

**UNITED STATES DISTRICT COURT  
EASTERN DISTRICT OF TEXAS  
MARSHALL DIVISION**

4WEB, INC.,

Plaintiff,

v.

NUVASIVE, INC.,

Defendants.

Civil Action No.: 2:23-cv-192

**COMPLAINT FOR PATENT INFRINGEMENT**

Plaintiff 4WEB, Inc. doing business as 4WEB Medical (hereinafter “Plaintiff” or “4WEB”), a Texas corporation, by and through its attorneys, for its Complaint against NuVasive, Inc., a Delaware corporation (hereinafter “Defendant” or “NuVasive”), hereby alleges as follows:

1. This is a civil action for patent infringement arising under the Patent laws of the United States, 35 U.S.C. § 1 et seq.

2. This action arises out of NuVasive’s infringement of United States Patent Nos. 8,430,930 (attached as Exhibit A); 9,999,516 (attached as Exhibit B); 9,545,317 (attached as Exhibit C); 11,278,421 (attached as Exhibit D); 9,271,845 (attached as Exhibit E); 9,549,823 (attached as Exhibit F); 9,572,669 (attached as Exhibit G); 9,757,235 (attached as Exhibit H); 10,849,756 (attached as Exhibit I); 9,987,137 (attached as Exhibit J); and 9,636,226 (attached as Exhibit K) (collectively, the “Asserted Patents” or the “Patents-in-Suit”).

**PARTIES**

3. Plaintiff 4WEB is a Texas corporation having a principal place of business at 2801 Network Boulevard #620, Frisco, Texas 75034.

4. Defendant NuVasive is a Delaware corporation, with its principal place of business located at 7475 Lusk Boulevard, San Diego, California 92121. NuVasive is registered to do business in the State of Texas and has a registered agent in Texas. NuVasive's registered agent is Cogency Global Inc., and it is located at 1601 Elm Street, Suite 4360, Dallas, Texas 75201.

5. NuVasive makes, sells, offers for sale in the United States, and imports into the United States, medical equipment and devices, including spinal implants.

### **JURISDICTION**

6. This Court has subject matter jurisdiction over this action pursuant to 28 U.S.C. §§ 1331 and 1338(a) because this action arises under the patent laws of the United States, including 35 U.S.C. § 271 *et seq.*

7. This Court has personal jurisdiction over Defendant NuVasive because NuVasive has (1) substantial, continuous, and systematic contacts within this district, (2) maintains a broad distribution network within the Eastern District of Texas (this "District"), and (3) enjoys substantial income from sales of infringing products within this District in violation of 35 U.S.C. § 271.

8. On information and belief, NuVasive markets and intends to market, distribute, and sell the infringing products in this district with the reasonable expectation, knowledge, and intent that such products will be purchased and used by consumers in this District. NuVasive has thus purposefully targeted its conduct to cause harm in the State of Texas, and particularly in this District.

**VENUE**

9. Venue in this Court is proper under 28 U.S.C. § 1400(b).

10. Venue is proper with respect to 4WEB because 4WEB's principal place of business is within this District.

11. Venue is proper with respect to NuVasive because NuVasive has committed acts of infringement and maintains regular and established business in this District. Defendant has committed infringing acts in this District and in Texas and has a regular and established place of business in this District and in Texas because Defendant "does its business in th[is] [D]istrict through a permanent and continuous presence" in this District. *In re Cordis Corp.*, 769 F.2d 733, 738 (Fed. Cir. 1985).

12. NuVasive employs full-time, exclusive employees in this District, including at least a Sales Representative, a Sales Specialist, a Neurophysiologist, a Senior Field Logistics Specialist, and a Spine Specialist. Cities within this district that these employees are located in include at least Tyler, Frisco, and Beaumont. Multiple NuVasive employee public LinkedIn profiles confirm their locations and employment affiliations within this District.

13. Employees of NuVasive have conducted substantial business activities within this district that include but are not limited to the following:

- Providing technical expertise through sales presentations, product demonstrations, installation, and maintenance of company products;
- Working with Sales Representatives to meet existing potential clients to identify their clinical needs, goals, and constraints related to patient care and to discuss and demonstrate how NuVasive products can help them achieve their goals and meet patient/client needs;

- Providing clinical/technical expertise relative to NuVasive products in an Operating Room (OR) setting;
- Developing and establishing relationships with key spine surgeon customers;
- Observing and assisting clinical staff in spine and orthopedic procedures;
- Assisting physicians in identifying cases that would benefit significantly from the utilization of company products;
- Facilitating product demonstrations and trials;
- Evaluating the impacts of product implementation;
- Facilitating post-sale implementation meetings with hospital staff;
- Serving as the primary, post-implementation technical resource for clinical staff;
- Providing weekly/monthly/quarterly reporting deliverables; and
- Executing sales and technical support responsibilities to customers in the respective territories assigned.

14. NuVasive is actively seeking to hire additional full-time, exclusive employees in this District, including a Senior Regional Clinical Specialist in Beaumont, Texas, whose primary responsibilities would include providing technical expertise through sales presentations, product demonstrations, installation, and maintenance of company products; working with Sales Representatives to meet existing potential clients to identify their clinical needs, goals, and constraints related to patient care; and discussing and demonstrating how company products can help clients achieve their goals and meet patient/client needs. (See <https://beaumont-tx.geebo.com/jobs-online/view/id/1070862106-sr-regional-clinical-specialist>). NuVasive intends to compensate such employees with a salary and benefits.

15. In addition, NuVasive has used, sold, advertised, marketed, and distributed products and services in this District and induced others to use products and perform methods that practice the claimed inventions of the Asserted Patents (as defined below). NuVasive derives substantial revenue from these activities within the District, and expects or should reasonably expect its actions to have consequences within the District, and derives substantial revenue from interstate and international commerce. On information and belief, NuVasive has and continues to achieve substantial sales of products, including products alleged to infringe the Asserted Patents (as defined below), in Texas and in this District. Those acts have caused and continue to cause injury to 4WEB within this District.

16. NuVasive and its affiliates have at least three Texas taxpayer identification numbers (32040829858, 32050562092, and 13307685985) and a Texas registered agent, Cogency Global Inc., located at 1601 Elm St., Suite 4360, Dallas, Texas, 75201.

17. NuVasive has therefore availed itself of the benefits and privileges of conducting business in the State of Texas and in this District, and the exercise of jurisdiction over NuVasive would not offend traditional notions of fair play and substantial justice.

### **THE ASSERTED PATENTS**

18. 4WEB is an orthopedic device company focused on developing innovative implants. It was founded in 2008 in Dallas, Texas, to address problems with then existing spinal implant technology. Over the following years, 4WEB utilized research in topological dimension theory and developed a proprietary truss implant platform. One of the features of 4WEB's truss implant technology is that it produces strains in the bone tissue it is in contact with to promote bone growth and thus the implant is an interbody structure actively participating in the healing process.

19. As a leading innovator in spinal implant technology, 4WEB developed the first spinal implant manufactured with 3D printing technology that, in 2011, received 510K premarket notification clearance for commercial sale by the U.S. Food and Drug Administration.

20. 4WEB has since 2008 been actively developing truss implant designs for tumor, trauma, and patient-specific applications. 4WEB's truss implant technology pioneered the use of novel web geometries that can be used as a building block to create high-strength, lightweight truss implant structures. Moreover, 4WEB discovered that a truss structure could be optimized by design, selecting one or more of the density of struts in the implant, the length of the struts, and the cross sectional dimension of the struts (e.g., diameter), so that when implanted and under strain the truss structures in contact with the bone generates a microstrain in adhered osteoblasts, bone matrix, or lamellar tissue to obtain therein an osteogenic response (also referred to in 4WEB's patents as an "osteogenetic" response, *see*, e.g., the '845 patent at Column 14, lines 4-11). This in turn stimulates bone growth into and within the bone contacting surfaces of the implant and, as a result of using 4WEB's innovative truss technology, achieves improved bone implant fusion.

21. The 4WEB spine product portfolio currently includes the Cervical Spine Truss System™, the Stand Alone Cervical Spine Truss System™, the Anterior Spine Truss System™, the Stand Alone Anterior Spine Truss System™, the Posterior Spine Truss System™, the Lateral Spine Truss System™, and the Lumbar Spine Plating Solution.

22. Beginning in 2008, 4WEB and its scientists filed for and obtained patents on many innovations relating to spinal and other bone-contacting implants. The following 4WEB patents are asserted in this action.

**U.S. Patent No. 8,430,930**

23. 4WEB owns by assignment all right, title and interest in U.S. Patent No. 8,430,930 (the “‘930 patent”), entitled Truss Implant, and holds the right to sue and recover damages for infringement thereof, including for past infringement. The ‘930 patent duly and lawfully issued on April 30, 2013, with Jessee Hunt as the sole named inventor. The ‘930 patent issued from U.S. application No. 12/640,825, which was filed on December 17, 2009 and on its face claims priority to a provisional application No. 61/138,707 filed on December 18, 2008. A true and correct copy of the ‘930 patent is attached hereto as Exhibit A and made a part hereof.

**U.S. Patent No. 9,999,516**

24. 4WEB owns by assignment all right, title and interest in U.S. Patent No. 9,999,516 (the “‘516 patent”), entitled Implant Device Having a Non-Planar Surface, and holds the right to sue and recover damages for infringement thereof, including for past infringement. The ‘516 patent duly and lawfully issued on June 18, 2018, with Jessee Hunt as the sole named inventor. The ‘516 patent issued from U.S. application No. 14/743,555, which was filed on June 18, 2015 and on its face claims priority as a continuation of application No. 12/960,092 filed on December 3, 2010, which is a continuation of application No. 12/640,825 filed on December 17, 2009, and which claims priority to a provisional application No. 61/138,707 filed on December 18, 2008. A true and correct copy of the ‘516 patent is attached hereto as Exhibit B and made a part hereof.

**U.S. Patent No. 9,545,317**

25. 4WEB owns by assignment all right, title and interest in U.S. Patent No. 9,545,317 (the “‘317 patent”), entitled Implant Interface System And Device, and holds the right to sue and recover damages for infringement thereof, including for past infringement. The ‘317 patent duly and lawfully issued on January 17, 2017, with Jessee Hunt as the sole named inventor. The ‘317

patent issued from U.S. application No. 14/743,579, which was filed on June 18, 2015 and on its face claims priority as a continuation of application No. 12/960,092 filed on December 3, 2010, which is a continuation of application No. 12/640,825 filed on December 17, 2009, and which claims priority to a provisional application No. 61/138,707 filed on December 18, 2008. A true and correct copy of the '317 patent is attached hereto as Exhibit C and made a part hereof.

**U.S. Patent No. 11,278,421**

26. 4WEB owns by assignment all right, title and interest in U.S. Patent No. 11,278,421 (the "'421 patent"), entitled Implant Device Having Curved or Arced Struts, and holds the right to sue and recover damages for infringement thereof, including for past infringement. The '421 patent duly and lawfully issued on March 22, 2022, with Jessee Hunt as the sole named inventor. The '421 patent issued from U.S. application No. 14/743,607, which was filed on June 18, 2015 and on its face claims priority as a continuation of application No. 12/960,092 filed on December 3, 2010, which is a continuation of application No. 12/640,825 filed on December 17, 2009, and which claims priority to a provisional application No. 61/138,707 filed on December 18, 2008. A true and correct copy of the '421 patent is attached hereto as Exhibit D and made a part hereof.

**U.S. Patent No. 9,271,845**

27. 4WEB owns by assignment all right, title and interest in U.S. Patent No. 9,271,845 (the "'845 patent"), entitled Programmable Implants And Methods Of Using Programmable Implants To Repair Bone Structures, and holds the right to sue and recover damages for infringement thereof, including for past infringement. The '845 patent duly and lawfully issued on March 1, 2016, with Jessee Hunt as the sole named inventor. The '845 patent issued from U.S. application No. 14/036,974, which was filed on September 25, 2013 and on its face claims priority to provisional application No. 61/705,403 filed on September 25, 2012 and provisional application



No. 61/801,597 filed on March 15, 2013. A true and correct copy of the '845 patent is attached hereto as Exhibit E and made a part hereof.

**U.S. Patent No. 9,549,823**

28. 4WEB owns by assignment all right, title and interest in U.S. Patent No. 9,549,823 (the "'823 patent"), entitled Programmable Implant Having Curved or Arced Struts, and holds the right to sue and recover damages for infringement thereof, including for past infringement. The '823 patent duly and lawfully issued on January 24, 2017, with Jessee Hunt as the sole named inventor. The '823 patent issued from U.S. application No. 15/057,190, which was filed on March 1, 2016 and on its face claims priority to U.S. application 14/036,974 filed on September 25, 2013, and to provisional applications No. 61/705,403 filed on September 25, 2012 and No. 61/801,597 filed on March 15, 2013. A true and correct copy of the '823 patent is attached hereto as Exhibit F and made a part hereof.

**U.S. Patent No. 9,572,669**

29. 4WEB owns by assignment all right, title and interest in U.S. Patent No. 9,572,669 (the "'669 patent"), entitled Programmable Implant Having An Angled Exterior Surface, and holds the right to sue and recover damages for infringement thereof, including for past infringement. The '669 patent duly and lawfully issued on February 21, 2017, with Jessee Hunt as the sole named inventor. The '669 patent issued from U.S. application No. 15/057,192, which was filed on March 1, 2016 and on its face claims priority to U.S. application 14/036,974 filed on September 25, 2013, and to provisional applications No. 61/705,403 filed on September 25, 2012 and No. 61/801,597 filed on March 15, 2013. A true and correct copy of the '669 patent is attached hereto as Exhibit G and made a part hereof.

**U.S. Patent No. 9,757,235**

30. 4WEB owns by assignment all right, title and interest in U.S. Patent No. 9,757,235 (the “‘235 patent”), entitled Spinal Programmable Implant, and holds the right to sue and recover damages for infringement thereof, including for past infringement. The ‘235 patent duly and lawfully issued on September 12, 2017, with Jessee Hunt as the sole named inventor. The ‘235 patent issued from U.S. application No. 15/057,195, which was filed on March 1, 2016 and on its face claims priority to U.S. application 14/036,974 filed on September 25, 2013, and to provisional applications No. 61/705,403 filed on September 25, 2012 and No. 61/801,597 filed on March 15, 2013. A true and correct copy of the ‘235 patent is attached hereto as Exhibit H and made a part hereof.

**U.S. Patent No. 10,849,756**

31. 4WEB owns by assignment all right, title and interest in U.S. Patent No. 10,849,756 (the “‘756 patent”), entitled Programmable Implant, and holds the right to sue and recover damages for infringement thereof, including for past infringement. The ‘756 patent duly and lawfully issued on December 1, 2020, with Jessee Hunt as the sole named inventor. The ‘756 patent issued from U.S. application No. 15/991,272, which was filed on May 29, 2018 and on its face claims priority to U.S. application 15/695,122 filed on September 5, 2017, which is a continuation of U.S. application No. 15/057,195 filed on March 1, 2016, which is a continuation of U.S. application No. 14/036,974 filed on September 25, 2013, and to provisional applications No. 61/705,403 filed on September 25, 2012 and No. 61/801,597 filed on March 15, 2013. A true and correct copy of the ‘756 patent is attached hereto as Exhibit I and made a part hereof.

**U.S. Patent No. 9,987,137**

32. 4WEB owns by assignment all right, title and interest in U.S. Patent No. 9,987,137 (the “‘137 patent”), entitled Programmable Implant Having Curved Or Arced Struts, and holds the right to sue and recover damages for infringement thereof, including for past infringement. The ‘137 patent duly and lawfully issued on June 5, 2018, with Jessee Hunt as the sole named inventor. The ‘137 patent issued from U.S. application No. 15/695,122, which was filed on September 5, 2017, which is a continuation of U.S. application No. 15/057,195 filed on March 1, 2016, which is a continuation of U.S. application No. 14/036,974 filed on September 25, 2013, and which claims priority to provisional applications No. 61/705,403 filed on September 25, 2012 and No. 61/801,597 filed on March 15, 2013. A true and correct copy of the ‘137 patent is attached hereto as Exhibit J and made a part hereof.

**U.S. Patent No. 9,636,226**

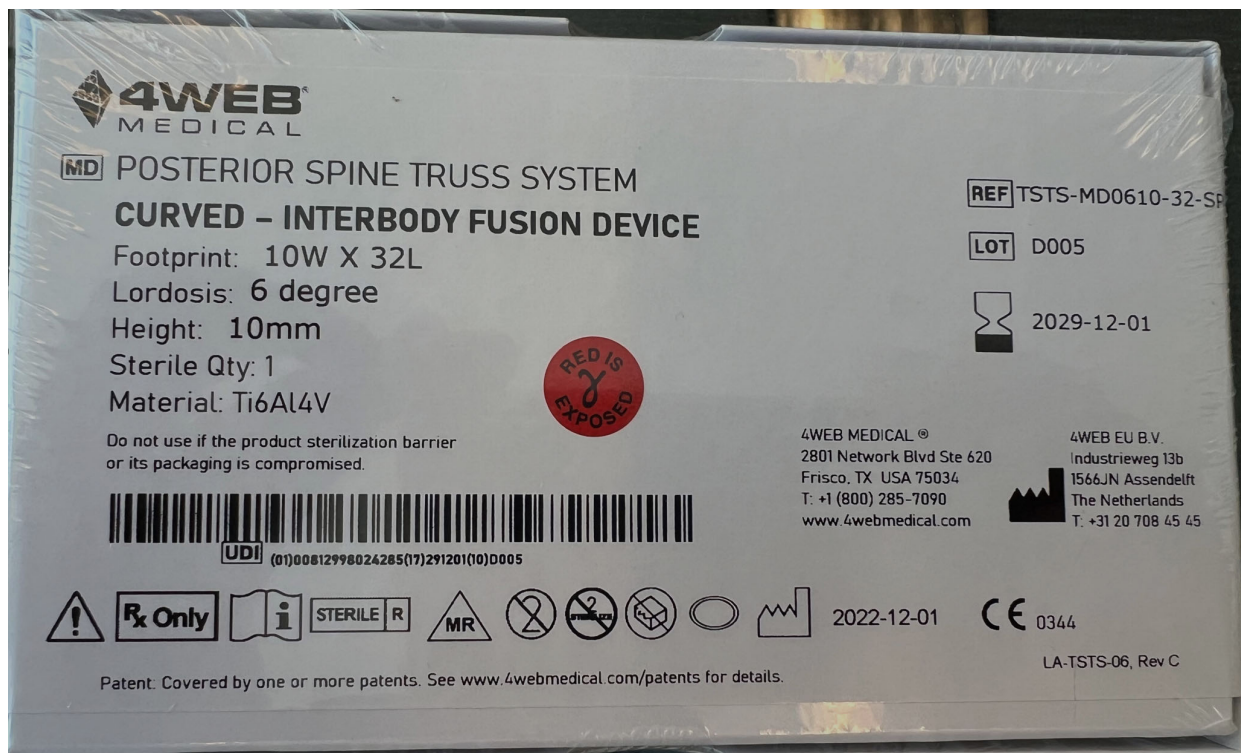
33. 4WEB owns by assignment all right, title and interest in U.S. Patent No. 9,636,226 (the “‘226 patent”), entitled Traumatic Bone Fracture Repair Systems and Methods, and holds the right to sue and recover damages for infringement thereof, including for past infringement. The ‘226 patent duly and lawfully issued on May 2, 2017, with Jessee Hunt as the sole named inventor. The ‘226 patent issued from U.S. application No. 14/215,961, which was filed on March 17, 2014 and on its face claims priority to U.S. provisional application No. 61/801,524 filed on March 15, 2013. A true and correct copy of the ‘226 patent is attached hereto as Exhibit K and made a part hereof.

34. 4WEB has satisfied the patent marking requirements of 35 U.S.C. § 287(a) since first placing its patented products on sale in February 2012. Since 2015, 4WEB affixes to the packaging of its patented implants the language “Patent. Covered by one or more patents. See

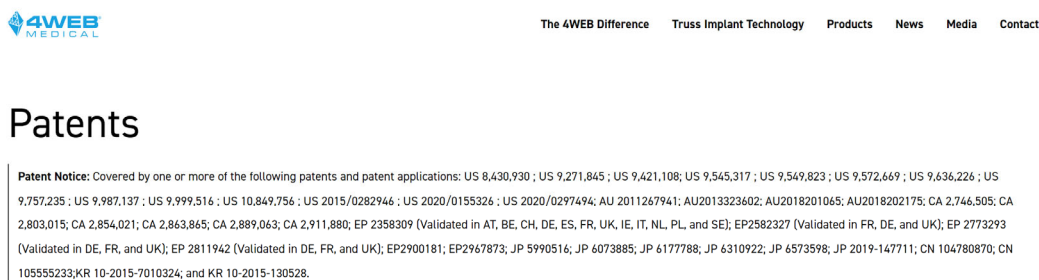
[www.4webmedical.com/patents](http://www.4webmedical.com/patents) for details[,]” as set forth on the following representative products manufactured and offered for sale circa December 1, 2015:



and circa December 1, 2022:



35. The address <https://4webmedical.com/patents/> is accessible to the public without charge for accessing information associating 4WEB’s patented articles with the numbers of the patent(s) covering the products. The publicly accessible patent disclosure as of the filing date of this Complaint is as follows:



4WEB Medical, Patents, <https://4webmedical.com/patents/>, (last visited April 25, 2023).

36. 4WEB has not licensed the Asserted Patents.

37. NuVasive had specific notice of the ‘930 patent, which issued April 30, 2013, as covering the 4WEB implant product and prototypes then in existence, as well as of 4WEB’s then

pending U.S. application Nos. 12/960,092 filed December 3, 2010 (on which U.S. Patent 9,421,108 subsequently issued on August 23, 2016) (the “’092 application”), 14/036,974 filed September 23, 2013 (on which the ’845 patent subsequently issued March 1, 2016) (the “’974 application”), and 14/215,961 filed March 17, 2014 (on which ’226 patent subsequently issued on May 2, 2017) (the “’961 application”), disclosing, describing and claiming 4WEB’s truss implant products, since before 4WEB’s patented products were placed on sale (collectively 4WEB’s “2015 IP Portfolio”).

38. On information and belief, by May 2015, NuVasive was on full notice of 4WEB’s 2015 IP Portfolio as it existed at that time, including the information about the patent and patent applications and their respective patent prosecution histories, which were all then publicly available in the records of the United States Patent and Trademark Office. In this regard, on February 27, 2015, Jessee Hunt, then (and still) 4WEB’s President, and Jim Bruty, then 4WEB’s Vice President of Sales and Marketing, had a lunch meeting with Augustus (“Gusty”) Denis, then NuVasive’s Director of Corporate Development and Strategy, in Dallas, Texas. At that meeting, the three discussed 4WEB’s and NuVasive’s respective visions for advancing spine surgery, and potential partnership opportunities. Following that meeting, on March 3, 2015, Mr. Denis wrote via email to Messrs. Hunt and Bruty that he wanted to “continue our discussion around partnership opportunities and would like to introduce you to some of our Global Marketing & Development leadership” and that his colleague would provide a “mutual NDA” for their review. On March 4, 2015, Mr. Bruty responded that 4WEB was “interested in progressing our discussions with you and the NuVasive leadership team” and proposed setting up a follow-up meeting. In the ensuing weeks, Mr. Denis proposed that Messrs. Hunt and Bruty meet with at least Frank Vizesi (on information and belief then NuVasive’s Director of Research and Development (via LinkedIn),

Eric Dasso (then NuVasive's VP, Global Implants), Pat Miles (then NuVasive's President & COO), and Ryan Donahoe (then NuVasive's Sr. Director of Development and lead Interbody development engineer, and on information and belief currently Vice President, Development). NuVasive and 4WEB also entered into a Mutual Non-Disclosure and Non-Use Agreement (the "NDA") that was executed on May 5, 2015 by 4WEB and May 7, 2015 by NuVasive and made effective as of March 3, 2015. Among other provisions, the NDA provided in Sections 5 and 6:

5. **Patent or Copyright Infringement.** Nothing in this Agreement is intended to grant any rights under any patent or copyright of Disclosing Party, nor shall this Agreement grant Receiving Party any rights in or to the Confidential Information, except the limited right to review such Confidential Information solely for the purpose contemplated by this Agreement.

6. **Term.** The foregoing commitments in this Agreement shall survive for a period of three (3) years after the termination of discussions or any business relationship between the parties.

39. On May 13, 2015, Mr. Denis wrote to Mr. Hunt and proposed a partnership framework including the following:

**Partnership: Big Picture**

Exclusive Partnership for Lateral  
ROFO on License for all of Spine (2Yr Term)  
Supply Agreement – Cost-plus supply of implants  
Labeling: "NuVasive powered by 4Web" – this is just an idea. Worth discussing

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**Exclusive License for Lateral:**

Exclusive License to all IP, Know-how, and assets associated with 4Web's 3D printed truss-design technology for use in lateral interbodies  
Upfront payment + 2 Milestones based on (1) IP issuance and (2) competitive conversion

**ROFO:**

Exclusive license for all IP, Know-how, and assets associated with 4Web's 3D printed truss-design for use in Spine  
Term of ROFO: 2 Yrs

**Supply Agreement:**

4Web will be NUVA's exclusive OEM supplier of 3D printed 4Web based designs  
Consideration: Cost-plus – to be negotiated  
Term: 2 Years, with renewable term based on mutual agreement  
Parties agree to negotiate in good faith as early as 90 days prior to end of first term – based on prevailing commercial terms

40. In the May 13, 2015 email, Mr. Denis acknowledged that NuVasive had already conducted what due diligence it could on 4WEB's 2015 IP Portfolio to the extent that it was publicly available, and thus had knowledge of the '930 patent and the '092, '974, and '961 applications included in the 2015 IP Portfolio and their relevance to 4WEB's patented truss

structure implant technology. In this regard, on May 13, 2015, Mr. Denis also proposed as a next step:

**Next Steps:**

- Due Diligence with a focus on IP and clinical assessment
  - Our major questions here are regarding (1) freedom to operate and anticipated allowable claims. Our IP team has done as much as they can in a vacuum but would definitely benefit from your/your IP firms input. Now that we have the NDA executed, I hope this will not be a problem

41. Ultimately, 4WEB and NuVasive could not agree on a valuation for a business arrangement including transfer in whole or in part of 4WEB's 2015 IP Portfolio from 4WEB to NuVasive, whether by sale or license or an option for a future transfer, and, on information and belief, discussions between 4WEB and NuVasive regarding a potential partnership or business relationship in any form terminated by August 29, 2015. On information and belief, as a result of the termination of discussions, 4WEB's and NuVasive's respective obligations under the NDA terminated on or about August 29, 2018.

42. On information and belief, as of the date discussions terminated, NuVasive was aware of 4WEB's then existing 2015 IP Portfolio and had neither a commercial product nor a product in development based on a 3D printed, titanium spinal implant having a strut or truss-like structure between the endplates facing adjacent vertebrae.

43. On information and belief, NuVasive confirmed having knowledge of 4WEB's '930 patent and '961 and '974 applications by April 30, 2019 because the '930 patent, U.S. Pat. Publ. No. 20140121776A1 (which published on the '974 application and on which the '845 patent subsequently issued) and U.S. Pat. Pub. No. 2014/0288649 (which published on the '961 application and on which the '226 patent subsequently issued) were disclosed by a NuVasive representative, Jia Zhong, Ph.D., Registration Number 71,826, during the prosecution of NuVasive's US Patent No. 10,675,158, in an information disclosure statement filed by Zhong on April 30, 2019.



### **NuVasive's Infringing Modulus Products**

44. NuVasive competes with 4WEB in the spinal implant market, more specifically in the cervical and lumbar interbody fusion device (IFD) space. Prior to 4WEB meeting with NuVasive's business development personnel, engineers, and executives, NuVasive's IFD portfolio included structural designs commonly associated with legacy implants having an annular / ring shape defined by solid walls. These structures limited the performance of the implants to being static spacers. They did not actively participate in the healing process. The newer infringing Modulus implants (as defined and discussed below) include an optimized lattice / truss design that behaves, under load, in a manner that significantly undermines the proprietary nature of 4WEB's intellectual property. The structural mechanics of the Modulus implant have been incorporated into Cervical, Anterior Lumbar, Lateral Lumbar and Posterior Lumbar IFD's. All these implant types directly compete with products that 4WEB markets to end users that are shared by both companies.

45. NuVasive presents itself as "a global medical technology company focused on developing, manufacturing, selling and providing procedural solutions for spine surgery, with a guiding purpose to transform surgery, advance care and change lives. We offer a comprehensive portfolio of procedurally integrated spine surgery solutions, including surgical access instruments, spinal implants, fixation systems, biologics, and enabling technologies, as well as systems and services for intraoperative neuromonitoring. In addition, we develop and sell magnetically adjustable implant systems for spine and specialized orthopedic procedures. For the year ended December 31, 2022, we generated net sales of \$1.2 billion, including sales in more than 50 countries. Since our incorporation in 1997, we have grown from a small developer of specialty spinal implants into a leading medical technology company delivering procedurally integrated

solutions for spine surgery.” Form 10-K Annual Report of NuVasive, Inc. Pursuant to Section 13 or 15(D) of the Securities Exchange Act of 1934 for the fiscal year ended December 31, 2022, <https://ir.nuvasive.com/static-files/b63edd75-760e-4d6a-8224-395fda938f5d> (“2022 Annual Report”) at page 5/141.

46. According to its 2022 Annual Report, NuVasive states that: “Underlying our procedurally integrated solutions for spine surgery are innovative technologies designed to enable better clinical, financial, and operational outcomes, including: ... • our Advanced Materials Science portfolio of specialized spinal implants, designed to advance spinal fusion by enhancing the osseointegration and biomechanical properties of implant materials, including porous titanium and porous polyetheretherketone, or PEEK; ....” *Id.*

47. NuVasive further states that: “Our Advanced Materials Science portfolio of implants, designed to improve spinal fusion by enhancing the osseointegration and biomechanical properties of implant materials, includes our Modulus porous titanium implants and Cohere and Coalesce porous PEEK implants. Our implants are designed for insertion into the smallest possible space while maximizing surface area contact for fusion.” *Id.* at 13/141.

48. NuVasive acknowledged in its 2022 Annual Report that it faced certain “Risks Related to Litigation and Intellectual Property • Defending against litigation or other proceedings or third-party claims of intellectual property infringement could require us to spend significant time and money, and if we are unsuccessful, we may be obligated to pay damages and halt sales of our products.” *Id.* at 24/141. On information and belief, this stated risk factor arose at least in part out of NuVasive’s knowledge of 4WEB’s IP portfolio and the Asserted Patents.

49. NuVasive also acknowledged in its 2022 Annual Report a risk factor that “Many of our competitors have greater resources than we have ... including ... • more expansive portfolios

of intellectual property rights....” On information and belief, this stated risk factor arose at least in part out of NuVasive’s knowledge of 4WEB’s 2015 IP Portfolio and the Asserted Patents, including the 4WEB ‘930 patent and two patent application publications that later issued as the ‘845 and ‘226 patents, which NuVasive had cited to the U.S. Patent and Trademark Office as prior art to a NuVasive patent application.

50. NuVasive stated in its 2022 Annual Report that “[t]he majority of our net sales are derived from the sale of implants and fixation products, biologics, disposables and IONM services, and we expect this trend to continue for the foreseeable future. Our implants and fixation products, biologics, and disposables are currently sold and shipped from our distribution and warehousing operations. .... We make available surgical instrument sets and neuromonitoring systems to hospitals to facilitate surgeon access to the spine to perform restorative and fusion procedures using our implants and fixation products.” *Id.* at 64/141. On information and belief, sales of the Accused Products (described below) by NuVasive implicate the sales of certain goods associated with the sale and use of the Accused Products which reflects harm to 4WEB arising from the infringement.

51. NuVasive currently offers for sale and sells, and on information and belief designed and manufactures, a series of spinal implant products identified as Modulus ALIF, Modulus Cervical (or Modulus-C), Modulus XLIF, Modulus TLIF-0, and Modulus TLIF-A (collectively the “Modulus implants” or the “Accused Products”). Representative images of several Modulus implants are set forth below:

MODULUS ALIF



View the Modulus ALIF animation

MODULUS CERVICAL



View the Modulus Cervical animation

MODULUS XLIF



View the Modulus XLIF animation

MODULUS TLIF-0



View the Modulus TLIF-0 animation

MODULUS TLIF-A



View the Modulus TLIF-A animation

NuVasive, Inc., Modulus® Titanium Technology, <https://www.nuvasive.com/surgical-solutions/advanced-materials-science/modulus-titanium-technology/> (last visited April 22, 2023).

At the foregoing link, NuVasive provides links to animations of the Modulus implants and Accused Products pictured above, as follows:

- for the Modulus ALIF implant: NuVasiveInc, *Modulus ALIF animation*, YouTube, [https://www.youtube.com/watch?v=Qke8p\\_cDdSw](https://www.youtube.com/watch?v=Qke8p_cDdSw);
- for the Modulus Cervical implant: NuVasiveInc, *Modulus Cervical Procedural Animation*, YouTube, [https://www.youtube.com/watch?v=iH\\_ydvpbl-8](https://www.youtube.com/watch?v=iH_ydvpbl-8);
- for the Modulus XLIF implant: NuVasiveInc, *NuVasive Modulus® Animation*, YouTube, <https://www.youtube.com/watch?v=4XssrijPobI>;

- for the Modulus TLIF-O: NuVasiveInc, *Modulus TLIF-O Procedural Animation*, YouTube, <https://www.youtube.com/watch?v=qzN3f0eErWI>; and
- for the Modulus TLIF-A: NuVasiveInc, *Modulus TLIF-A Procedural Animation*, YouTube, <https://www.youtube.com/watch?v=z1-FaAPLsXw>.

52. NuVasive describes its Modulus implants as follows: “The market disrupting design and manufacturing process of Modulus integrates endplate porosity with an optimized body lattice structure, providing a fully porous architecture and favorable environment for osseointegration – bone on-growth and in-growth – while enhancing visualization compared to traditional titanium interbody implants in a variety of imaging modalities. Modulus is available in a number of sizes and lordotic options for ALIF, XLIF, TLIF and Cervical.” NuVasive, Inc., *Changing Architecture. Changing Outcomes*, <https://www.nuvasive.com/surgical-solutions/advanced-materials-science/> (last visited April 8, 2023).

53. NuVasive represents that its Modulus products are a “3D printed titanium implant” that have a “porous surface designed to participate in fusion” and a “porosity [that] elicits a significantly stronger osteogenic response at the cellular level compared to roughened or nano-roughened surfaces on their own. Fully porous endplate design promotes new bone on-growth and in-growth,” and a “microporous endplate architecture [that] maximized bone-to-implant contact, increasing expulsion resistance.” NuVasive, Inc., *Modulus® Titanium Technology*, <https://www.nuvasive.com/surgical-solutions/advanced-materials-science/modulus-titanium-technology/> (last visited April 8, 2023) (emphasis and footnotes omitted).

54. NuVasive describes its Modulus Interbody System as including the Modulus XLIF Interbody System, the Modulus TLIF Interbody System, and the Modulus-C Interbody System, and describes them and their indications for use as follows<sup>1</sup>:

#### DESCRIPTION

The NuVasive Modulus Interbody System interbody implants and Modulus XLIF internal fixation plates and bone screws are manufactured from Ti-6Al-4V ELI conforming to ASTM F3001, ASTM F136 and ISO 5832-3. The fixation plate also includes components manufactured from nickel-cobalt-chromium-molybdenum alloy (Carpenter MP35N alloy) per ASTM F562. The implants are available in a variety of different shapes and sizes to suit the individual pathology and anatomical conditions of the patient.

#### INDICATIONS FOR USE

##### MODULUS XLIF INTERBODY SYSTEM

The NuVasive Modulus XLIF Interbody System is indicated for intervertebral body fusion of the spine in skeletally mature patients. The System is designed for use with autogenous bone graft, allogeneic bone graft comprised of cancellous and/or corticocancellous bone graft, or a bone void filler as cleared by FDA for use in intervertebral body fusion to facilitate fusion. When used with or without Modulus XLIF internal fixation, the system is intended for use with supplemental spinal fixation systems cleared by the FDA for use in the thoracolumbar spine. The devices are to be used in patients who have had at least six months of non-operative treatment. The NuVasive Modulus XLIF Interbody System is intended for use in interbody fusions in the thoracolumbar spine from T1 to T12 and at the thoracolumbar junction (T12-L1), and for use in the lumbar spine from L1 to S1, for the treatment of symptomatic disc degeneration (DDD), degenerative spondylolisthesis, and/or spinal stenosis at one or two adjacent levels, including thoracic disc herniation (with myelopathy and/or radiculopathy with or without axial pain). DDD is defined as back pain of discogenic origin with degeneration of the disc confirmed by history and radiographic studies. The NuVasive Modulus XLIF Interbody System can also be used as an adjunct to fusion in patients diagnosed with multilevel degenerative scoliosis and sagittal deformity.

##### MODULUS TLIF INTERBODY SYSTEM

The NuVasive Modulus TLIF Interbody System is indicated for intervertebral body fusion of the spine in skeletally mature patients. The System is designed for use with autogenous

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<sup>1</sup> The text quoted was cut and pasted from the webpage found at the link referenced, and thus may appear differently than it appears on the webpage as viewed in a browser.

bone graft, allogeneic bone graft comprised of cancellous and/or corticocancellous bone graft, or a bone void filler as cleared by FDA for use in intervertebral body fusion to facilitate fusion and supplemental internal spinal fixation systems cleared by the FDA for use in the thoracolumbar spine. The devices are to be used in patients who have had at least six months of non-operative treatment. The NuVasive Modulus TLIF Interbody System is intended for use in interbody fusions in the thoracolumbar spine from T1 to T12 and at the thoracolumbar junction (T12-L1), and for use in the lumbar spine from L1 to S1, for the treatment of symptomatic disc degeneration (DDD), degenerative spondylolisthesis, and/or spinal stenosis at one or two adjacent levels, including thoracic disc herniation (with myelopathy and/or radiculopathy with or without axial pain). DDD is defined as back pain of discogenic origin with degeneration of the disc confirmed by history and radiographic studies. The NuVasive Modulus TLIF Interbody System can also be used as an adjunct to fusion in patients diagnosed with multilevel degenerative scoliosis and sagittal deformity.

#### MODULUS-C INTERBODY SYSTEM

The NuVasive Modulus-C Interbody System is indicated for intervertebral body fusion of the spine in skeletally mature patients. The Modulus-C Interbody System is intended for use for anterior cervical interbody fusion in patients with cervical disc degeneration and/or cervical spinal instability, as confirmed by imaging studies (radiographs, CT, MRI), that results in radiculopathy, myelopathy, and/or pain at multiple contiguous levels from C2 – T1. The System is intended to be used with supplemental fixation. The System is designed for use with autogenous and/or allogeneic bone graft comprised of cancellous, cortical and/or corticocancellous bone graft to facilitate fusion.

NuVasive® Modulus® Interbody System Intervertebral Body Fusion Device Instructions For Use,

<https://atlasapi.nuvasive.com/public/ifu/documents/retrieve?get&pVersion=0046&contRep=ZN>

[UVEP1&docId=0050568619A61EDCBC9808369E3F2148&compId=9402506-](https://atlasapi.nuvasive.com/public/ifu/documents/retrieve?get&pVersion=0046&contRep=ZN&docId=0050568619A61EDCBC9808369E3F2148&compId=9402506-)

[EN%20IFU%20Rev%20H%20Final%20Copy%20-](https://atlasapi.nuvasive.com/public/ifu/documents/retrieve?get&pVersion=0046&contRep=ZN&docId=0050568619A61EDCBC9808369E3F2148&compId=9402506-)

[%20Modulus%20Interbody%20System%20IFU.pdf](https://atlasapi.nuvasive.com/public/ifu/documents/retrieve?get&pVersion=0046&contRep=ZN&docId=0050568619A61EDCBC9808369E3F2148&compId=9402506-) (last visited April 8, 2023).

55. NuVasive describes its Modulus ALIF System and indications for use as follows<sup>2</sup>:

#### DESCRIPTION

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<sup>2</sup> The text quoted was cut and pasted from the webpage found at the link referenced, and thus may appear differently than it appears on the webpage as viewed in a browser.

The NuVasive Modulus ALIF System interbody implants and bone screws are manufactured from Ti-6Al-4V ELI conforming to ASTM F3001, ASTM F136 and ISO 5832-3. The implants are available in a variety of different shapes and sizes to suit the individual pathology and anatomical conditions of the patient. The Modulus ALIF System 10° - 20° lordotic cages may be used as a standalone system. The Modulus ALIF System 25° - 30° lordotic cages must be used with supplemental internal spinal fixations systems (e.g., posterior pedicle screw and rod system) that are cleared by the FDA for use in the lumbar spine.

#### INDICATIONS FOR USE

The NuVasive Modulus ALIF System is indicated for spinal fusion procedures in skeletally mature patients. The Modulus ALIF System 10° - 20° lordotic cages may be used as a standalone system. The Modulus ALIF System 25° - 30° lordotic cages must be used with supplemental internal spinal fixation systems (e.g., posterior pedicle screw and rod system) that are cleared by the FDA for use in the lumbar spine. The System is designed for use with autogenous bone graft, allogeneic bone graft comprised of cancellous and/or corticocancellous bone graft, or a bone void filler as cleared by FDA for use in intervertebral body fusion to facilitate fusion. The devices are to be used in patients who have had at least six months of non-operative treatment. The NuVasive Modulus ALIF System is intended for use in interbody fusions in the lumbar spine from L2 to S1, following discectomy in the treatment of symptomatic degenerative disc disease (DDD), degenerative spondylolisthesis, and/or spinal stenosis at one or two adjacent levels. DDD is defined as back pain of discogenic origin with degeneration of the disc confirmed by history and radiographic studies. The Modulus ALIF System implants can also be used as an adjunct to fusion in patients diagnosed with multilevel degenerative scoliosis and sagittal deformity; however, when used in these patients at multiple levels and for patients with degenerative spondylolistheses and spinal stenosis at one or two adjacent levels, the Modulus ALIF System must be used with a supplemental internal spinal fixation system (e.g., pedicle screw system) cleared by FDA for use in the lumbar spine in addition to the integrated screws.

NuVasive® Modulus ALIF System Intervertebral Body Fusion Device Instructions For Use,

<https://atlasapi.nuvasive.com/public/ifu/documents/retrieve?get&pVersion=0046&contRep=ZN>

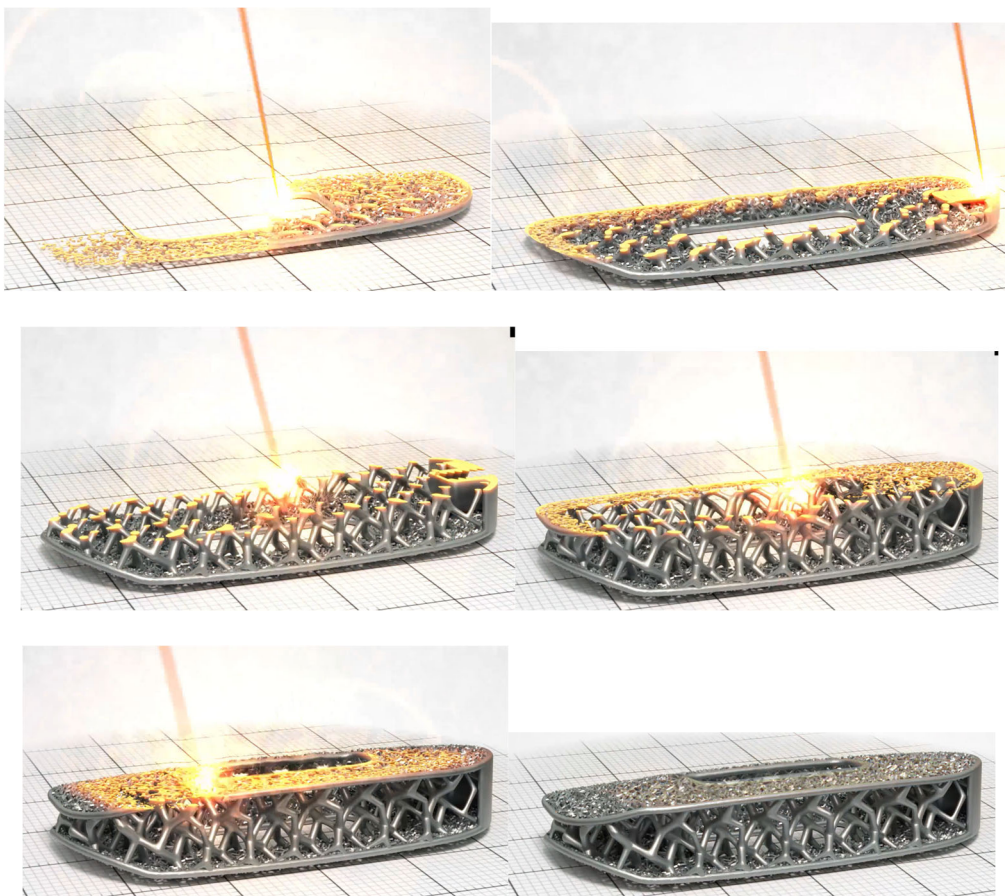
[UVEP1&docId=0050568619A61EDCBC980BE944E48148&compId=9400085-](https://atlasapi.nuvasive.com/public/ifu/documents/retrieve?get&pVersion=0046&contRep=ZN&docId=0050568619A61EDCBC980BE944E48148&compId=9400085-)

[EN%20IFU%20Rev%20G%20Final%20Copy%20-](https://atlasapi.nuvasive.com/public/ifu/documents/retrieve?get&pVersion=0046&contRep=ZN&docId=0050568619A61EDCBC980BE944E48148&compId=9400085-EN%20IFU%20Rev%20G%20Final%20Copy%20-)

[%20Modulus%20ALIF%20System%20IFU.pdf](https://atlasapi.nuvasive.com/public/ifu/documents/retrieve?get&pVersion=0046&contRep=ZN&docId=0050568619A61EDCBC980BE944E48148&compId=9400085-%20Modulus%20ALIF%20System%20IFU.pdf) (last visited April 8, 2023).

56. NuVasive represents that its Modulus implant products are manufactured using a 3D printing technology, as can be seen from the following screen shots taken from a video NuVasive has made publicly available:





See NuVasiveInc, *NuVasive Modulus® Animation*, YouTube, <https://www.youtube.com/watch?v=4XssrijPobl>; at t=0:59 to 1:06.

57. On information and belief, NuVasive has manufactured and sold, and continues to make and/or sell, and presently intends to make and/or sell, in the United States, the Modulus implants, including sales to persons with instructions for surgically implanting the Modulus implants in humans.

### **COUNT ONE**

#### **(Infringement of the '930 Patent)**

58. Plaintiff 4WEB repeats and realleges as if fully set forth herein the allegations contained in all the preceding paragraphs ¶¶ 1 - 57.

59. The '930 patent is valid and enforceable.

60. NuVasive's actions, as set forth herein, constitute patent infringement of the '930 patent under 35 U.S.C. § 271. More specifically, as set forth herein, NuVasive has infringed and continues to infringe one or more claims, including at least claims 1-10 and 18 of the '930 patent under 35 U.S.C. § 271 by manufacturing, using, providing, selling, offering to sell, importing and/or distributing without authority the Modulus implants, and by inducing surgeons to implant Modulus implants into humans, such infringement occurring literally or by application of the doctrine of equivalents.

61. By way of example, the Modulus implants have common construction features that comprise "an implant" for insertion between adjacent vertebrae having "an implant body comprising one or more contact faces configured to be disposed at or near a bony structure; and a truss structure coupled to at least one of the contact faces, wherein the truss structure is configured to be disposed adjacent the bony structure during use, wherein the truss structure comprises two or more struts extending from the contact face, away from an interior of the implant defined, in part by one or more of the contact faces, and wherein two or more of the struts define an opening configured to enable bone through growth through the opening" as required by claims 1 and 18 of the '930 patent.

62. By way of further example, NuVasive's Modulus XLIF implant meets each and every limitation of claim 1 of the '930 patent as shown in the chart below comparing claim 1 (with annotations added in brackets) to two screen shots taken from the aforementioned Modulus XLIF product animation (at t=0:01:07 and t=0:01:12, respectively):

NuVasive's Modulus XLIF – '930 patent claim 1

Claim 1:

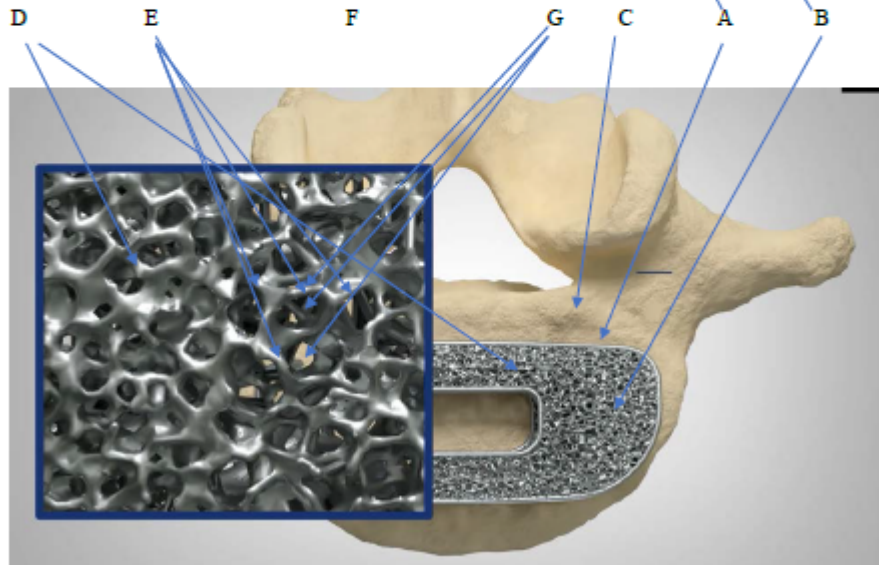
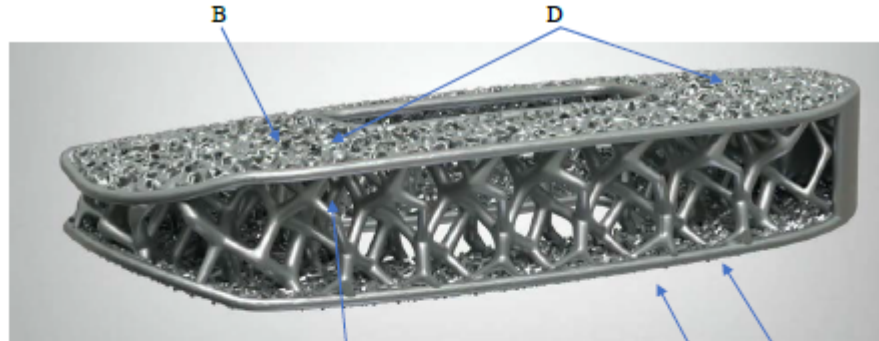
An implant comprising:

an implant body [A] comprising one or more contact faces [B] configured to be disposed at or near a bony structure [C]; and

a truss structure [D] coupled to at least one of the contact faces [B], wherein the truss structure [D] is configured to be disposed adjacent the bony structure [C] during use,

wherein the truss structure [D] comprises two or more struts [E] extending from the contact face, away from an interior [F] of the implant defined, in part by one or more of the contact faces [B], and

wherein two or more of the struts [E] define an opening [G] configured to enable bone through growth through the opening.



63. NuVasive has had actual knowledge of the '930 patent since May 2015 and that its use thereof has been unauthorized, and on information and belief has used, offered for sale and sold the Modulus implants in the United States including this District with the knowledge that the Modulus implants infringed at least claims 1-10 and 18 of the '930 patent, and with the specific intent that surgeons would use the Modulus implants in surgical procedures, thereby indirectly infringing at least claim 18 of the '930 patent. NuVasive provides surgeons with Modulus implants having indications for use and with instructions, tools, and assistance for surgically inserting Modulus implants adjacent bony structures in humans as discussed above. In any event, NuVasive has had notice of its infringement of the '930 patent as of the filing date of this complaint.

64. As outlined above, under the totality of the circumstances, NuVasive's infringement of the '930 patent is willful from at least the date after NuVasive first learned of 4WEB's 2015 IP Portfolio and the dates NuVasive commenced commercial sale in the United States of each of its respective Modulus implants.

65. On information and belief, NuVasive has gained profits and market share by virtue of its infringement of the '930 patent.

66. 4WEB has sustained damages as a direct and proximate result of NuVasive's infringement of the '930 patent.

67. 4WEB is entitled to recover at least a reasonable royalty, and its lost profits, enhanced damages, costs and expenses and attorney fees, and all other relief allowed under the Patent Act.

68. 4WEB will suffer and is suffering irreparable harm from NuVasive's infringement of the '930 patent. 4WEB has no adequate remedy at law and is entitled to an injunction against

NuVasive's continuing infringement of the '930 patent. Unless enjoined, preliminarily and permanently, NuVasive will continue its infringing conduct.

## **COUNT TWO**

### **(Infringement of the '516 Patent)**

69. Plaintiff 4WEB repeats and realleges as if fully set forth herein the allegations contained in all the preceding paragraphs ¶¶ 1 - 68.

70. The '516 patent is valid and enforceable.

71. NuVasive's actions, as set forth herein, constitute patent infringement of the '516 patent under 35 U.S.C. § 271. More specifically, as set forth herein, NuVasive has infringed and continues to infringe one or more claims, including at least claims 1, 4, 6, 8, and 18 of the '516 patent under 35 U.S.C. § 271 by manufacturing, using, providing, selling, offering to sell, importing and/or distributing without authority the Modulus implants, and by inducing surgeons to implant Modulus implants into humans, such infringement occurring literally or by application of the doctrine of equivalents.

72. By way of example, the Modulus implants have common construction features that comprise "an internal web structure" for insertion between separated bone structures such as adjacent vertebrae as required by claims 1 and 18 of the '516 patent. By way of further example, NuVasive's Modulus XLIF implant meets each and every limitation of claim 1 of the '516 patent as shown in the chart below comparing claim 1 (with annotations added in brackets) to a screen shot taken from the aforementioned Modulus XLIF product animation (at t=0:01:07) and a photograph taken (with white triangle annotations added) of a Modulus XLIF product:

NuVasive's Modulus XLIF – '516 patent claim 1

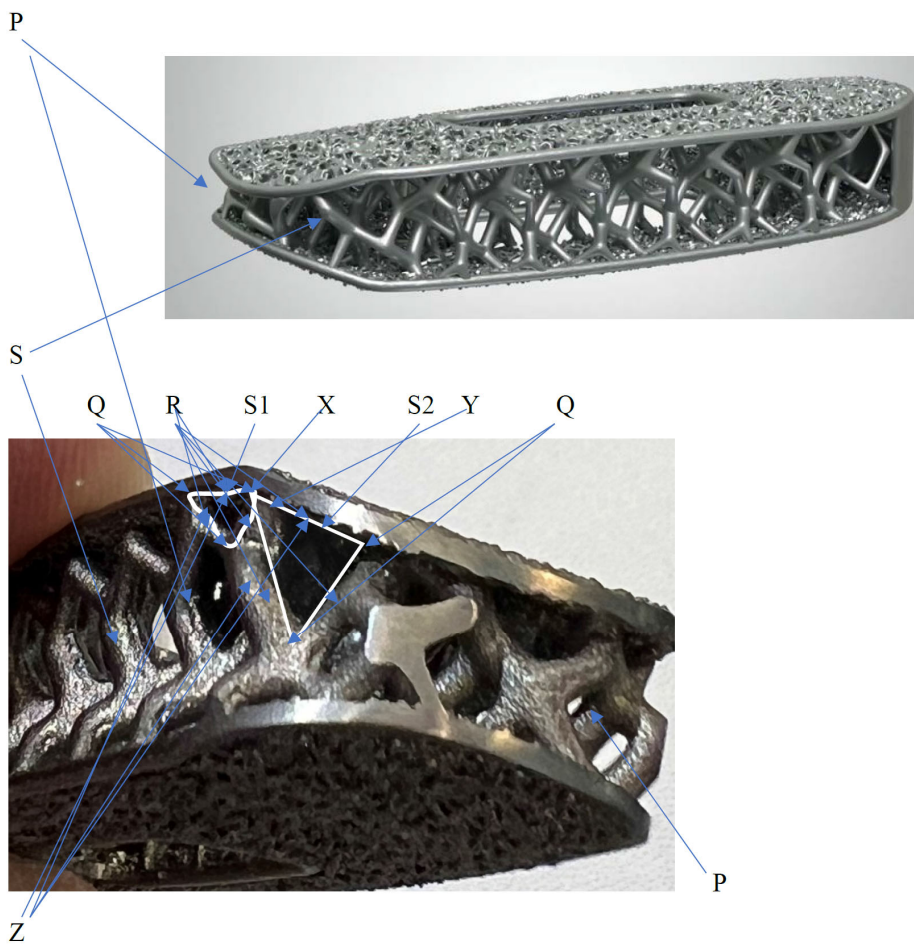
Claim 1:

An implant comprising an internal web structure [P], wherein the internal web structure comprises:

a plurality of planar truss units coupled to each other, the planar truss units [S] comprising a plurality of struts [R] coupled to a plurality of nodes [Q];

wherein one or more angles [X] defined by two struts [R] and a node [Q] of one or more planar truss units [S1] are different than one or more corresponding angles [Y] defined by two struts [R] and a node [Q] of one or more other planar truss units [S2],

wherein connecting exterior surface struts [Z] couple the nodes [Q] of the non-equivalent angle planar truss units [S1, S2] to each other such that the implant has a varied height;



wherein the plurality of planar truss units are coupled to one another such that one or more planar truss units lie in a plane that is not substantially parallel to a plane of a planar truss unit that shares at least one strut with the one or more planar truss units [S1, S2].	
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73. On information and belief, NuVasive has had knowledge of the ‘516 patent at least as of the issue date of the ‘516 patent because since 2015 NuVasive had knowledge of 4WEB’s 2015 IP portfolio from which the ‘516 patent claims priority, and NuVasive routinely monitors patents that are issued in the field of spinal implants. Furthermore, NuVasive has knowledge that its use thereof has been unauthorized, and on information and belief, has used, offered for sale and sold the Modulus implants in the United States including this District with the knowledge that the Modulus implants infringed at least claims 1, 4, 6, 8, and 18 of the ‘516 patent, and with the specific intent that surgeons would use the Modulus implants in surgical procedures, thereby indirectly infringing at least claim 18 of the ‘516 patent. NuVasive provides surgeons with Modulus implants having indications for use and with instructions, tools, and assistance for surgically inserting Modulus implants adjacent bony structures in humans as discussed above. In any event, NuVasive has had notice of its infringement of the ‘516 patent as of the filing date of this complaint.

74. As outlined above, under the totality of the circumstances, NuVasive’s infringement of the ‘516 patent is willful from at least the date after NuVasive first learned of 4WEB’s ‘516 patent and the dates NuVasive commenced commercial sale in the United States of each of its respective Modulus implants.

75. On information and belief, NuVasive has gained profits and market share by virtue of its infringement of the '516 patent.

76. 4WEB has sustained damages as a direct and proximate result of NuVasive's infringement of the '516 patent.

77. 4WEB is entitled to recover at least a reasonable royalty, and its lost profits, enhanced damages, costs and expenses and attorney fees, and all other relief allowed under the Patent Act.

78. 4WEB will suffer and is suffering irreparable harm from NuVasive's infringement of the '516 patent. 4WEB has no adequate remedy at law and is entitled to an injunction against NuVasive's continuing infringement of the '516 patent. Unless enjoined, preliminarily and permanently, NuVasive will continue its infringing conduct.

### **COUNT THREE**

#### **(Infringement of the '317 Patent)**

79. Plaintiff 4WEB repeats and realleges as if fully set forth herein the allegations contained in all the preceding paragraphs ¶¶ 1 -78.

80. The '317 patent is valid and enforceable.

81. NuVasive's actions, as set forth herein, constitute patent infringement of the '317 patent under 35 U.S.C. § 271. More specifically, as set forth herein, NuVasive has infringed and continues to infringe one or more claims, including at least claims 1-22 of the '317 patent under 35 U.S.C. § 271 by manufacturing, using, providing, selling, offering to sell, importing and/or distributing without authority the Modulus implants, and by inducing surgeons to implant Modulus implants into humans, such infringement occurring literally or by application of the doctrine of equivalents.



82. By way of example, the Modulus implants have common construction features that comprise an orthopedic implant having a bone interface structure having a bone interface surface comprising a plurality of struts connected at nodes configured to be disposed at least partially into a bone structure such as between two vertebrae during use as required by claims 1 and 12 of the '317 patent. By way of further example, NuVasive's Modulus XLIF implant meets each and every limitation of claim 1 of the '317 patent as shown in the chart below comparing claim 1 (with annotations added in brackets) to two screen shots taken from the aforementioned Modulus XLIF product animation (at t=0:01:07 and t=0:01:12, respectively):

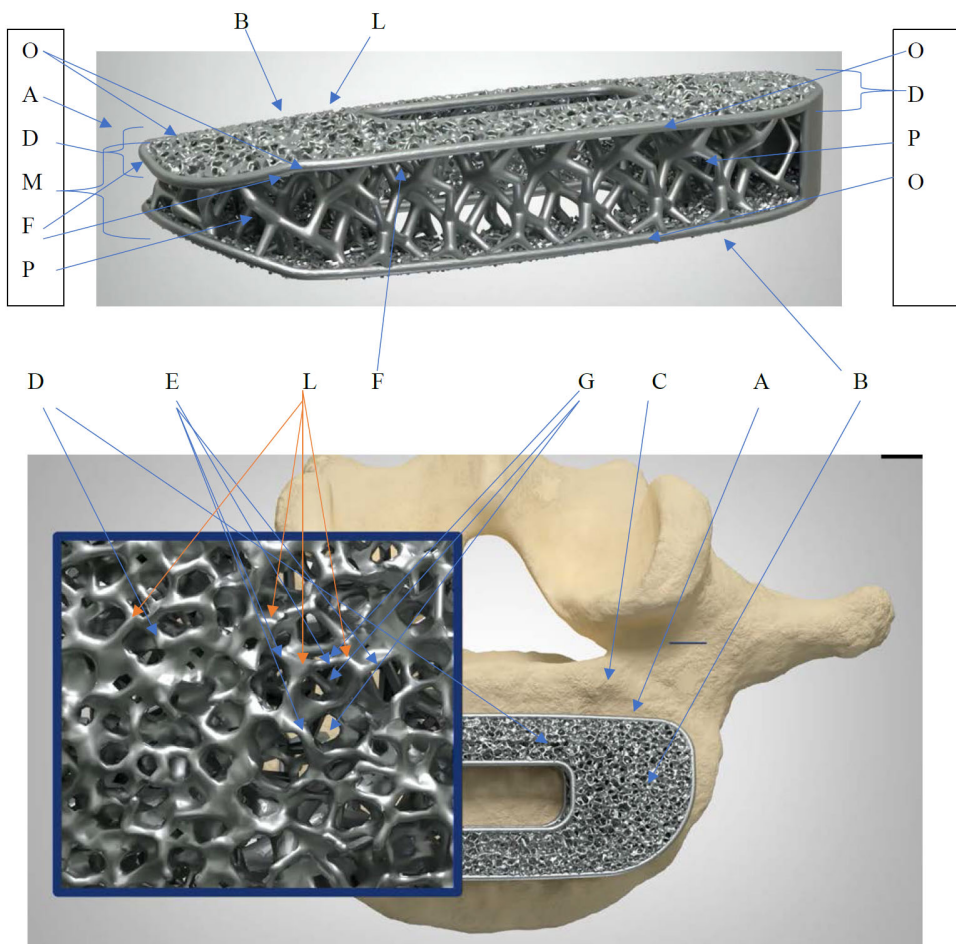
**NuVasive's Modulus XLIF – '317 patent claim 1**

An orthopedic implant, comprising:

an implant body [A] comprising a bone interface surface [B] having a bone interface structure [D] protruding therefrom, wherein the bone interface structure comprises:

a proximal portion [F] of the bone interface structure [D] adjacent the bone interface surface [B],

wherein the proximal portion [F] of the bone interface structure [D] comprises a web structure [M] comprising a plurality of struts [E] connected at nodes [L]; and



<p>a distal portion [B] of the bone interface structure [D] extending from the proximal portion [F] of the bone interface structure [D], wherein the distal portion [B] of the bone interface structure configured to be disposed at least partially into a bone structure [C] during use;</p>	
<p>wherein the web structure [M] comprises an external frame [O] at least partially defining an exterior surface of the web structure; and an internal truss structure [P] at least partially enclosed by the external frame [O], the internal web structure [M] comprising a plurality of space trusses.</p>	

83. On information and belief, NuVasive has had knowledge of the ‘317 patent at least as of the issue date of the ‘317 patent because since 2015 NuVasive had knowledge of 4WEB’s 2015 IP portfolio from which the ‘317 patent claims priority, and NuVasive routinely monitors patents that are issued in the field of spinal implants. Furthermore, NuVasive has knowledge that its use thereof has been unauthorized, and on information and belief has used, offered for sale and sold the Modulus implants in the United States including this District with the knowledge that the Modulus implants infringed at least claims 1-22 of the ‘317 patent, and with the specific intent that

surgeons would use the Modulus implants in surgical procedures, thereby indirectly infringing at least claims 12-22 of the '317 patent. NuVasive provides surgeons with Modulus implants having indications for use and with instructions, tools, and assistance for surgically inserting Modulus implants adjacent bony structures in humans as discussed above. In any event, NuVasive has had notice of its infringement of the '317 patent as of the filing date of this complaint.

84. As outlined above, under the totality of the circumstances, NuVasive's infringement of the '317 patent is willful from at least the date after NuVasive first learned of 4WEB's '317 patent and the dates NuVasive commenced commercial sale in the United States of each of its respective Modulus implants.

85. On information and belief, NuVasive has gained profits and market share by virtue of its infringement of the '317 patent.

86. 4WEB has sustained damages as a direct and proximate result of NuVasive's infringement of the '317 patent.

87. 4WEB is entitled to recover at least a reasonable royalty, and its lost profits, enhanced damages, costs and expenses and attorney fees, and all other relief allowed under the Patent Act.

88. 4WEB will suffer and is suffering irreparable harm from NuVasive's infringement of the '317 patent. 4WEB has no adequate remedy at law and is entitled to an injunction against NuVasive's continuing infringement of the '317 patent. Unless enjoined, preliminarily and permanently, NuVasive will continue its infringing conduct.

#### **COUNT FOUR**

##### **(Infringement of the '421 Patent)**

89. Plaintiff 4WEB repeats and realleges as if fully set forth herein the allegations contained in all the preceding paragraphs ¶¶ 1 - 88.

90. The '421 patent is valid and enforceable.

91. NuVasive's actions, as set forth herein, constitute patent infringement of the '421 patent under 35 U.S.C. § 271. More specifically, as set forth herein, NuVasive has infringed and continues to infringe one or more claims, including at least claims 1-3, 7, 9-12, 14, 15, and 20 of the '421 patent under 35 U.S.C. § 271 by manufacturing, using, providing, selling, offering to sell, importing and/or distributing without authority the Modulus implants, and by inducing surgeons to implant Modulus implants into humans, such infringement occurring literally or by application of the doctrine of equivalents.

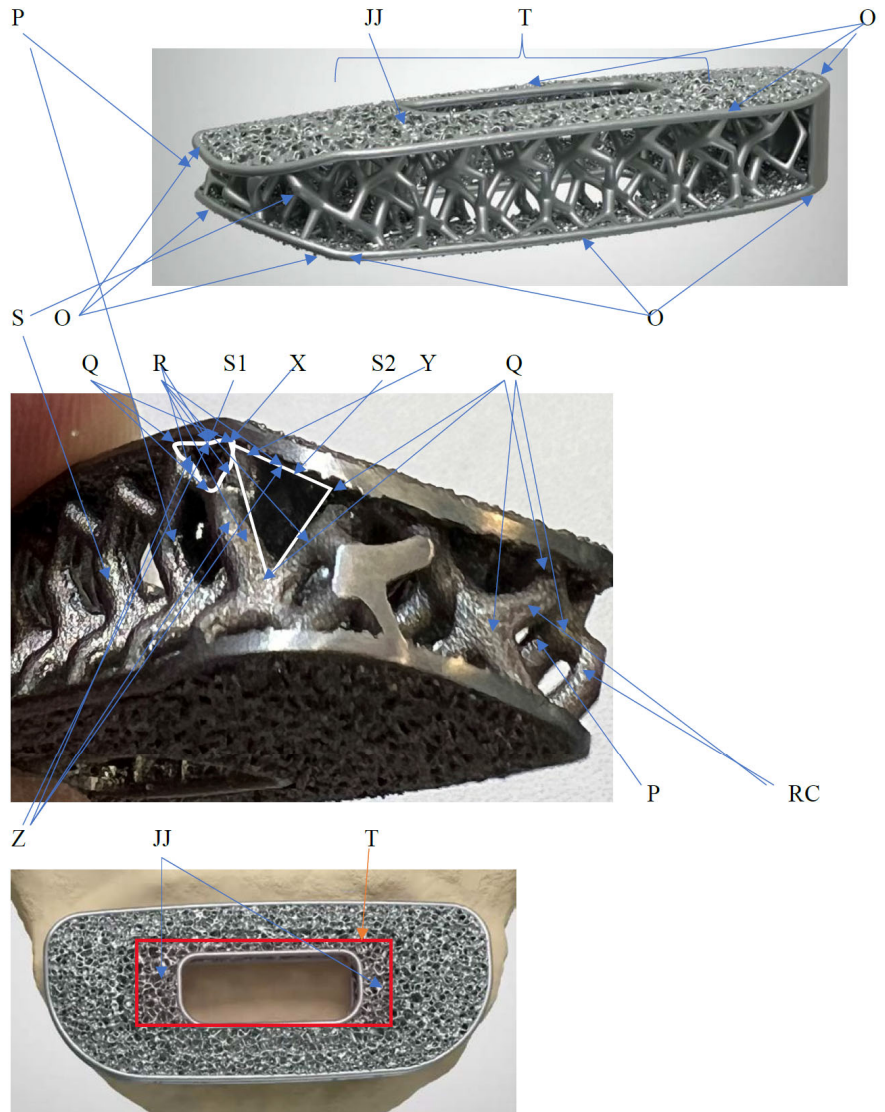
92. By way of example, the Modulus implants have common construction features that comprise "an implant for interfacing with a bone structure" having an external frame and an internal space truss structure at least partially enclosed by the frame, including planar truss units with struts joined at nodes as required by claims 1 and 11 of the '421 patent. By way of further example, NuVasive's Modulus XLIF implant meets each and every limitation of claim 1 of the '421 patent as shown in the chart below comparing claim 1 (with annotations added in brackets) to a screen shot taken from the aforementioned Modulus XLIF product animation (at t=0:01:07), a photograph taken of a Modulus XLIF product (with white triangle annotations added), and a second screen shot taken from the aforementioned Modulus XLIF product animation (at t=0:01:10):

**NuVasive's Modulus XLIF – '421 patent claim 1**

An implant for interfacing with a bone structure, comprising:

an external frame [O] defining an exterior surface of the implant, and

an internal space truss structure [P] at least partially enclosed by the external frame [O] comprising two or more planar truss units [S1, S2] comprising a plurality of struts [R] joined at nodes [Q], wherein at least two nodes [Q] within the internal space truss structure [P] are connected by a strut [RC] that curves or arcs between the at least two nodes [Q], and wherein at least one of the two or more planar truss units lies in a plane that is not substantially parallel to a plane of at least one or more of the other two or more planar truss units [S1, S2];



<p>wherein at least a portion of the internal space truss structure [JJ] extends into a central portion [T] of the implant.</p>	
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93. On information and belief, NuVasive has had knowledge of the ‘421 patent at least as of the issue date of the ‘421 patent because since 2015 NuVasive had knowledge of 4WEB’s 2015 IP portfolio from which the ‘421 patent claims priority, and NuVasive routinely monitors patents that are issued in the field of spinal implants. Furthermore, NuVasive has knowledge that its use thereof has been unauthorized, and on information and belief has used, offered for sale and sold the Modulus implants in the United States including this District with the knowledge that the Modulus implants infringed at least claims 1-3, 7 , 9-12, 14, 15, and 20 of the ‘421 patent, and with the specific intent that surgeons would use the Modulus implants in surgical procedures, thereby indirectly infringing at least claims 11, 12, 14, 15 and 20 of the ‘421 patent. NuVasive provides surgeons with Modulus implants having indications for use and with instructions, tools, and assistance for surgically inserting Modulus implants adjacent bony structures in humans as discussed above. In any event, NuVasive has had notice of its infringement of the ‘421 patent as of the filing date of this complaint.

94. As outlined above, under the totality of the circumstances, NuVasive’s infringement of the ‘421 patent is willful from at least the date after NuVasive first learned of 4WEB’s ‘421 patent and the dates NuVasive commenced commercial sale in the United States of each of its respective Modulus implants.

95. On information and belief, NuVasive has gained profits and market share by virtue of its infringement of the ‘421 patent.

96. 4WEB has sustained damages as a direct and proximate result of NuVasive's infringement of the '421 patent.

97. 4WEB is entitled to recover at least a reasonable royalty, and its lost profits, enhanced damages, costs and expenses and attorney fees, and all other relief allowed under the Patent Act.

98. 4WEB will suffer and is suffering irreparable harm from NuVasive's infringement of the '421 patent. 4WEB has no adequate remedy at law and is entitled to an injunction against NuVasive's continuing infringement of the '421 patent. Unless enjoined, preliminarily and permanently, NuVasive will continue its infringing conduct.

#### **COUNT FIVE**

#### **(Infringement of the '845 Patent)**

99. Plaintiff 4WEB repeats and realleges as if fully set forth herein the allegations contained in all the preceding paragraphs ¶¶ 1-98.

100. The '845 patent is valid and enforceable.

101. NuVasive's actions, as set forth herein, constitute patent infringement of the '845 patent under 35 U.S.C. § 271. More specifically, as set forth herein, NuVasive has infringed and continues to infringe one or more claims, including at least claims 1-3, 11, 13- 15, 18 and 21-26 of the '845 patent under 35 U.S.C. § 271 by manufacturing, using, providing, selling, offering to sell, importing and/or distributing without authority the Modulus implants, and by inducing surgeons to implant Modulus implants into humans, such infringement occurring literally or by application of the doctrine of equivalents.

102. By way of example, the Modulus implants have common construction features that comprise "an implant for interfacing with a bone structure" having a web structure comprising "a plurality of struts joined at nodes to form a space truss," comprising space truss units "coupled to



one another such that one or more planar truss units lie in a plane that is not substantially parallel to a plane of a planar truss unit that shares at least one strut” with another planar truss unit, and “wherein a diameter and/or length of the struts and/or density of the web structure are predetermined such that when the web structure is in contact with the bone at least a portion of the struts create a microstrain in adhered osteoblasts, bone matrix, or lamellar tissue” as required by independent claims 1 and 14 of the ‘845 patent, and when placed under load produces an osteogenetic response in the adhered osteoblasts, bone matrix, or lamellar tissue as required by claim 2, depending from claim 1, and claim 15, depending from claim 14, of the ‘845 patent. Research conducted at the University of Pennsylvania has verified that individual elements (struts) in a web structure having a plurality of space trusses as required by the claims of the ‘845 patent claims can be predetermined by selecting one or more of the density of the web structure, the diameter of the struts, and the length of the struts, to produce a microstrain in osteoblasts, bone matrix, or lamellar tissue that has adhered to the struts. The microstrain produces an osteogenetic response in the adjacent cellular material. This research was sponsored by 4WEB and published as Lee, S., et al., *Mechanobiology At Work: Physiologic Load Induced Strain Of 3d Printed Truss Element Amplifies Osteogenic Response off Human Mesenchymal Stem Cells Compared To Static Surface Feature Influence*. Orthopedic Research Society Annual Meeting, Dallas, TX (2023). The aforementioned animations of the Modulus implants describe how the trusses of each of the Modulus implants are optimized, i.e., predetermined, by having the strut length, diameter, and/or density modified so as to provide an osteogenetic response in the bone in which it is in contact with so as to induce bone growth and fusion to the Modulus implants.

103. By way of further example, NuVasive’s Modulus XLIF implant meets each and every limitation of claim 1 of the ‘845 patent as shown in the chart below comparing claim 1 (with

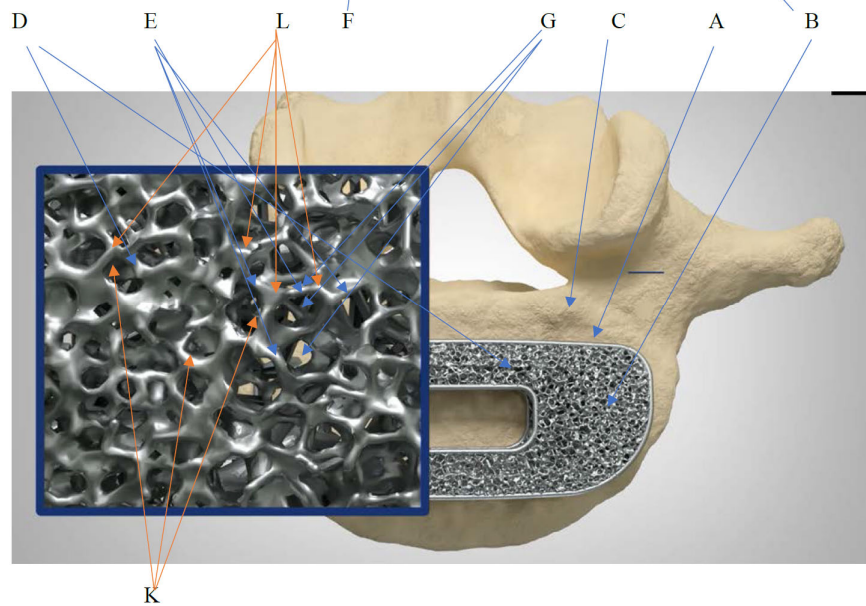
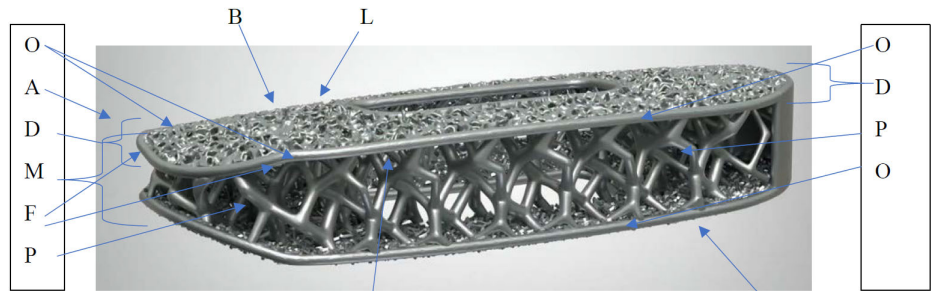
annotations added in brackets) to two screen shots taken from the aforementioned Modulus XLIF product animation (at t=0:01:07 and t=0:01:12, respectively), a photograph taken of a Modulus XLIF product (with white triangle annotations added), and a series of six screen shots taken from the aforementioned Modulus XLIF product animation relating to optimization of the structure (at t=0:59 to 1:07):

**NuVasive's Modulus XLIF – '845 patent claim 1**

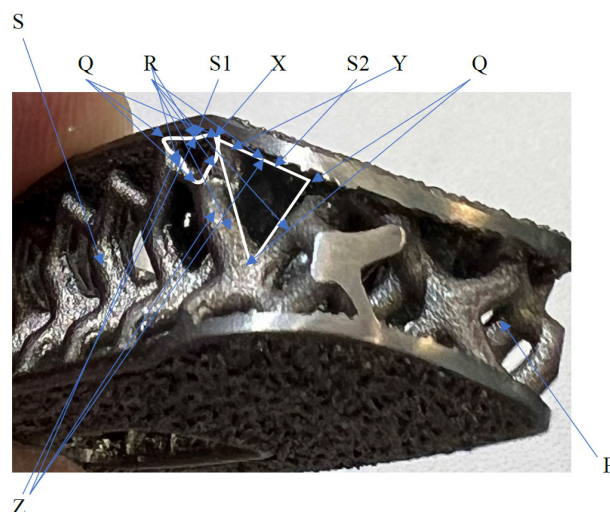
Claim 1:

An implant for interfacing with a bone structure, comprising:

a web structure [M] comprising a plurality of struts [E, R] joined at nodes [L, Q] to form a space truss [P] comprising a plurality of planar truss units [K, S], wherein the web structure is configured to interface with bone tissue [C], and wherein the plurality of planar truss units [S1, S2] are coupled to one another such that one or more planar truss units lie in a plane that is not substantially parallel to a plane of a planar truss unit that shares at least one strut with the one or more planar truss units;

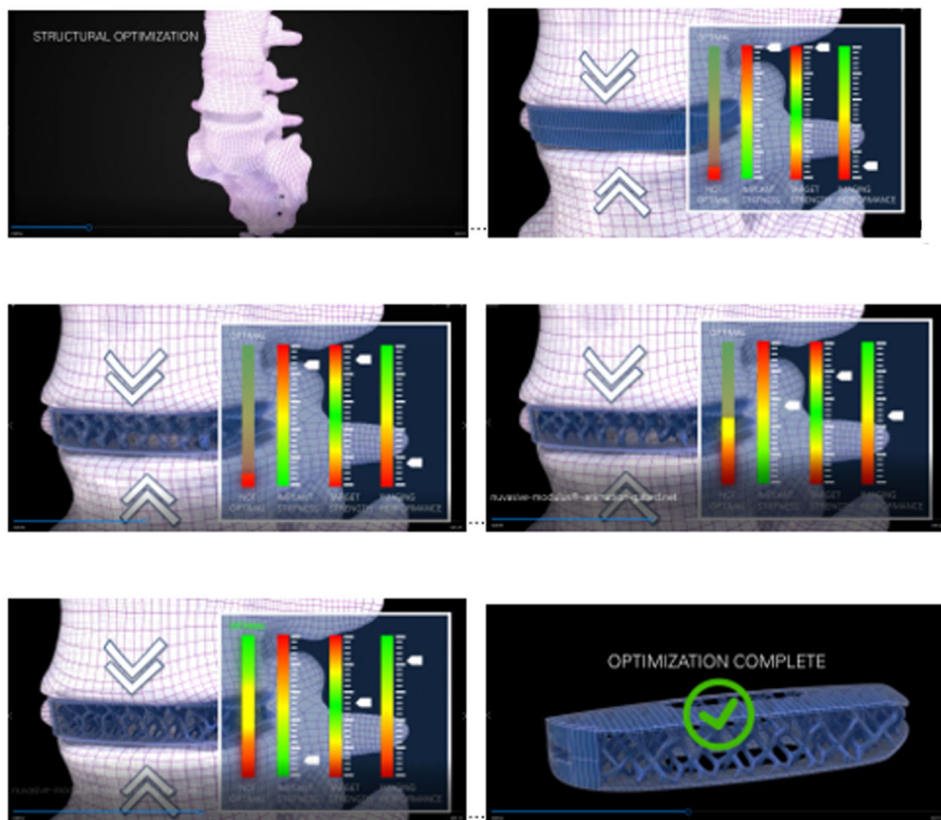


wherein a diameter and/or length of the struts and/or density of the web structure are predetermined such that when the web structure is in contact with the bone at least a portion of the struts create a microstrain in adhered osteoblasts, bone matrix, or lamellar tissue.



Claim 2:

The implant of claim 1, where in the diameter and/or length of the struts and/or density of the web structure is predetermined so that the struts, under load, create a microstrain, in adhered osteoblasts, bone matrix, or lamellar tissue, wherein the microstrain is within a range that stimulates an osteogenetic response.



104. On information and belief, NuVasive has had knowledge of the '845 patent at least as of the issue date of the '845 patent because since 2015 NuVasive had knowledge of 4WEB's 2015 IP portfolio including the '845 patent and the application from which the '845 patent claims priority, and NuVasive routinely monitors patents that are issued in the field of spinal implants. Furthermore, NuVasive has knowledge that its use thereof has been unauthorized, and on information and belief has used, offered for sale and sold the Modulus implants in the United States including this District with the knowledge that the Modulus implants infringed at least claims 1-3, 11, 13- 15, 18 and 21-26 of the '845 patent, and with the specific intent that surgeons would use the Modulus implants in surgical procedures, thereby indirectly infringing at least claims 14, 15, and 21-26 of the '845 patent. NuVasive provides surgeons with Modulus implants having indications for use and with instructions, tools and assistance for surgically inserting Modulus implants adjacent bony structures in humans as discussed above. In any event, NuVasive has had notice of its infringement of the '845 patent as of the filing date of this complaint.

105. As outlined above, under the totality of the circumstances, NuVasive's infringement of the '845 patent is willful from at least the date after NuVasive first learned of 4WEB's '845 patent and the dates NuVasive commenced commercial sale in the United States of each of its respective Modulus implants.

106. On information and belief, NuVasive has gained profits and market share by virtue of its infringement of the '845 patent.

107. 4WEB has sustained damages as a direct and proximate result of NuVasive's infringement of the '845 patent.

108. 4WEB is entitled to recover at least a reasonable royalty, and its lost profits, enhanced damages, costs and expenses and attorney fees, and all other relief allowed under the Patent Act.

109. 4WEB will suffer and is suffering irreparable harm from NuVasive's infringement of the '845 patent. 4WEB has no adequate remedy at law and is entitled to an injunction against NuVasive's continuing infringement of the '845 patent. Unless enjoined, preliminarily and permanently, NuVasive will continue its infringing conduct.

### **COUNT SIX**

#### **(Infringement of the '823 Patent)**

110. Plaintiff 4WEB repeats and realleges as if fully set forth herein the allegations contained in all the preceding paragraphs ¶¶ 1 -109.

111. The '823 patent is valid and enforceable.

112. NuVasive's actions, as set forth herein, constitute patent infringement of the '823 patent under 35 U.S.C. § 271. More specifically, as set forth herein, NuVasive has infringed and continues to infringe one or more claims, including at least claims 1-3, 11, 13- 17, 20, and 22-24 of the '823 patent under 35 U.S.C. § 271 by manufacturing, using, providing, selling, offering to sell, importing and/or distributing without authority the Modulus implants, and by inducing surgeons to implant Modulus implants into humans, such infringement occurring literally or by application of the doctrine of equivalents.

113. By way of example, the Modulus implants have common construction features that comprise "a spinal implant for interfacing with a bone structure of a subject's spine" having a web structure comprising "a plurality of struts joined at nodes to form a space truss," comprising planar truss units, "wherein the web structure is configured to interface with bone tissue, and wherein the plurality of planar truss units are coupled to one another such that one or more planar truss units

lie in a plane that is not substantially parallel to a plane of a planar truss unit that shares at least one strut with the one or more planar truss units” having a planar truss unit that has a curved or arced strut, “wherein a diameter and/or length of the struts and/or density of the web structure are predetermined such that when the web structure is in contact with the bone at least a portion of the struts create a microstrain in adhered osteoblasts, bone matrix, or lamellar tissue” as required by independent claims 1 and 16 of the ‘823 patent, and when placed under load produces an osteogenetic response in the adhered osteoblasts, bone matrix, or lamellar tissue as required by claim 2, depending from claim 1 of the ‘823 patent. Research conducted at the University of Pennsylvania has verified that individual elements (struts) in a web structure having a plurality of space trusses as required by the claims of the ‘823 patent claims can be predetermined by selecting one or more of the density of the web structure, the diameter of the struts, and the length of the struts, to produce a microstrain in osteoblasts, bone matrix, or lamellar tissue that has adhered to the struts. The microstrain produces an osteogenetic response in the adjacent cellular material. This research was sponsored by 4WEB and published as Lee, S., et al., *Mechanobiology At Work: Physiologic Load Induced Strain Of 3d Printed Truss Element Amplifies Osteogenic Response off Human Mesenchymal Stem Cells Compared To Static Surface Feature Influence*. Orthopedic Research Society Annual Meeting, Dallas, TX (2023). The aforementioned animations of the Modulus implants describe how the trusses of each of the Modulus implants are optimized, i.e., predetermined, by having the strut length, diameter, and/or density modified so as to provide an osteogenetic response in the bone in which it is in contact with so as to induce bone growth and fusion to the Modulus implants.

114. By way of further example, NuVasive’s Modulus XLIF implant meets each and every limitation of claim 1 of the ‘823 patent as shown in the chart below comparing claim 1 (with

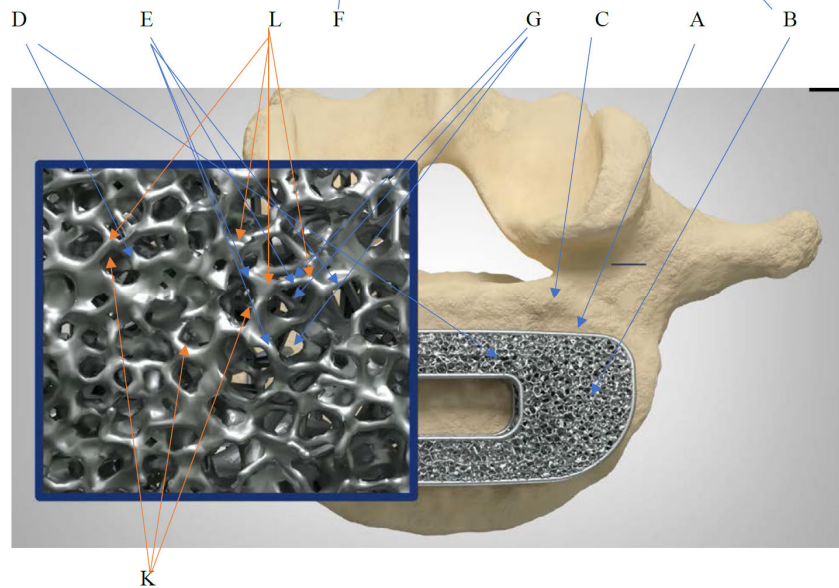
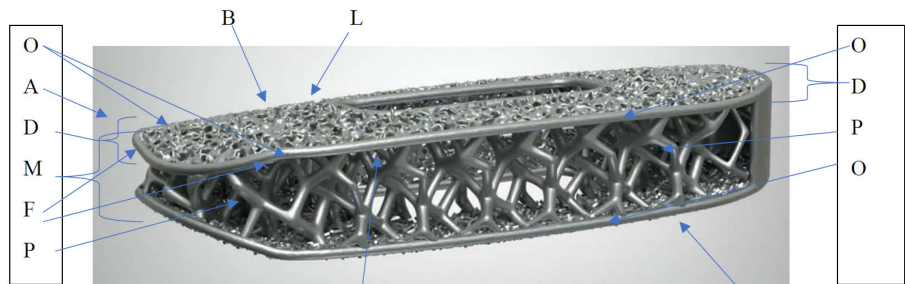
annotations added in brackets) to two screen shots taken from the aforementioned Modulus XLIF product animation (at t=0:01:07 and t=0:01:12, respectively) and a photograph taken of a Modulus XLIF product (with white triangle annotations added), and a series of six screen shots taken from the aforementioned Modulus XLIF product animation relating to optimization of the structure:

**NuVasive’s Modulus XLIF – ‘823 patent claim 1**

Claim 1:

A spinal implant for interfacing with a bone structure of a subject's spine, comprising:

a web structure [M] comprising a plurality of struts [E, R] joined at nodes [L, Q] to form a space truss [H, P] comprising a plurality of planar truss units [K, S], wherein the web structure is configured to interface with bone tissue [C], and wherein the plurality of planar truss units [S1, S2] are coupled to one another such that one or more planar truss units lie in a plane that is not substantially parallel to a plane of a planar truss unit that shares at least one strut with the one or more planar truss units;

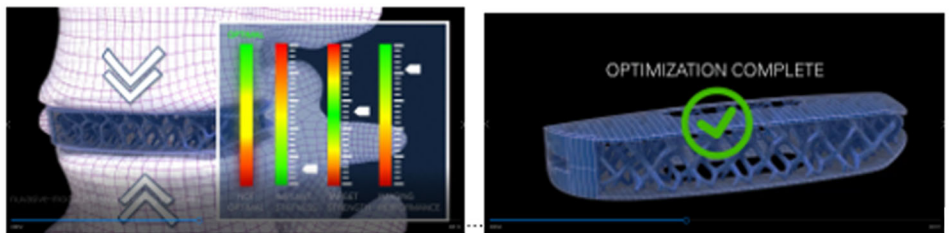
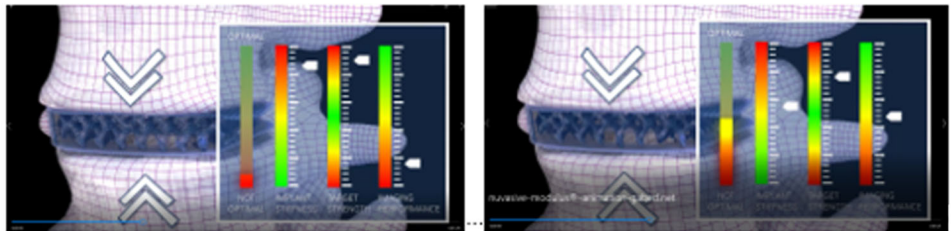
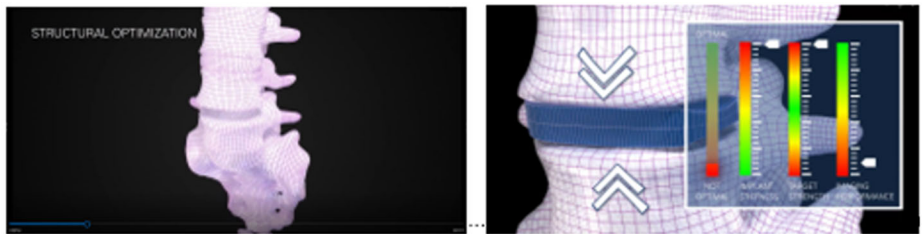
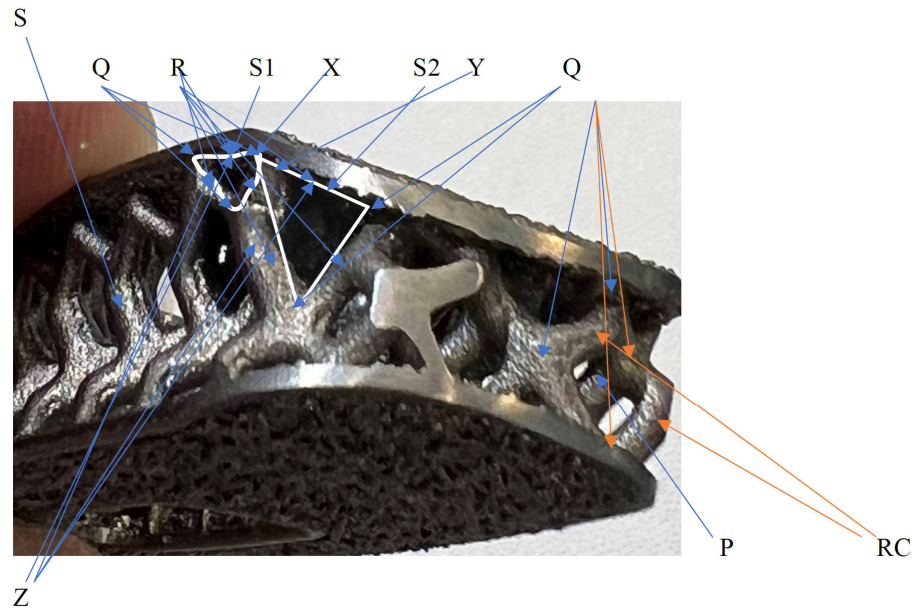




and wherein one or more planar truss units comprises one or more curved or arced struts [RC] joined at nodes [Q]; and

wherein a diameter and/or length of the struts and/or density of the web structure are predetermined such that when the web structure is in contact with the bone [C] at least a portion of the struts create a microstrain in adhered osteoblasts, bone matrix, or lamellar tissue; and

wherein the implant has a shape and size that allows the implant to be implanted in between vertebrae [C] of the subject's spine.



<p>Claim 2:</p> <p>The implant of claim 1, where in the diameter and/or length of the struts and/or density of the web structure is predetermined so that the struts, under load, create a microstrain, in adhered osteoblasts, bone matrix, or lamellar tissue, wherein the microstrain is within a range that stimulates an osteogenetic response.</p>	<p>See above for Claim 1.</p>
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115. On information and belief, NuVasive has had knowledge of the '823 patent at least as of the issue date of the '823 patent because since 2015 NuVasive had knowledge of 4WEB's 2015 IP portfolio and the application from which the '823 patent claims priority, and NuVasive routinely monitors patents that are issued in the field of spinal implants. Furthermore, NuVasive has knowledge that its use thereof has been unauthorized, and on information and belief has used, offered for sale and sold the Modulus implants in the United States including this District with the knowledge that the Modulus implants infringed at least claims 1-3, 11, 13- 17, 20, and 22-24 of the '823 patent, and with the specific intent that surgeons would use the Modulus implants in surgical procedures, thereby indirectly infringing at least claims 16, 17, 20 and 22-24 of the '823 patent. NuVasive provides surgeons with Modulus implants having indications for use and with instructions, tools, and assistance for surgically inserting Modulus implants adjacent bony structures in humans as discussed above. In any event, NuVasive has had notice of its infringement of the '823 patent as of the filing date of this complaint.

116. As outlined above, under the totality of the circumstances, NuVasive's infringement of the '823 patent is willful from at least the date after NuVasive first learned of 4WEB's '823 patent and the dates NuVasive commenced commercial sale in the United States of each of its respective Modulus implants.

117. On information and belief, NuVasive has gained profits and market share by virtue of its infringement of the '823 patent.

118. 4WEB has sustained damages as a direct and proximate result of NuVasive's infringement of the '823 patent.

119. 4WEB is entitled to recover at least a reasonable royalty, and its lost profits, enhanced damages, costs and expenses and attorney fees, and all other relief allowed under the Patent Act.

120. 4WEB will suffer and is suffering irreparable harm from NuVasive's infringement of the '823 patent. 4WEB has no adequate remedy at law and is entitled to an injunction against NuVasive's continuing infringement of the '823 patent. Unless enjoined, preliminarily and permanently, NuVasive will continue its infringing conduct.

### **COUNT SEVEN**

#### **(Infringement of the '669 Patent)**

121. Plaintiff 4WEB repeats and realleges as if fully set forth herein the allegations contained in all the preceding paragraphs ¶¶ 1-120.

122. The '669 patent is valid and enforceable.

123. NuVasive's actions, as set forth herein, constitute patent infringement of the '669 patent under 35 U.S.C. § 271. More specifically, as set forth herein, NuVasive has infringed and continues to infringe one or more claims, including at least claims 1-3, 11, 13- 17, 19, and 22-24 of the '669 patent under 35 U.S.C. § 271 by manufacturing, using, providing, selling, offering to

sell, importing and/or distributing without authority the Modulus implants, and by inducing surgeons to implant Modulus implants into humans, such infringement occurring literally or by application of the doctrine of equivalents.

124. By way of example, the Modulus implants have common construction features that comprise “an implant for interfacing with a bone structure” having a web structure comprising “a plurality of struts joined at nodes to form a space truss,” comprising planar truss units, “wherein the web structure is configured to interface with bone tissue, and wherein the plurality of planar truss units are coupled to one another such that one or more planar truss units lie in a plane that is not substantially parallel to a plane of a planar truss unit that shares at least one strut with the one or more planar truss units,” “wherein a diameter and/or length of the struts and/or density of the web structure are predetermined such that when the web structure is in contact with the bone at least a portion of the struts create a microstrain in adhered osteoblasts, bone matrix, or lamellar tissue” as required by independent claims 1 and 16 of the ‘669 patent, and when placed under load produces an osteogenetic response in the adhered osteoblasts, bone matrix, or lamellar tissue as required by claim 2, depending from claim 1 of the ‘669 patent. Research conducted at the University of Pennsylvania has verified that individual elements (struts) in a web structure having a plurality of space trusses as required by the claims of the ‘845 patent claims can be predetermined by selecting one or more of the density of the web structure, the diameter of the struts, and the length of the struts, to produce a microstrain in osteoblasts, bone matrix, or lamellar tissue that has adhered to the struts. The microstrain produces an osteogenetic response in the adjacent cellular material. This research was sponsored by 4WEB and published as Lee, S., et al., *Mechanobiology At Work: Physiologic Load Induced Strain Of 3d Printed Truss Element Amplifies Osteogenic Response off Human Mesenchymal Stem Cells Compared To Static Surface Feature Influence.*

Orthopedic Research Society Annual Meeting, Dallas, TX (2023). The aforementioned animations of the Modulus implants describe how the trusses of each of the Modulus implants are optimized, i.e., predetermined, by having the strut length, diameter, and/or density modified so as to provide an osteogenetic response in the bone in which it is in contact with so as to induce bone growth and fusion to the Modulus implants.

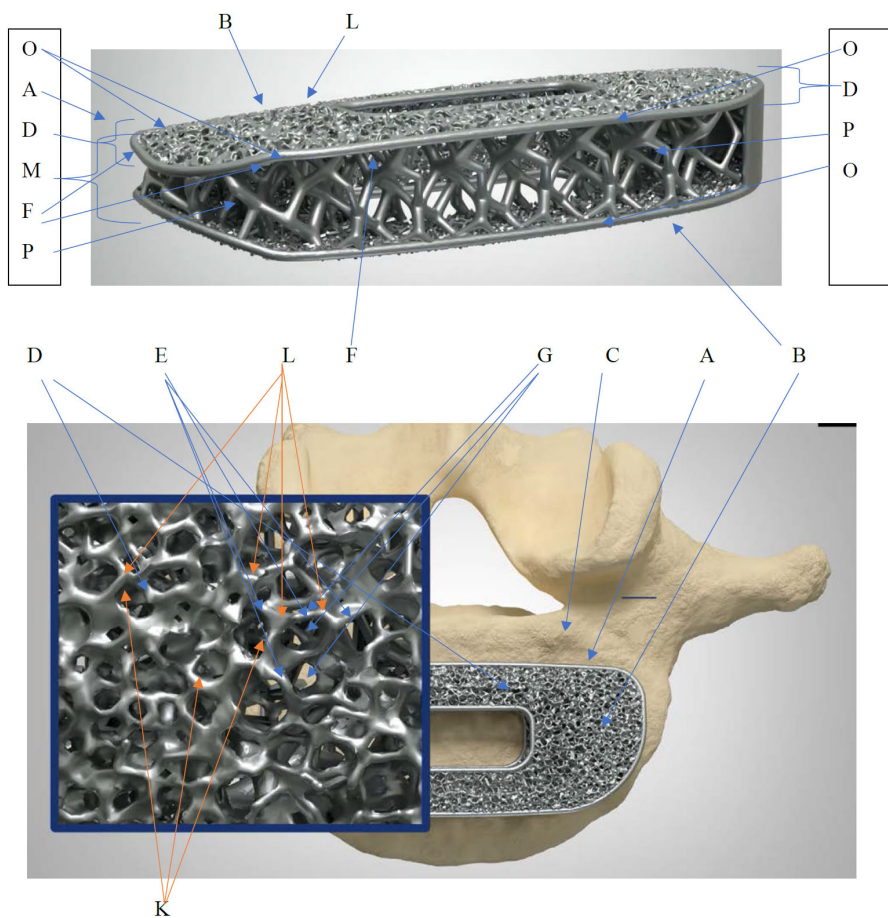
125. By way of further example, NuVasive's Modulus XLIF implant meets each and every limitation of claim 1 of the '669 patent as shown in the chart below comparing claim 1 (with annotations added in brackets) to two screen shots taken from the aforementioned Modulus XLIF product animation (at t=0:01:07 and t=0:01:12, respectively) and a photograph taken of a Modulus XLIF product (with white triangle annotations added), and a series of six screen shots taken from the aforementioned Modulus XLIF product animation relating to optimization of the structure:

NuVasive's Modulus XLIF – '669 patent claim 1

Claim 1:

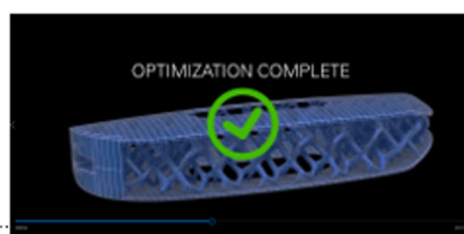
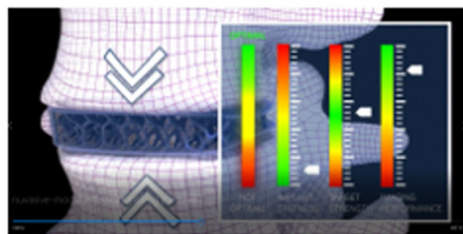
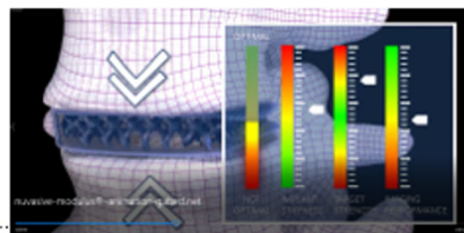
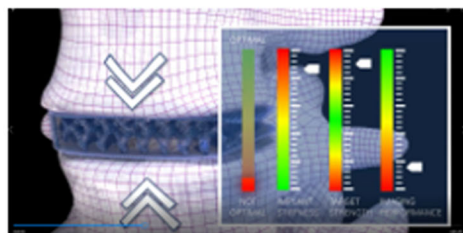
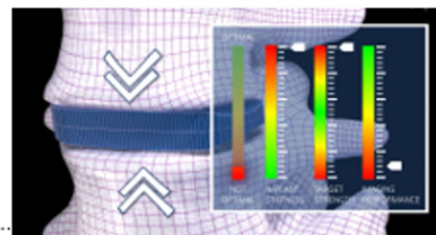
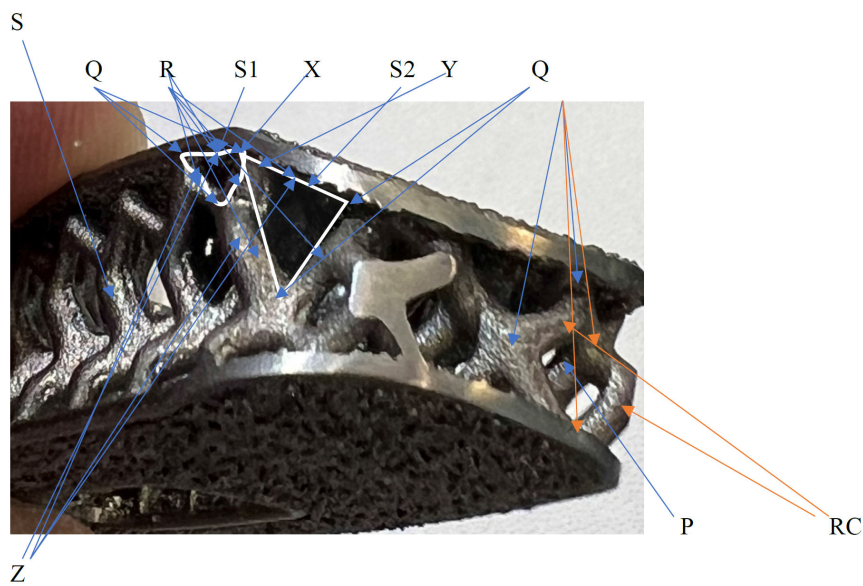
An implant for interfacing with a bone structure, comprising:

a web structure [M] comprising a plurality of struts [E, R] joined at nodes [L, Q] to form a space truss [P] comprising a plurality of planar truss units [K, S], wherein the web structure is configured to interface with bone tissue [C], and wherein the plurality of planar truss units [S1, S2] are coupled to one another such that one or more planar truss units lie in a plane that is not substantially parallel to a plane of a planar truss unit that shares at least one strut with the one or more planar truss units;



wherein a diameter and/or length of the struts and/or density of the web structure are predetermined such that when the web structure is in contact with the bone at least a portion of the struts create a microstrain in adhered osteoblasts, bone matrix, or lamellar tissue; and

wherein one or more angles [X, Y] defined by two struts [R] and a node [Q] of one or more of the planar truss units [S1, S2] are different than one or more corresponding angles defined by two struts [R] and a node [Q] of one or more other planar truss units, wherein connecting exterior surface struts [R] couple the nodes of the non-equivalent angle planar truss units to each other such that the implant has a varied height.



<p>Claim 2:</p> <p>The implant of claim 1, where in the diameter and/or length of the struts and/or density of the web structure is predetermined so that the struts, under load, create a microstrain, in adhered osteoblasts, bone matrix, or lamellar tissue, wherein the microstrain is within a range that stimulates an osteogenetic response.</p>	<p>See above for Claim 1.</p>
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126. On information and belief, NuVasive has had knowledge of the ‘669 patent at least as of the issue date of the ‘669 patent because since 2015 NuVasive had knowledge of 4WEB’s 2015 IP portfolio and the application from which the ‘669 patent claims priority, and NuVasive routinely monitors patents that are issued in the field of spinal implants. Furthermore, NuVasive has knowledge that its use thereof has been unauthorized, and on information and belief has used, offered for sale and sold the Modulus implants in the United States including this District with the knowledge that the Modulus implants infringed at least claims 1-3, 11, 13-17, 19, and 22-24 of the ‘669 patent, and with the specific intent that surgeons would use the Modulus implants in surgical procedures, thereby indirectly infringing at least claims 16, 17, 19, and 22-24 of the ‘669 patent. NuVasive provides surgeons with Modulus implants having indications for use and with instructions, tools, and assistance for surgically inserting Modulus implants adjacent bony structures in humans as discussed above. In any event, NuVasive has had notice of its infringement of the ‘669 patent as of the filing date of this complaint.



127. As outlined above, under the totality of the circumstances, NuVasive's infringement of the '669 patent is willful from at least the date after NuVasive first learned of 4WEB's '669 patent and the dates NuVasive commenced commercial sale in the United States of each of its respective Modulus implants.

128. On information and belief, NuVasive has gained profits and market share by virtue of its infringement of the '669 patent.

129. 4WEB has sustained damages as a direct and proximate result of NuVasive's infringement of the '669 patent.

130. 4WEB is entitled to recover at least a reasonable royalty, and its lost profits, enhanced damages, costs and expenses and attorney fees, and all other relief allowed under the Patent Act.

131. 4WEB will suffer and is suffering irreparable harm from NuVasive's infringement of the '669 patent. 4WEB has no adequate remedy at law and is entitled to an injunction against NuVasive's continuing infringement of the '669 patent. Unless enjoined, preliminarily and permanently, NuVasive will continue its infringing conduct.

### **COUNT EIGHT**

#### **(Infringement of the '235 Patent)**

132. Plaintiff 4WEB repeats and realleges as if fully set forth herein the allegations contained in all the preceding paragraphs ¶¶ 1 - 131.

133. The '235 patent is valid and enforceable.

134. NuVasive's actions, as set forth herein, constitute patent infringement of the '235 patent under 35 U.S.C. § 271. More specifically, as set forth herein, NuVasive has infringed and continues to infringe one or more claims, including at least claims 1-3, 11, 13- 17, 20, and 22-24

of the '235 patent under 35 U.S.C. § 271 by manufacturing, using, providing, selling, offering to sell, importing and/or distributing without authority the Modulus implants, and by inducing surgeons to implant Modulus implants into humans, such infringement occurring literally or by application of the doctrine of equivalents.

135. By way of example, the Modulus implants have common construction features that comprise a “spinal implant for interfacing with a bone structure of a subject’s spine” having a web structure comprising “a plurality of struts joined at nodes to form a space truss,” comprising planar truss units, “wherein the web structure is configured to interface with bone tissue, and wherein the plurality of planar truss units are coupled to one another such that one or more planar truss units lie in a plane that is not substantially parallel to a plane of a planar truss unit that shares at least one strut with the one or more planar truss units,” “wherein a diameter and/or length of the struts and/or density of the web structure are predetermined such that when the web structure is in contact with the bone at least a portion of the struts create a microstrain in adhered osteoblasts, bone matrix, or lamellar tissue” as required by independent claims 1 and 16 of the '235 patent, and when placed under load produces an osteogenetic response in the adhered osteoblasts, bone matrix, or lamellar tissue as required by claim 2, depending from claim 1 of the '235 patent. Research conducted at the University of Pennsylvania has verified that individual elements (struts) in a web structure having a plurality of space trusses as required by the claims of the '845 patent claims can be predetermined by selecting one or more of the density of the web structure, the diameter of the struts, and the length of the struts, to produce a microstrain in osteoblasts, bone matrix, or lamellar tissue that has adhered to the struts. The microstrain produces an osteogenetic response in the adjacent cellular material. This research was sponsored by 4WEB and published as Lee, S., et al., *Mechanobiology At Work: Physiologic Load Induced Strain Of 3d Printed Truss Element*

Amplifies Osteogenic Response of Human Mesenchymal Stem Cells Compared To Static Surface Feature Influence. Orthopedic Research Society Annual Meeting, Dallas, TX (2023). The aforementioned animations of the Modulus implants describe how the trusses of each of the Modulus implants are optimized, i.e., predetermined, by having the strut length, diameter, and/or density modified so as to provide an osteogenetic response in the bone in which it is in contact with so as to induce bone growth and fusion to the Modulus implants.

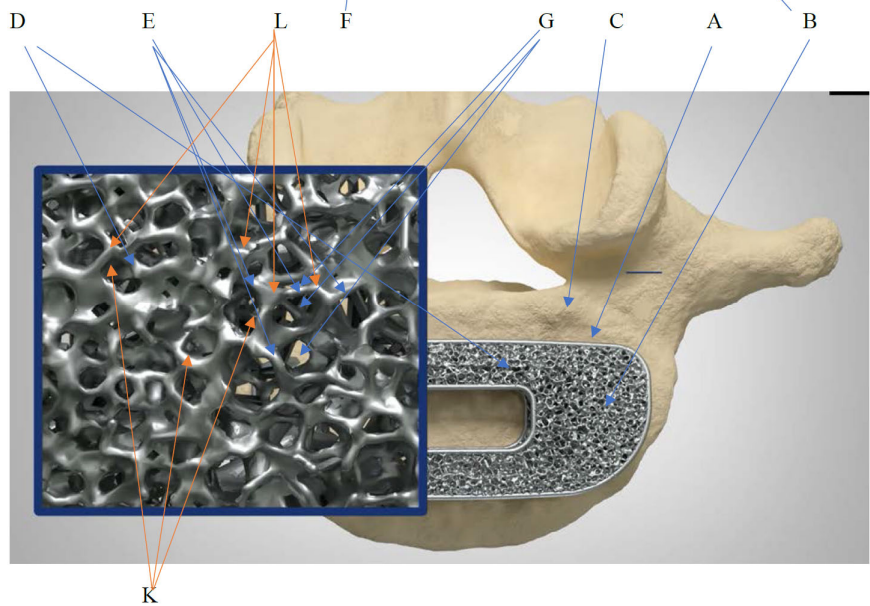
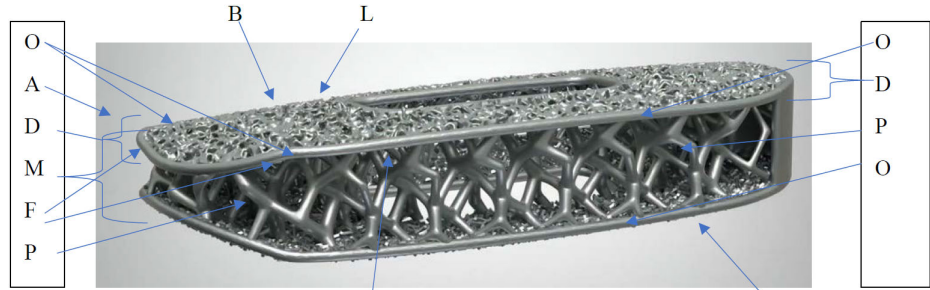
136. By way of further example, NuVasive's Modulus XLIF implant meets each and every limitation of claim 2 of the '235 patent as shown in the chart below comparing claims 1 and 2 (with annotations added in brackets) to two screen shots taken from the aforementioned Modulus XLIF product animation (at t=0:01:07 and t=0:01:12, respectively) and a photograph taken of a Modulus XLIF product (with white triangle annotations added), and a series of six screen shots taken from the aforementioned Modulus XLIF product animation relating to optimization of the structure:

**NuVasive's Modulus XLIF – '235 patent claim 1**

Claim 1:

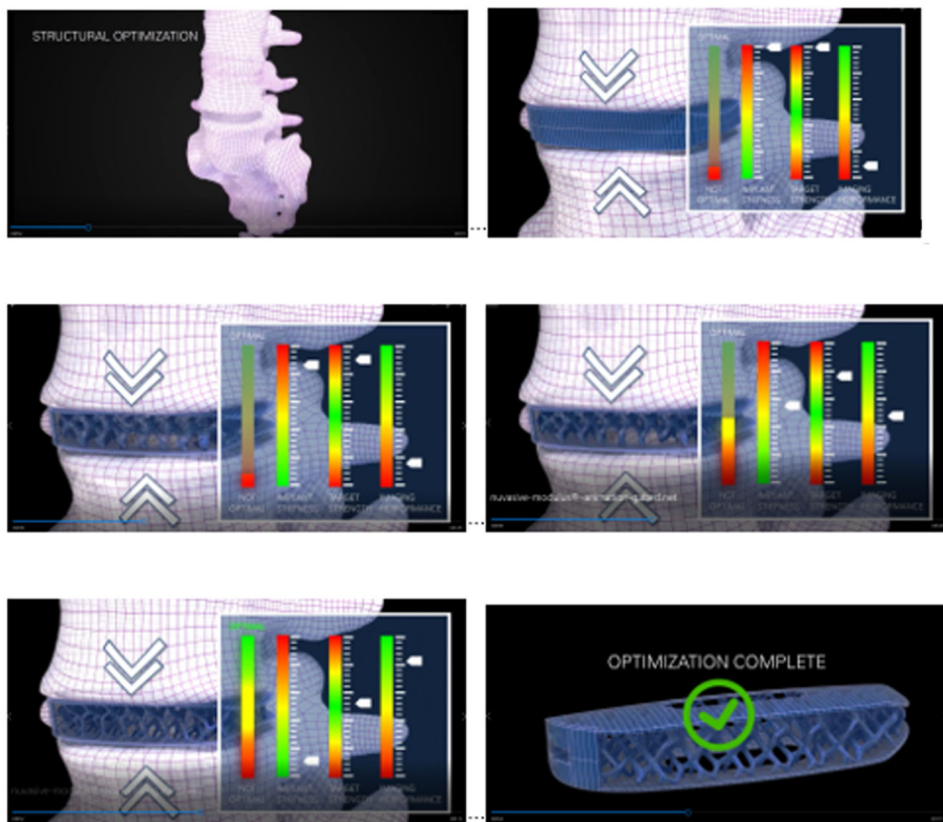
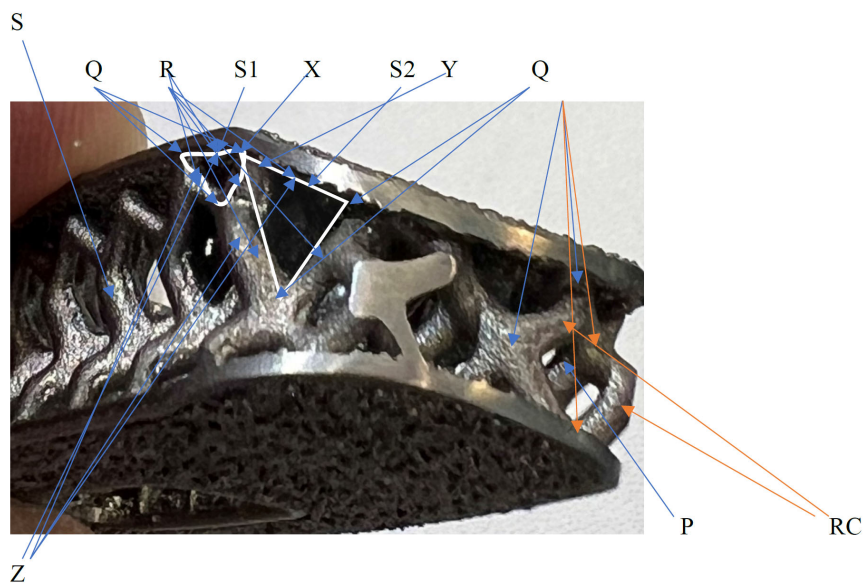
A spinal implant for interfacing with a bone structure of a subject's spine, comprising:

a web structure [M] comprising a plurality of struts [E, R] joined at nodes [L, Q] to form a space truss [P] comprising a plurality of planar truss units [K, S], wherein the web structure is configured to interface with bone tissue [C], and wherein the plurality of planar truss units [S1, S] are coupled to one another such that one or more planar truss units lie in a plane that is not substantially parallel to a plane of a planar truss unit that shares at least one strut with the one or more planar truss units;



wherein a diameter and/or length of the struts and/or density of the web structure are predetermined such that when the web structure is in contact with the bone at least a portion of the struts create a microstrain in adhered osteoblasts, bone matrix, or lamellar tissue; and

wherein the implant has a shape and size that allows the implant to be implanted in between vertebrae of the subject's spine.



<p>Claim 2:</p> <p>The implant of claim 1, where in the diameter and/or length of the struts and/or density of the web structure is predetermined so that the struts, under load, create a microstrain, in adhered osteoblasts, bone matrix, or lamellar tissue, wherein the microstrain is within a range that stimulates an osteogenetic response.</p>	<p>See above for Claim 1.</p>
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137. On information and belief, NuVasive has had knowledge of the ‘235 patent at least as of the issue date of the ‘235 patent because since 2015 NuVasive had knowledge of 4WEB’s 2015 IP portfolio and the application from which the ‘235 patent claims priority, and NuVasive routinely monitors patents that are issued in the field of spinal implants. Furthermore, NuVasive has knowledge that its use thereof has been unauthorized, and on information and belief has used, offered for sale and sold the Modulus implants in the United States including this District with the knowledge that the Modulus implants infringed at least claims 1-3, 11, 13- 17, 20, and 22-24 of the ‘235 patent, and with the specific intent that surgeons would use the Modulus implants in surgical procedures, thereby indirectly infringing at least claims 16, 17, 20, and 22-24 of the ‘235 patent. NuVasive provides surgeons with Modulus implants having indications for use and with instructions, tools, and assistance for surgically inserting Modulus implants adjacent bony structures in humans as discussed above. In any event, NuVasive has had notice of its infringement of the ‘235 patent as of the filing date of this complaint.

138. As outlined above, under the totality of the circumstances, NuVasive's infringement of the '235 patent is willful from at least the date after NuVasive first learned of 4WEB's '235 patent and the dates NuVasive commenced commercial sale in the United States of each of its respective Modulus implants.

139. On information and belief, NuVasive has gained profits and market share by virtue of its infringement of the '235 patent.

140. 4WEB has sustained damages as a direct and proximate result of NuVasive's infringement of the '235 patent.

141. 4WEB is entitled to recover at least a reasonable royalty, and its lost profits, enhanced damages, costs and expenses and attorney fees, and all other relief allowed under the Patent Act.

142. 4WEB will suffer and is suffering irreparable harm from NuVasive's infringement of the '235 patent. 4WEB has no adequate remedy at law and is entitled to an injunction against NuVasive's continuing infringement of the '235 patent. Unless enjoined, preliminarily and permanently, NuVasive will continue its infringing conduct.

## **COUNT NINE**

### **(Infringement of the '137 Patent)**

143. Plaintiff 4WEB repeats and realleges as if fully set forth herein the allegations contained in all the preceding paragraphs ¶¶ 1- 142.

144. The '137 patent is valid and enforceable.

145. NuVasive's actions, as set forth herein, constitute patent infringement of the '137 patent under 35 U.S.C. § 271. More specifically, as set forth herein, NuVasive has infringed and continues to infringe one or more claims, including at least claims 1-3, 11, 13- 17, 20, and 22-24

of the '137 patent under 35 U.S.C. § 271 by manufacturing, using, providing, selling, offering to sell, importing and/or distributing without authority the Modulus implants, and by inducing surgeons to implant Modulus implants into humans, such infringement occurring literally or by application of the doctrine of equivalents.

146. By way of example, the Modulus implants have common construction features that comprise a “spinal implant for interfacing with a bone structure of a subject's spine” having a web structure comprising “a plurality of struts joined at nodes to form a space truss,” comprising planar truss units, “wherein the web structure is configured to interface with bone tissue, and wherein the plurality of planar truss units are coupled to one another such that one or more planar truss units lie in a plane that is not substantially parallel to a plane of a planar truss unit that shares at least one strut with the one or more planar truss units,” “wherein a diameter and/or length of the struts and/or density of the web structure are predetermined such that when the web structure is in contact with the bone at least a portion of the struts create a microstrain in adhered osteoblasts, bone matrix, or lamellar tissue” as required by independent claims 1 and 16 of the '137 patent, and when placed under load produces an osteogenetic response in the adhered osteoblasts, bone matrix, or lamellar tissue as required by claim 2, depending from claim 1 of the '137 patent. Research conducted at the University of Pennsylvania has verified that individual elements (struts) in a web structure having a plurality of space trusses as required by the claims of the '845 patent claims can be predetermined by selecting one or more of the density of the web structure, the diameter of the struts, and the length of the struts, to produce a microstrain in osteoblasts, bone matrix, or lamellar tissue that has adhered to the struts. The microstrain produces an osteogenetic response in the adjacent cellular material. This research was sponsored by 4WEB and published as Lee, S., et al., *Mechanobiology At Work: Physiologic Load Induced Strain Of 3d Printed Truss Element*



Amplifies Osteogenic Response of Human Mesenchymal Stem Cells Compared To Static Surface Feature Influence. Orthopedic Research Society Annual Meeting, Dallas, TX (2023). The aforementioned animations of the Modulus implants describe how the trusses of each of the Modulus implants are optimized, i.e., predetermined, by having the strut length, diameter, and/or density modified so as to provide an osteogenetic response in the bone in which it is in contact with so as to induce bone growth and fusion to the Modulus implants.

147. By way of further example, NuVasive's Modulus XLIF implant meets each and every limitation of claim 2 of the '137 patent as shown in the chart below comparing claims 1 and 2 (with annotations added in brackets) to two screen shots taken from the aforementioned Modulus XLIF product animation (at t=0:01:07 and t=0:01:12 respectively), a photograph taken of a Modulus XLIF product (with white triangle annotations added), and a series of six screen shots taken from the aforementioned Modulus XLIF product animation relating to optimization of the structure:

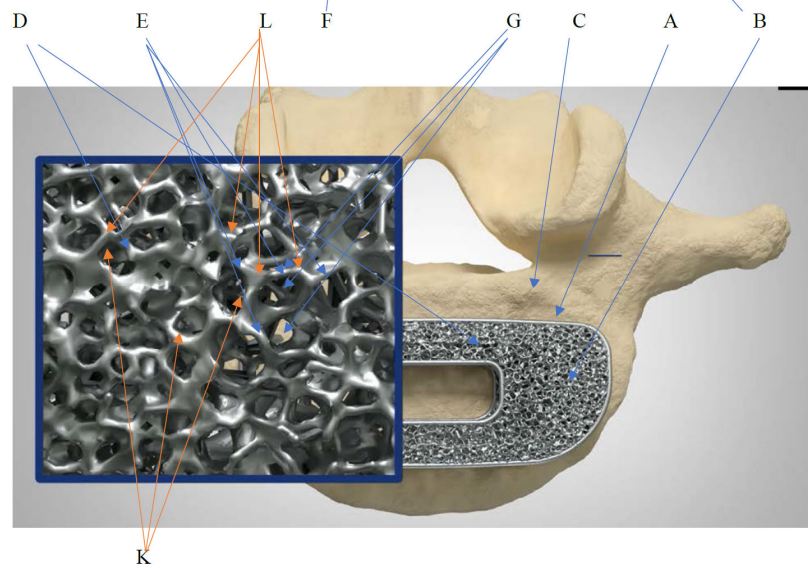
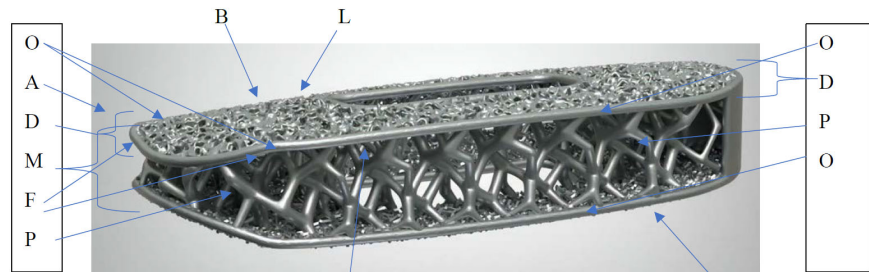
**NuVasive's Modulus XLIF – '137 patent claim 1**

Claim 1:

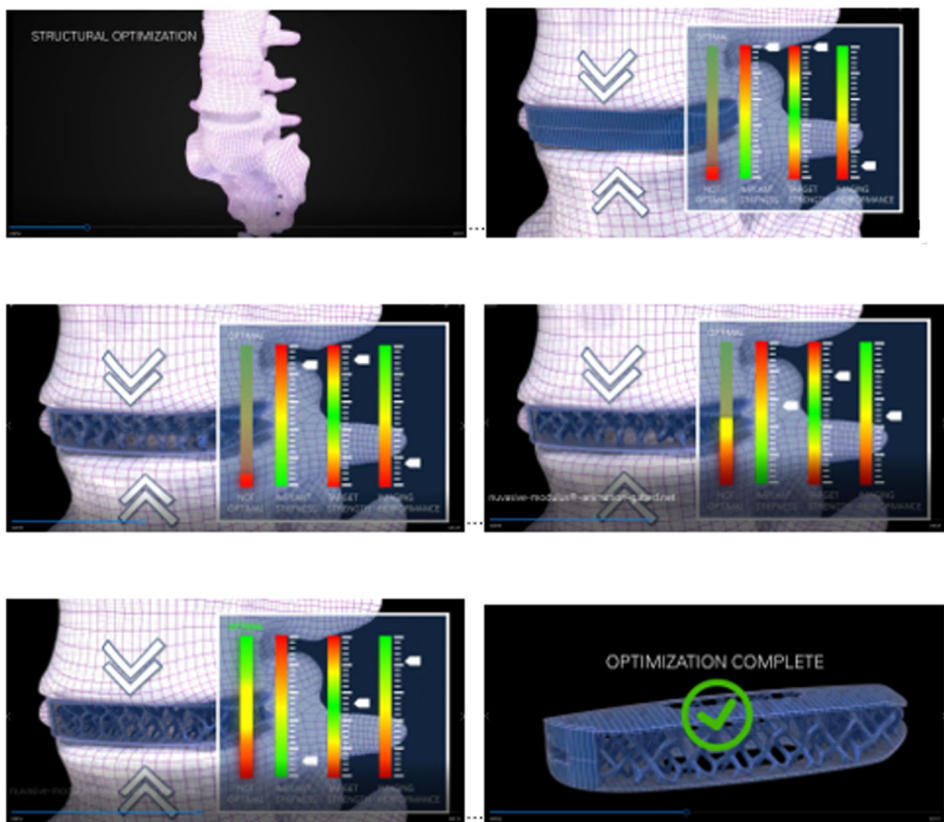
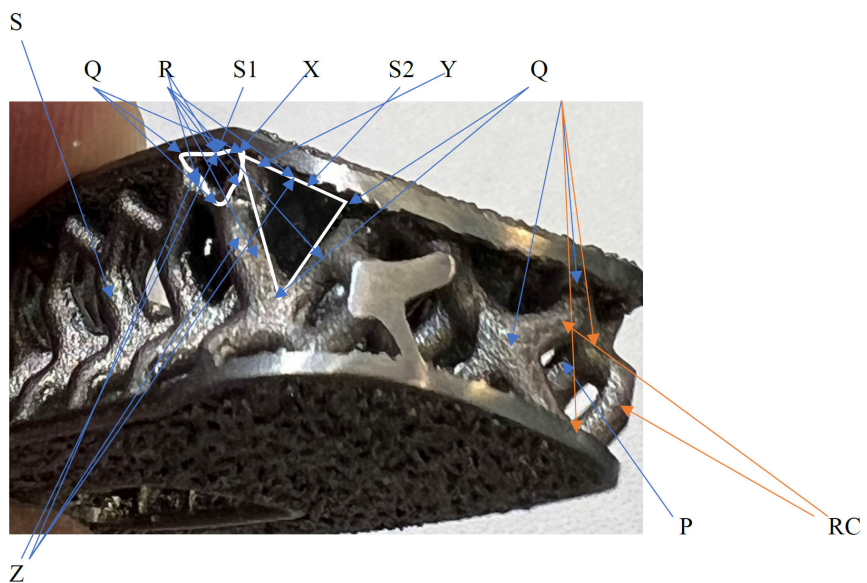
A spinal implant for interfacing with a bone structure of a subject's spine, comprising:

a web structure [M] comprising a plurality of struts [E, R] joined at nodes [L, Q] to form a space truss [P] comprising a plurality of planar truss units [K, S], wherein the web structure is configured to interface with bone tissue [C], and wherein the plurality of planar truss units [S1, S2] are coupled to one another such that one or more planar truss units lie in a plane that is not substantially parallel to a plane of a planar truss unit that shares at least one strut with the one or more planar truss units;

and wherein one or more planar truss units comprises one or more curved or arced struts [RC] joined at nodes [Q]; and



wherein a diameter and/or length of the struts [E, R] and/or density of the web structure are predetermined such that when the web structure is in contact with the bone at least a portion of the struts create a microstrain in adhered osteoblasts, bone matrix, or lamellar tissue.



<p>Claim 2:</p> <p>The implant of claim 1, where in the diameter and/or length of the struts and/or density of the web structure is predetermined so that the struts, under load, create a microstrain, in adhered osteoblasts, bone matrix, or lamellar tissue, wherein the microstrain is within a range that stimulates an osteogenetic response.</p>	<p>See above for Claim 1.</p>
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148. On information and belief, NuVasive has had knowledge of the '137 patent at least as of the issue date of the '137 patent because since 2015 NuVasive had knowledge of 4WEB's 2015 IP portfolio and the application from which the '137 patent claims priority, and NuVasive routinely monitors patents that are issued in the field of spinal implants. Furthermore, NuVasive has knowledge that its use thereof has been unauthorized, and on information and belief has used, offered for sale and sold the Modulus implants in the United States including this District with the knowledge that the Modulus implants infringed at least claims 1-3, 11, 13- 17, 20, and 22-24 of the '137 patent, and with the specific intent that surgeons would use the Modulus implants in surgical procedures, thereby indirectly infringing at least claims 16, 17, 20, and 22-24 of the '137 patent. NuVasive provides surgeons with Modulus implants having indications for use and with instructions, tools, and assistance for surgically inserting Modulus implants adjacent bony

structures in humans as discussed above. In any event, NuVasive has had notice of its infringement of the '137 patent as of the filing date of this complaint.

149. As outlined above, under the totality of the circumstances, NuVasive's infringement of the '137 patent is willful from at least the date after NuVasive first learned of 4WEB's '137 patent and the dates NuVasive commenced commercial sale in the United States of each of its respective Modulus implants.

150. On information and belief, NuVasive has gained profits and market share by virtue of its infringement of the '137 patent.

151. 4WEB has sustained damages as a direct and proximate result of NuVasive's infringement of the '137 patent.

152. 4WEB is entitled to recover at least a reasonable royalty, and its lost profits, enhanced damages, costs and expenses and attorney fees, and all other relief allowed under the Patent Act.

153. 4WEB will suffer and is suffering irreparable harm from NuVasive's infringement of the '137 patent. 4WEB has no adequate remedy at law and is entitled to an injunction against NuVasive's continuing infringement of the '137 patent. Unless enjoined, preliminarily and permanently, NuVasive will continue its infringing conduct.

#### **COUNT TEN**

##### **(Infringement of the '756 Patent)**

154. Plaintiff 4WEB repeats and realleges as if fully set forth herein the allegations contained in all the preceding paragraphs ¶¶ 1 -153.

155. The '756 patent is valid and enforceable.

156. NuVasive's actions, as set forth herein, constitute patent infringement of the '756 patent under 35 U.S.C. § 271. More specifically, as set forth herein, NuVasive has infringed and continues to infringe one or more claims, including at least claims 1-3, 8-10, and 15 of the '756 patent under 35 U.S.C. § 271 by manufacturing, using, providing, selling, offering to sell, importing and/or distributing without authority the Modulus implants, and by inducing surgeons to implant Modulus implants into humans, such infringement occurring literally or by application of the doctrine of equivalents.

157. By way of example, the Modulus implants have common construction features that comprise an "implant for interfacing with a bone structure" having a web structure comprising "a plurality of struts joined at nodes to form a space truss," and "wherein the web structure is configured to interface with human bone tissue, and wherein the web structure comprises a space truss comprising two or more planar truss units," "wherein a density of the web structure is predetermined such that when the web structure is in contact with the bone at least a portion of the struts create a microstrain in adhered osteoblasts, bone matrix, or lamellar tissue" as required by independent claims 1 and 9 of the '756 patent, and when placed under load produces an osteogenetic response in the adhered osteoblasts, bone matrix, or lamellar tissue as required by claim 2, depending from claim 1 of the '756 patent. Research conducted at the University of Pennsylvania has verified that individual elements (struts) in a web structure having a plurality of space trusses as required by the claims of the '845 patent claims can be predetermined by selecting one or more of the density of the web structure, the diameter of the struts, and the length of the struts, to produce a microstrain in osteoblasts, bone matrix, or lamellar tissue that has adhered to the struts. The microstrain produces an osteogenetic response in the adjacent cellular material. This research was sponsored by 4WEB and published as Lee, S., et al., *Mechanobiology At Work*:

Physiologic Load Induced Strain Of 3d Printed Truss Element Amplifies Osteogenic Response off Human Mesenchymal Stem Cells Compared To Static Surface Feature Influence. Orthopedic Research Society Annual Meeting, Dallas, TX (2023). The aforementioned animations of the Modulus implants describe how the trusses of each of the Modulus implants are optimized, i.e., predetermined, by having the density of the web structure modified so as to provide an osteogenic response in the bone in which it is in contact with so as to induce bone growth and fusion to the Modulus implants.

158. By way of further example, NuVasive's Modulus XLIF implant meets each and every limitation of claim 2 of the '756 patent as shown in the chart below comparing claims 1 and 2 (with annotations added in brackets) to two screen shots taken from the aforementioned Modulus XLIF product animation, (at t=0:01:07 and t=0:01:12, respectively) a photograph taken of a Modulus XLIF product (with white triangle annotations added), and a series of six screen shots taken from the aforementioned Modulus XLIF product animation relating to optimization of the structure:

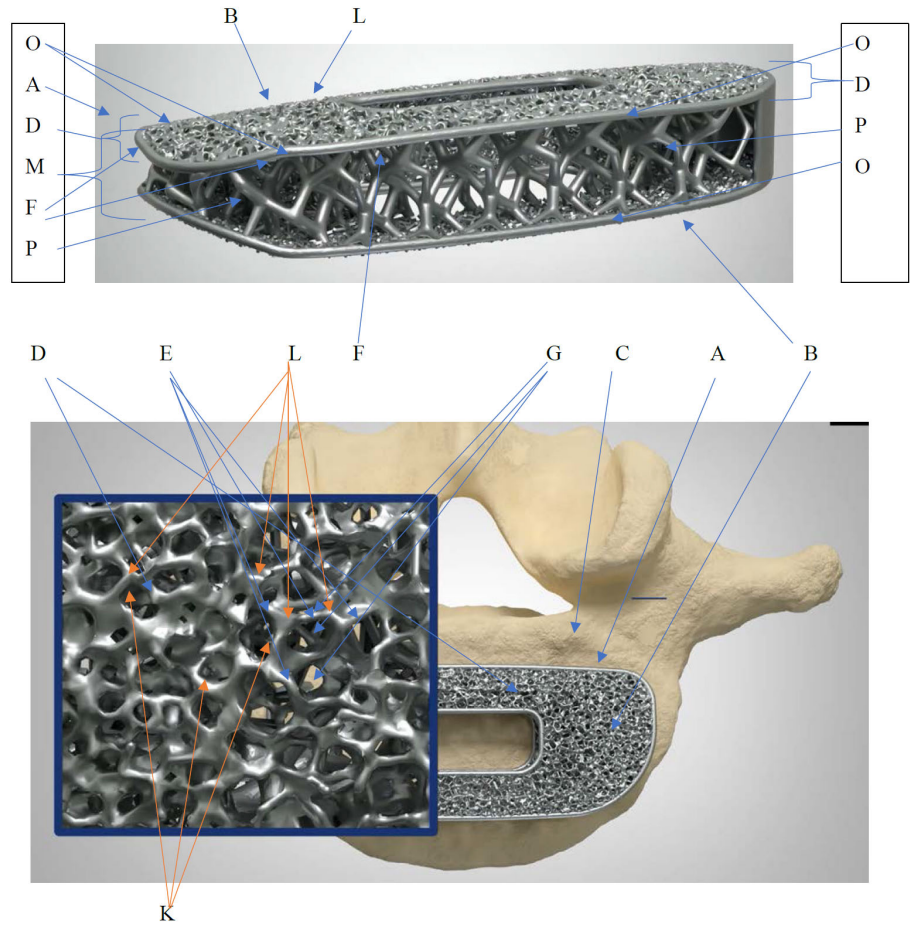
NuVasive's Modulus XLIF – '756 patent claim 1

Claim 1:

An implant for interfacing with a bone structure, comprising:

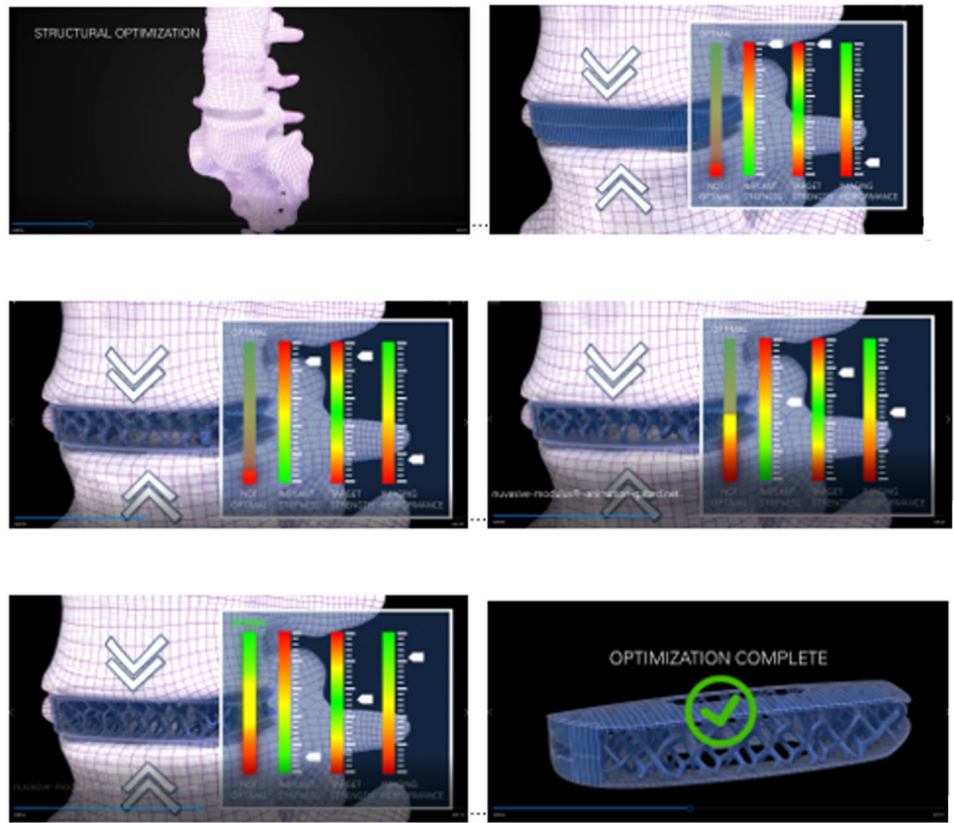
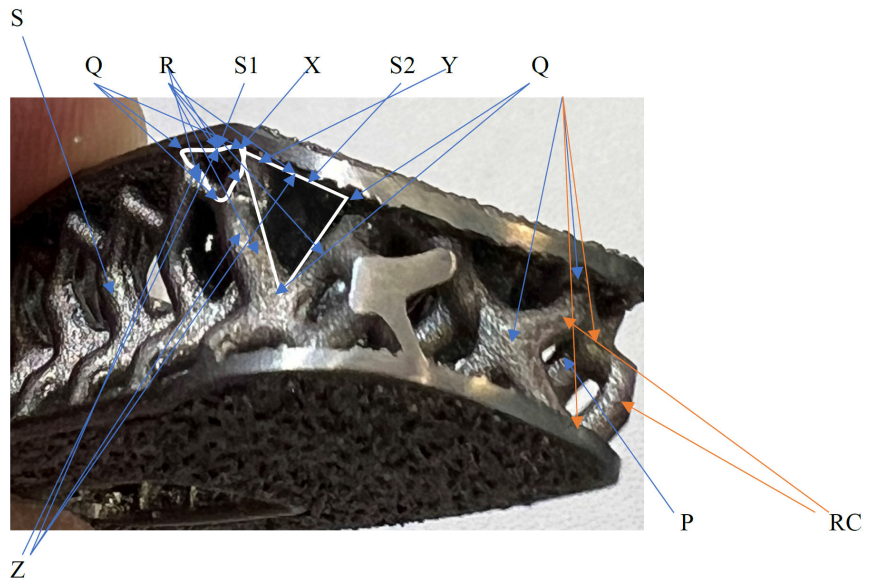
a web structure [M] comprising a plurality of struts [E, R] joined at nodes [L, Q], wherein the web structure is configured to interface with human bone tissue [C], and wherein the web structure comprises a space truss [P] comprising two or more planar truss units [S1, S2];

wherein a density of the web structure is predetermined such that when the web structure is in contact with the bone at least a portion of the struts create a microstrain in adhered osteoblasts, bone matrix, or lamellar tissue; and





wherein one or more of the planar truss units [S1, S2] are coupled to one another such that one or more planar truss units lie in a plane that is not substantially parallel to a plane of a planar truss unit that shares at least one strut with the one or more planar truss units.



<p>Claim 2:</p> <p>The implant of claim 1, wherein the density of the web structure is predetermined so that the struts, under load, create a microstrain, in adhered osteoblasts, wherein the microstrain is within a range that stimulates an osteogenetic response.</p>	<p>See above for Claim 1.</p>
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159. On information and belief, NuVasive has had knowledge of the ‘756 patent at least as of the issue date of the ‘756 patent because since 2015 NuVasive had knowledge of 4WEB’s 2015 IP portfolio and the application from which the ‘756 patent claims priority, and NuVasive routinely monitors patents that are issued in the field of spinal implants. Furthermore, NuVasive has knowledge that its use thereof has been unauthorized, and on information and belief has used, offered for sale and sold the Modulus implants in the United States including this District with the knowledge that the Modulus implants infringed at least claims 1-3, 8-10, and 15 of the ‘756 patent, and with the specific intent that surgeons would use the Modulus implants in surgical procedures, thereby indirectly infringing at least claims 9, 10 and 15 of the ‘756 patent. NuVasive provides surgeons with Modulus implants having indications for use and with instructions and tools for surgically inserting Modulus implants adjacent bony structures in humans as discussed above. In any event, NuVasive has had notice of its infringement of the ‘756 patent as of the filing date of this complaint.

160. As outlined above, under the totality of the circumstances, NuVasive’s infringement of the ‘756 patent is willful from at least the date after NuVasive first learned of

4WEB's '756 patent and the dates NuVasive commenced commercial sale in the United States of each of its respective Modulus implants.

161. On information and belief, NuVasive has gained profits and market share by virtue of its infringement of the '756 patent.

162. 4WEB has sustained damages as a direct and proximate result of NuVasive's infringement of the '756 patent.

163. 4WEB is entitled to recover at least a reasonable royalty, and its lost profits, enhanced damages, costs and expenses and attorney fees, and all other relief allowed under the Patent Act.

164. 4WEB will suffer and is suffering irreparable harm from NuVasive's infringement of the '756 patent. 4WEB has no adequate remedy at law and is entitled to an injunction against NuVasive's continuing infringement of the '756 patent. Unless enjoined, preliminarily and permanently, NuVasive will continue its infringing conduct.

#### **COUNT ELEVEN**

##### **(Infringement of the '226 Patent)**

165. Plaintiff 4WEB repeats and realleges as if fully set forth herein the allegations contained in all the preceding paragraphs ¶¶ 1 -164.

166. The '226 patent is valid and enforceable.

167. NuVasive's actions, as set forth herein, constitute patent infringement of the '226 patent under 35 U.S.C. § 271. More specifically, as set forth herein, NuVasive has infringed and continues to infringe one or more claims, including at least claims 1, 3, 4, 7, 9, and 15 of the '226 patent under 35 U.S.C. § 271 by manufacturing, using, providing, selling, offering to sell, importing and/or distributing without authority the Modulus ALIF product, and by inducing

surgeons to implant using fasteners (e.g., screws) Modulus ALIF products into humans, such infringement occurring literally or by application of the doctrine of equivalents.

168. By way of example, the Modulus ALIF product has construction features that comprise “an implant for interfacing with a bone structure” having a “web structure comprising a space truss comprising two or more planar truss units having a plurality of struts joined at nodes, wherein the space truss comprises planar truss units forming one or more polyhedron truss units” and “one or more cylindrical channels extending through the space truss, the one or more cylindrical channels having channel exits in at least two sides of the web structure” as required by claims 1 and 15 of the ‘226 patent. By way of further example, NuVasive’s Modulus ALIF implant meets each and every limitation of claim 1 of the ‘226 patent as shown in the chart below comparing claim 1 (with annotations added in brackets) to three screen shots (with annotations in white added to the first and second screen shots) taken from the aforementioned Modulus ALIF product animation (at t=0:21, 0:57, and 2:05, respectively):

**NuVasive's Modulus ALIF – '226 patent claim 1**

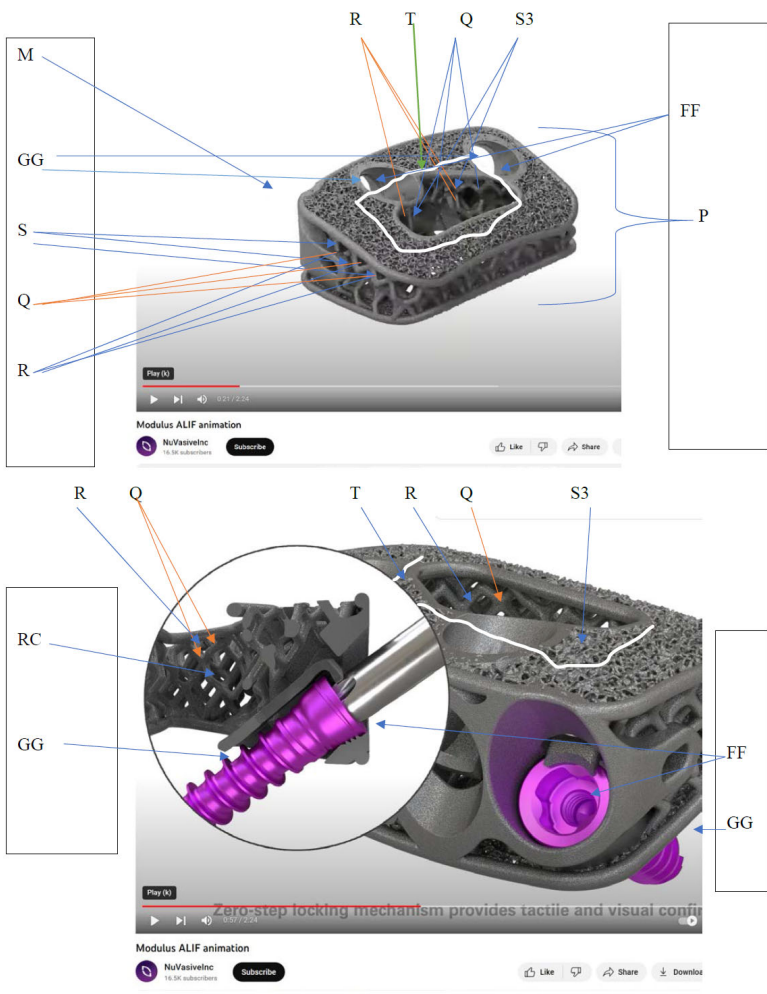
Claim 1:

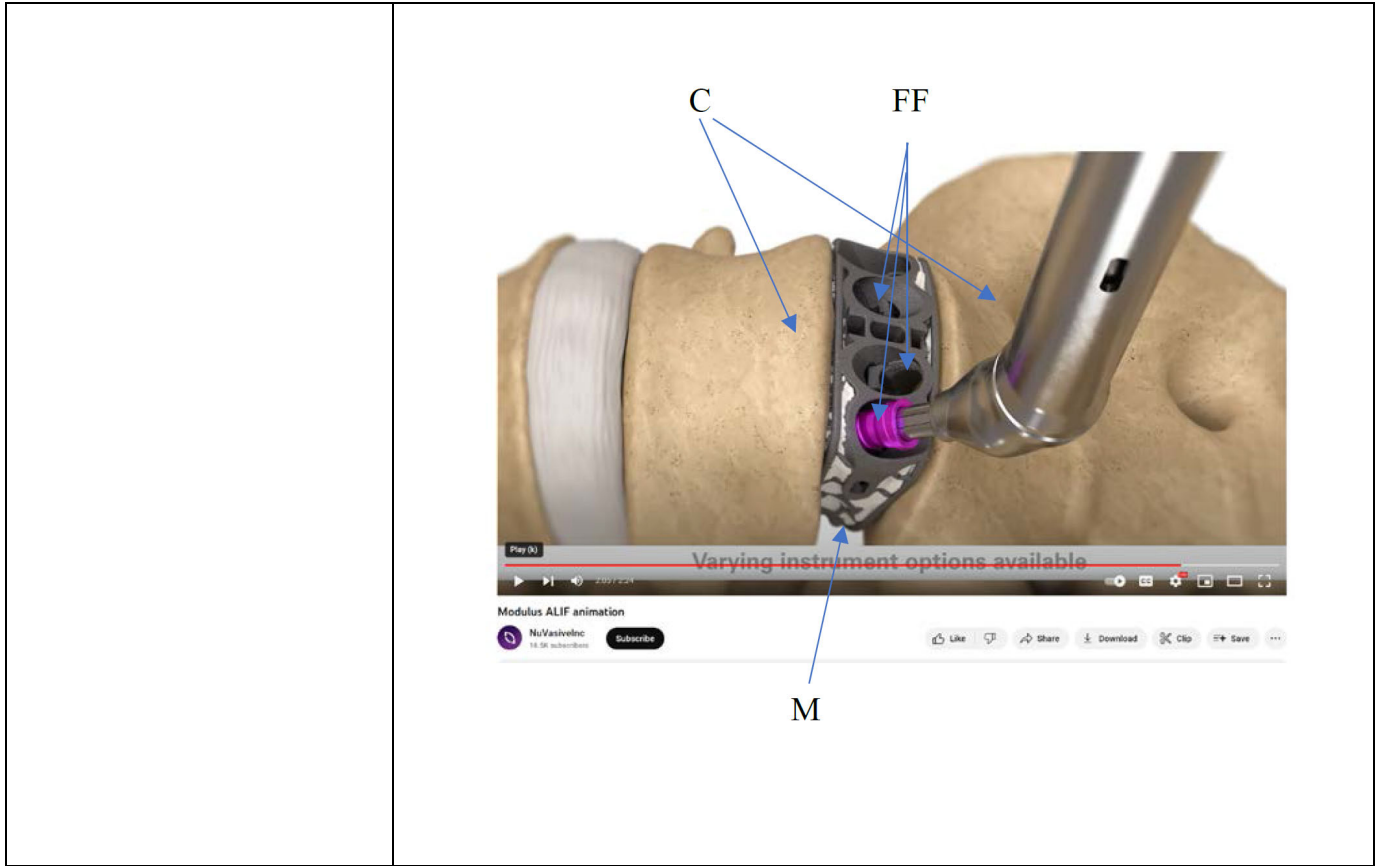
An implant for interfacing with a bone structure [C], comprising:

a web structure [M] comprising a space truss [P] comprising two or more planar truss units [S] having a plurality of struts [R] joined at nodes [Q], wherein the space truss comprises planar truss units forming one or more polyhedron truss units [S3], and

wherein at least one polyhedron truss unit [S3] of the web structure passes into a central portion [T] of the implant, and wherein the web structure is configured to interface with human bone tissue [C]; and

one or more cylindrical channels [FF] extending through the space truss, the one or more cylindrical channels having channel exits [GG] in at least two sides of the web structure.





169. On information and belief, NuVasive has had knowledge of the '226 patent at least as of the issue date of the '226 patent because since 2015 NuVasive had knowledge of 4WEB's 2015 IP portfolio from which the '226 patent claims priority, and NuVasive routinely monitors patents that are issued in the field of spinal implants. Furthermore, NuVasive has knowledge that its use thereof has been unauthorized, and on information and belief has used, offered for sale and sold the Modulus ALIF implant product in the United States including this District with the knowledge that the Modulus ALIF implant product infringed at least claims 1, 3, 4, 7, 9, and 15 of the '226 patent, and with the specific intent that surgeons would use fasteners to attach the Modulus ALIF implant product to a patient's bone in surgical procedures thereby indirectly infringing at least claims 9 and 15 of the '226 patent. NuVasive provides surgeons with Modulus ALIF implant products having indications for use and with instructions, tools, and assistance for

surgically inserting Modulus implants adjacent bony structures in humans as discussed above. In any event, NuVasive has had notice of its infringement of the '226 patent as of the filing date of this complaint.

170. As outlined above, under the totality of the circumstances, NuVasive's infringement of the '226 patent is willful from at least the date after NuVasive first learned of 4WEB's '226 patent and the dates NuVasive commenced commercial sale in the United States of each of its respective Modulus implants.

171. On information and belief, NuVasive has gained profits and market share by virtue of its infringement of the '226 patent.

172. 4WEB has sustained damages as a direct and proximate result of NuVasive's infringement of the '226 patent.

173. 4WEB is entitled to recover at least a reasonable royalty, and its lost profits, enhanced damages, costs and expenses and attorney fees, and all other relief allowed under the Patent Act.

174. 4WEB will suffer and is suffering irreparable harm from NuVasive's infringement of the '226 patent. 4WEB has no adequate remedy at law and is entitled to an injunction against NuVasive's continuing infringement of the '226 patent. Unless enjoined, preliminarily and permanently, NuVasive will continue its infringing conduct.

#### **PRAYER FOR RELIEF**

WHEREFORE, Plaintiff 4WEB respectfully requests that the Court grant the following relief:

- a. A judgment that Defendant NuVasive has infringed one or more claims of the '930 patent;

- b. A judgment that Defendant NuVasive has infringed one or more claims of the ‘516 patent;
- c. A judgment that Defendant NuVasive has infringed one or more claims of the ‘317 patent;
- d. A judgment that Defendant NuVasive has infringed one or more claims of the ‘421 patent;
- e. A judgment that Defendant NuVasive has infringed one or more claims of the ‘845 patent;
- f. A judgment that Defendant NuVasive has infringed one or more claims of the ‘823 patent;
- g. A judgment that Defendant NuVasive has infringed one or more claims of the ‘669 patent;
- h. A judgment that Defendant NuVasive has infringed one or more claims of the ‘235 patent;
- i. A judgment that Defendant NuVasive has infringed one or more claims of the ‘137 patent;
- j. A judgment that Defendant NuVasive has infringed one or more claims of the ‘756 patent;
- k. A judgment that Defendant NuVasive has infringed one or more claims of the ‘226 patent;
- l. A judgment that Defendant NuVasive’s infringement of the ‘930, ‘516, ‘317, ‘421, ‘845, ‘823, ‘669, ‘235, ‘137, ‘756, and ‘226 patents was willful;



- m. An order preliminarily and permanently enjoining NuVasive, its owners, subsidiaries, divisions, branches, affiliates, predecessors or successors in business, parents and wholly owned or partially owned entities, and any entities acting or purporting to act for or on behalf of the foregoing, including any agents, employees, representatives, officers, directors, servants, partners, and those persons in active concert or participation with them, from further acts of infringement of 4WEB's asserted '930, '516, '317, '421, '845, '823, '669, '235, '137, '756, and '226 patents;
- n. An award of damages to compensate 4WEB for NuVasive's infringement under 35 U.S.C. § 284;
- o. An Order awarding 4WEB a reasonable royalty;
- p. An award of all damages, including treble damages based on any infringement found to be willful, pursuant to 35 U.S.C. § 284;
- q. An Order awarding 4WEB pre-judgment and post-judgment interest on all applicable damages at the maximum rates permitted by applicable law;
- r. An accounting for all damages not presented at trial;
- s. An Order declaring this case exceptional and awarding 4WEB its reasonable attorney fees pursuant to 35 U.S.C. § 285; and
- t. Such other and further relief as the Court deems just and proper.

**JURY DEMAND**

4WEB demands a trial by jury on all issues so triable.

Dated: April 25, 2023



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