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TACTION TECHNOLOGY, INC.
11

12 **UNITED STATES DISTRICT COURT**
13 **SOUTHERN DISTRICT OF CALIFORNIA**

14 TACTION TECHNOLOGY, INC.,

15 Plaintiff,

16 vs.

17 APPLE INC.,

18 Defendant
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Case No. '21CV812 GPC MSB

**COMPLAINT FOR PATENT
INFRINGEMENT**

JURY TRIAL DEMANDED

1 Plaintiff Taction Technology, Inc. (“Taction”) asserts the following claims for
2 patent infringement against Defendant Apple Inc. (“Apple”), and alleges as follows.

3 INTRODUCTION

4 1. Taction is a technology innovator specializing in enhanced haptics for
5 electronic devices.

6 2. “Haptics” refers to the science of enabling interaction with technology
7 through the sense of touch. Haptic feedback in electronic devices such as
8 smartphones, smartwatches, virtual reality/game controllers, and headphones provides
9 important sensory information to users. In many such devices, haptic feedback allows
10 users to feel the device responding to their input, and to receive tactile accompaniment
11 to music, dialogue, or actions occurring on a screen.

12 3. Haptic devices can also provide alerts and other information to users,
13 from simple buzzing when a smart phone is “ringing” in silent mode to more complex
14 signals used to indicate specific responses to inputs. Haptic feedback in these types of
15 devices is created by electromechanical actuators—small motors enclosed in a housing
16 or frame. A mass inside a haptic actuator vibrates in response to electric signals.
17 High-fidelity actuators can generate different haptic sensations based on different input
18 signals, from short, sharp taps to low-frequency rumbles.

19 4. A problem with traditional low-fidelity haptic actuators is their limited
20 ability to faithfully reproduce a variety of input signals. Haptic actuators tend to have
21 resonant frequencies at which the movement and vibration of the mass is accentuated.
22 For example, a resonating mass can be slow to begin producing noticeable vibration
23 when a signal is initiated, and can continue vibrating even after the signal is removed.

24 5. Traditional haptic actuators can also produce attenuated vibrations when
25 the input signal is different from the resonant frequency of the actuator. These effects
26 can contribute to distortion of the input signal and the production of a tactile vibration
27 that may differ significantly from the original signal. Thus, traditional low-fidelity
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1 haptic actuators may not be capable of producing more than a relatively small number
2 of different output signals.

3 6. Taction’s patented inventions are directed to ways to more accurately
4 reproduce a wider range of signals with a haptic actuator. Taction’s approach can
5 employ specific configurations of flexures, coils, magnets, and magnetic ferrofluid to
6 act on the moving mass to lessen, or “damp,” undesired vibrations while also allowing
7 the actuator to be operated efficiently.

8 7. Taction’s techniques can reduce the “Q-factor”—a damping metric—of a
9 haptic actuator. This leads to tactile feedback that can more accurately reproduce
10 complex input signals, and that can reproduce different input frequencies more
11 precisely. Taction’s technology directly improves the overall user experience of a
12 device by enabling better haptic feedback.

13 8. Accurate haptic feedback is important to Apple.

14 9. Apple has included the specially-branded “Taptic Engine” in multiple
15 models of the iPhone and Apple Watch to provide haptic effects.

16 10. Since introducing the specially-branded “Taptic Engine” haptic actuator
17 in the iPhone and Apple Watch, Apple has updated the hardware design numerous
18 times.

19 11. These updates to the Apple Taptic Engine hardware design reflect an
20 effort to improve haptic performance in Apple’s devices.

21 12. The initial Taptic Engines in the original Apple Watch and iPhone 6S
22 were not damped using ferrofluid.

23 13. More recent Taptic Engines are damped using magnetic ferrofluid.

24 14. Similarly, the initial Taptic Engines in the original Apple Watch and
25 iPhone 6S used coil springs to provide controlled resistance to motion and a central
26 locating rod to locate the moving mass.

27 15. More recent Taptic Engines use a plurality of flexures to both locate the
28 mass and to provide controlled resistance to motion.

1 37. Venue is appropriate under 28 U.S.C. 1400(b) at least because Apple is
2 incorporated in California and because Apple has committed acts of infringement and
3 has a regular and established place of business in this district.

4 38. Apple's acts of infringement in this district include but are not limited to
5 sales of the Accused Products at Apple Store locations in this district, including but not
6 limited to 7007 Friars Road, San Diego, CA 92108 and 4505 La Jolla Village Drive,
7 San Diego, CA 92122.

8 39. Apple's Apple Stores in San Diego County alone employ at least 600
9 people.¹

10 40. In addition to the Apple Stores, Apple has a regular and established place
11 of business in University City, San Diego, including a "100,000 square-foot
12 research/office building" and a second 204,000 square-foot building.²

13 41. Apple has publicly announced that its location in University City is a
14 "principal engineering hub" and that it expects to hire 1,200 people over three years.³

15 42. Apple has stated that it would need "hundreds of thousands of square
16 feet" of real estate in San Diego to accommodate its growing team in the area.⁴

17 43. Since 2019, Apple has been the employer of at least 127 recipients of H-
18 1B visas who work and reside in San Diego.⁵

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21 ¹ [https://www.sandiegouniontribune.com/business/technology/sd-fi-apple-](https://www.sandiegouniontribune.com/business/technology/sd-fi-apple-hiring-san-diego-20190306-story.html)
22 [hiring-san-diego-20190306-story.html](https://www.sandiegouniontribune.com/business/technology/sd-fi-apple-hiring-san-diego-20190306-story.html)

23 ² [https://www.sandiegouniontribune.com/business/technology/story/2019-11-](https://www.sandiegouniontribune.com/business/technology/story/2019-11-13/apple-inks-deal-for-second-utc-building-as-part-of-san-diego-expansion)
24 [13/apple-inks-deal-for-second-utc-building-as-part-of-san-diego-expansion](https://www.sandiegouniontribune.com/business/technology/story/2019-11-13/apple-inks-deal-for-second-utc-building-as-part-of-san-diego-expansion)

25 ³ [https://www.sandiegouniontribune.com/business/technology/sd-fi-apple-](https://www.sandiegouniontribune.com/business/technology/sd-fi-apple-hiring-san-diego-20190306-story.html)
26 [hiring-san-diego-20190306-story.html](https://www.sandiegouniontribune.com/business/technology/sd-fi-apple-hiring-san-diego-20190306-story.html)

27 ⁴ [https://www.pacificcoastcommercial.com/post/apple-leases-full-building-in-](https://www.pacificcoastcommercial.com/post/apple-leases-full-building-in-expansion-in-san-diego-high-tech-hub)
28 [expansion-in-san-diego-high-tech-hub](https://www.pacificcoastcommercial.com/post/apple-leases-full-building-in-expansion-in-san-diego-high-tech-hub)

1 44. Apple is currently advertising approximately 278 jobs in San Diego.⁶

2 45. Apple's open job listings in San Diego include at least a Haptics
3 Firmware Engineer who will "develop Taptic Engine firmware for next-generation
4 Apple products, including iPhone, Apple Watch, and Mac" and will "join a tightly-
5 integrated team of hardworking engineers to deliver world-class haptic experiences
6 that will be enjoyed by millions of customers."⁷

7 46. Apple's open job listings in San Diego also include at least a Haptics
8 Quality Engineer who will "test and validate Apple's Taptic Engine firmware,
9 software and algorithms for next generation haptic devices including iPhone [and]
10 Watch."⁸

11 47. In February 2021, Apple advertised an open job listing in San Diego for a
12 Haptics Product Design Engineer, part of "[t]he Haptic Engineering team [that]
13 develops state of the art haptic solutions that are central to Apple's products, including
14 the iPhone and Apple Watch," and who will "lead the design, development, and
15 validation of next-generation haptic actuators and experiences" and "will have end-to-
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21 ⁵ H1B Salary Database,
22 [https://h1bdata.info/index.php?em=APPLE+INC&job=&city=SAN+DIEGO&year=](https://h1bdata.info/index.php?em=APPLE+INC&job=&city=SAN+DIEGO&year=All+Years)
23 [All+Years](https://h1bdata.info/index.php?em=APPLE+INC&job=&city=SAN+DIEGO&year=All+Years)

24 ⁶ <https://jobs.apple.com/en-us/search?location=san-diego-SDO>

25 ⁷ Exhibit C, [https://jobs.apple.com/en-us/details/200220549/hid-haptics-](https://jobs.apple.com/en-us/details/200220549/hid-haptics-firmware-engineer?team=HRDWR)
26 [firmware-engineer?team=HRDWR](https://jobs.apple.com/en-us/details/200220549/hid-haptics-firmware-engineer?team=HRDWR) (last visited Feb. 26, 2021)

27 ⁸ Exhibit D, [https://jobs.apple.com/en-us/details/200201277/hid-haptics-quality-](https://jobs.apple.com/en-us/details/200201277/hid-haptics-quality-engineer?team=HRDWR)
28 [engineer?team=HRDWR](https://jobs.apple.com/en-us/details/200201277/hid-haptics-quality-engineer?team=HRDWR) (las visited Apr. 19, 2021)

1 end responsibility for the mechanical design and integration of haptic actuators from
2 concept to production.”⁹

3 TACTION’S INVENTIONS AND PRODUCTS

4 48. Dr. S. James Biggs, the inventor of the Asserted Patents, earned his Ph.D.
5 in Bioengineering from the University of Utah and worked early in his career at the
6 MIT Touch Lab.

7 49. Dr. Biggs’ research at the MIT Touch Lab focused on the effect of
8 different types of vibrations on human skin, including the differences between axial
9 vibrations (perpendicular to the skin) and shear vibrations (parallel to the skin).

10 50. Over the course of his career, Dr. Biggs has explored new types of haptic
11 actuators that could produce shear vibrations that accurately reproduced a wider range
12 of frequencies, including bass frequencies lower than 200 Hz.

13 51. As a result of his research, development, and engineering, Dr. Biggs
14 developed an improved haptic actuator, the Taction Transporter®, that incorporates
15 specific configurations of flexures, coils, magnets, and a magnetic ferrofluid to damp
16 undesired vibrations while also allowing the actuator to be operated efficiently.

17 52. The Taction Transporter is able to produce relatively uniform output
18 across a wider range of input frequencies than previous haptic actuators.

19 53. One application for the Taction Transporter is to provide an enhanced
20 bass response for personal audio applications.

21 54. Taction successfully Kickstarted its own brand of haptic-enhanced
22 headphones, the Taction Kannon.¹⁰

23 ⁹ Exhibit E, <https://sandiego.jobd.org/view/259155.html> (last visited Feb. 26,
24 2021) (originally posted at [https://jobs.apple.com/en-us/details/200219890/haptics-
25 product-design-engineer?team=HRDWR](https://jobs.apple.com/en-us/details/200219890/haptics-product-design-engineer?team=HRDWR))

26 ¹⁰ [https://www.kickstarter.com/projects/2053327139/kannon-headphones-
27 accurate-bass-you-can-feel](https://www.kickstarter.com/projects/2053327139/kannon-headphones-accurate-bass-you-can-feel)
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1 55. Each earcup in the Taction Kannon contained a traditional acoustic
2 speaker driver as well as a planar haptic actuator.

3 56. The Taction Kannon produced shear vibrations, parallel to the side of the
4 user's head.

5 57. This was an improvement over older designs that moved axially, or
6 perpendicular to the user's head.

7 58. Compared to earlier devices, the Taction Kannon left the volume of air
8 within the earcup relatively unchanged, preserving the fidelity of the audio coming
9 from the traditional speaker driver.



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23 59. Taction has received widespread acclaim for the Taction Kannon and the
24 Taction Transporter.

25 60. One reviewer noted that "[i]t took about half a second for a wide grin to
26 spread across my face when I first put the Taction Kannons on. It's not a generic
27 shaking sensation as soon as bass notes hit, it's a masterfully accurate vibration that
28

1 mirrors what you would feel in the real world were such a note played.”¹¹

2 61. HiFi+ wrote that the Taction Kannon “artfully combines a traditional
3 dynamic driver with a well crafted, proprietary Taction haptic driver.”¹²

4 62. Taction has licensed its patented haptics technology.

5 63. For example, Taction’s technology powers the Corsair HS60 Haptic
6 headphones, named the “most immersive gaming headset” of 2020.¹³

7 64. Product review website The Gamer declared that the HS60 Haptic was
8 “no gimmick” and that they “add a new sensory layer to any game and have the power
9 to turn a mundane experience into a thrilling one.”¹⁴

10 65. TechPowerUp’s reviewer commented that “it truly manages to achieve
11 what it set out to” and that “[t]he haptic system feels incredibly responsive and on
12 point.”¹⁵

13 TACTION’S PATENTS

14 66. Taction applied for and has been granted numerous United States patents
15 since the company’s inception. Two of those patents are at issue in this case.

16 67. U.S. Patent No. 10,659,885 (the “’885 patent”) is entitled “Systems and
17 Methods for Generating Damped Electromagnetically Actuated Planar Motion for
18 Audio-Frequency Vibrations” and issued on May 19, 2020. A true and correct copy of
19 the ’885 patent is attached as Exhibit A to this Complaint.

20 68. Taction is the owner of all rights, title, and interest in and to the ’885
21 patent, with the full and exclusive right to file suit to enforce the ’885 patent, including
22 the right to recover for past infringement.

23 ¹¹ <http://www.basshead.club/taction-kannon-prototype-review/>

24 ¹² <http://www.hifiplus.com/articles/canjam-socal-2016-report-part-4/?page=3>

25 ¹³ <https://www.pcgamesn.com/best-gaming-headset>

26 ¹⁴ <https://www.thegamer.com/corsair-hs60-haptic-headphone-review/>

27 ¹⁵ <https://www.techpowerup.com/review/corsair-hs60-haptic/4.html>

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1 69. The '885 patent is valid and enforceable under United States patent laws.

2 70. The '885 patent claims are directed to a patent-eligible, non-abstract idea.
3 They address, among other things, a specific improvement to the way electronic
4 devices operate, including specific claimed materials, structures, and configurations of
5 a haptic apparatus that provides enhanced haptic sensations to an end-user.

6 71. U.S. Patent No. 10,820,117 (the "'117 patent") is entitled "Systems and
7 Methods for Generating Damped Electromagnetically Actuated Planar Motion for
8 Audio-Frequency Vibrations" and issued on October 27, 2020. A true and correct
9 copy of the '117 patent is attached as Exhibit B to this Complaint.

10 72. Taction is the owner of all rights, title, and interest in and to the '117
11 patent, with the full and exclusive right to bring suit to enforce the '117 patent,
12 including the right to recover for past infringement.

13 73. The '117 patent is valid and enforceable under United States patent laws.

14 74. The '117 patent claims are directed to a patent-eligible, non-abstract idea.
15 They address, among other things, a specific improvement to the way electronic
16 devices operate, including specific claimed materials, structures, and configurations of
17 a haptic apparatus that provides enhanced haptic sensations to an end-user.

18 **APPLE'S USE OF TACTION'S PATENTS**

19 75. Haptics are important to Apple.

20 76. Apple offers state-of-the-art haptics solutions.

21 77. Apple's haptics solutions are central in shaping the experience of using
22 many of Apple products.

1 78. For example, a recent job posting by Apple for its San Diego facility
2 stated that “state of the art haptic solutions . . . are central in shaping the experience of
3 using Apple products.”¹⁶

4 79. Apple’s Human Interface Guidelines also emphasize the importance of
5 haptics to Apple products.¹⁷

6 Haptics

7
8 Haptics engage people's sense of touch to enhance the experience of interacting with
9 onscreen interfaces. For example, when an Apple Pay transaction is confirmed, the system
10 plays haptics in addition to providing visual and auditory feedback. Haptics can also
enhance touch gestures and interactions like scrolling through a picker or toggling a switch.

11 Haptics

12 Haptics are a great way to get people’s attention and to convey important information. In
13 addition to system haptics, Apple Watch Series 4 and later provides haptic feedback for
14 interactions with the Digital Crown; for guidance, see [Digital Crown](#).

15 80. Apple products including the iPhone and the Apple Watch have
16 implemented increasingly sophisticated haptics technology over time.

17 81. Since the release of the first Apple Watch in 2015, Apple has included a
18 customized haptic actuator, called the “Taptic Engine,” in many of its devices:¹⁸

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21 ¹⁶ Exhibit D, <https://sandiego.jobd.org/view/259155.html> (last visited Feb. 26,
22 2021) (originally posted at [https://jobs.apple.com/en-us/details/200219890/haptics-](https://jobs.apple.com/en-us/details/200219890/haptics-product-design-engineer?team=HRDWR)
23 [product-design-engineer?team=HRDWR](https://jobs.apple.com/en-us/details/200219890/haptics-product-design-engineer?team=HRDWR))

24 ¹⁷ [https://developer.apple.com/design/human-interface-guidelines/ios/user-](https://developer.apple.com/design/human-interface-guidelines/ios/user-interaction/haptics/)
25 [interaction/haptics/](https://developer.apple.com/design/human-interface-guidelines/ios/user-interaction/haptics/); [https://developer.apple.com/design/human-interface-](https://developer.apple.com/design/human-interface-guidelines/watchos/interaction/haptics/)
26 [guidelines/watchos/interaction/haptics/](https://developer.apple.com/design/human-interface-guidelines/watchos/interaction/haptics/)

27 ¹⁸ [https://web.archive.org/web/20150911022920/http://www.apple.com/](https://web.archive.org/web/20150911022920/http://www.apple.com/watch/watch-reimagined/)
28 [watch/watch-reimagined/](https://web.archive.org/web/20150911022920/http://www.apple.com/watch/watch-reimagined/)



Taptic Engine. Technology with a more human touch.

This linear actuator inside Apple Watch taps you on the wrist when you receive a notification, press down on the display, or use Digital Touch. The Taptic Engine gives different kinds of notifications and actions their own distinct character. So even with the accompanying audio cues turned off, you can feel the difference between an alarm and an incoming phone call without even looking.

82. The Taptic Engines in Apple's devices have been redesigned several times to improve their haptic performance.

83. In particular, since late 2016 Taptic Engines have employed ferrofluid to damp vibrations of the moving mass.

84. Similarly, since late 2016 Taptic Engines have included in-plane flexures to locate and suspend the moving mass.

85. In 2019, Apple continued to expand its haptics functionality, introducing the Core Haptics library.

86. With the Core Haptics library, app developers can "engage users physically, with tactile and audio feedback that gets attention and reinforces actions."¹⁹

87. Among other things, the Core Haptics library includes functionality that allows for precise synchronization of haptic sensations to audio tracks.²⁰

¹⁹ <https://developer.apple.com/documentation/corehaptics>

1 88. Using ferrofluids to damp unwanted vibrations in the Taptic Engine
2 allows the Taptic Engine to more accurately produce desired haptic vibrations.

3 89. More accurately producing desired haptic vibrations improves the overall
4 user experience of the Accused Products.²¹

5 90. More accurately producing desired haptic vibrations enables other
6 hardware aspects of the Accused Products to change in ways that improve their overall
7 user experience.

8 91. For example, more accurately producing desired haptic vibrations allowed
9 Apple to remove the physical home button from most current iPhones and to expand
10 the size of the screen to almost the entire front surface of the device.

11 **COUNT I: INFRINGEMENT OF U.S. PATENT NO. 10,659,885**

12 92. Taction incorporates by reference and re-alleges all of the foregoing
13 paragraphs of this Complaint as if fully set forth herein.

14 93. Apple has directly infringed, continues to infringe, and has induced or
15 contributed to the infringement of the '885 patent by making, using, selling, and

16 ²⁰ <https://developer.apple.com/videos/play/wwdc2019/520/> (“Core Haptics lets
17 you design fully customized haptic patterns with synchronized audio. See examples
18 of how haptics and audio enables you to create a greater sense of immersion in your
19 app or game.”); <https://developer.apple.com/videos/play/wwdc2019/223/> (“Discover
20 how to combine visuals, audio and haptics, using the Taptic Engine, to add a new
21 level of realism and improve feedback in your app or game.”).

22 ²¹ *E.g.*, [https://developer.apple.com/design/human-interface-guidelines/ios/user-
23 interaction/haptics/](https://developer.apple.com/design/human-interface-guidelines/ios/user-interaction/haptics/) (“Impact haptics provide a physical metaphor you can use to
24 complement a visual experience. For example, people might feel a tap when a view
25 snaps into place or a thud when two heavy objects collide.”). [https://developer.
26 apple.com/documentation/corehaptics](https://developer.apple.com/documentation/corehaptics) (“Use haptics to engage users physically, with
27 tactile and audio feedback that gets attention and reinforces actions.”).
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1 offering for sale, without authority or license the Accused Products in violation of 35
2 U.S.C. § 271(a).

3 94. The Accused Products are non-limiting examples that were identified
4 based on publicly available information, and Taction reserves the right to identify
5 additional infringing activities, products, and services, including, for example, on the
6 basis of information obtained during discovery.

7 95. By way of example only, the Accused Products meet all the limitations of
8 at least claim 1 of the '885 patent, which recites: An apparatus for imparting motion to
9 the skin of a user, the apparatus comprising: a housing; a plurality of coils capable of
10 carrying electrical current; a plurality of magnets arranged in operative proximity to
11 the plurality of coils; a moving portion comprising an inertial mass and the plurality of
12 magnets; a suspension comprising a plurality of flexures that guides the moving
13 portion in a planar motion with respect to the housing and the plurality of conductive
14 coils; wherein movement of the moving portion is damped by a ferrofluid in physical
15 contact with at least the moving portion; and wherein the ferrofluid reduces at least a
16 mechanical resonance within the frequency range of 40-200 Hz in response to
17 electrical signals applied to the plurality of conductive coils.

18 96. The Accused Products are, or contain, an apparatus for imparting motion
19 to the skin of a user.

20 97. The Accused Products include Taptic Engine haptic actuators that employ
21 ferrofluid damping.

22 98. The Taptic Engines use a moving mass that causes the Taptic Engines to
23 vibrate.

24 99. The vibration of the Taptic Engines is transferred to the housing of an
25 iPhone or Apple Watch, which then imparts motion to the skin of a user in contact
26 with the device.

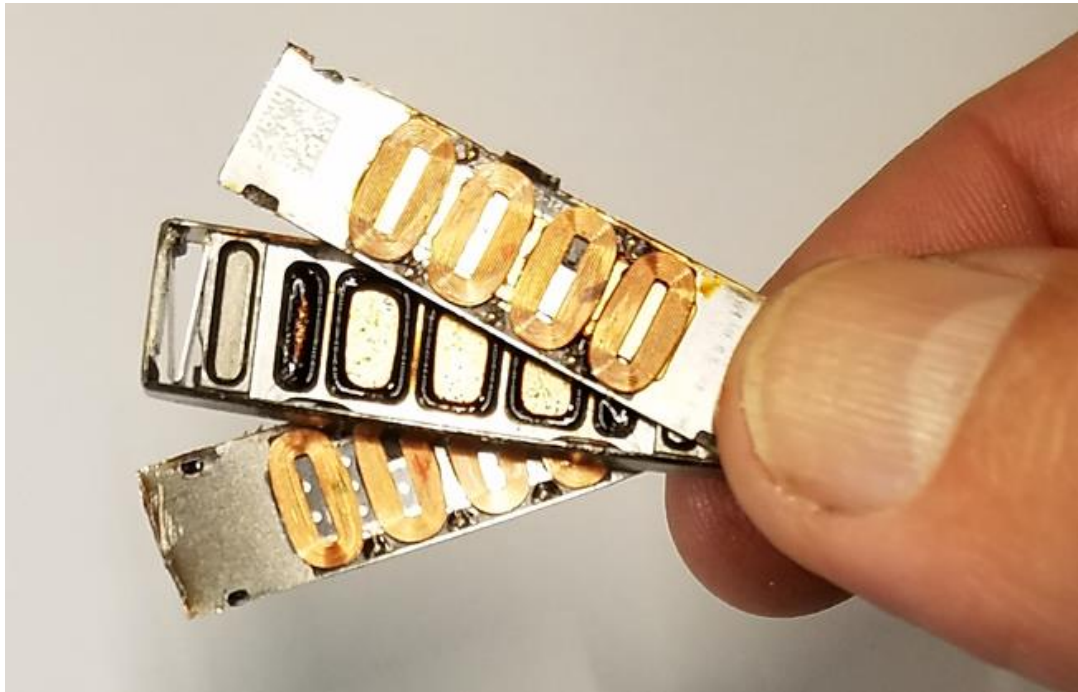
27 100. The Accused Products contain a Taptic Engine that includes a housing.

28 101. One example in the 2020 iPhone SE is shown below:



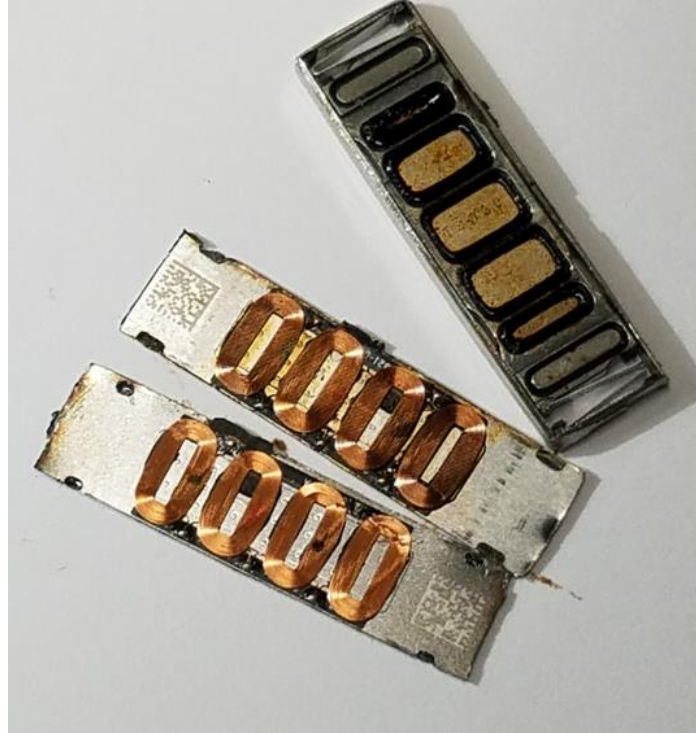
102. The Taptic Engines in the Accused Products contain a plurality of coils capable of carrying electrical current.

103. One example in the 2020 iPhone SE is shown below:



104. The Taptic Engines in the Accused Products contain a plurality of magnets arranged in operative proximity to the plurality of coils.

105. One example in the 2020 iPhone SE is shown below:



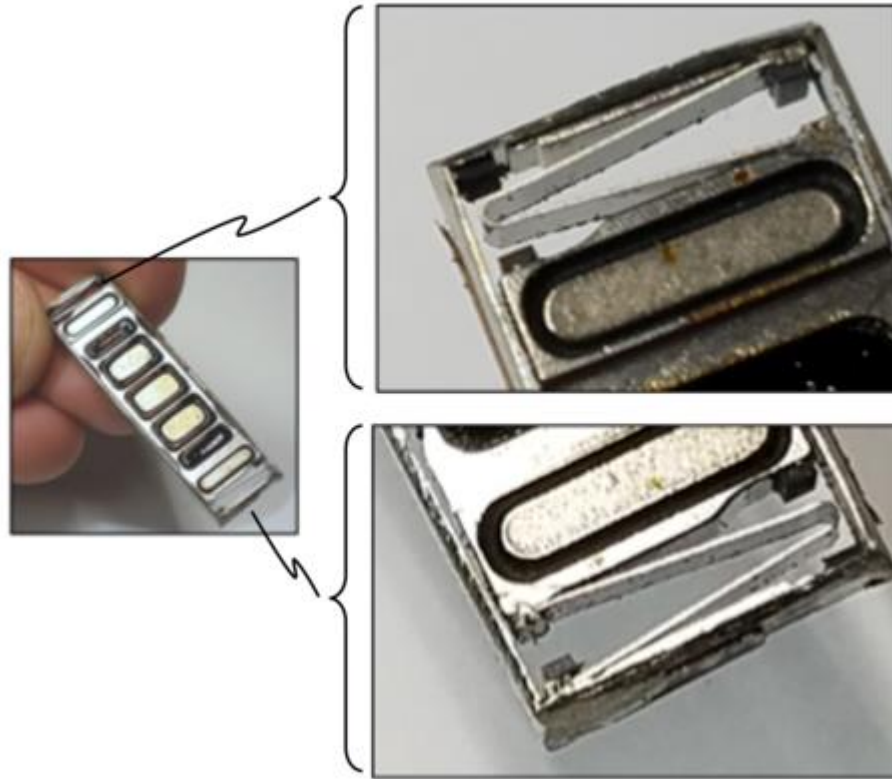
106. The Taptic Engines in the Accused Products contain a moving portion comprising an inertial mass including tungsten inserts and a plurality of magnets.

107. One example in the 2020 iPhone SE is shown below:



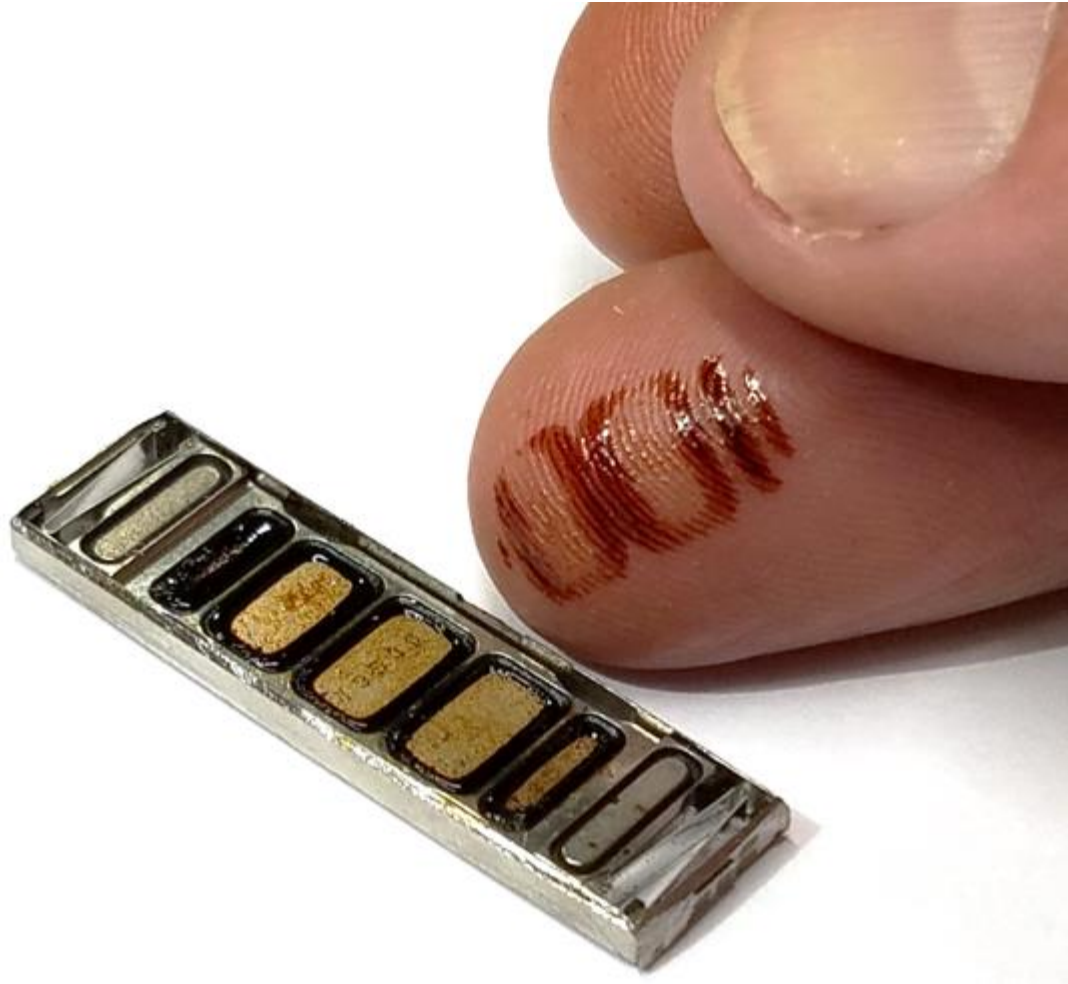
1 108. The Taptic Engines in the Accused Products contain a suspension
2 comprising a plurality of flexures that guides the moving portion in a planar motion
3 with respect to the housing and the plurality of conductive coils.

4 109. One example in the 2020 iPhone SE is shown below:



18 110. The movement of the moving portion of the Taptic Engines in the
19 Accused Products is damped by a ferrofluid in physical contact with at least the
20 moving portion.

21 111. One example in the 2020 iPhone SE is shown below:



112. On information and belief, the ferrofluid in the Taptic Engines in the Accused Products reduces at least a mechanical resonance within the frequency range of 40-200 Hz in response to electrical signals applied to the plurality of conductive coils.

113. Apple actively, knowingly, and intentionally induces infringement of one or more claims of the '885 patent under 35 U.S.C. § 271(b) by actively encouraging others to make, use, sell, and offer to sell in the United States, the Accused Products.

114. For example, Apple provides directions, instruction manuals, guides, and/or other materials that encourage and facilitate infringing use by others.

115. Apple has sold and is selling the Accused Products with the knowledge and intent that customers who buy the products will use the products for their

1 infringing use and therefore that customers have been and are directly infringing the
2 '885 patent.

3 116. Apple contributes to the infringement of one or more claims of the '885
4 patent under 35 U.S.C. § 271(c) by offering to sell and selling a component of the
5 Accused Products that constitutes a material part of the inventions, knowing the same
6 to be especially made or especially adapted for use in an infringement of the '885
7 patent, and is not a staple article or commodity of commerce suitable for substantial
8 noninfringing use.

9 117. Apple was aware of the '885 patent at least from the date of this
10 Complaint.

11 118. On information and belief, Apple was aware of the '885 patent since its
12 issuance on May 19, 2020.

13 119. As one example, on information and belief, Apple was aware of the '885
14 patent by purchasing, using, and reverse engineering two Taction Kannon headsets.

15 120. The headsets were ordered by Anna Mirabella, Product Design
16 Engineering Program Manager at Apple, on April 7, 2017, and shipped to Apple at 1
17 Infinite Loop, Cupertino, California on February 24, 2018, in the care of James
18 Vandyke, Product Design Engineer at Apple.

19 121. Both the headsets and their manuals were marked with U.S. Patent No.
20 9,439,921, and were marked with additional patents pending.

21 122. U.S. Patent No. 9,439,921 is in the same family as the '885 patent.

22 123. As an additional example, on information and belief, Apple was aware of
23 the '885 patent because Taction's U.S. Patent Publication No. 2016/0086458, which is
24 in the same family as the '885 patent, is cited as prior art on the face of Apple's U.S.
25 Patent No. 10,237,660, which issued from an application filed on March 16, 2016.

26 124. As a further example, on information and belief, Apple was aware of the
27 '885 patent by Apple's research into competing technology for the Accused Products,
28 as well as competing products for the AirPods Max and various Beats headphones.

1 125. As another example, on information and belief, Apple was aware of the
2 '885 patent due to Apple's knowledge of Taction and Taction's disclosure of its
3 patents (including the '885 patent) on its website.²²

4 126. On information and belief, Apple knew that the Accused Products
5 infringe the '885 patent, or at a minimum believed there was a high probability that the
6 accused products were covered by Taction's patents, but willfully blinded itself to
7 Taction's patents and the infringing nature of the Accused Products.

8 127. The foregoing allegations are based on publicly available information and
9 a reasonable investigation of the structure and operation of the Accused Products.

10 128. Taction reserves the right to modify this description, including, for
11 example, on the basis of information about the Accused Products that it obtains during
12 discovery.

13 129. The infringement details provided for claim 1 of the '885 patent are
14 exemplary, and Taction intends to assert additional claims of the '885 patent beyond
15 claim 1.

16 130. Apple's infringement has damaged and continues to damage Taction in an
17 amount yet to be determined, of at least a reasonable royalty and the lost profits that
18 Taction would have made but for Apple's acts of infringement.

19 131. This is an exceptional case. Taction is entitled to attorneys' fees and costs
20 under 35 U.S.C. § 285 as a result of the infringement of the '885 patent by Apple.

21 **COUNT II: INFRINGEMENT OF U.S. PATENT NO. 10,820,117**

22 132. Taction incorporates by reference and re-alleges all of the foregoing
23 paragraphs of this Complaint as if fully set forth herein.

24 133. Apple has directly infringed, continues to infringe, and has induced or
25 contributed to the infringement of the '117 patent by making, using, selling, and
26

27 ²² <https://www.tactiontechnology.com/patents/>
28

1 offering for sale, without authority or license the Accused Products in violation of 35
2 U.S.C. § 271(a).

3 134. The Accused Products are non-limiting examples that were identified
4 based on publicly available information, and Taction reserves the right to identify
5 additional infringing activities, products, and services, including, for example, on the
6 basis of information obtained during discovery.

7 135. By way of example only, the Accused Products meet all the limitations of
8 at least claim 1 of the '117 patent, which recites: An apparatus comprising: a housing;
9 a plurality of conductive coils capable of carrying electrical current; a plurality of
10 magnets arranged in operative proximity to the plurality of conductive coils; a moving
11 portion comprising an inertial mass and the plurality of magnets; a suspension
12 comprising a plurality of flexures that guides the moving portion in a planar motion
13 with respect to the housing and the plurality of conductive coils; wherein vibration of
14 the apparatus imparts vibrations to a user's skin; wherein vibration of the apparatus is
15 damped by a viscous ferrofluid in physical contact with at least the moving portion;
16 wherein the viscous ferrofluid reduces at least a resonance within a frequency range of
17 40-200 Hz in response to signals applied to the plurality of conductive coils; wherein
18 said moving portion includes at least a pocket that provides space for at least a magnet;
19 herein each of said plurality of flexures is more resistant to motion transverse to a
20 plane of the moving portion than it is to linear motion in the plane of the moving
21 portion; and herein said housing is generally cuboid in shape.

22 136. The Accused Products are, or contain, an apparatus.

23 137. The Accused Products include Taptic Engine haptic actuators that employ
24 ferrofluid damping.

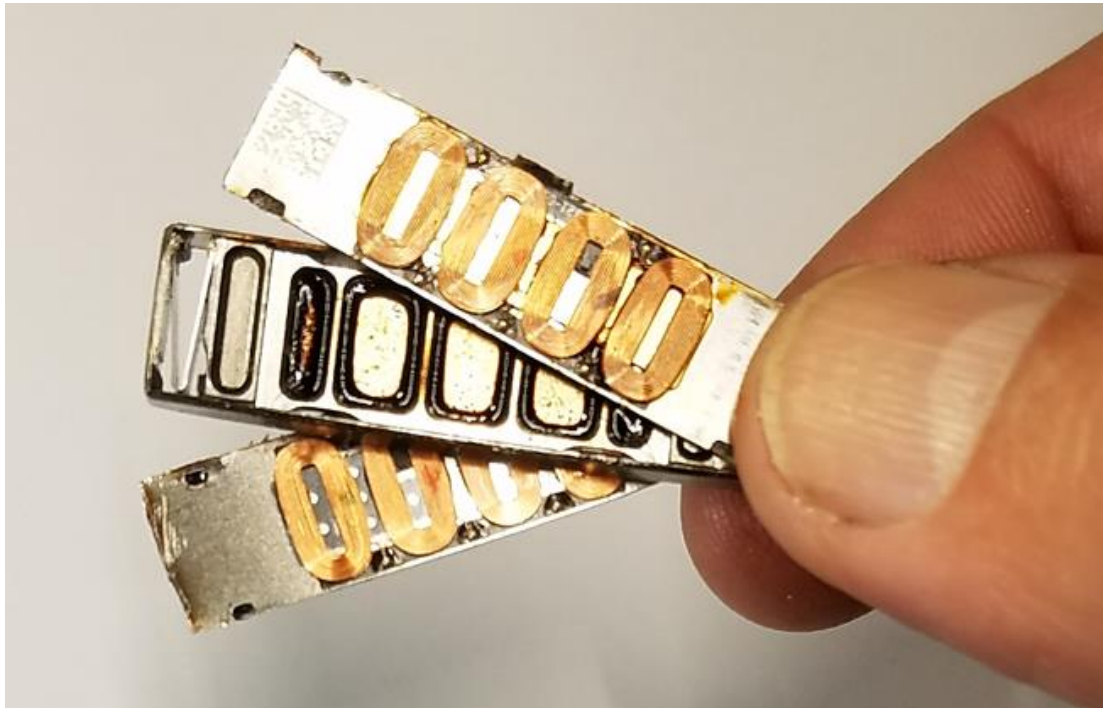
25 138. The Accused Products contain a Taptic Engine that includes a housing.

26 139. One example in the 2020 iPhone SE is shown below:
27
28



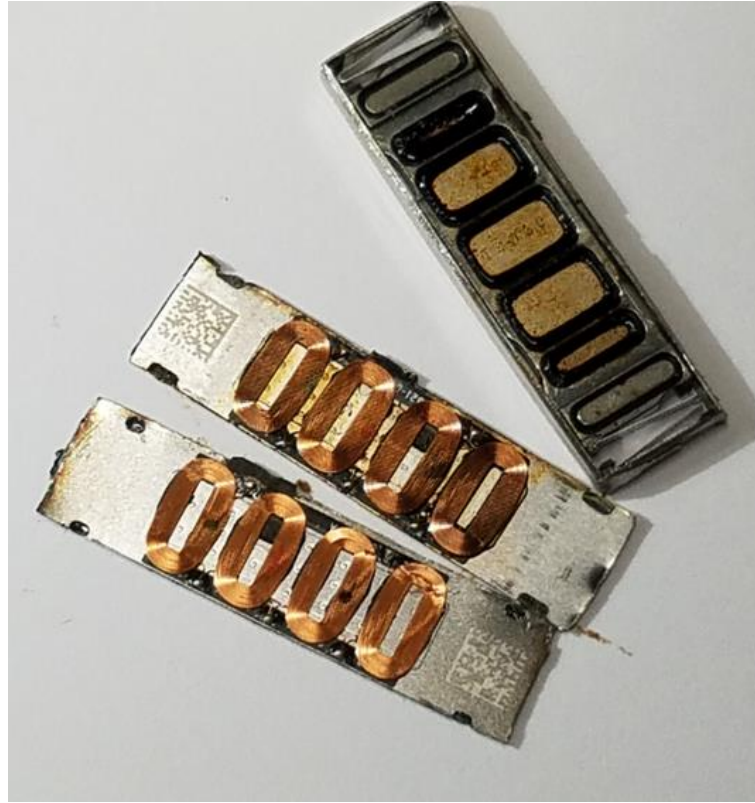
140. The Taptic Engines in the Accused Products contain a plurality of conductive coils capable of carrying electrical current.

141. One example in the 2020 iPhone SE is shown below:



142. The Taptic Engines in the Accused Products contain a plurality of magnets arranged in operative proximity to the plurality of conductive coils.

143. One example in the 2020 iPhone SE is shown below:



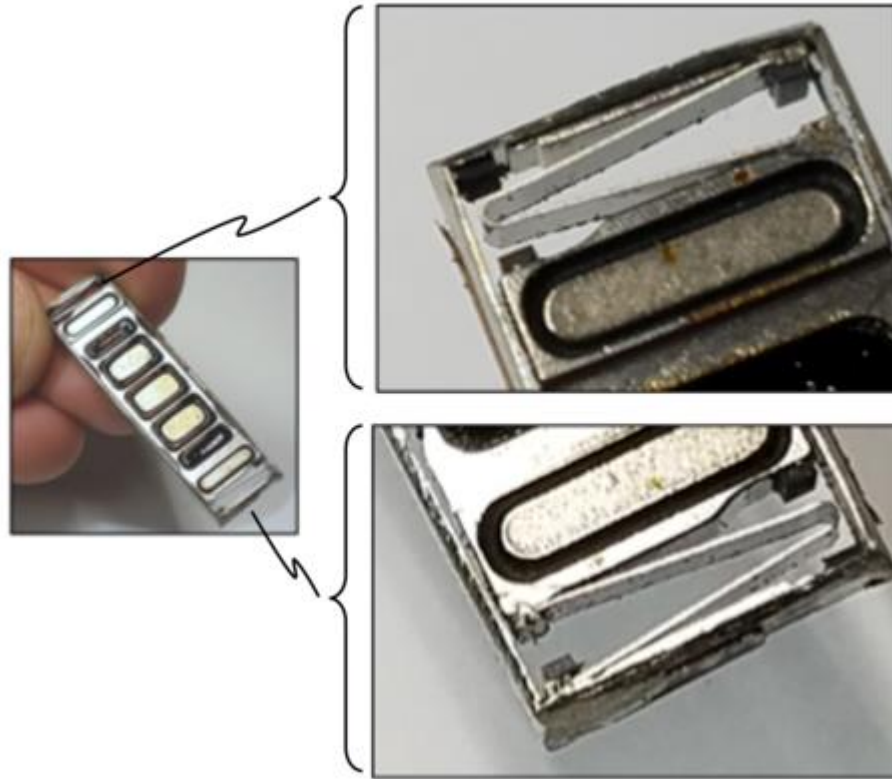
144. The Taptic Engines in the Accused Products contain a moving portion comprising an inertial mass, including tungsten inserts, and a plurality of magnets.

145. One example in the 2020 iPhone SE is shown below:



1 146. The Taptic Engines in the Accused Products contain a suspension
2 comprising a plurality of flexures that guides the moving portion in a planar motion
3 with respect to the housing and the plurality of conductive coils.

4 147. One example in the 2020 iPhone SE is shown below:



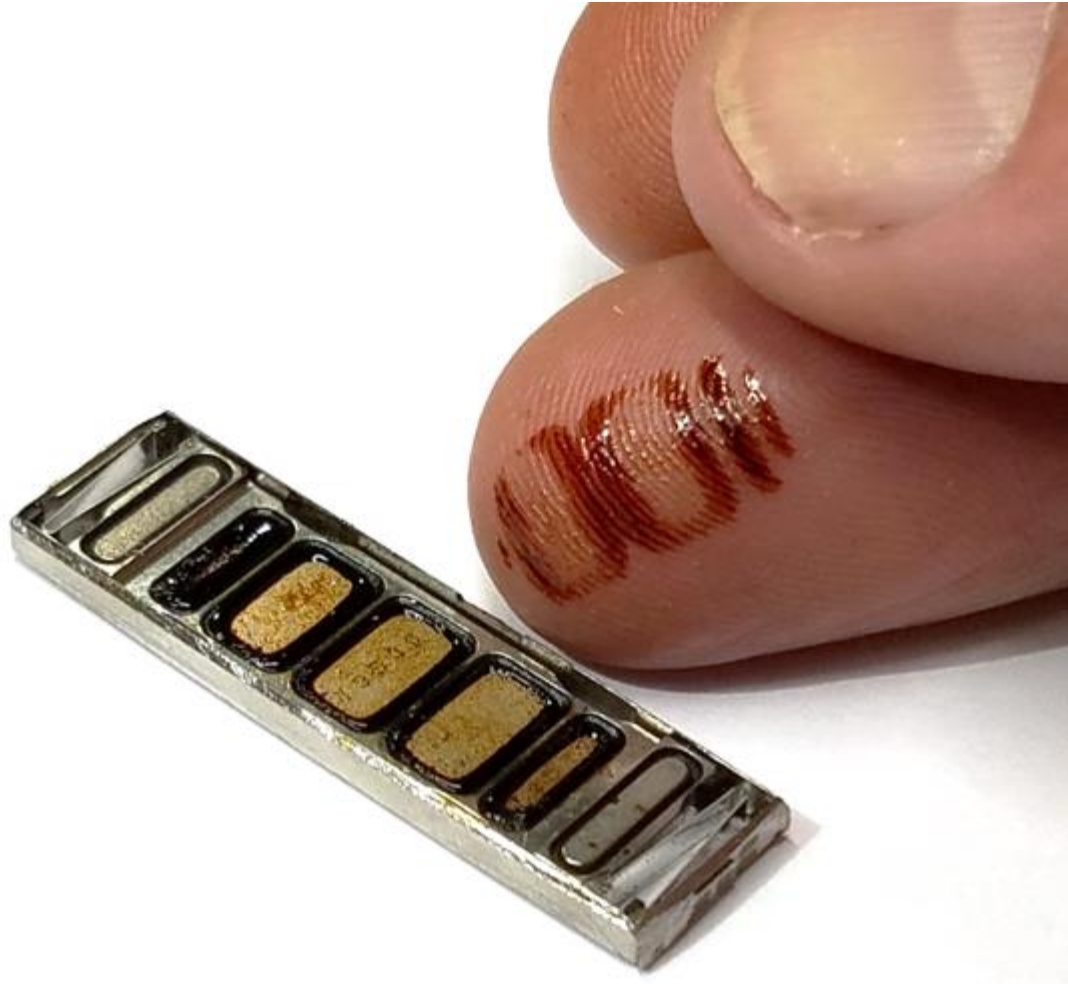
18 148. The vibration of the apparatus imparts vibrations to the user's skin.

19 149. The Taptic Engines use a moving mass that causes the Taptic Engines to
20 vibrate.

21 150. The vibration of the Taptic Engines is transferred to the housing of an
22 iPhone or Apple Watch, which then imparts motion to the skin of a user in contact
23 with the device.

24 151. The vibration of the apparatus is damped by a viscous ferrofluid in
25 physical contact with at least the moving portion.

26 152. One example in the 2020 iPhone SE is shown below:



153. On information and belief, the viscous ferrofluid in the Taptic Engines in the Accused Products reduces at least a resonance within the frequency range of 40-200 Hz in response to signals applied to the plurality of conductive coils.

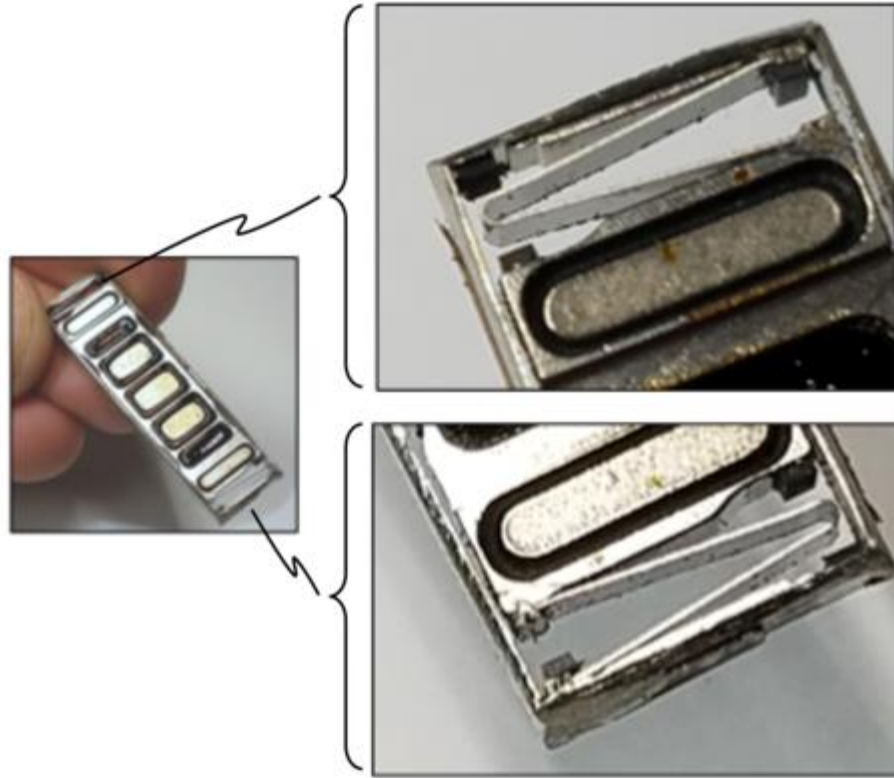
154. The moving portion in the Taptic Engines in the Accused Products includes at least a pocket that provides space for at least a magnet.

155. One example in the 2020 iPhone SE is shown below:



156. In the Taptic Engines in the Accused Products, each of said plurality of flexures is more resistant to motion transverse to a plane of the motion portion than it is to linear motion in the plane of the moving portion.

157. One example in the 2020 iPhone SE is shown below:



158. The housing of the Taptic Engines in the Accused Products is generally cuboid in shape.

159. One example in the 2020 iPhone SE is shown below:



160. Apple actively, knowingly, and intentionally induces infringement of one or more claims of the '117 patent under 35 U.S.C. § 271(b) by actively encouraging others to make, use, sell, and offer to sell in the United States, the Accused Products.

161. For example, Apple provides directions, instruction manuals, guides, and/or other materials that encourage and facilitate infringing use by others. Apple has sold and is selling the Accused Products with the knowledge and intent that customers who buy the products will use the products for their infringing use and therefore that customers have been and are directly infringing the '885 patent.

1 162. Apple contributes to the infringement of one or more claims of the '117
2 patent under 35 U.S.C. § 271(c) by offering to sell and selling a component of the
3 Accused Products that constitutes a material part of the inventions, knowing the same
4 to be especially made or especially adapted for use in an infringement of the '885
5 patent, and is not a staple article or commodity of commerce suitable for substantial
6 noninfringing use.

7 163. Apple was aware of the '117 patent at least from the date of this
8 Complaint.

9 164. On information and belief, Apple was aware of the '117 patent since its
10 issuance on October 27, 2020.

11 165. As one example, on information and belief, Apple was aware of the '117
12 patent by purchasing, using, and reverse engineering two Taction Kannon headsets.

13 166. The headsets were ordered by Anna Mirabella, Product Design
14 Engineering Program Manager at Apple, on April 7, 2017, and shipped to Apple at 1
15 Infinite Loop, Cupertino, California on February 24, 2018, in the care of James
16 Vandyke, Product Design Engineer at Apple.

17 167. Both the headsets and their manuals were marked with U.S. Patent No.
18 9,439,921, and were marked with additional patents pending.

19 168. U.S. Patent No. 9,439,921 is in the same family as the '117 patent.

20 169. As an additional example, on information and belief, Apple was aware of
21 the '117 patent because Taction's U.S. Patent Publication No. 2016/0086458, which is
22 in the same family as the '885 patent, is cited as prior art on the face of Apple's U.S.
23 Patent No. 10,237,660, which issued from an application filed on March 16, 2016.

24 170. As another example, on information and belief, Apple was aware of the
25 '117 patent due to Apple's knowledge of Taction and Taction's disclosure of its
26 patents (including the '117 patent) on its website.²³

27 ²³ <https://www.tactiontechnology.com/patents/>
28

1 171. As a further example, on information and belief, Apple was aware of the
2 '117 patent by Apple's research into competing technology for the Accused Products,
3 as well as competing products for the AirPods Max and various Beats headphones.

4 172. On information and belief, Apple knew that the Accused Products
5 infringe the '117 patent, or at a minimum believed there was a high probability that the
6 accused products were covered by Taction's patents, but willfully blinded itself to
7 Taction's patents and the infringing nature of the Accused Products.

8 173. The foregoing allegations are based on publicly available information and
9 a reasonable investigation of the structure and operation of the Accused Products.

10 174. Taction reserves the right to modify this description, including, for
11 example, on the basis of information about the Accused Products that it obtains during
12 discovery.

13 175. The infringement details provided for claim 1 of the '117 patent are
14 exemplary, and Taction intends to assert additional claims of the '117 patent beyond
15 claim 1.

16 176. Apple's infringement has damaged and continues to damage Taction in an
17 amount yet to be determined, of at least a reasonable royalty and the lost profits that
18 Taction would have made but for Apple's acts of infringement.

19 177. This is an exceptional case. Taction is entitled to attorneys' fees and costs
20 under 35 U.S.C. § 285 as a result of the infringement of the '885 patent by Apple.

21 **REQUEST FOR A JURY TRIAL**

22 178. Taction requests a jury trial of all issues in this action so triable.

23 **PRAYER FOR RELIEF**

24 WHEREFORE, Taction respectfully requests:

25 A. That Judgment be entered that Apple have infringed one or more claims
26 of the Asserted Patents, directly and indirectly, literally and under the doctrine of
27 equivalents;

1 B. That, in accordance with 35 U.S.C. § 283, Apple and all its affiliates,
2 employees, agents, officers, directors, attorneys, successors, and assigns and all those
3 acting on behalf of or in active concert or participation with any of them, be
4 preliminarily and permanently enjoined from (1) infringing the Asserted Patents and
5 (2) making, using, selling, and offering for sale the Accused Products;

6 C. An award of damages sufficient to compensate Taction for Apple's
7 infringement under 35 U.S.C. § 284, including an enhancement of damages on account
8 of Apple's egregious willful infringement;

9 D. That the case be found exceptional under 35 U.S.C. § 285 and that
10 Taction be awarded its reasonable attorneys' fees;

11 E. Costs and expenses in this action;

12 F. An award of prejudgment and post-judgment interest; and

13 G. Such other and further relief as the Court may deem just and proper.
14

15 Dated: April 26, 2021

Respectfully submitted,

16 By: /s/ Sean Pak

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