UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
MIDLAND-ODESSA DIVISION

RESONANT SYSTEMS, INC. d/b/a RevelHMI, *Plaintiff*, v. APPLE INC., *Defendant*.	Case No. 7:23-cv-00077-DC JURY TRIAL DEMANDED

DEFENDANT APPLE INC.'S OPENING CLAIM CONSTRUCTION BRIEF

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INTRODUCTION

Apple and Resonant have agreed on the construction of several claim terms in Resonant's asserted patents, narrowing the number of disputed issues for the Court. Specifically, the parties have agreed that: (1) the preambles are limiting in claim 1 of the '767 patent; claims 1 and 20 of the '830 patent; and claims 1 and 10 of the '882 patent; (2) the "control component …" limitations in three of the four asserted patents should be construed as means-plus-function terms and given their agreed-upon function, and (3) the "driving component …" limitations should be construed as means-plus-function limitations and given their agreed-upon function and corresponding structure. Agreed constructions are listed in Section I of Appendix A.

Four disputes regarding claim construction remain: (1) whether the term "control component …" in the '767 patent is also a means-plus-function term for one claim (it is, as Resonant has agreed it is for all other claims) and the appropriate corresponding structure for the term across all the asserted patents (i.e., to cover the structure shown in the specification); (2) whether the preambles of two claims are limiting (they are); (3) whether fourteen claims are indefinite (they are); and (4) whether the Court should rewrite two claims (it should not).

First, the Court should construe the term "control component …" in claim 1 of the '767 patent as a means-plus-function term, just as the parties have agreed for the same term in all the other asserted claims and patents. The Federal Circuit has explained that, where, as here, claim terms do not recite sufficient structure for performing the claimed function, they must be construed as means-plus-function limitations. Courts have routinely found (and as Resonant has agreed in this and in other cases), the term "component" is a generic term that provides no details about structure, and thus the limiting structure must come from the specification. Next, in construing the term as means-plus-function, the Court should adopt both the function and corresponding structure proposed by Apple. Resonant agrees with Apple's proposed function, but Resonant has

proposed a corresponding structure that fails to comport with Federal Circuit precedent because it expands the scope of the claim far beyond the structure disclosed in the specification.

Second, the Court should find that the preambles of ***all*** asserted independent claims limit their scope. Resonant agrees for all claims except two: "A linear vibration module" in claim 2 of the '337 patent and "A vibration module" in claim 20 of the '830 patent. Resonant used these terms in the preamble to distinguish the claims from the prior art, so they must limit the scope of the claims. Indeed, Resonant has agreed that these exact same preambles are limiting in other claims. These two claims should be treated the same as the others.

Third, the Court should find that certain claims are indefinite because the claims fail to inform, with reasonable certainty, those skilled in the art and the public about the scope of the invention. Some claims lack reasonable certainty in that they recite multiple different masses or outputs, for example, and then later add more detail about a mass or an output without specifying which of the masses or outputs is meant. Other claims recite the subjective term "desired output," but fail to provide any objective standard to determine what is "desirable." Because these claims do not have objective boundaries as to their scope, they are indefinite.

Fourth, the Court should reject Resonant's invitation to rewrite claim 4 of the '830 patent and claim 17 of the '882 patent. The Federal Circuit precedent is clear that courts may not redraft claims to fix an alleged error in draftsmanship where the alleged error is subject to reasonable debate. Here it is not clear that the claims even contain an error, and if they do, there are multiple corrections that are equally as plausible as the ones Resonant proposes.

TECHNOLOGY OVERVIEW

Apple's products utilize some of the most innovative methods and structures ever conceived to communicate information to and from its users. Apple's introduction of a graphical user interface in computers, and touch screens in mobile phones and tablets, revolutionized entire

industries. The asserted patents stand far afield from Apple's products and technology and instead are directed to "adult sex toy" devices. The claim construction disputes in this case arise from the gulf separating Apple's products from Resonant's "adult sex toy" patents.

The asserted patents trace their lineage to a provisional application titled "Linear Vibrating Motor for Sex Toy." Ex. 1 (Pro. App. No. 61/179,109 (the "'109 provisional")). The provisional explains that the purported invention is directed to "variations of a linear resonating vibration motor primarily for use in adult sex toys," further explaining that, in the state of the art at that time, "most vibrating motors used for adult sex toys use rotary motors that push an off-center weight around to create vibrations," whereas the purported "invention moves a weight back and forth (linearly) to create vibrations." *Id*.

The '109 provisional discloses two examples of a "linear vibrator" to create vibrations—(1) a "Thumper" that moves a magnet "back and forth" and (2) a "Pattycake" that moves a plunger "up and down." *Id*. at 8–12. In operation, vibration is caused through the movement of the weight back and forth as a result of current applied to an electromagnet, creating a magnetic force that accelerates the weight (a magnet) in a first direction, and the current is then reversed, resulting in acceleration of the weight in the opposite direction. *Id*. at 7–9; *see also* Visell Dec. ¶¶ 55–64[1]. As confirmed by Dr. Visell, this general structure was well-known in the art. Visell Dec. ¶¶ 39–54.

The asserted patents all relate to controlling vibrators. Visell Dec. ¶¶ 55–64. The three asserted patents that stem from the '109 provisional (the '767, '337, and '830 patents) are directed to controlling the vibrator based on the strength of the vibration. *Id*. The '882 patent (filed several

[1] With this brief, Apple submits a declaration from Dr. Yon J. Visell (Exhibit 5 to Yang Declaration)—an expert in the field of haptic engineering and robotics. Dr. Visell holds a Ph.D. in Electrical and Computer Engineering and has more than a decade of experience in the field of haptics, which is the study of technology that provides tactile information to a user. Dr. Visell has provided additional background concerning the state of the art in Sections V–VII of his declaration.

years later) is directed to controlling vibrators based on the position of the moving mass. '882 patent at cover, Figs. 45, 31:19–32:13.

LEGAL PRINCIPLES OF CLAIM CONSTRUCTION

Claim construction is a pivotal procedure where the Court determines the meaning of the words used in the asserted patent claims as a matter of law, and those definitions are then used to determine infringement and validity. *See Wavetronix LLC v. EIS Elec. Integrated Sys.*, 573 F.3d 1343, 1354 (Fed. Cir. 2009) ("Infringement analysis involves a two-step process: the court first determines the meaning of disputed claim terms and then compares the accused device to the claims as construed."); *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 996 n.7 (Fed. Cir. 1995) ("A claim must be construed before determining its validity just as it is first construed before deciding infringement."). By resolving disputes as to the meaning and scope of the asserted claims, the Court will allow the parties to enter discovery with increased certainty as to what is needed for each party to prove their case. *See, e.g.*, *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 372 (1996).

Claim construction requires examining the words of the claims to determine the scope of a patented invention. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005). The words of the claims are generally given the "ordinary and customary meaning" that they "would have to a person of ordinary skill in the art in question at the time of the invention" "in the context of the entire patent, including the specification." *Id.* The specification—the part of the patent preceding the claims describing the invention—provides the "single best guide to the meaning of a disputed term" and is usually dispositive of a term's meaning. *Id.* at 1315. The entire intrinsic record, including the specification, prosecution history, and prior art cited, must be examined when determining the meaning of a claim term. *Id.* at 1315–16; *see also E.I. du Pont De Nemours & Co. v. Unifrax I LLC*, 921 F.3d 1060, 1068 (Fed. Cir. 2019).

The Federal Circuit has endorsed the use of extrinsic evidence (*i.e.*, evidence outside of the patent and its prosecution history) in the form of expert testimony, dictionaries, and treatises to "help educate the court regarding the field of the invention and can help the court determine what a person of ordinary skill in the art would understand claim terms to mean." *Phillips*, 415 F.3d at 1318–19.

AGREED CONSTRUCTIONS

The parties have agreed to the following constructions (Appx A, Section I):

- The preambles of the following claims are limiting: claim 1 of the '767 patent; claims 1 and 20 of the '830 patent; and claims 1 and 10 of the '882 patent; and
- "a driving component that drives the moveable component in each of two opposite directions [within the housing]" ('767 patent, claim 1; '337 patent, claim 2) and "a driving component that drives the moveable component to oscillate within the housing" ('830 patent, claims 1, 19, 20) should be construed as means-plus-function terms pursuant to 35 U.S.C. § 112(f), with the agreed-upon function and corresponding structure set forth in Appendix A at Section I to this brief.

Further, Resonant is withdrawing its allegation that Apple infringes claim 7 of the '882 patent and claims 1 and 4 of the '337 patent, mooting claim construction disputes on those claims. Apple respectfully asks that this Court memorialize these agreements in its order.

ARGUMENT

I. "Control Component …" is a Means-Plus-Function Term in All (Not Just Some) of the Asserted Patents and Should Be Construed as Having the Function and Corresponding Structure Apple Proposes

The term "control component …" appears in asserted claims in all four patents (claim 1 of the '767 patent, claim 2 of the '337 patent, claims 1, 19, and 20 of the '830 patent, and claims 1 and 10 of the '882 patent). There are two steps to construing this term. *See* Appx A, Section II.B.

First is the issue of whether the term should be construed as a means-plus-function term pursuant to 35 U.S.C. § 112(f) (explained further below). It should, and for three of the four patents, Resonant agrees. But in the '767 patent alone, Resonant contends that "control

component" is not a means-plus-function limitation and should be treated differently. As discussed in Section I.B, *infra*, the Court should construe "control component" as a means-plus-function term consistently across all four patents.

Second, after determining that "control component …" is a means-plus-function term for all claims, the Court must then construe the term by identifying its function and corresponding structure. The parties agree on the claimed function but disagree on the corresponding structure.[2] For the reasons set out in Section I.C, *infra*, the Court should adopt Apple's proposed corresponding structure.

But first, we start with an overview of means-plus-function claiming under § 112(f).

A. Legal Principles of Means-Plus-Function Claiming under 35 U.S.C. § 112(f)

A patent claim must be directed to a particular ***mechanism*** of achieving a result or function rather than claiming just the result of the function itself—lest a patentee's claims be so broad as to cover ***any*** mechanism of performing that function, whether described in the patent or not. *See Holland Furniture Co. v. Perkins Glue Co.*, 277 U.S. 245, 257 (1928). In other words, claims cannot broadly cover only the function of a particular structure but must be limited to the structure as well, and that structure must be specifically described in the patent. *Halliburton Oil Well Cementing Co. v. Walker*, 329 U.S. 1, 12 (1946) (rejecting the practice of functional claiming because of "the broadness, ambiguity, and overhanging threat of the functional claim" deters the development of other devices to accomplish the same purpose); *see also Enfish, LLC v. Microsoft Corp.*, 9 F. Supp. 3d 1126, 1128 n.1 (C.D. Cal. 2014) (summarizing 35 U.S.C. § 112(f)).

Section 112(f)[3] of the Patent Act allows an applicant to write a claim limitation "by reciting

[2] *See* Section II.B of Appendix A.
[3] § 112(f) was previously codified at § 112 ¶ 6, so some earlier decisions refer to this section in this manner.

a function to be performed, rather than a structure for performing that function." Such claim limitations are referred to as means-plus-function limitations, and they are properly construed to cover "only the structure, materials, or acts described in the specification as corresponding to the function and equivalents thereof." *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1347 (Fed. Cir. 2015) (*en banc*); *see also* 35 U.S.C. § 112(f); *Lockheed Martin Corp. v. Space Systems/Loral, Inc.*, 324 F.3d 1308, 1318 (Fed. Cir. 2003). For example, a patentee may describe several different kinds of chairs in the specification of her patent and then claim a "means for sitting" that covers only the chairs described in the specification and equivalents thereof.

B. "Control Component" Should Be Construed as a Means-Plus-Function Term Under § 112(f)

1. Legal Principles Regarding When § 112(f) Applies.

The use of the word "means" in a claim limitation creates a rebuttable presumption that § 112(f) applies. *Williamson*, 792 F.3d at 1348. Similarly, the lack of the word "means" creates a rebuttable presumption that § 112(f) does not apply. *Id.* That presumption is rebutted, and § 112(f) ***applies*** when the claim "fails to 'recite sufficiently definite structure' or else recites 'function without reciting sufficient structure for performing that function.'" *Id.* (overruling prior precedent that, in the absence of the word "means," presumption against the application of § 112(f) was "strong").

For example, in *Williamson*, the Federal Circuit found the presumption rebutted—and construed the phrase "distributed learning control module" pursuant to § 112(f)—because it did not recite a sufficiently definite structure. *Id.* at 1349–54. The Federal Circuit explained that, like the word "means," "modules" is just another "nonce" term—*i.e.*, a term that has no specific meaning. *See, e.g.*, *Williamson*, 792 F.3d at 1350 (explaining that "[g]eneric terms such as 'mechanism,' 'element,' 'device,' and other nonce words that reflect nothing more than verbal

constructs may be used in a claim in a manner that is tantamount to using the word 'means' …").

2. "Control Component …" Is a Means-Plus-Function Term Under § 112(f) Because It Does Not Provide Sufficient Structure.

Like the terms means, mechanism, element, or device, the claimed "control ***component***" is another classic example of a generic nonce word that fails to provide sufficient structure and is thus subject to § 112(f). As confirmed by Dr. Visell, the term "component" connotes no structure and rather refers to a generic part (hardware and/or software) of a larger assembly. *See* Visell Dec. ¶¶ 69–81. Adding "control" to the term "component" offers no help as it only explains the supposed function performed by the component—not its structure. *See* Visell Dec. ¶¶ 69–81; *see also, e.g.*, *Amdocs (Israel) Ltd. V. Openet Telecom, Inc*., 2018 WL 1699429, at *19 (E.D. Va. Apr. 6, 2018) (construing "enhancement ***component***" pursuant to § 112(f) because "'component' does not refer to any specifically known structure in the art"); *see also Umbanet Inc. v. Epsilon Data Management, LLC*, 2017 WL 3508771, at *7 (E.D. Tex. Aug. 16, 2017) (applying § 112(f) for "document-encoding ***component***"); *Cypress Lake Software, Inc. v. Samsung Elecs. Am., Inc.*, 382 F. Supp. 3d 586, 622 (E.D. Tex. 2019) (applying § 112(f) for "navigation element handler ***component***" and "navigation director ***component***"); *cf.* USPTO's Manual of Patent Examination Procedure ("MPEP") at § 2181 (identifying "***component*** for" as a potential "non-structure generic placeholder" that is subject to § 112(f)). Put differently, a "control component" is not any different than simply reciting a "means for control" and is subject to § 112(f). *See, e.g., Williamson*, 792 F.3d at 1350.

Resonant agrees that "control component" should be construed pursuant to § 112(f) for the '337 patent (claim 2), '830 patent (claims 1, 10, 19, 20) and '882 patent (claims 1, 10). But Resonant argues that the same term in claim 1 of the '767 patent § 112(f) does not apply because the "control component" includes a "microprocessor," "control program," and "switch." Resonant

is wrong because "[t]he question is not whether a claim term recites any structure but whether it recites *sufficient* structure"—that is structure "sufficient … for performing [the] function[s]" recited. *Egenera, Inc. v. Cisco Sys., Inc.*, 972 F.3d 1367, 1374 (Fed. Cir. 2020). In this case, Claim 1 of the '767 patent does not recite sufficient structure, because the "microprocessor," "program," and "switch"—either alone or in combination—are not sufficient structures for performing the claimed functions. *See* Visell Dec. ¶¶ 74–87.

The relevant portion of claim 1 of the '767 patent is reproduced below, with the "control component" limitation in **bold emphasis** and the language that Resonant claims provides the allegedly sufficient structure called out in **red**:

> a **control component** that includes a **microprocessor** and
>
> > that controls supply of power from the power supply to the driving component to cause the moveable component to linearly oscillate,
> >
> > the **control component** including, in addition to the **microprocessor**,
> >
> > > **a control program**, stored in one of a separated electronic memory or within the processor, that is executed by the microprocessor to control operation of the linear resonant vibration module, and
> > >
> > > **a switch** that receives a directional signal d from the processor and that selects a corresponding direction of the two opposite directions in which the driving component drives the moveable component,
>
> the **control component** receiving output signals from sensors within the linear resonant vibration module during operation of the linear resonant vibration module and adjusting one or more operational control outputs of the control component according to the received output signals from the sensors in order that subsequent operation of linear resonant vibration module produces desired outputs from the one or more sensors corresponding to one or more operational control parameters.

'767 Patent, Claim 1 (emphases added). Notably, nearly all the language surrounding "control component" describes its functions. For example, the claim explains that the control component "control[s] operation of the linear resonant vibration module," that it "controls supply of power from the power supply," that it "receive[s] output signals," and that it "adjust[s] one or more operational control outputs." None of this language connotes any structure because it describes

what the control component ***does*** rather than what it ***is***. Visell Dec. ¶¶ 74–81; *see also WSOU Invs. LLC v. Google LLC*, 2023 WL 6210607, at *4 (Fed. Cir. Sept. 25, 2023).

The "microprocessor," "program," and "switch"—either alone or in combination—are not sufficiently specific structures for performing the claimed functions because they are only generic computer components. *See* Visell Dec. ¶¶ 82–87. As the Federal Circuit has explained, general-purpose computer components—tantamount to an unexplained "black box"—do not connote a specific structure absent a description of how they are programmed to operate. *WMS Gaming, Inc. v. Int'l Game Tech.*, 184 F.3d 1339, 1348 (Fed. Cir. 1999). Thus, simply reciting generic computer components in a claim is insufficient structure to remove a claim from ¶ 112(f) treatment because generic components do not provide the structure for the special purpose computer recited in the claims. *See, e.g.*, *WSOU*, 2023 WL 6531525 at *4 (finding recitation of "processor" in a claim insufficient).

Here, with respect to the "microprocessor" or "control program," the claim provides no structural detail other than that the "control program" is stored in memory (as is every computer program) and that it is executed by a microprocessor (again, as is nearly every computer program). *See* Visell Dec. ¶ 78. And the claim provides no structural detail concerning the structure of the switch and certainly not sufficient structure for performing any of the claimed functions. *See* Visell Dec. ¶¶ 78–81. In other words, the claim provides nothing more than a black-box collection of generic computer parts "that captures any and all structures that fulfill the function, just as if 'means' was used"—*i.e.*, "the epitome of functional claiming." *WSOU Invs. v. Google*, 2023 WL 6531525, at *4 (Fed. Cir. Oct. 6, 2023). This is exactly the kind of situation where the Federal Circuit has found § 112(f) applies—namely, where the claim "recites function without reciting sufficient structure for performing that function." *Mass. Inst. of Tech. v. Abacus Software*, 462

F.3d 1344, 1353 (Fed. Cir. 2006) (internal quotation marks omitted); *see also Diebold Nixdorf, Inc. v. In'l Trade Com'n*, 899 F.3d 1291, 1298 (Fed. Cir. 2018) (same).

Outside the claim language, the specification does not connote sufficient structure either. The term "control component" is used only once, in a description of Figure 14 as part of a list of components inside the vibration module: "[t]he plunger 1402 is oriented orthogonally to a main housing 1404 of the LRVM that includes the power supply, microcontroller, and other control components." '767 patent, 9:34–47. Nothing in this description indicates that the term "control component" has any structure and certainly not sufficiently definite structure. *See* Visell Dec. ¶ 81. Nothing in the prosecution history helps elucidate any more structural meaning for the term "control component," nor has Resonant identified any portion of the prosecution history it believed was relevant. And, as mentioned previously, Resonant has already agreed that "control component" is a nonce term in the context of the other asserted patents.

C. The Construction of "Control Component …" Under § 112(f)

Because § 112(f) applies to the "control component …" term in all the asserted claims, this Court must turn to finding the proper construction of these terms.

1. Legal Principles of Construing § 112(f) Limitations.

Construction of a means-plus-function claim is a two-step process. *Williamson*, 792 F.3d at 1351–52. A court must first determine the ***function*** that is performed by the limitation. *Id.*; *see also Micro Chem., Inc. v. Great Plains Chem. Co., Inc.*, 194 F.3d 1250, 1258 (Fed. Cir. 1999). The function is determined by construing the claim language. *Cardiac Pacemakers, Inc. v. St. Jude Med., Inc.*, 296 F.3d 1106, 1113 (Fed. Cir. 2002). Second, "the court must determine what ***structure***, if any, disclosed in the specification corresponds to the claimed function." *Williamson*, 792 F.3d at 1351. "Structure disclosed in the specification qualifies as 'corresponding structure' if the intrinsic evidence ***clearly links or associates*** that structure to the function recited in the

claim." *Id*. at 1352 (emphasis added); *Omega Eng'g, Inc. v. Raytek Corp*., 334, F.3d 1314, 1321 (Fed. Cir. 2003); *B. Braun Med. Inc. v. Abbott Labs*., 124 F.3d 1419, 1424 (Fed. Cir. 1997) ("This duty to link or associate structure to function is the *quid pro quo* for the convenience of employing § 112, ¶ 6.").

2. There Is No Dispute Over the Function of the "Control Component …" Terms Under § 112(f).

The parties agree on the functions performed by the control component terms of each asserted patent (but for Resonant's position that § 112(f) should not apply to claim 1 of the '767 patent). Those constructions are set forth in Appendix A. Each of the functions mirrors the language of the claim, and accurately describes what each "control component …" does. *See* Visell Dec. ¶¶ 88–104. The Court should adopt them as part of its order.

3. The Corresponding Structure of the "Control Component …" Is the Structure Disclosed in Each Respective Specification, as Required Under § 112(f).

The corresponding structures for each "control component …" term proposed by Apple should be adopted because the "intrinsic evidence ***clearly links or associates*** that structure to the function recited in the claim." *Williamson*, 792 F.3d at 1351 (emphasis added). The proposed corresponding structures for each "control component …" term are listed below (with items in dispute shown in emphasis):

Claim	Apple's Construction	Resonant's Latest Construction
'767 Patent, Claim 1	(1) a microprocessor; (2) a switch … ; and (3) a control program … that performs ***the algorithm shown in Figs. 7A–C and described at 6:15–8:3*** and equivalents thereof.	a microprocessor; a switch; electronic memory; a control program that, if an algorithm is required, performs ***an algorithm comprising the following steps***: (a) receive the value of an output signal; (b) compare that value to a different value, which could be a previous value; and (c) adjust one or more operational control outputs based on that comparison; and equivalents thereof
'337 Patent, Claim 2	(1) ***the switches shown in Figures 5A–6 (and described in the***	microcontroller with internal or external memory; processor; CPU; microprocessor; and equivalents thereof

Claim	Apple's Construction	Resonant's Latest Construction
'830 Patent, Claim 20	***specification)*** (2) the processor / microprocessor / microcontroller / CPU that performs ***the algorithm shown in Figures 7A–C and described at 6:43–8:30 and 13:3-41 (of the '337 Patent) (6:52–8:40 and 13:20–59 in the '830 Patent)*** and equivalents thereof	[if an algorithm is required] Where the corresponding structure is a processor, CPU, or microprocessor, the processor / CPU / microprocessor is programmed with ***an algorithm comprising the following steps***: (a) set the mode and strength to values representing selections made by user input to the user input features; (b) provide a corresponding output to the power supply so that the power supply provides a corresponding output to the driving component; and (c) drive simultaneous oscillation of the moveable component at two or more frequencies.
'830 Patent, Claims 1 & 19	(1) ***the switches shown in Figures 5A–6 and described at 5:52–6:5, 6:9–16;*** and (2) the processor / microprocessor / microcontroller / CPU that performs ***the algorithm shown in Figures 7A–C and described at 6:52–8:40***; and equivalents thereof	***oscillator circuit***; microcontroller with internal or external memory; processor; CPU; microprocessor; and equivalents thereof Where the corresponding structure is a processor, CPU, or microprocessor, the processor / CPU / microprocessor is programmed with ***an algorithm comprising the following steps***: (a) set the mode and strength to default values or values representing selections made by user input to the user input features; and (b) provide a corresponding output to the power supply so that the power supply provides a corresponding output to the driving component.
'882 Patent, Claims 1 & 10	the processor/logic circuitry that performs ***the algorithm shown in Fig. 45 and described at 31:19–32:13***; and equivalents thereof	***oscillator circuit***; microcontroller with internal or external memory; processor; CPU; microprocessor; and equivalents thereof Where the corresponding structure is a processor, CPU, or microprocessor, the processor / CPU / microprocessor is programmed with an algorithm comprising the following steps: (a) receive a target frequency; (b) receive sensor outputs indicating (1) position of the mass, or (2) position and velocity of the mass; and (c) generate control outputs based on the target frequency and the current position and velocity of the mass.

Resonant disputes only certain limited aspects of Apple's corresponding structure.[4] As illustrated by the color-coding above, the disputes generally fall into three buckets:

(a) Algorithms: Whether the corresponding structure should include the control algorithm disclosed in the specifications of each of the patents (as urged by Apple), or whether the corresponding structure should include a different algorithm or no algorithm at all (as urged by Resonant). This dispute applies for all asserted patents.

(b) Switches: Whether the corresponding structure should include one of the switches disclosed in the specification for controlling the supply of power (as urged by Apple), or whether the corresponding structure can be a switchless structure described nowhere in the specification (as urged by Resonant). This dispute applies to the '337 and '830 patents.

(c) Oscillator Circuit: Whether the corresponding structure for claims reciting the use of stored values (as in the '830 patent) includes an "oscillator circuit" (as urged by Resonant) even though the specification does not disclose the use of stored values with an oscillator circuit.

a) Algorithms: The Structure Must Include the Control Program in the Specification Because It Is Clearly Linked to the Claimed Function

This Court should construe each of the "control component …" terms to require the algorithm disclosed in the specification, not some watered-down version of the algorithm or no algorithm at all (as suggested by Resonant). When claims are written in functional terms under § 112(f), courts "shall" construe those limitations "to cover the corresponding structure … ***described in the specification*** and equivalents thereof." 35 U.S.C. § 112(f); *see also Default Proof*

[4] During the meet-and-confer process, Resonant provided three entirely different constructions for the "control component" terms as used in these patents—including its most recent set provided on the Monday before this brief was due (March 18, 2024), more than two weeks past the deadline for exchanging final constructions (February 29, 2024). Apple has done its best to understand where the disputes are—a difficult task given Resonant's shifting-sands approach to construing this term and its untimely disclosure of new constructions.

Credit Card Sys. v. Home Depot U.S.A., Inc., 412 F.3d 1291, 1298 (Fed. Cir. 2005) ("The corresponding structure 'must include all structure that actually performs the recited function.'").

In the context of computer-implemented means-plus-function limitations, that structure must include an algorithm. *See, e.g.*, *WMS Gaming, Inc. v. In'l Game Tech*., 184 F.3d 1339, 1348 (Fed. Cir. 1999) (explaining that "[t]he structure of a microprocessor programmed to carry out an algorithm is limited by the disclosed algorithm").

Thus, pursuant to § 112(f), the bargain Resonant struck when drafting its claims in functional terms is that the claims would be limited to the structure disclosed in the specification ***programmed to perform the algorithm disclosed in the specification***. *See id.*

1) In Each Patent, the Specification Clearly Links Algorithms to the Claimed Function.

For each of the asserted patents, the algorithms Apple has identified are "clearly linked" to the recited functions and should be adopted by the Court.

For the '767 patent (claim 1), the agreed-upon function is: "controlling supply of power from the power supply to the driving component …"; "controlling operation of the linear resonant vibration module;" "receiving output signals from sensors …"; and "adjusting one or more operational control outputs of the control component according to the received output signals from the sensors ...." *See* Appx A, Section II.B. The specification of the '767 patent explains that the vibration module "is controlled by a control program," where "FIGS. 7A-C provide control-flow diagrams that illustrate the ***control program***, executed by the CPU, that controls operation" of the vibration module. '767 patent, 6:15–17 (emphasis added). The algorithm illustrated in Figs. 7A-C (as explained by the description of those figures, which appears from column 6, line 15 and column 8, line 3 of the '767 patent) is thus part of the corresponding structure because the patent clearly links the claimed function with the disclosed structure, here, a computer implemented

algorithm. *See, e.g.*, Visell Dec. ¶¶ 90–93.

The specifications of the other patents contain similar statements expressly linking specific algorithms to the "control" function. For example:

For the '337 patent (claim 2) and '830 patent (claims 1, 19, and 20), the patents' specifications also clearly link the recited function with the control algorithm that controls the operation of the control component: "FIGS. 7A-C provide control-flow diagrams that illustrate the ***control program***, executed by the CPU, that controls operation" of the vibration module. '337 patent, 6:43–45 (emphasis added) (the description of Figs. 7A–C appears at 6:43–8:30); *see also* 8:16–20 (explaining that, in order effectuate the ultimate control, the control mechanism outputs a value "to the power supply so that the power supply outputs and appropriate current to the coil"); '830 Patent, 6:52–54; *see also id.* at 6:52–8:40 (description of the algorithm); Visell Dec. ¶¶ 94–100. These algorithms shown in Figs. 7A–C are the corresponding structure.

For claim 2 of the '337 patent and claim 20 of the '830 patent, those claims require more complex vibration modes (as is reflected in the agreed functions for those terms) in addition to the functionality recited in Claims 1, 19, and 20 of the '830 patent and Claim 2 of the '337 patent, the corresponding structure must also include the ***additional*** structure that the specifications clearly link to this complex vibration mode functionality. The algorithm for the "non-default" modes of operation is discussed in the algorithms shown in Figs. 7A–C. More specifically, Fig. 7B contains a step for "handl[ing] [a] non-default mode" (*i.e.*, item 734). *E.g.*, '337 patent, Fig. 7B. The only disclosed examples of this non-default mode are so-called "more complex operational modes" that are "handled by various more complex routines," *i.e.*, additional algorithms. '337 patent, 7:43–45; *see also* '830 patent, 7:53–55. "These more complex modes … are not further described in the control-flow diagrams." '337 patent, 7:45–50; *see also* '830 patent, 7:55–60. They are,

however, described in the specification. *See* '337 patent, 13:10–41; '830 patent, 13:28–59. Because these additional algorithms are part of the algorithm linked to the "control component" with respect to the more complex vibration modes, they must also be included as corresponding structure for '337 claims 2 and '830 claim 20 (the claims that require more complex vibration functionality). *See* Visell Dec. ¶¶ 94–100.

For the '882 patent, the specification clearly links the recited function with the algorithm depicted in Figure 45. '882 patent, 31:19–56; *see also* Visell Dec. ¶¶ 101–104. As this algorithm is clearly linked with the function recited (*i.e.*, control based on direct sensing), it must be included as corresponding structure for the "control component." *See* Visell Dec. ¶ 104.

2) Each of Resonant's Proposed Algorithms Excludes Steps that the Specification Clearly Links to the Claimed Function.

Resonant proposes that only some unspecified parts of these algorithms are required, though Resonant could not identify any portion of the algorithm that was not required for performing the claimed function during the meet-and-confer process. But the Patent Act says the claim shall be construed to cover the structure specifically disclosed in the specification, not some arbitrary portion of it. *See* 35 U.S.C. § 112(f) (means-plus-function terms "***shall*** be construed to cover the corresponding structure, material, or acts described ***in the specification*** and equivalents thereof" (emphases added)). This is the trade-off Resonant made when writing its claims in functional terms, that the claims must be limited to what is described in the specification. Yet Resonant now asks this Court to re-write the terms of this bargain by, instead of adopting the algorithm "described in the specification," adopting something it made up in the context of litigation. The Court should decline to do so.

Resonant's newest[5] proposal with respect to the '830 patent illustrates why this issue matters. As discussed above, the '830 patent discusses a control algorithm, and links that control algorithm to the functions recited for the control component. However, Resonant has written a new algorithm that requires just two steps: "(a) set the mode and strength to [default values or] values representing selections made by the user input to the user input features; and (b) provide a corresponding output to the power supply so that the power supply provides a corresponding output to the driving component." *See* Ex. 3 (2024-03-18 Resonant's Draft Joint CC Statement, listing Resonant's proposed constructions). Resonant's proposed algorithm squarely contravenes § 112(f)'s requirement (and Federal Circuit precedent) because Resonant's algorithm is nowhere disclosed in the specification, and significantly broader than the one disclosed in the specification.

For example, Resonant's proposal entirely omits the "monitor" routine described in the specification that allows the vibrational device to ensure it is vibrating "at a frequency and an amplitude specified by one or more stored values"—as is required by the claim and the agreed function. *See* Visell Dec. ¶¶ 94–100. Namely, as the specification explains, when in default mode, the monitor routine "uses continuous feedback control to optimize the vibrational force," and then sets stored variables accordingly. *See, e.g.*, '830 patent, 7:42–8:19; *see also* Visell Dec. ¶¶ 94–100. In other words, this "monitor routine" is what sets the "stored values" referred to in the claim (and in the agreed function) and is what ensures that the vibration device is "oscillat[ing] at a frequency and an amplitude specified"—again as required by the agreed function. *See* '830 Patent, Claim 1. Yet, if Resonant would have its way, none of this would be required—despite it being

[5] Earlier during the meet-and-confer process, Resonant agreed with Apple as to the algorithm. *See* Ex. 2 (2024-02-28 Resonant's Draft Joint CC Statement, listing Resonant's proposed constructions). However, on the Monday before this brief was due, Resonant provided new constructions with significantly broader and oversimplified algorithms, such as what is discussed here with respect to the '830 patent. *See* Ex. 3 (2024-03-18 Resonant's Proposed Constructions).

the only way the specification discloses to perform these aspects of the claimed function.

Resonant's newest proposal for each of the other patents suffers from similar problems. Instead of the algorithm disclosed in the specification, Resonant proposes algorithms consisting of only a couple of steps that do little more than mirror the functions recited by the claims. In other words, Resonant urges that the algorithm can be ***any*** algorithm that performs the functions recited.

Resonant's approach here is wrong for the same reasons the Federal Circuit identified in *WMS Gaming, Inc. v. Int'l Game Tech.*, 184 F.3d 1339, 1347 (Fed. Cir. 1999). There, the Federal Circuit considered whether the district court's identification of corresponding structure for a claim term ("means for assigning") was overly broad. *Id.* at 1348. The district court had determined that the limitation would cover "any table, formula, or algorithm for determining correspondence" between a number appearing on a reel and a number selected by a random-number-generator. *Id.* As the Federal Circuit explained, though, this construction was erroneous because the district court "fail[ed] to limit the claim to the algorithm ***disclosed in the specification***." *Id.* (emphasis added).

Here, in essence, Resonant asks this Court to broaden its claims beyond what is disclosed in the specification and to remove all meaningful limits as to the required structure, which would improperly broaden the scope of its claims. While Resonant has not expressly proposed that the corresponding structure can be the physical structure programmed to perform ***any*** algorithm capable of achieving the same function, the constructions it has proposed are not meaningfully different. By rewriting each algorithm to include only a few high-level steps, Resonant is asking this Court to "fail[] to limit [each] claim to the algorithm ***disclosed in the specification***"— the exact error committed by the district court in *WMS Gaming*.

The error in Resonant's constructions is also illustrated by *Peloton Interactive, Inc. v. Icon Health & Fitness, Inc.*, 2021 WL 4133702, at *5 (D. Del. Sept. 10, 2021). In *Peloton*, the District

of Delaware considered a dispute between the parties as to the meaning of the term "means for comparing." There, contrary to one party's urging, the court found it not "proper to amend the algorithmic disclosure" in the specification "to expand its scope." *Id.* at *8. Here, this is exactly what Resonant urges this Court to do—amend the actual disclosure from the specification in lieu of its broader, high-level descriptions of the algorithm. Just as the Court did in *Peloton*, this Court should reject Resonant's attempted post-hoc expansion of its claims in violation of § 112(f) and adopt Apple's proposed corresponding structure for each "control component" limitation.

Lastly, Resonant argues that an algorithm is not needed for a microcontroller (despite Resonant's acknowledgment that one is required for a microprocessor). Resonant has yet to identify any reasoned basis for this distinction. As Dr. Visell explains, and as has been repeatedly confirmed in caselaw, a "microcontroller" is not different in substance than a "microprocessor": both require programming to operate. *See* Visell Dec. ¶¶ 82–87; *see also UUSI, LLC v. United States*, 131 Fed. Cl. 244, 271 (Fed. Cl. Apr. 17, 2017) ("When the corresponding structure is a microcontroller or microprocessor, the structure is limited by the disclosed algorithms in the specification."); *Universal Elecs., Inc. v. Roku, Inc.*, No. 2021-1992, 2023 WL 5316526, at *7 (Fed. Cir. Aug. 18, 2023) (finding Board's construction requiring a "microcontroller that performs [an] algorithm" was appropriate means-plus-function construction) (quotes omitted)). There is no reason for the distinction proposed by Resonant, and this Court should not adopt it.

b) Switches: The Corresponding Structure Must Include Switches

The corresponding structure for the "control component" terms of the '337 and '830 patents must also include a switch, which is part of the control mechanism described in each specification and is correctly included in Apple's proposed constructions.[6] The specification contains no

[6] Because the '337 patent and '830 patents are identical as relevant here, we provide cites only to the '337 patent.

disclosure of a mechanism by which the claimed control can be accomplished without a switch.

In all disclosed embodiments, signals are sent to a switch to control the flow of current. For example, a direction-control signal is sent to a series of switches 506-509 (highlighted in Figure 5A, reproduced below to the right) to alternate the direction of current sent by the power supply, thus alternating the polarity of the electromagnet, causing vibration. *See, e.g.*, '337 patent, 5:43–65; *see also* Visell Dec. ¶¶ 105–108. Even where the microprocessor/microcontroller/CPU is replaced with "a simpler oscillator circuit"—that too still sends signals to a switch to control the current. *See, e.g.*, '337 patent, 11:43–49 (explaining, for example, "[t]he H switch . . . can be controlled by an oscillating current input rather than digital outputs from a microprocessor"); *see also* Visell Dec. ¶¶ 105–108.

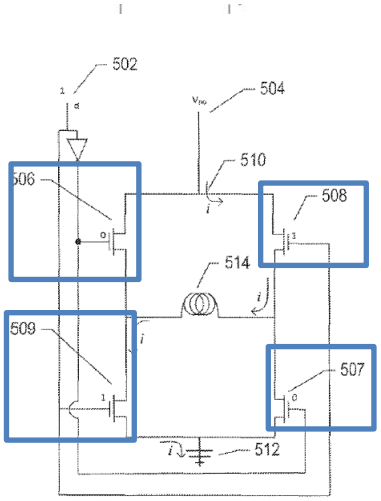

FIG. 5A

The Court should reject Resonant's assertion that the corresponding structure does not require a switch so that the function can be accomplished through some other, unspecified means. Section 112(f) requires that a means-plus-function limitation be limited to the structure "disclosed in the specification" and not some theoretical alternative not disclosed. *Biomedino, LLC v. Waters Techs. Corp.*, 490 F.3d 946, 953 (Fed. Cir. 2007) (explaining that, for § 112(f), the proper "inquiry is whether one of skill in the art would understand the specification itself to disclose a structure, not simply whether that person would be capable of implementing a structure").

c) An Oscillator Circuit Cannot Be a Corresponding Structure for Claims that Recite Stored Values

Lastly, this Court should decline to adopt an "oscillator circuit" as corresponding structure for the "control component …" in the '830 patent's claims. Visell Dec. ¶¶ 109–111. Claims 1,

19, and 20 of the '830 patent recite, "a control component that controls supply of power from the power supply to the driving component to cause the moveable component to oscillate at a frequency and an amplitude specified by one or more stored values." There is no description of the "oscillator circuit" using stored values, as is required by those claims, and thus is not the clearly linked structure to the claimed function of "controlling supply of power . . . specified by one or more stored values." Furthermore, as Dr. Visell explains, "stored values" are stored in memory, to be used by a processor (or similar structure). Visell Dec. ¶ 111. The "oscillating circuit" described in the specification is analog and incapable of retrieving stored values from memory. *See* Visell Dec. ¶ 111. Indeed, the "oscillator circuit" is described (accordingly) as being a "simpler" "less functional" replacement for a processor wherein the switch "be controlled by an oscillating current input rather than digital outputs from a microprocessor." '830 patent, 11:57–63; *see also id*., 11:67–12:2 (oscillator circuits "lack[] the extremely broad range of vibration patterns and modes available to processor or microprocessor-controlled vibration modules").

Accordingly, because the "oscillator circuit" is not described as performing and is unable to perform the recited function, it cannot be the corresponding structure, as urged by Resonant. *See Display Techs., LLC v. Mechtronics Corp.*, 335 F. Supp. 2d 431, 438 (S.D.N.Y. 2004) ("While the structures disclosed in the specification need not be the best mode of carrying out the means, a structure that is specifically described as being incapable of performing the recited function has been disclaimed."); *Signtech USA, Ltd. v. Vutek, Inc.*, 174 F.3d 1352, 1357 (Fed. Cir. 1999) ("[B]y stating that the accused structure was 'incapable' of achieving the desired results of the invention, the patentee expressly excluded it as an equivalent of the disclosed structure.").

II. The Preamble of Each Asserted Claim Is Limiting

The preamble of each independent claim limits the scope of that claim. Resonant agrees for all claims except for two: claim 2 of the '337 patent and claim 20 of the '830 patent ("A linear

vibration module" and "A vibration module," respectively). These two preambles are limiting like all the others. Resonant's position to the contrary should be rejected. *See* Appx A, Section II.A.

To determine whether the preamble is limiting, courts look to the plain meaning of the claim, the written description in the specification, and the prosecution history. *See, e.g., Corning Glass Works v. Sumitomo Elec. U.S.A., Inc.*, 868 F.2d 1251, 1257 (Fed. Cir. 1989). For example, if a patent applicant "clearly relie[s]" on the preamble to distinguish its invention from the prior art, the preamble may limit the claim scope. *Hearing Components, Inc. v. Shure Inc.*, 600 F.3d 1357, 1366, 94 USPQ2d 1385 (Fed. Cir. 2010). Similarly, the preamble may be limiting when "[t]he specification is replete with references to the invention as [described in the preamble], including the title of the patent itself and the 'Summary of the Invention.'" *Poly-Am., L.P. v. GSE Lining Tech., Inc.*, 383 F.3d 1303, 1310 (Fed. Cir. 2004).

For claim 2 of the '337 patent and claim 20 of the '830 patent—just as with all the other asserted claims—Resonant relied on the preamble limitations to distinguish the claimed invention from the prior art. Indeed, the specifications expressly distinguish linear resonant vibration modules from the prior art involving an "unbalanced electric motor typically used for generating vibrations." '337 patent, 1:23–3:3 (Background section describing the problems with unbalanced electric motors); '830 patent, 1:25–3:7 (same). The preambles are also limiting because the specifications are replete with references to the "invention" as described in the preamble. '767 patent, 10:9–14; '337 patent, 14:39–44; '830 patent, 14:59–64, '882 patent, 32:14–20. Even the title of each patent is "Linear Vibration Modules and Linear-Resonant Vibration Modules." '337 patent, cover; '830 patent, cover. And, in each patent, the first words of the Abstract, Summary, and Detailed Description are: "The current application is directed to various linear vibrational modules." *See generally* '337 and '830 patents. Because the specification tells the world that the

purported invention is a vibration module, the scope of the claims should be limited by the use of "linear vibration module" and "vibration module" in the preambles.

Resonant's contrary position is untenable. First, Resonant agrees that the preamble in claim 19 of the '830 patent is limiting but then asserts that the exact ***same*** preamble ("vibration module") in nearly identical claim 20 is not. Second, before Resonant dropped claim 1 of the '337 patent, Resonant agreed that its preamble is limiting but now argues that the exact ***same*** preamble ("linear vibration module") in nearly identical claim 2 is not. Ex. 2 (2-28 Resonant's Proposed Constructions). There is no justifiable reason why the two preambles Resonant has focused on should be treated differently from the preambles of the other asserted independent claims.

Resonant's inconsistent positions may arise from an incorrect belief that a preamble is limiting only when it serves as an antecedent basis for another term in the body of that claim, but that is wrong as a matter of law. *See, e.g.*, *MEMS Tech. Berhad v. Int'l Trade Comm'n*, 447 F. App'x 142, 154 (Fed. Cir. 2011) (finding preamble "microelectromechanical system package" to be a limitation where the body of the claim merely "listed components" of this "package" without referring back to "package" as an antecedent basis). Apple's consistent position and constructions—unlike Resonant's—should be adopted.

III. Indefiniteness

Certain claims of the asserted patents are indefinite because they fail to "particularly point[] out and distinctly claim[] the subject matter" of the claimed inventions. 35 U.S.C. § 112, ¶ 2. *See* Appx A, Section II.C.

As the Supreme Court has explained, 35 U.S.C. § 112, ¶ 2 requires the claims to "inform those skilled in the art about the scope of the invention with reasonable certainty." *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 909–10 (2014) (35 U.S.C. § 112, ¶ 2 requires that a patent "be precise enough to afford clear notice of what is claimed, thereby apprising the public of

what is still open to them.") (internal quotations and alterations omitted). In other words, "[t]he claims, when read in light of the specification and the prosecution history, must provide objective boundaries for those of skill in the art." *Interval Licensing LLC v. AOL, Inc.*, 766 F.3d 1364, 1371 (Fed. Cir. 2014). Claims that fail to do so are indefinite and invalid. *Nautilus*, 572 U.S. at 902.

A. This Court Should Find Indefinite the Asserted Claims that Lack Antecedent Basis

In a patent claim, "antecedent basis" is where a claim element is introduced once and then subsequently referred to as "said" element or "the" element. Failure to provide an antecedent basis is a common reason for finding a claim invalid as indefinite. *See Halliburton Energy Servs., Inc. v. M-I LLC*, 514 F.3d 1244, 1249 (Fed. Cir. 2008) ("if a term [in that claim] does not have a proper antecedent basis where such basis is not otherwise present by implication or the meaning is not reasonably ascertainable" it is indefinite); Visell Dec. ¶¶ 112–116.

For example, the lack of reasonable clarity and indefiniteness in a claim arises where a claim refers to "said lever" or "the lever" without an earlier recitation or limitation of "a lever" such that it would be unclear as to what element the limitation is referencing. MPEP § 2173.05(e) (discussing the need for antecedent bases). Similarly, "if two different levers are recited earlier in the claim, the recitation of 'said lever' in the same or subsequent claim would be unclear where it is uncertain which of the two levers was intended. [And a] claim which refers to 'said aluminum lever,' but recites only 'a lever' earlier in the claim, is indefinite because it is uncertain as to the lever to which reference is made." *Id.* Where a term is indefinite for lack of proper antecedent basis, "courts may not redraft claims, whether to make them operable or to sustain their validity." *Chef Am., Inc. v. Lamb-Weston, Inc.*, 358 F.3d 1371, 1372–74 (Fed. Cir. 2004); *Bushnell Hawthorne v. Cisco*, 813 F. App'x 522, 525–27 (Fed. Cir. 2020).

1. Claim 4 of the '830 Patent and Claims 17, 19, and 20 of the '882 Patent Are Indefinite Because They Lack Any Antecedent Basis.

Claim 4 of the '830 patent and claims 17, 19, and 20 of the '882 patent are indefinite because they undisputedly fail to provide an antecedent basis for several recited claim limitations. Visell Dec. ¶¶ 112–116. Claim 4 of the '830 patent recites: (i) "the one or more operational control outputs"; (ii) "the received output signals"; (iii) "the sensors"; and (iv) "the one or more sensors." Claim 17 of the '882 patent recites: (i) "the physical device"; and (ii) "the one or more oscillating resonant module." Claims 19 and 20 of the '882 patent, which depend from claim 17, recite the term "the one or more oscillating resonant module[s]."

Effectively conceding that each of these claims is indefinite, Resonant has asked the Court to rewrite them. For the reasons explained below in Section IV, the Court should not do so. Hence, these claims, and the claims that they depend from,[7] are indefinite.

2. Claims 1, 3–7, and 10 of the '882 Patent Are Indefinite Because They Fail to Limit the Claim to One of Two Possible Antecedent Bases.

Claims 1 and 10 of the '882 patent each recites "a mass" two times. '882 patent, 32:54, 32:55, 33:47, 33:49. Those two masses must be different; otherwise, the second instance would be referred to as "the mass." After the two recitations of "a mass," the claim recites "an actuator that drives the mass," which could refer to either the first or second "mass" recited earlier in the claims. '882 patent, 32:60, 32:66, 33:2–3, 33:54, 33:60, 34:2. A skilled artisan could not determine with reasonable certainty which of the two masses to which the term "that drives the mass" refers. Visell Dec. ¶ 115. Thus, claims 1 and 10 are indefinite, as are claims 3–7, which depend from claim 1 and likewise recite "the mass." *See Sensor Electronic Technology, Inc. v.*

[7] If claim 4 of the '830 patent is found to be invalid, then asserted claims 5 and 6, which depend from claim 4, are also invalid because, by definition, they include all of the limitations of claim 4, including the terms that lack antecedent basis. Likewise, if claim 17 of the '882 patent is found to be invalid, asserted claims 19 and 20 are also invalid.

Bolb, Inc., 2019 WL 4645338, *31–32 (N.D. Cal. 2019) (finding claim indefinite for lack of antecedent basis where the independent claim recited the term "a material" twice); *Image Processing Technologies, LLC v. Samsung Electronics Co., Ltd.*, 2017 WL 2672616, *31–33 (E.D. Tex. 2017) (finding a claim reciting "the boundary" indefinite where the independent claim recited "boundaries" because a skilled artisan would not have known which boundary "the boundary" referred to).

Resonant asks the Court to re-write the claims so that they recite only one mass instead of two. Ex. 2 (2-28 Proposed Constructions). But as the Federal Circuit explained, it is improper for a court to "retroactively edit[]" or "rewrite claims to preserve their validity." *Synchronoss Technologies, Inc. v. Dropbox Inc.*, 2019 WL 2503642, *7–8 (N.D. Cal. 2019), *aff'd*, 987 F.3d 1358, 1366–67 (Fed. Cir. 2021). The Court should, therefore, decline to do so here.

3. Claim 1 of the '767 Patent and Claim 20 of the '882 Patent Are Indefinite Because the Antecedent Basis Conflicts with a Recited Term.

Claim 1 of the '767 patent first recites "sensors" (plural) and then recites "the one or more sensors." '767 patent, 11:25–26, 11:32. Thus, as recited by the claim, the later term ("the one or more sensors") can be just ***one*** sensor. But there is no antecedent basis for "one" sensor because the claim first requires "sensors" (plural). As such, a skilled artisan would not be able to determine which of the multiple "sensors" is being referred to in the instance of just a single "the sensor." Visell Dec. ¶ 116. *Sensor Electronic*, 2019 WL 4645338 at *31–32. Similarly, claim 20 of the '882 patent recites "one or more oscillating resonant modules" and later recites the term "the oscillating resonant modules." It is unclear which "modules" the term would refer to if there is only ***one*** module. '882 patent, 34:56–61. Contrary to Resonant's urging that this Court rewrite these claims so that "one or more" is read as "the," it is improper for a court to retroactively edit an indefinite claim to preserve its validity, as discussed below in Section IV.

B. Claim 1 of the '767 Patent and Claim 4 of the '830 Patent Are Indefinite Because They Lack Objective Boundaries.

When a claim recites a subjective term, that claim is indefinite unless the specification provides an objective test to determine its scope. *See, e.g.*, *Intell. Ventures I LLC v. T-Mobile USA, Inc.*, 902 F.3d 1372, 1381 (Fed. Cir. 2018) (explaining "a term of degree that is purely subjective and depends on the unpredictable vagaries of any one person's opinion is indefinite"); *Interval Licensing LLC v. AOL, Inc.*, 766 F.3d 1364, 1371 (Fed. Cir. 2014) (similar). Claim 1 of the '767 patent and claim 4 of the '830 patent recite the subjective term "desired output" without providing objective criteria as to its limits, rendering them indefinite.

Here, similar to the Eastern District of Texas's decision in *Ultravision*, the specification is devoid of any guidance on the scope of "desired output": there is no standard by which to ascertain whether an output is desirable, no description as to who or what desires it, no range of desirable output values, or any method of calculating a desired output, etc. Visell Dec. ¶ 117. *See Ultravision Techs. v. Holophane Eur. Ltd.*, 2020 WL 6271231, at *27–28 (E.D. Tex. Oct. 26, 2020) (finding the similar term "desired uniformity ratio" indefinite where the intrinsic evidence failed to provide adequate guidance as to the term's boundaries.). Because there is no evidence from which a skilled artisan could ascertain with reasonable certainty the scope of the claimed "desired output," these claims are indefinite. Visell Dec. ¶ 117.

IV. The Court Should Not Rewrite Two of Resonant's Claims

The Federal Circuit "'repeatedly and consistently has recognized that courts may not redraft claims, whether to make them operable or to sustain their validity.'" *Rembrandt Data Technologies, LP v. AOL, LLC*, 2011 WL 1458662, *7 (Fed. Cir. 2011) (citing *Chef Am.*, 358 F.3d at 1374). Accordingly, this Court should decline Resonant's request to re-write two claims to save them from indefiniteness. *See* Section III, *supra*; Appx A, Section III.

First, Resonant asks this Court to re-write claim 4 of the '830 patent to say that it depends from "claim 3" instead of "claim 1," but provides no legal justification for doing so. The claim does not require construction as its meaning is clear on its face. Even assuming, *arguendo*, that the reference to "claim 1" instead of "claim 3" was a clear error (and there is no indication it was), the right correction of that alleged error would be subject to reasonable debate. Indeed, Apple's proposed correction (Correction 1, below, removing several occurrences of the word "the") and Resonant's proposed correction (Correction 2, below, replacing "claim 1" with "claim 3") have different scopes but are each equally plausible. Visell Dec. ¶¶ 118–120.

Correction 1

4. The vibration module of claim 1 wherein the control component adjusts ~~the~~ one or more operational control outputs of the control component according to ~~the~~ received output signals from ~~the~~ sensors in order that subsequent operation of the vibration module produces desired outputs from ~~the~~ one or more sensors corresponding to one or more operational control parameters.

Correction 2

4. The vibration module of claim ~~1~~ **[3]** wherein the control component adjusts the one or more operational control outputs of the control component according to the received output signals from the sensors in order that subsequent operation of the vibration module produces desired outputs from the one or more sensors corresponding to one or more operational control parameters.

The specification also supports both proposed corrections as it does not limit the location of "sensors" to those "within the vibration module," as would be allowed under the first correction but not the second. *See, e.g.*, '830 patent, 6:9–16, 6:34–37, Fig. 6; *see also* Visell Dec. ¶¶ 119–120; Ex. 4 (Samsung's Expert Forlines Dec.), ¶¶ 52–53, 56. This ends the inquiry. *See Arlington Indus., Inc. v. Bridgeport Fittings, Inc.*, 345 F.3d 1318, 1331 n.1 (Fed. Cir. 2003) (Courts "can only correct an error in a claim if [] the correction is not subject to reasonable debate based on consideration of the claim language and the specification") (internal quotes omitted); *see also Ocean Semiconductor LLC v. Huawei Device USA, Inc.*, No. 4:20-CV-00991-ALM, 2022 WL 389916, at *13 (E.D. Tex. Feb. 8, 2022) (refusing to redraft the claim because the contended "error

in" "antecedent basis" was "subject to reasonable debate and, therefore, impermissible").

Resonant also asks this Court to re-write claim 17 of the '882 patent to say that it depends from "claim 10" instead of "claim 1." Again, Resonant has failed to demonstrate any error, or justification for the Court re-writing this claim. Visell Dec. ¶ 121. Even assuming *arguendo* that the reference to "claim 1" in claim 17 was a clear error, the required correction of that alleged error would be subject to reasonable debate because there are at least six equally plausible alternate corrections: "claim 1" can be replaced with "claim 11," "claim 12," "claim 13," "claim 14," "claim 15," or "claim 16." Each correction would fix the alleged error and result in different combinations of features (*i.e.*, different claim scope). Because the required correction is "subject to reasonable debate based on consideration of the claim language and the specification," *Cellular Commc'ns Equip.*, 2016 WL 7364266, at *10, this ends the inquiry.

Moreover, under Resonant's proposed construction (having claim 17 refer to claim 10 instead of claim 1), "the controller" in claim 10 would lack a proper antecedent because claims 10 and 17 each recite "a controller." Thus, it is unclear which controller "the controller" refers to.

Accordingly, the Court should decline Resonant's request to re-write these claims.

Date: March 21, 2024

Respectfully submitted,

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Attorneys for Defendant Apple Inc.

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CERTIFICATE OF SERVICE

Pursuant to the Federal Rules of Civil Procedure and Local Rule CV-5, I hereby certify that, on March 21, 2024, all counsel of record who have appeared in this case are being served with a copy of the foregoing via the Court's CM/ECF system:

/s/ Roger A. Denning
Roger A. Denning

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APPENDIX A

Table of Proposed Constructions

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I. AGREED CONSTRUCTIONS

Claim Language	Agreed Construction
'767 patent, claim 1; '830 patent, claims 1, 19; '882 patent, claims 1, 10 *Preambles*: "linear resonant vibration module"; "vibration module"; "oscillating resonant module[s]"	Preamble is limiting
'767 patent, claim 1 "a driving component that drives the moveable component in each of two opposite directions"	Subject to 35 U.S.C. § 112(f) **Function**: driving the moveable component in each of two opposite directions **Structures**: coils 420, 514, 626, 1202, 1204, 1302, 1304, 1412, 1414, 1510 (also shown in Figs. 16–17); electromagnets shown in Figs. 10–11; and equivalents thereof
'337 patent, claim 2 "a driving component that drives the moveable component in each of two opposite directions within the housing"	Subject to 35 U.S.C. § 112(f) **Function**: driving the moveable component in each of two opposite directions within the housing **Structures**: coils 420, 514, 626, 1202, 1204, 1302, 1304, 1412, 1414, 1510 (also shown in Figs. 16–17); stator coils of Figs. 24A, 24B, 25; electromagnets shown in Figs. 10–11; and equivalents thereof
'830 patent, claims 1, 19, 20 "a driving component that drives the moveable component to oscillate within the housing"	Subject to 35 U.S.C. § 112(f) **Function**: driving the moveable component to oscillate within the housing **Structures**: coils 420, 514, 626, 1202, 1204, 1302, 1304, 1412, 1414, 1510 (also shown in Figs. 16–17); stator coils of Figs. 24A, 24B, 25; electromagnets shown in Figs. 10–11; and equivalents thereof

II. DISPUTED CONSTRUCTIONS: APPLE'S PROPOSED TERMS

A. Preambles

Claim Language	Apple's Proposed Construction	Resonant's Proposed Construction
'337 patent, claim 2 "linear vibration module" **'830 patent, claim 20** "vibration module"	Limiting	Preamble is not limiting; no construction necessary; plain and ordinary meaning

B. "Control Component …"

Claim Language	Apple's Proposed Construction	Resonant's Proposed Construction[1]
'767 patent, claim 1 a control component that includes a microprocessor and that controls supply of power from the power supply to the driving component to cause the moveable component to linearly oscillate, the control component including, in addition to the microprocessor, a control program, stored in one of a separated electronic memory or	Subject to 35 U.S.C. § 112(f)	Plain and ordinary meaning; not subject to 35 U.S.C. § 112 ¶ 6 If subject to 35 U.S.C. § 112 ¶ 6, then:
	Agreed Function: controlling supply of power from the power supply to the driving component to cause the movable component to linearly oscillate; controlling operation of the linear resonant vibration module; receiving output signals from sensors within the linear resonant vibration module during operation of the linear resonant vibration module; and adjusting one or more operational control outputs of the control component according to the received output signals from the sensors in order that subsequent operation of linear resonant vibration module produces desired outputs from the one or more sensors corresponding to one or more operational control parameters	

[1] This column represents the most-recently received proposals from Resonant, receive on March 18, 2024 (three days before the deadline for Apple's Opening Brief and weeks after the Court ordered deadline to provide such proposals) and is provided based on a good-faith effort to fairly represent Resonant's positions based on materials received from Resonant and meet and confers. Apple reserves the right to move to strike claim construction positions presented in Resonant's Responsive Brief that were not timely presented.

Claim Language	Apple's Proposed Construction	Resonant's Proposed Construction[1]
within the processor, that is executed by the microprocessor to control operation of the linear resonant vibration module, and a switch that receives a directional signal d from the processor and that selects a corresponding direction of the two opposite directions in which the driving component drives the moveable component, the control component receiving output signals from sensors within the linear resonant vibration module during operation of the linear resonant vibration module and adjusting one or more operational control outputs of the control component according to the received output signals from the sensors in order that subsequent operation of linear resonant vibration module produces desired outputs from the one or more sensors corresponding to one or more operational control parameters	**Structure**: a microprocessor; a switch that receives a directional signal d from the processor and that selects a corresponding direction of the two opposite directions in which the driving component drives the moveable component; a control program, stored in one of a separated electronic memory or within the processor, that is executed by the microprocessor wherein the control program performs the algorithm shown in Figs. 7A–C and described at 6:15–8:3; and equivalents thereof	**Structure**: a microprocessor; a switch; electronic memory; a control program that, if an algorithm is required, performs an algorithm comprising the following steps: (a) receive the value of an output signal; (b) compare that value to a different value, which could be a previous value; and/ (c) adjust one or more operational control outputs based on that comparison; and equivalents thereof *See*, *e.g.*, '767 patent at 5:15-48, 6:14-8:3, Figs. 5A-6, 7A-7C

<table>
<tr><th>Claim Language</th><th>Apple's Proposed Construction</th><th>Resonant's Proposed Construction[1]</th></tr>
<tr><td rowspan="2"><u>'337 patent, claim 2</u>

a control component that controls supply of power from the power supply to the driving component to cause the moveable component to oscillate at a frequency and an amplitude specified by user input received from the user-input features,

wherein the control component drives simultaneous oscillation of the moveable component at two or more frequencies to generate complex vibration modes.</td><td colspan="2">No Dispute: Subject to 35 U.S.C. § 112(f)

<u>Agreed Function</u>:
controlling supply of power from the power supply to the driving component to cause the moveable component to oscillate at a frequency and an amplitude specified by user input received from the user-input features; driving simultaneous oscillation of the movable component at two or more frequencies to generate complex vibration modes</td></tr>
<tr><td><u>Structure</u>:
the switches shown in Figures 5A–6 and described at 5:45–65, 6:2–8 with the processor/microprocessor/ microcontroller/CPU that performs the algorithm shown in Figures 7A–C and described at 6:43–8:30 and 13:3-41; and equivalents thereof</td><td><u>Structure</u>:
microcontroller with internal or external memory; processor; CPU; microprocessor; and equivalents thereof

[if an algorithm is required] Where the corresponding structure is a processor, CPU, or microprocessor, the processor / CPU / microprocessor is programmed with an algorithm comprising the following steps: (a) set the mode and strength to values representing selections made by user input to the user input features; (b) provide a corresponding output to the power supply so that the power supply provides a corresponding output to the driving component; and (c) drive simultaneous oscillation of the moveable component at two or more frequencies.

See, e.g., '337 patent at 5:43-6:10, 6:43-8:30, 11:43-12:5; Figs. 5A-6, 7A-7C, 13, 22A-23</td></tr>
</table>

<table>
<tr><th>Claim Language</th><th>Apple's Proposed Construction</th><th>Resonant's Proposed Construction[1]</th></tr>
<tr><td rowspan="2"><u>'830 patent, claims 1 & 19</u>

a control component that controls supply of power from the power supply to the driving component to cause the moveable component to oscillate at a frequency and an amplitude specified by one or more stored values</td><td colspan="2">No Dispute: Subject to 35 U.S.C. § 112(f)

<u>Agreed Function</u>:
controlling supply of power from the power supply to the driving component to cause the movable component to oscillate at a frequency and an amplitude specified by one or more stored values</td></tr>
<tr><td><u>Structure</u>:
the switches shown in Figures 5A–6 and described at 5:52–6:5, 6:9–16 and the processor/microprocessor/microcontroller/CPU that performs the algorithm shown in Figures 7A–C and described at 6:52–8:40; and equivalents thereof</td><td><u>Structure</u>:
oscillator circuit; (except as to claim 20); microcontroller with internal or external memory; processor; CPU; microprocessor; and equivalents thereof

Where the corresponding structure is a processor, CPU, or microprocessor, the processor / CPU / microprocessor is programmed with an algorithm comprising the following steps: (a) set the mode and strength to default values or values representing selections made by user input to the user input features; and (b) provide a corresponding output to the power supply so that the power supply provides a corresponding output to the driving component.

See, e.g., '830 patent at 5:50-6:18, 6:52-8:40, 11:57-12:19; Figs. 5A-6, 7A-7C</td></tr>
</table>

Claim Language	Apple's Proposed Construction	Resonant's Proposed Construction[1]
'830 patent, claim 20	**No Dispute:** Subject to 35 U.S.C. § 112(f)	
a control component that controls supply of power from the power supply to the driving component to cause the moveable component to oscillate at a frequency and an amplitude specified by one or more stored values, wherein the control component drives simultaneous oscillation of the moveable component at two or more frequencies to generate complex vibration modes.	**Function**: controlling supply of power from the power supply to the driving component to cause the moveable component to oscillate at a frequency and an amplitude specified by one or more stored values; and driving simultaneous oscillation of the moveable component at two or more frequencies to generate complex vibration modes **Structure:** the switches shown in Figures 5A–6 and described at 5:52–6:5, 6:9–16 and the processor/microprocessor/microcontroller/CPU that performs the algorithm shown in Figures 7A–C and described at 6:52–8:40 and 13:20–59; and equivalents thereof	**Function**: controlling supply of power from the power supply to the driving component to cause the movable component to oscillate at a frequency and an amplitude specified by one or more stored values[2] **Structure**: microcontroller with internal or external memory; processor; CPU; microprocessor; and equivalents thereof Where the corresponding structure is a processor, CPU, or microprocessor, the processor / CPU / microprocessor is programmed with an algorithm comprising the following steps: (a) set the mode and strength to default values or values representing selections made by user input to the user input features; and (b) provide a corresponding output to the power supply so that the power supply provides a

[2] During the parties' meet and confers, Apple understood that Resonant does not dispute the proposed function for all of the "control component" terms, including the '830 patent, claim 20. However, in Resonant's latest claim construction proposal (Ex. 3), Resonant's proposal did not include "and driving simultaneous oscillation of the moveable component at two or more frequencies to generate complex vibration modes" for the'830 patent, claim 20's "control component" term. While Apple suspects this may be a typographical error, Apple has nonetheless reproduced Resonant's proposal verbatim here.

Claim Language	Apple's Proposed Construction	Resonant's Proposed Construction[1]
		corresponding output to the driving component. For claim 20, the algorithm comprises the following additional step: (c) drive simultaneous oscillation of the moveable component at two or more frequencies. *See, e.g.*, '830 patent at 5:50-6:18, 6:52-8:40, 11:57-12:19; Figs. 5A-6, 7A-7C
'882 patent, claim 1 a control component that receives control signals input to the oscillating resonant module, receives outputs from the one or more sensors, and controls oscillation of the mass to produce a vibration response according to the received control signals by generating, using one or more of the received sensor outputs, control outputs to an actuator that drives the mass to oscillate.	**No Dispute:** Subject to 35 U.S.C. § 112(f) **Agreed Function**: receiving control signals input to the oscillating resonant module; receiving outputs from the one or more sensors; controlling oscillation of the mass to produce a vibration response according to the received control signals by generating, using one or more of the received sensor outputs, control outputs to an actuator that drives the mass to oscillate	
	Structure: the processor/logic circuitry that performs the algorithm shown in Fig. 45 and described at 31:19–32:13; and equivalents thereof	**Structure**: oscillator circuit; microcontroller with internal or external memory; processor; CPU; microprocessor; and equivalents thereof Where the corresponding structure is a processor, CPU, or microprocessor, the processor / CPU / microprocessor is programmed with an algorithm comprising the following steps: (a) receive a target frequency; (b) receive sensor outputs indicating (1) position of the mass, or (2) position and velocity of the mass; and (c)

<table>
<tr><th>Claim Language</th><th>Apple's Proposed Construction</th><th>Resonant's Proposed Construction[1]</th></tr>
<tr><td></td><td></td><td>generate control outputs based on the target frequency and the current position and velocity of the mass

See, e.g., '882 patent at 31:19-32:23, Fig. 45</td></tr>
<tr><td rowspan="2"><u>'882 patent, claim 10</u>

a control component that

receives control signals input to the oscillating resonant module by the controller,

receives outputs from the one or more sensors, and

controls oscillation of the mass to produce a vibration response according to the received control signals by generating, using one or more of the received sensor outputs, control outputs to an actuator that drives the mass to oscillate.</td><td colspan="2">No Dispute: Subject to 35 U.S.C. § 112(f)

<u>Agreed Function</u>:
receiving control signals input to the oscillating resonant module; receiving outputs from the one or more sensors; controlling oscillation of the mass to produce a vibration response according to the received control signals by generating, using one or more of the received sensor outputs, control outputs to an actuator that drives the mass to oscillate</td></tr>
<tr><td><u>Structure</u>:
the processor/logic circuitry that performs the algorithm shown in Fig. 45 and described at 31:19–32:13; and equivalents thereof</td><td><u>Structure</u>:
oscillator circuit; microcontroller with internal or external memory; processor; CPU; microprocessor; and equivalents thereof

Where the corresponding structure is a processor, CPU, or microprocessor, the processor / CPU / microprocessor is programmed with an algorithm comprising the following steps: (a) receive a target frequency; (b) receive sensor outputs indicating (1) position of the mass, or (2) position and velocity of the mass; and (c) generate control outputs based on the target frequency and the current position and velocity of the mass

See, e.g., '882 patent at 31:19-32:23, Fig. 45</td></tr>
</table>

C. Indefiniteness

Claim Language	Apple's Proposed Construction	Resonant's Proposed Construction
'767 patent, claim 1; '830 patent, claim 4 "the one or more sensors"	Indefinite	No construction necessary; plain and ordinary meaning Alternatively, to the extent a construction is deemed necessary, "the sensors"
'767 patent, claim 1; '830 patent, claim 4 "desired outputs"	Indefinite	No construction necessary; plain and ordinary meaning
'830 patent, claim 4 "the one or more operational control outputs"	Indefinite	No construction necessary; plain and ordinary meaning
'830 patent, claim 4 "the received output signals"	Indefinite	No construction necessary; plain and ordinary meaning
'830 patent, claim 4 "the sensors"	Indefinite	No construction necessary; plain and ordinary meaning
'882 patent, claims 1, 3–6, 10 "the mass"	Indefinite	Plain and ordinary meaning, in which all recitations of "a mass" and "the mass" refer to the same mass
'882 patent, claims 10, 17, 19, 20 "the oscillating resonant module[s]" / "the one or more oscillating resonant module[s]"	Indefinite	No construction necessary; plain and ordinary meaning
'882 patent, claim 17 "the physical device"	Indefinite	No construction necessary; plain and ordinary meaning

III. Resonant's Proposed Constructions

Term, Patent and Claim	Apple's Proposal	Resonant's Proposal
'830 patent, claim 4 "claim 1"	Plain and ordinary meaning	"claim 3"
'882 patent, claim 17 "claim 1"	Plain and ordinary meaning	"claim 10"