motor so long as the eccentric shaft is one of them by reciting that the “push rod assembly [is] *operatively* connected to the motor” and “the push rod assembly is connected to the eccentric shaft” in claim 1 and “the proximal end of the push rod is *operatively* connected to the motor by the eccentric shaft” in claims 2 and 18. (*emphasis* added).

91. This additional and different disclosure in the '919 Patent is made more clear when viewing relevant portions of the '424 Provisional and the '919 Patent as a compare, shown below with the changes relative to the '424 Provisional:

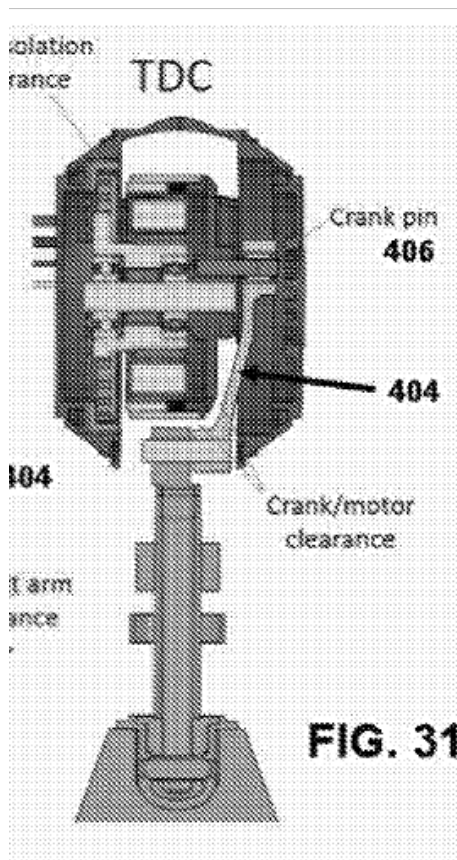
~~The~~In a preferred embodiment, the device includes a push rod or shaft ~~404~~14 that is connected directly to a shaft 16 that is rotated by the motor ~~402 by a pin 406~~and the motor shaft 21 extending therefrom. The shaft 16 can be part of a counterweight assembly 17 that includes a counterweight 19.

Ex. 1001 at 14:56–15:20; Ex. 1017 at ¶[00118]. In particular, the '919 Patent discloses only a direct connection between the push rod *and the shaft* and no longer discloses the direct connection between the push rod *and the motor* as in the '424 Provisional. The '919 Patent also introduces the concept of intermediate elements between the push rod and the motor in the form of the “counterweight assembly 17,” which was not disclosed in the '424 Provisional.

92. A side-by-side comparison of the relevant figure of the '424 Provisional and the '919 Patent also shows this difference in disclosure. The right-side of the drawing³ in Figure 31 of the '424 Provisional (below left) identifies the push rod 404 and the crank pin 406 and illustrates the crank pin 406 as extending into the (unlabeled) motor, consistent with the '424 Provisional's disclosure of the pin 406 being part of the motor 402 and the push rod 404 being “connected directly to the motor 402.” On the other hand, Figure 22B of the '919 Patent (below right) adds

³ The left-side image in FIG. 31 of the '424 Provisional shows a cross-sectional view of some components but shows a full side view of the critical motor/crank pin interface. In my opinion, the left-side drawing confuses the '424 Provisional.

the counterweight assembly 17 between the push rod 14 and the motor 406, which is connected to the motor shaft 21 and includes the shaft 16. Also different from the '424 Provisional, in the '919 Patent, the shaft 16 (again, identified by the Applicant as the eccentric shaft) does not extend into the motor 406 and does not even meaningfully overlap with the motor shaft 21, both arrangements that differ from the '424 Provisional.



Right-Side Image of FIG. 31
of the '424 Provisional

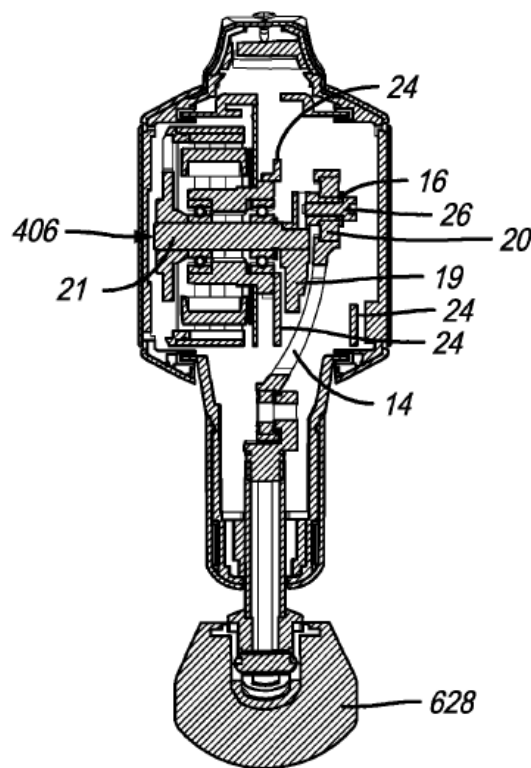


FIG. 22B of the '919 Patent

93. Accordingly, in my opinion, even if the break in continuity caused by the '081 Patent is ignored, the '424 Provisional does not sufficiently support the

claims of the '919 Patent because the claims cover a substantially broader and fundamentally different push rod to motor connection arrangement than the narrow direct connection via only the pin 406 disclosed in the '424 Provisional.

VII. UNPATENTABILITY UNDER 35 U.S.C. § 112

A. Ground 1A: The Specification Fails to Disclose “a Proximal End of the Push Rod Assembly is Connected to the Eccentric Shaft at a Location Offset from the Dividing Plane in a First Direction” in Claim 1

94. In my opinion, the '919 Patent does not disclose “a dividing plane” or the “reciprocation axis,” which is necessary to define the “dividing plane.” Further, in my opinion, the '919 Patent does not disclose any relationship between a “dividing plane” and where “the proximal end of the push rod assembly is connected to the eccentric shaft” or even any relevance of such a limitation. In my opinion, this claim limitation is unrelated to anything the inventor had possession of or actually invented as of the filing date.

95. For example, the '919 Patent describes the push rod 14 as having a single relevant feature, that is, it “is L-shaped or includes an arc shape” such that “the point where the push rod 14 is connected to the shaft 16 is offset from the reciprocating path that the distal end 18 of the push rod 14 (and the massage attachment 628) travel.” Ex. 1001 at 14:60–65. The '919 Patent further describes having this particular shape allows it to “transmit the force at least partially

diagonally or in an arc along its shape instead of vertically so the motor can be located at or near the middle of the device” to “allow[] the outer housing to be smaller than similar prior art devices.” *Id.* at 14:66–15:10. In my opinion, the relevant disclosure of the ’919 Patent is specifically and exclusively directed to an offset between opposite (proximal and distal) ends of the push rod 14 to form an L-shaped or arc shaped push rod, but is not directed to and does not even disclose the location of the push rod 14 with respect to a “dividing plane” as recited in claim 1. See FIG. 22B of the ’919 Patent (below).

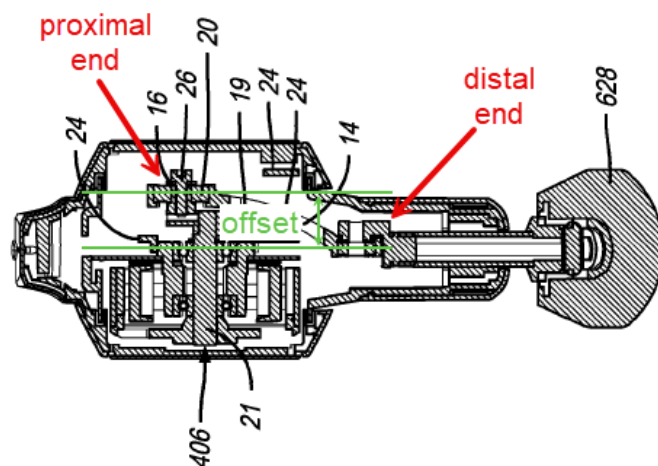


FIG. 22B

96. In my opinion, claim 1’s requirement that “a proximal end of the push rod assembly is connected to the eccentric shaft at a location offset from the dividing plane in a first direction” is not only undisclosed in the ’919 Patent but is entirely unrelated to the relevant disclosure of the ’919 Patent and would not provide the benefit contemplated by the specification, that is, “allow[ing] the outer housing to be smaller than similar prior art devices.” Ex. 1001 at 15:1–10. For example, by

limiting the location of the proximal end of the push rod 14 with respect to an imaginary, undescribed “dividing plane” rather than to the distal end of the push rod 14 as disclosed, a straight push rod could meet the limitations of claim 1 so long as the proximal end is offset from the imaginary “dividing plane.” However, a straight push rod is contrary to the ’919 Patent’s disclosure asserting that “This capability is provided by the arc or L-shape [of the push rod 14].” Ex. 1001 at 14:65–66.

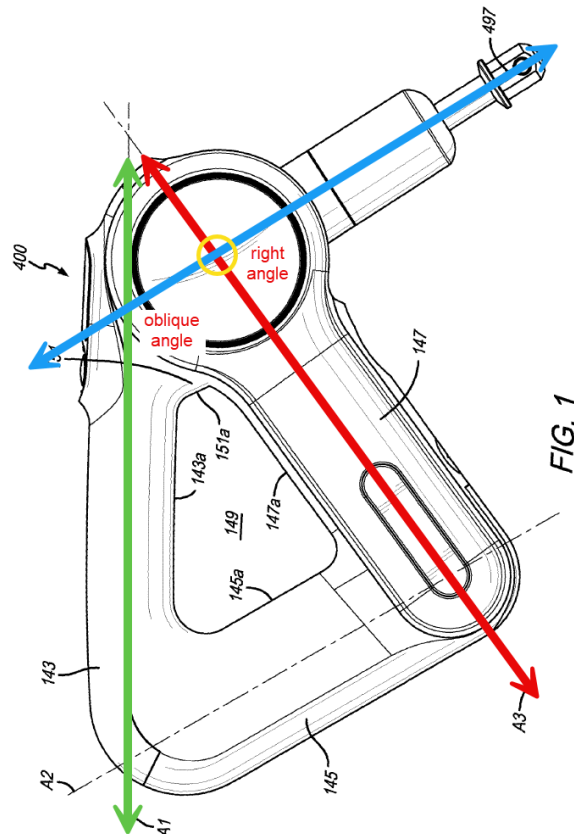
97. In my opinion, the ’919 Patent does not confirm or even suggest that the inventor was in possession of or had actually invented “a proximal end of the push rod assembly is connected to the eccentric shaft at a location offset from the dividing plane in a first direction” as recited in claim 1 at the time the original patent was filed. Accordingly, it is my opinion that claim 1, and claims 3–11, which depend from claim 1, are invalid under 35 U.S.C. § 112(a) as lacking written description support.

B. Ground 1B: The Specification Fails to Disclose “the Handle Portion Extends at an Oblique Angle to the Reciprocation Axis and Intersects ... the Motor Axis” in Claims 2 and 18

98. In my opinion, the ’919 Patent does not disclose “the handle portion axis extends at an oblique angle to the reciprocation axis and intersects the reciprocation axis and the motor axis” as recited in claims 2 and 18. In relevant part, the ’919 Patent discloses a device having three handle portions 143/145/147 with respective handle portion axes A1/A2/A3. *See* Ex. 1001 at FIG. 1. However, none

of the handle portion axes A1–A3 are described with reference to the reciprocation axis or the motor axis. Ex. 1001 at 6:15–39. The '919 Patent also does not illustrate this limitation. Rather, as shown in Figure 1 of the '919 Patent (below), the third handle portion 147 defines a third handle portion axis A3 [red] that intersects the reciprocation axis [blue] and the motor axis [yellow circle], which I understand to be at the center of the circular housing⁴, but the third handle portion 147 and axis A3 extends at a right angle to the reciprocation axis [blue], *not* at an oblique angle. On the other hand, the first handle portion 143 defines a first handle portion axis A1 [green] that intersects and extends at an oblique angle to the reciprocation axis [blue] but does *not* intersect the motor axis [yellow circle].

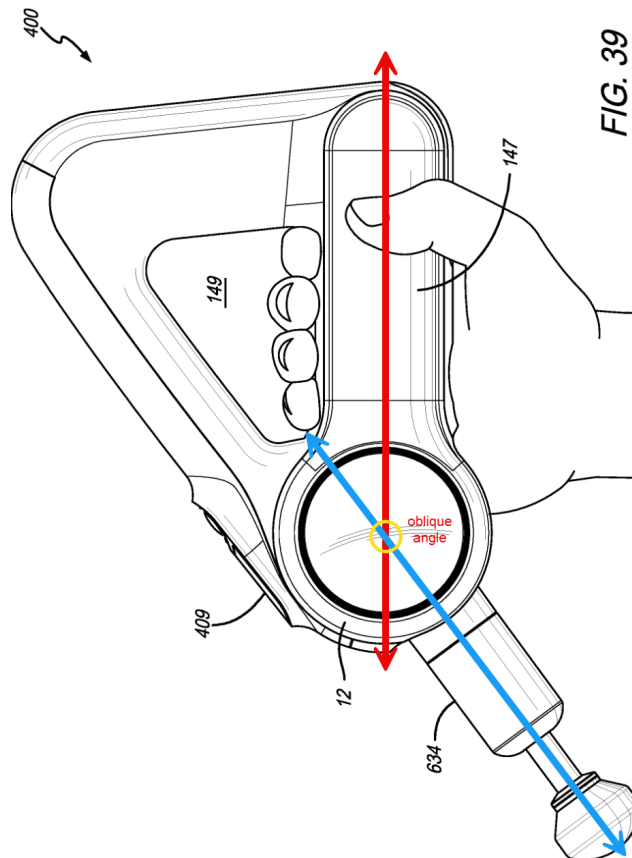
⁴ “Motor axis” is another term that appears in the claims but not in the '919 Patent itself.



99. Confusing the matter, U.S. Patent 11,357,697 (Ex. 1021), filed as U.S. Application No. 17/018,099, discloses an embodiment in Figure 39 (below) in which the handle portion axis [red] extends at an oblique angle to the reciprocation axis [blue] and intersects the reciprocation axis [blue] and the motor axis [yellow]. But this Figure was expressly omitted in the subsequent patents⁵, including the '919 Patent. *Compare* Ex. 1021 at 36:7–16 (“Grip 2, for example, may be the grip shown on the third handle portion 147 depicted in FIG. 39, otherwise referred to as

⁵ U.S. Patent Nos. 11,564,860, 11,452,670, 11,890,253, and 12,064,387 (Exs. 1029, 1028, 1027, 1011, respectively).

a ‘reverse’ grip.”) *with* Ex. 1001 at 17:57–65 (“Grip 2, for example, may be a grip on the third handle portion 147, otherwise referred to as a ‘reverse’ grip.”) (emphasis added).



100. Thus, it is my opinion that claims 2 and 18, and claims 12–17, 19, and 20, which depend from either claim 2 or 18, are invalid under 35 U.S.C. §112(a) as lacking written description support.

C. Ground 1C: The Specification Fails to Disclose “the Common Plane Bisects the Housing” as Recited in Claim 9

101. Claim 9 recites a “common plane” on which both the reciprocation axis and the handle portion axis lie and requires that the “common plane bisects the

housing.” The ’919 Patent, in my opinion, does not disclose this limitation. For example, the text of the ’919 Patent does not describe a “common plane” or anything equivalent. Moreover, the ’919 Patent does not include any figure expressly showing “the reciprocation axis and the handle portion axis both lie on a common plane.” For example, Figure 1 shows the handle portion axes A1–A3 but not in a cross-sectional view that might provide insight into a plane on which these axes lie, Figures 19 and 21 are cut-away views of the housing 101 but a full side-view of the output shaft, hiding the location of the reciprocation axis, Figures 22A and 22B do not show the handle portions or their axes, Figure 23 is an exploded view omitting the housing altogether, and Figure 23A is an exploded view omitting the output shaft.

102. Confusing matters, the ’919 Patent discloses a different embodiment in which a different axis (the motor shaft axis) bisects the housing, but only in connection with a later-added and different embodiment. In connection with the embodiment shown in Figures 29–33⁶, the ’919 Patent discloses “[t]he motor shaft axis A4 (or a plane defined by the motor shaft axis) bisects the housing 101.” Ex. 1001 at 23:31–32. But claim 9 refers to the “reciprocation axis” and the “handle

⁶ First introduced as Figures 49-53 in US 11,357,697, filed on September 11, 2020.

Ex. 1021.

portion axis” as bisecting the housing, not the “motor shaft axis.” Accordingly, in my opinion, claim 9 is invalid under 35 U.S.C. §112(a) as lacking written description support

D. Ground 1D: The Specification Fails to Disclose “a Battery Housed in the Handle Portion” as Recited in Claim 10

103. Claim 1 requires that “an interior angle defined between the handle portion and the output shaft is obtuse,” and claim 10 depends from claim 1 and additionally requires “battery housed in the handle portion.” But the ’919 Patent fails to describe the battery 114 as being in the first handle portion 143, which is the only handle portion that forms an obtuse angle with the output shaft in the ’919 Patent. The ’919 Patent instead describes the battery 114 as being in the second handle portion 145, which is parallel to the output shaft. Ex. 1001 at 6:35–42, FIG. 19.

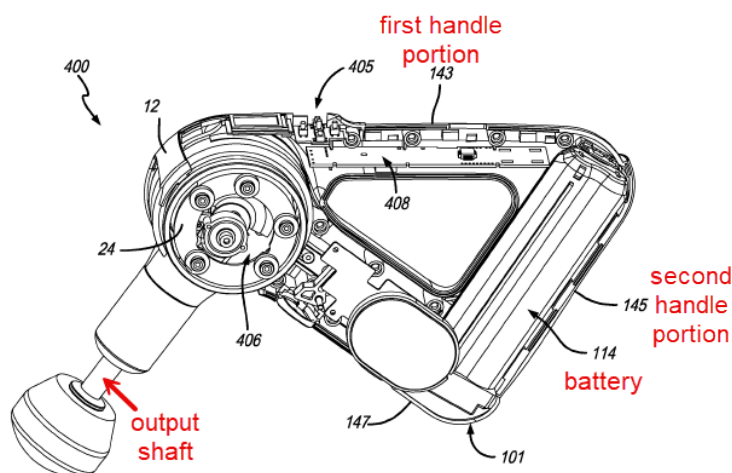


FIG. 19

104. In my opinion, claim 10 is invalid under 35 U.S.C. §112(a) as lacking written description support.

E. Ground 1E: The Specification Fails to Disclose a “Handle” as Recited in Claim 16

105. Claim 2 recites “a handle portion,” and claim 16, which depends therefrom, introduces “a handle ... comprising the handle portion.”⁷ The specification of the ’919 Patent exclusively describes “handle portions,” not “a handle,” with the sole exception being a reference to “the top handle or first handle portion 143.” Ex. 1001 at 23:35. But this passage indicates that “handle” and “handle portion” are *interchangeable* terms and not *different* structures as recited in claim 16. Further, the Applicant expressly rejected the Examiner’s attempt to treat the disclosed handle portions as portions of a larger structure, i.e., as portions of a “handle,” during prosecution of the ’322 Application. Ex. 1014 at 237.

106. Because the ’919 Patent fails to disclose “a handle ... comprising a handle portion,” it is my opinion that claim 16 is invalid under 35 U.S.C. §112(a) as lacking written description support.

⁷ As explained above, the ’919 Patent discloses that the battery 114 is in the second handle portion 145, which is different from the first handle portion 143 that forms the obtuse angle with the reciprocation axis as recited in claim 2. Ex. 1001, 6:35-42, FIG. 19.

F. Ground 1F: The Specification Fails to Disclose a “the Housing Comprises a First Portion ... [and] a Second Portion” as Recited in Claims 11 and 17

107. Claims 11 and 17 recite “the housing comprises a first portion ... [and] a second portion.” During prosecution of the ’919 Patent, these claims originally recited “first extension” and “second extension,” which the Examiner rejected under 35 U.S.C. §112(a). Ex. 1003 at 564–68, 588. Applicant never explained where support could be found in the ’919 Patent for “first portion” and “second portion,” which replaced “first extension” and “second extension,” respectively. *Id.* at 568. The Applicant also substantially copied amended claim 17 into the specification but without any reference to *any* originally-disclosed subject matter (below). *Id.* at 289, 308; Ex. 1001 at 15:61–65.

components that allows connection of an attachment to be used for massage or therapy. The housing comprises a first portion that extends away from the handle portion and encloses a portion of the push rod assembly, and the housing comprises a second portion that extends away from the handle portion and the first portion.

Ex. 1003 at 289.

108. Because the ’919 Patent, as originally filed, lacked disclosure of a housing comprising “a first portion” and “a second portion,” which appears consistent with the Applicant’s failure to tie the new disclosure added to the specification to any prior disclosure, in my opinion, claims 11 and 17 are invalid under 35 U.S.C. §112(a) as lacking written description support.

VIII. THE PRIOR ART REFERENCES

A. Hu '965 (Exs. 1022–1024)

109. I understand that Chinese publication CN 109907965 to Hu (“Hu ’965”) published on June 21, 2019. The below analysis of Hu’ 965 is based on the certified English translation of Hu ’965 (Ex. 1023).

110. Referring primarily to Figures 1, 10, and 4 (reproduced below in that order), Hu ’965 discloses a deep myofascial impact massager, which is another name for a percussive therapy system and device, featuring a Z-shaped connecting rod 120. Ex. 1023 at Abstract. According to Hu ’965, the Z-shaped connecting rod allows “the drive structure [to be] located within the main body housing without protruding therefrom, allowing the top of the main body housing to be configured flush, resulting in a more compact structure and smaller volume for the main body” and “the overall appearance of the main body is more aesthetic.” *Id.* at ¶[0009]. The Z-shaped connecting rod 120 is essentially identical to the “L-shaped” push rod described in the ’919 Patent and serves the same purpose, that is, reducing the overall package size of the massage gun.

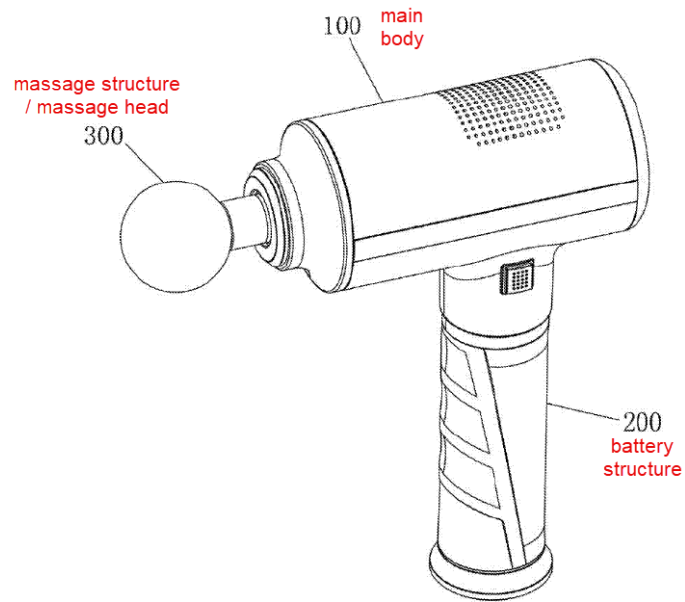


FIG. 1

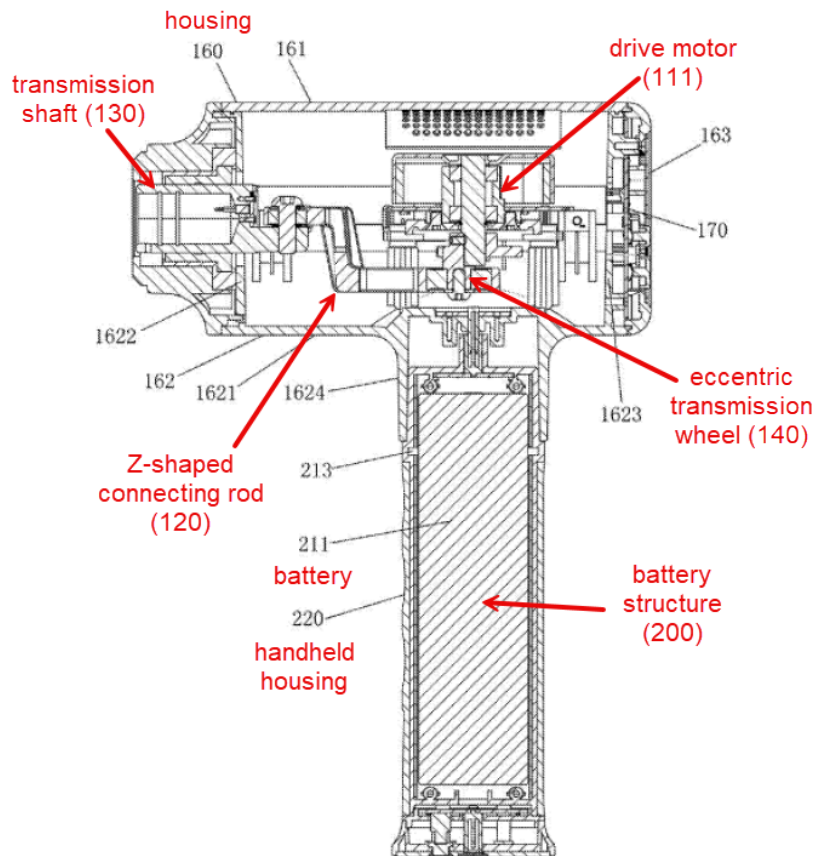


FIG. 10

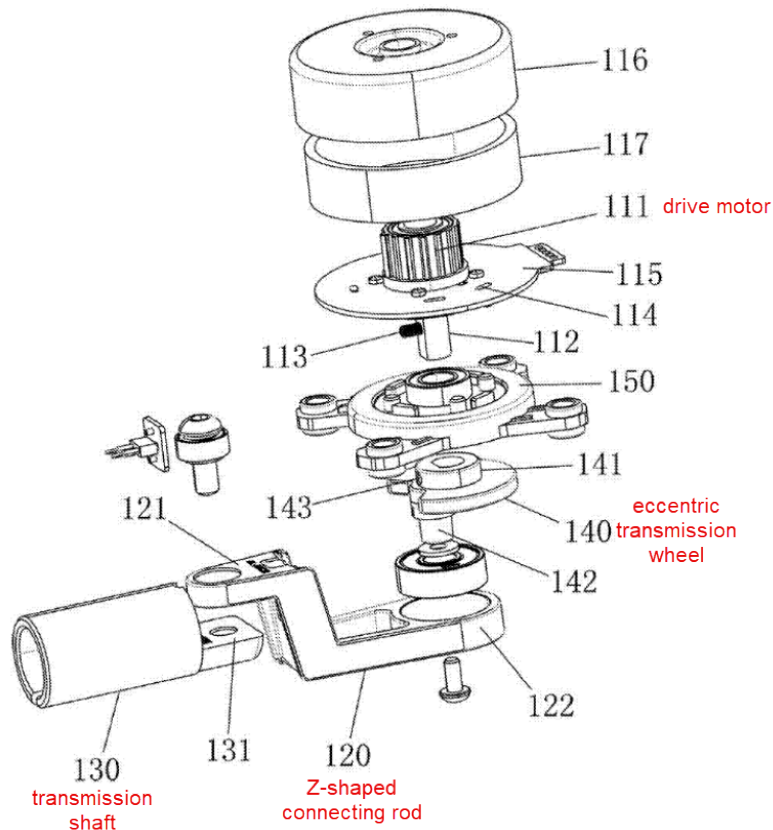


FIG. 4

B. Pepe

111. I understand that U.S. Publication No. 2017/0304145 to Pepe (“Pepe”) was filed on April 21, 2017, and published on October 26, 2017. Ex. 1025 at codes [22] and [43]. Pepe discloses “an electronic handheld device for performing a massage” and “supports ... percussive therapeutic techniques.” *Id.* at Abstract, ¶[0023]. The most relevant aspects of Pepe’s design are highlighted in Figure 2 (below). Pepe’s massager has the same general form factor as the triangular-shaped massager described in the ’919 Patent with the motor extending at a 90° angle to the handle axes.

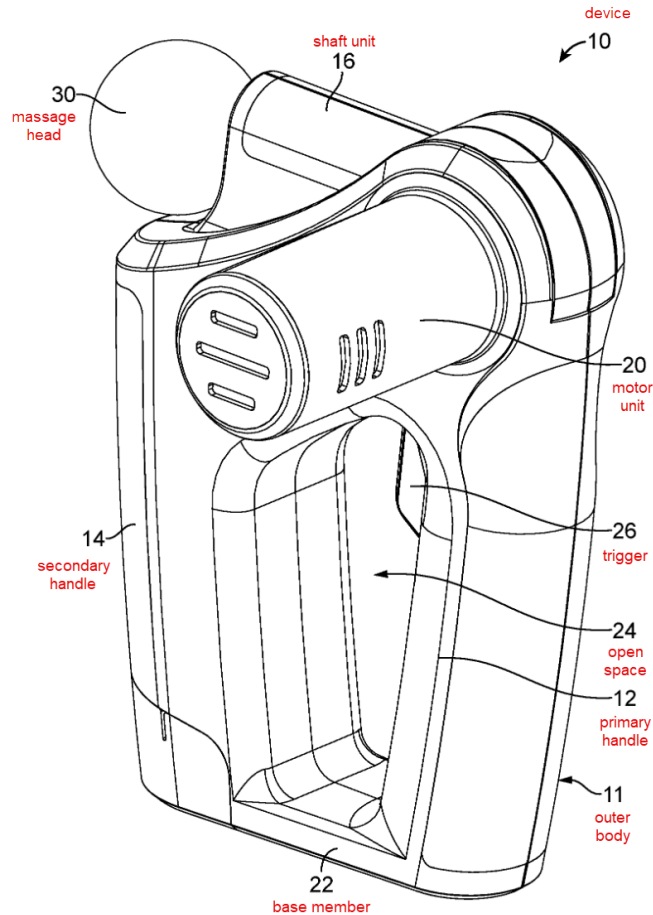


FIG. 2

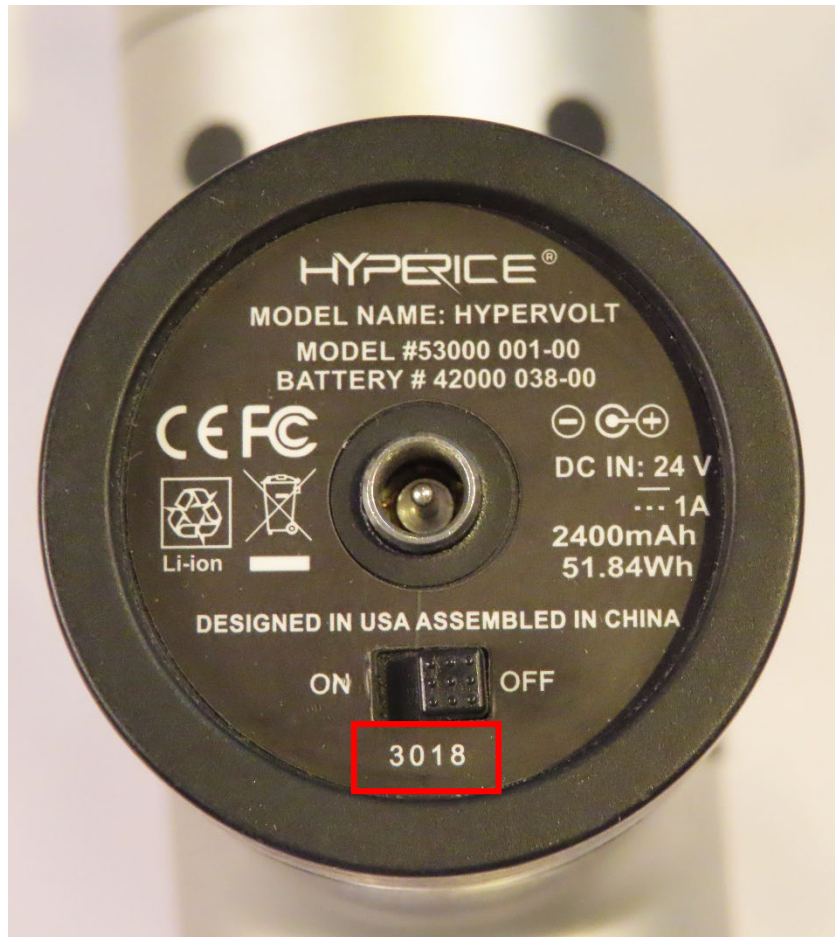
C. The Hypervolt Product

112. I understand that Hyperice released the Hypervolt on February 28, 2018. Exs. 1006 and 1032–34. As part of the launch, Hyperice also released a YouTube video showing (conceptually) the internal workings of the Hypervolt. Exs. 1004 and 1005. I also reviewed articles and YouTube videos confirming that the general public was in receipt of and actually using the Hypervolt by (and well before) October 2018. Exs. 1007, 1008, and 1032–34.

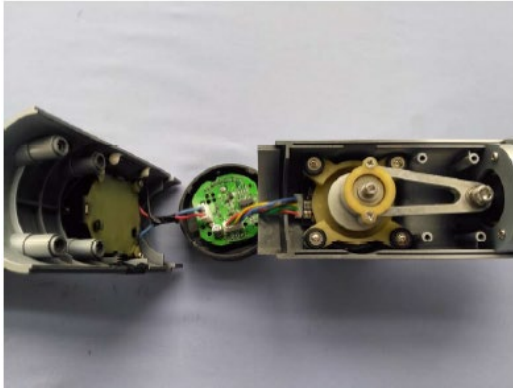
113. I was also provided with a Hypervolt massage gun to disassemble and analyze. I understand that the Hypervolt I received was purchased from a third party

and that shipping label indicates that it was shipped directly to my office from that third party. I understand that the Hypervolt I received was used but in disassembling it, I did not see any evidence that the device had ever been previously disassembled or tampered with in any way. Moreover, as explained in more detail below, the Hypervolt is a relatively simple device to assemble and disassemble (at an end user level, obviously certain parts of the device that cannot be disassembled by an end user are more complicated, such as the motor itself or the press-fit bearing in the push rod). This sort of controlled design and simplicity is to be expected in mass produced consumer devices as it ensures easy manufacturability and repairability along with a consistent user experience between devices.

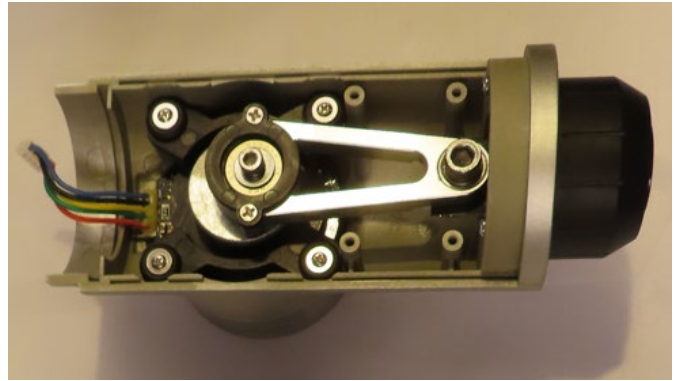
114. The particular Hypervolt I was provided with had a serial number of 3018 (shown below) on the bottom of the handle. Four-digit codes are commonly used in consumer products, such as consumer electronics, to trace manufacturing date. Four digit codes are often either WWYY format or YYWW format. Here, I understand “30” to refer to the week of manufacture, i.e., the 30th week of the year, and “18” to refer to the year of manufacture, i.e., 2018. The reverse, “30” being the year, would make no sense since it would mean the device was manufactured in 1930. Separately, the device being manufactured in late July 2018 is consistent with the publicly disclosed release date of February 2018.



115. I also reviewed a document titled EMC Test Report, dated March 1, 2018. Ex. 1054. In particular, I compared the device disassembly photo at page 62 with the device I disassembled. As can be seen below, both the device in the March 2018 EMC Test Report and the 3018 device I disassembled have an elastomer ring attached to the bottom of the push rod (beige in the EMC Test; black in the 3018 device).

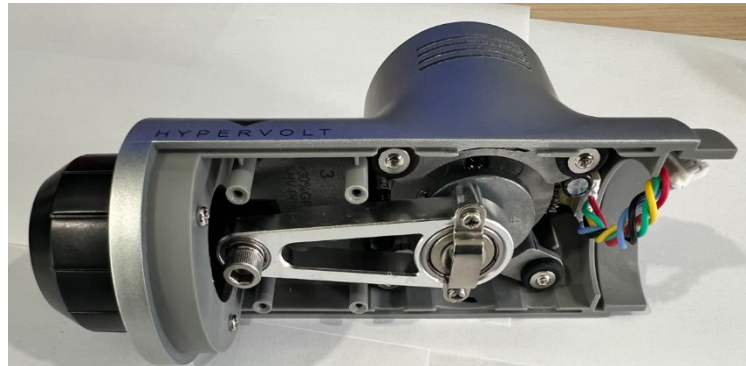


EMC Test Report
(Mar. 1, 2018)



3018 Hypervolt

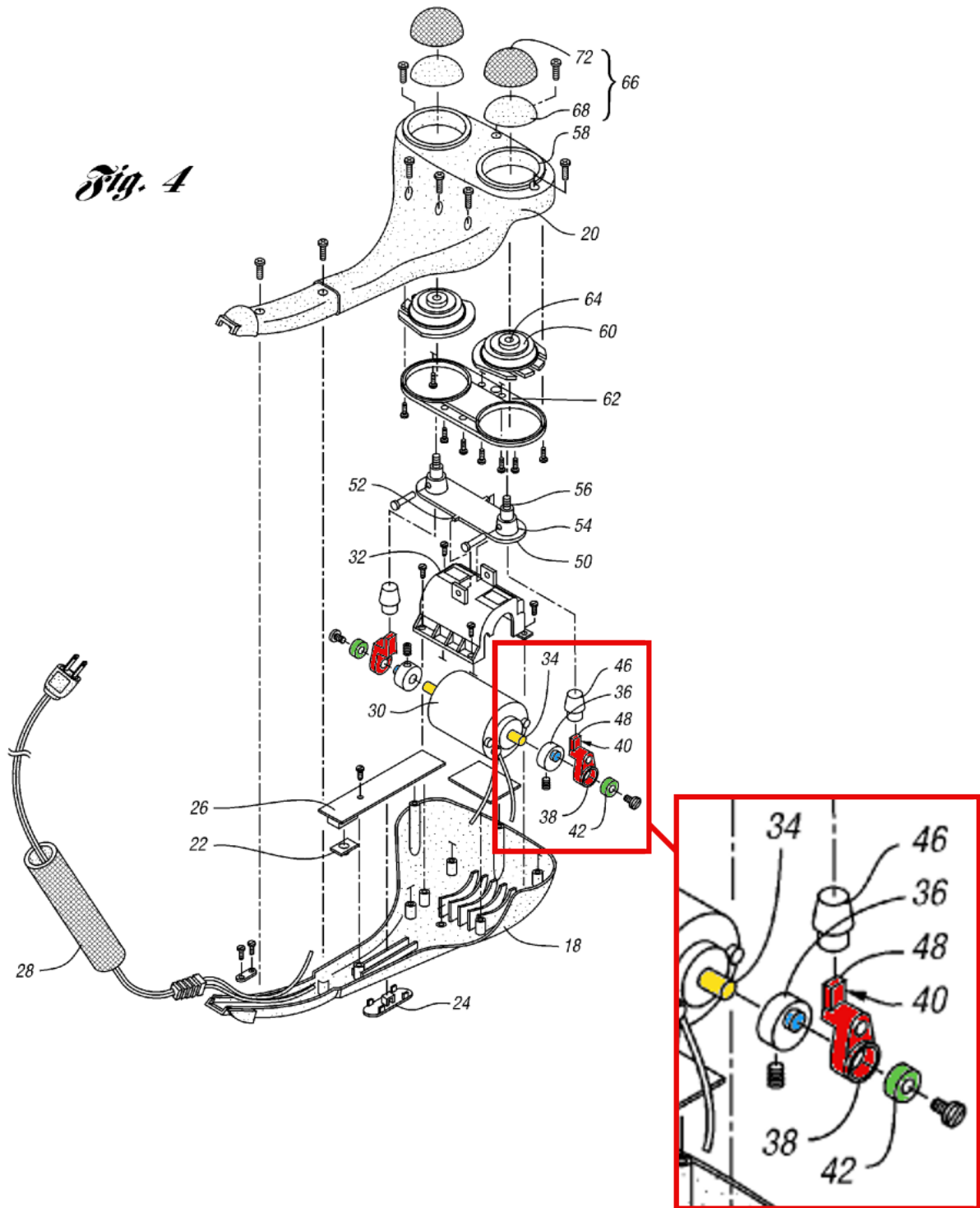
116. I reviewed images of another Hypervolt having serial number 4019 (indicating a late September or early October 2019 manufacturing date) that was also disassembled (below). Different from the 2018 models pictured above, the 4019 model omitted the elastomer ring but added a metal cage to the bottom of the push rod. Thus, I am confident that the 3018 model I disassembled and reviewed was a 2018 model and not a later model.



D. Huang

117. I understand that U.S. Publication 2001/0027280 A1 to Huang (“Huang”) published on October 4, 2001. Ex. 1035, code [43].

118. Huang is directed to a handheld “percussive massager” that features a dual eccentric drive system including, with reference to Figures 4 and 5 thereof (below), a motor 30 having an output shaft 34 [yellow], crank arms 36 [the “eccentric shaft” part thereof highlighted in blue] connected to the output shaft 34, and L-shaped connecting rods 40 [red] respectively connected to the crank arm 36 via a rotary bearing 42 [green]. *Id.* at Title, ¶¶[0020]–[0022], [0025].



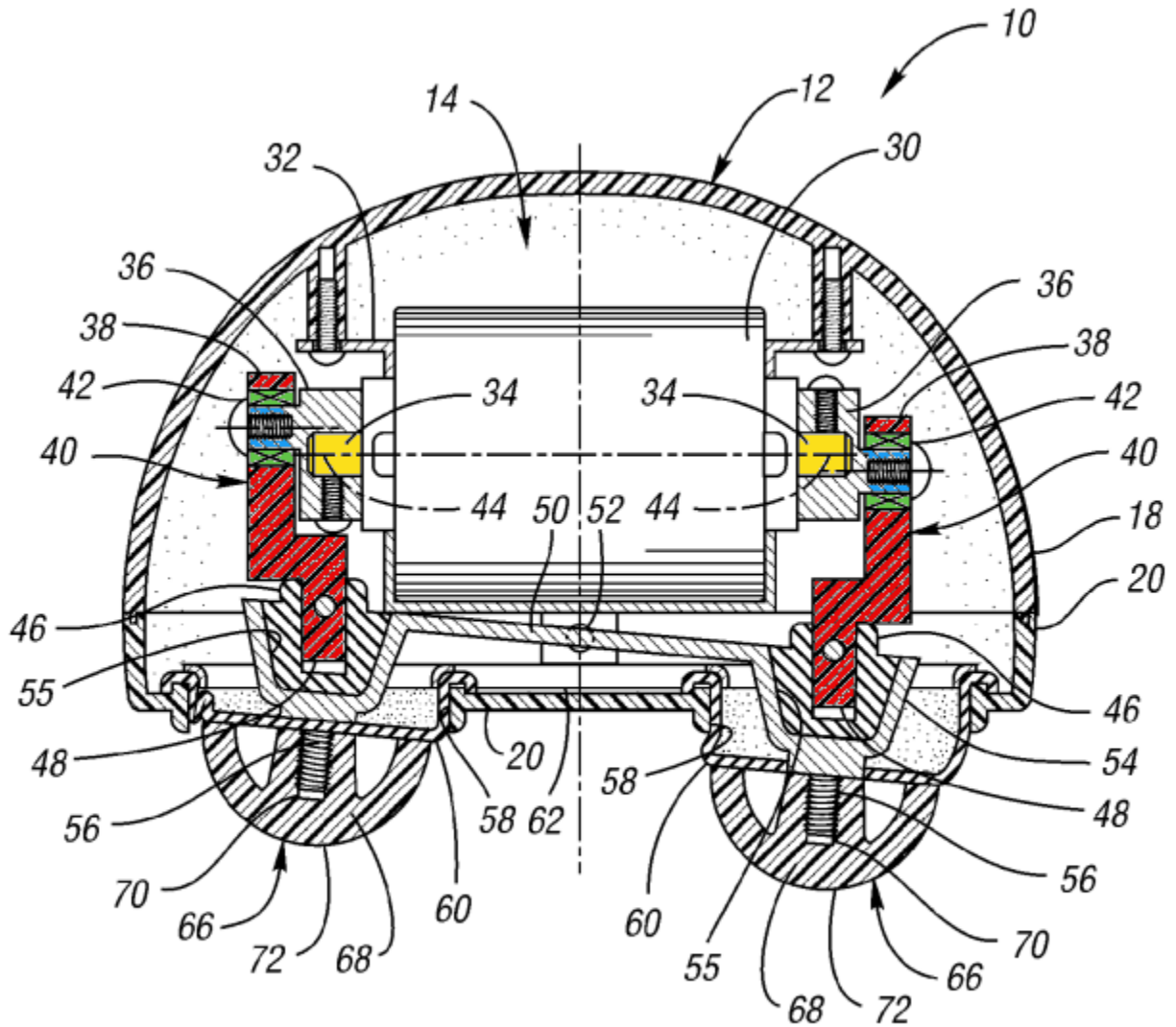


Fig. 5

E. Hu '951

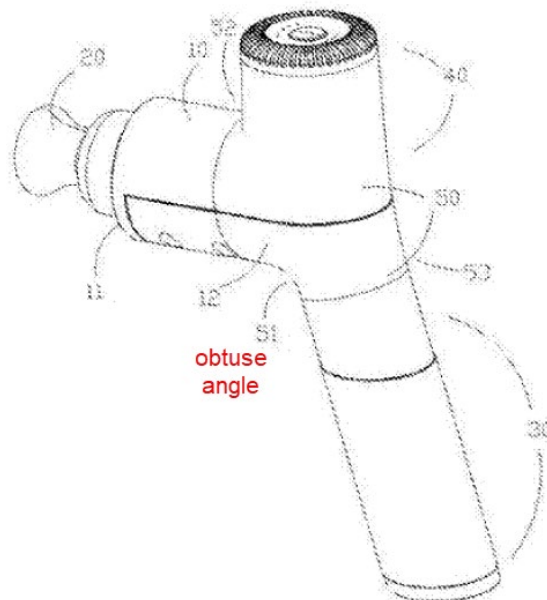
119. I understand that U.S. Publication No. 2021/0022951 A1 to Hu (“Hu ’951”) was filed Sept. 28, 2020, as a national stage entry of PCT/CN2019/086962 (“Hu PCT”), which was filed May 15, 2019, and claims priority to Chinese application 201910056372.9 (“Hu CN”), filed January 18, 2019. Exs. 1036–1042. I understand that, in certain situations, a U.S. patent publication

can act as prior art as of its earlier foreign filing date, in this case, the January 18, 2019 filing date of Hu CN if the relied-upon subject matter in the U.S. patent publication is present in the earlier filed application(s). I have reviewed Hu '951, Hu PCT, and Hu CN and confirmed that every aspect of Hu '951 I relied upon in reaching my opinion was fully supported in each of Hu PCT and Hu CN as indicated in the following chart:

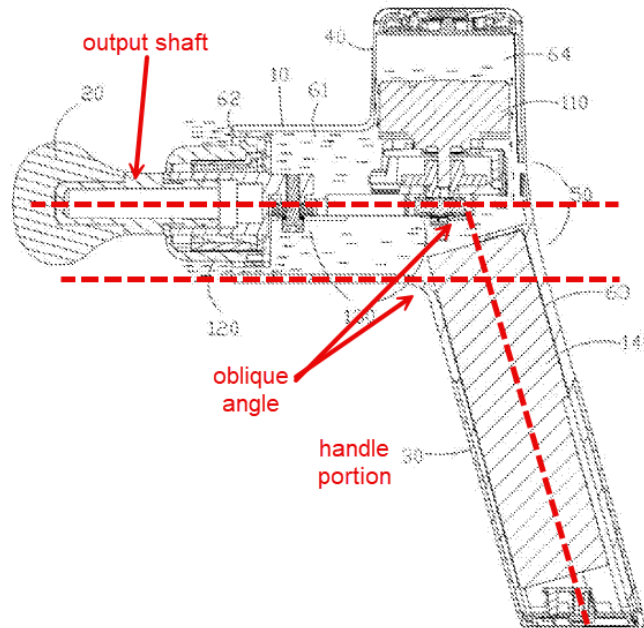
Hu '951 (US2021/0022951) (Ex. 1036)	Hu PCT (WO 2020/147223) (Ex. 1038)	Hu CN (CN 109771238 A) (Ex. 1041)
[0001]	p.1, ¶1	[0001]
[0011]	p.2, ¶11	[0023]
[0028]	p.2, ¶28	[0037]
[0029]	p.2, ¶29	[0038]
[0031]	p.3, ¶31	[0040]
[0034]	p.3, ¶34	[0043]
[0036]	p.3, ¶36	[0045]
[0038]	p.3, ¶38	[0047]
[0039]	p.3, ¶39	[0048]
[0040]	p.3, ¶40	[0049]
[0041]	p.3, ¶41	[0050]
[0042]	p.3, ¶42	[0051]

Hu '951 (US2021/0022951) (Ex. 1036)	Hu PCT (WO 2020/147223) (Ex. 1038)	Hu CN (CN 109771238 A) (Ex. 1041)
[0045]	p.3, ¶45	[0054]
FIG. 3	Same	Same
FIG. 5	Same	Same

120. Hu '951 describes a “handheld muscle massager” having “a unique holding method.” Ex. 1036 at Title, ¶[0001]. As shown in Figure 3 (below), Hu '951 describes a “main angle 51” “formed between the massage body 10 and the main handle 30” that “is greater than 90° and less than or equal to 135°.” *Id.* at ¶¶[0034], [0036]. An angle “greater than 90° and less than or equal to 135°” is an obtuse angle.



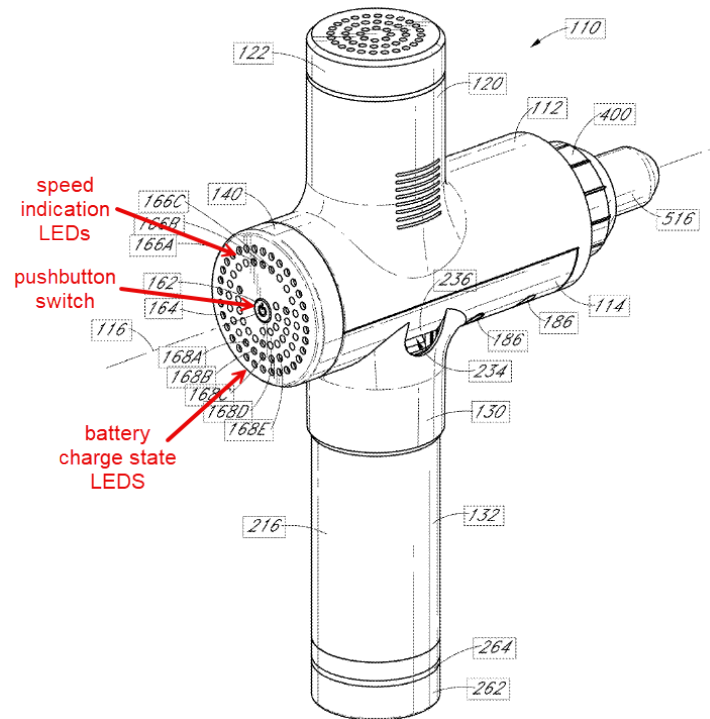
121. Although Hu '951 describes its “main angle 51” as being formed between the between the massage body 10 and the main handle 30, the same angle is formed between the main handle 30 and the output shaft 120 because the output shaft 120 and the massage body 10 are parallel.



F. Marton

122. I understand that U.S. Patent 10,314,762 B1 to Marton et al. was filed on November 27, 2018, and issued on June 11, 2019. Ex. 1043, codes [22], [45].

123. As shown most clearly in Figure 2 (below), Marton is directed to a percussive massager having a switch and display in the form of a series of LEDs on a rear side of the massager. *Id.* at Title, 7:62–8:18.



IX. UNPATENTABILITY UNDER 35 U.S.C. § 103

A. Ground 2: Claims 1–6, 9–11, and 14–20 are Obvious over Hu ’965 in view of Hu ’951

1. A POSITA Would Have Been Motivated to Modify Hu ’965 in View of Hu ’951’s Teachings with a Reasonable Expectation of Success

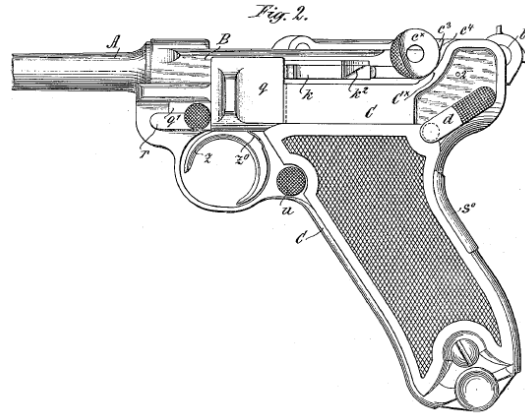
124. A POSITA would have been motivated to combine Hu ’965 and Hu ’951 with a reasonable expectation of success in the combination. Both Hu ’965 and Hu ’951 are directed to the same field of handheld, reciprocating massagers that operate in a substantially similar manner by converting a motor’s rotary (or rotational) output to a reciprocating output suitable for percussive massage. Ex. 1023 at ¶¶[0034]–[0038], [0041]; Ex. 1036 at ¶¶[0031], [0038]–[0042]. Both references also feature a rechargeable battery in the handle to power the device and a gun-style form factor in which the handle extends downwardly from the housing where the motor and drive mechanism are located for easy handling and control. Ex. 1023 at ¶[0041], FIG. 10; Ex. 1036 at ¶[0045], FIG. 5. As such, Hu ’965 and Hu ’951 are analogous art, and a POSITA would have been motivated to combine and/or modify Hu ’965 in view of Hu ’951.

125. Hu ’951’s disclosure focuses on a main handle 30 that extends at an angle “that is greater than 90° and less than or equal to 135°” with respect to the massage body 10. Ex. 1036 at ¶¶[0034], [0036]. According to Hu ’951, and as

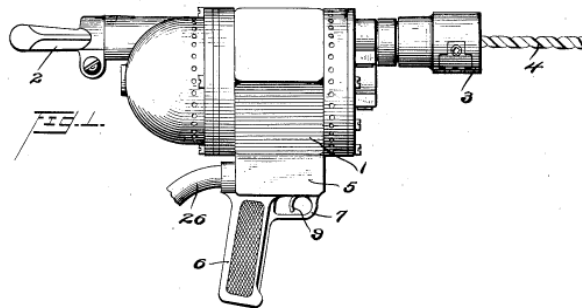
would be well-understood by a POSITA even absent Hu '951's express teaching, the angled handle can "improve the user experience and is convenient for the user to apply force, and enhance the massage effect." *Id.* at ¶[0033].

126. In particular, use of an obtuse-angled⁸ handle represents a simple and straightforward application of ergonomic design principles well known to a POSITA that can be applied to a modern handheld percussive massage device. By way of background, obtuse-angled handles, when measured against the device's operative axis, colloquially known as "pistol grip" style handles, gained widespread notoriety at least as of the early 1900s. Perhaps the first and most famous application of the obtuse-angled handle was the Luger P08 pistol, which features a handle extending at a 145° angle to the barrel. Ex. 1044, FIG. 2 (below); Ex. 1045 (webpage showing numerous historical firearms with obtuse-angled handles, including the Luger P08's grip angle).

⁸ Claims 2 and 18 require that "the handle portion axis extends at an oblique angle to the reciprocation axis." An oblique angle is an angle that is not a right angle or a multiple thereof such that an obtuse angle is a subset of oblique angles. Thus, any reference to an "obtuse angle" should be understood to apply equally to an "oblique angle."



127. The angled handle design allows the user's wrist to remain in a natural or neutral orientation while pointing the barrel straight ahead, which is more comfortable and allows for easier aiming. This design was subsequently applied to handheld tools, such as Black & Decker's 1917 electric drill featuring a "pistol grip support 6," which forms an obtuse angle with the drill chuck 3. Ex. 1046 at 1:69, FIG. 1 (below).



128. It is, thus, not surprising that the pistol grip handle design has been implemented in other handheld devices. For example, a spinal adjustment instrument was patented in 1997 featuring “a pistol grip 14” extending at an obtuse angle with respect to the elongated rod 10 “for ease of handling.” Ex. 1047 at 2:65–67, FIG. 2 (below).

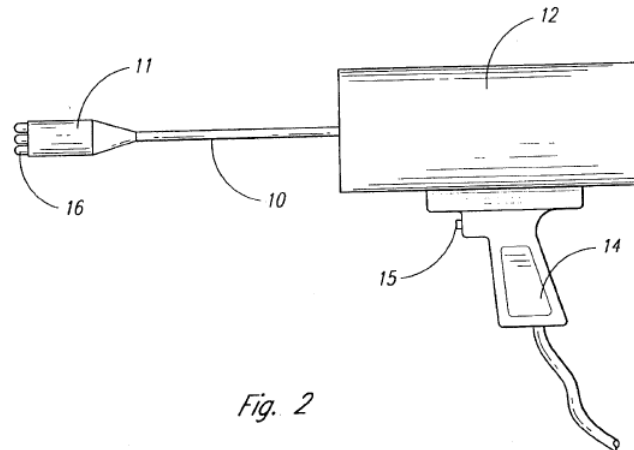
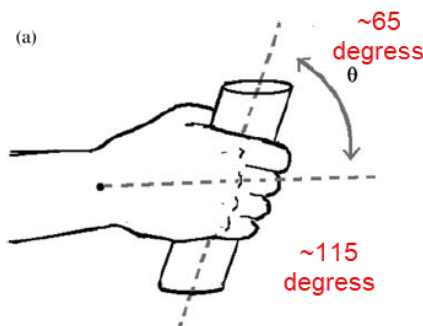


Fig. 2

129. In 2013, a study was conducted to quantify the ideal handle angle for use with pushing exertions, which would include percussive massagers as users push the device into their muscles. Ex. 1045 (“Young”). According to this study, the “[a]verage [] natural angle over all trials was 65(7) degrees,” which corresponds to theta in Figure 1(a) (below), meaning that the ideal natural angle when measured from the operative axis to the handle is about 115° , *i.e.*, an obtuse angle. *Id.* at p. 7. The ideal 115° angle quantified by Young’s study is nearly the midpoint in the “greater than 90° and less than or equal to 135° ” range disclosed in Hu ’951, confirming that Hu ’951’s disclosure represents the simple application of well-known ergonomic principals to percussive massagers. Ex. 1036 at ¶[0036].



130. Thus, in my opinion, as of 2019 and even earlier, obtuse-angled handles (when measured with reference to the device's primary operating axis or direction) were well-known for use with various types of handheld devices to provide known ergonomic benefits related to the body's natural wrist position and alignment. In my opinion, the use of an obtuse-angled handle in percussive massagers, such as in Hu '951, is simply an application of the same design rationales present in the earlier pistol-grip implementations and confirmed by Young: reorienting the handle allows for better alignment of a user's wrist and forearm with the direction of applied force, thereby improving comfort, control, and stability during operation. As such, in my opinion, a POSITA would have been motivated to and would have understood that incorporating Hu '915's obtuse-angled handle into Hu '965 to provide the well-known ergonomic benefits that stem from the obtuse-angled handle.

131. In sum, in my opinion, a POSITA would have been motivated to modify other handheld especially gun-type percussive devices, such as Hu '965, to include the obtuse-angled handle as taught by Hu '951 with a reasonable expectation of success. For example, Hu '965 shares the same basic design layout as Hu '951, including a motor housed within a main body and a handle extending downwardly therefrom, a POSITA would have readily looked to Hu 951's angled handle as an established ergonomic improvement applicable to Hu '965 without altering (and in fact improving) its percussive functionality.

132. A POSITA would have had a reasonable expectation of success in the modification at least because Hu '965 and Hu '951 share the same basic design layout. In my opinion, it would have been readily within the skill of a POSITA to modify Hu '965 to provide the preferred obtuse-angled handle as taught by Hu '951. For example, Hu '965 includes a detachable battery structure 200 that a user connects to the main body 100 by inserting an upper portion 210 of the battery structure 200 into a boss 1624 provided at a bottom end of the housing 160. Ex. 1023 at ¶¶[0041], [0043]. To achieve Hu '951's preferred angle, the boss 1624, the upper portion 210 of the battery structure 200, and the internal connection mechanisms therebetween could remain unchanged with the handheld housing 220 being modified to extend at the obtuse angle. Thus, the detachable connection between the battery structure 200 Hu '965 would extend at an obtuse angle and the main body 100 and the battery structure 200 in Hu '965 would remain operable as designed. Alternatively, the boss 1624 and physical connections formed therein could be rotated to have the same obtuse angle as the handheld housing 220, providing a straight battery structure 200 that takes on the obtuse angle arrangement upon being attached to the main body 100. Either such modification would have been, in my opinion, well within the skill and ability of a POSITA as of the effective filing date.

2. **Claim 1**

a) **Claim 1[pre]**

133. If the preamble is determined to be limiting, Hu '965 in view of Hu '951 teaches or suggests *a percussive therapy system*⁹. For example, Hu '965 states that “[t]he present invention relates to a deep myofascial impact massager” that “drives the massage structure 300 to perform reciprocating motion via the transmission shaft 130.” Ex. 1023 at Abstract, ¶¶[0034]. A POSITA would have understood that Hu '965's reference to an “impact massager” driving a massage structure 300, *i.e.*, a massage head, in reciprocal motion as describing a percussive therapy system. *Id.* at ¶¶[0034]–[0035].

b) **Claim 1[a]–[d] – Device Structure**¹⁰

134. Hu '965 in view of Hu '951 teaches or suggests 1[a] *a percussive therapy device* [100/200]¹¹ *comprising* 1[b] *a housing* [160], 1[c] *a handle portion* [220], and 1[d] *a motor* [111] *positioned in the housing* [160] *and configured to output torque about a motor axis* [red dotted line]. For example, and with reference

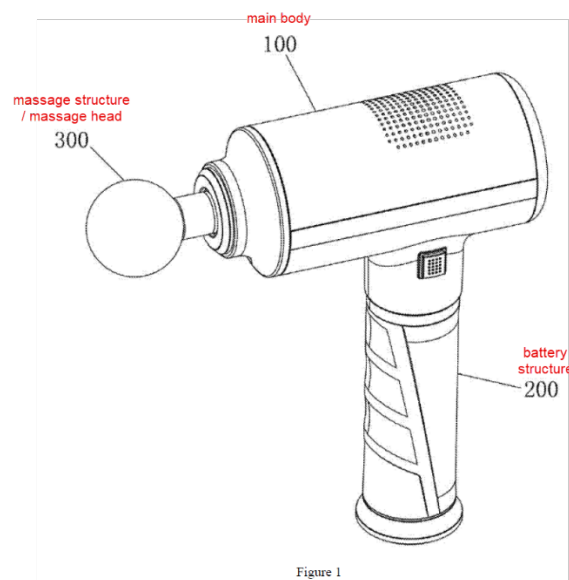
⁹ Hereinafter, claim language is *italicized*.

¹⁰ For convenience, claim limitations are addressed based on relatedness rather than in the order presented.

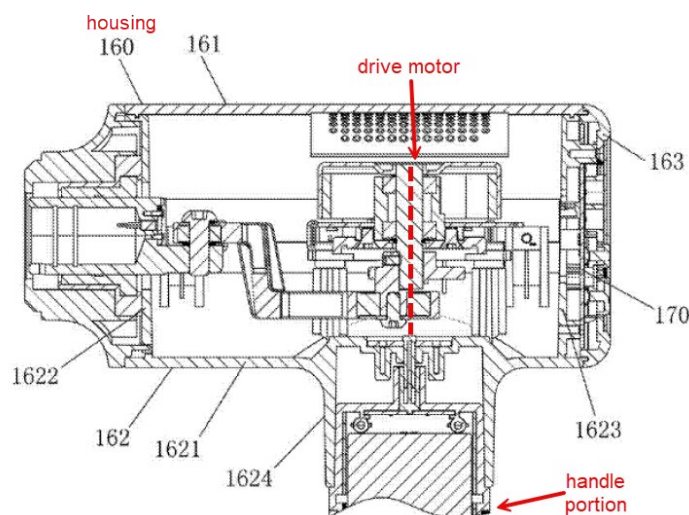
¹¹ In Grounds 2 and 3, all bracketed reference numerals refer to Hu '965 unless specifically described otherwise.

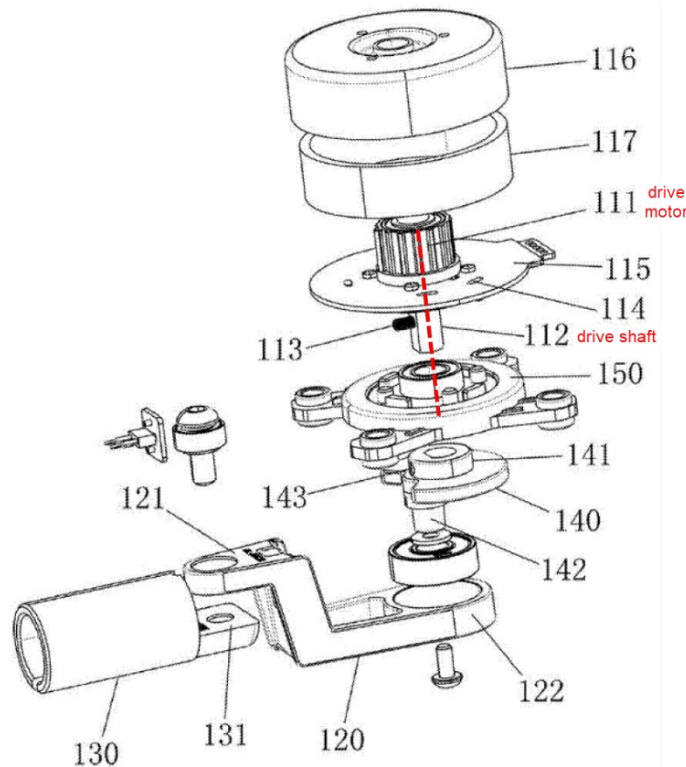
to Figures 1 and 6 of Hu '965 (below), Hu '965 discloses “a deep myofascial impact massager comprises a main body 100 and a massage structure 300 located outside the main body 100” and “further comprises a battery structure 200 ... compris[ing] a handheld housing 220.” Ex. 1023 at ¶¶[0034], [0041]. A POSITA would have understood that an “impact massager” is another name for a percussive therapy device and that Hu '965 operates as a percussive therapy device because it “drives the massage structure 300 to perform reciprocating motion.” *Id.* at ¶[0034].

135. Hu '965 also discloses that “[t]he exterior of the handheld housing 220 is provided with an anti-slip portion 221” which “makes the product easy to hold and prevents slipping, facilitating use while protecting the product from damage due to fall,” which a POSITA would have understood to mean that the handheld housing 220 of the battery structure 200 is designed to be held, *i.e.*, is designed as a handle portion. *Id.* at ¶[0041].



136. A POSITA would further understand Hu '965 disclosure that “The mounting frame 150 is mounted inside the housing 160, and the drive motor 111 is mounted on the mounting frame 150 through the motor mounting plate 115” to mean that the drive motor 111 is positioned in the housing 160.” *Id.* at ¶[0038]. A POSITA would also understand that the drive motor 111 is configured to output torque about a motor axis [red dotted line] at least based on Hu '965 discloses that “[t]he drive structure 110 drives the Z-shaped connecting rod 120 to perform reciprocating back-and-forth motion through the eccentric transmission wheel 140” and that “the eccentric transmission wheel 140 and the drive shaft 112 are locked together via the fastener 113.” *Id.* at ¶¶[0034], [0037]. In more detail, a POSITA reviewing Hu '965 as a whole would readily understand that Hu '965's drive motor 111 is configured to output a rotational force, *i.e.*, torque, via the drive shaft 112 to the drive structure 110 to cause the connecting rod 120 to reciprocate. *See also id.* at FIG. 4 (second image below).

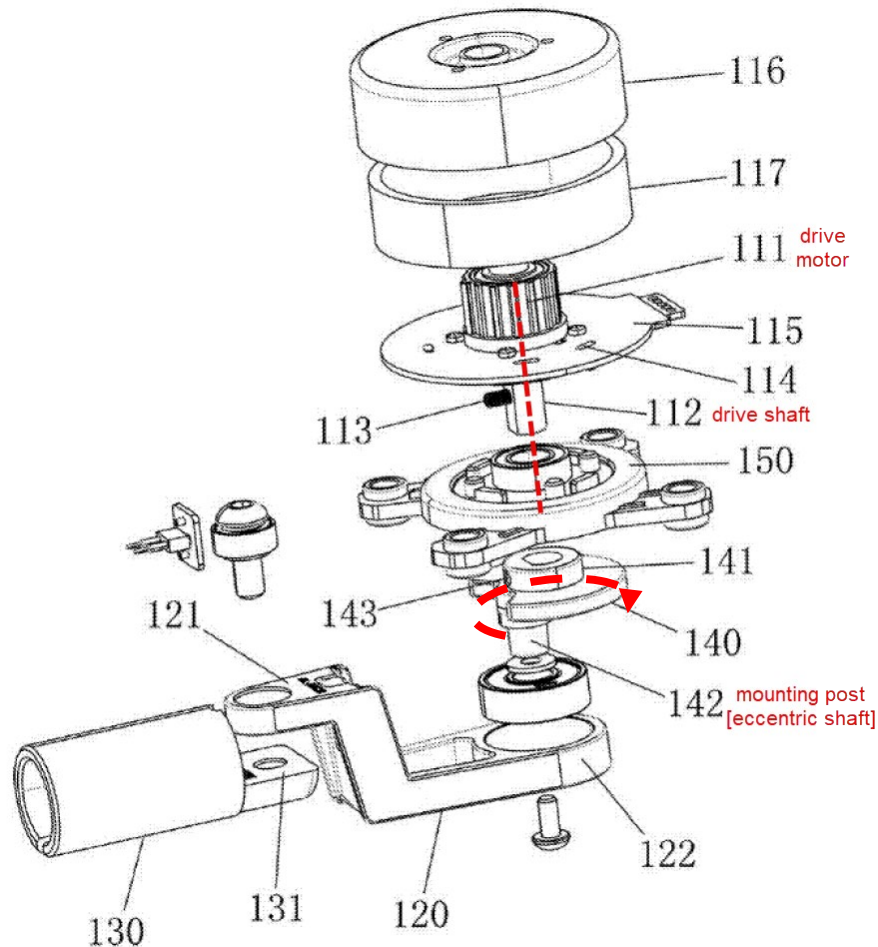




c) Claim 1[e]-[f-2] – Drive Mechanism

137. Hu '965 in view of Hu '951 teaches or suggests 1[e] *an eccentric shaft [142] configured to travel in a circle about the motor axis [red dotted line] in response to activation of the motor [111]*. Referring to Figure 4 of Hu '965 (below), Hu '965 discloses that a “linkage system is detachably connected to the massage structure 300 and comprises an eccentric transmission wheel 140, a connecting rod 120, and a transmission shaft 130.” *Id.* at ¶[0034]. Hu '965 further explains that that “eccentric transmission wheel 140” has a “downwardly protruding lower hollow mounting post 142 ... [that] receives the low end 122 of the connecting rod 120.” *Id.* at ¶[0037]. A POSITA would also understand that, because “The centerlines of the upper hollow mounting post 141 and the lower hollow mounting post 142 are

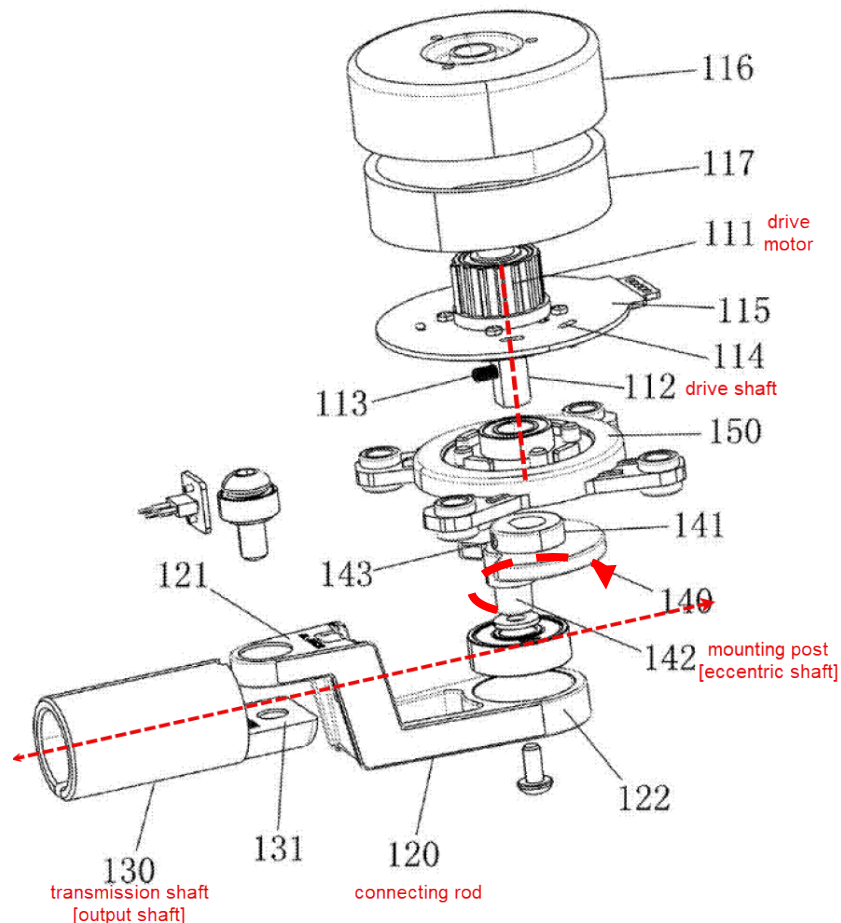
not on the same vertical line,” the eccentric shaft [142] would travel in a circle [red dashed arrow] about the motor axis [red dotted line] in response to activation of the motor [111], that is, when the motor [111] outputs torque.



138. Hu '965 in view of Hu '951 also teaches or suggests 1[f-1] a *push rod assembly* [120/130] *operatively connected to the motor* [111] and *configured to reciprocate in response to activation of the motor* [111], and 1[f-2] wherein the *push rod assembly* [120/130] *comprises an output shaft* [130] *configured to travel along a reciprocation axis* [red double-ended arrow] *when the push rod assembly* [120/130] *reciprocates*. Hu '965 discloses, in relevant part, that:

The drive structure 110 drives the Z-shaped connecting rod 120 to perform reciprocating back-and-forth motion through the eccentric transmission wheel 140, and the Z-shaped connecting rod 120 drives the massage structure 300 to perform reciprocating motion via the transmission shaft 130. By arranging the linkage structure, drive structure 110, and massage structure 300, the deep myofascial impact massager of the present invention utilizes the linkage structure to connect the drive structure 110 and the massage structure 300, enabling the drive structure 110 to drive the massage structure 300 in a reciprocating motion for massage.

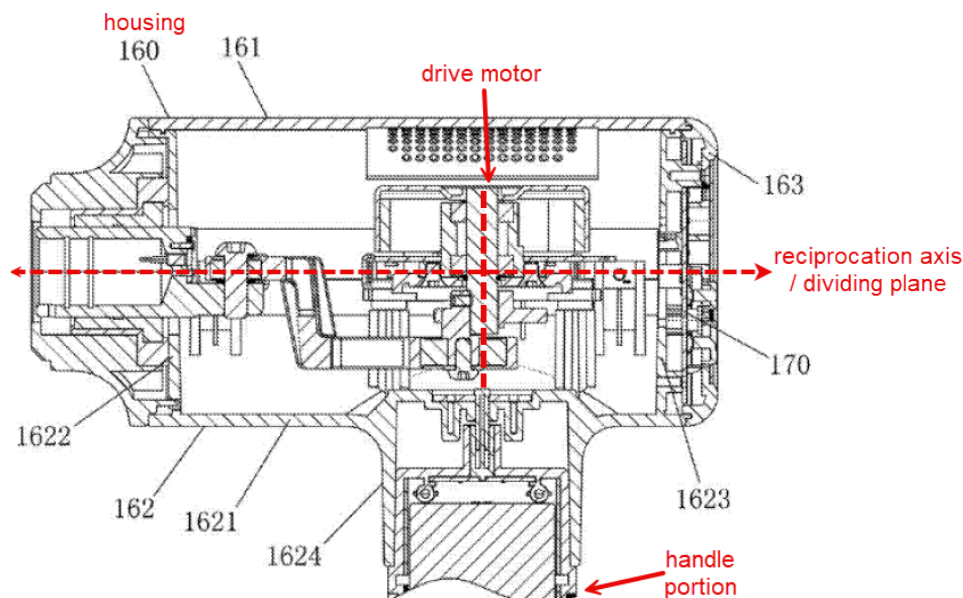
Id. at ¶[0034].



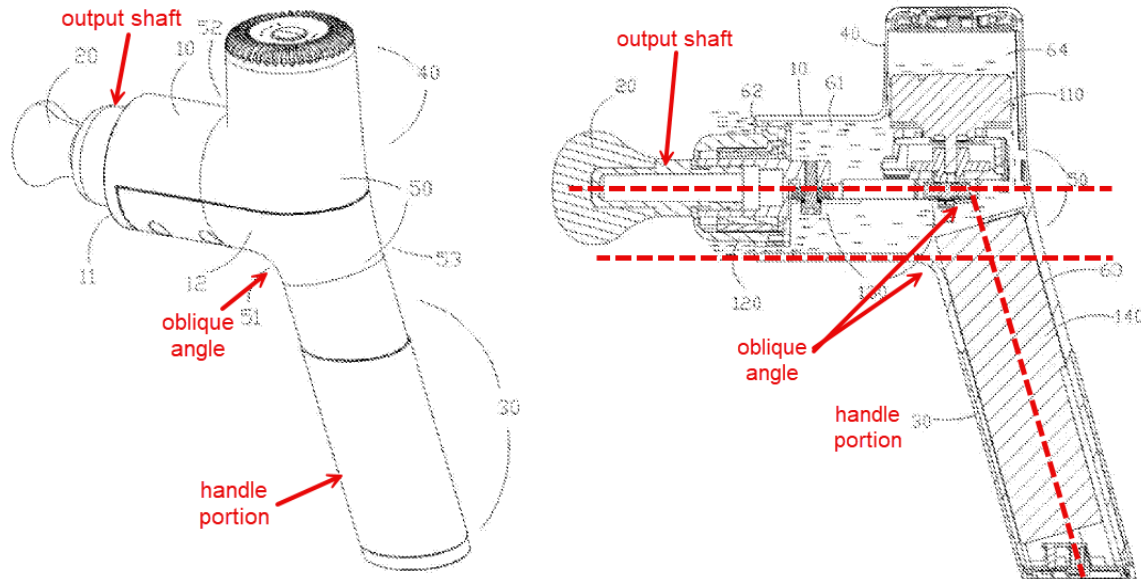
d) Claim 1[f-3]/[f-6] – Handle Alignment

139. Hu '965 in view of Hu '951 teaches or suggests 1[f-3] *the reciprocation axis [red double-ended arrow] extends transverse to the handle portion [220] on a dividing plane [red double-ended arrow extending into the page of, for example, FIG. 6 (below)] normal to the motor axis [red dotted line], and 1[f-6] an interior angle defined between the handle portion [220, modified in view of Hu '951] and the output shaft [130] is obtuse.*

140. First, with reference to Figure 6 of Hu '965 (below), Hu '965's reciprocating axis [red double-ended arrow] is on the dividing plane [red double-ended arrow extending into the page] and is normal to, *i.e.*, is at a right angle to or perpendicular to, the motor axis [red dotted line].

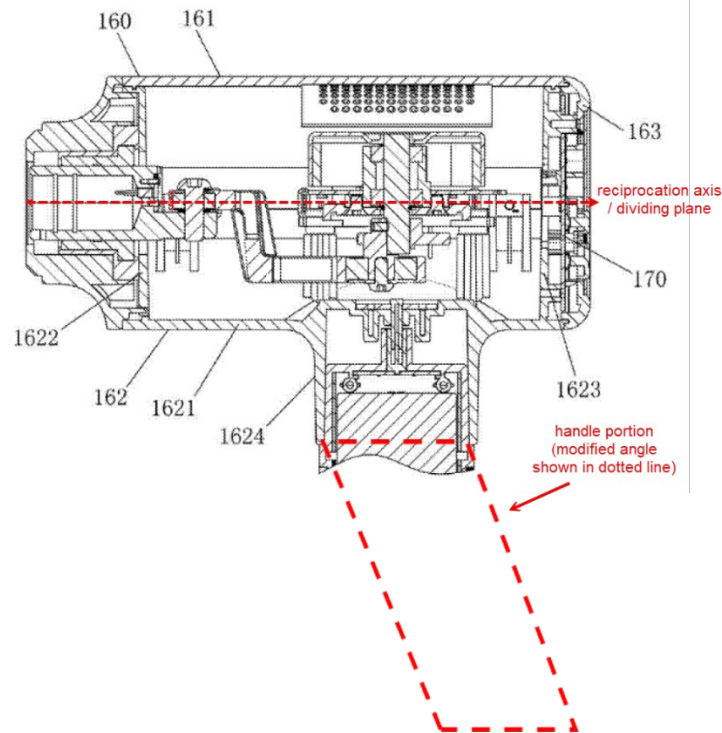


141. Second, as explained above in Section IX.A.1, *supra*, a POSITA would have been motivated to modify the handle portion [220] of Hu '965 to form an angle greater than 90° and less than or equal to 135°, any angle of which is an obtuse angle, with the lower shell 162 and the output shaft [130] thereof as taught by Hu '951 to provide better user ergonomics. As explained above, as can be seen in Figures 3 and 5 of Hu '951 (below), although Hu '951 describes the main angle 51 (which is the obtuse angle) as being “formed between the massage body 10 and the main handle 30,” the output shaft in Hu '951, element 120, to which the massage head 20 is attached, is parallel with the massage body 10. Ex. 1036 at ¶¶[0028]–[0029], [0034]. Thus, the main angle 51 between the massage body 10 and the main handle 30 is the same as the angle formed between Hu '951's output shaft and main handle 30. See below Figures 3 and 5 of Hu '951 (Ex. 1036). Similar to Hu '951, as can be seen in Figure 6 of Hu '965 (above), the output shaft [130] in Hu '965 is parallel to the lower body 162, such that the angle formed between the handle portion [220] and the lower body 162 would be the same as the angle formed between the handle portion [220] and the output shaft [130].



142. As explained above, a POSITA would have been motivated to modify Hu '956's handle portion [220] to extend at an obtuse angle with respect to the lower body 162 / the output shaft [130] as taught by Hu '951, which would also cause the reciprocation axis to extend transverse to (non-parallel to) the handle portion [220]. Thus, in Hu '956 modified in view of Hu '951, the reciprocation axis would extend transverse to, *i.e.*, would be across or non-parallel with¹², the handle portion [220], and an interior angle defined between the handle portion [220] and the output shaft [130] would be obtuse.

¹² See Section V, *supra*.

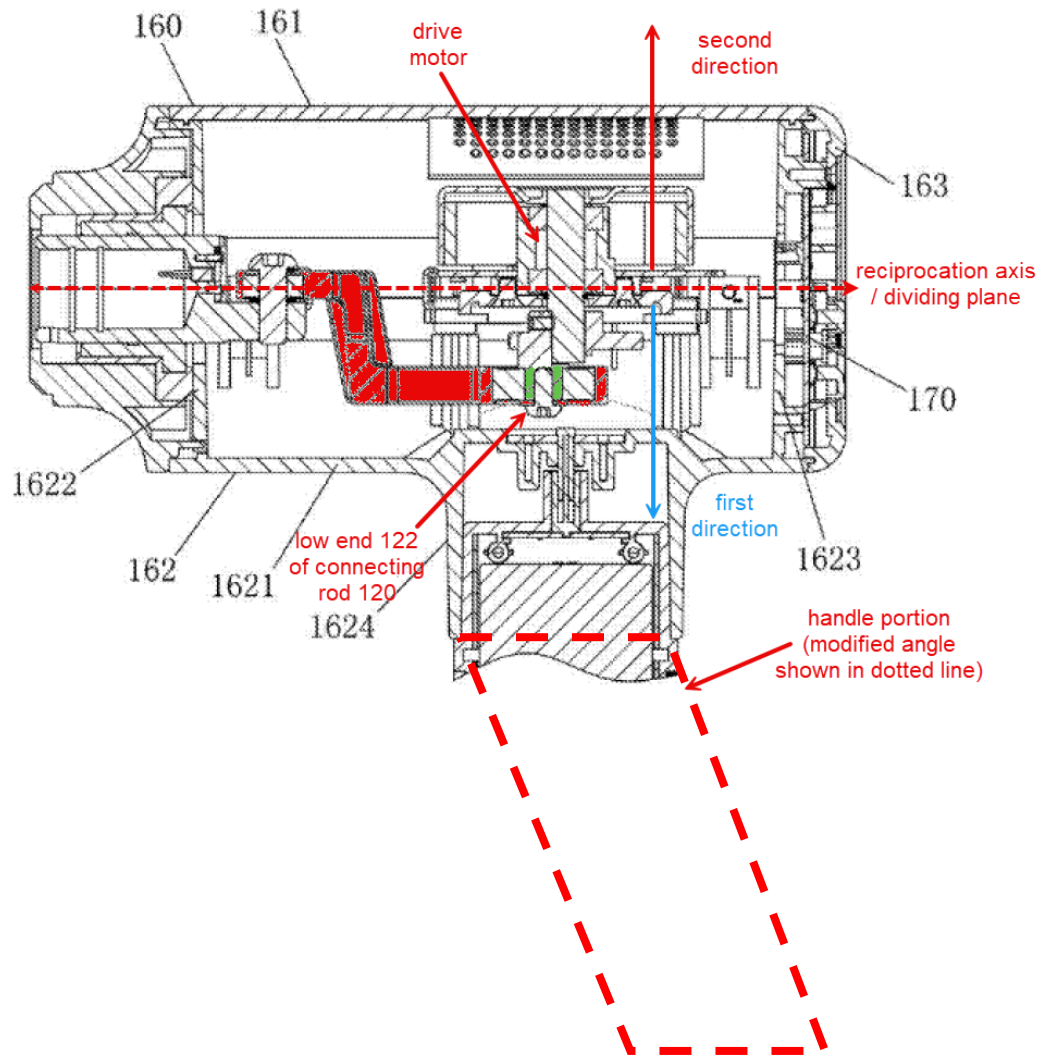


e) **Claim 1[f-4]/[f-5] – Dividing Plane**

143. Hu '965 in view of Hu '951 teaches or suggests 1[f-4] *a proximal end [122] of the push rod assembly [120/130] is connected to the eccentric shaft [142] at a location offset from the dividing plane [red double-ended arrow extending into the page] in a first direction [blue downwardly vertical arrow], and 1[f-5] the motor [111] extends transverse to the handle portion [220] and away from the dividing plane [red double-ended arrow extending into the page] in a second direction [red upwardly vertical arrow] opposite the first direction.*

144. In relevant part, Hu '965 discloses that “The linkage structure adopts a Z-shaped connecting rod 120 designed with one low end and one high end; the low end 122 is connected to the drive structure 110 via the eccentric transmission wheel

140” and that “the lower hollow mounting post 142 receives the low end 122 of the connecting rod 120.” Ex. 1023 at ¶¶[0034], [0037]. According to Hu ’965, the Z-shaped connecting rod 120 allows “the drive structure 110 [to be] located within the housing 160 of the main body 100 without protruding therefrom, allowing the top of the housing 160 to be flush. This makes the structure of the main body 100 more compact and smaller in volume.” *Id.* at ¶[0034]. As can be seen in Figure 6 of Hu ’965 (below), the low end [proximal end] 122 of the connecting rod 120 [red] is connected to the eccentric shaft [142, green] at a location offset from (below) the dividing plane in a first direction [blue arrow, down], and the motor [111] extends transverse to the handle portion [220, modified in view of Hu ’951] and away from the dividing plane in a second direction [red arrow, up] opposite to the first direction.



f) Claim 1[g] – Attachment

145. Hu '965 in view of Hu '951 teaches or suggests *an attachment* [300] *configured to be operatively connected to the output shaft* [130] *of the percussive therapy device* [100/200]. For example, Hu '965 discloses that “[t]he linkage structure is detachably connected to the massage structure 300,” “[t]he transmission shaft 130 is connected to the massage structure 300,” and “the Z-shaped connecting rod 120 drives the massage structure 300 to perform reciprocating motion via the

transmission shaft 130.” *Id.* at ¶[0034]. Thus, a POSITA would have understood that the attachment 300 is configured to be operatively connected to the transmission shaft 130 to be reciprocated thereby and to provide the impact (percussive) massage.

146. Accordingly, in my opinion, claim 1 is invalid as obvious in view of Hu ’965 and Hu ’951.

3. Claims 2/18¹³

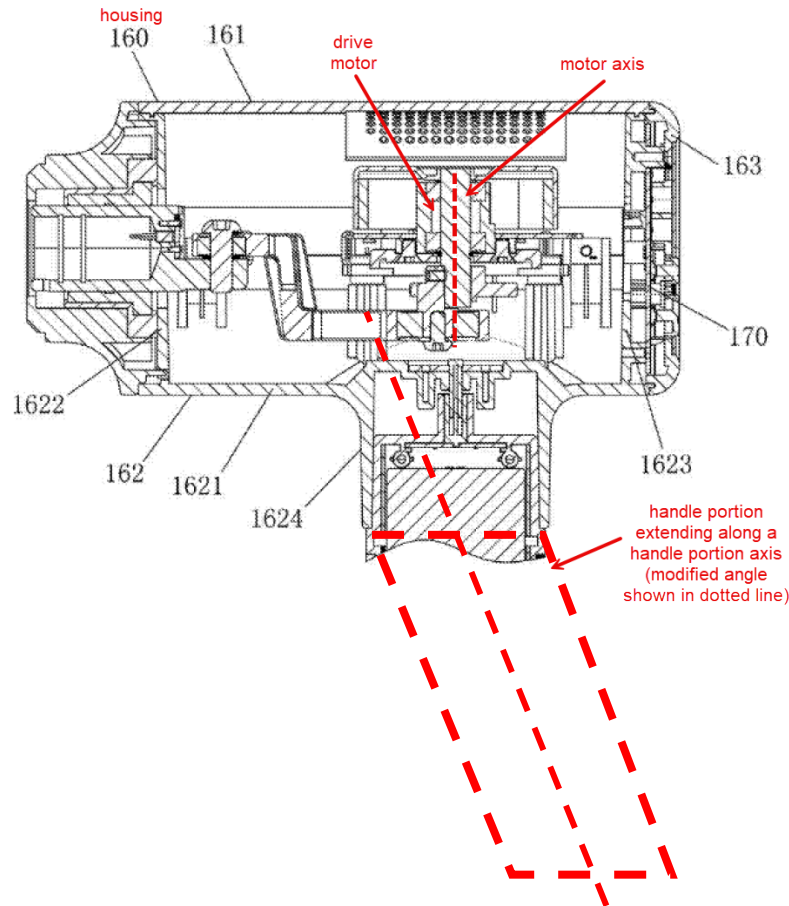
a) Claim 2/18[pre]

147. To the extent the preamble is limiting, Hu ’965 in view of Hu ’951 teaches or suggests *a percussive therapy device* [100/200]. *See* Section IX.A.2.a-b, *supra* (addressing Claim 1[a]).

b) Claim 2/18[a]–[c] – Device Structure

148. Hu ’965 in view of Hu ’951 teaches or suggests 2/18[a] *a motor* [111] *configured to output torque about a motor axis* [**red** dotted line], 2/18[b] *a handle portion* [220, modified in view of Hu ’951] *extending along a handle portion axis* [**red** dotted line], and 2/18[c] *a housing* [160]. *See* Section IX.A.2.b, *supra* (discussing Claim 1[a]–[d]).

¹³ Claims 2 and 18 are identical except for limitation [j] and, thus, will be addressed together with the exception of limitation [j].



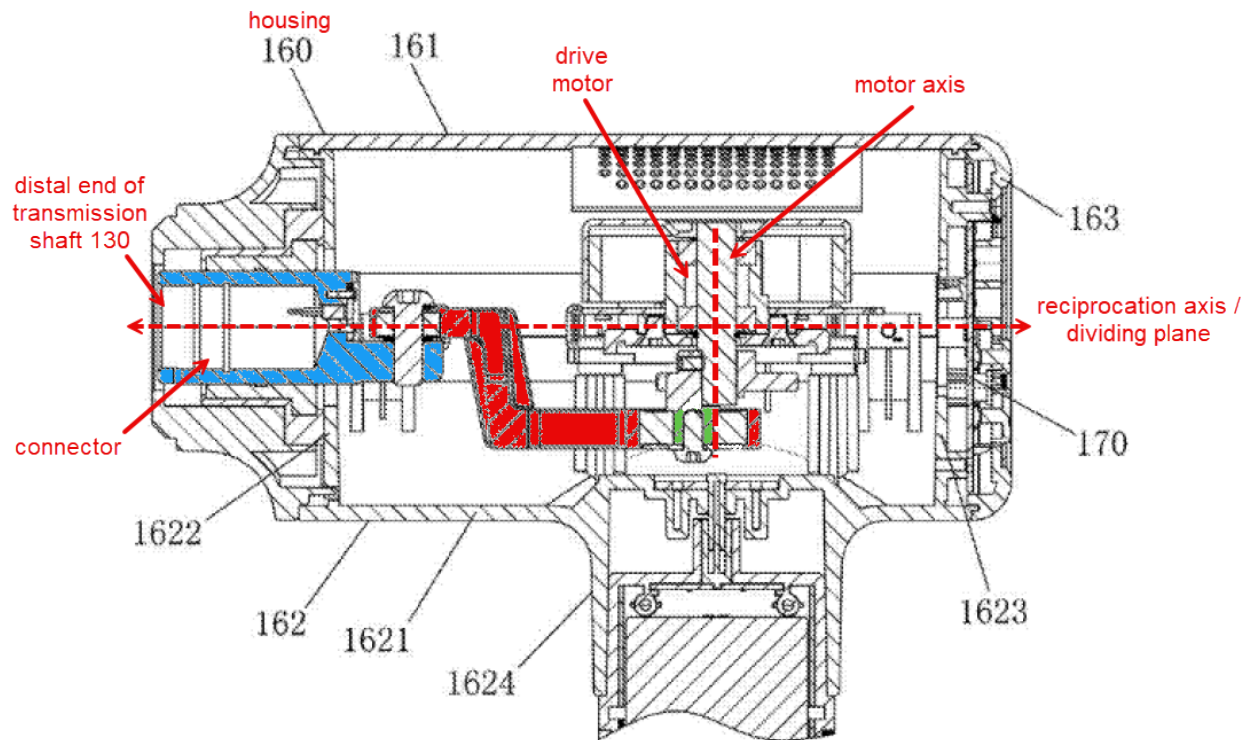
c) Claim 2/18[d]–[d-2], [h] – Drive Mechanism

149. Hu '965 in view of Hu '951 teaches or suggests 2/18[d] *a push rod assembly [120/130] comprising: 2/18[d-1] an output shaft [130] configured to reciprocate along a reciprocation axis [red double-ended arrow] in response to activation of the motor and having a distal end [exposed end] that comprises a connector [annular grooves] for an attachment [300], wherein the output shaft [130] is centered on the reciprocation axis [red double-ended arrow] and the reciprocation axis extends on a dividing plane [red double-ended arrow extending into, for example, Figure 6 (below)]; and 2/18[d-2] a push rod [120] having a*

proximal end [122] operatively connected to the motor [111] and a distal end [121] connected to the output shaft [130]. Hu '965 in view of Hu '951 also teaches or suggests 2/18[h] the device includes an eccentric shaft [142] that is configured to travel in a circle about the motor axis [red dotted line] when the motor is active. See Section IX.A.2.c, supra (discussing Claim 1[e], [f-1], and [f-2]).

150. Referring to Figure 6 of Hu '965 (below), Hu '965 discloses that “The linkage structure is detachably connected to the massage structure 300 and comprises an eccentric transmission wheel 140, a connecting rod 120, and a transmission shaft 130” and that “[t]he drive structure 110 drives the Z-shaped connecting rod 120 to perform reciprocating back-and-forth motion through the eccentric transmission wheel 140, and the Z-shaped connecting rod 120 drives the massage structure 300 to perform reciprocating motion via the transmission shaft 130.” Ex. 1023 at ¶[0034]. Hu '965 also discloses that “an interior of the hollow transmission shaft 130 is provided with at least two annular grooves,” which act as a connector for “the massage rod [that] is provided with protruding rings matched with the annular grooves.” *Id.* at ¶[0035]. Hu '965 also states “[t]he low end 122 of the Z-shaped connecting rod 120 [red] is connected to the drive structure 110 through the eccentric transmission wheel 140, and the high end 121 of the Z-shaped connecting rod 120 is connected to the transmission shaft 130 [blue]” and that “the lower hollow mounting post 142 [green] is connected to the Z-shaped

connecting rod 120 [red].” *Id.* at ¶¶[0034], [0037].



d) Claim 2/18[e]–[g] and [i] – Spatial Arrangement

151. Hu '965 in view of Hu '951 teaches or suggests 2/18[e] *the dividing plane* [red double-ended arrow extending into, for example, Figure 6 (below)] *is normal to the motor axis* [red dotted line], 2/18[f] *the handle portion axis* [red dotted line] *extends at an oblique angle to the reciprocation axis* [red double-ended arrow] *and intersects the reciprocation axis and the motor axis* [orange circles show points of intersection], 2/18[g] *the motor* [111] *is located on a first side* [green arrow, up] *of the dividing plane*, and 2/18[i] *the proximal end* [122] *of the push rod* [red, 120] *is operatively connected to the motor* [111] *by the eccentric shaft* [142], wherein the proximal end [122] of the push rod [120] is coupled to the eccentric shaft

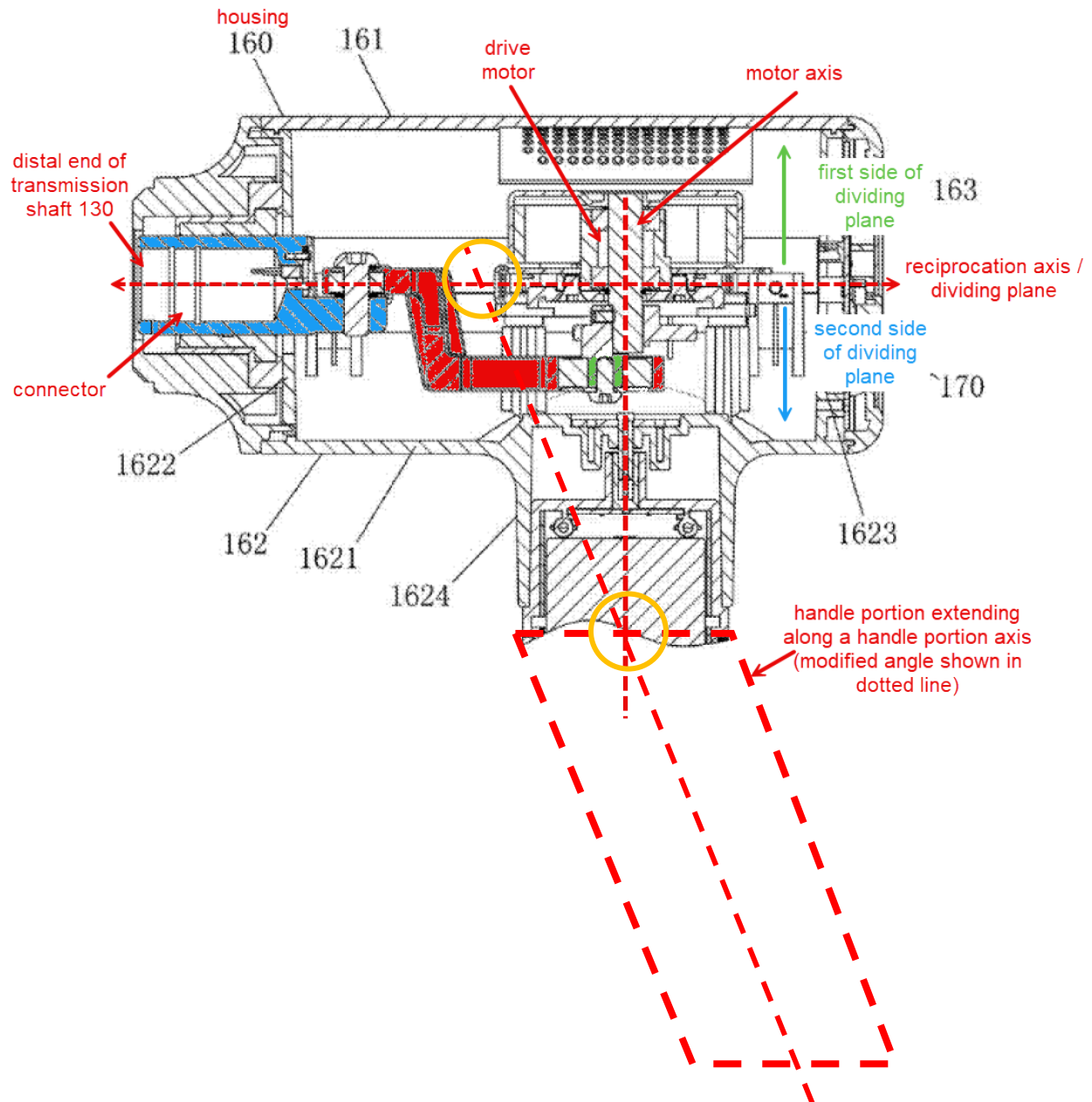
[green, 142] on a second side [blue arrow, down] of the dividing plane that is opposite from the first side of the dividing plane.

152. Again, Hu '965 describes the connecting rod 120 as being “designed with one low end and one high end” such that “Once installed, the drive structure is located within the main body housing without protruding therefrom, allowing the top of the main body housing to be configured flush, resulting in a more compact structure and smaller volume for the main body.” Ex. 1023 at ¶[0009]. Similar to Hu '965, the later-filed '919 Patent explains that its “arc or L-shape” push rod provides the same benefits, that is, that “the push rod 14 is designed ... so the motor can be located at or near the middle of the device, otherwise a large protrusion would be necessary to keep the shaft in the center with the motor offset therefrom (and positioned in the protrusion),” which “allows the outer housing to be smaller than similar prior art devices.” Ex. 1001 at 14:65–15:9.

153. Moreover, Hu '965 modified in view of Hu '951 teaches or suggests that the handle portion axis [red dotted line] extends at an obtuse angle, of which an oblique angle is a type¹⁴, to the reciprocation axis [red double-ended arrow] and

¹⁴ An oblique angle is an angle other than a 90° or a multiple thereof. For example, the Merriam-Webster dictionary defines “oblique angle” as “an acute or obtuse angle.” (<https://www.merriam-webster.com/dictionary/oblique%20angle>)

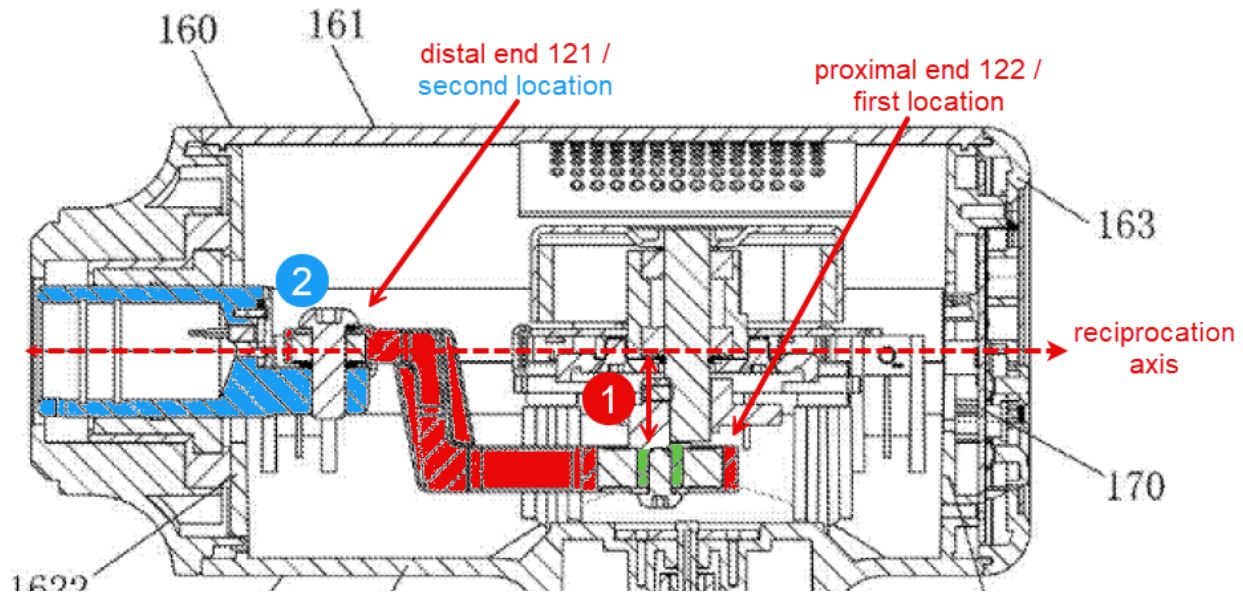
intersects the reciprocation axis and the motor axis on the plane of Figure 6 (points of intersection are circled in **orange**).



(accessed May 18, 2026).

e) Claim 2[j] and 18[j]

154. Hu '965 in view of Hu '951 teaches or suggests 2[j] *the proximal end [122] of the push rod [120] is farther from the reciprocation axis than the distal end [121] is* and similarly teaches or suggests 18[j] *the proximal end [122] of the push rod [120] is coupled to the eccentric shaft [142, green] at a first location, the distal end [121] of the push rod [120] is connected to the output shaft [130] at a second location, and the first location is farther from the reciprocation axis than the second location is.* Referring to Figure 6 of Hu '965 (below), Hu '965's Z-shaped connecting rod 120 is arranged such that the low end [proximal end] 122 is farther from the reciprocation axis (distance 1) than the high end [distal end] 121 is (distance 2). In detail, the high end [distal end] 121 of the connecting rod 120 is on the reciprocation axis while the low end [proximal end] 122 thereof is spaced apart from the reciprocation axis. For these same reasons, Hu '965's Z-shaped connecting rod 120 is arranged such that the first location where the low end [proximal end] 122 of the connecting rod 120 is coupled to the lower hollow mounting post [eccentric shaft, green] 142 is farther from the reciprocation axis [the red double-ended arrow] than the second location where the high end [distal end] 121 of the connecting rod 120 is connected to the transmission shaft 130 is.

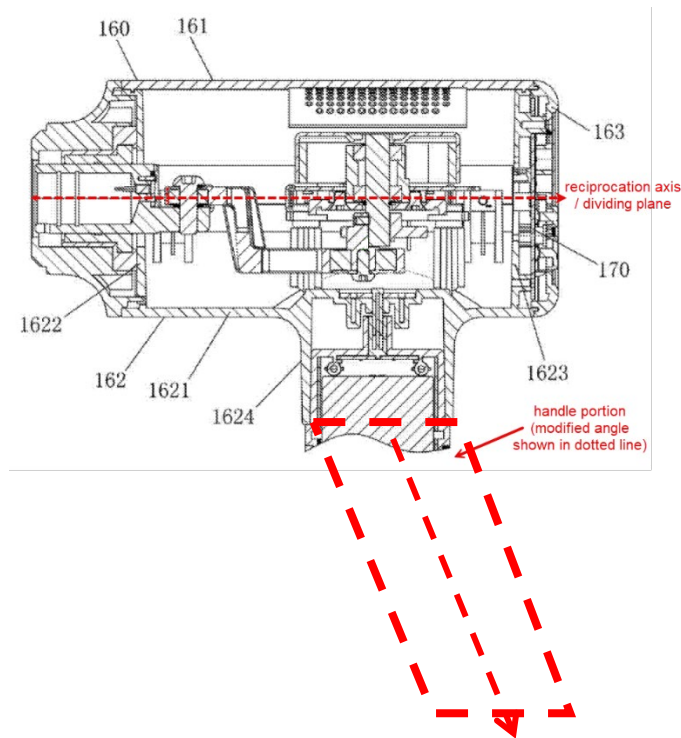


155. Accordingly, in my opinion, claims 2 and 18 are also invalid as obvious in view of Hu '965 and Hu '951.

4. Claims 3/14/19¹⁵

156. Hu '965 in view of Hu '951 teaches or suggests *the handle portion extends longitudinally away from the reciprocation axis* as recited in each of claims 3, 14, and 19. As shown in annotated Figure 6 of Hu '965 (below), the handle portion [220, modified in view of Hu '951] extends downwardly and away from the reciprocation axis along its longitudinal axis or direction [**red** dotted arrow].

¹⁵ I have addressed dependent claims having similar or the same limitations together to avoid redundancy. Where relevant, any differences between the addressed claims are addressed.



157. Accordingly, in my opinion, claims 3, 14, and 19 are also invalid as obvious in view of Hu '965 and Hu '951.

5. Claims 15/20

158. Hu '965 in view of Hu '951 teaches or suggests *an interior angle defined between the handle portion [220, modified in view of Hu '951] and the output shaft [130] is obtuse* as recited in claims 15 and 20. See Section IX.A.2.d, *supra* (discussing Claim 1[f-6]).

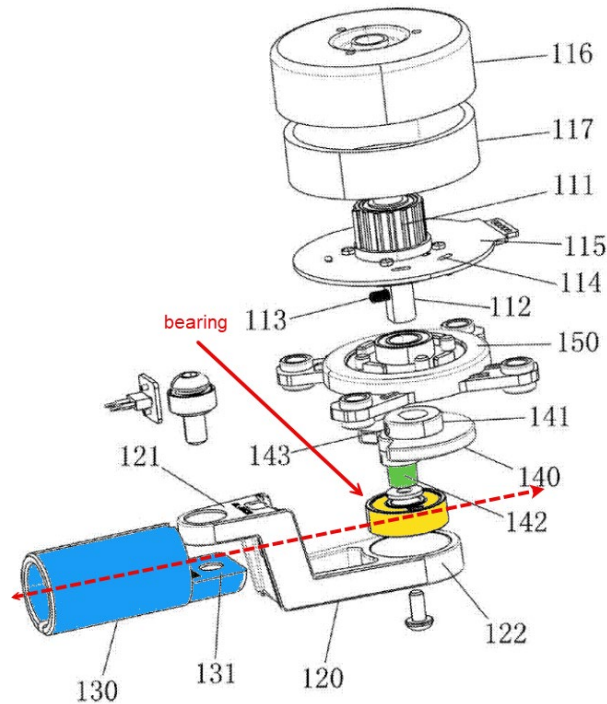
159. Accordingly, in my opinion, claims 15 and 20 are also invalid as obvious in view of Hu '965 and Hu '951.

6. Claim 4

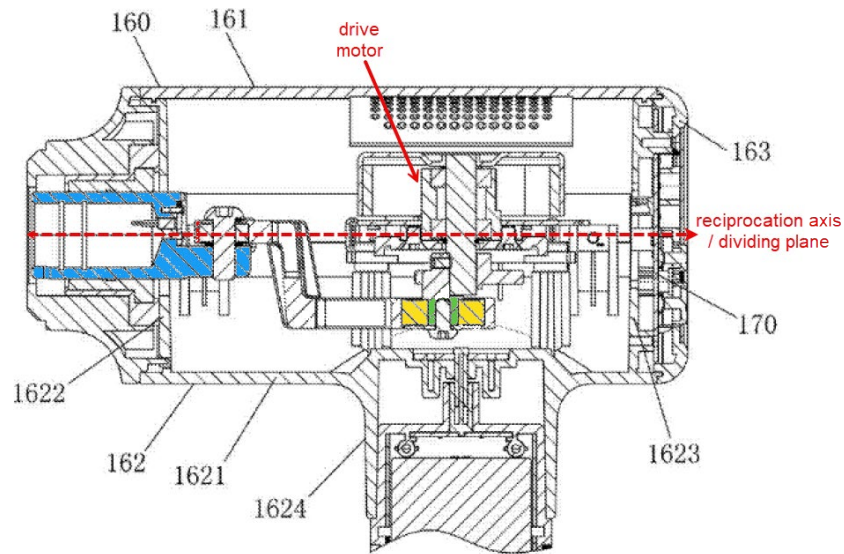
160. Hu '965 in view of Hu '951 teaches or suggests *the percussive therapy device comprises a bearing* [illustrated but not numbered, yellow] *between the eccentric shaft* [142, green] *and the push rod assembly* [120/130], *the output shaft* [130, blue] *is centered on the reciprocation axis* [red double-ended arrow], *and the bearing* [illustrated, yellow] *and the motor* [111] *are positioned on opposite sides* [below / above, respectively] *of the reciprocation axis* [red double ended arrow].

161. First, referring to Figure 4 of Hu '965 (below), a POSITA would have understood that a bearing is illustrated between the eccentric shaft [142, green] and the push rod assembly [120/130], in particular, the connecting rod 120. A POSITA would have understood that the illustrated structure is a bearing due to its shape, which represents a traditional sealed ball-bearing shape¹⁶, and due to its position between two components moving in different manners (*i.e.*, rotational vs reciprocal), which most often necessitates or greatly benefits from the presence of a bearing.

¹⁶ A schematic illustration of a seal ball-bearing is available at <https://bywbbearing.com/what-are-the-different-types-of-bearing-seals/> (accessed May 18, 2026) and bears a striking resemblance to the bearing illustrated in Hu '965.



162. Second, referring to Figure 6 of Hu '965 (below), the output shaft [130, blue] is centered on the reciprocation axis [red double-ended arrow], and the bearing [yellow] and the motor [111] are positioned on opposite sides of [below /above, respectively] the reciprocation axis [red double ended arrow], with the bearing below the reciprocating axis and the motor above it.



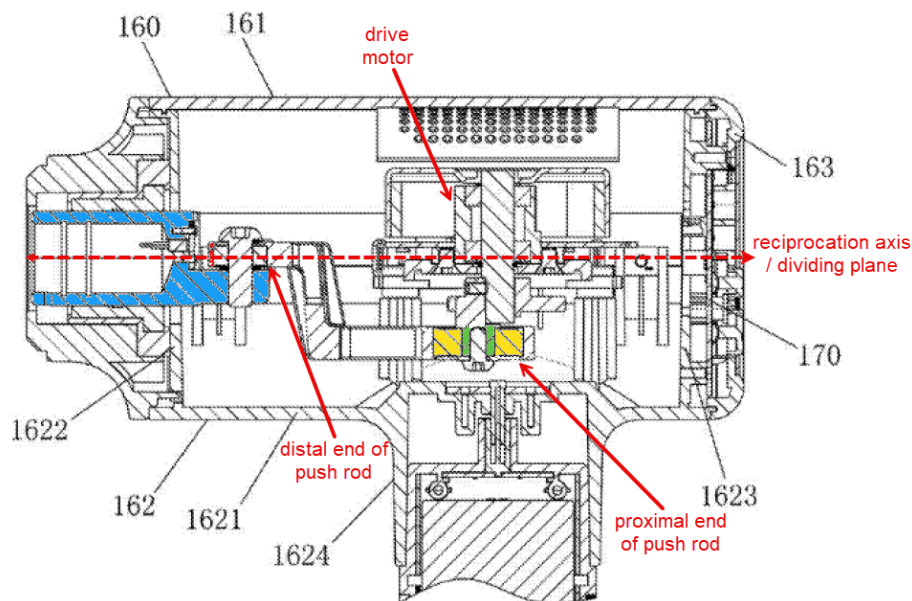
163. Accordingly, in my opinion, claim 4 is also invalid as obvious in view of Hu '965 and Hu '951.

7. Claims 5/6

164. Hu '965 in view of Hu '951 teaches or suggests *the push rod assembly* [120/130] *comprises a push rod* [120], *the push rod* [120] *comprises a proximal end* [122] *coupled to the bearing* [illustrated, **yellow**], *the push rod* [120] *comprises a distal end* [121] *coupled to the output shaft* [130, **blue**], and *the proximal end* [121] *of the push rod* [120] *is farther from the reciprocation axis than the distal end* [122] *of the push rod is.*¹⁷ See Section IX.A.3.c & e, *supra* (discussing Claim 2/18[d-2],

¹⁷ Claim 5 additionally recites the underlined limitations compared to claim 6. Thus, I understand that claim 6 is broader than claim 5 because it omits limitations present in in claim 5. Accordingly, my analysis of the narrower claim 5 should be

[j]). With reference to Figure 6 of Hu '965 (below), Hu '965 discloses that the connecting rod 120 has proximal end 121 coupled to the bearing [yellow] and a distal end 122 coupled to the transmission shaft 130. Ex. 1023 at ¶[0034]. As explained above in Section IX.A.3.e (discussing Claim 2[j]), Hu '965 also discloses at least in Figure 6 that the proximal end 122 of the connecting rod 120 is farther from the reciprocation axis than the distal end 121 is.



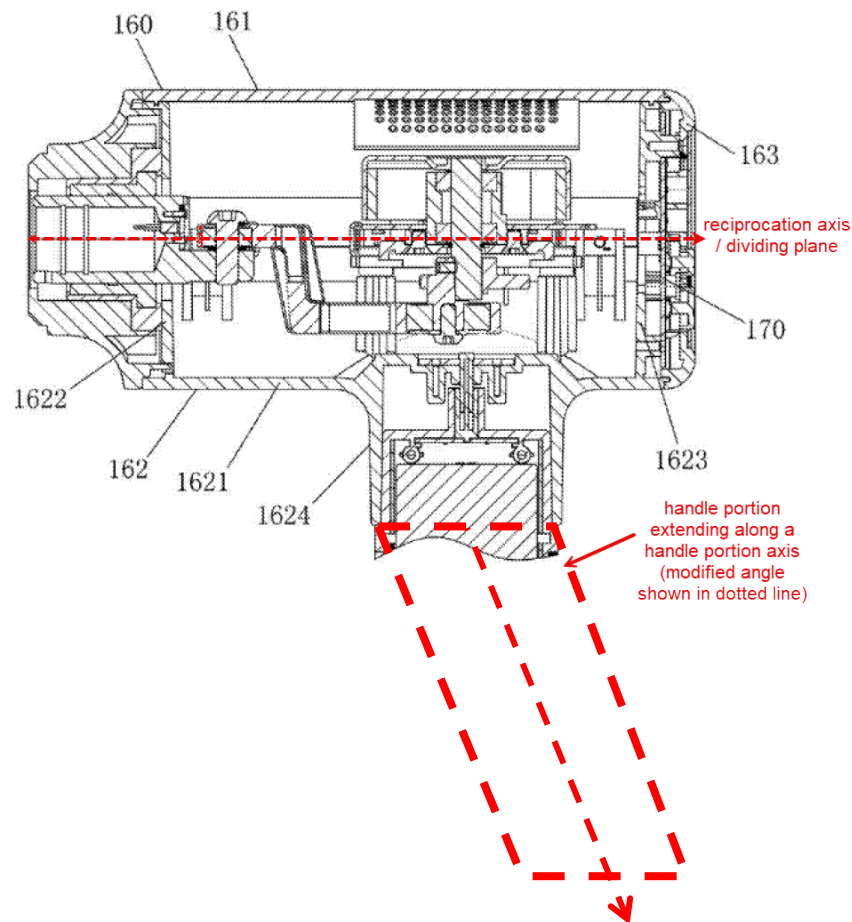
165. Accordingly, in my opinion, claims 5 and 6 are also invalid as obvious in view of Hu '965 and Hu '951.

8. Claim 9

166. Hu '965 in view of Hu '951 teaches or suggests *the handle portion* [220, modified in view of Hu '951] *extends along a handle portion axis* [red dotted line],

understood to also address the broader claim 6.

the reciprocation axis [red double-ended arrow] and the handle portion axis both lie on a common plane [plane of FIG. 6], and the common plane bisects the housing [160]. The cross-sectional view of Figure 6 of Hu '965 is taken along a plane (i.e., a common plane) and is the plane on which both the reciprocation axis [red double-ended arrow] and the handle portion axis [red dotted arrow] lie and which bisects the housing [160] into left and right portions into and out of the page of Figure 6.



167. Accordingly, in my opinion, claim 9 is also invalid as obvious in view of Hu '965 and Hu '951.

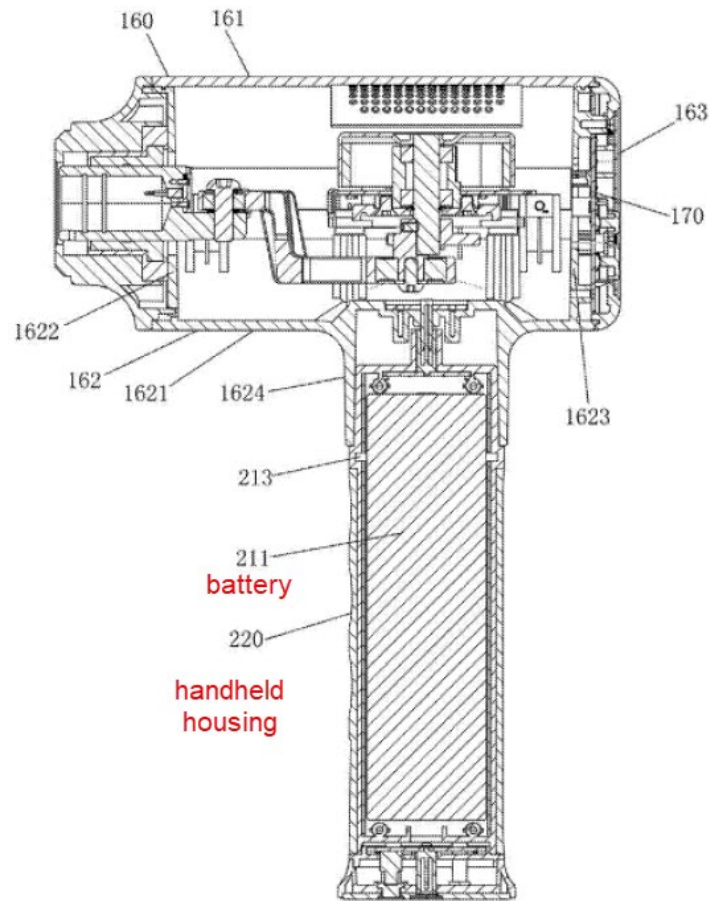
9. Claims 10/16

168. Hu '965 in view of Hu '951 teaches or suggests *a battery* [210/211] *housed in the handle portion* [220] as recited in claim 10 and *a battery* [210/211] *and a handle*¹⁸ [200/220], *wherein the handle* [200/220] *comprises the handle portion* [220] *and the battery* [210/211] *is housed in the handle* [200/220] as recited in claim 16.

169. Hu '965 discloses that “[t]he battery structure 200 comprises a handheld housing 220 [and] a battery assembly 210” and that “the battery assembly 210 comprises a lithium-ion battery 211.” Ex. 1023 at ¶[0041], FIG. 10. The modification to the handle portion [220] of Hu '965 in view of Hu '951 does not change the location of the battery because Hu '951 also places its battery assembly 140 within its angled handle 30/63. See Ex. 1036 at ¶¶[0038], [0045], FIG. 6. A POSITA would, thus, understand that an angled handle, such as in

¹⁸ As explained above, the '919 Patent does not describe “a handle,” only handle portions. Further complicating matters, claim 16 recites “a handle,” but claim 2, from which claim 16 depends, introduces “a handle portion.” Nevertheless, for the avoidance of doubt, the battery structure 200 of Hu '956 includes the handheld housing [the handle portion] 220 and can be equated with the recited “handle comprises the handle portion” as recited in claim 16.

Hu '951 and in modified Hu '965, is suitable to accommodate or house a battery.

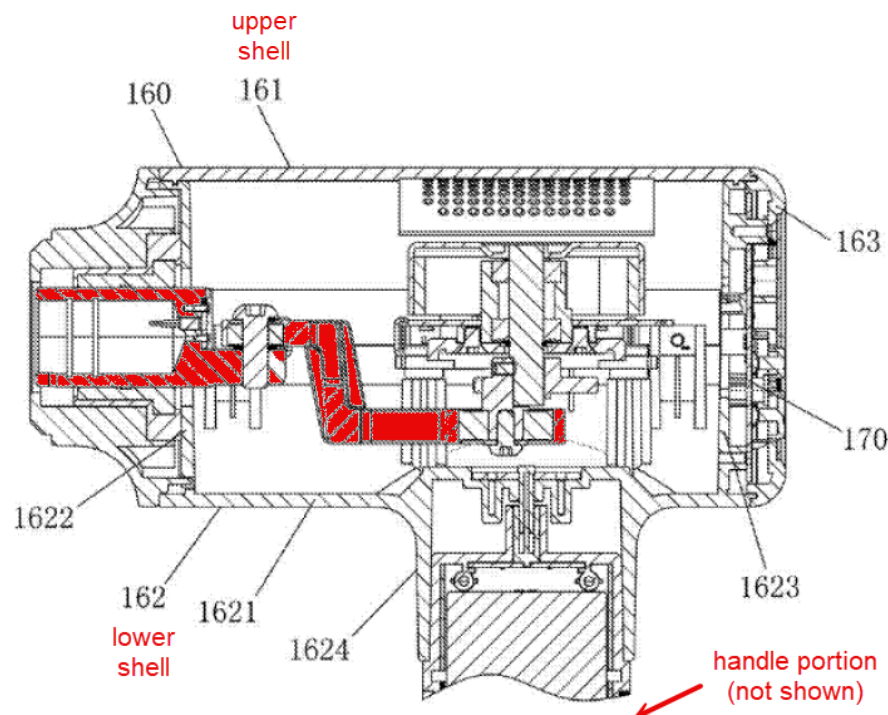


170. Accordingly, in my opinion, claims 10 and 16 are also invalid as obvious in view of Hu '965 and Hu '951.

10. Claim 11/17

171. Hu '965 in view of Hu '951 teaches or suggests *the housing* [160] *comprises a first portion* [162] *that extends away from the handle portion* [220] *and encloses a portion of the push rod assembly* [120/130, red], *and the housing* [160] *comprises a second portion* [161] *that extends away from the handle portion* [220] *and the first portion* [162] as recited in claims 11 and 17.

172. For example, Hu '965 discloses that the “housing 160 comprises an upper shell 161 and a lower shell 162.” Ex. 1023 at ¶[0039]. Referring to Figure 6 of Hu '965 (below), the lower shell [the first portion] 162 of the housing [160] extends upwardly at its ends and, thus, away from the handle portion [220] and encloses at least the low end 122 of the connecting rod 120, which is a portion of the recited push rod assembly. In addition, the upper shell [the second portion] 161 of the housing [160] also extends upwardly from its ends toward its center and, thus, away from both the handle portion [220] and from the lower shell [the first portion] 162.



173. Accordingly, in my opinion, claims 11 and 17 are also invalid as obvious in view of Hu '965 and Hu '951.

B. Ground 3: Claims 7, 8, 12, and 13 are Obvious over Hu '965, Hu '951, and Marton

1. A POSITA Would Have Been Motivated to Combine Hu '965 and Hu '951 with Marton's Teachings with a Reasonable Expectation of Success

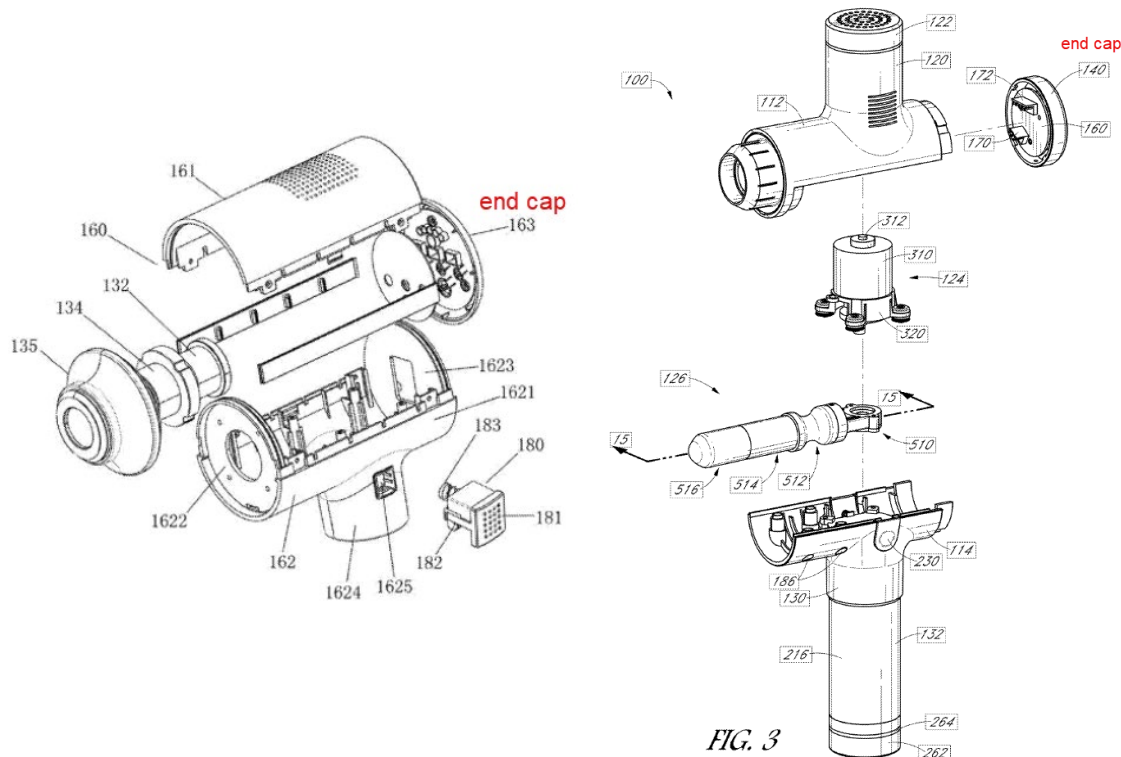
174. Marton, similar to Hu '965 and Hu '951, describes a percussive massage device using an eccentric drive mechanism to convert the rotational output of the motor to reciprocal motion for percussive massage. *See* Section IX.A.1, *supra*; Ex. 1043 at 9:57–10:37, 10:63–11:3. A POSITA would have understood that Marton complements the Hu '965/Hu '951 combination by disclosing a main body endcap 140 including a pushbutton switch 162 and various light-emitting diodes (LEDs) 166/168 on the rear of the percussive massager, which is the direction facing opposite to the application direction of the percussive massager and most commonly toward the user. *Id.* at 7:42–8:18; FIG. 2.

175. In detail, a POSITA would have been motivated to further modify Hu '965/Hu '951 in view of Marton by adding the pushbutton switch 162 and various LEDs 166/168 onto the rear of Hu '965's housing 160 to improve usability for user by making the pushbutton switch that control the motors easily accessible during use and to provide information regarding the operating state of the device to a user in a convenient location. For example, a POSITA would have understood that the rear of a percussive massager, opposite to the direction of force application by the

massage head, is usually pointed toward the user's face and eyes during use because the user is looking to where the massager is being applied. Thus, a POSITA would have understood that the rear of a percussive massager is the portion of the device most often in the user's eyesight such that it is a desirable location to place components intended for the user's interaction and viewing, such as a pushbutton switch to control the motor and LEDs graphically describing various states of the device.

176. Moreover, a POSITA would have had a reasonable expectation of success in combining the teachings of Marton with Hu '965/Hu '951. First, these devices are each percussive massagers featuring a common "gun-type" layout, with a central housing and a downwardly extending handle, and operate on similar design principles. Second, Hu '965 and Marton feature a similar relatively large, flat "end cap," the area near to 163 in Hu '965 / 140 in Marton (see images below), at the rear of their central housing 160 in Hu '965 / 110 in Marton and both accommodate a circuit board 170 in Hu '965 / 160 in Marton therein. Ex. 1023 at ¶[0045], FIGS. 6, 11; Ex. 1043 at 7:62–8:24, FIGS. 4A and 4B. Thus, a POSITA would have understood that because Hu '965 and Marton already feature similar flat "end cap" designs, Hu '965's end cap 163 is a suitable location to accommodate the pushbutton switch and LEDs taught by Marton without substantial reconstruction or redesign of Hu '965's design.

177.

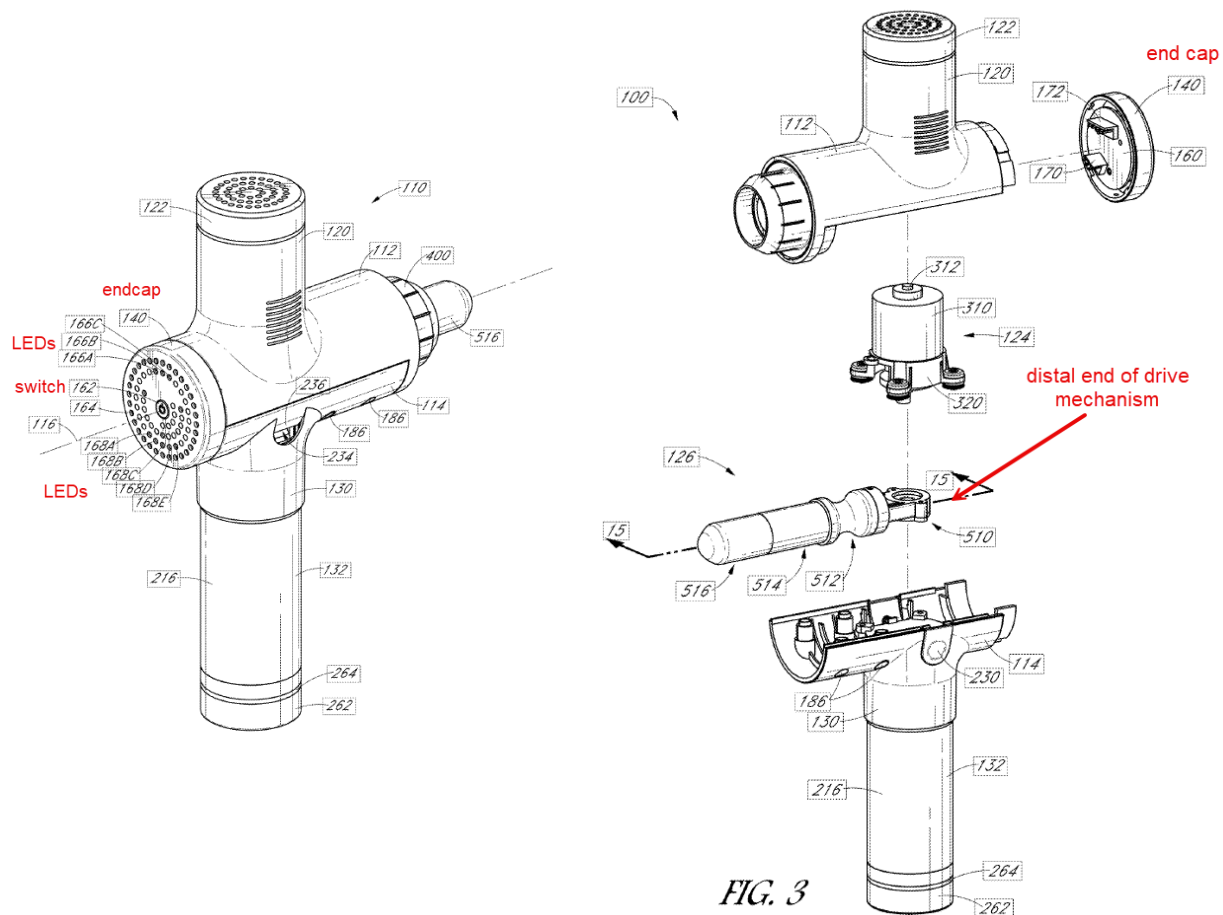


2. Claims 7/8/12/13

178. Each of claims 7, 8, 12, and 13 recites a variation of the percussive therapy device comprising a switch for activating the motor on a portion of the housing that faces an opposite direction as the distal end of the push rod assembly or the output shaft (claimed as a “backward facing switch” in claim 12) with claims 8 and 12 adding an electronic display facing the same direction as the switch. In my opinion, Hu ’965 in view of Hu ’951 and Marton teaches or suggests the limitations of each of Claims 7, 8, 12, and 13.

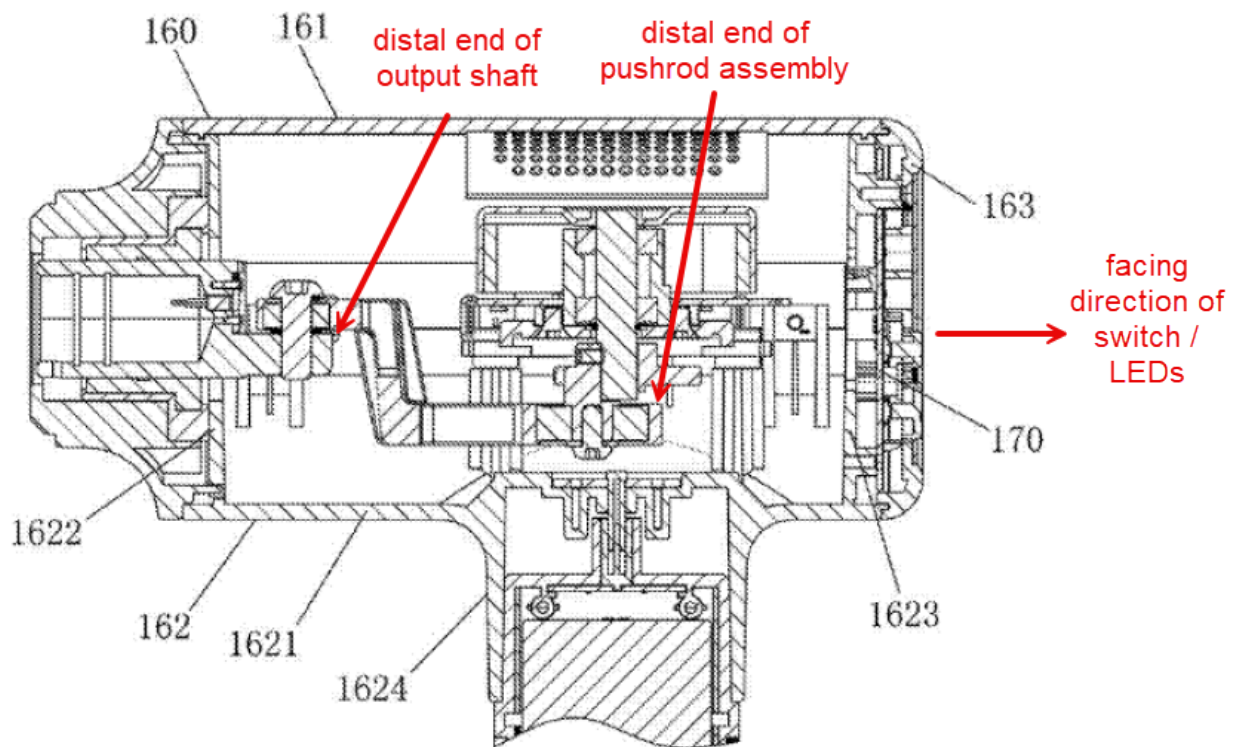
179. In particular, as explained above, Marton discloses and teaches a main body endcap 140 that forms part of the housing 110 by “serv[ing] as a clamping

mechanism to hold the respective proximal ends of the upper body portion 112 and the lower body portion 114 together.” Ex. 1043 at 7:42–47. A POSITA would have understood that Marton teaches that the pushbutton switch 162 is configured to activate the motor and the LEDs 166/168 act as one or more electronic displays and are located on the endcap 140 and respectively face an opposite direction as the pushrod assembly, also referred to as backwards. *Id.* at 7:62–8:18, 23:4–38 (describing switch 162 as being configured to control on/off states and speeds of the motor), 23:53–24:4 (describing the LEDs 166A-C as displaying the on state/selected speed of the motor), 24:19–23 (describing the LEDs 168A-E as displaying the battery charge state), FIG. 2 and 3. Briefly, the ’919 Patent does not describe an “electronic display;” however, it explains that “The display 709” is “a series of LEDs depicting an amount of force,” “current battery or battery pack charge,” or “current speed of the percussive massage device.” Ex. 1001 at 8:55–63. Thus, a POSITA would have understood that Marton’s LEDs, which display the on state/selected speed of the motor and the battery charge state are equivalent the “electronic displays” as recited in claims 8 and 12.



180. As explained previously, a POSITA would have been motivated incorporate Marton's pushbutton switch 162 and LEDs 166/168 onto the endcap 163 of Hu '965's device because it is a suitable location that already accommodates a circuit board 170 and would provide the user with easier ability to turn the motor on/off and would make important device information, such as motor speed and battery charge state, readily visible to the user while the device is in use. Ex. 1023 at ¶[0045]. A POSITA would have understood that, based on Marton's teachings, these additional features taught by Marton would complement Hu '965's existing main power switch 241, located at the bottom of the battery structure 200, and light

guide plate 230, which displays battery charge state, because Marton itself including the switch 162 and LEDs 166/168 on the endcap 140 in combination with an on/off switch 256 and a plastic ring 264 that also display battery charge state at the bottom of the battery assembly 132. Ex. 1023 at ¶[0041]; Ex. 1040 at 9:33–56. Moreover, similar to Marton’s disclosure, in modified Hu ’965, the switch 162 and LEDs 166/168 would respectively face an opposite direction as the pushrod assembly [120/130], also referred to as backwards, as shown below.



181. Accordingly, in my opinion, claims 7, 8, 12, and 13 are invalid as obvious in view of Hu ’965, Hu ’951, and Marton.

C. Ground 4: Claims 1–6, 9–11, and 14–20 are Obvious Over Pepe, Hu ’951, and Huang

1. A POSITA Would Have Been Motivated to Modify Pepe in View of Hu ’951 and Huang’s Teachings with a Reasonable Expectation of Success

182. A POSITA would have understood that Pepe, Hu ’951, and Huang are each directed to the same class of handheld percussive therapy devices (often referred to percussive massagers or massage guns) addressing the same basic design challenges, such as ergonomic handling of a motor-driven percussion mechanism during use on different areas of a user’s body. Ex. 1025 at Title, ¶¶[0024], [0026]; Ex. 1036 at Title, ¶¶[0011], [0038]; Ex. 1035 at ¶¶[0019], [0020]. A POSITA would also understand that Pepe, Hu ’951, and Huang each disclose a handheld massage device incorporating (i) a drive mechanism designed to convert rotary motion output from a motor into reciprocal, percussive motion; and (ii) a handle designed to allow a user to grip and control the device during operation. *Id.* Based on the overarching design similarities, a POSITA would have readily looked to and between Pepe, Hu ’951, and Huang to provide an improved percussive massager.

a) Pepe in view of Hu ’951

183. As explained above in detail, as early as the early 1900s, the use of obtuse angle, *i.e.*, “pistol grip” style, handles were known to provide ergonomic benefits by allowing the wrist and hand to sit in a more natural alignment. Hu ’951

is merely an application of this well-known design concept to percussive massagers. *See* Section IX.A.1, *supra*. Specific to this combination, Pepe describes its own device as “look[ing] similar to a drill,” and handheld drills were modified to have a pistol grip handle as early as 1914. Ex. 1025 at ¶[0023]; Ex. 1046. Accordingly, for the reasons as discussed above in Section IX.A.1, in my opinion a POSITA would have been motivated to modify Pepe’s primary handle 12, which is most often used handle and “meant to be gripped by [the user’s] dominant ... hand[,],” to form an angle “that is greater than 90° and less than or equal to 135°” with respect to the shaft 18 (as forming the device’s operative axis) as taught by Hu ’951 to provide known ergonomic benefits to users. Ex. 1025 at [0024]; Ex. 1036 at ¶[0036].

b) Pepe/Hu ’951 in view of Huang

184. Although Pepe describes an operative percussive massager, it does not specifically limit the drive mechanism. Rather, Pepe simply states that “the device 10 further comprises a motor unit 20 ... [that] houses a motor (not shown) that drives the shaft 18” and that “[t]he motor is disposed in operative mechanical communication with the shaft 18 whereby, the motion outputted by the motor is transmitted to the shaft 18 by means of gears, or the like.” Ex. 1025 at ¶[0026]. Pepe further explains that “the motion transmitted to the shaft 18 is rotary motion. In one embodiment, the motion imparted to the shaft 18 by the motor is pulsating, longitudinal to-and-fro motion.” *Id.* A POSITA would have understood that Pepe’s

silence as to any particular specific drive mechanism means that Pepe is amenable to any suitable drive mechanism that can convert the motor's rotational output to the reciprocal (referred to as "longitudinal to-and-fro" motion"). *Id.*

185. As such, in my opinion, a POSITA would have been motivated to look to known rotational-to-reciprocal drive mechanisms, with a particular focus on such drive mechanisms used in other handheld percussive massagers, to complement and complete Pepe's disclosure. A POSITA would have identified Huang as a suitable example. Huang discloses an eccentric drive mechanism that converts rotational output from the output shaft 34 of the motor 30 to reciprocal motion in a connecting rod 40 by using a crank arm 36. Ex. 1035 at ¶¶[0020]–[0021] ("In operation, the rotation of output shaft 34 by motor 30 causes each connecting rod 40 to reciprocate axially."). Thus, a POSITA would have identified and understood that Huang's eccentric drive mechanism is suitable for use in Pepe's device as it would achieve Pepe's design intent. Moreover, given the similarities of Pepe and Huang as handheld percussive massagers, a POSITA would have understood that incorporating Huang's eccentric drive mechanism in Pepe, *e.g.*, between the motor and shaft 18, to be an application of a rotational-to-reciprocal drive mechanism known to be suitable for handheld percussive massagers and would have had a reasonable expectation of success in such a combination.

2. Claim 1

a) Claim 1[pre]

186. If the preamble is determined to be limiting, Pepe in view of Hu '951 and Huang teaches or suggests *a percussive therapy system*. Pepe describes its device as “an electronic, wireless, portable, handheld massage device for relieving muscle aches, stress and pains resulting from strenuous workouts, injuries, etc.” that “helps support hot, cold, vibratory and percussive therapeutic techniques.” Ex. 1025 at ¶[0005]. Pepe also discloses that its device includes a “motor unit [that] houses a motor that drives the shaft [18],” and “The free extremity of the shaft is removably fitted with a massage head whereby, when the motor is activated, the motion of the shaft is imparted to the massage head.” *Id.* at ¶¶[0006], [0008]. Pepe explains that “In one embodiment, the motion imparted to the shaft 18 by the motor is pulsating, longitudinal to-and-fro motion” and “the to-and-fro motion is part of percussive massage therapy.” *Id.* at ¶[0026]. Taken together, a POSITA would have understood Pepe’s disclosure as describing a percussive therapy system.

b) Claim 1[a]–[d] – Device Structure¹⁹

187. Pepe in view of Hu '951 and Huang teaches or suggests 1[a] *a percussive therapy device [10]*²⁰ *comprising 1[b] a housing [11], 1[c] a handle portion [12], and 1[d] a motor [20] positioned in the housing [11] and configured to output torque about a motor axis [red dotted line].*

188. Pepe describes its device 10 as “compris[ing] an outer body 11, which is unitary piece preferably made of a hard plastic material.” Ex. 1025 at ¶[0024]. The outer body 11 “comprises pair of substantially parallel handles viz., primary 12 and secondary 14,” which are designed to be gripped by the user, and “further comprises a shaft unit 16 ... [that] houses a shaft 18.” *Id.* at ¶¶[0024]–[0025]. According to Pepe, “the shaft unit 16, the base member 22, and the pair of handles 12 and 14 are integral with respect to one another,” which a POSITA would have understood to be a housing as recited. *Id.* at ¶[0025].

189. Pepe further explains that its device 10 “further comprises a motor unit 20 [below, blue], which comprises a cylindrical structure extending through the

¹⁹ Any *italicized* text is claim language, and the claim limitations are labeled using the number and bracketed letter.

²⁰ All bracketed reference numerals refer to elements of Pepe (Ex. 1025) unless specifically described otherwise.

integral portion of the device 10 that joins the primary handle 12 and the shaft unit 16,” and the “motor unit 20 houses a motor (not shown) that drives the shaft 18.” *Id.* at ¶[0026]; *see also id.* at cl. 5 (“the motor unit extends through the outer body”). A POSITA would have understood, from Pepe’s disclosure, that the motor unit 20 [blue] extends from one side of the housing 11, through the housing 11, and from the opposite side thereof as shown below. A POSITA would have understood from Pepe’s disclosure that the motor in the motor unit 20 is similarly positioned in the housing 11 as the motor is in the motor unit 20.

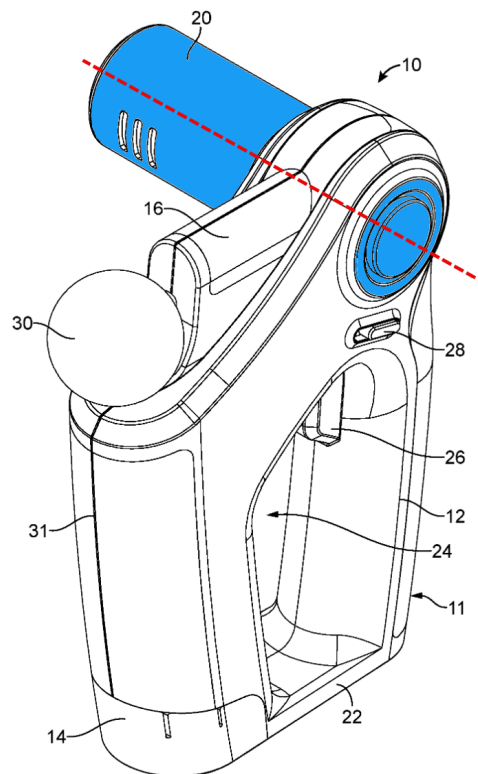


FIG. 1

190. Moreover, a POSITA would have understood that it is desirable to locate the motor at least partially in and connected to the housing even when the

motor partially protrudes from the housing. By including the motor at least partially in the housing, the motor's torque is more easily controlled and transferred to the shaft 18. Also, by connecting the motor to the housing, a stronger connection is achieved that can reduce vibrations and provide the perception of a more solid device. These design principles are present in at least Hu '951 and Marton. For example, Figure 6 of Hu '951 (below left) and Figure 7 of Marton (below right) both show that, even though the motor extends away from the central housing, it still extends at least partially into the central housing and is connected to the central housing (rather than being only connected to the portion of the housing extended from the central housing). Thus, a POSITA would have understood that Pepe's design would follow these same design principles, placing the motor at least partially in the housing 11 to provide an easier to control device with a more solid feel to the user.

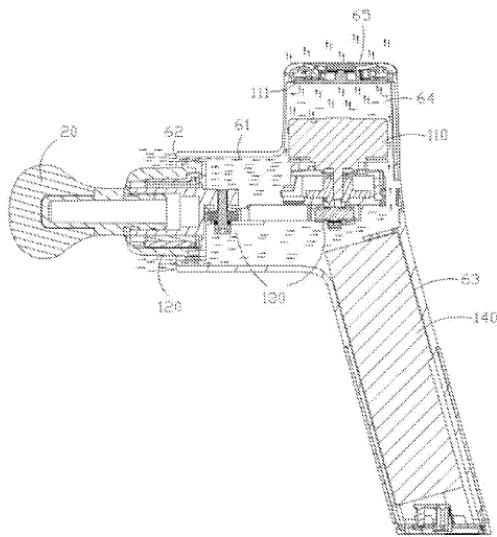


Fig. 6

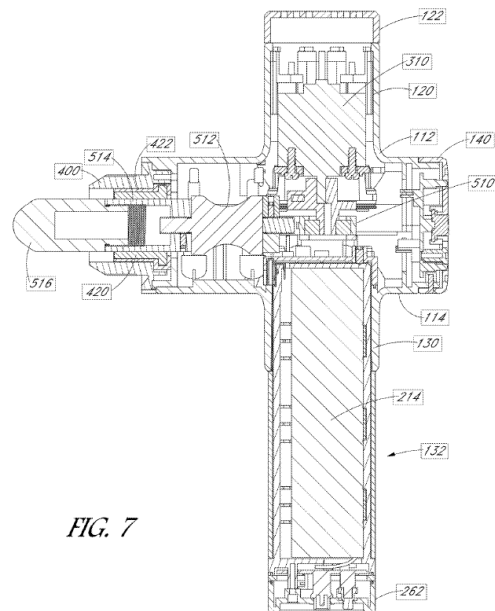
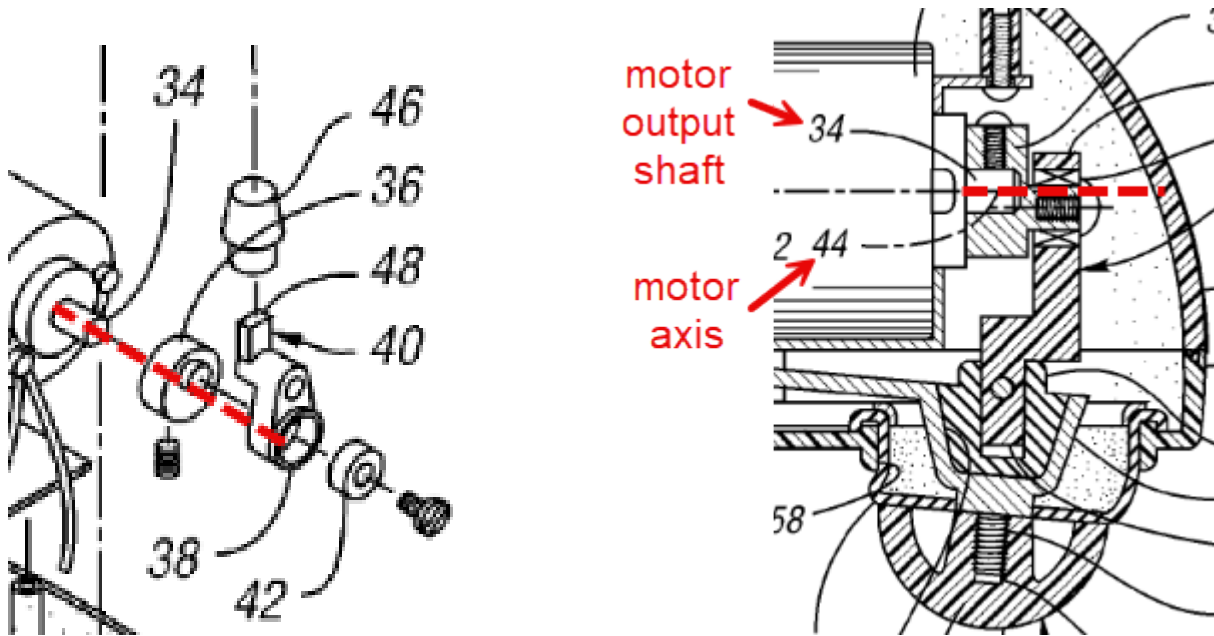


FIG. 7

191. Further, Pepe describes that “The motor is disposed in operative mechanical communication with the shaft 18 whereby, the motion outputted by the motor is transmitted to the shaft 18 by means of gears, or the like,” and that “the motion transmitted to the shaft 18 is rotary motion.” *Id.* at ¶[0026]. A POSITA would have understood that the “rotary motion” transmitted from the motor to the shaft 18 is output torque, that is, a rotational force, about a motor axis.

192. Huang, similar to Pepe, discloses “An output shaft 34 [that] is rotatably driven by motor 30.” Ex. 1035 at ¶[0020], FIGS. 4 and 5. The rotatably driven output shaft 34 outputs torque about a motor axis. For ease of understanding, the right-side eccentric drive mechanism in Pepe is highlighted in Figure 4 because it is more visible and includes reference numerals. It is a mirror image of the left-side drive mechanism.



c) **Claim 1[e]–[f-2] – Drive Mechanism**

193. Pepe in view of Hu '951 and Huang teaches or suggests 1[e] *an eccentric shaft [Huang-36, blue] configured to travel in a circle about the motor axis in response to activation of the motor.* Huang describes its drive mechanism as including “A crank arm 36 [that] is affixed to each end of output shaft 34 [yellow] adjacent motor 30, so that crank arms 36 rotate along with output shaft 34 [yellow]” and “a first end 38 of a vertical connecting rod 40 [red] is affixed eccentrically, preferably with a rotary bearing 42 [green] (best shown in FIG. 4) in between crank arm 36 and connecting rod 40 [red].” Ex. 1035 at ¶[0020]. As shown in Figure 5 of Huang (below), the eccentric shaft [part of the crank arm 36, blue] is offset from the motor axis 44 and the motor output shaft 34, which a POSITA would have understood as causing the eccentric shaft to travel in a circle about the motor axis 44 in response to activation of the motor 34.

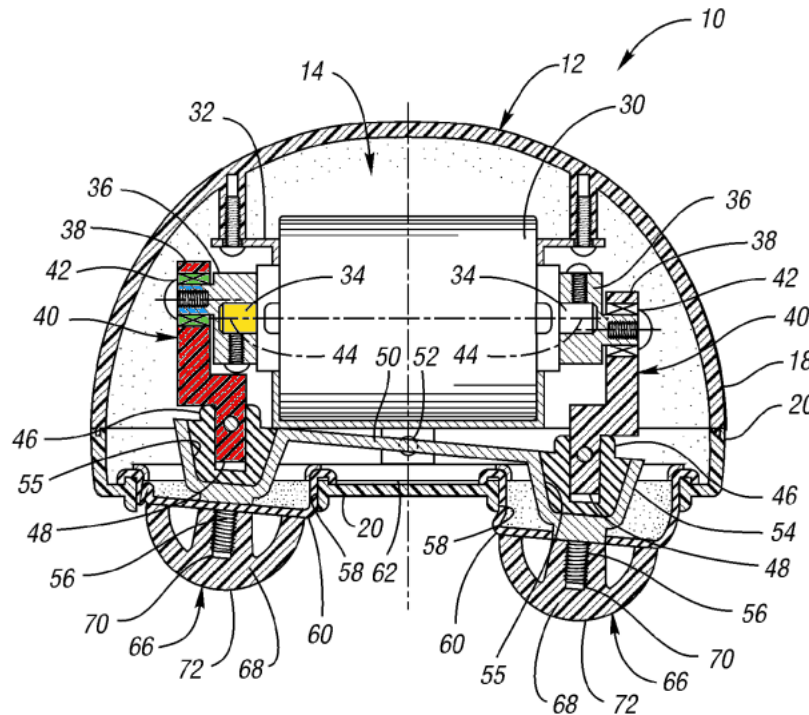


Fig. 5

194. Pepe in view of Hu '951 and Huang also teaches or suggests 1[f-1] *a push rod assembly [Pepe-18/Huang-40] operatively connected to the motor [20] and configured to reciprocate in response to activation of the motor, and 1[f-2] comprising an output shaft [Pepe-18] configured to travel along a reciprocation axis [red double-ended arrow] when the push rod assembly reciprocates.*

195. Referring to the annotated Figures 4 and 5 of Huang provided in Section IX.C.2.b, above, Huang discloses a connecting rod 40 operatively connected to the motor 30 (via the crank arm 36) and configured to reciprocate in response to activation of the motor. Pepe also discloses that the “motor ... drives the shaft 18” to provide “longitudinal to-and-fro motion.” Ex. 1025 at ¶[0026]. Based at least on these disclosures, a POSITA would have been motivated to implement Huang’s

crank arm 36 and connecting rod 40 between Pepe's the motor and the shaft 18 to complement and complete Pepe's disclosure. In this combination, a POSITA would have understood that the push rod assembly would include Huang's connecting rod 40 and Pepe's shaft 18, which would be configured to reciprocate together in response to activation of the motor 20 via Huang's crank arm 36. Ex. 1025 at ¶[0026]; Ex. 1035 at ¶[0021].

d) Claim 1[f-3]/[f-6] – Handle Alignment

196. Pepe in view of Hu '951 and Huang teaches or suggests 1[f-3] *the reciprocation axis [red double-ended arrow] extends transverse to the handle portion [12] on a dividing plane normal to the motor axis [reciprocation axis (red dot) extending into the page in plane with the blue line in FIG. 6] and 1[f-6] an interior angle defined between the handle portion [12] and the output shaft [18] is obtuse.*

197. As explained above, a POSITA would have been motivated to modify the primary handle 12 of Pepe to form an angle greater than 90° and less than 135° with the shaft 18, which define the device's operative axis. The modified primary handle 12 is illustrated as the red rectangular shape in Figure 3 of Pepe.

198. Turning to the claim limitations, Pepe in view of Hu '951 and Huang teaches or suggests that the reciprocation axis [red double-ended arrow in FIG. 3 of Pepe (below left); red dot in FIG. 6 of Pepe (below right) extending into the page

(exaggerated in size for visibility²¹)] extends transverse to, *i.e.*, is non-parallel with, the modified handle portion 12 [the **red** dotted line in FIG. 3 represents the axis of the primary handle 12 modified in view of Hu '951 and is non-parallel to the reciprocation axis]. Further, the reciprocation axis [**red** double-ended arrow in FIG. 3, **red** dot in FIG. 6] is on a dividing plane [**blue** line in FIG. 6 extending into the page; the red double-ended arrow in FIG. 3 extending into the page in FIG. 6] normal to the motor axis [the dividing plane (**blue** line in FIG. 6) is normal to, *i.e.*, perpendicular to, the motor axis (the **red** dotted double-ended arrow in FIG. 6)].

²¹ In the mechanical arts, “planes” and “axis (or axes)” are treated as if they have zero thickness because they are reference features rather than physical structures. Because a zero thickness plane or axis cannot be illustrated, I have exaggerated the size of these imaginary reference features for easier illustration and comprehension.

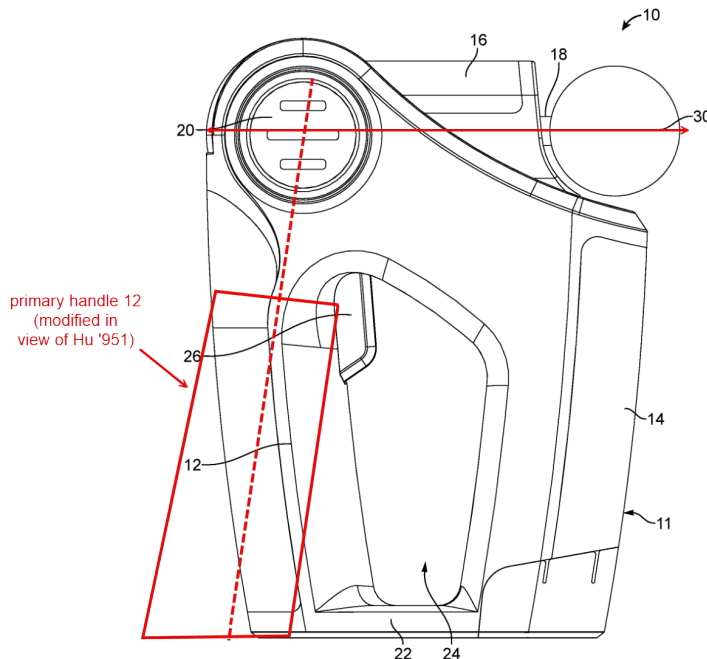


FIG. 3

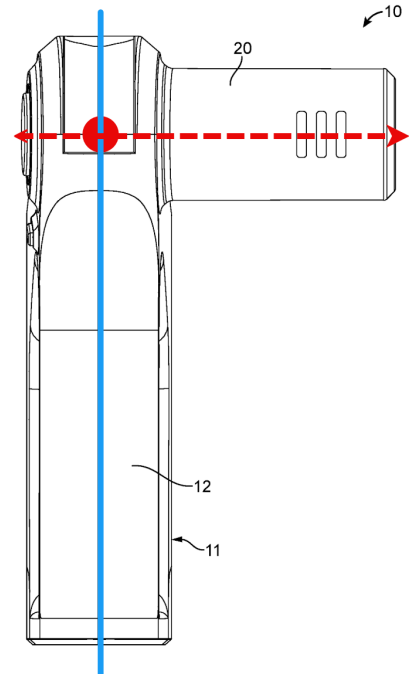
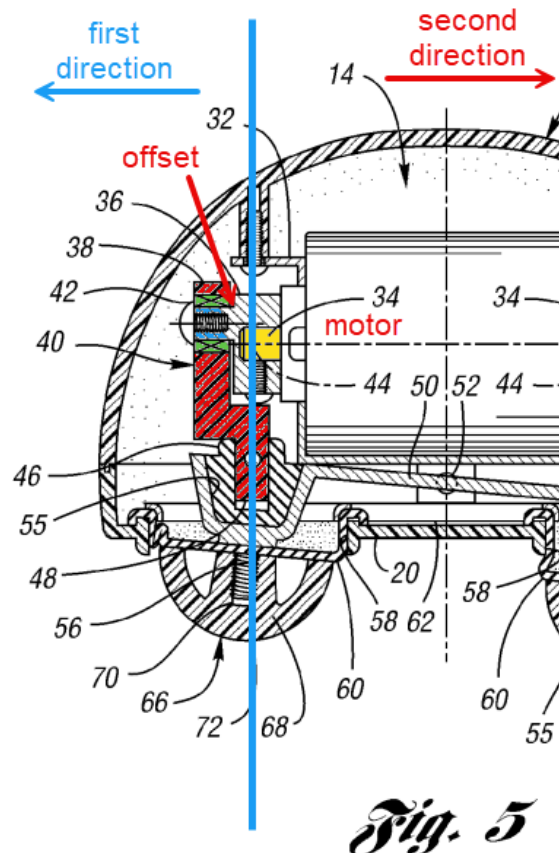


FIG. 6

e) **Claim 1[f-4]/[f-5] – Dividing Plane**

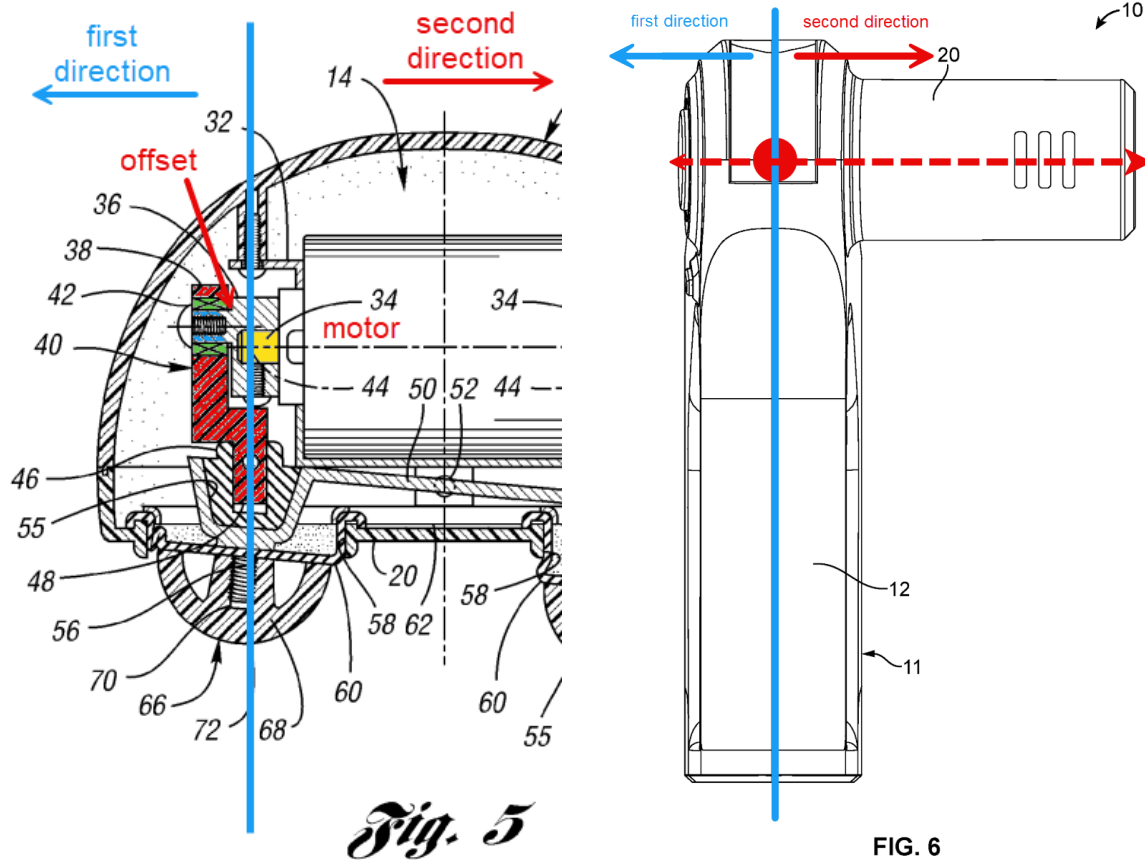
199. Pepe in view of Hu '951 and Huang teaches or suggests 1[f-4] *a proximal end of the push rod assembly [Huang-40] is connected to the eccentric shaft [Huang-36, blue] at a location [at the bearing 42, green] offset from the dividing plane [blue line extending into the page of FIG. 5 of Huang / FIG. 6 of Pepe] in a first direction [blue arrow], and 1[f-5] the motor [Pepe-20] extends transverse to the handle portion [Pepe-12] and away from the dividing plane [blue line] in a second direction [red arrow] opposite the first direction [as shown].*

200. Referring first to FIG. 5 of Huang (below), the area where the connecting rod 40 [red] is connected to the eccentric shaft/crank arm 36 [blue] via the bearing 42 [green] is offset from the dividing plane [blue line extending into the page] in a first direction [blue leftward arrow in FIG. 5].



201. Referring to Figure 5 of Haung (below left) together with Figure 6 of Pepe (below right), Figure 6 of Pepe shows that the motor [20] extends rightward while the handle portion [12] extends generally downwardly. As such, a POSITA would have understood that the motor [20] extends transverse to the handle portion [12]. Moreover, Figure 5 of Huang confirms that the motor 34 extends away from the dividing plane [blue line] in a second direction [red arrow] opposite to the first direction [blue arrow]. Huang discloses two mirror-image drive mechanisms on either side of the motor 30, and the left-side drive mechanism depicted in Figure 5 (below) matches the orientation of the motor in Figure 6 of Pepe. Ex. 1010, ¶¶[0020]-[0025]. As can be seen in the below figures of Pepe and Huang, a POSITA

would understand that the motor extends away from the dividing plane [blue line] in the second direction [red arrow].



f) Claim 1[g] – Attachment

202. Pepe in view of Hu '951 and Huang teaches or suggests *an attachment* [30] *configured to be operatively connected to the output shaft* [18] *of the percussive therapy device*. For example, Pepe states that “the free extremity of the shaft 18 is removably fitted with a massage head 30” and that “when the motor is activated, the motion of the shaft 18 is imparted to the massage head 30, at which point, the massage head 30 is said to be active.” Ex. 1025 at ¶[0028].

203. Accordingly, in my opinion, claim 1 is invalid as obvious in view of

Pepe, Hu '951, and Huang.

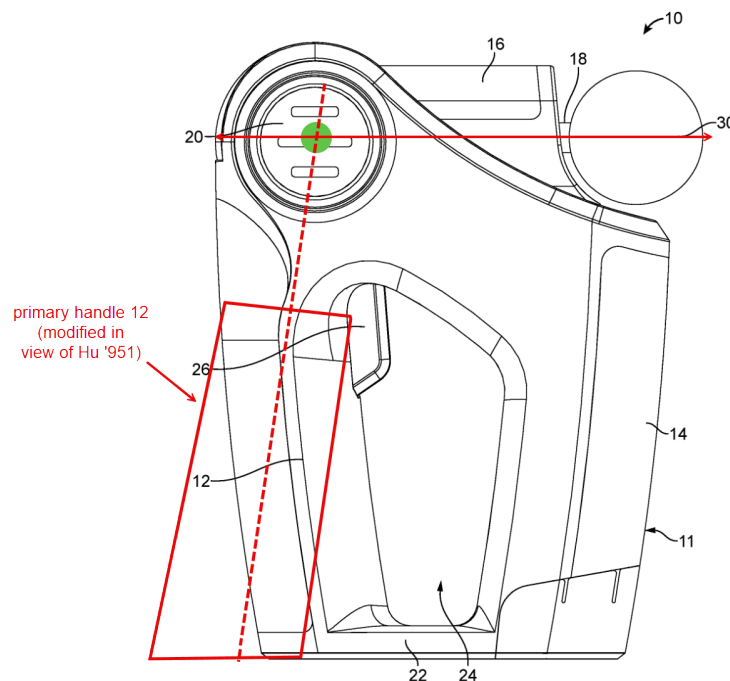
3. Claims 2/18

a) Claim 2/18[pre]

204. If the preamble is determined to be limiting, Pepe in view of Hu '951 and Huang teaches or suggests *a percussive therapy device* [10]. See Section IX.C.2.b, *supra* (discussing Claim 1[a]).

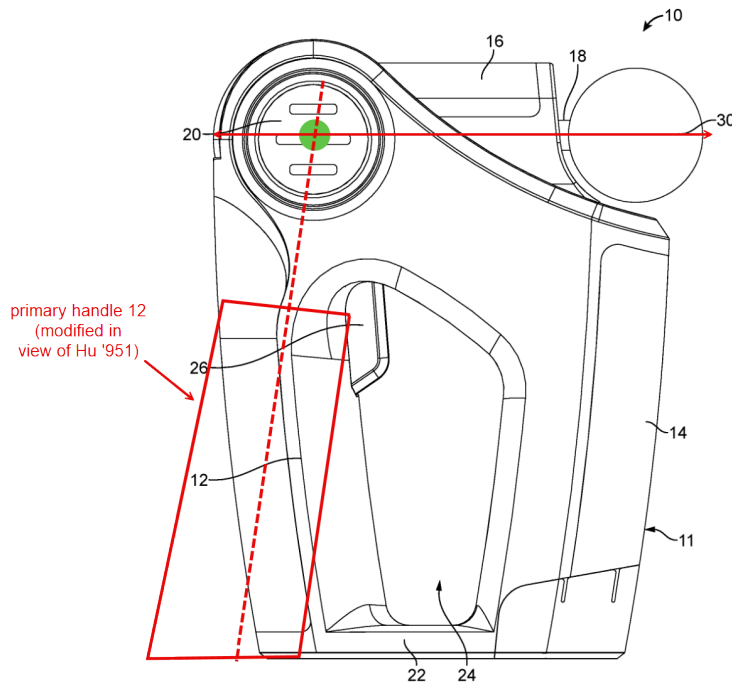
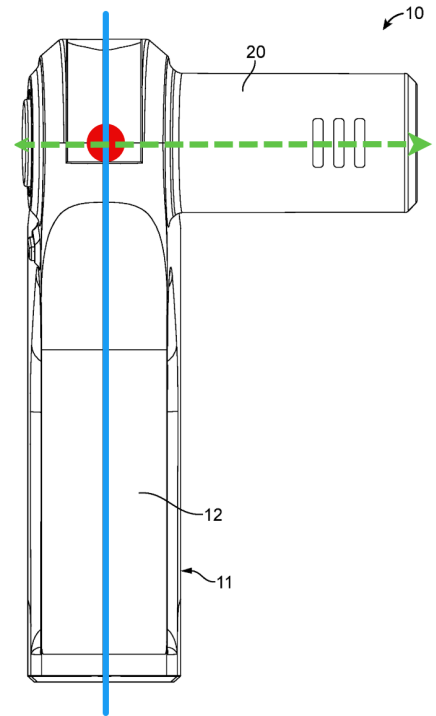
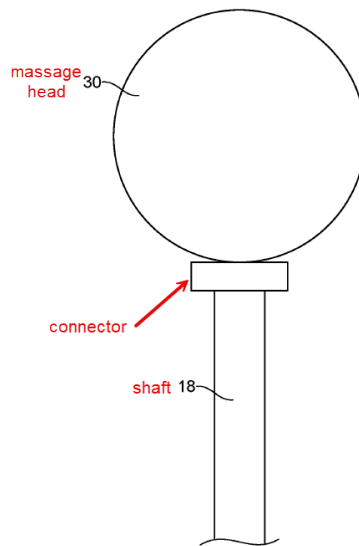
b) Claim 2/18[a]–[c] – Device Structure

205. Pepe in view of Hu '951 and Huang teaches or suggests 2/18[a] *a motor* [20] *configured to output torque about a motor axis* [green dot extending into the page of Figure 3 of Pepe, below], 2/18[b] *a handle portion* [12, modified in view of Hu '951] *extending along a handle portion axis* [red dotted line], and 2/18[c] *a housing* [11]. See Section IX.C.2.b, *supra* (discussing Claim 1[a]–[d]).



c) **Claim 2/18[d]–[d-2], [h] – Drive Mechanism**

206. Pepe in view of Hu '951 and Huang teaches or suggests 2/18[d] *a push rod assembly [Pepe-18/Huang-40] comprising: 2/18[d-1] an output shaft [18] configured to reciprocate along a reciprocation axis [red double-ended arrow in Figure 3 of Pepe, below; red dot extending into the page in Figure 6 of Pepe, below] in response to activation of the motor and having a distal end [the exposed end of the shaft 18] that comprises a connector for an attachment [30], wherein the output shaft [18] is centered on the reciprocation axis [red double-ended arrow/red dot] and the reciprocation axis extends on a dividing plane [blue line extended into the page of Figure 6 of Pepe, below]. See Section IX.C.2.c, supra (discussing Claim 1[f-1], [f-2], and [e]).* Pepe describes that the shaft 18 reciprocates along a reciprocation axis when the motor is activated and has a distal end, described as “the free extremity of the shaft 18,” that is configured to be received in “a central hole” in the massage head 30 “to mount the massage head 30 to the shaft 18.” Ex. 1025 at ¶[0028]; FIG. 9A. A POSITA would have understood that the distal end of the shaft 18 comprises a connector for the massage head 30 because the distal end of the shaft 18 is designed to connect to (referred to as “mount” in Pepe) the massage head 30.



207. Pepe in view of Hu '951 and Huang also teaches or suggests 2/18[d-2] *a push rod [Huang-40, red] having a proximal end [Huang-38] operatively connected to the motor [Pepe-20] and a distal end [Huang-48] connected to the*

output shaft [Pepe-18] and also teaches or suggests 2/18[h] the device includes an eccentric shaft [Huang-36, blue] that is configured to travel in a circle about the motor axis [Huang-44] when the motor is active. See Section IX.C.2.c, supra (discussing Claim 1[f-1], [f-2], and [e]).

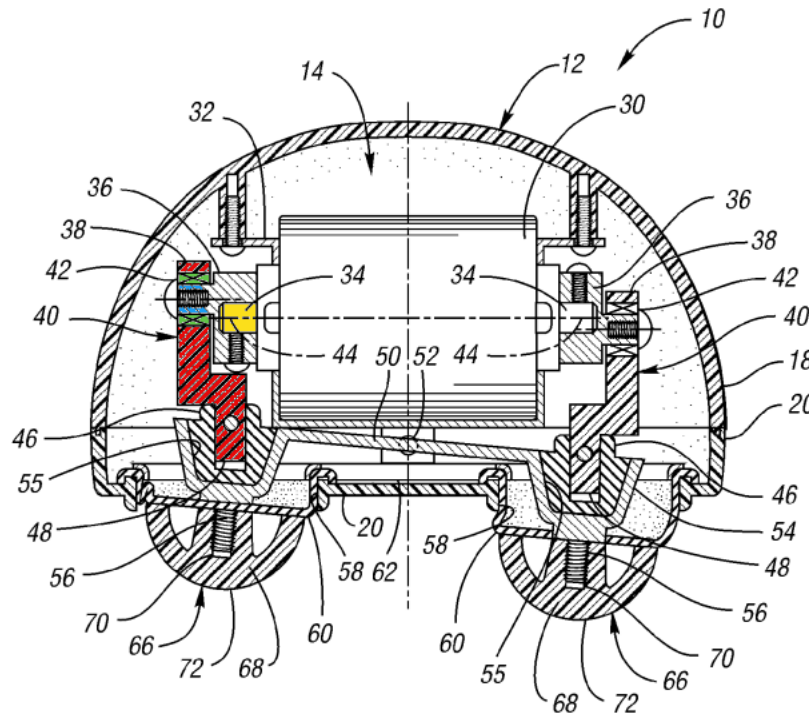


Fig. 5

d) Claim 2/18[e]–[g] and [i] – Spatial Arrangement

208. Pepe in view of Hu '951 and Huang teaches or suggests 2/18[e] *the dividing plane [blue line extending into the page of Figure 6 of Pepe (below left)] is normal to the motor axis [green double-ended arrow line in Figure 6; green dot in Figure 3 of Pepe (below right)], 2/18[f] the handle portion axis [red dotted line in Figure 3 of Pepe (below right)] extends at an oblique angle to the reciprocation axis [red double-ended arrow] and intersects the reciprocation axis*

and the motor axis [intersection of the **red** dotted line, the **red** double-ended arrow, and the **green** dot the as shown in Figure 3 of Pepe (below right)].

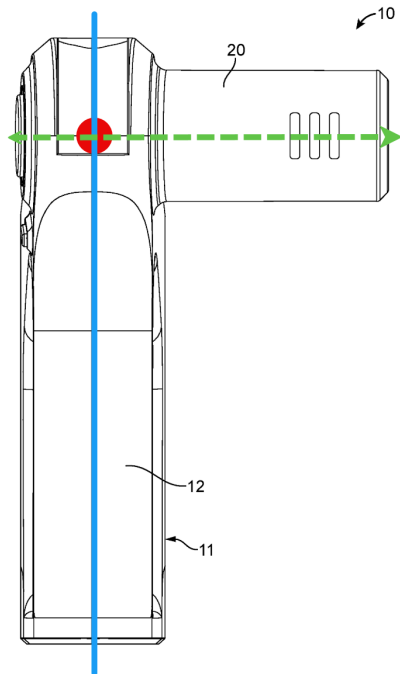


FIG. 6

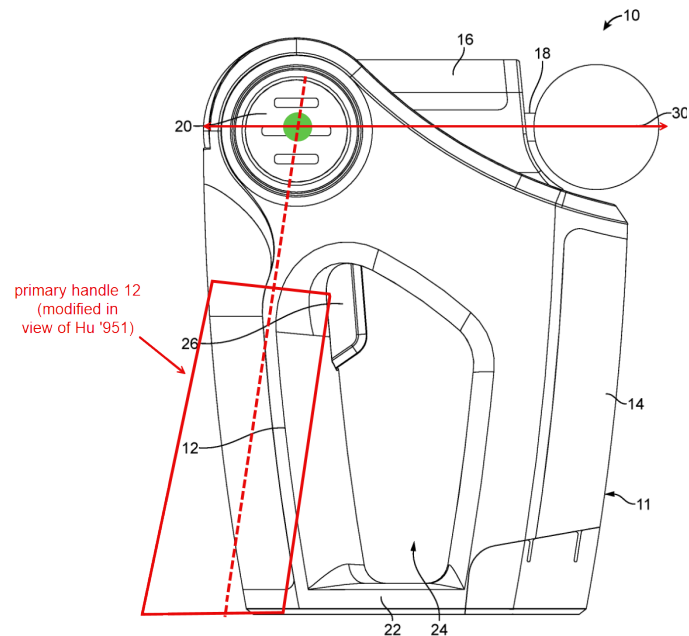


FIG. 3

209. Pepe in view of Hu '951 and Huang also teaches or suggests 2/18[g] the motor [Pepe-20] is located on a first side [**red** arrow] of the dividing plane [**blue** line], and 2/18[i] the proximal end [Huang-38] of the push rod [Huang-40, **red**] is operatively connected to the motor [Pepe-20] by the eccentric shaft [Huang-36, **blue**], wherein the proximal end [Huang-38] of the push rod [Huang-40, **red**] is coupled to the eccentric shaft [Huang-36, **blue**] on a second side [**blue** arrow] of the dividing plane that is opposite from the first side of the dividing plane [as shown using the right-side drive mechanism of Huang for consistency with Figure 6 of Pepe].

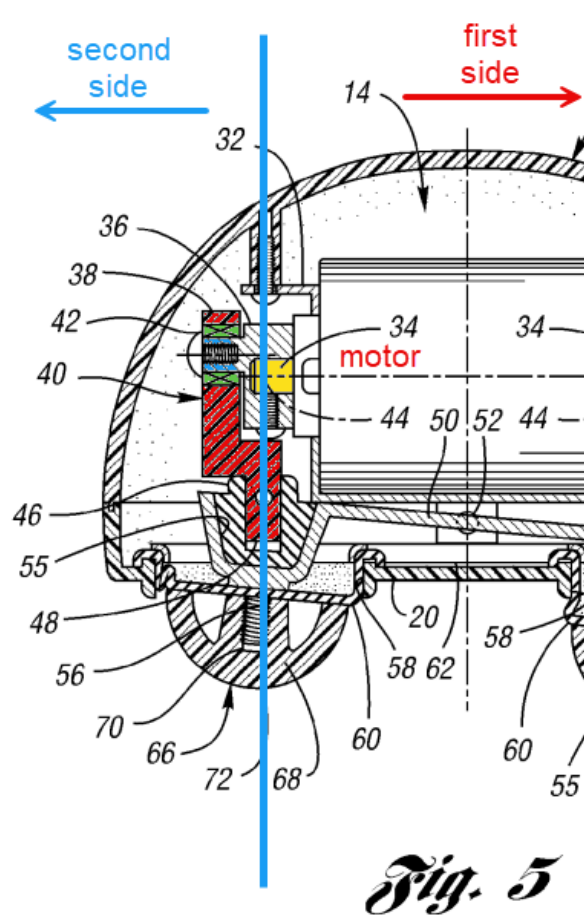


Fig. 5

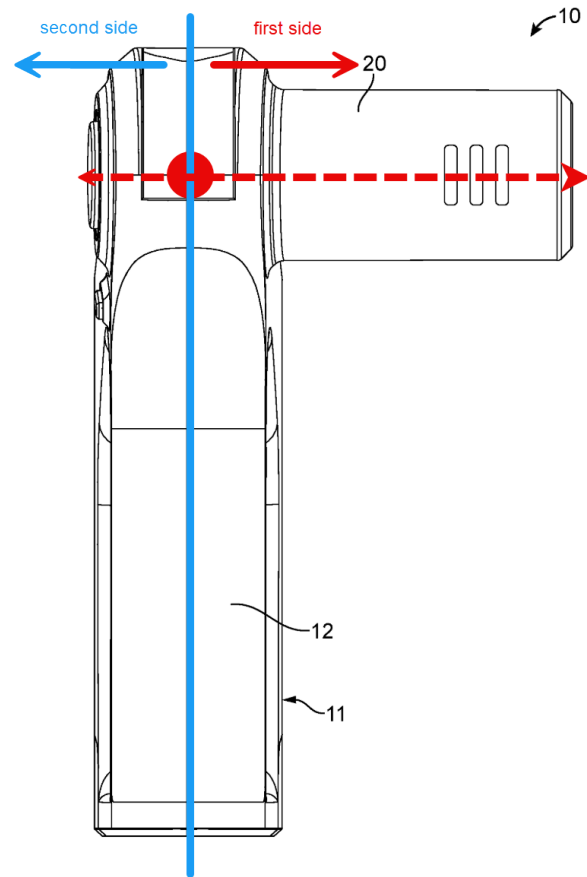
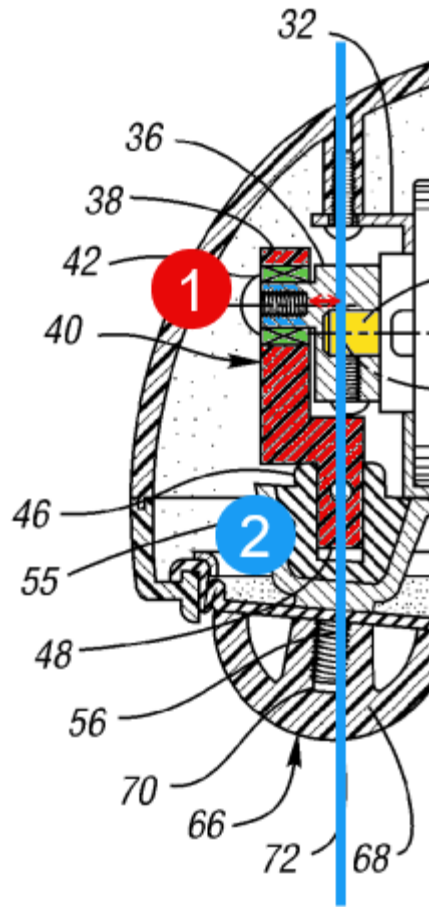


FIG. 6

e) Claim 2/18[i]

210. Pepe in view of Hu '951 and Huang teaches or suggests 2[j] *the proximal end [Huang-38] of the push rod [Huang-40] is farther from the reciprocation axis [blue line] than the distal end [Huang-48] is and teaches or suggests 18[j] the proximal end [Huang-38] of the push rod [Huang-40] is coupled to the eccentric shaft [Huang-36, blue] at a first location, the distal end [Huang-48] of the push rod [Huang-40] is connected to the output shaft [Pepe-18] at a second location, and the first location is farther from the reciprocation axis than the second location is.*

211. Referring first to Figure 5 of Huang (below), the proximal end 38 of the connecting rod 40 in Huang is farther from the reciprocation axis [distance 1, shown by the **red** double-ended arrow between the **blue** line representing the reciprocation axis and the proximal end 38 of the connecting rod 40] than the distal end 48 is. In more detail, the distal end 48 of the connecting rod is on the reciprocation axis while the proximal end 38 is spaced apart therefrom. For the same reason, the first location [area 1] where the proximal end 38 of Huang's connecting rod 40 is coupled to the crank arm 36, *i.e.*, at the bearing 42 [**green**], is farther from [shown by the **red** double-ended arrow] the reciprocation axis [**blue** line] than the second location [area 2] where the distal end 48 of Huang's connecting rod 40, which would be connected to Pepe's output shaft 18, is.



212. Accordingly, in my opinion, claims 2 and 18 are invalid as obvious in view of Pepe, Hu '951, and Huang.

4. Claims 3/14/19²²

213. Pepe in view of Hu '951 and Huang teaches or suggests *the handle portion* [12, modified in view of Hu '951] *extends longitudinally away from the*

²² In addressing the dependent claims, those having similar or the same limitations are addressed together to avoid redundancy. Where relevant, any differences due to the dependent claims' different dependencies is addressed.

reciprocation axis [red doubled-ended arrow] as recited in each of claims 3, 14, and 19. For example, Figure 3 of Pepe (below) shows that handle portion [12, modified in view of Hu '951] extends downwardly and away from the reciprocation axis along its longitudinal axis or direction [the red dotted line].

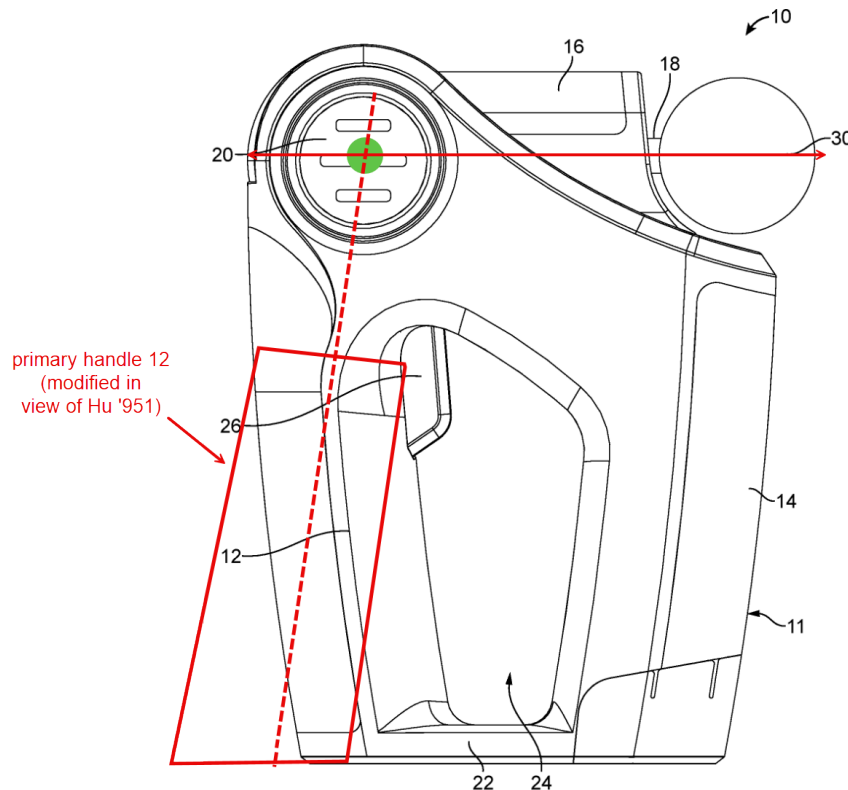


FIG. 3

214. Accordingly, in my opinion, claims 3, 14, and 19 are invalid as obvious in view of Pepe, Hu '951, and Huang.

5. Claims 15/20

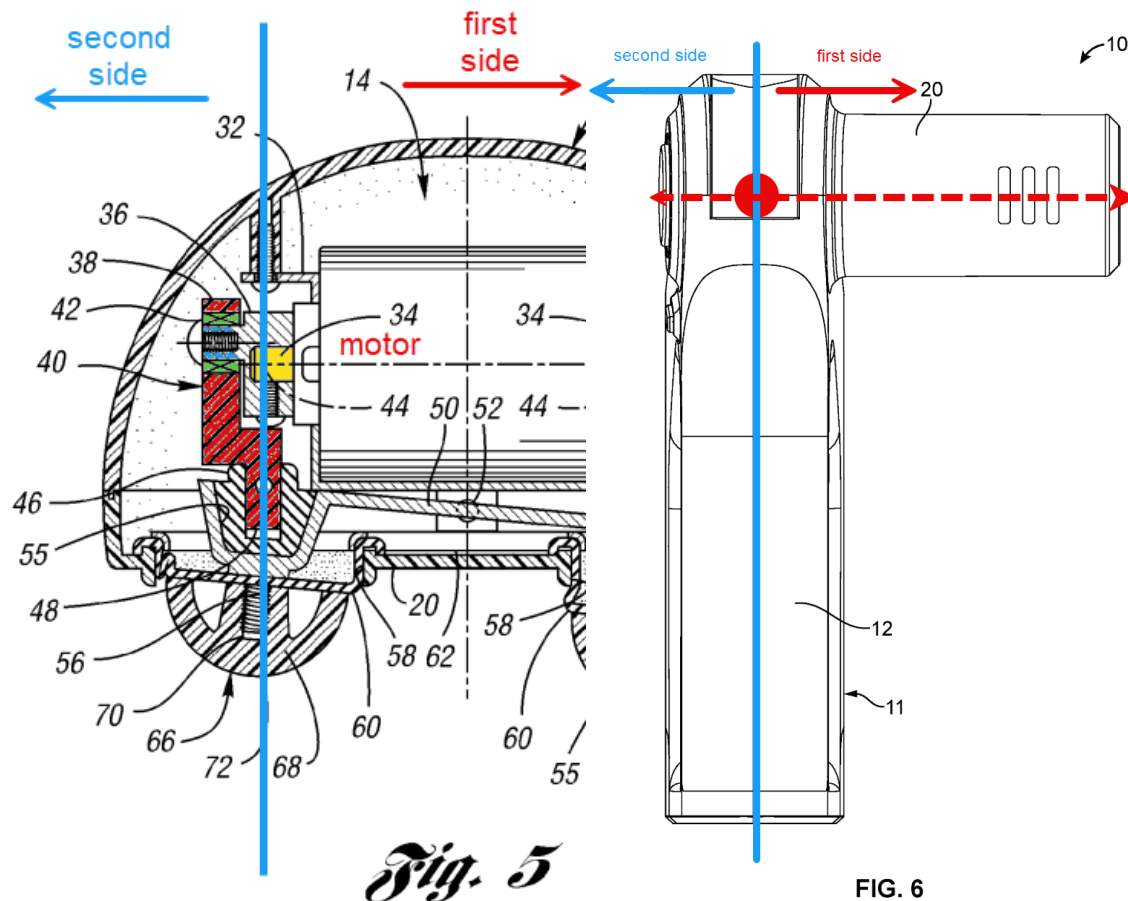
215. Pepe in view of Hu '951 and Huang teaches or suggests *an interior angle defined between the handle portion and the output shaft is obtuse* as recited in claims 15 and 20. See Section IX.C.2.d, *supra* (discussing Claim 1[f-6]).

216. Accordingly, in my opinion, claims 15 and 20 are invalid as obvious in view of Pepe, Hu '951, and Huang.

6. Claim 4

217. Pepe in view of Hu '951 and Huang teaches or suggests *the percussive therapy device comprises a bearing [Huang-42, green] between the eccentric shaft [Huang-36, blue] and the push rod assembly [Huang-40, red/Pepe-18], the output shaft [Pepe-18] is centered on the reciprocation axis [blue line in FIG. 5 of Huang; red dot extending into the page of FIG. 6 of Pepe], and the bearing [Huang-42, green] and the motor [Pepe-20] are positioned on opposite sides of the reciprocation axis [blue line in Figure 5 of Huang; red dot extending into the page of Figure 6 of Pepe].*

218. First, referring to Figure 5 of Huang (below left), a rotary bearing 42 [green] is illustrated between the eccentric shaft 36 [blue] and the connecting rod 40 [red], with the connecting rod 40 being part of the push rod assembly. Ex. 1035 at ¶[0020] (“a first end 38 of a vertical connecting rod 40 is affixed eccentrically, preferably with a rotary bearing 42 (best shown in FIG. 4) in between crank arm 36 and connecting rod 40”).



219. Second, referring to Figure 5 of Huang and Figure 6 of Pepe (above), the output shaft [Pepe-18] is centered on the reciprocation axis, and the bearing [Huang-42, green] and the motor [Pepe-20] are positioned on opposite sides of the reciprocation axis, with the bearing [Huang-42, green] on the second side of the reciprocating axis and the motor [Pepe-20] on the opposite first side of the reciprocating axis.

220. Accordingly, in my opinion, claim 4 is invalid as obvious in view of Pepe, Hu '951, and Huang.

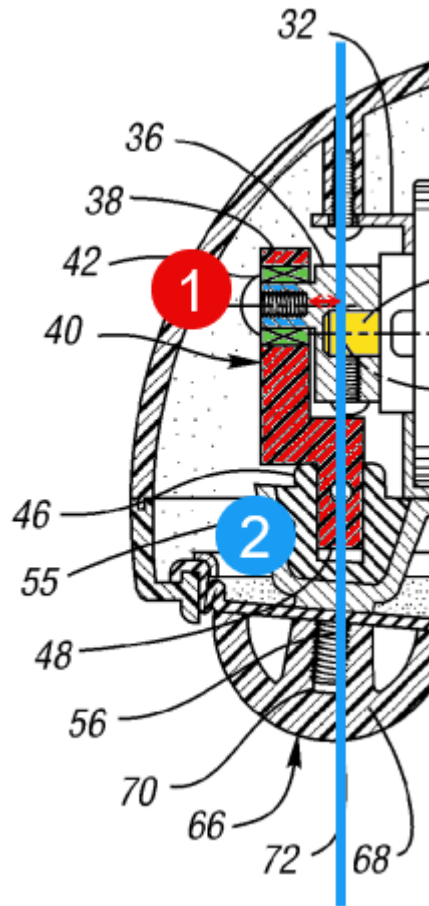
7. Claims 5/6

221. Pepe in view of Hu '951 and Huang teaches or suggests *the push rod assembly* [Huang-40/Pepe-18] *comprises a push rod* [Huang-40, red], *the push rod* [Huang-40, red] *comprises a proximal end* [Huang-38] *coupled to the bearing* [Huang-42, green], *the push rod* [Huang-40, , red] *comprises a distal end* [Huang-48] *coupled to the output shaft* [Pepe-18], *and the proximal end* [Huang-38] *of the push rod* [Huang-40, red] *is farther from the reciprocation axis* [blue line] *than the distal end* [Huang-48] *of the push rod is*.²³ See Section IX.C.3.c&e, *supra* (discussing Claim 2/18[d-2], [j]).

222. Referring to Figure 5 of Huang (below), Huang discloses that the connecting rod 40 [red] has a proximal end 38 coupled to the rotary bearing 42 [green] and a distal end 48 coupled to a rubber stud 46, which is coupled to the massager node 66. Ex. 1035 at ¶[0034]. As explained above in Section IX.C.3.c (discussing Claim 2/18[d-2]), a POSITA would have been motivated to utilize Huang's drive mechanism, including the crank arm 36, the rotary bearing 42, and the connecting rod 40, between Pepe's motor [20] and output shaft [18] to convert the motor's rotational output to reciprocal motion in the output shaft [18] to achieve Pepe's design intent. Ex. 1025 at ¶[0026].

²³ See fn. 17.

223. Moreover, as explained in Section IX.C.3.e (discussing Claim 2[j]) and as shown in Figure 5 of Huang (below), Huang illustrates that the proximal end 38 of the push rod [40] [location 1] is farther from the reciprocation axis [blue line] than the distal end 48 of the push rod [40] [location 2].



224. Accordingly, in my opinion, claim 5 and 6 are invalid as obvious in view of Pepe, Hu '951, and Huang.

8. Claim 9

225. Pepe in view of Hu '951 and Huang teaches or suggests *the handle portion* [12, modified in view of Hu '951] *extends along a handle portion axis*

[**blue** line in Figure 6 of Pepe, below], *the reciprocation axis* [**red** dot extending into the page in Figure 6 of Pepe, below] *and the handle portion axis both lie on a common plane* [the **blue** line into the page of Figure 6 of Pepe, below], *and the common plane bisects the housing* [Pepe-11]. A POSITA would have understood that the cross-sectional view of Figure 6 of Pepe shows a common plane on which both the reciprocation axis [**red** dot] and the handle portion axis [**blue** line on 12] lie also on a common plane that bisects the housing [11] into left and right portions or halves.

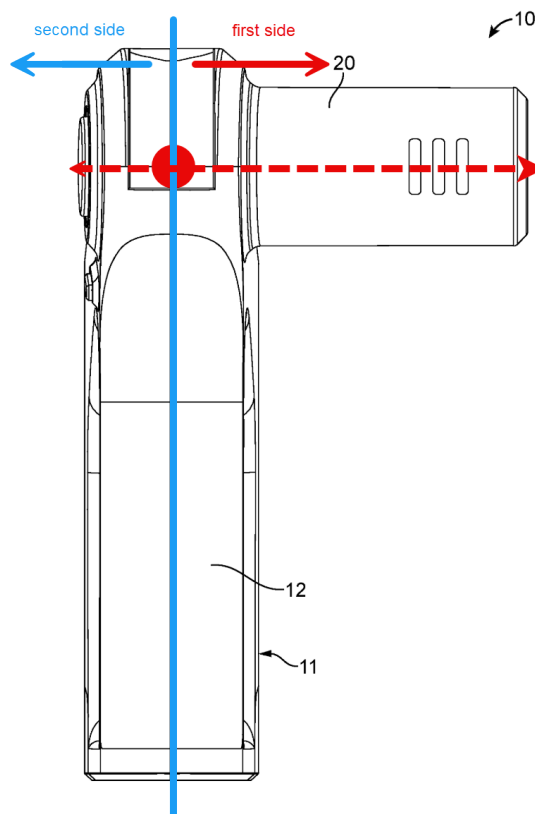


FIG. 6

226. Accordingly, in my opinion, claim 9 is invalid as obvious in view of Pepe, Hu '951, and Huang.

9. Claims 10/16

227. Pepe in view of Hu '951 and Huang teaches or suggests *a battery housed in the handle portion* [12] as recited in claim 10 and *a battery and a handle*²⁴ [12], *wherein the handle* [12] *comprises the handle portion* [12] *and the battery is housed in the handle* [12] as recited in claim 16. Plainly, Pepe states that “The motor is powered by a rechargeable battery, which is preferably housed within one of the handles.” Ex. 1025 at ¶[0028]. Thus, a POSITA would have understood that Pepe contemplated and disclosed a battery being housed in the handle [12].

228. Accordingly, in my opinion, claims 10 and 16 are invalid as obvious in view of Pepe, Hu '951, and Huang.

10. Claim 11/17

229. Pepe in view of Hu '951 and Huang teaches or suggests *the housing* [11] *comprises a first portion* [left-side portion of shaft unit 16, **blue**] *that extends away from the handle portion* [12] *and encloses a portion of the push rod assembly* [Pepe-18/Huang-40], *and the housing* [11] *comprises a second portion* [right-side portion of shaft unit 16, **green**] *that extends away from the handle portion* [12] *and*

²⁴ See fn. 18. Pepe has a handle [12] comprising a gripping portion, and a POSITA would have understood that the gripping portion is a handle portion of the handle [12]. Ex. 1025, ¶[0024].

the first portion [left-side portion of shaft unit 16, **blue**] as recited in claims 11 and 17.

230. Pepe discloses that “the outer body 11 further comprises a shaft unit 16” which “houses a shaft 18,” and the shaft 18 is part of the push rod assembly. Ex. 1025 at ¶[0025]. Referring to Figures 1 and 2 of Pepe (below, top), the shaft unit 16 is provided in two parts, a left-side part and a right-side part with a seam down the middle. The highlighted first portion of the shaft unit 16 [in **blue**] extends away (upwardly) from the handle 12 and encloses at least a part of, *e.g.*, the upper side of, the shaft 18, while the highlighted second portion of the shaft unit 16 [in **green**] extends (rightward) away from the first portion [in **blue**] and extends (upwardly) away from the handle 12. The Examiner, in rejecting claim 11 during prosecution of the '919 Patent, asserted that different portions of Lee's housing, not limited to distinct components (even though there is a distinction between the left- and right-side parts of the shaft unit 16 due to the seam) was sufficient to read on this claim. *See* Ex. 1003 at 313 (annotated Figure 5 of Lee as provided by the Examiner indicating the first and second portions thereof is reproduced below, bottom).

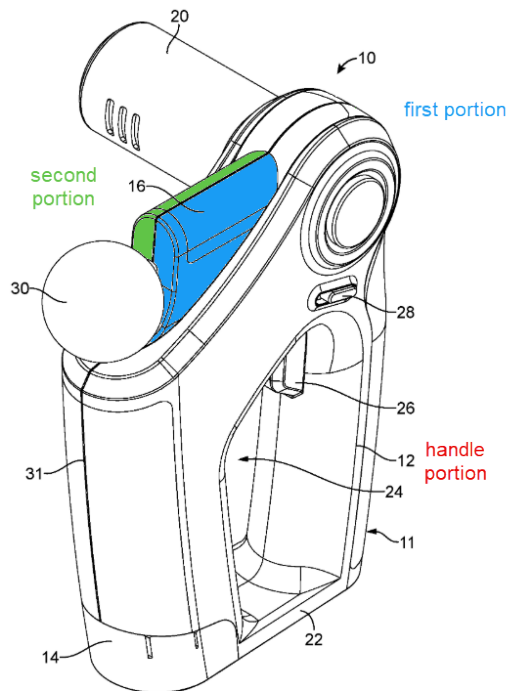


FIG. 1

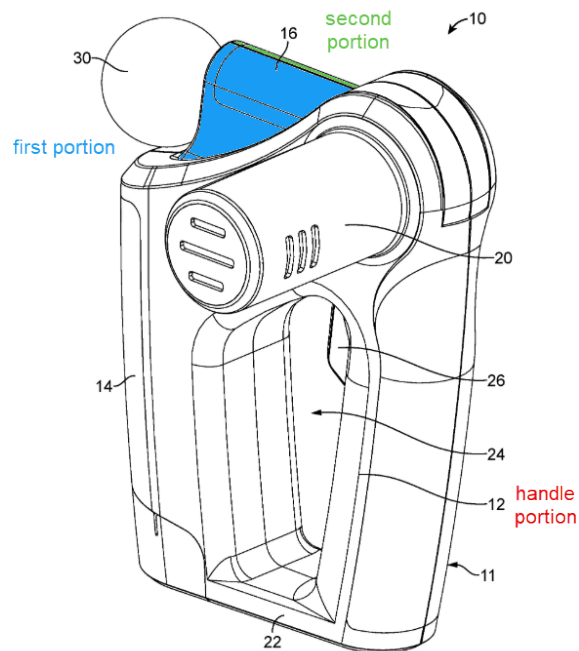


FIG. 2

FIGS. 1 and 2 of Pepe

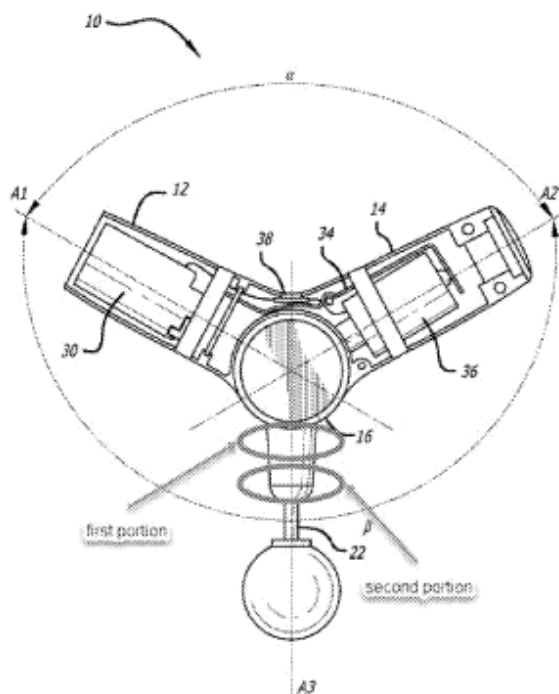


FIG. 5

FIG. 5 of Lee with Examiner's Annotations (Ex. 1003 at 313)

231. Accordingly, in my opinion, claims 11 and 17 are invalid as obvious in view of Pepe, Hu '951, and Huang.

D. Ground 5: Claims 7, 8, 12, and 13 are Obvious over Pepe, Hu '951, Huang, and Marton

1. A POSITA Would Have Been Motivated to Combine Pepe/Hu '951/Huang's Teachings with Marton's Teachings with a Reasonable Expectation of Success

232. A POSITA would have understood that Marton, similar to Pepe, Hu '951, and Huang, is directed to a handheld percussive massager. *See* Section IX.C.1, *supra*; Ex. 1043 at 9:57–11:3. A POSITA would also have understood that Marton complements the previously-described Pepe/Hu '951/Huang combination by further disclosing a main body endcap 140 that includes a pushbutton switch 162 and various light-emitting diodes (LEDs) 166/168 acting as a display on the rear of the percussive massager in direction facing opposite to the application direction of the percussive massager and toward the user. Ex. 1043 at 7:42–8:18, FIG. 2.

233. A POSITA would have been motivated to further modify Pepe/Hu '951/Huang by adding the pushbutton switch 162 and various LEDs 166/168 on the rear of Pepe's housing [11] for increased ease of use and visibility to a user as explained in Section IX.B.1, *supra*. With specific reference to Pepe, Pepe explains that “the trigger is lockable, whereby the user can simply press and

release the trigger to continuously run the motor,” meaning the trigger acts like a pushbutton rather than a traditional trigger. Ex. 1025 at ¶[0007]. Also, as discussed above in connection with claims 10 and 16, Pepe features a battery to power the motor and selectable speed operation but lacks any way to indicate battery charge state or the selected motor speed to the user. *Id.* at ¶¶[0007], [0026]. Thus, a POSITA would have been motivated to incorporate Marton’s teachings regarding the pushbutton switch 162 and the LEDs 166/168 because they complement Pepe’s disclosure by providing an easy to use and out of the way pushbutton switch 162 to control the motor and LEDs facing toward the user that “provide an indication of the operational state of the percussive massage applicator” and “provide an indication of the charge state of the battery.” Ex. 1040 at 7:62–8:18, 23:53–24:4. In more detail, a POSITA would have been motivated to replace Pepe’s finger operated trigger 26 with Marton’s rear-mounted pushbutton switch 162 to allow the user’s fingers to sit in a more even position with all four fingers wrapped evenly around the handle 12 instead of having the index finger resting extended on the trigger, increasing comfort during extended periods of use. A POSITA would have also been motivated to add LEDs to Pepe that indicate the operational state/speed of the device and battery charge state to provide the user with additional information about the device’s operation.

234. A POSITA would have had a reasonable expectation of success in combining the teachings of Marton with Pepe/Hu '951/Huang. All three devices are handheld percussive massagers featuring a common layout with a motor and output shaft arranged above a handle. Implementing buttons and LEDs within various portions of a device's housing was well within the skill of a POSITA as of the effective filing date. Further, Pepe's housing 11 features a relatively large, otherwise unoccupied portion of the housing 11 above the handle 12 and facing toward the user/backward that a POSITA would have understood to be suitable for a pushbutton and LEDs as taught by Marton. *See* Ex. 1025, FIG. 6.

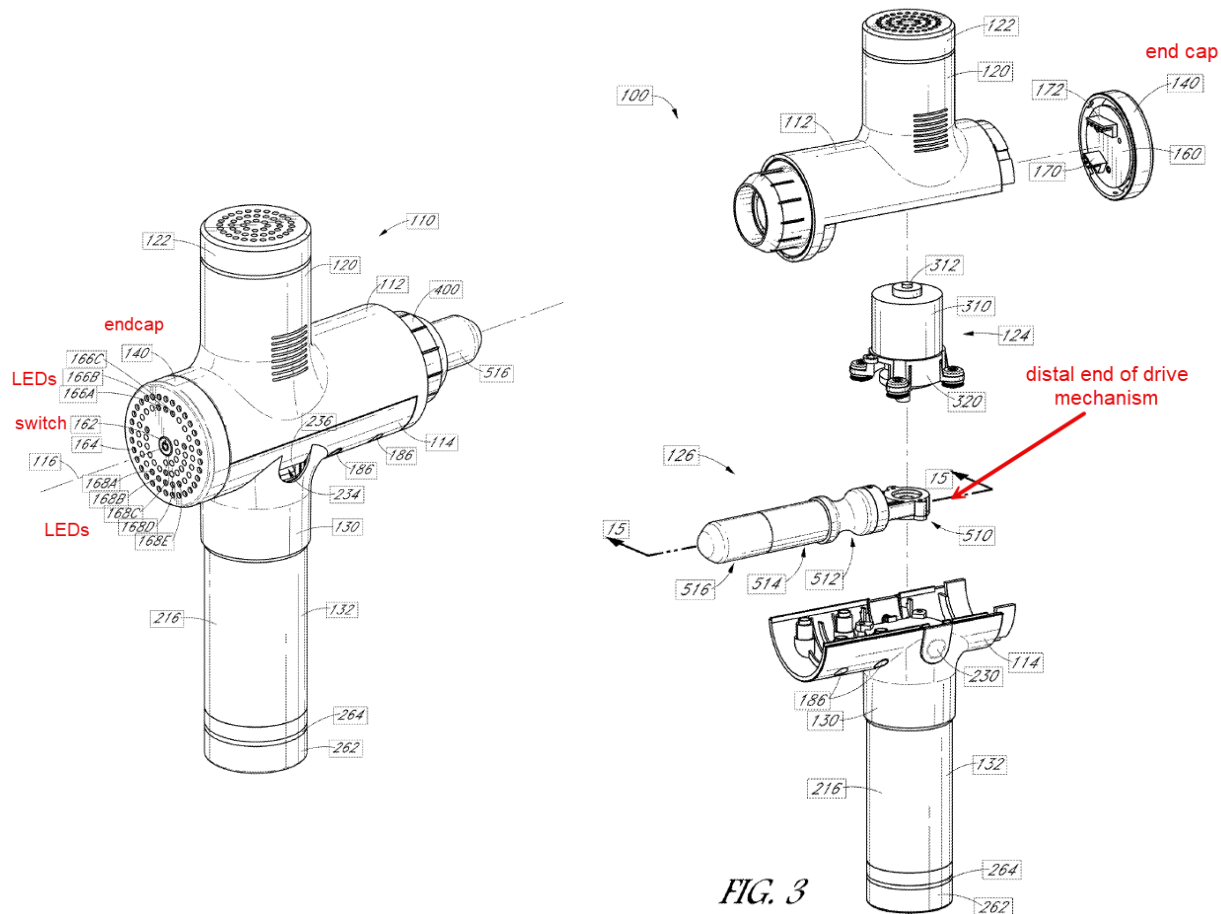
2. Claims 7/8/12/13

235. Each of claims 7, 8, 12, and 13 recites a variation of the percussive therapy device comprising a switch for activating the motor on a portion of the housing that faces an opposite direction as the distal end of the push rod assembly or the output shaft (claimed as a "backward facing switch" in claim 12) while claims 8 and 12 add an electronic display facing the same direction as the switch. Pepe in view of Hu '951, Huang, and Marton teaches or suggests Claims 7, 8, 12, and 13.

236. For example, Marton discloses a main body endcap 140 that forms part of the housing 110 and includes the pushbutton switch 162 configured to activate the motor and LEDs 166/168, which act as one or more electronic displays, located

on the endcap 140 and facing an opposite direction as the pushrod assembly.

Ex. 1043 at 7:42–47, 7:62–8:18, 23:4–38, 23:53–24:4, 24:19–23, FIGS. 2 and 3.



237. As explained, a POSITA would have been motivated to incorporate Marton's pushbutton switch 162 and LEDs 166/168 onto the rear of Pepe's housing [11] because it is a suitable, unoccupied location that faces toward the user during use. In modified Pepe, as in Marton, the switch 162 and LEDs 166/168 would face an opposite direction as the pushrod assembly [Pepe-18/Huang-40], also referred to as backwards.

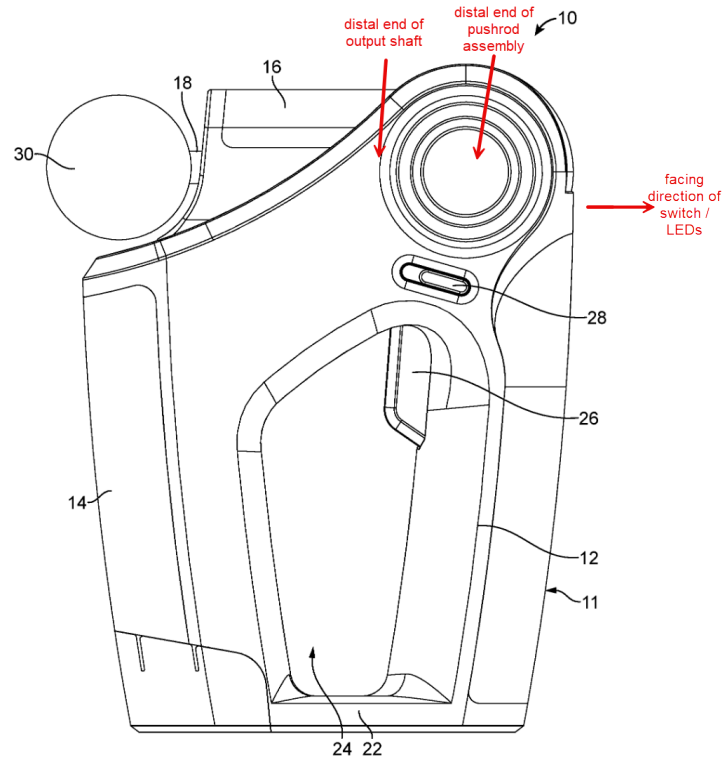


FIG. 4

238. Accordingly, in my opinion, claims 7, 8, 12, and 13 are invalid as obvious in view of Pepe, Hu '951, and Huang.

E. Ground 6: Claims 1, 3, 4, and 7–11 are Obvious over Hypervolt and Hu '951

1. A POSITA Would Have Been Motivated to Modify Hypervolt in View of Hu '951's Teachings with a Reasonable Expectation of Success

239. A POSITA would have understood that Hypervolt and Hu '951 are both directed to the same class of handheld percussive therapy devices and address the same basic design challenges, including ergonomic handling of a motor-driven percussion mechanism during use on different areas of a user's body. A POSITA

would also have recognized that Hypervolt and Hu '951 disclose handheld massage devices incorporating an eccentric drive mechanism to convert rotary motion into reciprocal, percussive motion and a handle that houses a rechargeable battery for powering the motor and allows a user to grip and control the device during operation. Indeed, both Hypervolt and Hu '951 exhibit a gun-style form factor in which a handle extends downwardly from the housing for easy handling and control.

240. As explained, it was well-known in the field of handheld devices that obtuse angle, *i.e.*, “pistol grip” style, handles provide known ergonomic benefits, with Hu '951 being an application of this well-understood principle to percussive massagers. *See* Section IX.A.1, *supra*. Thus, for at least the same reasons as discussed above in Section IX.A.1, a POSITA would have been motivated to modify Hypervolt’s handle to form an angle “that is greater than 90° and less than or equal to 135°” with respect to the output shaft as taught by Hu '951 to provide the known ergonomic benefits. Ex. 1036 at ¶[0036]. Moreover, a POSITA would have had a reasonable expectation of success in the combination because both Hypervolt and Hu '951 are the same type of device and same numerous design similarities, as discussed above.

2. Claim 1

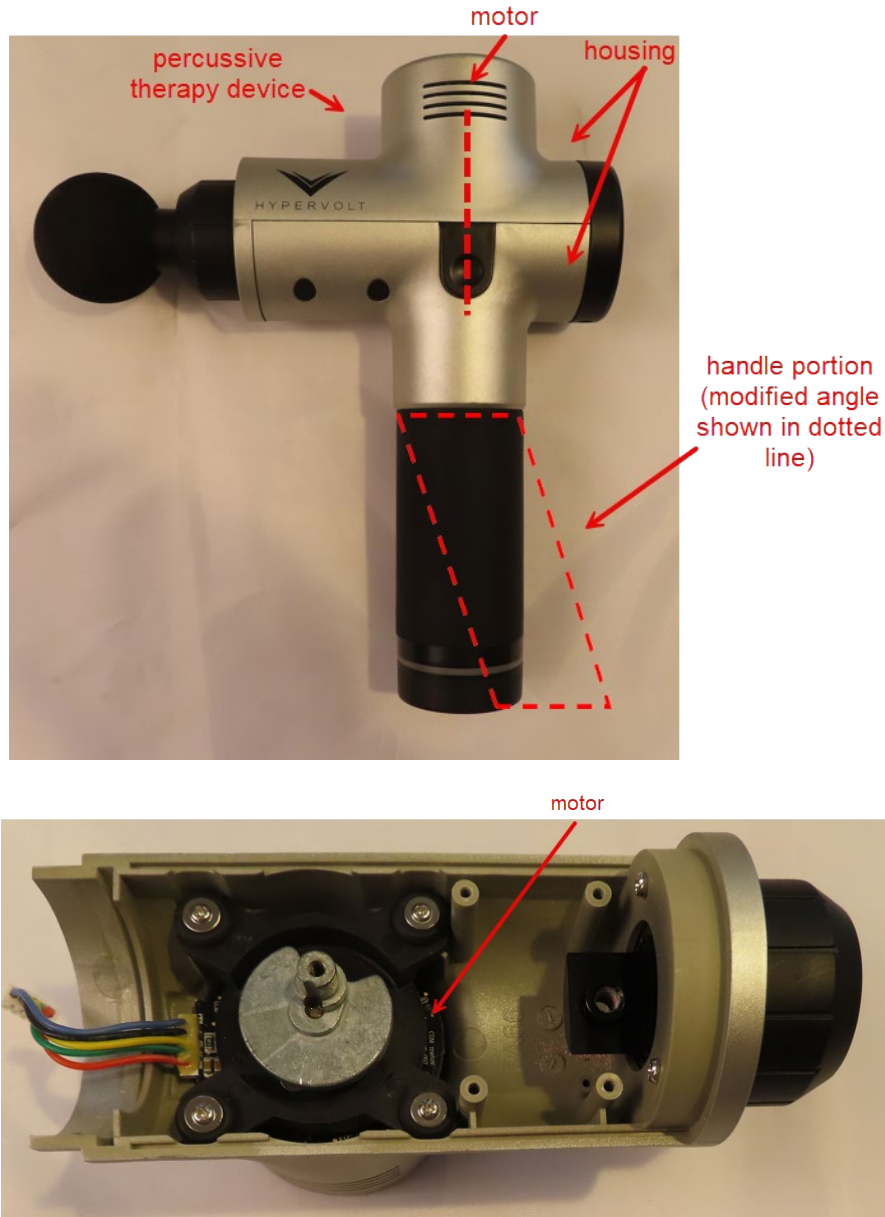
a) Claim 1[pre]

241. If the preamble is determined to be limiting, Hypervolt in view of Hu '951 teaches or suggests *a percussive therapy system*. A POSITA would have understood that Hypervolt provides high-impact, reciprocating massage to a user or patient. Ex. 1032.

b) Claim 1[a]–[d] – Device Structure²⁵

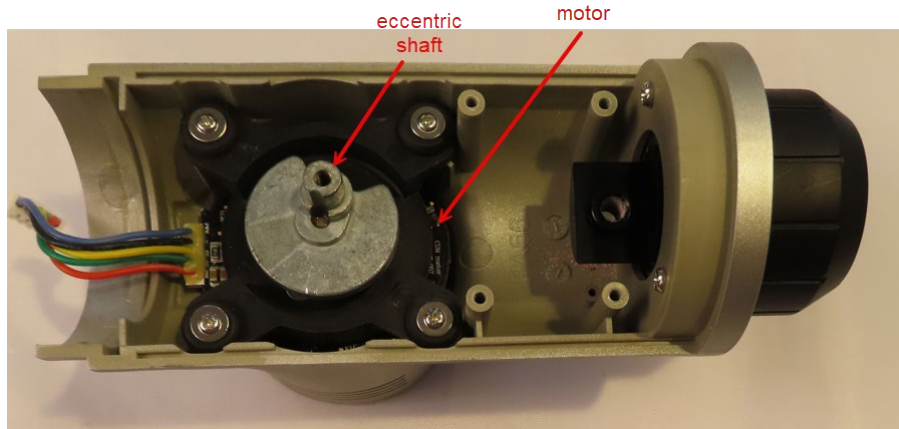
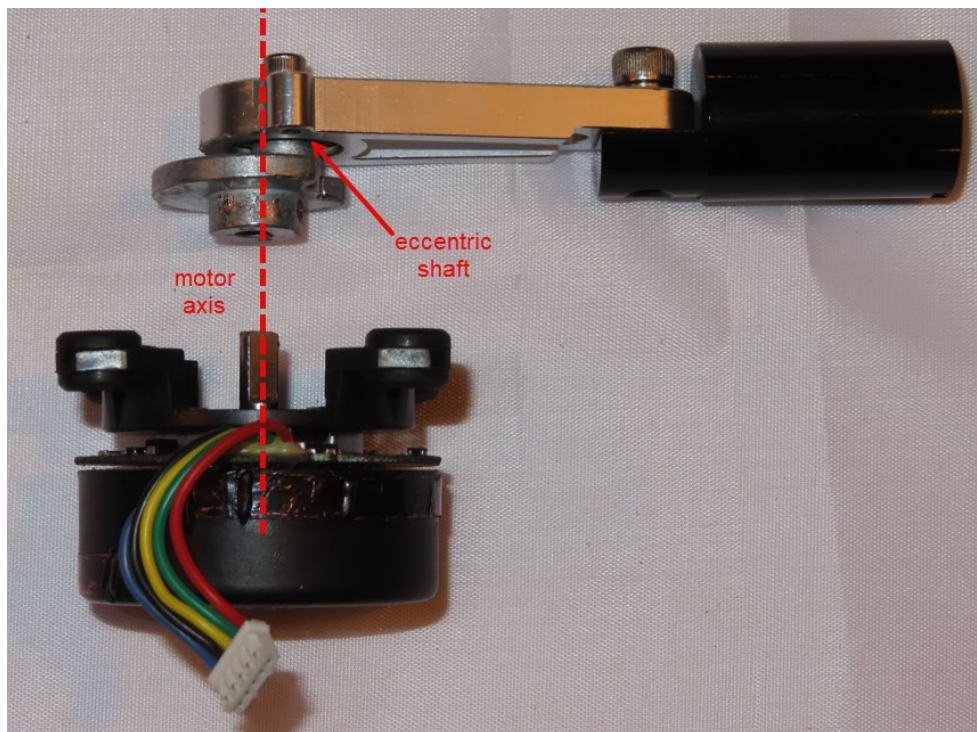
242. Hypervolt in view of Hu '951 teaches or suggests 1[a] *a percussive therapy device comprising* 1[b] *a housing*, 1[c] *a handle portion* [modified in view of Hu '951], and 1[d] *a motor positioned in the housing and configured to output torque about a motor axis* [red dotted line]. These components of Hypervolt are indicated in the below-reproduced images I took of the Hypervolt bearing number 3018.

²⁵ For convenience, related claim limitations are addressed together. Any italicized text is claim language, with the claim limitations being labeled using the bracketed letter.



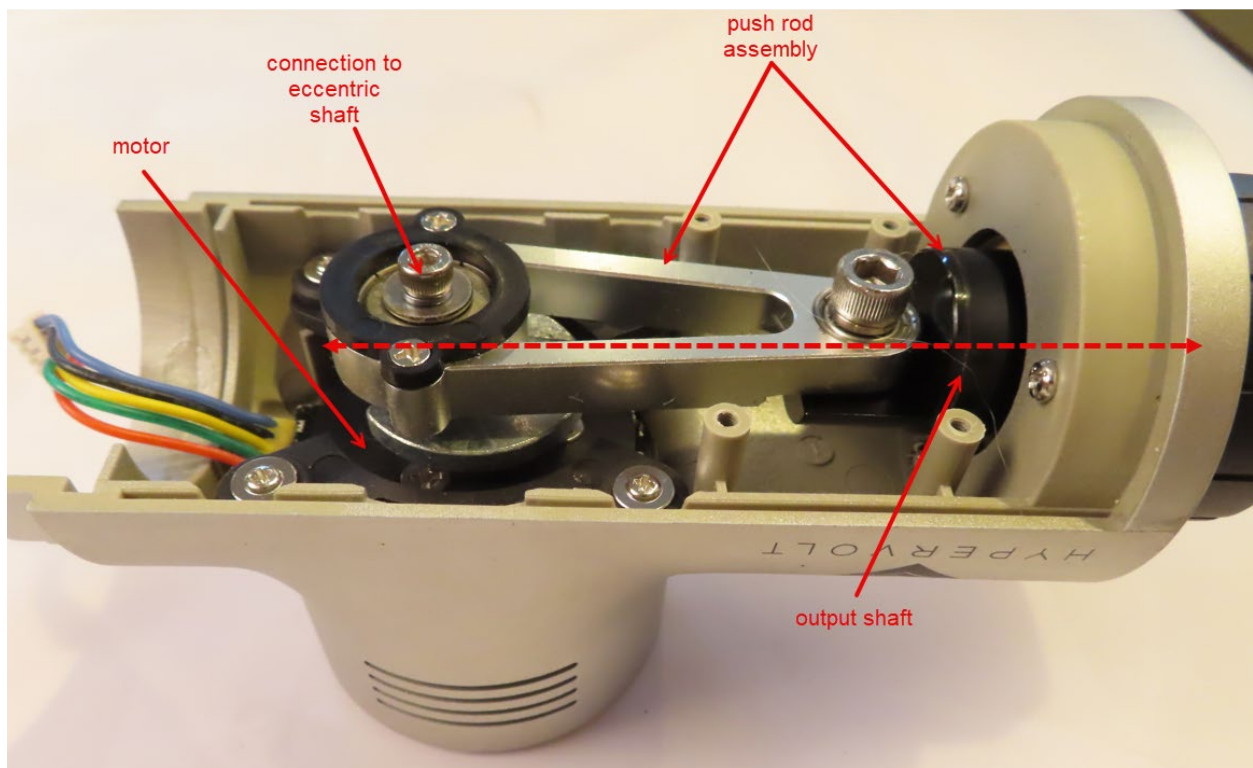
c) **Claim 1[e]–[f-2] – Drive Mechanism**

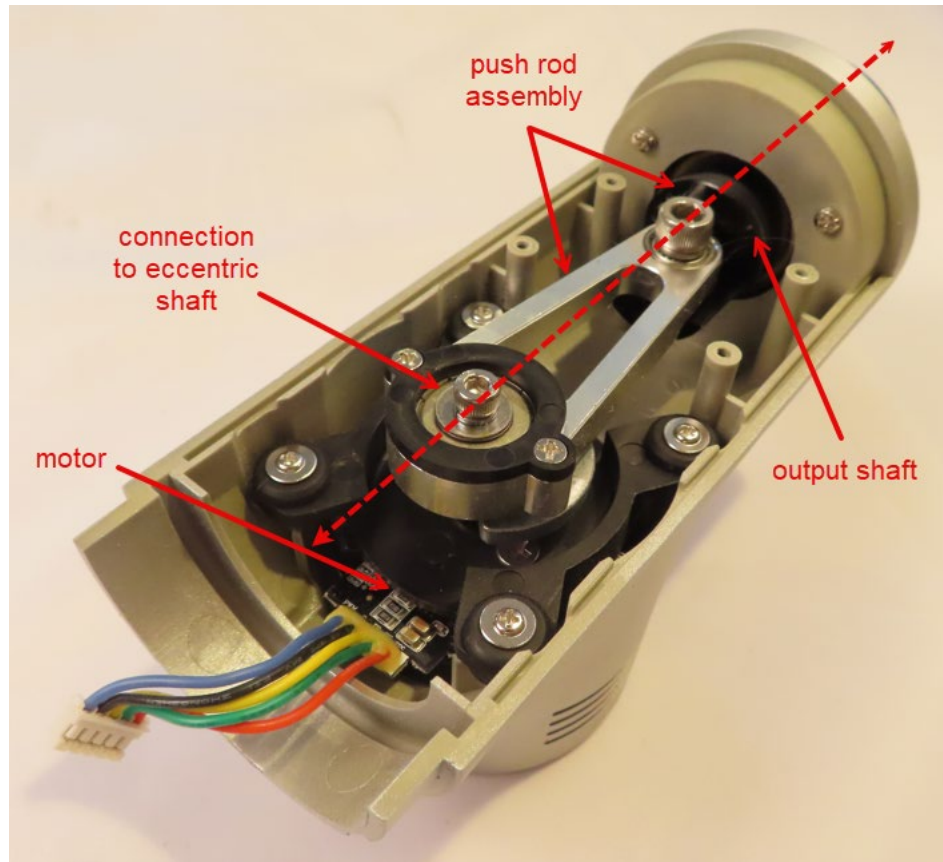
243. Hypervolt in view of Hu '951 teaches or suggests 1[e] *an eccentric shaft configured to travel in a circle about the motor axis in response to activation of the motor*. As shown in the below-reproduced images I took of the 3018 Hypervolt, the eccentric shaft is offset from the motor axis [red dotted line] such that it would move in a circle about the motor axis when the motor is activated.



244. Hypervolt in view of Hu '951 also teaches or suggests 1[f-1] *a push rod assembly operatively connected to the motor and configured to reciprocate in response to activation of the motor*, and 1[f-2] *comprising an output shaft configured to travel along a reciprocation axis [red double-ended arrow] when the push rod assembly reciprocates*. As shown in the below-reproduced images I took of the 3018 Hypervolt, the Hypervolt features a push rod assembly including at least the V-

shaped push rod and the black output shaft, which is connected to the motor via the bearing and the eccentric shaft. The push rod assembly would reciprocate in response to activation of the motor due to the offset eccentric shaft rotating about the motor axis, causing the push rod assembly to reciprocate. The movement of the push rod assembly would also cause the output shaft (the black object in Hypervolt) to travel along a reciprocation axis [red double-ended arrow].

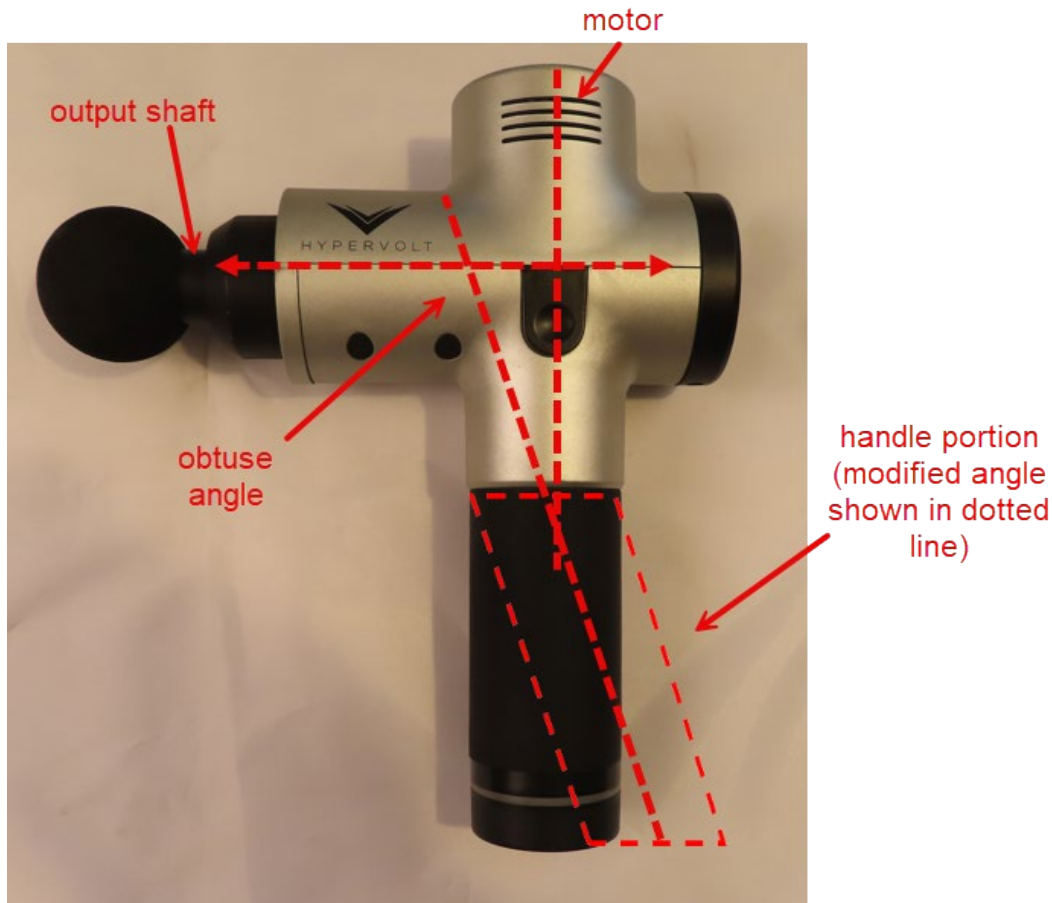




d) Claim 1[f-3]/[f-6] – Handle Alignment

245. Hypervolt in view of Hu '951 teaches or suggests 1[f-3] *the reciprocation axis [red double-ended arrow] extends transverse to the handle portion [modified in view of Hu '951] on a dividing plane [red double-ended arrow extended into the page] normal to the motor axis [red dotted line] and 1[f-6] an interior angle defined between the handle portion and the output shaft is obtuse [as shown].* As shown in the below-reproduced images I took of the 3018 Hypervolt, in Hypervolt modified in view of Hu '951, the reciprocation axis extends transverse to, *i.e.*, is non-parallel with, the handle portion and is on a dividing plane [a plane extending into the page from the reciprocating axis] normal to the motor axis

[red vertical dotted line]. Moreover, as explained above in Section IX.E.1, *supra*, a POSITA would have been motivated to modify Hypervolt's handle portion to form an angle greater than 90° and less than or equal to 135°, *i.e.*, an obtuse angle, with the output shaft as taught by Hu '951 to provide better user ergonomics.



e) **Claim 1[f-4]/[f-5]– Dividing Plane**

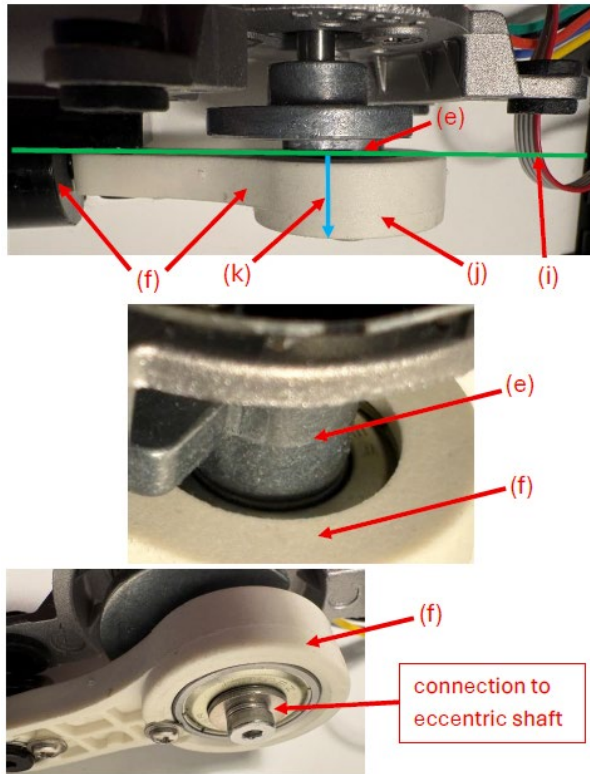
246. Hypervolt in view of Hu '951 teaches or suggests 1[f-4] *a proximal end of the push rod assembly is connected to the eccentric shaft at a location offset from the dividing plane in a first direction*, and 1[f-5] *the motor extends transverse to the handle portion and away from the dividing plane in a second direction opposite the*

first direction.

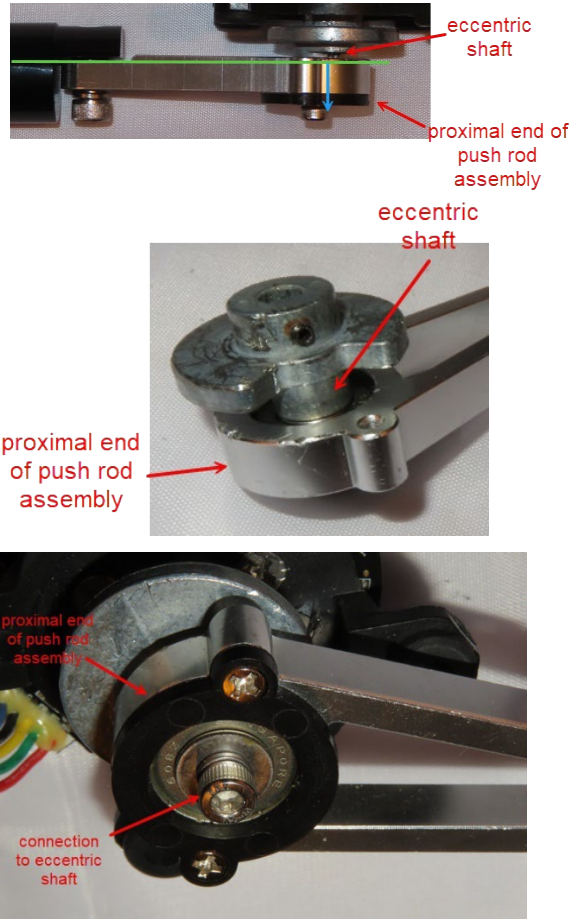
247. First, a side-by-side comparison between Patent Owner's infringement contentions directed to the accused Hypervolt Go 2 product and the prior art Hypervolt is provided below. The comparison confirms that the prior art Hypervolt has the same connection arrangement and spatial orientation with respect to the push rod assembly and the eccentric shaft as in the accused Hypervolt Go 2, which is accused of infringing claim 1.

**Therabody's Infringement
Contentions (Ex. 1049)**

A proximal end (j) of the push rod assembly (f) is connected to the eccentric shaft (e) at a location offset from the dividing plane (i) in a first direction (k).



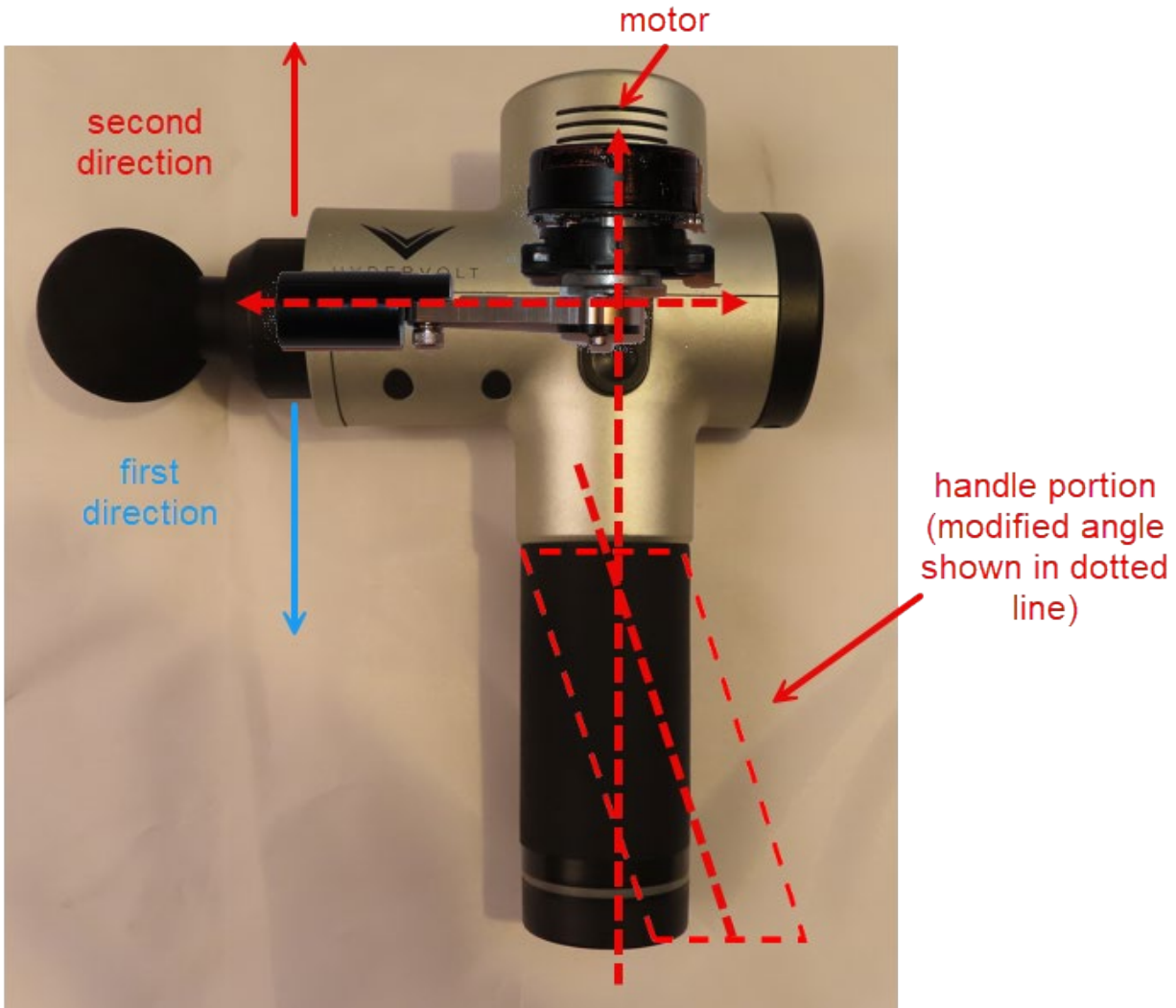
Hypervolt



248. As can be seen above, the accused Hypervolt Go 2 and the Hypervolt feature the same eccentric drive mechanism with the same spatial orientations between components. In particular, the bearing is recessed into the push rod away from the motor. In more detail, as shown in the middle images above, the bearing does not sit in the middle of the push rod in the thickness direction but is actually recessed away from the motor and toward the handle portion of the device. Often, in manufacturing a bearing connected structure, a bearing seat is formed in the

component that is to receive the bearing, and then the bearing is pressed into the component from the other end until the bearing rests against the bearing seat. In both the Hypervolt Go 2 and the Hypervolt, the bearing seat is formed at the bottom surface of the push rod, but because the bearing is thinner than the push rod, after installation the bearing sits recessed into the push rod from the top surface facing the motor. This arrangement of the bearing in the push rod similarly moves the connection area between the push rod assembly and the eccentric shaft downwardly, away from the motor such that it is offset from the reciprocation axis (downwardly, away from the motor). In short, this design, present in both Hypervolt Go 2 and Hypervolt, offsets the connection location between the push rod assembly and the eccentric shaft from the dividing plane in a first direction, *i.e.*, downwardly in a direction away from the motor.

249. Second, the image below is a composite of an image I took of 3018 Hypervolt overlaid with an image I took of the motor, drive mechanism, and push rod assembly. The below composite image shows that the motor extends transverse to the handle portion (as modified in view of Hu '951) and away from the dividing plane [**red** double-ended arrow extending into the page] in a second direction (upwardly) opposite the first direction (downwardly, as discussed above).



f) Claim 1[g] – Attachment

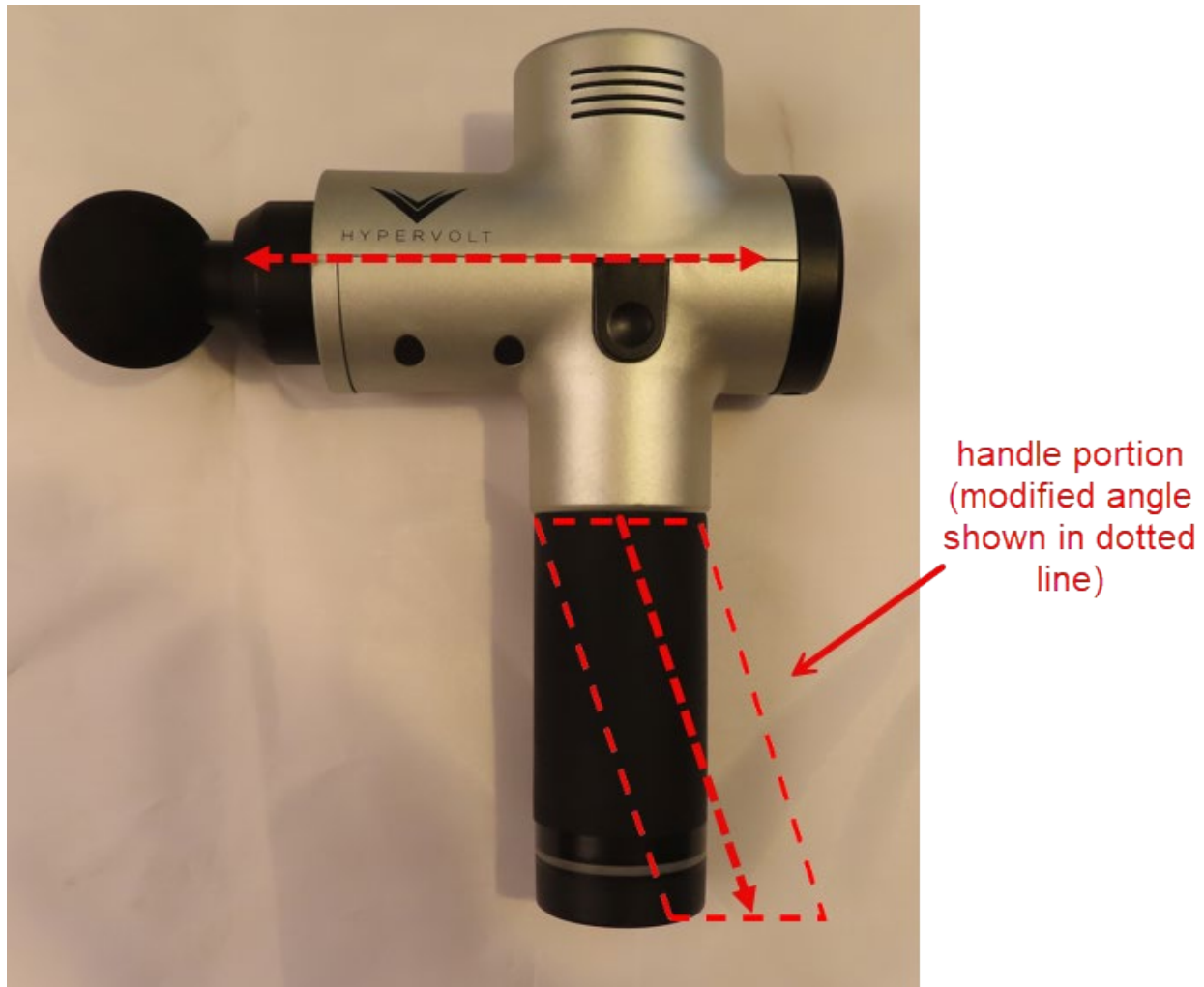
250. Hypervolt in view of Hu '951 teaches or suggests *an attachment configured to be operatively connected to the output shaft of the percussive therapy device*. During my analysis of Hypervolt, I was able to connect and remove the various attachments (or massage heads) from the output shaft. *See also* Ex. 1047 (describing Hypervolt as having “4 interchangeable head attachments”).



251. Accordingly, in my opinion, claim 1 is invalid as obvious in view of Hypervolt and Hu '951.

3. Claim 3

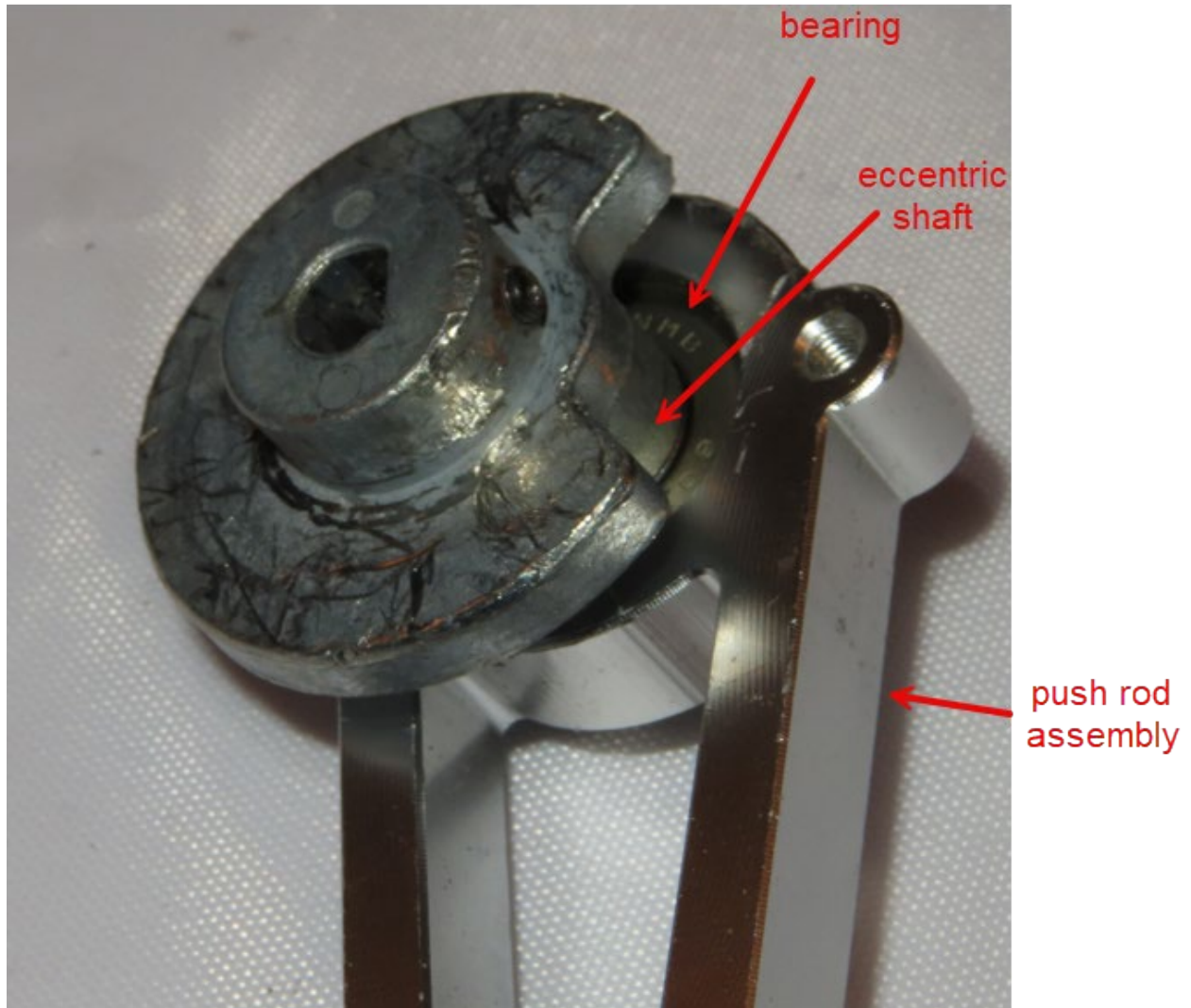
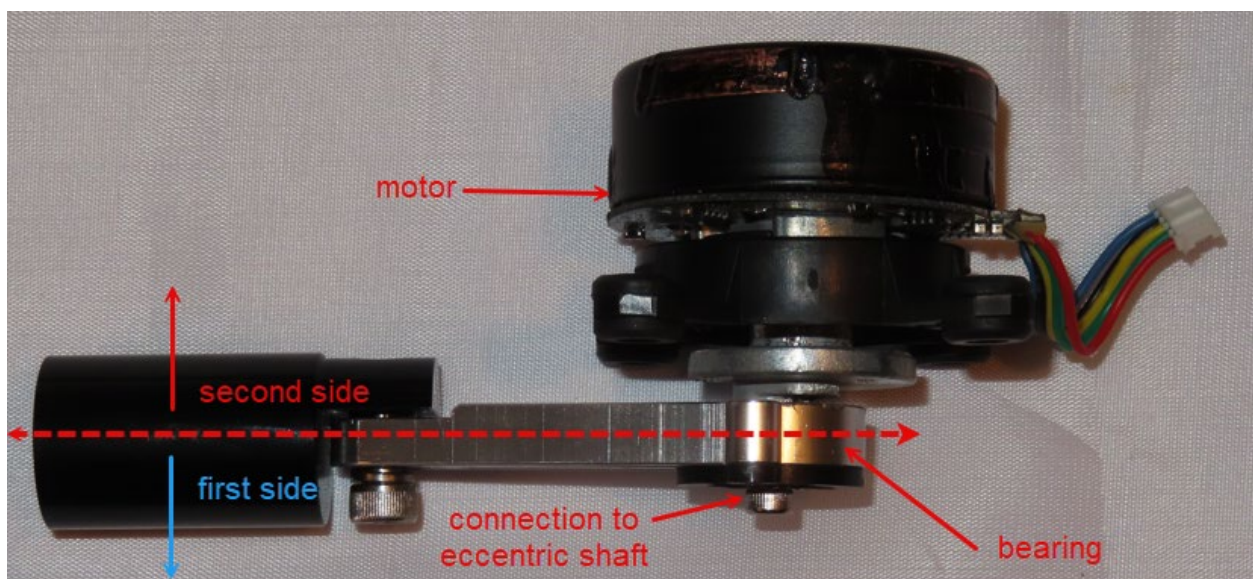
252. Hypervolt in view of Hu '951 teaches or suggests *the handle portion extends [red dotted line arrow] longitudinally away from the reciprocation axis [red doubled-ended arrow]*. These claim limitations are shown in the below-annotated image I took of 3018 Hypervolt.



253. Accordingly, in my opinion, claim 3 is also invalid as obvious in view of Hypervolt and Hu '951.

4. Claim 4

254. Hypervolt in view of Hu '951 teaches or suggests *the percussive therapy device comprises a bearing between the eccentric shaft and the push rod assembly, the output shaft is centered on the reciprocation axis [red double-ended arrow], and the bearing and the motor are positioned on opposite sides of the reciprocation axis [red double-ended arrow].*



255. Accordingly, in my opinion, claim 4 is also invalid as obvious in view of Hypervolt and Hu '951.

5. Claim 7/8

256. Hypervolt in view of Hu '951 teaches or suggests *a switch for activating the motor, and the switch is located on a portion of the housing that faces an opposite direction from a distal end of the push rod assembly as recited in claim 7 and a switch and an electronic display that faces a same direction as the switch, wherein the switch is configured for activating the motor as recited in claim 8.* These claim limitations are shown in the below-annotated images I took of 3018 Hypervolt. Based on my analysis of Hypervolt, the indicated switch controls the motor.



257. Accordingly, in my opinion, claims 7 and 8 are also invalid as obvious in view of Hypervolt and Hu '951.

6. **Claim 9**

258. Hypervolt in view of Hu '951 teaches or suggests *the handle portion extends along a handle portion axis* [red dotted line arrow], *the reciprocation axis* [red dot extending into the page] *and the handle portion axis both lie on a common plane* [blue line extending into the page], *and the common plane bisects the housing* [into left/right portions]. These claim limitations are shown in the below-annotated image I took of 3018 Hypervolt.



259. Accordingly, in my opinion, claim 9 is also invalid as obvious in view of Hypervolt and Hu '951.

7. **Claim 10**

260. Hypervolt in view of Hu '951 teaches or suggests *a battery housed in the handle portion*. The handle portion shown in the below-annotated image I took of 3018 Hypervolt includes a battery, which is confirmed by the owner's manual.



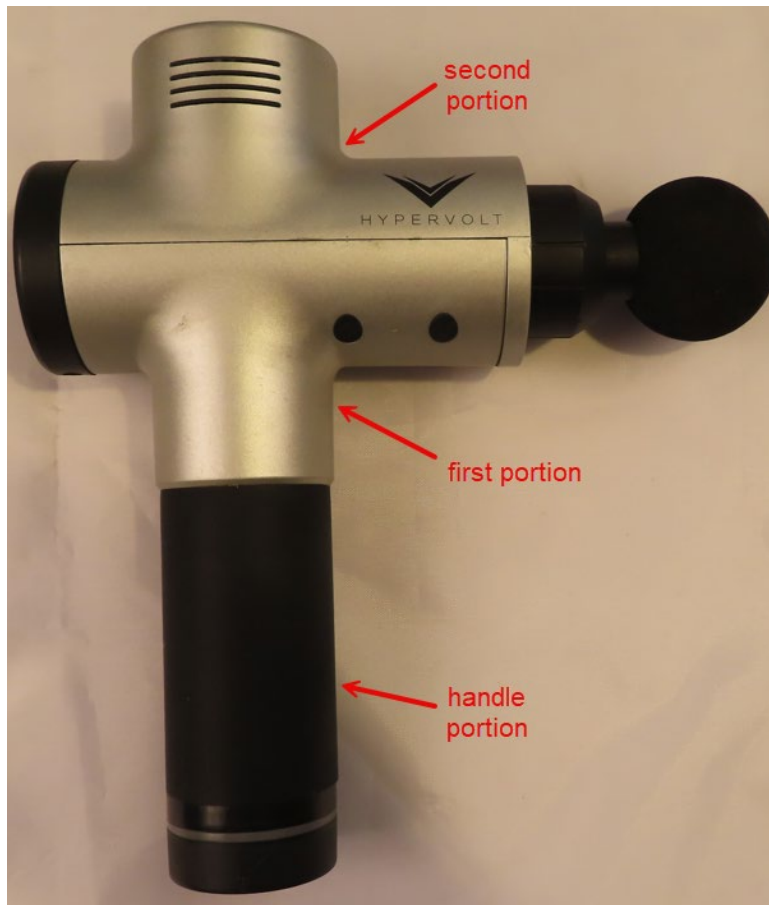


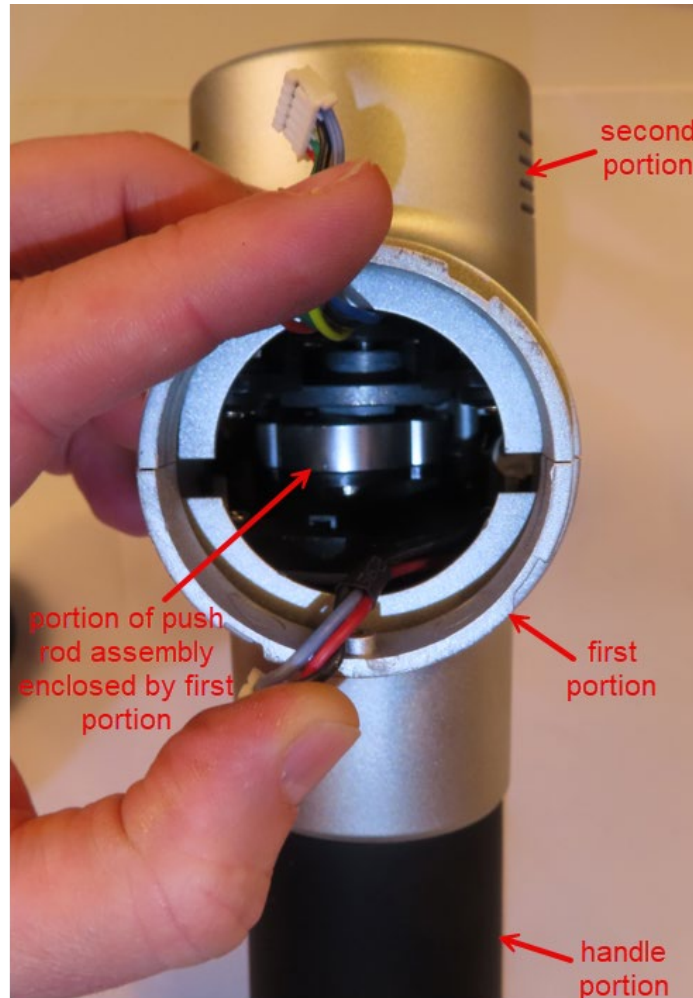
261. Accordingly, in my opinion, claim 10 is also invalid as obvious in view of Hypervolt and Hu '951.

8. Claim 11

262. Hypervolt in view of Hu '951 teaches or suggests *the housing comprises a first portion that extends away from the handle portion and encloses a portion of the push rod assembly, and the housing comprises a second portion that extends away from the handle portion and the first portion*. These claim limitations are shown in the below-annotated images I took of 3018 Hypervolt. In particular, the first portion of the housing, which extends from the handle portion to the second portion, encloses at least the bottom portion of the push rod assembly as shown in

the second image below.





263. Accordingly, in my opinion, claim 11 is also invalid as obvious in view of Hypervolt and Hu '951.

X. CONCLUSION

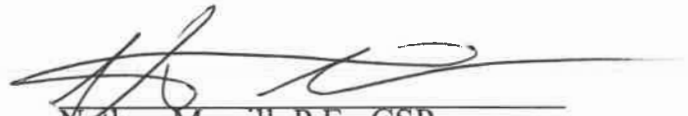
264. In my opinion, and for the reasons set forth above, the challenged claims of the '919 Patent are unpatentable under 35 U.S.C. § 112(a) and 35 U.S.C. § 103 for the reasons set forth herein.

265. 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.

266. I reserve the right to supplement my opinions in the future to respond to any arguments that the Patent Owner raises and to take into account new information as it becomes available to me.

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

Dated: May 26 2026



Nathan Morrill, P.E., CSP



CURRICULUM VITAE

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PROFILE

Experienced mechanical engineer with eleven issued patents. Performed safety reviews for many companies including those ranked by Fortune 500. Lead engineer on the design and analysis of multiple products including: aerial lifts, custom trailers, high thrill rides, ziplines, machine guarding, high energy guarding, hydraulic design, pneumatic design, and drilling equipment. Participated in new product development, design optimization, stress and motion analysis, prototyping, testing, and safety.

Licensed professional engineer (PE) in five states; Utah, Idaho, Texas, Florida, and New York. Certified safety professional in comprehensive practice (CSP). Certified trainer for boom lifts, scissor lifts, rough terrain and counterbalanced forklifts. Over two decades of experience in product development, patents, equipment safety, risk assessments, warnings, and training.

Experienced expert witness having drafted reports/declarations in personal injury and patent cases. Experienced in designing and building multiple custom testing devices to obtain data, verify compliance with standards, and evaluate opinions. Experience testifying in deposition and at trial.

CERTIFICATIONS

- Professional Engineer (PE)
 - Utah License # 5567105-2203
 - Florida License # 72189
 - Texas License # 120869
 - Idaho License # 22093
 - New York License # 108213-01
- Certified Safety Professional (CSP)
 - Comprehensive Practice License #CSP-30841
- Certified Forklift Operator
- Certified Counterbalanced Forklift Operator Trainer
- Certified Rough Terrain Forklift Operator Trainer
- Certified Aerial Boom Lift Operator Trainer
- Certified Aerial Work Platform (Scissor Lift) Operator Trainer
- Member of the National Associations of Amusement Ride Safety Officials
- Member of the American Society for Testing and Materials F24 Committee

EDUCATION

Bachelor's of Science - Mechanical Engineering
University of Utah

2001-2004

Associate's of Science - Pre-Engineering
Utah Valley State College

1998-2001

CONSULTING FOCUS

Involved in hundreds of consulting projects. Major areas of focus and expertise include: aerial lifts, boom lifts, bucket trucks, cherry pickers, trailers, end dumps, side dumps, belly dumps, flat beds, goose neck trailers, 5th wheel trailers, specialty trailers, towing systems, tarping systems, container covers, cranes, refuse trucks, recycling trucks, automated side loaders, fall protection, exercise equipment, forklifts, forklift attachments, powered industrial trucks, telehandlers, rough terrain forklifts, drilling equipment, drill pipe handling equipment, automated drill pipe systems, oil and gas equipment, heavy equipment, construction equipment, conveyors, hydraulic equipment, mobile powered equipment, manufacturing equipment, industrial plant equipment, safety equipment, machine guarding, bunker design, consumer products, stability and tipping, ziplines, high thrill rides, swing rides, drop rides, designing to standards, and design for safety.

PATENTS

During his time at Alpine Engineering and Design, Inc., Mr. Morrill has become familiar with patents and the patent process. He has written multiple provisional patent applications, and has worked with attorneys in writing the specifications, creating drawings and drafting claims for utility patents on products he has helped design. As part of the product development process, he has performed patent searches, both for informational purposes and to lessen the likelihood that new developments would infringe other's intellectual property. Mr. Morrill is listed as in inventor on eleven issued patents.

- US 7,341,157 Enclosed Reeving Live-Line Boom
- US 7,413,234 Tarping System for Open Top Containers
- US 7,458,629 Tarping System for Open Top Containers
- US 7,673,926 Tarping System for Open Top Containers
- US 7,762,616 Cross-member for a Trailer Frame
- US 7,954,877 Tarping System for Open Top Containers
- US 8,287,026 Tarping System for Open Top Containers
- US 8,998,287 Roll Tarp System
- US9,415,667 Roll Tarp System
- US 10,071,619 Roll Tarp System
- US 10,683,176 Material Placer

EXPERT WITNESS

Mr. Morrill has been retained as an expert on over 50 cases. Has worked as the lead associated in over 75 cases. Has experience in personal injury, product failures, safety in design, litigation of patents, intellectual property. Has provided opinions for analysis of failures based on testing of products, calculations and well-known industry information. Experience drafting reports, creating simulations, and demonstratives. Provided infringement opinions, invalidity opinions, claim construction opinions, claim charts, and prior art searches. Some of the industries and products Mr. Morrill has consulted on include:

Trailers
Dump Trucks
Belly Dump
Agricultural Equipment
Trailer Tarping Systems
Boom Lifts
Aerial Lifts
Telehandlers
Forklifts
Hydraulic Equipment

Heavy Equipment
Ziplines
Thrill Rides
Ladders
Garbage Trucks
Hand Tools
Saws
Canopies
Cage Welders
RVs