

Filed on behalf of: Fitbit, Inc.

By: Naveen Modi (PH-Fitbit-Aliph-IPR@paulhastings.com)
Yar R. Chaikovsky (PH-Fitbit-Aliph-IPR@paulhastings.com)
Michael C. Hendershot (PH-Fitbit-Aliph-IPR@paulhastings.com)
David T. Okano (PH-Fitbit-Aliph-IPR@paulhastings.com)
Paul Hastings LLP

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

FITBIT, INC.
Petitioner

v.

ALIPHCOM, INC. D/B/A JAWBONE
Patent Owner

U.S. Patent No. 8,529,811

**PETITION FOR *INTER PARTES* REVIEW OF
U.S. PATENT NO. 8,529,811**

TABLE OF CONTENTS

	Page
I. INTRODUCTION	1
II. MANDATORY NOTICES UNDER 37 C.F.R. § 42.8.....	3
III. PAYMENT OF FEES UNDER 37 C.F.R. §§ 42.15 AND 42.103	4
IV. GROUNDS FOR STANDING AND IDENTIFICATION OF CHALLENGE	4
V. BACKGROUND	6
A. Knowledge in the Relevant Field	7
B. The '811 Patent	9
C. Prosecution History of the '811 Patent and Its Parent Applications...	12
1. Prosecution of the Parent Applications.....	12
2. The '811 Patent Prosecution	15
VI. CLAIM CONSTRUCTION	16
VII. CLAIMS 1–26 OF THE '811 PATENT ARE UNPATENTABLE.....	19
A. The Board Should Adopt the Proposed Grounds.....	19
B. Ground 1: Claims 16–19, 23, and 26 Are Anticipated by <i>Lo</i>	19
1. Overview of <i>Lo</i>	19
2. Claim 16.....	20
3. Claim 17	24
4. Claim 18.....	25
5. Claim 19	26
6. Claim 23	27
7. Claim 26	28
C. Ground 2: Claims 20–22 Are Obvious over <i>Lo</i> in view of <i>Huang</i>	28
1. Claim 20	28
2. Claim 21	30
3. Claim 22	32
D. Ground 3: Claim 24 is Obvious over <i>Lo</i> in view of <i>Handbook of Thermoplastic Elastomers</i>	33
1. Claim 24	33
E. Ground 4: Claim 25 is Obvious over <i>Lo</i> in view of <i>Toyoda</i>	35

TABLE OF CONTENTS

(continued)

	<u>Page</u>
1. Claim 25	35
F. Ground 5: Claims 1, 6, and 15 Are Obvious over <i>Anderson</i> in view of <i>Downey</i>	37
1. Overview of <i>Anderson</i>	37
2. Overview of <i>Downey</i>	38
3. Claim 1	39
4. Claim 6	45
5. Claim 15	46
G. Ground 6: Claims 2, 3, and 5 Are Obvious over <i>Anderson</i> and <i>Downey</i> in view of <i>Huang</i>	46
1. Claim 2	46
2. Claim 3	47
3. Claim 5	48
H. Ground 7: Claims 4 and 7 Are Obvious over <i>Anderson</i> and <i>Downey</i> in view of <i>Handbook of Thermoplastic Elastomers</i>	49
1. Claim 4	49
2. Claim 7	50
I. Ground 8: Claims 8 and 9 Are Obvious over <i>Anderson</i> and <i>Downey</i> in view of <i>Toyoda</i>	52
1. Claim 8	52
2. Claim 9	53
J. Ground 9: Claims 10–12 are Obvious over <i>Anderson</i> and <i>Downey</i> in view of <i>Azuma</i>	54
1. Claim 10	54
2. Claim 11	56
3. Claim 12	58
K. Ground 10: Claims 13 and 14 Are Obvious over <i>Anderson</i> and <i>Downey</i> in view of <i>Brennan</i>	58
1. Claim 13	58
2. Claim 14	60
VIII. CONCLUSION	60

TABLE OF AUTHORITIES

Page(s)

Cases

<i>AliphCom d/b/a Jawbone and BodyMedia, Inc. v. Fitbit, Inc.</i> , No: 3:15-cv-02579 (N.D. Cal.)	3
<i>Certain Activity Tracking Devices, Systems, and Components Thereof</i> , Inv. No. 337-TA-963 (ITC)	3
<i>In re Cuozzo Speed Techs., LLC</i> , 793 F.3d 1268 (Fed. Cir. 2015)	17, 18
<i>KSR Int’l Co. v. Teleflex Inc.</i> , 550 U.S. 398 (2007)	<i>passim</i>
<i>In re Translogic Tech., Inc.</i> , 504 F.3d 1249 (Fed. Cir. 2007)	17
<i>In re Yamamoto</i> , 740 F.2d 1569 (Fed. Cir. 1984)	17

Statutes

35 U.S.C.	
§ 102	3, 5, 15, 16
§ 102(a)	5
§ 102(b)	5
§ 103	3
§ 103(a)	3, 6, 13, 16
§ 112	15

Other Authorities

37 C.F.R.	
§ 42.1(b)	19
§ 42.8	3
§ 42.8(b)(1)	3
§ 42.8(b)(2)	3
§ 42.15	4
§ 42.103	4
Patent Office Trial Practice Guide, 77 Fed. Reg. 48,756 (Aug. 14, 2012)	17

LIST OF EXHIBITS

No.	Description
1001	U.S. Patent No. 8,529,811 to Drysdale et al.
1002	Declaration of Dr. Darran R. Cairns
1003	U.S. Patent Application Pub. No. 2006/0264756 to Lo et al.
1004	U.S. Patent Application Pub. No. 2009/0047797 to Anderson et al.
1005	U.S. Patent Application Pub. No. 2009/0295596 to Downey et al.
1006	Jiri G. Drobny, <i>Handbook of Thermoplastic Elastomers</i> (1st ed. 2007)
1007	U.S. Patent Application Pub. No. 2006/0110537 to Huang et al.
1008	U.S. Patent Application Pub. No. 2010/0178834 to Toyoda et al.
1009	U.S. Patent No. 5,286,330 to Azuma et al.
1010	U.S. Patent No. 5,844,523 to Brennan et al.
1011	U.S. Patent No. 6,361,870 to Steffl et al.
1012	U.S. Patent No. 6,447,886 to Mohamed et al.
1013	Eric L. Bruner, Edward Hughes, <i>Surfaces Matter</i> , 1209 Mater. Res. Symp. Proc. (2010)
1014	Marketing Materials, SRI International, <i>Anti-Smudge, Easy-to-Clean Product Coatings</i> (2010)
1015	Marketing Materials, Henkel Corporation, <i>Electronic Solutions</i> (2005)
1016	Prosecution history of U.S. Application No. 13/135,728
1017	Prosecution history of U.S. Application No. 13/158,372
1018	Prosecution history of U.S. Application No. 13/158,416
1019	Prosecution history of U.S. Application No. 13/427,839
1020	<i>Certain Activity Tracking Devices, Systems, and Components Thereof,</i>

LIST OF EXHIBITS

No.	Description
	ITC Inv. 337-TA-963, Complainant AliphCom's Rebuttal Claim Construction Brief
1021	<i>Certain Activity Tracking Devices, Systems, and Components Thereof</i> , ITC Inv. 337-TA-963, Respondents Fitbit, Inc., Flextronics Int'l Ltd., and Flextronics Sales and Marketing (A-P) Ltd.'s Responsive Claim Construction Brief
1022	CV of Dr. Darran R. Cairns
1023	Charles A. Harper, <i>Handbook of Plastics, Elastomers, and Composites</i> (3rd ed. 1996)
1024	Reserved
1025	Geoffrey Holden, Hans R. Kricheldorf & Roderic P. Quirk, <i>Thermoplastic Elastomers</i> (3rd ed. 2004)
1026	Marketing Materials, DuPont Engineering Polymers, <i>Electrical/Electronic Thermoplastic Encapsulation</i> (1997)
1027	Marketing Materials, Dow Corning, <i>Information About Dow Corning Brand[®] Conformal Coatings</i> (2008)

I. INTRODUCTION

Fitbit, Inc. (“Petitioner”) requests *inter partes* review of claims 1–26 of U.S. Patent No. 8,529,811 (“the ’811 patent”) (Ex. 1001), which is assigned to AliphCom, Inc., d/b/a Jawbone (“Patent Owner”). The ’811 patent broadly claims a process for applying coating layers, some of them protective, on top of one or more electronic elements including a sensor, “coupled with a framework for a wearable device.” Ex. 1001 at 2:14–18, 12:36–39, 13:40–54, and 14:24–38.

Although the claims recite additional design choices, such as using a framework comprised of synthetic fiber (claim 10) or polypropylene (claim 14), providing waterproof protection (claims 6 and 18), or making one of the layers antibacterial (claims 2 and 22), the underlying processes and the added design choices were well-known long before the earliest priority date of the ’811 patent. Applying protective coatings or moldings over microelectronic elements coupled to a framework, such as a circuit board, was commonplace in the prior art.

For example, the ’811 patent describes forming a protective coating with Loctite®, a commercially available product marketed by Henkel & Co. *See, e.g., Id.* at 4:44–56. Henkel marketed Loctite and related products for this very purpose well before the ’811 patent’s 2011 priority date. In a May 2005 brochure for Loctite and its other “Electronic Solutions” products, Henkel explained it “delivers a wide range of off-the-shelf and custom-developed solutions” that emphasize

“compatibility between materials from wafer-level to board-level and final assembly.” Ex. 1015 at ii. The brochure describes a variety of coatings and moldings that “protect PCBs and electrical devices by . . . increasing vibration and shock resistance” and protect against “moisture, . . . extending their longevity in . . . consumer electronic applications.” *Id.* at 29. A figure from the 2005 brochure illustrates the application of a number of such off-the-shelf coatings—the core of what Patent Owner claimed to invent in the ’811 patent half a decade later. *Id.* at 35–36.

As highlighted by the brochure and demonstrated by the patents and publications applied herein, the application of multiple coatings or moldings to protect an electronic device was well within the understanding of those skilled in the art long before the ’811 patent. Ex. 1002 at ¶¶ 16–34. Skilled artisans were likewise aware of what properties were desirable in various product applications, such as wearable devices, as well as a variety of materials and techniques that may be selected to impart such properties to an end product. *Id.* The ’811 patent claims recite nothing more than predictable design choices that use known materials and techniques according to their well-understood and established functions.

This petition shows that there is a reasonable likelihood that Petitioner will prevail with respect to at least one of the challenged claims, and thus a trial should be instituted. This petition also establishes by a preponderance of evidence that

claims 1–26 of the '811 patent are unpatentable under 35 U.S.C. § 102 and § 103. Accordingly, a trial should be instituted and these claims should be canceled.

II. MANDATORY NOTICES UNDER 37 C.F.R. § 42.8

Real Party-in-Interest: Pursuant to 37 C.F.R. § 42.8(b)(1), Petitioner identifies Fitbit, Inc., as the real party-in-interest.

Related Matters: Pursuant to 37 C.F.R. § 42.8(b)(2), Petitioner identifies the following related matters. The '811 patent and two patents in the same family as the '811 patent, U.S. Patent Nos. 8,793,522 and 8,446,275, are involved in *AliphCom d/b/a Jawbone and BodyMedia, Inc. v. Fitbit, Inc.*, No: 3:15-cv-02579 (N.D. Cal.), and *Certain Activity Tracking Devices, Systems, and Components Thereof*, Inv. No. 337-TA-963 (ITC). The '811 patent claims priority to three pending applications: U.S. Patent Application Nos. 13/135,728, 13/158,416, and 13/158,372. In addition, the following pending applications claim priority to the '811 patent: U.S. Patent Application Nos. 13/942,503, 14/145,887, and 14/145,894.

Counsel and Service Information: Lead counsel is Naveen Modi (Reg. No. 46,224). Yar R. Chaikovsky (Reg. No. 39,625), Michael C. Hendershot (*pro hac vice* admission to be requested) and David T. Okano (Reg. No. 66,657) are back-up counsel. The mailing address for all correspondence is Paul Hastings LLP, 875 15th St. N.W., Washington, D.C., 20005 (Telephone: 202.551.1700/Fax:

202.551.1705). Petitioner consents to electronic service of documents at PH-Fitbit-Aliph-IPR@paulhastings.com.

III. PAYMENT OF FEES UNDER 37 C.F.R. §§ 42.15 AND 42.103

Petitioner submits the required fees with this petition. Please charge any additional fees required for this proceeding to Deposit Account No. 50-2613.

IV. GROUND FOR STANDING AND IDENTIFICATION OF CHALLENGE

Petitioner certifies that the '811 patent is available for *inter partes* review, and that Petitioner is not barred or estopped from requesting such review on the grounds identified. Claims 1–26 of the '811 patent are unpatentable in view of the following prior art references: U.S. Patent Application Publication Nos. 2006/0264756 to Lo et al. (“*Lo*”) (Ex. 1003), 2009/0047797 to Anderson et al. (“*Anderson*”) (Ex. 1004), 2009/0295596 to Downey et al. (“*Downey*”) (Ex. 1005), 2006/0110537 to Huang et al. (“*Huang*”) (Ex. 1007), and 2010/0178834 to Toyoda et al. (“*Toyoda*”) (Ex. 1008), U.S. Patent Nos. 5,286,330 to Azuma et al. (“*Azuma*”) (Ex. 1009) and 5,844,523 to Brennan et al. (“*Brennan*”) (Ex. 1010), and an industry reference entitled *Handbook of Thermoplastic Elastomers* (“*Handbook of Thermoplastic Elastomers*”) (Ex. 1006). As discussed in Section V *infra*, the '811 patent claims priority to an application filed on June 10, 2011. Ex. 1001 at title page. For the purpose of this petition, Petitioner assumes the priority date for the '811 patent is June 10, 2011.

Toyoda was published on July 15, 2010, was filed on January 15, 2010, and is a continuation of an international application filed on July 16, 2008. Ex. 1008 at title page. *Toyoda* is prior art to the '811 patent under 35 U.S.C. § 102(a).

Lo was published November 23, 2006. Ex. 1003 at title page. *Anderson* was published February 19, 2009. Ex. 1004 at title page. *Downey* was published December 3, 2009. Ex. 1005 at title page. The *Handbook of Thermoplastic Elastomers* is a treatise with a publication date of 2007. Ex. 1006 at 2. *Huang* was published May 25, 2006. Ex. 1007 at title page. *Azuma* issued February 15, 1994. Ex. 1009 at title page. *Brennan* issued on December 1, 1998. Ex. 1010 at title page. *Lo*, *Anderson*, *Downey*, *Handbook of Thermoplastic Elastomers*, *Huang*, *Azuma*, and *Brennan* are prior art to the '811 patent under 35 U.S.C. § 102(b).

The '811 patent's claims should be cancelled in view of the following grounds. For claim 16 and its dependent claims: **Ground 1:** claims 16–19, 23, and 26 are unpatentable under 35 U.S.C. § 102 as anticipated by *Lo*. **Ground 2:** claims 20–22 are unpatentable under 35 U.S.C. § 103(a) as obvious over *Lo* in view of *Huang*. **Ground 3:** claim 24 is unpatentable under 35 U.S.C. § 103(a) as obvious over *Lo* in view of *Handbook of Thermoplastic Elastomers*. **Ground 4:** claim 25 is unpatentable under 35 U.S.C. § 103(a) as obvious over *Lo* in view of *Toyoda*.

For claim 1 and its dependent claims: **Ground 5:** claims 1, 6, and 15 are unpatentable under 35 U.S.C. § 103(a) as obvious over *Anderson* and *Downey*.

Ground 6: claims 2, 3, and 5 are unpatentable under 35 U.S.C. § 103(a) as obvious over *Anderson* and *Downey* in view of *Huang*. **Ground 7:** claims 4 and 7 are unpatentable under 35 U.S.C. § 103(a) as obvious over *Anderson* and *Downey* in view of *Handbook of Thermoplastic Elastomers*. **Ground 8:** claims 8 and 9 are unpatentable under 35 U.S.C. § 103(a) as obvious over *Anderson* and *Downey* in view of *Toyoda*. **Ground 9:** claims 10–12 are unpatentable under 35 U.S.C. § 103(a) as obvious over *Anderson* and *Downey* in view of *Azuma*. **Ground 10:** claims 13 and 14 are unpatentable under 35 U.S.C. § 103(a) as obvious over *Anderson* and *Downey* in view of *Brennan*.

Supporting these grounds, Petitioner offers a declaration from Dr. Darran Cairns, Professor of Mechanical and Aerospace Engineering at West Virginia University. Ex. 1002 at ¶¶ 1–15 and 57. Dr. Cairns’ CV is attached as Exhibit 1022.

V. BACKGROUND

The ’811 patent issued from U.S. Patent App. No. 13/427,839 (“the ’839 application”), was filed on Mar 22, 2012, and purports to be a continuation of U.S. Patent App. No. 13/135,728 (“the ’728 application”), which was filed on July 12, 2011 is currently pending, and purports to be a continuation-in-part of U.S. Patent App. No. 13/158,416 (“the ’416 application”), which was filed on June 11, 2011, is currently pending, and purports to be a continuation-in-part of U.S. Patent App.

No. 13/158,372 (“the ’372 application”), which was filed on June 10, 2011 and is currently pending. Ex. 1001 at title page.

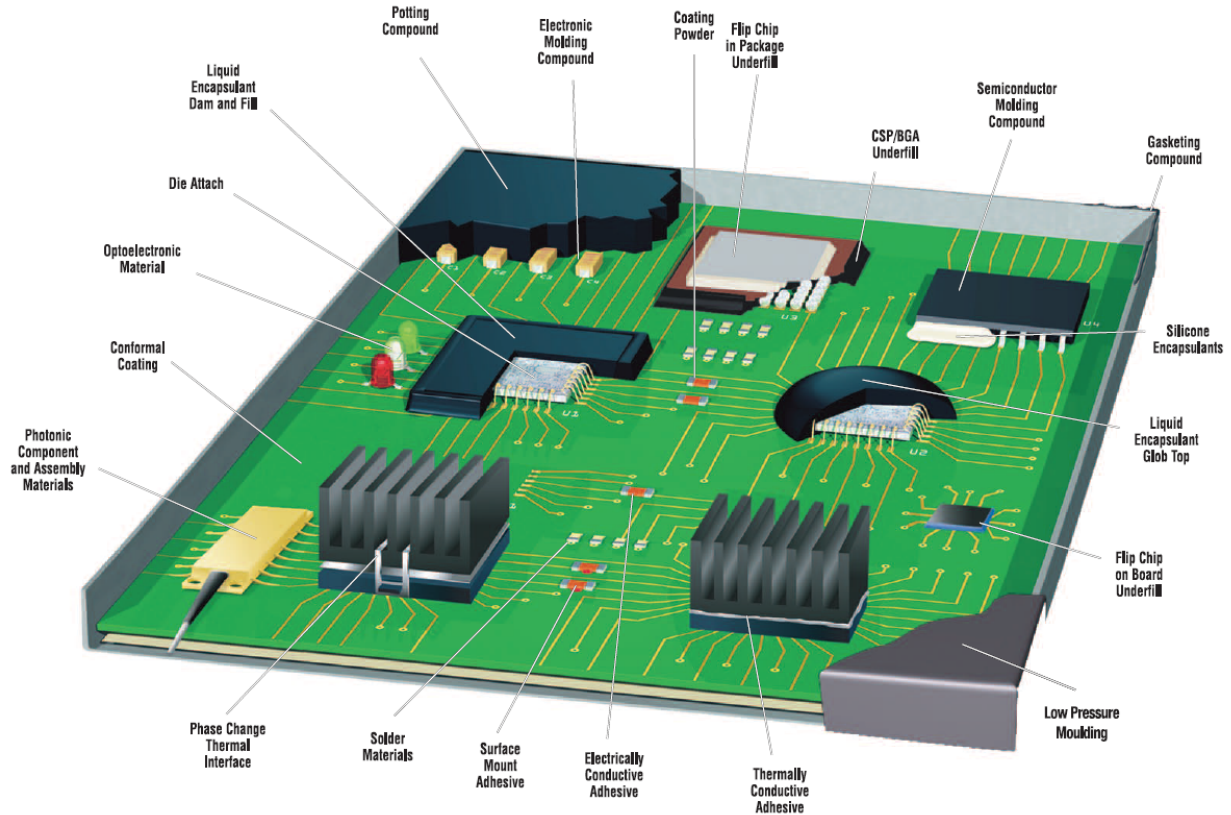
A. Knowledge in the Relevant Field

By June 2011, the application of protective overmoldings and coatings to electronic devices was a mature and well-developed field. Ex. 1002 at ¶¶ 21–23. Applying multiple protective coatings and moldings to circuitry in consumer electronic devices was a basic manufacturing technique well-understood by those of ordinary skill in the art. *Id.* at ¶ 21. Skilled artisans were well versed in what properties were desirable in various product applications, such as wearable devices, as well as a variety of materials and techniques that may be selected to apply such materials and impart such properties to an end product. *Id.* at ¶¶ 19–34. Indeed, determining such requirements and selecting combinations of materials and application techniques were basic design choices commonly made as part of typical projects in the field. *Id.* at ¶¶ 19 and 22.

Such knowledge is reflected in a number of industry reference handbooks that catalogued the properties, application methods and conditions, and product applications for a variety of materials, such as plastics, elastomers, and composites. *See id.* at ¶¶ 23–26; *see also* Exs. 1023–1025. In addition, skilled artisans also had access to and familiarity with a variety of resources from industry suppliers (*e.g.*,

Henkel, Dow, and DuPont). Ex. 1002 at ¶¶ 27–34. These included off-the-shelf solutions, recommendations, instructions, and design and engineering support. *Id.*

For example, the '811 patent describes forming a protective coating over electronic elements and a circuit board with Loctite®, a product marketed by Henkel for this very purpose well before the '811 patent's 2011 priority date. *See, e.g.*, Ex. 1001 at 4:44–56. A 2005 product circular for Loctite and related Henkel “Electronics Solutions” products illustrates the variety of off-the-shelf coatings for consumer electronic devices that were known to skilled artisans well before June 2011. *See* Ex. 1002 at ¶¶ 30–33; Ex. 1015 at ii, 29, and 35–36. A figure in the Henkel circular (below) illustrates a number of these known, off-the-shelf coatings and moldings that may be applied to a circuit board. *See* Ex. 1002 at ¶ 31. Similar solutions, services, and product documents were provided by other suppliers, such as Dow and DuPont. *See, e.g., id.* at ¶¶ 27–29; Ex. 1027 at 2 (2005 Dow “*Information About Dow Corning Brand® Conformal Coatings*”); *see generally* Ex. 1026 (1997 DuPont “*Electrical/Electronic Thermoplastic Encapsulation*”).



Ex. 1015 at 35-36 (2005 Henkel product circular).

B. The '811 Patent

The '811 patent relates to a method of applying a number of coating layers, some of them protective, on top of one or more electronic elements including a sensor, “coupled with a framework for a wearable device.” Ex. 1001 at 2:14–18, 12:36–39, 13:40–54, and 14:24–38. The framework may include, *inter alia*, a printed circuit board. *Id.* at 3:36–40 (“In some examples, framework 102 may be referred to interchangeably as a substrate, wafer, board (printed, unprinted, or otherwise), or other surface upon which elements 104–106 may be mounted, placed, or otherwise fixed.”). The elements are described generally as “electrical

and electronic components such as microprocessors, processors, data storage and computer memory, [or] sensors.” *Id.* at 10:30–32. *See* Ex. 1002 at ¶ 35.

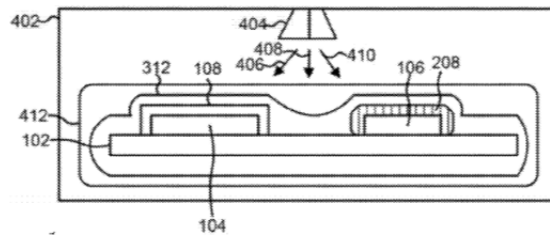
The ’811 patent describes applying three types of layers to the elements and framework: (1) a “covering” or “protective material” over one or more of the elements; (2) one or more “inner moldings” substantially over the covering or protective material, the framework, and the elements; and (3) an “outer molding” covering “all or substantially all” of the one or more inner moldings. Ex. 1001 at 13:40–54, 14:24–38. Such layers are to protect against “various conditions such as use, weather, shock, temperature, or other environmental conditions to which finished products . . . may be subjected.” *Id.* at 9:39–44. *See* Ex. 1002 at ¶ 36.

The first coating layer is described as a “covering” (claims 1–15) or “protective material” (claims 16–25) applied “substantially over one or more of a plurality of elements coupled with a framework.” Ex. 1001 at 13:41–43, 14:24–26. The patent does not specify whether this layer must be molded or what material must be used. Rather, it “may be” any of numerous materials, including “coatings, adhesives, gels, [or] liquids” as well as “epoxies, polymers, elastomers, and the like, without limitation.” *Id.* at 4:44–47, 6:48–51, 8:1–12. *See* Ex. 1002 at ¶ 37.

The second type of layer is one or more “inner moldings” substantially over the first coating layer, plurality of elements, and the framework. *Id.* at 13:46–48, 14:29–33. The ’811 patent does not specify a molding technique or material that

must be used for the inner moldings, but rather discloses that “a variety of molding techniques” may be implemented, using “any . . . organic or inorganic material that can be molded in [a] mold cavity.” *Id.* at 5:19–24. *See* Ex. 1002 at ¶ 38.

The third type of layer, an “outer molding,” covers “all or substantially all” of the one or more inner moldings and is “configured to be positioned in contact with the user.” Ex. 1001 at 13:51–54, 14:34–37. The layers are depicted in Fig. 4:



The '811 patent includes 26 claims, with two independent claims: claim 1 and claim 16. *Id.* at 13:40–54, 14:23–38. Both independent claims are directed to the number of layers applied and the method of applying them. *Id.* The twenty four dependent claims are directed to the materials used in the framework (claims 10–14, *id.* at 14:10–20), quality control steps of inspecting for defects and removing then reapplying defective layers (claims 8, 9, and 25, *id.* at 14:3–9 and 60–62), and the qualities of the layers, such as making them “anti-bacterial” or “oleophobic” or giving them a pattern (claims 2–7, 15, 18–24, and 26, *id.* at 13:55–14:2, 14:21–22, 14:42–59, and 14:63–64). One dependent claim also discloses that the elements mentioned in independent claim 16 are configured to perform some unspecified operation with the data from the sensor. *Id.* at 14:39–41. *See* Ex. 1002 at ¶¶ 39–40.

C. Prosecution History of the '811 Patent and Its Parent Applications

1. Prosecution of the Parent Applications

The '811 patent descended from three parent applications: the '728, the '416, and the '372 applications. All three are pending with all claims rejected. Patent Owner has disclaimed any term of the '811 patent beyond the term of any patent issued from these applications. Ex. 1019 at 224–225 and 244.

i. Prosecution of the '728 application

The '728 application purports to be a continuation-in-part of the '416 application and was filed on July 12, 2011. Ex. 1016 at 3. Its claims closely resemble those of the '811 patent. For example, proposed claim 1 provides:

selectively applying a material substantially over a framework configured to be worn and coupled to one or more elements . . . molding a protective layer substantially over the framework and the material, after the material has been selectively applied; and depositing a coating over the protective layer, the coating having a protective property.

Id. at 31. The dependent claims likewise parallel those of the '811 patent, reciting, *inter alia*, materials that may be used for the substrate or the qualities of the coatings. *Id.* at 31–32 (*e.g.*, “the framework is formed using carbon fiber . . . one or more filaments . . . a thermoplastic elastomer,” “the coating is anti-bacterial . . . oleophobic . . . configured to protect against ultraviolet radiation . . .”).

In response to prior art rejections of all claims, the Patent Owner amended the claims to recite that one of the applied layers may be removable and removing a layer after it is determined to be defective. *Id.* at 119, 144–49, 155–57, 174–77, 197, and 211. On July 16, 2015, the examiner issued a Final Rejection, finding all claims invalid in view of the prior art under 35 U.S.C. § 103(a). *Id.* at 234.

ii. Prosecution of the '416 application

The '416 application purports to be a continuation-in-part of the '372 application and was filed on June 11, 2011. Ex. 1018 at 1. Its claims also closely resemble those of the '811 patent. For example, proposed claim 1 provides:

selectively applying protective material substantially over one or more elements coupled to a framework; molding a first protective layer over the framework the one or more elements, and the protective material, . . . the first protective layer being configured to cover the framework and each of the one or more elements; and molding a second protective layer over the first protective layer, the first protective layer being configured to cover the framework and to provide a cosmetic surface configured to receive a pattern, the second protective layer being removable if a defect is yielded during an inspection.

Id. at 46. The dependent claims likewise parallel those of the '811 patent, reciting, *inter alia*, the qualities of the coatings. *Id.* at 47–48 (*e.g.*, “the protective material comprises an ultra violet curable material . . . a thermoplastic elastomer . . .”).

The examiner rejected all pending claims as invalid over the prior art. *Id.* at 140–144. The pending claims included limitations also found in the '811 patent's

claims, such as “performing an inspection” after applying each layer and removing a layer “if an inspection . . . yields a defect in the second protective layer.” *Id.* at 101–102, and 144 (rejecting claims 29–33 and 36). The examiner found “such quality assurance measures are well-known in the molding art in order to ensure high quality products.” *Id.* at 144. The examiner also rejected claims directed to layers of “an ultraviolet curable material” or “a thermoplastic elastomer,” *id.* at 122–123, finding “the use of a specific material is a mere obvious matter of choice dependent on the desired final product and of little patentable consequence.” *Id.* at 144.

Despite numerous amendments, all pending claims were found invalid in a Final Rejection on September 10, 2015. *Id.* at 29. Patent Owner has since submitted a Request for Continued Examination on January 11, 2016. *Id.* at 298.

iii. Prosecution of the ’372 application

The ’372 application was filed on June 10, 2011. Ex. 1017 at 1. Its claims also closely resemble those of the ’811 patent. Proposed claim 1 provides:

selectively applying protective material substantially over one or more elements coupled to a framework; molding a first protective layer over the framework the one or more elements, and the protective material . . . and molding a second protective layer over the first protective layer, the first protective layer being configured to cover the framework and to provide a cosmetic surface configured to receive a

pattern, the second protective layer being removable if a defect is yielded during an inspection.

Id. at 42. The dependent claims likewise parallel those of the '811 patent, reciting, *inter alia*, the qualities of the coatings. *Id.* at 42–43 (e.g., “the protective material comprises an ultra violet curable material . . . a thermoplastic elastomer”).

In addition to finding the claimed quality assurance steps of inspecting a layer for defects and removing and reapplying defective layers “well-known in the encapsulant art,” *id.* at 117, the examiner found “the claimed materials are well-known in the encapsulant art in order to produce diverse, high-quality encapsulants” and “[t]hus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the claimed materials.” *Id.* The examiner also rejected claims based on 35 U.S.C. §§ 102, 112, and nonstatutory obviousness-type double patenting. *Id.* at 112–113. On October 13, 2015, all claims were finally rejected. *Id.* at 263 and 272.

2. The '811 Patent Prosecution

The '811 patent issued from the '839 application, which purports to be a continuation of the '728 application, and continuations-in-part of the '416, and '372 applications. Ex. 1019 at 15. Before the first Office Action, the applicant submitted an Information Disclosure Statement (IDS) containing citations to a total of 200 references. *Id.* at 96–120. The claims initially recited the successive

application of a protective coating and a molding to elements coupled to a framework in a wearable device. *Id.* at 67. In the first Office Action, the examiner rejected the pending claims under 35 U.S.C. §§ 102 and 103(a) in view of U.S. Patent Application No. 2004/0167409 to Lo et al. *Id.* at 127–30.

Thereafter, Patent Owner amended its claims to specify the application of multiple moldings as opposed to one without explanation or argument beyond simply stating that “[a]s amended herein, independent Claims 1 and 16, and their respective dependent claims are not anticipated by and are non-obvious in view of the cited sections” of the art cited by the examiner. *Id.* at 171.

Following an obviousness-type double patenting rejection of all the claims in view of the ’728, ’416, and ’372 applications, Patent Owner filed a terminal disclaimer. *Id.* at 185–87 and 224–25. Thereafter, the examiner allowed all claims without substantive comment concerning the prior art. *Id.* at 251–52.

VI. CLAIM CONSTRUCTION

In an *inter partes* review, claim terms are given their broadest reasonable interpretation (BRI).¹ *In re Cuozzo Speed Techs., LLC*, 793 F.3d 1268, 1275–79

¹ Petitioner notes that district courts and the International Trade Commission (“ITC”) currently apply a claim construction standard based on a term’s plain and ordinary meaning. Petitioner reserves its rights to make arguments based on that different standard in the district court and before the ITC.

(Fed. Cir. 2015). Under this standard, claim terms are given their “broadest reasonable interpretation, consistent with the specification.” *In re Yamamoto*, 740 F.2d 1569, 1571 (Fed. Cir. 1984); Patent Office Trial Practice Guide, 77 Fed. Reg. 48,756, 48,764 (Aug. 14, 2012). Claim terms are also “generally given their ordinary and customary meaning,” which is the meaning that the term would have to a person of ordinary skill in the art² at the time of the invention. *See In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007) (quoting *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312, 1313 (Fed. Cir. 2005) (*en banc*)). The U.S. Supreme Court has granted a petition for certiorari in *Cuozzo* on issues including whether the Board may construe claims in an issued patent according to their BRI rather than their plain and ordinary meaning. 793 F.3d 1268, *cert. granted*, 2016 WL 205946, 84 U.S.L.W. 3218 (U.S. Jan. 15, 2016).

Under either legal standard, there is (1) a reasonable likelihood that Petitioner will prevail with respect to at least one of the challenged claims and (2) a preponderance of the evidence that claims 1–26 of the ’811 patent are unpatentable. Thus, the Supreme Court’s grant of certiorari in *Cuozzo* should not

² A person of ordinary skill in the art would have had at least two years of relevant college-level coursework in an engineering field with one to two years of post-education relevant work experience. Ex. 1002 at ¶¶ 16–19.

impact the Board's decision to institute this petition or to find the challenged claims unpatentable.

All terms should be given their plain and ordinary meaning. Patent Owner has agreed that this is the appropriate construction for the all terms of the '811 patent claims asserted in the pending ITC proceeding. *See* Ex. 1020 at 1, 2 (Patent Owner's Rebuttal *Markman* Brief identifying only one '811 patent claim term for potential construction, "forming . . . a molding," and proposing "No construction necessary" for that term). As demonstrated in the grounds below, the prior art discussed herein teaches or suggests every limitation of the '811 patent claims under any reasonable interpretation of the claims.³

³ In the ITC proceeding, the only '811 claim term proposed for construction is "forming . . . a molding." Ex. 1021 at 3. Although Patent Owner asserted that no construction was necessary, it secondarily proposed "using a mold to form a . . . material" if the term were construed. Ex. 1020 at 2. Like Patent Owner, the ITC Staff attorney asserted that no construction was needed for this term but, if construed, the term should mean "making with a mold . . . a molding." *Id.* at 9. Fitbit proposed "using a . . . mold to apply material." *Id.* For purposes of this proceeding, no construction is required. Nonetheless, the prior art discussed herein teaches "forming . . . a molding" under any of these proposed constructions.

VII. CLAIMS 1–26 OF THE '811 PATENT ARE UNPATENTABLE

A. The Board Should Adopt the Proposed Grounds

The Board should adopt all grounds. Only one ground is raised for each claim and Petitioner has attempted to streamline the petition by relying on only two primary references, *Lo* and *Anderson*. This achieves the goal of “just, speedy, and inexpensive resolution” consistent with 37 C.F.R. § 42.1(b). Moreover, neither *Lo*⁴ nor *Anderson* was before the Office and the examiner did not have the benefit of the declaration of Dr. Cairns (Ex. 1002), an expert in a relevant field to the '811 patent. The arguments here are all new, thus the Board should institute trial.

B. Ground 1: Claims 16–19, 23, and 26 Are Anticipated by *Lo*

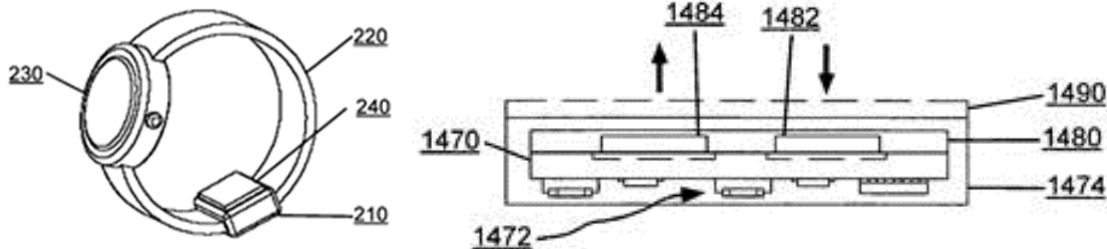
1. Overview of *Lo*

Lo discloses a “wrist-worn” ultrasonic monitor system 200 with ultrasonic monitor module 210, strap 220, display device 230 and transmission medium 240. Ex. 1002 at ¶¶ 48–49; Ex. 1003 at ¶ 0063. The *Lo* wearable wrist monitor detects blood flow through the radial artery of the user’s wrist in order to provide heart rate data to display 230. *Id.* A user’s blood flow is detected by sensors utilizing

⁴ The examiner applied a separate application by *Lo* that did not disclose the figures and embodiments of *Lo* relied upon herein, including the “protective layer.”

ultrasonic transducer elements. *Id.* at ¶ 0057. These transducer sensors and other circuitry elements are mounted directly to a printed circuit board. *See id.* at ¶ 0060.

To protect its underlying microelectronic circuitry, *Lo* describes applying three layers of protective material over the sensors and other elements coupled to the circuit board. These layers include: (1) a “protective layer” that covers the transducers and printed circuit board framework (*id.* at ¶ 0115); (2) a “plastic housing” molded so that it “encapsulates the entire ultrasonic monitor, including [the] protective layer” (*id.* at ¶ 0125); and (3) an outer layer “transmission medium” that is “over-molded onto . . . the plastic housing” and positioned to be in contact with the user’s skin (*id.* at ¶¶ 0101, 0109–0110, 0114). *Id.* at Figs 2A, 14C.



2. Claim 16

- i. **[16A] “A method, comprising: selectively applying at least one protective material substantially over one or more of a plurality of elements coupled with a framework for a wearable device configured to be worn by a user, the plurality of elements including at least a sensor;”**

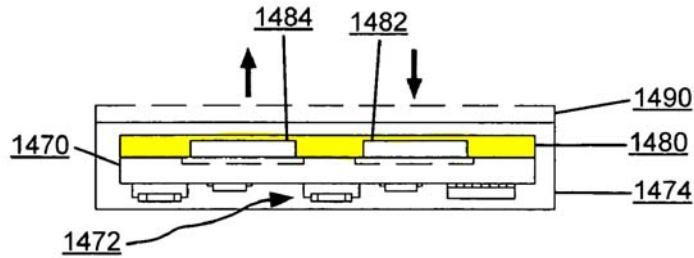
Lo discloses a method of forming a wrist-worn ultrasonic monitor (*i.e.*, a wearable device) that includes a number of electronic processing components and ultrasonic transducer sensors mounted to a printed circuit board (*i.e.*, a plurality of

elements coupled with a framework). *Lo* further describes selectively applying a “protective layer” over the transducer sensors (*i.e.*, selectively applying at least one protective material substantially over one or more of a plurality of elements).

Lo discloses a “wrist-worn” ultrasonic monitor system 200 with module 210, strap 220, display device 230 and transmission medium 240 (*i.e.*, a wearable device configured to be worn by a user). Ex. 1003 at ¶ 0063, Fig. 2A. *See* Ex. 1002 at ¶¶ 48 and 58.

The *Lo* wearable monitor utilizes ultrasonic transducer elements as sensors to monitor blood flow through the user’s radial artery to provide heart rate data to display 230. Ex. 1003 at ¶¶ 0057, 0060, and 0063. These transducers and other circuitry elements are mounted to a printed circuit board (*i.e.*, a plurality of elements coupled with a framework, including at least one sensor). *Id.* at ¶¶ 0060, and 0075. *See* Ex. 1002 at ¶¶ 48 and 58.

Lo also describes applying a “protective layer [that] may be molded such that it encompasses the transducers and a portion of the PCB outer surface” (*i.e.*, selectively applying at least one protective material). Ex. 1003 at ¶ 0115. As illustrated in Figure 14C of *Lo*, excerpted below, protective layer 1480 (*i.e.*, a protective coating) is applied substantially over the transducer sensors 1482 and 1484 mounted on the printed circuit board 1470 (*i.e.*, substantially over one or more elements coupled to a framework). *Id.* at ¶ 0125. *See* Ex. 1002 at ¶¶ 49, 58.

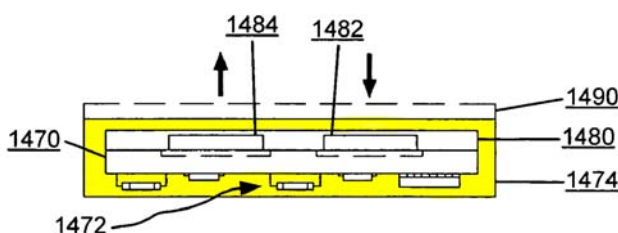


- ii. **[16B] “forming one or more inner moldings substantially over a subset or all of the framework, the at least one protective material and the plurality of elements, after the selectively applying, at least one of the one or more inner moldings having a protective property; and”**

Lo discloses a method of forming a plastic housing by a molding process (*i.e.*, an inner molding) substantially over the protective layer, the transducer sensors, and the printed circuit board (*i.e.*, the protective material, the plurality of elements, and the framework). Ex. 1003 at ¶ 0115; Ex. 1002 at ¶ 58. *Lo* discloses that this plastic layer or housing helps to protect the device (*i.e.*, it has a protective property). Ex. 1003 at ¶ 0062.

In particular, *Lo* describes forming a plastic housing 1474 (*i.e.*, inner molding) that “encapsulates the entire ultrasonic monitor, including protective layer 1480 [*i.e.*, protective material], PCB 1470 [*i.e.*, framework] and circuitry 1472 [*i.e.*, a plurality of elements which includes transducer sensors].” *Id.* at ¶ 0125. *Lo* discloses forming the plastic housing by applying material using a mold: “PCB 1410 and circuitry 1412 are molded and sealed in plastic (such as ABS plastic) housing 1414.” *Id.* at ¶ 0123. *See* Ex. 1002 at ¶ 58.

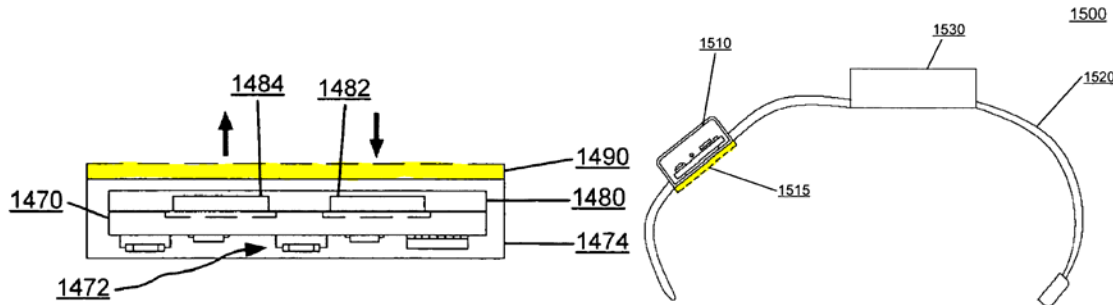
Lo further discloses applying the ABS plastic to the wearable monitor “to make it water resistant” (*i.e.*, it has a protective property). Ex. 1003 at ¶ 0121. As shown in Fig. 14C below, *Lo* discloses applying the plastic housing 1474 substantially over the circuit board framework 1470, the plurality sensor elements 1482/1484, and the previously applied protective material 1480. Ex. 1002 at ¶ 58.



- iii. [16C] “forming an outer molding of the wearable device that covers all or substantially all of the one or more inner moldings, the outer molding configured to be positioned in contact with the user.”

Lo discloses forming a transmission medium (*i.e.*, an outer molding) on the wearable monitor that covers substantially all of the plastic housing (*i.e.*, the inner molding) and that is configured to be in contact with the user. *Lo* describes applying this transmission-medium layer on the exterior of the monitor by using a mold. *See, e.g.*, Ex. 1003 at ¶ 0114. *Lo* explains that this “transmission medium can be . . . **over-molded** onto . . . the plastic housing” and that “[o]il-based transmission media having a fixed or balm-like consistency are well suited for **over-molding**.” *Id.* at ¶¶ 0114–0118 (emphasis added). *See* Ex. 1002 at ¶ 58. The ’811 patent similarly describes forming layers, including an outer molding, by “overmolding.” *See, e.g.*, Ex. 1001 at title, 1:23–25, 2:43–45, and 5:47–49.

Lo further describes that the transmission medium molded to the exterior of the wearable monitor is configured to be in contact with a user's skin: "The outer surface of the oil-based transmission medium can then be placed in contact with a subject's skin." Ex. 1003 at ¶ 0118. *See id.* at ¶¶ 0101, 0109–0110, and Fig. 15A. As depicted in Figures 14C and 15A below, the transmission medium (*i.e.*, outer molding) covers substantially all of the plastic housing 1474 (*i.e.*, the inner molding) and is configured to be in contact with the user. *See* Ex. 1002 at ¶ 58.



3. Claim 17

- i. **“The method of claim 16, wherein the plurality of elements are configured to perform an operation using data from the sensor”**

As discussed above in connection with claim element 16.A, *Lo* discloses a number of electronic processing components and ultrasonic transducer sensors mounted to a printed circuit board. *See supra* section VII.B.2.i. The electronic processing elements are configured to perform various operations on data from the transducer sensors. Ex. 1002 at ¶ 59.

In particular, *Lo* discloses that the transducer sensors measure the movement of blood at the user's wrist. *See, e.g.*, Ex. 1003 at ¶¶ 0006, 0011, and 0055. This

data is relayed from the sensors to electronic processing elements, also coupled to the printed circuit board, that are configured to perform operations on the data from the transducer sensors to “determine blood flow rate, heart rate, or pulse rate” of the user. *Id.* at ¶ 0055. These electronic processing elements “include[] the electrical components required to transmit, receive, and process the ultrasonic signals . . . [p]rocessing may include amplifying, filtering, demodulating, digitizing, squaring, and other functions” on the sensor data. *Id.* at ¶ 0058.

These electronic processing elements are depicted as “circuitry” 960 in Figures 9A–C and 760 and 860 in Figures 7 and 8B respectively, and “include[] surface mount ICs and electrical components such as resistors and capacitors that can implement the electrical system of the ultrasonic monitor.” *Id.* at ¶ 0080. The general arrangement of the ultrasonic monitor’s components, including the transducer sensor and electronic processing elements, is depicted in Figure 3, and the operations said elements are configured to perform on the data from the transducer sensors are summarized in Figures 4 and 5. *Id.* at Fig. 3 (items 310–370, and 390), Fig. 4 (items 430–470), Fig. 5 (items 510–540). *See* Ex. 1002 at ¶ 59.

4. Claim 18

i. “The method of claim 16, wherein the protective property is waterproofing.”

As discussed in connection with claim element 16.B, *Lo* discloses that the plastic housing (*i.e.*, the inner molding) has a protective property. *See supra*

section VII.B.2.ii. *Lo* discloses that the protective property is waterproofing. Ex. 1002 at ¶ 60. In particular, *Lo* discloses that “[t]he entire ultrasonic monitor may be encapsulated in plastic, a transmission medium, or both to provide water resistant properties.” Ex. 1003 at Abstract. *Lo* further describes that the molded plastic housing (*i.e.*, the inner molding) applied over the protective layer is sealed to “make it water resistant.” *Id.* at ¶ 0121. *See also id.* at ¶¶ 0125 (“Plastic housing 1474 encapsulates the entire ultrasonic monitor”), 0062, and Fig. 14C.

5. Claim 19

i. “The method of claim 16, wherein the protective property is water-resistance.”

As discussed in connection with claim element 16.B, *Lo* discloses that the plastic housing (*i.e.*, the inner molding) has a protective property. *See supra* section VII.B.2.ii. *Lo* discloses that the protective property is waterproofing. Ex. 1002 at ¶ 60. In particular, *Lo* discloses that “[t]he entire ultrasonic monitor may be encapsulated in plastic, a transmission medium, or both to provide water resistant properties.” Ex. 1003 at Abstract. *Lo* further describes that the molded plastic housing (*i.e.*, the inner molding) applied over the protective layer is sealed so as to “make it water resistant.” *Id.* at ¶ 0121. *See also id.* at ¶¶ 0125 (“Plastic housing 1474 encapsulates the entire ultrasonic monitor”), 0062, and Fig. 14C.

6. Claim 23

- i. “The method of claim 16, wherein the at least one protective material is configured to protect the one or more of the plurality of elements from damage occurring during the forming of the one or more inner moldings.”**

As discussed above in connection with claim element 16.A, *Lo* discloses first applying a protective layer (*i.e.*, a protective material) to cover the ultrasonic transducer sensors coupled to the circuit board (*i.e.*, one or more of the plurality of elements) before applying subsequent coatings. *See supra* Section VII.B.2.i. This layer is configured to protect such elements from damage during formation of subsequent moldings. Ex. 1003 at ¶ 0115; Ex. 1002 at ¶ 62.

In particular, *Lo* discloses that the “protective layer may be molded such that it encompasses the transducers and a portion of the PCB outer surface.” Ex. 1003 at ¶ 0115. This protective layer is applied to protect the electronic elements coupled to the circuit board prior to application of the molded plastic housing (*i.e.*, an inner molding) and possesses “firmness” that “can prevent damage to the transducer elements due to contact with the oil-based transmission medium or other objects.” *Id.* at ¶ 0115, Fig. 14C (protective layer 1480 underlying plastic housing 1474); Ex. 1002 at ¶ 62. *Lo* further discloses that the protective layer “may be comprised of a room temperature vulcanizing (RTV) . . . silicones, which are used to encapsulate and protect transducers” or “other types of materials so long as they provide adequate mechanical strength” Ex. 1003 at ¶ 0116.

7. Claim 26

- i. “The method of claim 16, at least one protective material comprises a curable coating.”**

As discussed above in connection with claim element 16.A, *Lo* discloses first applying a protective layer (*i.e.*, a protective material) to cover the ultrasonic transducer sensors coupled to the circuit board (*i.e.*, one or more of the plurality of elements) before applying subsequent coatings. *See supra* Sections VII.B.2.i–iii. *Lo* discloses that the protective layer (*i.e.*, the protective material) is a curable coating. Ex. 1003 at ¶ 0116 (“the protective layer may be comprised of a room temperature vulcanizing (RTV) silicone rubber layer adhesive” or “suitable substitutes” that may be “moisture cured” or cured through “chemical reactions . . . or ultraviolet light.”); Ex. 1002 at ¶ 63.

C. Ground 2: Claims 20–22 Are Obvious over *Lo* in view of *Huang*

As discussed in connection with claim element 16.B., *Lo* discloses a plastic housing (*i.e.*, the inner molding) with a protective property. *See supra* Sections VII.B.2.i–iii. Further, as shown below, *Lo* in combination with *Huang* teaches or suggests that the protective property includes the features recited in claims 20–22.

1. Claim 20

- i. “The method of claim 16, wherein the protective property is being hydrophobic.”**

Using hydrophobic materials as moldings on electronic devices was well known in the art before the ’811 patent’s priority date. *See* Ex. 1002 at ¶ 64. For

example, *Huang* describes a hydrophobic coating that is “environmentally friendly and suitable for application to both a metal surface and a nonmetal surface of an electronic device.” Ex. 1007 at ¶ 0006. This may be applied to “a plastic material, glass, a ceramic material, [or] a polymer” that “may be part of an enclosure or an outer housing of” a variety of electronic devices that contact a user’s skin. *Id.* at ¶ 0014. *Huang* further discloses the coating may be “a layer formed of . . . a hydrophobic nano-composite material” that prevents sweat from adhering to the electronic device. *Id.* at ¶¶ 0014, 0015, and 0019. *See* Ex. 1002 at ¶ 64.

The use of a variety of hydrophobic materials in coatings, such as the one described in *Huang*, was well understood in the prior art at the time. Ex. 1002 at ¶ 64. Those skilled in the art understood that a number of common moldings were inherently hydrophobic and commercially available from a variety of vendors. *Id.*; *see also* Ex. 1011 at 1:16–21 (“Polymer surfaces typically have hydrophobic . . . properties”), Ex. 1014 at 1 (marketing products for “rendering [surfaces] to be hydrophobic, hydrophilic, oleophobic or oleophilic by design”), Ex. 1013 at 5 (describing products that “create[] a water-repellant (hydrophobic) and oil-repellant (oleophobic) surfaces [*sic*]” for a variety of materials and applications).

The plastic housing of *Lo*’s monitor would have been in prolonged exposure adjacent to a user’s skin, likely during exercise, and was designed to “keep[] the system of the ultrasonic monitor protected from . . . water.” Ex. 1003 at ¶ 0062. It

would have been obvious to utilize the well understood application of hydrophobic materials, such as in *Huang*, to have imparted protective properties to the plastic housing in *Lo*. See Ex. 1002 at ¶ 64. To an individual of ordinary skill in the art, the use of *Huang*’s protective properties would have been a natural design choice for providing a water resistant device. See *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 416–17 (2007). It likewise simply would have involved the application of well-known prior art elements, according to their established functions, to predictably improve the heart rate monitor device of *Lo*. *Id.*

2. Claim 21

i. “The method of claim 16, wherein the protective property is being oleophobic.”

The use of plastic materials with oleophobic properties (commonly used for fingerprint resistance) as a molding on an electronic device—particularly one that would contact a user’s skin—was well known to those skilled in the art before the priority date of the ’811 patent. Ex. 1002 at ¶¶ 50 and 65.

Huang describes the application of an oleophobic coating “[that] is environmentally friendly and suitable for application to both a metal surface and a nonmetal surface of an electronic device.” Ex. 1007 at ¶ 0006. It may be applied to “a plastic material, glass, a ceramic material, [or] a polymer” that “may be part of an enclosure or an outer housing of” a variety of electronic devices that contact a user’s skin. *Id.* at ¶ 0014. *Huang* discloses that the coating may be “a layer formed

of . . . an oleophobic nano-composite material” that prevents sweat from adhering to the electronic device. *Id.* at ¶¶ 0014, 0015, and 0019.

The use of a variety of oleophobic materials in coatings, such as the one described in *Huang*, was well understood prior to the ’811 patent’s priority date. *See* Ex. 1002 at ¶ 65. Such oleophobic coating materials were commercially available from numerous vendors. *Id.*; *see also*, Ex. 1011 at 1:22–24 (“[n]umerous . . . compositions for oleophobizing of polymer or porous surfaces are already known.”), Ex. 1014 at 1 (marketing products for “rendering [surfaces] to be hydrophobic, hydrophilic, oleophobic or oleophilic by design”), Ex. 1013 at 5 (describing products that “create[] a water-repellant (hydrophobic) and oil-repellant (oleophobic) surfaces [*sic*]” for a variety of applications).

It would have been obvious to apply known oleophobic materials, such as those in *Huang*, to impart protective properties to the plastic housing in *Lo*. *See* Ex. 1002 at ¶ 65. To one skilled in the art, this would have been a natural design choice and an obvious application of known techniques to surfaces of *Lo*’s wearable monitor that would have yielded predictable and beneficial results. *See KSR*, 550 U.S. at 416–17. One skilled in the art would have been aware of the benefits of oleophobic coatings in a wearable device like *Lo*’s monitor, which is “a valuable tool during physical exercise.” Ex. 1003 at ¶ 0008; Ex. 1002 at ¶ 65. This would have protected against sweat or grease from the user’s skin, as taught in *Huang*.

Ex. 1002 at ¶ 65. Oleophobicity also would have been particularly useful in *Lo* given its suggestion that “an oil, such as baby oil or mineral oil, may be applied between” the user and the monitor. Ex. 1003 at ¶ 0120; Ex. 1002 at ¶ 65.

3. Claim 22

i. “The method of claim 16, wherein the protective property is being anti-bacterial.”

Molding an anti-bacterial or anti-microbial plastic material on an electronic device—particularly one that would contact a user skin—was well known to those skilled in the art before the priority date of the ’811 patent. Ex. 1002 at ¶ 66.

For example, *Huang* describes a fingerprint resistant outer coating with anti-bacterial properties “[that] is environmentally friendly and suitable for application to both a metal surface and a nonmetal surface of an electronic device.” Ex. 1007 at ¶ 0006. It may be applied to “a plastic material, glass, a ceramic material, [or] a polymer” that “may be part of an enclosure or an outer housing of” a variety of electronic devices that contact a user’s skin. *Id.* at ¶ 0014. *Huang* explains that its coating “has good . . . **antibacterial properties**.” *Id.* at ¶ 0019 (emphasis added).

The use of a variety of anti-bacterial coatings, such as the one described in *Huang*, was well understood prior to the ’811 patent’s priority date. *See* Ex. 1002 at ¶ 66; *see also* Ex. 1006 at 23–24 (discussing the use of antimicrobial and antibacterial coatings and referring to a “comprehensive list” of commercially available antimicrobial additives that was published in 2001).

It would have been obvious to use known anti-bacterial materials, such as in *Huang*, in the plastic housing of *Lo*'s monitor. Ex. 1002 at ¶ 66. Given that *Lo*'s monitor was designed to be in prolonged contact with a user's skin, including during exercise, modifying the plastic housing to be anti-bacterial would have combined prior art elements according to known methods to produce predictable benefits. *KSR*, 550 U.S. at 416–17. Furthermore, such a modification would have been an obvious design choice for preventing bacterial buildup—one of a “finite number of identified, predictable solutions”—to one skilled in the art. Ex. 1002 at ¶ 66; *see KSR*, 550 U.S. at 417 and 421.

D. Ground 3: Claim 24 is Obvious over *Lo* in view of *Handbook of Thermoplastic Elastomers*

1. Claim 24

- i. “The method of claim 16, wherein at least one of the one or more inner moldings comprises a medical-grade thermoplastic elastomer.”**

Lo teaches that materials contacting a user's skin should preferably be “medical grade” to avoid irritation. *See* Ex. 1003 at ¶¶ 0109 (“It is also preferable that the pressure sensitive adhesive is medical grade that does not cause skin sensitization.”) and 0110 (“This is particularly convenient . . . medical grade mineral oil is used as the diluent in the gel. Such oil, if it migrates into the skin, does not cause adverse effect to the living tissues.”). Surfaces of *Lo*'s housing (*i.e.*, the inner molding) would be exposed near a user's skin. *See id.* at Figs. 2A, 15A,

and 15B; *see also* Ex. 1002 at ¶ 67. Forming *Lo*'s housing from medical grade plastic would have been obvious based on *Lo*'s teachings and *Handbook of Thermoplastic Elastomers*, which reflected basic knowledge in the art. *Id.*

A number of medical-grade thermoplastic elastomers were known in the art. For example, an industry reference handbook, *Handbook of Thermoplastic Elastomers*, identifies materials suitable for medical applications, explaining that certain of “[t]hese applications employ grades approved by U.S. Food and Drug Administration.” Ex. 1006 at 293, 303 (“[t]hermoplastic polyurethanes are compatible with human blood and tissue and therefore can be used in medical devices”), 309 (discussing “Medical Applications” for polyamide thermoplastic elastomers), and 174–175 (styrenic block copolymers demonstrate potential for “medical and biomedical applications”); *see also* Ex. 1002 at ¶ 67.

Using known medical grade thermoplastic elastomers, such as those elastomers taught in *Handbook of Thermoplastic Elastomers*, according to their established purpose in the plastic housing of *Lo*'s monitor would have been an obvious design choice to one skilled in the art that yielded predictable results, *i.e.*, suitable for use on a body. Ex. 1002 at ¶ 67; *see KSR*, 550 U.S. at 416–17 and 421. Medical grade thermoplastic elastomers were commonly used in biomedical applications because they were known to be one of a “finite number of identified,

predictable solutions” to avoid skin irritation with wearable devices. Ex. 1002 at ¶ 67; *see KSR*, 550 U.S. at 416–17 and 421.

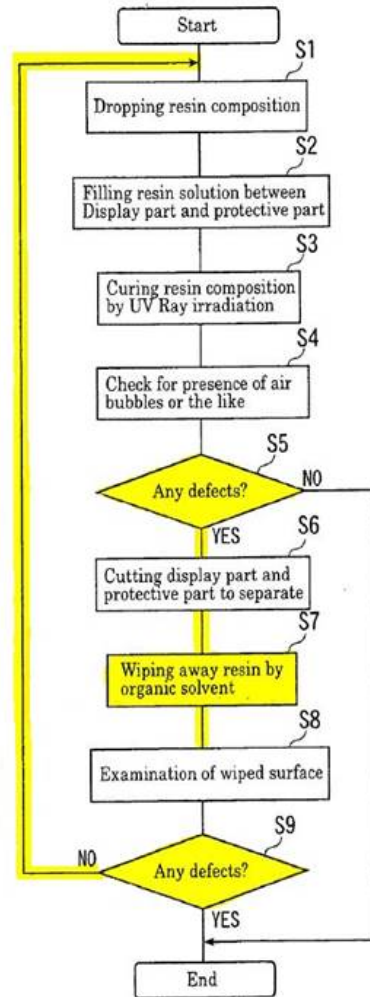
E. Ground 4: Claim 25 is Obvious over *Lo* in view of *Toyoda*

1. Claim 25

- i. “The method of claim 16, further comprising removing and re-applying at least one of the one or more inner moldings after an inspection of the one or more inner moldings.”**

Inspecting a product for defects, particularly a device’s visible outer molding, is a standard and fundamental step of manufacturing processes that has been well understood since long before the ’811 patent’s priority date. *See* Ex. 1002 at ¶ 68. Techniques for the removal and re-application of defective moldings were likewise well understood in the art before the ’811 patent’s priority date. *Id.*

For example, *Toyoda* discloses a method of forming resin layers on electronic devices that includes inspecting a resin layer for defects, and if any are found, removing and re-applying the layer. Ex. 1008 at Abstract. In *Toyoda*’s steps S2 and S3, a resin layer is applied and cured. *Id.* at ¶ 0055. In step S4, the layer is “checked” for defects, such as foreign substances or air bubbles. *Id.* at ¶ 0062. If a defect is found, the layer is separated and removed at steps S6 and S7. *Id.* at ¶¶ 0064–0065, and 0073. The device is then checked for further underlying defects and, if none are detected at step S9, a layer is re-applied by returning to step S1. *Id.* at ¶ 0085. *Toyoda*’s process is generally depicted in Figure 1 below:



It would have been obvious to one skilled in the art to utilize the fundamental manufacturing inspection steps of *Toyoda* to the molded plastic housing of *Lo* (*i.e.*, the inner molding)—particularly given the plastic housing’s protection of *Lo*’s internal circuitry, which could have been compromised by an unaddressed defect. *See* Ex. 1002 at ¶ 68. It was well known long before the ’811 patent’s priority date that a defective molding left a designer with two primary options: (1) discard the entire device, or (2) remove and re-apply the molding. *Id.* It was also well known that the choice between these options was generally dictated

by the cost of the device’s constituent components. Ex. 1002 at ¶ 68. Given the electronic components protected by the plastic housing in *Lo* (e.g., ultrasonic transducers, wireless transmitter, amplifiers, microcontroller), using the inspection steps of *Toyoda* would merely involve the application of known techniques to improve the reliability of *Lo*’s moldings in the same way as in *Toyoda*, and it would have been one of a “finite number of identified, predictable solutions” to the problem of otherwise having to scrap the entire device. *Id.*; see also *KSR*, 550 U.S. at 416–17 and 421.

F. Ground 5: Claims 1, 6, and 15 Are Obvious over *Anderson* in view of *Downey*

1. Overview of *Anderson*

Anderson discloses processes for producing a “microelectronic device . . . resistant to: tampering, inspection . . . , moisture, vibration, shocks and other environmental hazards.” See Ex. 1004 at ¶ 0046. To provide such protection, *Anderson* describes applying protective coatings to “[a] chip, integrated circuit, memory, or any combination thereof” mounted on a substrate. *Id.* at ¶ 0026.

Anderson discloses that the coatings may be applied using “molded encapsulation methods.” *Id.* at ¶ 0049. Such coatings or moldings include: (1) an initial layer applied to protect the microelectronic elements during the application of subsequent coatings (*id.* at ¶ 0031); (2) a tamper-resistant coating (*id.* at ¶¶ 0033, 0049); (3) an encapsulant coating to fill gaps and protect against shock

and vibration (*id.* at ¶ 0041); and (4) an outer encapsulant layer that provides a “moisture resistant and durable handling surface for the microelectronic device” (*id.* at ¶ 0044). Figures 1b and 4b below are illustrative. *See* Ex. 1002 at ¶¶ 45–46.

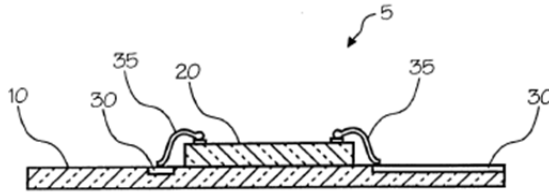


Fig. 1b

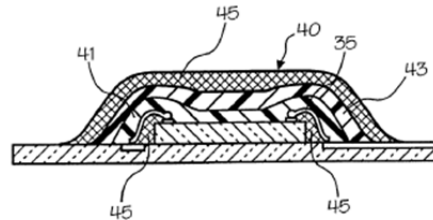


Fig. 4b

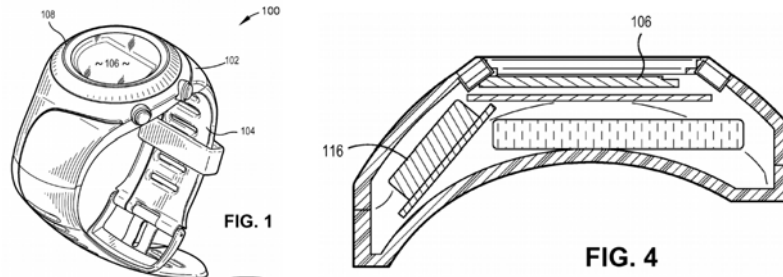
Anderson teaches that its multi-layer protection of microelectronic elements (*e.g.*, integrated circuits) may be beneficially applied to applications where a high tolerance to impact, shock, and vibration as well as protection from moisture and environmental hazards are desired. Ex. 1004 at Abstract and ¶ 0046.

2. Overview of *Downey*

Downey discloses a wearable exercise watch containing a variety of microelectronic elements (*e.g.*, inertial and GPS sensors, processors) that may track the activity and location of a user, even while swimming. *See* Ex. 1002 at ¶ 47; Ex. 1005 at ¶¶ 0034–0035. *Downey* teaches that its wearable device’s components require protection against “environmental contaminants, moisture, vibration, and the like.” *Id.* at ¶ 0026. *Downey* does not apply protective coatings to its internal microelectronic elements, but rather relies on mechanical seals on the exterior housing that are “substantially waterproof or water-resistant to prevent the

intrusion of liquids and other foreign objects within the housing.” *Id.* at ¶ 0022.

Figures 1 and 4 of *Downey* (below) illustrate its exercise/swim watch:

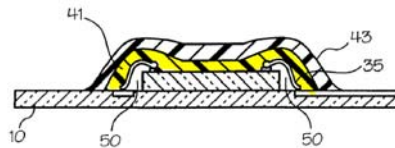


3. Claim 1

- i. [1A] “A method, comprising: selectively applying at least one covering substantially over one or more of a plurality of elements coupled with a framework for a wearable device configured to be worn by a user, the plurality of elements including at least a sensor”

Anderson discloses a method of selectively applying a primer layer (*i.e.*, a protective covering) substantially over circuit components coupled with a substrate (*i.e.*, elements coupled with a framework). Ex. 1002 at ¶ 69; *see* Ex. 1004 at ¶¶ 0027, 0041. In particular, *Anderson* describes selectively applying an “intermediate layer (primer coating)” (*i.e.*, at least one covering) to one or more microelectronic components coupled to a substrate (*i.e.*, elements coupled to a framework). *Id.* at ¶¶ 0025, 0026, 0031. The elements may be “any type of chip, integrated circuit, memory, or any combination thereof that is desired to be attached to substrate 10.” *Id.* at ¶ 0026. The substrate or framework is “any material suitable for mounting a circuit die 20 thereon and is preferably an interconnecting laminate substrate.” *Id.*

The primer coating 41 promotes adhesion of subsequent layers and serves as insulation “to protect circuit 5 components (20, 35) from being damaged” during the application of subsequent layers. *Id.* at ¶ 0031. The coating may be a suitable material “for providing the adhesion and/or insulation properties” needed. *Id.* As shown in Fig. 2B below, coating 41 (*i.e.*, at least one covering) is selectively applied substantially over one or more of the elements on the substrate framework:



Although *Anderson* does not disclose that the framework is part of a wearable device to be worn by a user, it describes techniques that may be generally applied to “produc[e] a microelectronic device resistant to . . . damage from surrounding environment or operating conditions” such as “moisture, vibration, shocks and other environmental hazards.” Ex. 1004 at Abstract, ¶ 0046.

Downey describes an exercise watch that tracks activity and location, even while swimming. Ex. 1002 at ¶ 58; Ex. 1005 at ¶¶ 0034–0035. Its housing contains electronic elements and sensors coupled to frameworks: “one or more printed circuit boards . . . may support a processing system 110, a location determining component 112, a memory, an inertial sensor 114, [and] wireless transmission components.” See Ex. 1005 at Abstract, ¶¶ 0026, 0031, and Figs. 1 and 4.

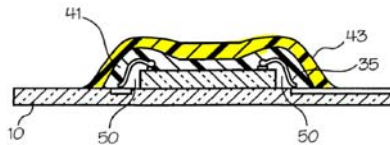
Downey teaches that its wearable device’s microelectronic components require protection against “environmental contaminants, moisture, vibration, impact, and the like”—the same protections taught by *Anderson*. *Id.* at ¶ 0026. *Downey* does not describe applying protective coatings to its internal elements, but rather relies on mechanical seals on the exterior housing that are “substantially waterproof or water-resistant to prevent the intrusion of liquids and other foreign objects within the housing 102.” *Id.* at ¶ 0022.

One skilled in the art would have been motivated to apply *Anderson*’s method to protect the internal components of *Downey*’s watch, which is subjected to moisture, vibration, shocks, and environmental hazards during exercise or swimming. Ex. 1002 at ¶ 69. A person of ordinary skill in the art would have recognized that using *Anderson*’s method to provide added protection to *Downey*’s expensive and sensitive circuitry would have been a simple application of a known prior art method according to its established function to predictably improve the protection of the internal components of the device of *Downey*’s wearable device. *See* Ex. 1002 at ¶ 69; *see also KSR*, 550 U.S. at 416–17.

- ii. **[1B] “selectively forming a first inner molding that covers all or substantially all of the at least one covering, the plurality of elements, and the framework”**

Anderson discloses selectively forming a tamper-resistant coating (*i.e.*, a first inner molding) that covers substantially all of the primer coating, the circuit

elements, and/or the printed circuit board (*i.e.*, the at least one covering, plurality of elements, and framework). *See* Ex. 1002 at ¶ 69. *Anderson* describes the application of a tamper-resistant coating (TRC) 43 over the intermediate primer layer 41, including using a mold to apply the material, through a thermal spray process or “molded encapsulation methods.” *See* Ex. 1004 at ¶¶ 0033, 0049 and Fig. 2B; *see also* Ex. 1002 at ¶ 69. As shown in Fig. 2B below, this coating covers substantially all of the intermediate primer coating 41 (*i.e.*, the covering):

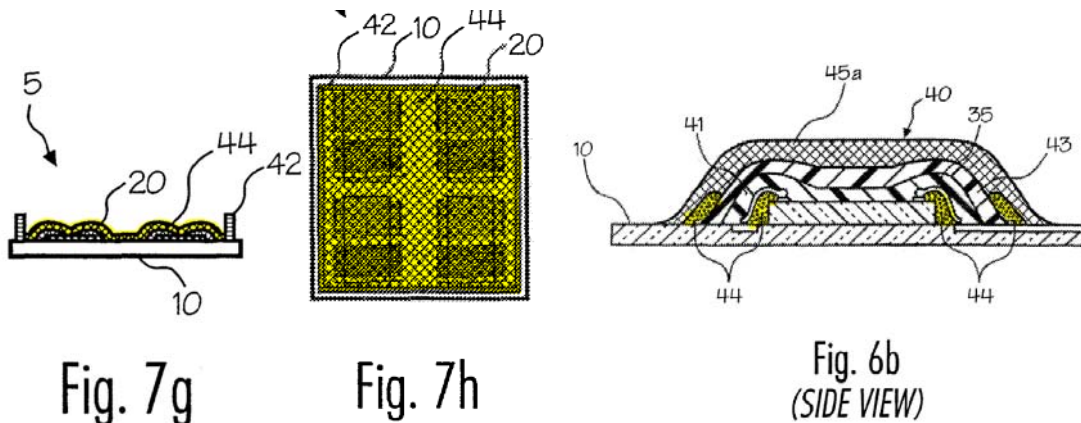


iii. [1C] “selectively forming a second inner molding that covers all or substantially all of the first inner molding”

Anderson discloses selectively forming a filler-material inner coating (*i.e.*, a second inner molding) that covers substantially all of the tamper-resistant coating (*i.e.*, the first inner molding). *See* Ex. 1002 at ¶ 69. *Anderson* describes forming the first of “at least two encapsulant layers” over the tamper-resistant coating. *See* Ex. 1004 at ¶ 0039. The first of these encapsulant layers is identified as “inner coating 44” and constitutes a second inner molding. *Id.*; *see* Ex. 1002 at ¶ 69. This second inner molding can be a “low viscosity, low stress epoxy material” that flows easily and “wicks up to fill gaps or spaces.” Ex. 1004 at ¶ 0041.

The second inner molding is selectively formed over the tamper-resistant coating (*i.e.*, the first inner molding) by “saturat[ing] and fill[ing] spaces around

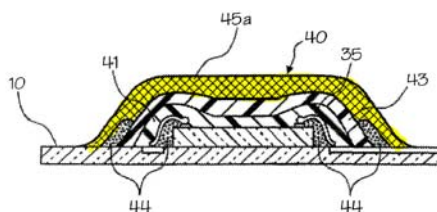
TRC 43.” *Id.* at ¶ 0039. A barrier or mold may be applied around the circuit and the coating material “applied to partially fill the area defined by the barrier (42 FIGS. 7e–7h) and surrounding the TRC coated circuit.” *Id.* at ¶ 0040; *see* Ex. 1002 at ¶ 68. *Anderson* teaches that this second inner molding may “be equally applied using molded encapsulation methods.” Ex. 1004 at ¶ 0049. Figures 7g, 7h, and 6b below illustrate that the coating 44 covers substantially all of the tamper-resistant coating (*i.e.*, the first inner molding). *See* Ex. 1002 at ¶ 69.



- iv. [1D] “selectively forming an outer molding of the wearable device, the outer molding covering all or substantially all of the second inner molding, the outer molding configured to be positioned in contact with the user.”

Anderson discloses a method of selectively forming a shell outer coating (*i.e.*, an outer molding) that covers substantially all of the inner coating (*i.e.*, the second inner molding) to provide a moisture barrier and handling surface. *See* Ex. 1002 at ¶ 69. In particular, *Anderson* describes forming the second of “at least two encapsulant layers” after the inner coating 44 is applied. *See* Ex. 1004 at ¶ 0039.

This second encapsulant layer, “outer coating 45 (referred to as ‘shell coating’ 45),” may be an epoxy or other material with a higher viscosity than the inner coating in order to “provid[e] a moisture barrier 42 and handling surfaces of the microelectronic device.” *Id.* at ¶ 0039. This outer coating, “when hardened, provides a smooth, rigid, moisture resistant and durable handling surface for the microelectronic device.” *Id.* at ¶ 0044. As with the other layers, *Anderson* teaches that this coating can be applied with a mold “using molded encapsulation methods.” *Id.* at ¶ 0049. As shown in Fig. 6B below, the outer coating 45 covers substantially all of the second inner molding 44. *See* Ex. 1002 at ¶ 69.



Although *Anderson* does not expressly disclose a wearable device positioned to be in contact with a user, it would have been obvious to one of ordinary skill in the art to apply the *Anderson* multi-layer method to a wearable device positioned to be in contact with a user, such as *Downey*. See Ex. 1002 at ¶ 69.

Anderson teaches that the outer molding has “resilient handling characteristics” and “provides a smooth, rigid, moisture resistant and durable handling surface for the microelectronic device.” Ex. 1004 at ¶¶ 0039, 0044. A skilled artisan would have understood these properties of *Anderson’s* outer

molding would have been equally applicable to and desirable for the outer housing of *Downey*'s exercise watch, which would have been in contact with a user during active use. *See* Ex. 1002 at ¶ 69. Use of *Anderson*'s outer molding simply would have involved applying a well-known prior art method according to its established function to predictably improve the protection of the internal components of *Downey*'s exercise watch. *Id.*; *see also* *KSR*, 550 U.S. at 416–17.

4. Claim 6

- i. **“The method of claim 1, wherein the outer molding is configured to provide a waterproof seal over the plurality of elements.”**

Both *Anderson* and *Downey* disclose an outer molding configured to provide a waterproof seal over a plurality of elements. Specifically, *Anderson* discloses that “outer coating 45” (*i.e.*, the outer molding) “provid[es] a moisture barrier 42 and handling surfaces of the microelectronic device” (*i.e.*, provides a waterproof seal over the plurality of elements). *See* Ex. 1004 at ¶¶ 0039, 0044; *see also* Ex. 1002 at ¶¶ 45, 70. *Downey* discloses the outer housing of its exercise watch (*i.e.*, the outer molding) “may be made substantially waterproof or water-resistant to prevent the intrusion of liquids and other foreign objects within the housing” (*i.e.*, a waterproof seal over its elements). *See* Ex. 1005 at ¶ 0022; *see also* Ex. 1002 at ¶ 47.

5. Claim 15

- i. “The method of claim 1, wherein the at least one covering comprises a curable coating.”**

Anderson discloses that the “primer coating” (*i.e.*, the at least one covering) applied to the circuit elements and framework is hardened using a “raised temperature curing process.” Ex. 1004 at ¶¶ 0031–0032; *see also* Ex. 1002 at ¶ 71. *Anderson* further discloses that each of its layers and coverings may be curable coatings. *See, e.g.*, Ex. 1004 at ¶¶ 0032, 0034, 0036, 0040, 0043, and 0045.

G. Ground 6: Claims 2, 3, and 5 Are Obvious over *Anderson* and *Downey* in view of *Huang*

As discussed above in connection with claim element 1.D, it would have been obvious to apply the manufacturing method taught by *Anderson*, including the selective formation of a “shell coating” outer molding, to the exercise watch of *Downey*. *See supra* Sections VII.F.3.i–iv. Further, as discussed below, it would have been obvious to modify the outer molding to have the features recited in claims 2, 3, and 5 based the teachings of *Huang*.

1. Claim 2

- i. “The method of claim 1, wherein the outer molding comprises an anti-bacterial material.”**

As discussed above with claim 22, the use of an anti-bacterial material as an outer molding on an electronic device was well known to those skilled in the art before the ’811 patent’s priority date as evidenced by *Huang*. Ex. 1002 at ¶¶ 66

and 72; *supra* Section VII.C.3. For at least the reasons discussed above in connection with claim 22, it would have been obvious to apply the use of such anti-bacterial material to the outer molding of a wearable device. Ex. 1002 at ¶¶ 66 and 72; *supra* Section VII.C.3. Those teachings would have been equally applicable to the exercise/swim watch of *Anderson* and *Downey*. Ex. 1002 at ¶ 72.

It would have been obvious to apply known anti-bacterial materials, such as in *Huang*, to the outer molding of the watch in *Anderson* and *Downey*. See Ex. 1002 at ¶ 72. Use of *Huang*'s protective properties would have been a natural design choice that applied a known prior art technique, according to its established function, to predictably improve resistance to bacteria in an exercise watch like *Downey*, which was designed to be in prolonged contact with a user's skin in moist environments. *Id.*; see also *KSR*, 550 U.S. at 416–17 and 421.

2. Claim 3

i. “The method of claim 1, wherein the outer molding comprises an oleophobic material.”

As discussed above with claim 21, the use of an oleophobic material as an outer molding on an electronic device was well known to those skilled in the art before the '811 patent's priority date as evidenced by *Huang*. Ex. 1002 at ¶¶ 65 and 73; *supra* Section VII.C.2. For at least the reasons described in connection with claim 21, it would have been obvious to apply such an oleophobic material to the outer molding of a wearable device. See Ex. 1002 at ¶¶ 65 and 73; see also

supra Section VII.C.2. Those teachings would have been equally applicable to the exercise/swim watch of *Anderson* and *Downey*. Ex. 1002 at ¶ 73.

It would have been obvious to use known oleophobic materials in the outer molding of the watch of *Anderson* and *Downey*. *Id.* This would have been an obvious application of a known prior art element, according to its established function, to predictably improve an exercise watch's resistance to sweat and grease from a user's skin during exercise. *Id.*; *see also KSR*, 550 U.S. at 416–17 and 421. One skilled in the art would have been well aware of the benefits of an oleophobic coating in this environment to protect against sweat and grease from a user's skin as taught in *Huang*. Ex. 1002 at ¶ 73.

3. Claim 5

i. “The method of claim 1, wherein the outer molding comprises a hydrophobic material.”

As discussed above with claim 20, the use of a hydrophobic material as an outer molding on an electronic device was well known to those skilled in the art before the '811 patent's priority date as evidenced by *Huang*. Ex. 1002 at ¶¶ 64 and 74; *supra* Section VII.C.1. For at least the reasons discussed above in connection with claim 20, it would have been obvious to apply such a hydrophobic material to the outer molding of a wearable device. Ex. 1002 at ¶¶ 64 and 74; *supra* Section VII.C.1. Those teachings would have applied equally to the exercise/swim watch of *Anderson* and *Downey*. Ex. 1002 at ¶ 74.

It would have been obvious to use well-known hydrophobic materials as an outer molding in the combination of *Anderson* and *Downey*. *Id.* This would have been an obvious application of a prior art element according to its established function, that would have predictably improved the watch of *Anderson* and *Downey*, which is described for use during swimming exercises in *Downey*. *Id.*; see also *KSR*, 550 U.S. at 416–17 and 420.

H. Ground 7: Claims 4 and 7 Are Obvious over *Anderson* and *Downey* in view of *Handbook of Thermoplastic Elastomers*

1. Claim 4

- i. “The method of claim 1, wherein the outer molding is configured to protect against ultraviolet radiation.”**

Techniques for configuring an outer molding to protect against ultraviolet radiation were well understood by those skilled in the art long before the ’811 patent’s priority date. See Ex. 1002 at ¶ 75. This is consistent with the lack of description in the ’811 patent as to any particular method or materials for doing so.

An industry reference handbook, *Handbook of Thermoplastic Elastomers*, discloses that it was desirable for outer moldings to be configured to protect against ultraviolet radiation because “polymers deteriorate in the presence of sunlight” and more specifically, “as a result [of] exposure to ultraviolet light at wavelengths 290–400 nm.” See Ex. 1006 at 13–14. The handbook identifies a number of well-known additives for configuring moldings to protect against ultraviolet radiation. *Id.* (discussing “[t]he most widely used UV absorbers” and

“quenchers”). As the handbook makes clear, it was an established practice in the industry to configure exposed, exterior coatings (*i.e.*, an outer molding) to protect against ultraviolet radiation. *Id.*; *see* Ex. 1002 at ¶ 75.

It would have been obvious to one skilled in the art to apply such known techniques to the outer molding of a wearable device, such as *Downey*’s exercise watch. Ex. 1002 at ¶ 75. Such devices would have been worn outside and would have been exposed to ultraviolet radiation. *Id.* Using an outer coating to protect against degradation from such radiation, as taught by *Handbook of Thermoplastic Elastomers*, would have applied a well-known prior art method, according to its established function, to predictably improve the combination of *Anderson* and *Downey*. *Id.*; *see also* *KSR*, 550 U.S. at 416–17 and 420–21.

2. Claim 7

i. “The method of claim 1, wherein a pattern is formed on the outer molding.”

A variety of methods to form a pattern on an outer molding of a device were well known long before the ’811 patent’s priority date and opting to do so in the device of *Anderson* and *Downey* would have been an obvious design choice within the basic knowledge of skilled artisans. *See* Ex. 1002 at ¶ 76. For example, an industry reference handbook, *Handbook of Thermoplastic Elastomers*, disclosed numerous methods for forming patterns on thermoplastic molding surfaces that were known to skilled artisans, including “in-mold decorating” and the use of

“appliqués,” “metallization,” “laser printing,” “fill and wipe,” “screen printing,” “diffusion,” “pad transfer,” “electrolytic plating,” “flame and arc spraying,” “molding,” and “flocking,” as well as other disclosed methods. *See* Ex. 1006 at 148–150.

The handbook further teaches that patterned outer moldings were widely used throughout the industry to provide a number of well-understood benefits in addition to aesthetics, including: “provid[ing] enhanced performance properties such as improved chemical, abrasion or weathering resistance, and electrical conductivity” and coverage of “surface imperfections” that often result from plastic molding manufacturing processes. *Id.* at 148 and 150.

In addition to the obvious benefits of aesthetic design and the display of a manufacturer’s logo or branding, it was known that such patterns could improve resistance to abrasion and weathering in a device intended for active use and repeated impacts like an exercise/swim watch. *See* Ex. 1002 at ¶ 76. Forming a pattern on the outer molding, as taught in *Handbook of Thermoplastic Elastomers*, would have been a natural design choice that applied a known prior art technique according to its established function to predictably improve the exercise/swim watch of *Downey*. *See* Ex. 1002 at ¶ 76; *see also KSR*, 550 U.S. at 416–17.

I. Ground 8: Claims 8 and 9 Are Obvious over *Anderson* and *Downey* in view of *Toyoda*

1. Claim 8

- i. “The method of claim 1, further comprising performing an inspection of the outer molding to determine if the outer molding is defective.”**

As discussed above with claim 25, performing an inspection of a molding for defects, as disclosed in *Toyoda*, was a well understood and fundamental manufacturing technique long before the '811 patent's priority date. *See* Ex. 1002 at ¶¶ 68 and 77; *see also supra* Section VII.E.1. As discussed in connection with claim 25, it would have been obvious to combine this step from *Toyoda* with the manufacturing of a wearable device, particularly for a visible outer molding. Ex. 1002 at ¶ 77. Those teachings would have been equally applicable to the combination of *Anderson* and *Downey*. *See Id.*

It would have been obvious to one of ordinary skill in the art to combine the inspection step from *Toyoda* with formation of the outer molding layer in *Downey* and *Anderson*. *Id.* Such inspection was well known and would have had obvious economic benefits, as it would have stopped defective products from being sold. *Id.* This would have been understood to be particularly important for devices like *Anderson* and *Downey*, where the outer molding was not only the most visible surface to a consumer, but also provided protection for sensitive internal circuitry from, for example, moisture. *Id.* In this context an undetected defect could have

resulted in damage to essential components and rendered the device inoperable. *Id.* Therefore, using the manufacturing inspection steps of *Toyoda* would have been an obvious design choice—one that simply applied a well-known prior art technique according to its established function to predictably improve the exercise/swim watch of *Downey*. *Id.*; see also *KSR*, 550 U.S. at 416–17.

2. Claim 9

- i. **“The method of claim 8, further comprising: removing the outer molding after determining the outer molding is defective; and re-forming the outer molding.”**

As discussed above with claim 25, removing and re-forming a defective molding, as disclosed in *Toyoda*, was well known long before the '811 patent's priority date and it would have been obvious to do so in manufacturing a wearable device, particularly for a visible outer molding. See Ex. 1002 at ¶¶ 68 and 78; see also *supra* Section VII.E.1. Those teachings would have applied equally to the combination of *Anderson* and *Downey*. Ex. 1002 at ¶ 78.

It would have been obvious to one skilled in the art to combine *Toyoda*'s basic techniques in forming an outer molding in *Anderson* and *Downey*. See *Id.* It was well understood that a defective molding left a designer with two primary options: (1) discard the entire device, or (2) remove and re-form the molding. *Id.* It was also well understood that the choice between these options was generally dictated by the cost of the device's components. *Id.* Given the costly components

in *Downey* (e.g., GPS circuitry, various sensors and processors), a skilled artisan would have applied such known techniques to improve the reliability of *Anderson*'s moldings in the same way as in *Toyoda*, as it was one of a “finite number of identified, predictable solutions” to the problem of otherwise having to scrap the entire device. *Id.*; *see also KSR*, 550 U.S. at 416–17 and 421.

J. Ground 9: Claims 10–12 are Obvious over *Anderson* and *Downey* in view of *Azuma*

1. Claim 10

i. “The method of claim 1, wherein the framework is comprised of a synthetic fiber.”

Anderson and *Downey* describe frameworks that include “printed circuit boards” (described in *Anderson* as “an interconnecting laminate substrate”). *See, e.g.,* Ex. 1004 at ¶ 0026; Ex. 1005 at ¶ 0026. Although not expressly stated in *Anderson* and *Downey*, it would have been obvious and expected to one skilled in the art for such circuit boards to include a synthetic fiber. *See* Ex. 1002 at ¶ 79.

Printed circuit boards have long been known in the art to be made of a series of laminar layers, including layers of synthetic fibers (often woven) embedded in a composite for dimensional reinforcement and stability of the board. *Id.*; *see also*, Ex. 1012 at 1:64–67 (“FR-4 laminates, perhaps the most widely used material in the PCB industry, include multiple plies of epoxy resin-impregnated woven glass cloth.”). The most widely used circuit board material, FR-4, includes reinforcement layers of woven fiberglass fibers. *Id.*

Azuma, a patent that issued fifteen years before the '811 patent's priority date, describes established techniques used in manufacturing printed circuit boards in its background section. Ex. 1009 at 1:6–51. These include forming a laminar layer containing synthetic fiber “by permeating a thermosetting resin . . . in a fabric or nonwoven fabric of a glass fiber, an aramid fiber, a polyester fiber, a carbon fiber, or paper, and drying the resultant structure.” *Id.* at 1:32–38.

It would have been obvious to one skilled in the art to use the circuit boards containing synthetic fibers described in *Azuma* in the combination of *Anderson* and *Downey*. See Ex. 1002 at ¶ 79. Any circuit board used, such as those in *Azuma*, would have been expected to include synthetic fibers as part of its basic design and the inclusion of such a commonly used synthetic fiber layer would have been one of a “finite number of identified, predictable solutions” for the construction of a circuit board. *Id.*; see *KSR*, 550 U.S. at 421.

In addition to circuit boards, embedding synthetic fibers in composite materials was a common way to enhance structural integrity of component supports, such as the framework of a molded device. See Ex. 1002 at ¶ 79; see also Ex. 1006 at 22 (discussing benefits of fiber reinforcement). It would have been an obvious design choice to form the framework and structural members of an exercise watch with well-known synthetic fiber composites. See Ex. 1002 at ¶ 79. The *Downey* exercise watch would have experienced active use and impacts. *Id.*

One skilled in the art would have recognized that using synthetic fibers in the watch's structural framework was a natural design choice that simply applied a well-known circuit board fabrication technique, according to its established function, to predictably improve the exercise/swim watch of *Downey*. *Id.*; *see also KSR*, 550 U.S. at 416–17.

2. Claim 11

i. “The method of claim 1, wherein the framework is formed using carbon fiber.”

Anderson and *Downey* describe frameworks that include “printed circuit boards” (described in *Anderson* as “an interconnecting laminate substrate”). *See e.g.*, Ex. 1004 at ¶ 0026; Ex. 1005 at ¶ 0026. It would have been obvious to a skilled artisan to include carbon fiber in these frameworks. *See* Ex. 1002 at ¶ 80.

Printed circuit boards have long been known to be made of laminar layers, including layers of synthetic fibers (often woven) embedded in a composite for dimensional stability. *See* Ex. 1002 at ¶ 80; *see also* Ex. 1012 at 1:64–67 (“FR-4 laminates, perhaps the most widely used material in the PCB industry, include multiple plies of epoxy resin-impregnated woven glass cloth.”). *Azuma*, describes several established techniques used in manufacturing printed circuit boards in its background. Ex. 1009 at 1:32–38. These include forming a laminar layer “by permeating a thermosetting resin . . . in a fabric or nonwoven fabric . . . *a carbon fiber* . . . and drying the resultant structure.” *Id.* (emphasis added).

It would have been obvious to one skilled in the art at the time of the invention to use the circuit boards containing carbon fiber described in *Azuma* in the combination of *Anderson* and *Downey*. Ex. 1002 at ¶ 80. The use of carbon fiber in circuit boards was known long before the '811 patent's priority date and was one of a finite number of solutions for forming a circuit board; it would have been an obvious design choice to predictably improve the structural integrity and weight in *Downey*'s exercise watch. *Id.*; *see also KSR*, 550 U.S. at 416-17 and 421.

In addition to circuit boards, embedding carbon fiber in composite materials was a common way to enhance the structural integrity of a component support, such as molded device's framework. *See* Ex. 1002 at ¶ 80; *see also* Ex. 1006 at 22 (“carbon fibers . . . have exceptional reinforcing properties” useful in “specialized applications, such as aerospace, marine . . . and medical applications.”). It would have been an obvious design choice to form the structural framework of an exercise watch with carbon fiber. Ex. 1002 at ¶ 80. The *Downey* watch was intended for active use with consequent impacts. *Id.* One skilled in the art would have known that using carbon fiber would have predictably benefited the *Downey* watch and simply substituted known materials to yield predictable results—enhanced structural integrity. *Id.*; *KSR*, 550 U.S. at 416–17 and 421.

3. Claim 12

- i. “The method of claim 1, wherein the framework is comprised of one or more filaments.”**

See supra Sections VII.J.1–2 (claims 10 and 11). Synthetic fibers, like those discussed with claims 10 and 11, are formed by combining one or more filaments into a fiber or strand. *See* Ex. 1002 at ¶ 81; *see also* Ex. 1006 at 22 (“Glass fiber reinforcements are strands of filaments The number of filaments per strand, the configuration of the strand, and the fiber length-to-weight ratio can be varied”).

K. Ground 10: Claims 13 and 14 Are Obvious over *Anderson* and *Downey* in view of *Brennan*

1. Claim 13

- i. “The method of claim 1, wherein the framework is formed using a thermoplastic elastomer.”**

As discussed in connection with claims 10 and 11, *supra* Sections VII.J.1–2, *Anderson* and *Downey* disclose frameworks that include printed circuit boards. It was well understood at the time of the invention that “[a] wide range of polymeric materials are used as substrate or laminate elements in electronics applications, and a great deal of information regarding their properties is known.” Ex. 1010 at 1:29–33. *See* Ex. 1002 at ¶ 82. Such polymeric materials that could be used in a printed circuit board included thermoplastic elastomers. Ex. 1010 at 12:14–15 (“One of the simplest applications of such a laminate structure is as a printed circuit board.”).

For example, *Brennan* describes “patterned laminated structures having at least one thermoplastic elastomeric layer . . . such as antennas or printed circuit boards.” *Id.* at 1:8–13. *Brennan* explains that such devices using thermoplastic elastomers “exhibit[ed] many desired properties, such as flexibility, conformability and weatherability.” *Id.* at Abstract. *Brennan* further discloses that “thermoplastic elastomer material is particularly well suited for use outdoors, as it is weatherable and its electrical properties, such as dielectric constant and loss tangent, experience little change over a wide temperature range.” *Id.* at 15:20–24.

In view of the teachings of *Brennan*, it would have been obvious to one skilled in the art that its use of a thermoplastic elastomer in printed circuit boards could have been applied to the framework of the *Downey* swim/exercise watch. Ex. 1002 at ¶ 82. The *Downey* swim/exercise watch was intended to be used outdoors—an environment in which *Brennan* teaches thermoplastic elastomers were “particularly well suited.” Ex. 1010 at 15:20–24; *see* Ex. 1002 at ¶ 82.

Downey discloses that its watch is intended for active use with consequent impact and shocks. Ex. 1009 at ¶ 0026. One skilled in the art would have been aware that utilizing a thermoplastic elastomer according to its established function would have predictably benefited the *Downey* watch and been a simple substitution of known materials to yield predictable results, *i.e.*, enhanced flexibility,

conformability, and weatherability, as taught in *Brennan*. See Ex. 1002 at ¶ 82; see also Ex. 1010 at Abstract; *KSR*, 550 U.S. at 416–17 and 421.

2. Claim 14

- i. “The method of claim 13, wherein the thermoplastic elastomer comprises polypropylene.”**

As discussed above in connection with Claim 13, *Brennan* teaches a circuit-board framework comprising a thermoplastic elastomer. *Brennan* further teaches that it is “particularly preferred” to use polypropylene in the thermoplastic elastomer component of its printed circuit boards. Ex. 1010 at 6:42–46. In view of this teaching and for the reasons set forth in connection with Claim 13, it would have been an obvious substitution of one prior art material for another to include a thermoplastic elastomer including polypropylene in the printed circuit boards of the combination of *Anderson* and *Downey*. Ex. 1002 at ¶ 83; *KSR*, 550 U.S. at 416–17 and 421.

VIII. CONCLUSION

For the reasons given above, Petitioner requests *inter partes* review and cancellation of claims 1–26 of the ’811 patent.

Respectfully submitted,

Dated: February 10, 2016

By: /Naveen Modi/
Naveen Modi (Reg. No. 46,224)
Paul Hastings LLP
Counsel for Fitbit, Inc.

CERTIFICATE OF SERVICE

I hereby certify that on February 10, 2016, I caused a true and correct copy of the foregoing Petition for *Inter Partes* Review of U.S. Patent No. 8,529,811 and supporting exhibits to be served via express mail on the Patent Owner at the following correspondence address of record as listed on PAIR:

KOKKA & BACKUS, PC
703 High Street
Palo Alto, CA 94301

A courtesy copy was also sent electronically to the Patent Owner's litigation counsel listed below:

Kalpana Srinivasan
SUSMAN GODFREY L.L.P.
1901 Avenue of the Stars, Suite 950
Los Angeles, California 90067-6029
Telephone: (310) 789-3100
Facsimile: (310) 789-3150
ksrinivasan@susmangodfrey.com

By: /Naveen Modi/
Naveen Modi (Reg. No. 46,224)