UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MEDTRONIC, INC.
Petitioner

v.

MOSKOWITZ FAMILY LLC.
Patent Owner

Patent No. 10,603,183

DECLARATION OF MR. BRAD CULBERT
IN SUPPORT OF PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 10,603,183

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I, Brad Culbert, declare as follows:

I. INTRODUCTION

1. I have been retained as an independent expert consultant by Medtronic, Inc. ("Petitioner") in this proceeding before the United States Patent and Trademark Office regarding U.S. Patent No. 10,603,183 ("the '183 patent") (Ex. 1001) assigned to Moskowitz Family LLC ("Patent Owner").[1] I have been asked to consider whether prior art references disclose or suggest the features recited in claims 1-4, 6, 8, 10-14, and 18-20 (the "challenged claims") of the '183 patent. My opinions are set forth below.

2. I am being compensated at my standard rate for services provided in this matter and reimbursed for reasonable expenses, including travel. My compensation is not contingent upon my opinions, the outcome of this matter, or any of the technical positions I present in this declaration.

II. BACKGROUND AND QUALIFICATIONS

3. My qualifications are stated more fully in my curriculum vitae ("CV"), which is attached as Exhibit 1003. My CV also lists patents and publications in

[1] In this Declaration, I refer to exhibits that I understand are to be attached to the petition for *Inter Partes* Review of the '183 patent.

which I am a named author and identifies parties on behalf of whom I have previously provided expert testimony.

4. I believe that I qualify as an expert in the field of intervertebral spinal implants, and as at least a person of ordinary skill in the art (*see infra* Section IV). Below is a summary of my education, work experience, and other qualifications.

5. I am a medical device engineer with substantial experience designing and developing spinal implants for treating damaged and diseased vertebrae.

6. I earned a Bachelor of Applied Science in Metals and Materials Engineering from the University of British Columbia in 1992, followed by a Master of Business Administration from California State University, Fullerton in 2001.

7. From 1994 to 1996, I worked as a manufacturing engineer and later served as the Angioplasty Product Team Leader at Vas-Cath, a medical device company specializing in dialysis and angioplasty catheters. In that role, I oversaw a multi-functional team of R&D, manufacturing, and quality engineers to improve the company's product lines.

8. From 1996 to 1998, I worked as an R&D Project Manager at CVD, a medical device company specializing in angioplasty balloons and stents. In that role, I designed and developed new catheters and stent delivery systems. I also contributed to the preparation and submission of regulatory documents for those products.

9. From 1998 to 2000, I worked as Senior R&D Project Manager at Endicor Medical, Inc, a medical device company specializing in percutaneous thrombectomy and atherectomy systems for cardiovascular and neurovascular applications. In that role, I designed and prototyped a new thrombectomy system, including developing animal models to satisfy FDA requirements.

10. From 2000 to 2010, I worked at Interventional Spine, Inc. (formerly known as Triage Medical, Inc.), a medical device company specializing in spinal and orthopedic trauma products. I was their first employee and started as Director of Engineering before being promoted to Vice President of R&D, and ultimately Chief Technology Officer. In these roles, I oversaw the design and development of a series of percutaneous spine procedures and devices, while leading and managing employees who were also considered persons of ordinary skill in the art.

11. With nearly 10 years of experience designing spinal fusion implants, I gained extensive familiarity with the surgical techniques used in these procedures. I attended many surgical conferences and lectures worldwide and was present for dozens of spinal fusion surgeries, collaborating closely with surgeons to develop implants, instruments, and surgical techniques. My work also included hosting hands-on cadaver laboratories, where I both assisted in surgical practice and trained new surgeons in the use of the implants, including performing cadaver surgeries myself as part of the training process.

12. Based on my experience at Interventional Spine, I am highly familiar with the anatomy of the spine and vertebrae, as well as intervertebral fusion devices designed for insertion into the intervertebral disc space. I also have extensive knowledge of supplemental fixation methods, such as anterior plates, used to secure implants after insertion, along with the surgical procedures and tools associated with intervertebral fusion devices.

13. Since 2010, I have operated a consulting business advising medical device companies, including those focused on spinal implant technology. My work spans a wide range of areas, including product development, regulatory approval, manufacturing, and intellectual property.

14. In addition to my professional experience and education discussed above, I am also listed as an inventor on over 30 U.S. patents relating to devices and methods for treating the spine. Many of my patents relate specifically to intervertebral spinal implants for insertion into the intervertebral space, including, for example, U.S. Patent Nos. 8,105,382; 8,568,481; and 10,390,963.

III. MATERIALS REVIEWED

15. The opinions contained in this Declaration are based on the documents I reviewed, my professional judgment, as well as my education, experience, and knowledge regarding spinal implants, including those that are inserted in the disc space between vertebrae.

16. In forming my opinions expressed in this Declaration, I reviewed the following materials:

Ex. 1001	U.S. Patent No. 10,603,183 ("the '183 patent")
Ex. 1004	File History for U.S. Patent No. 10,603,183
Ex. 1005	U.S. Patent Application Publication No. 2008/0033440 A1 to Moskowitz et al. ("Moskowitz 440")
Ex. 1006	U.S. Patent Application Publication No. 2008/0249569 A1 to Waugh et al. ("Waugh")
Ex. 1020	Phulchand Prithvi Raj, *Intervertebral Disc: Anatomy-Physiology-Pathophysiology-Treatment*, 8(1) PAIN PRACT. 18 (2008)
Ex. 1021	Fabio Galbusera et al., *Ageing and degenerative changes of the intervertebral disc and their impact on spinal flexibility*, 23(3) EUR. SPINE J. 324 (2014)
Ex. 1022	Dil Patel et al., *Interbody options in lumbar fusion*, 5(1) J. SPINE SURG. S19 (2019)
Ex. 1030	U.S. Patent No. 6,716,247 to Michelson ("Michelson '247")
Ex. 1043	File History for U.S. Patent No. 11,903,849
Ex. 1044	U.S. Patent No. 9,889,022 to Moskowitz et al. ("the '022 patent")
Ex. 1047	U.S. Patent No. 6,342,074 to Simpson ("Simpson")
Ex. 1048	U.S. Patent No. 11,903,849 to Moskowitz et al. ("the '849 patent")
Ex. 1049	U.S. Patent No. 6,972,019 to Michelson ("Michelson 019")
Ex. 1059	Patent Owner's Infringement Claim Charts, Exhibit G1, *Moskowitz Family, LLC v. Medtronic, Inc.*, No. 0:25-cv-00769 (D. Minn.), served October 30, 2025
Ex. 1060	Office Action citing Waugh in related U.S. Patent Application No. 13/418,335 (September 9, 2013)

Ex. 1062	Patent Owner's Preliminary Response, *Globus Medical, Inc., v. Moskowitz Family LLC*, IPR2020-01308 (October 28, 2020)
Ex. 1063	U.S. Patent Application Publication No. 2003/0208275 A1 to Michelson ("Michelson '275")

17. I also considered any other documents and materials I refer to in this Declaration.

18. My opinions have also been guided by my appreciation of how a person of ordinary skill in the art (a "POSITA") would have understood the state of the art, the prior art, and the claims and the specification of the '183 patent at the time of the alleged invention, which I discuss below.

19. I have been asked to consider that the time of the alleged invention of the '183 patent was late-2000s (including the time leading up to May 22, 2009).

20. Based on my experience and expertise, it is my opinion that certain references disclose or suggest all of the features recited in claims 1-4, 6, 8, 10-14, and 18-20 of the '183 patent, as I discuss in detail below.

IV. PERSON OF ORDINARY SKILL IN THE ART

21. I am familiar with the level of ordinary skill in the art regarding the '183 patent in the late-2000s. Considering the '183 patent, the technology, the educational level and experience of workers in the field relating to the patent, and problems and solutions in that field, and drawing on my own experience, I believe a POSITA at the time of the alleged invention (late-2000s, including the time leading

up to May 22, 2009) would have a bachelor's or equivalent degree in Mechanical Engineering or a related discipline (*e.g.*, biomechanics, biomedical or metals and materials engineering), and at least five years of experience. A person could have qualified as a POSITA with some combination of (a) more formal education and less technical or professional experience in the listed fields, or (b) less formal education and more technical or professional experience in the listed fields. In other words, more education can supplement practical experience and *vice versa*. For example, a POSITA could have an advanced degree, in the technical disciplines provided above, or a Doctor of Medicine, and at least two years of experience in the subject areas provided above.

22. My opinions in this Declaration regarding the '183 patent and the prior art (including the state of the art) are from the perspective of a POSITA during the relevant timeframe, as I defined above.

V. TECHNICAL BACKGROUND

23. Below, I present a brief overview of the anatomy of the spine and intervertebral fusion devices, including several advancements in the field. The functionalities and concepts I describe below in this technical background section reflect the state of the art that a POSITA would have understood prior to and at the time of the alleged invention of the '183 patent. I rely on and incorporate as applicable (even if not expressly mentioned below) the following disclosures and

opinions to support my opinions in this Declaration, including those opinions relating to how the prior art discloses or suggests the subject matter of the challenged claim of the '183 patent, as I explain below in Section VIII and in the Appendix. The concepts below would have been within the knowledge and mindset of a POSITA during the relevant time frame (late-2000s, including the time leading up to May 22, 2009).

A. Anatomy of the Spine and Intervertebral Discs

24. The human spine, or spinal column, is the body's central support structure that protects the spinal cord and allows flexibility for movement. (*See* Ex. 1020, 18-19.) It is composed of a series of bones called vertebrae. Most vertebrae are separated by joints known as intervertebral discs. (*See* Ex. 1021, 3.) These discs act as cushions, absorbing shock and allowing flexibility for movement. (*See, e.g.,* Ex. 1047, 1:46-61.) The figure below "shows a lateral view of a portion of a spinal column 10, illustrating a group of adjacent upper and lower vertebrae V1, V2, V3, V4 separated by natural intervertebral discs D1, D2, D3." (Ex. 1006, [0025].)

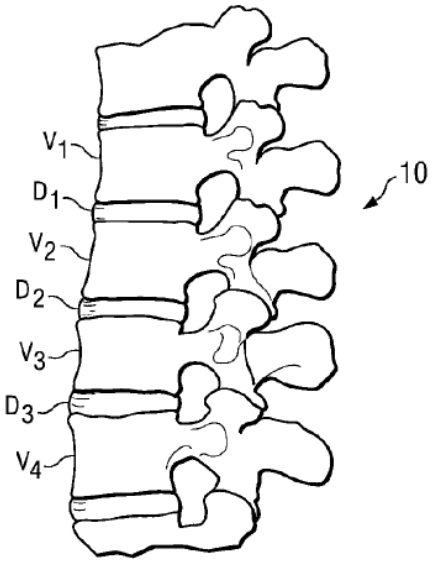


Fig. 1

(*Id*., Fig. 1.)

25. The intervertebral discs, however, can become damaged due to various reasons, including degenerative diseases, aging, trauma, and mechanical stress. (*See* Ex. 1020, 23-26; *see also* Ex. 1021, 2-3.) Damaged discs can bulge and lose height, which, in turn, can cause compression of nearby nerves, reduce the discs' ability to absorb mechanical loads, and lead to decreased mobility. (*See* Ex. 1020, 26-27.) When spinal disc injury is severe, surgical intervention may be needed.

B. Intervertebral Fusion Devices

26. Surgical intervention for severely damaged discs may involve a discectomy, in which the surgeon removes all or part of the damaged disc, followed by placement of an implant together with bone graft material that can fuse adjacent vertebrae through the implant. (*See* Ex. 1020, 32-37; *see also* Ex. 1022, 20.) These

implants, known as intervertebral or interbody fusion devices, are positioned between adjacent vertebrae and may employ various components, such as screws and bone graft material, to achieve fusion with the vertebrae. (*See* Ex. 1022, 19-21.) As shown in the figure below from Waugh, a damaged disc can be removed and replaced by an "implantable device . . . [s]ized to fit the disc space height in a manner similar to a natural intervertebral disc . . . ." (Ex. 1006, [0027].)

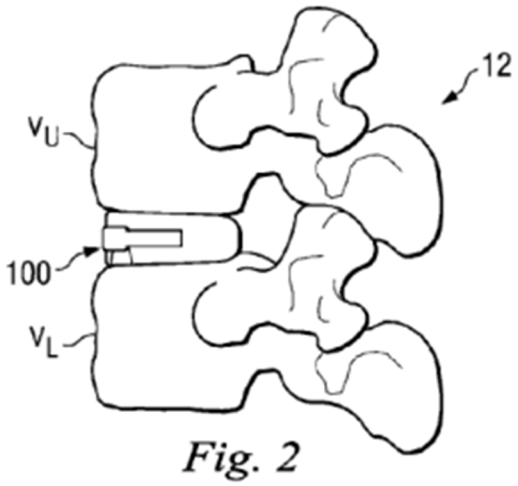
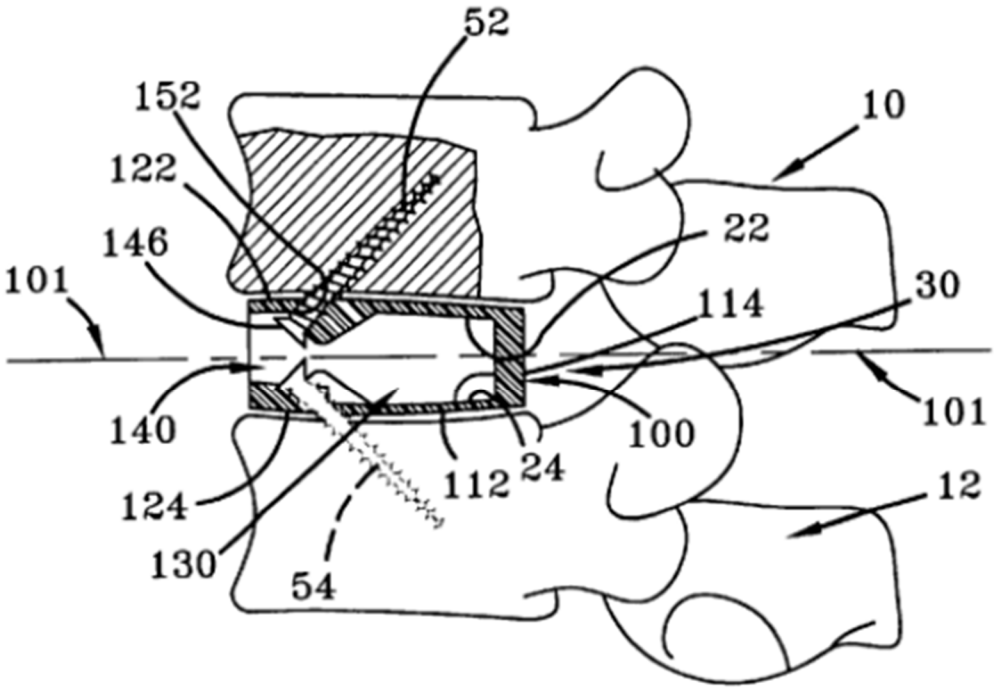


Fig. 2

(*Id*., Figs. 2.)

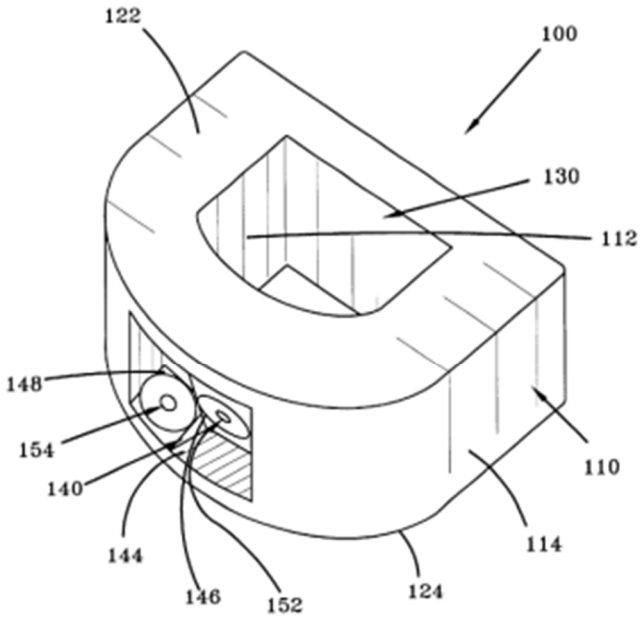
27. An example of such an implantable device is found in U.S. Patent No. 6,342,074 ("Simpson") (Ex. 1047). Simpson was filed in April 2000, almost five years before the earliest claimed 2005 priority date listed on the face of the '183 patent. Simpson discloses an "implant 100" inserted between two adjacent vertebrae 10 and 12. (Ex. 1047, 7:45-60, Figs. 1, 2.) The implant is held in place by "orthopedic screws 52, 54." (*Id*., 7:56-60.)



FIG–2

(*Id*., Fig. 2.)

28. As shown in figure 3 below, Simpson's implant has a cage-like structure with an "an interior chamber 130 that can be filled with bone graft material (not shown) for extending between and effecting fusion of central cancellous portions of the endplates 22, 24" of vertebrae 10 and 12. (*Id*., 8:1-4, Fig. 3.)



FIG–3

(*Id.*, Fig.3.)

29. Thus, intervertebral fusion devices that employed screws and bone graft to fuse adjacent vertebrae were well-known before the alleged invention of the '183 patent.

C. Fitting an Implant Within the Intervertebral Disc Space

30. Simpson's implant, as shown in figure 2 above, sits completely within the intervertebral disc space. Simpson's choice in seating the implant completely within the disc space was based on the known fact that implant parts protruding outside of the disc space could engage with vessels and tissues located outside the disc space. (Ex. 1047, 8:44-48.) Simpson further discloses that the implant "[is] provided in a variety of sizes and thickness," which a POSITA would have

understood allows fitting the implant inside differing sizes of the intervertebral disc space. (*Id*., 9:64-65, 10:20-23.)

31. Other patents similarly recognized the need to ensure that the cage-like implant remains within the disc space. Michelson 019 noted that prior implants have a "flanged portion [that] extends outside of the disc space which may not be desirable in all circumstances." (Ex. 1049, 1:55-57.) According to Michelson 019, "the present invention allows bone screws of the optimal diameter to be inserted into and in part through the implant and into the adjacent vertebral bodies ***without the necessity of a portion of the implant itself extending beyond the disc space and outside of the spine***." (*Id*., 2:39-43 (emphasis added).) Michelson 019 further discloses that "[a] further advantage is the accommodation of the trailing ends of bone screws within the depth of the disc space to reduce the risk of damage to adjacent delicate structures, including but not limited to proximate vascular and neurological structures within the body. Parts of implants extending beyond the depth of the disc space may have a risk of damaging these adjacent delicate structures." (*Id*., 4:30-36.) Michelson 019's implant is shown in figure 6 below as completely confined in the disc space.

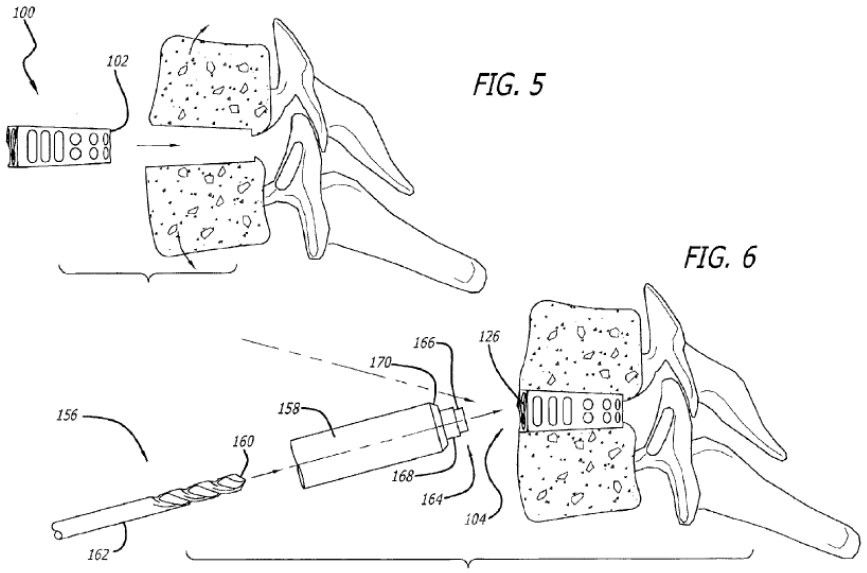


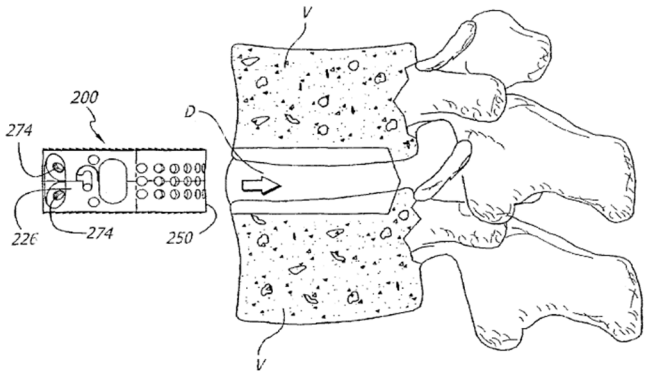
FIG. 5

FIG. 6

(*Id*., Fig. 5-6.)

32. In Michelson ’247, a spinal implant is disclosed for insertion “across a disc space between two adjacent vertebral bodies of a human spine,” with “the height of the implant . . . at least that of the height of the restored disc space into which it is inserted.” (Ex. 1030, 2:2-7, 2:61-62.) As shown in the figures below, Michelson ’247’s implant resides entirely in the disc space between adjacent vertebrae.

FIG. 24



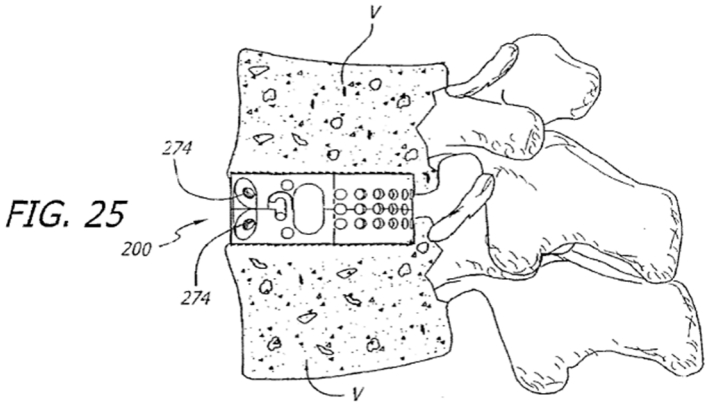


FIG. 25

(*Id.*, Figs. 24-25.)

33. Other patent literature also recognized the benefits of placing the intervertebral cage completely within the disc space. Waugh, for example, discloses an "implantable device 100" in figure 4 (reproduced below) in which the "anchor members 106 [*i.e.*, screws] . . . extend through the anchor member apertures 126 in the front surface 116 and upper and lower surfaces 108, 110 and out the hollow center 118 and into the bearing endplates of the vertebrae 14, 16," thereby securing the implant entirely within the disc space. (Ex. 1006, [0028]-[0030].)

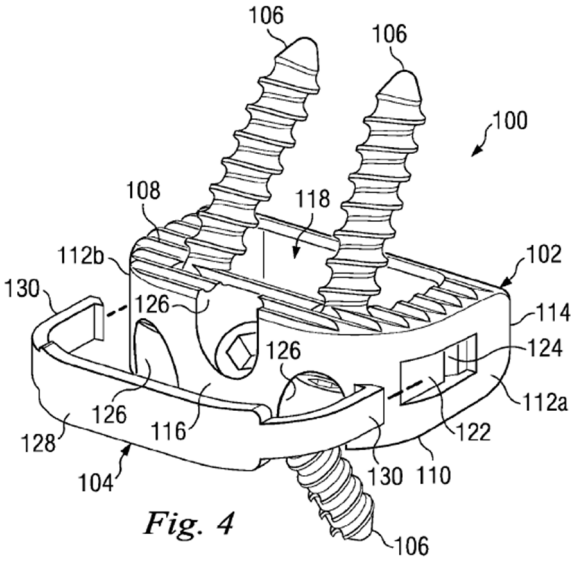


Fig. 4

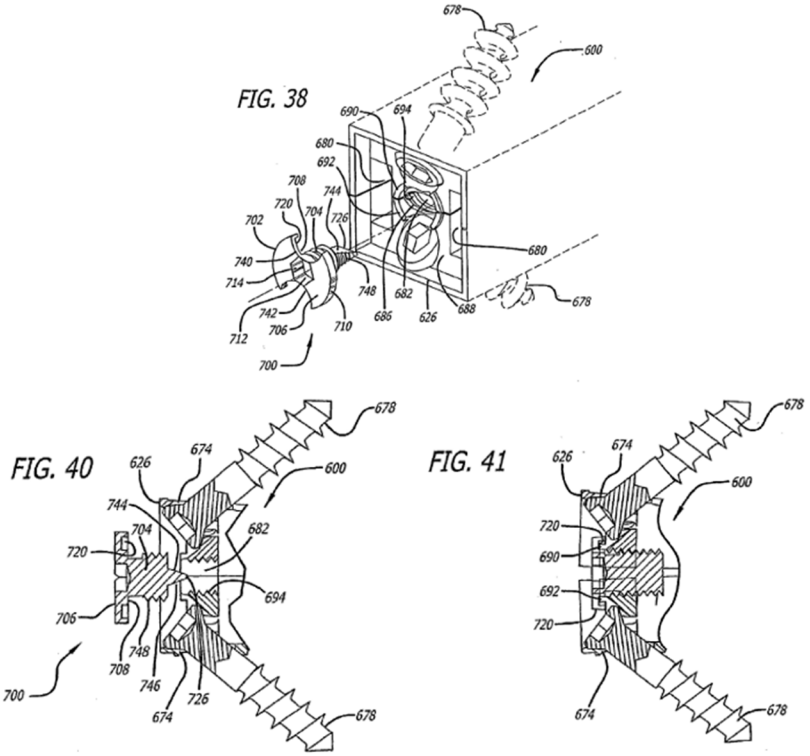
(*Id*., Fig. 4.)

34. Waugh recognizes that by placing the implantable device "entirely within the disc space," the surgeon "reduces [the] chance of creating additional patient trauma that can occur if organs and tissue are able to easily contact the implantable device outside the disc space." (*Id*., [0036].)

D. Screw Locking Mechanisms

35. For implants such as Simpson's that are held in place by bone screws, it was known to use mechanisms to ensure that the screws are secured in the implanted position and do not back out from the screw guides. For example, Michelson '275 (Ex. 1063) discloses embodiments of an interbody spinal fusion implant with a locking end cap that "locks bone screws to the implant by blocking the exit path of the bone screws in a direction opposite to the direction of insertion." (Ex. 1063, [0144].) One such embodiment of Michelson '275 is shown in figures

38 and 40-41, which depict an interbody spinal fusion implant 600 and locking end cap 700. (*Id.*, [0153].) As shown below, figure 38 is a front perspective view of implant 600 and locking end cap 700, figure 40 is a side view of the implant 600/end cap 700 prior to the end cap being fitted in the implant 600, and figure 41 is a side view of the implant 600/end cap 700 after the end cap 700 is fitted in the implant 600.



(*Id.*, Fig. 38 (top), Fig. 40 (bottom left), Fig. 41 (bottom right).)

36. As shown above, implant 600 includes a threaded opening 682 at the implant's trailing end 626. (*Id.*, [0156].) The end cap 700 includes a head 702 that fits into an indented portion of the implant's trailing end 626 and stem 704 that fits into the threaded opening 682 of the implant. (*Id.*, [0154]-[0155]). Once the end

cap 700 is fitted into the implant, bone screws 678 are inserted into screw guides of implant 600 through upper and lower cutout portions 740, 742 of the end cap head 702. (*Id.*, [0154].) "Once bone screws 678 are inserted, cap 500 may be rotated such that at least a portion of head 702 covers each of screws 678." (*Id.*) Thus, screws 678 are locked and restricted from pulling out or backing out of their screw guides.

37. Similarly, as shown below, Waugh discloses a spinal disc implant 102 with a "face plate 104 [] configured to extend across at least a portion of the anchor member apertures 126 and physically block anchor member back-out." (Ex. 1006, [0031].) Waugh discloses that the face plate 104 is provided "[t]o reduce the chance of the anchor members 106 backing out of the vertebral bodies over time and causing the implant member 102 to become loose." (*Id.*)

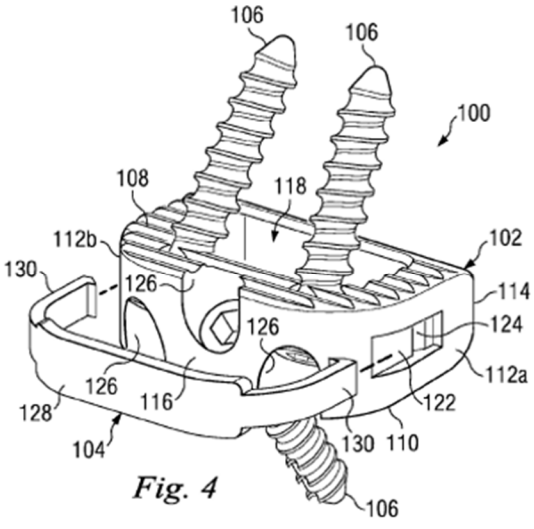


Fig. 4

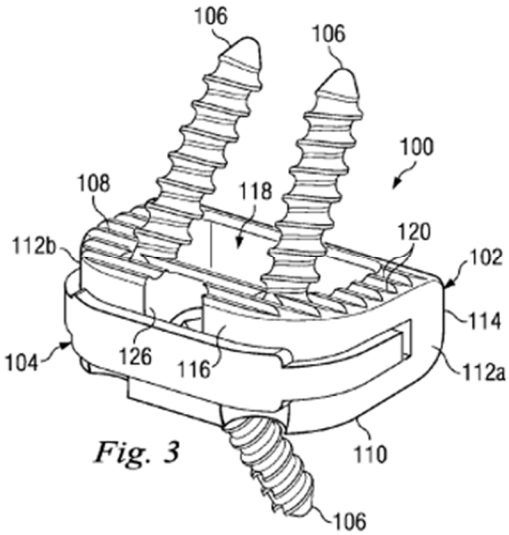


Fig. 3

(*Id.*, Fig. 4 (left), Fig. 3 (right).)

VI. THE '183 PATENT

38. The '183 patent generally relates to spinal devices, expandable and non-expandable, designed for insertion into the disc space between adjacent vertebrae. (*See generally* Ex. 1001.) As exemplified in figures 2(A)-2(D) (reproduced below), the '183 patent discloses a "screw/cage apparatus" 10 with bi-directional screws 12, 14, and a screw locking bracket which partially covers the screws. (*Id.*, 7:9-22, 8:43-48.) The screw box 10 also has a hollow space for receiving bone graft filling. (*Id.*, 7:22-23.) These bi-directional screws allow the screw box to be attached to adjacent vertebrae. (*Id.*, 7:15-39.)

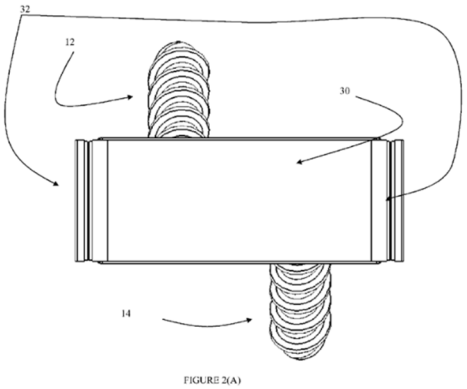


FIGURE 2(A)

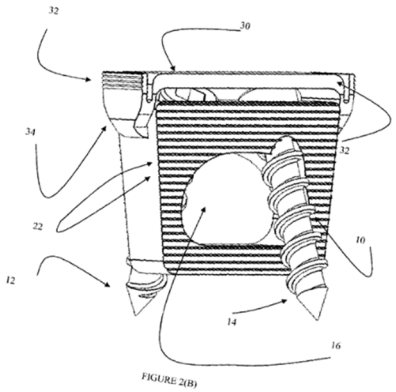


FIGURE 2(B)

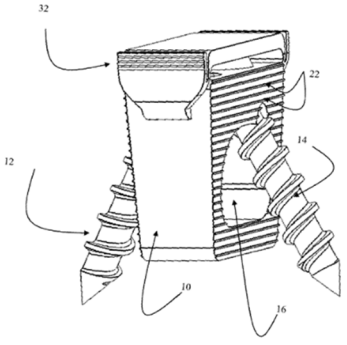


FIGURE 2(C)

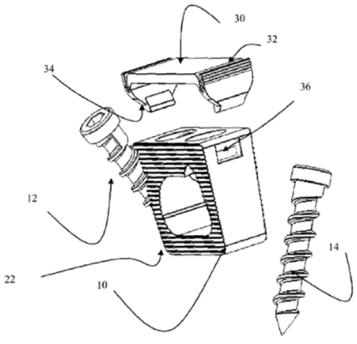


FIGURE 2(D)

(*Id.*, Figs. 2(A)-2(D).)

39. Claim 1 recites a spinal implant with the above-identified features, but also recites a host of limitations that are not described anywhere in the specification of the ’183 patent. To the extent they are even supported by the ’183 patent under 35 U.S.C. § 112, they can only be inferred from the figures. For example, claim 1 recites “an internal screw guide having a screw entrance portion and an internal bore portion.” (Ex. 1001, 20:22-23.) There is, however, no discussion of any “internal bore” in the specification or “internal screw trajectory guides” with any “internal bore.” As another example, claim 1 also recites that the apparatus comprises “a top wall, a bottom wall, and sidewalls.” (*Id.*, 20:19.) The specification, however, does not textually identify any structure as a “top wall,” “side wall,” “bottom wall.” Likewise, the specification does not explain or identify the claimed “entry opening” and “exit opening.”

40. The ’183 patent claims priority to U.S. Application No. 12/471,340 (“the ’340 application”), filed on May 22, 2009. No application predating the ’340 application in the ’183 patent priority chain discloses a screw/cage apparatus with two opposing slots and a screw locking bracket that inserts into the slots, as recited in each challenged claim, and described above with reference to figures 2(A)-2(D). For example, no application predating the ’340 application discloses “**a first slot**,” “**a second slot**,” “**a screw locking bracket having a first end portion sized and**

positioned to be inserted in the first slot," and "**a second end portion sized and positioned to be inserted in the second slot**," as recited in claim 1.

VII. CLAIM CONSTRUCTION

41. I understand that when considering the meaning of patent claims, one must consider the language of the claims, the specification, and the prosecution history of the patent. I also understand that claim terms are typically given their ordinary and customary meanings as would have been understood by a POSITA at the time of the invention for the patent. For purposes of my opinions in this Declaration, I have not expressly construed any claim term, other than those identified below, because the prior art discloses or suggests each claim limitation under any reasonable construction, particularly in view of Patent Owner's infringement contentions (*see* Ex. 1059). The terms I have identified below recite the phrase "means" for performing certain claimed functions. It is my understanding that the "means" should be construed as the corresponding structure in the specification.

42. **Claim 13** includes a means-plus-function limitation, *i.e.*, "means for fusing superior and inferior vertebral bodies in conjunction with the intervertebral cage." **Claims 6 and 14** includes a similar means-plus function limitation, *i.e.*, "means for fusing superior and inferior lumbar vertebral bodies in conjunction with the intervertebral cage." The specification discloses that "[t]he superior and inferior

surfaces or edges of the lumbar cage 10 can include ridges 22 to facilitate integration and fusion with superior and inferior vertebral bodies." (Ex. 1001, 7:36-39.) Figure 2C below shows ridges 22 on the surface of lumbar cage 10. Thus, the corresponding structure for the claimed "means" is ridges that facilitate integration and fusion with superior and inferior vertebral bodies.

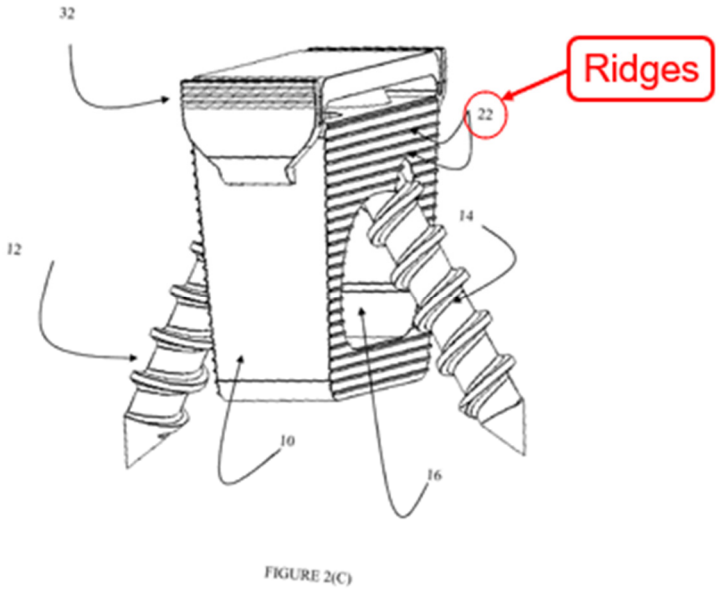


FIGURE 2(C)

(*Id*., Fig. 2C (annotated).)

VIII. THE PRIOR ART

43. I provide a detailed explanation of my opinions on each element of the challenged claims in the Appendix. In this section, I address the relevant disclosure of Moskowitz 440, Waugh and Michelson 019, as well as concepts known in the art at the time of the alleged invention. I also address some of the key issues.

A. Moskowitz 440

1. Overview

44. Moskowitz 440 generally relates to spinal devices, expandable and non-expandable, designed for insertion into the disc space between adjacent vertebrae. (*See generally* Ex. 1005.) As exemplified in figures 2A-2C, Moskowitz 440 discloses a "screw box" 200 with "bi-directional fixating transvertebral screws" 201, 202. (*Id*., [0065].) The screws engage and penetrate the vertebral bodies above and below the disc space to link, interlock, and eventually biologically fuse the vertebrae. (*Id.*, [0009].)

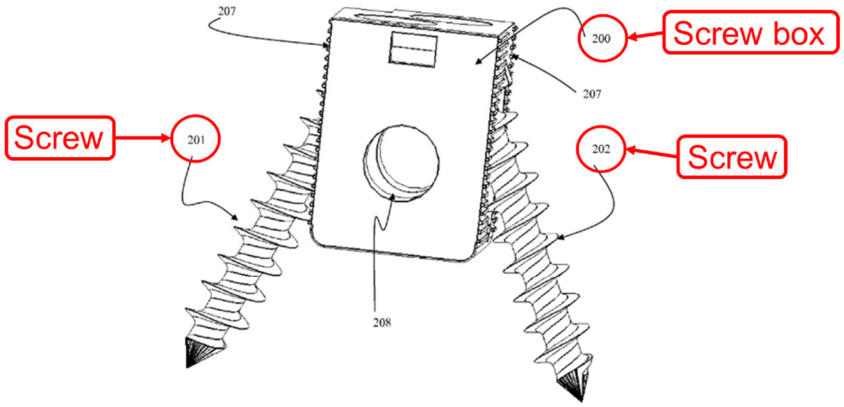


Fig. 2A

(*Id.*, Fig. 2A (annotated).)

45. Screws 201 and 202 are oriented in opposing directions, with one screw designed to penetrate a superior vertebra, and the other to penetrate an adjacent,

inferior vertebra. (*Id*., [0010].) To facilitate screw placement, screws 201, 202 sit within "internalized drill guides." (*Id*., [0065], [0093].)

2. Moskowitz 440 Discloses "Screw Entrance Portion[s]" That Are "Larger Than and Coaxial With the Internal Bore" and "Formed at Least Partially in a Top Surface of the Top Wall as Viewed From the Top"

46. Limitation [1.c] requires that "**the screw entrance portion is larger than and coaxial with the internal bore and is formed at least partially in a top surface of the top wall as viewed from the top of the intervertebral cage**."[2] Moskowitz 440 discloses this limitation, as I explain below.

47. As discussed in Appendix [1.a], screw box 200 comprises a "**top wall**." The outermost surface of the "**top wall**" is a "**top surface**." As discussed in Appendix [1.b], screw box 200 has two internal screw guides that are sized to allow for insertion of screws 201 and 202, with the **screw entrance portion** housing the screw head, and the **internal bore** designed to fit the threaded portion of the screw.

48. As shown in figure 2C below, the screw entrance portions cut through this outer "**top surface**" as seen from the top of the implant. (Ex. 1005, [0040] (figure 2C is a superior perspective view).) Moskowitz 440 thus discloses "**the**

[2] From here onwards, I bold all claim language and show any special emphasis in italics.

screw entrance portion . . . is formed at least partially in a top surface of the top wall as viewed from the top."

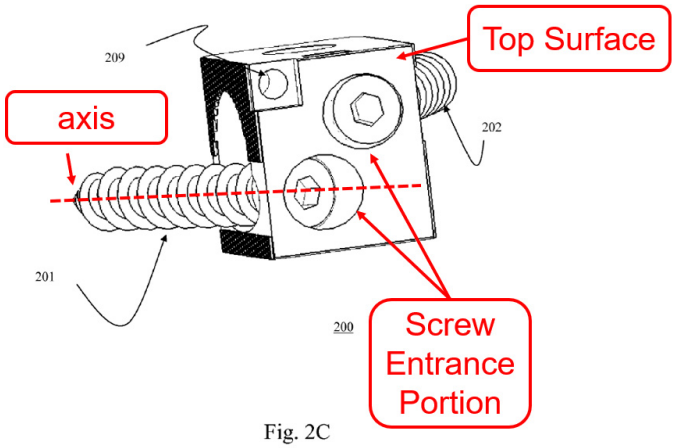


Fig. 2C

(Ex. 1005, Fig. 2C (annotated).) Moreover, a POSITA would have also understood that the different portions of the screw guide are aligned about a central axis of the screw as shown in figure 2C above, *i.e.*, "**the screw entrance portion**" must be **"coaxial with the internal bore**."[3]

49. Moskowitz 440 also discloses that the "**the screw entrance portion is larger than . . . the internal bore**" in the sense that the circumference of the screw entrance portion is larger than the circumference of the internal bore. For example, in figure 2C the screw is inserted at an angle relative to the top surface, which requires the **screw entrance portion**, which opens on a flat top surface, to be larger

[3] There is no discussion of an "**internal bore**" or the claimed "**coaxial**" aspect in the text of the '183 patent.

in circumference than the screw body, and therefore, larger than the **internal bore**. While figures 2A-2C do not depict the implant with screws 201, 202, removed, Moskowitz 440 provides an embodiment in figures 1A-1E where the entire structure of the screws is visible.

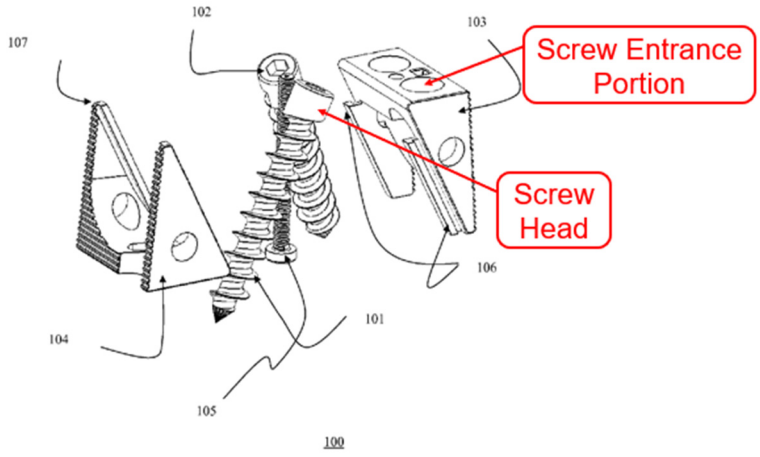


Fig. 1D

(Ex. 1005, Fig. 1D (annotated).)

50. Like box 200, box 100 also includes screw guides with screw entrance portions designed to allow insertion of transvertebral screws. (*Id*., [0064]-[0065].) During IPR2020-01308 of U.S. Patent No. 9,889,022, which has the same specification and figures as Moskowitz 440 (*compare* Ex. 1044, Figs. 1A-1E, *with* Ex. 1005, Figs. 1A-1E), Moskowitz stated that figures 1A-1E of the '022 patent (which are identical to figures 1A-1E of Moskowitz 440) disclose a "counterbore

that is larger than and coaxial with the internal bore." (Ex. 1062, 8-9.[4]) Thus, Moskowitz confirmed that figures 1A-1E of Moskowitz 440 disclose a "**screw entrance portion**" that is "**larger than . . . the internal bore**."

51. A POSITA would have understood that the screws, screw entrance portions, and internal bore portions in the figure 2A-2C embodiment are similar, if not identical, in form and function to those in the figure 1A-1E embodiment. For example, screws 101, 102, and screws 201, 202 are all BDFT screws that extend through respective screw boxes in opposing directions, to facilitate bi-directional transvertebral fusion. (Ex. 1005, [0009], [0062], [0064]-[0065], Fig. 1A, Fig. 2A.) Moskowitz 440 also teaches that the same surgical method is used for screw boxes 100 and 200, and that in both instances internal screw guides assist with screw placement. (*Id.*, [0086], [0089]-[0090], [0093] ("One, two or three screw box embodiments 100, 200, 300 (I-III) or a 2 in I construct can be placed. The screw placement is facilitated by the internal screw guides.").) Notably, Moskowitz 440 does not point out any differences in the screws or screw guides across the figures

[4] The term "counterbore" appears nowhere in the '022 patent specification but is synonymous with "screw entrance portion" because the "counterbore," like the "screw entrance portion" accommodates a screw head of the screw member. (*See* Ex. 1044, claim 37.)

1A-1E and figures 2A-2C embodiments. Thus, from the disclosures in figures 1A-1D and elsewhere in the specification, a POSITA would have understood that figures 2A-2C additionally disclose a "**screw entrance portion** [that] **is larger than and coaxial with the internal bore.**"

52. I further describe this aspect in my analysis below for limitation [1.o]. (*See* Appendix 1[o].)

B. Waugh

1. Overview

53. Waugh is titled "Implant Face Plates" and discloses "an implantable medical device" that can be used to replace the natural spinal disc that is affected due to "injury, degradation, disease or the like." (Ex. 1006, [0002], [0006], [0027].)

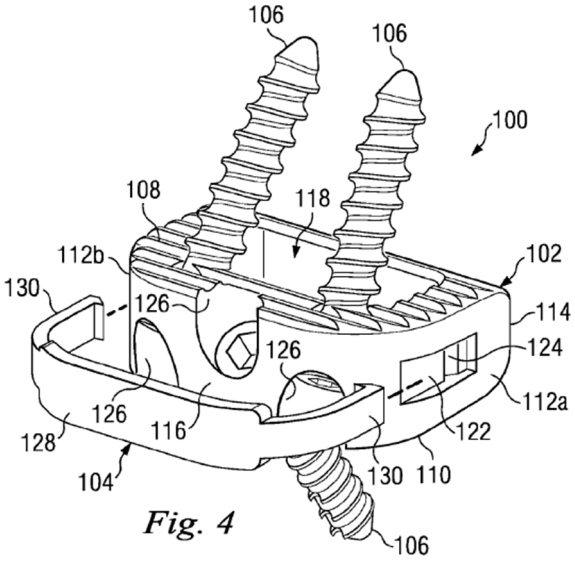


Fig. 4

(*Id*., Fig. 4.)

54. As shown in figure 4 above, an "implantable device 100" includes "an implant member 102, a face plate 104, and anchor members 106." (*Id*., [0028].) The "anchor members 106," (*i.e.*, screws), "extend through the anchor member apertures 126 in the front surface 116 and upper and lower surfaces 108, 110 and out the hollow center 118 and into the bearing endplates of the vertebrae 14, 16," thereby securing the implant entirely within the disc space. (*Id*., [0030].)

55. Waugh further discloses that a "face plate 104 is configured to extend across at least a portion of the anchor member apertures 126 and physically block anchor member back-out." (*Id.*, [0031].) The face plate 104 is provided "[t]o reduce the chance of the anchor members 106 backing out of the vertebral bodies over time and causing the implant member 102 to become loose." (*Id.*)

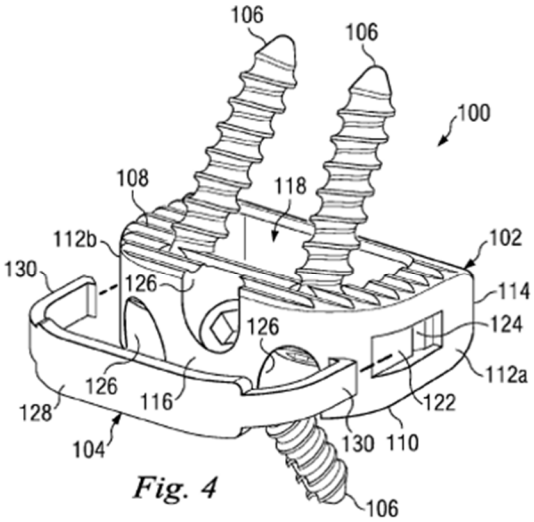


Fig. 4

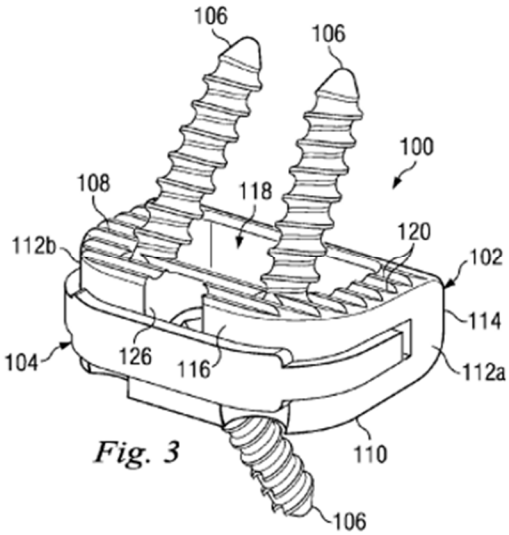


Fig. 3

(*Id*., Fig. 4 (left), Fig. 3 (right).)

56. Before filing the '183 patent, Moskowitz was made aware of Waugh during the prosecution of a related patent application, U.S. Appl. No. 13/418,335 ("the '335 application"). (Ex. 1060, 6-9.) In an office action dated September 9, 2013, the examiner of the '335 application rejected the claims as anticipated and obvious over Waugh. (*Id.*) In particular, the examiner explained that Waugh discloses "a universal, intervertebral combination bone fusion spacer and self-drilling screw apparatus" with a "screw locking mechanism." (*Id.*, 7.)

2. Waugh Discloses "A Screw Locking Mechanism" with "End Portion[s] Sized and Positioned to be Inserted in the [] Slot[s]"

57. Limitation [1.q] requires "**a screw locking bracket having a first end portion sized and positioned to be inserted in the first slot**." Moskowitz 440 combined with Waugh discloses and suggests this limitation, as I explain below.

58. As discussed above in Section VIII.A.1, Moskowitz 440 discloses a non-expandable spinal implant with screws for securing the implant to the adjacent vertebrae. As shown in Moskowitz 440's figure 2C, however, Moskowitz 440's implant does not have a locking bracket to prevent screw back-out.

59. Waugh discloses an implant that is similar to Moskowitz 440's figure 2C (*see* figure 4 below) with anchor members 106 (*i.e.*, screws), but also discloses a "face plate 104" that "reduce[s] the chance of the anchor members 106 [(*i.e.*,

screws)]) backing out of the vertebral bodies over time and causing the implant member 102 to become loose." (Ex. 1006, [0031].)

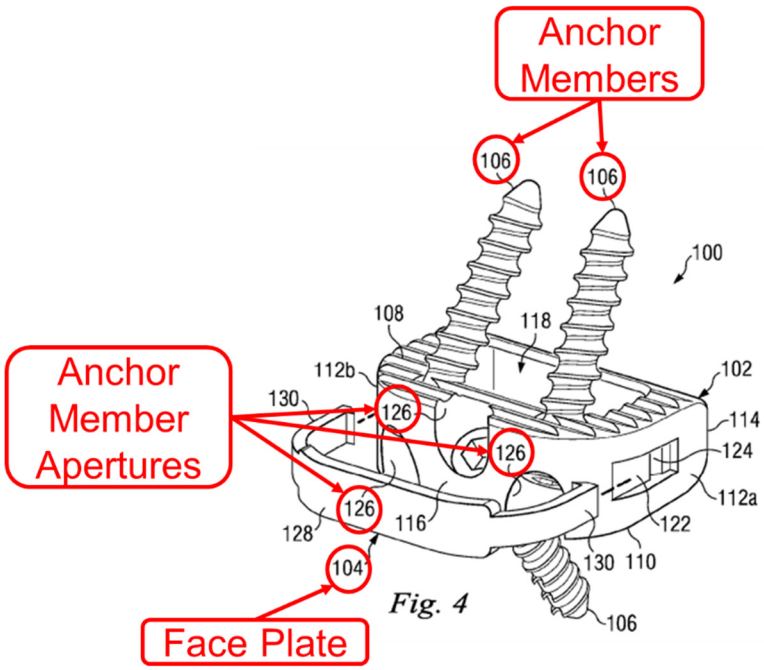


Fig. 4

(*Id.*, Fig. 4 (annotated).)

60. As shown in figure 4 above, face plate 104 "extend[s] across at least a portion of the anchor member apertures 126 [(*i.e.*, screw holes)] and physically block anchor member back-out." (*Id.*, [0031].) Waugh's face plate 104 is therefore a "**screw locking bracket**."

61. Waugh further discloses that face plate 104 "includes a main body 128 and locking features that cooperate with the implant member 102 to secure the main body 128 in place over the anchor member apertures 126." (*Id.,* [0031].) The locking features are "locking tabs 130" that extend from the first and second ends

140, 142 of the main body 128. (*Id.*, [0031], [0033].) Waugh's locking tabs are thus a "**first end portion**" and a "**second end portion**" of the screw locking bracket. As shown in figures 4 and 5 below, "[e]ach locking tab 130 includes a body portion 144" that "is configured to fit within the corresponding recessed slots 122 formed in the side surfaces 122*a*-*b* of the implant member 102." (*Id.*, [0033].) Waugh thus discloses "**a screw locking bracket having a first end portion sized and positioned to be inserted in the first slot**."

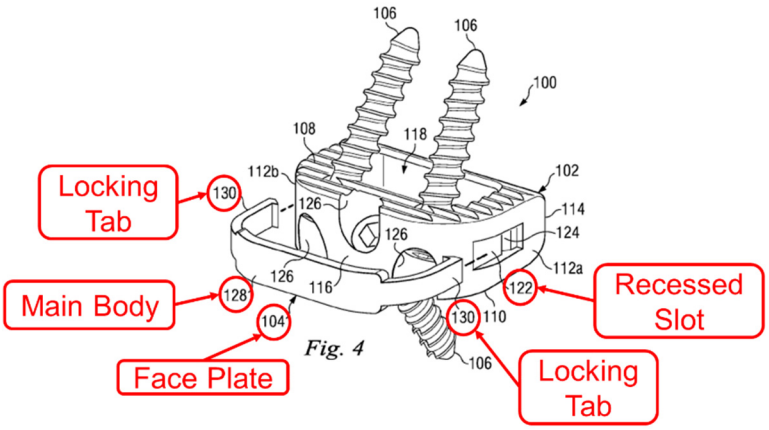


Fig. 4

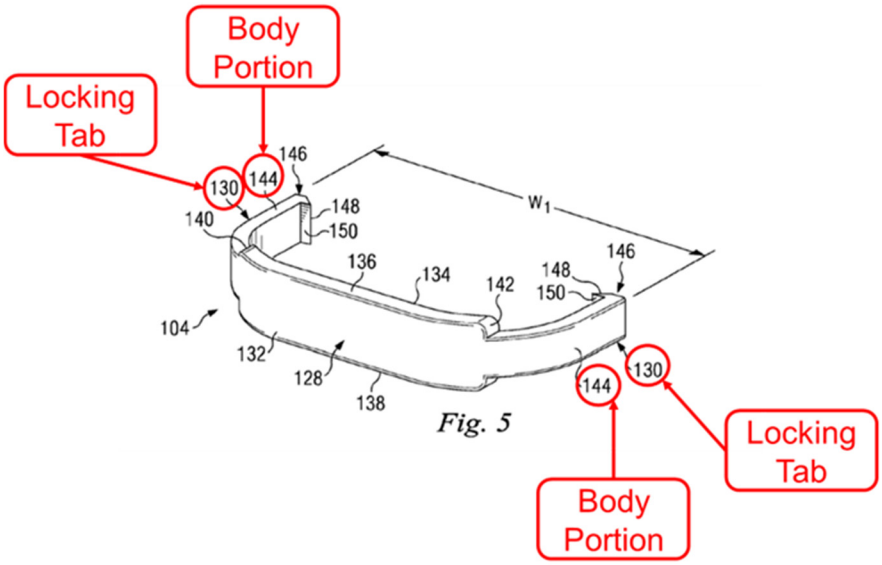


Fig. 5

(*Id.*, Figs. 4-5 (both annotated).)

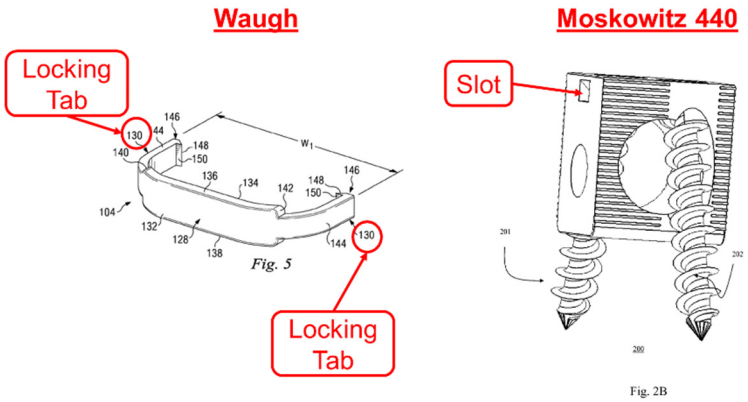
3. A POSITA Would Have Been Motivated to Use Waugh's Face Plate with Moskowitz 440's Implant

62. In view of Waugh, a POSITA's knowledge, and Moskowitz 440's teachings, a POSITA would have been motivated to combine Waugh's face plate 104 with Moskowitz 440's implant. Waugh teaches that "[o]ver time, due to micro motion of the vertebrae relative to the implant member, the anchor members may loosen and start to back out of the vertebrae." (Ex. 1006, [0004].) Waugh's face plate 104 fixes or, at minimum, reduces this issue by covering the screw holes to ensure the anchor members (screws) do not back out. (*Id.*, [0031].) Moskowitz 440's implant would be vulnerable to such back-out because it does not disclose any mechanism to block the screws 201 and 202 from backing out. Thus, a POSITA would have been motivated to look to Waugh's face plate 104 as a solution because Moskowitz's implant does not have any structure that is similar to Waugh's face plate 104. In particular, a POSITA would have been motivated to use Waugh's face plate 104 over other mechanisms to prevent back-out because Moskowitz's 440 implant already has indentations/slots on the sidewalls that could interact with the side locking tabs 130 of Waugh's face plate 104, just as Waugh's face plate 104 interacts with recessed slots 122 on Waugh's implant. Given these functional and structural similarities between the Moskowitz 440 and Waugh implants, a POSITA would have been motivated to use Waugh's face plate 104 to prevent back-out of

Moskowitz 440's screws because the modification could be made without otherwise affecting the performance of Moskowitz 440's implant. Furthermore, Waugh's face plate 104 would have allowed a surgeon to use the same structure, *i.e.*, indentations/slots, for both gripper prongs of a tool for insertion and for attaching the face plate. (*Id.*, [0029], [0033] (teaching that nearly identical slots to those in Moskowitz 440 can be used both "to cooperate with an insertion tool" and to "interface with locking protrusions" of the face plate 104).)

63. A POSITA would have had a reasonable expectation of success in configuring and using Waugh's face plate 104 with Moskowitz 440's implant because little to no modifications would have been needed to Waugh's face plate 104 or the slots in Moskowitz 440's implant. Both Moskowitz 440's and Waugh's implants are intervertebral devices designed to be placed within the disc space. (Ex. 1005, [0006], [0009], [0061]; Ex. 1006, [0003], [0030].) Additionally, both implants include a cage that preserves proper spacing of the vertebrae, and screws that fix the implant to the vertebral bodies. (Ex. 1005, [0002], [0006]; Ex. 1006, [0003], [0030].) Further, as described in Appendix [1.h]-[1.i], Moskowitz 440 discloses indentations/slots on its screw box 200 on each of its side walls. Waugh similarly has slots 122 on its side walls that locking tabs 130 of face plate 104 insert into to attach face plate 104. (*Supra*, Appendix [1.q].) As shown in the figures below, a POSITA would have known Waugh's locking tabs 130 could likewise insert into

Moskowitz 440's slots in the sidewalls to attach Waugh's face plate 104 to Moskowitz 440's screw box 200 and that the only modifications required to do so would be to account for the shape and size of the implant and the associated slots in screw box 200. Although Waugh's implant has three screws, a POSITA would have known Waugh's face plate 104 would have also worked with an implant with two screws.



(Ex. 1006, Fig. 5; Ex. 1005, Fig. 2B (both annotated).)

C. Michelson 019

1. Overview

64. Michelson 019 discloses a "spinal fusion implant for insertion between adjacent vertebral bodies" with "bone screw receiving holes 126 for receiving bone screws 128 for securing implant 100 to the adjacent vertebral bodies." (Ex. 1049, Abstract; 6:41-43.) When bone screws 128 are inserted into bone screw receiving holes 126 of the implant, "[t]he implant and the trailing end of the bone screw are

adapted to cooperatively engage each other so as to prevent the further advance of the bone screws through the implant." (*Id.*, 2:13-16.) Additionally, the "trailing end 104 can further include at least one locking mechanism 144 for locking the bone screws to implant 100." (*Id.*, 7:34-36.)

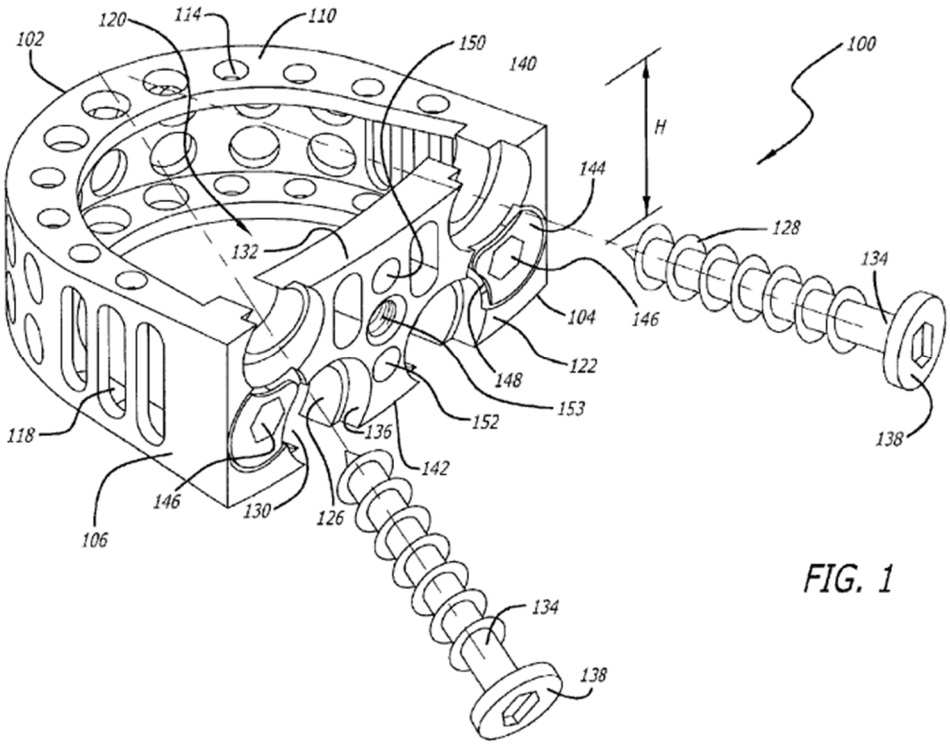


FIG. 1

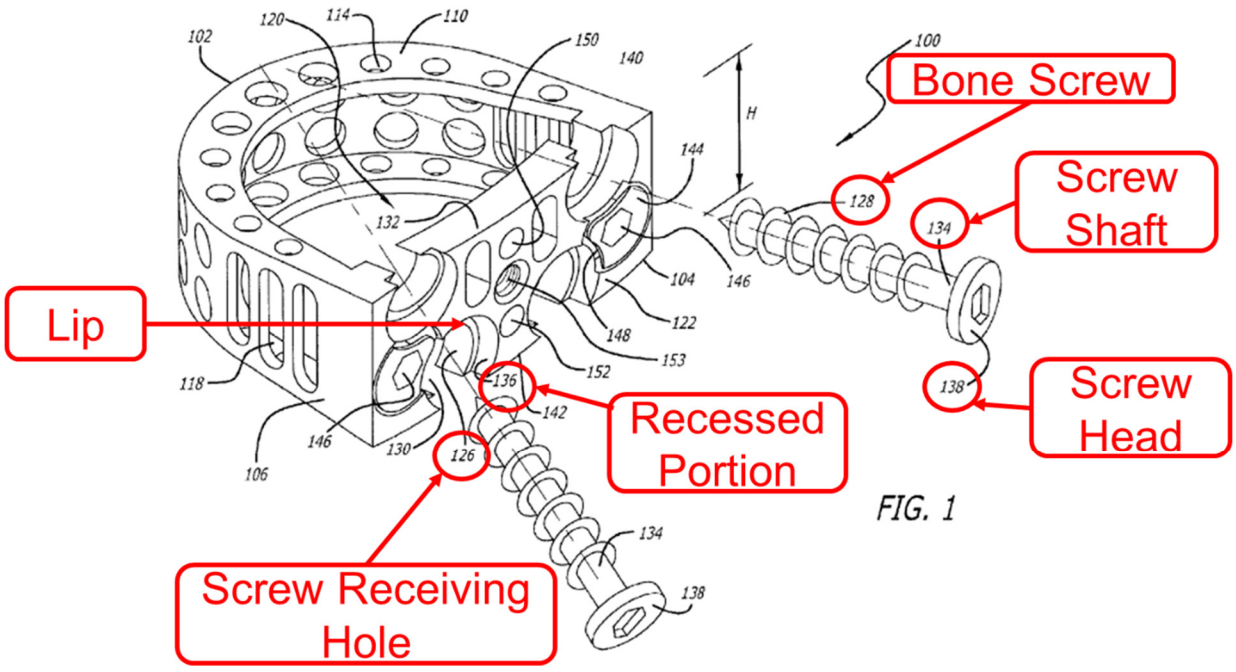
(*Id.*, Fig. 1.)

2. Michelson 019 Also Discloses "Screw Entrance Portion[s]" That Are "Larger Than and Coaxial With the Internal Bore" and "Formed at Least Partially in the Top Surface of the Top Wall as Viewed From the Top"

65. As discussed in Section VIII.A.2, limitation [1.c] requires that "**the screw entrance portion is larger than and coaxial with the internal bore and is formed at least partially in a top surface of the top wall as viewed from the top**

of the intervertebral cage." Michelson 019 discloses this limitation, as I explain below.

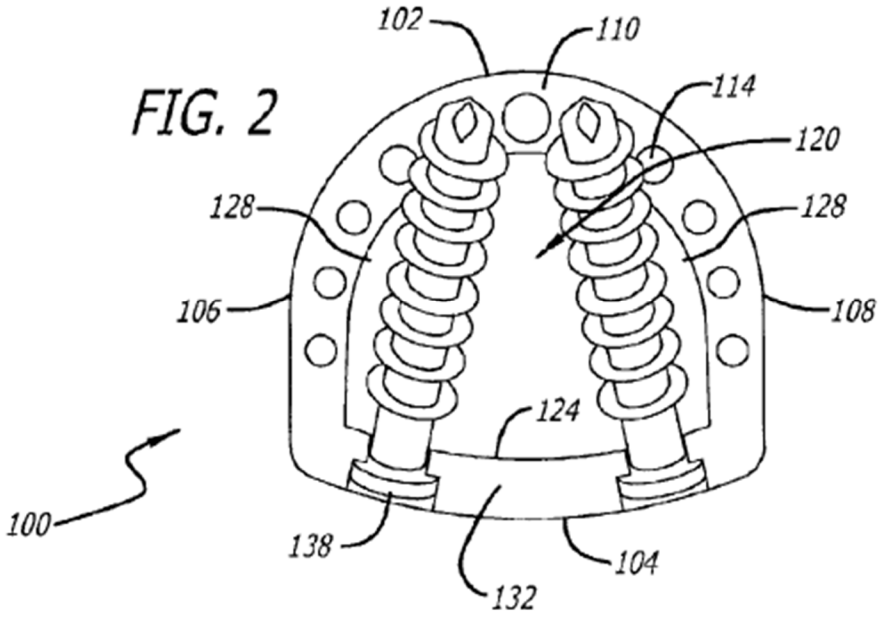
66. Like Moskowitz 440, Michelson 019 discloses an intervertebral implant that sits within the disc space with screws that go into the adjacent vertebral bodies above and below the implant. (*Supra*, Sections VIII.A.1, VIII.C.1.) As shown in figure 1 below, Michelson 019 also discloses bone screw receiving holes 126 for receiving bone screws 128. (Ex. 1049, 6:41-43.) Each of Michelson 019's bone screws 128 have screw heads 138 that are larger in diameter than the screw shafts 134.



(*Id.*, Fig. 1 (annotated).)

67. To accommodate screw heads 138 being larger in diameter than screw shafts 134, bone screw receiving holes 126 include a recessed portion 136 so that screw head 138 does not substantially protrude away from the trailing end 104 (the end of the implant where the screws enter the holes (*see id.*, 6:41:43, Fig. 1)). (*Id.*, 7:21-25.) The outer surface of the trailing end 104 is the "**top surface of the top wall**" as that feature is defined in Section VIII.A.2 and Appendix [1.a]. When viewed from above the top surface of the top wall, Michelson 019's screw entrance portions are formed at least partially in the top surface of the top wall, as seen in figure 1 above.

68. Because recessed portions 136 are where the bone screws enter the implant as seen in figure 1 above, and where screw heads 138 sit after insertion, recessed portions 136 are "**screw entrance portions**." As seen in figure 1 above and figure 2 below, there is a lip separating the recessed portion 136 from the bone screw receiving hole 126. The smaller bone screw receiving holes 126 hold the screw shafts and are "**internal bores**." Michelson 019's screw entrance portions are also "**coaxial with**" the internal bores along the axis of the screws, as shown in figure 2 below.



(*Id.*, Fig. 2.)

3. A POSITA Would Have Been Motivated to Use Michelson 019's Screw Guides with Moskowitz 440's Implant

69. A POSITA would have been motivated to modify each of Moskowitz 440's screw guides in the Moskowitz-Waugh combination (discussed above in Section VIII.B.3) to include "**screw entrance portion[s] [] larger than and coaxial with the internal bore[s]**" and "**internal bore portion[s] of the internal screw guide[s] [] sized with [] smaller diameter[s] than the screw entrance portion[s]**."

70. A POSITA would have been motivated to use Michelson 019's screw entrance portions that are larger in diameter than the internal bores (*i.e.*, a lip between the screw entrance portion and the internal bore) with Moskowitz 440's implant because, without this lip, the screws could go through the implant beyond a position

along the internal bore. (Ex. 1049, 7:17-20.[5]) The lip also secures the screws to the implant by, *e.g.*, preventing the screw from moving past a certain position in the implant. For example, Michelson 019 discloses that a shoulder of the bone screw may "stop the progress of a bone screw through the implant beyond a certain point along the bone screw." (Ex. 1049, 7:17-20.) This is achieved by the shoulder of screw interacting with the smaller diameter portion of the screw hole ("**the internal bore**"). Without a lip ensuring that an internal bore portion is smaller in diameter than the screw head, over time, the screw could keep advancing through the body of the implant until the implant backs out of the disc space. Additionally, without the lip formed by the internal bore, the screws would not be secured to the implant, and the implant could back out of proper positioning. The lip also lets the surgeon know when the head of the screw is engaged with the implant and when to sop screwing in. The Moskowitz 440-Michelson 019 combination thus discloses this limitation.

71. Both Moskowitz 440 and Michelson 019 disclose an implant and screws that are placed into the intervertebral disc space and that promote fusion of the adjacent vertebrae. (*Supra*, Sections VIII.A.1, VIII.C.1.) Michelson 019's implant is structured similarly to Moskowitz 440's implant, having a trailing end

[5] For the reasons I explain in Appendix 1[o], a POSITA would have also understood that the screw guides in Moskowitz 440 also have a similar lip.

104 and leading end 102, like Moskowitz 440's top and bottom walls as defined in Appendix [1.a], and sides 106, 108, like Moskowitz 440's sidewalls as defined in Appendix [1.a]. Both implants are designed to promote fusion of adjacent vertebrae and have central open spaces for bone growth or bone fusion material. (Appendix [1.a]; Ex. 1049, 6:11-17.) Both implants also have holes for bone screws to go through before going into the adjacent vertebral bodies. (*Supra*, Sections VIII.A.1, VIII.C.1.) A POSITA would have had a reasonable expectation of success configuring Moskowitz 440's implant to have a lip that prevents a screw head from moving past a certain position in a structure because it was common in the art and Moskowitz 440's implant is structurally and functionally similar to Michelson 019's implant. Additionally, this modification would have been well within the skill of a POSITA. The analysis for all remaining claim limitations discussed in the attached Appendix with respect to the Moskowitz-Waugh combination remains the same except for the modifications discussed above. Thus, the Moskowitz-Waugh-Michelson 019 combination discloses all of the limitations of 1-4, 6, 8, 10-14, and 18-20 for the reasons discussed in the Appendix and the additional reasons I discuss above.

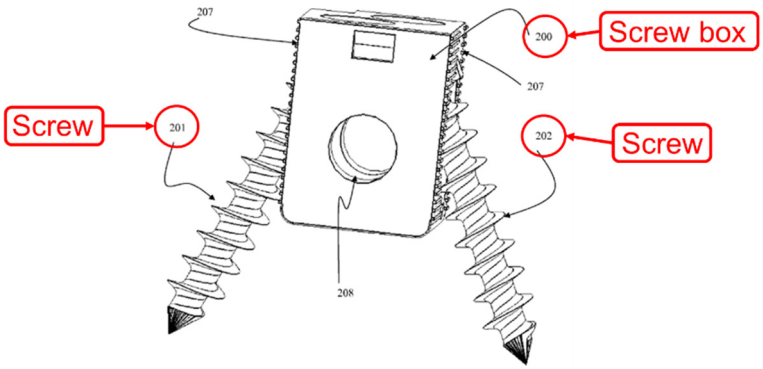
IX. CONCLUSION

72. I declare that all statements made herein of my knowledge are true, and that all statements made on information and belief are believed to be true, and that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

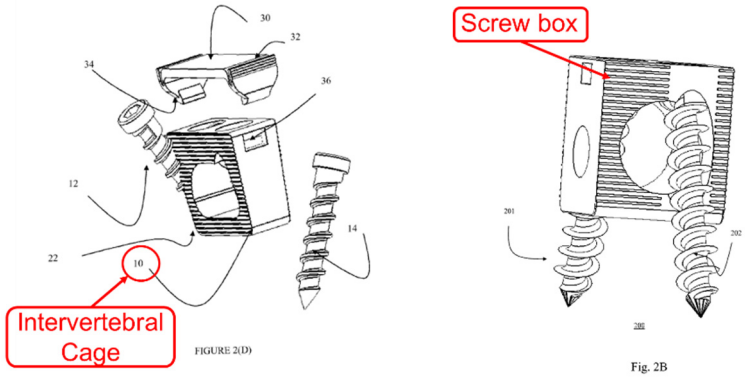
Dated: February 27, 2026 By:

Brad Culbert

APPENDIX

'183 Patent Claim Element	**Prior Art Analysis**
Claim 1	
[1.pre] "A intervertebral combination internal screw guide and fixation apparatus configured to be inserted into a disc space between a first vertebral body and a second vertebral body and to provide fusion of the first vertebral body to the second vertebral body via biological bone fusion and screw fusion, the apparatus comprising:"	Moskowitz 440 discloses this limitation. The embodiment shown in figures 2A-2C discloses an "intervertebral screw box 200 with two BDFT screws 201, 202." (Ex. 1005, [0065].) The screw box is designed for insertion into the intervertebral disc space between two adjacent vertebral bodies. (*Id.*, [0009]-[0010].) Once inserted, the BDFT screws engage and penetrate the vertebral bodies above and below the device to link, interlock, and biologically fuse the vertebrae. (*Id.*)  Fig. 2A (*Id.*, Fig. 2A (annotated).) Screw box 200 "incorporates built-in screw and/or drill guides which allow the direct placement and insertion" of the self-drilling screws in opposing directions. (*Id.*, [0010], [0093].) These screw guides have "built-in prescribe angles" that guide the screws through the screw box. (*Id.*, [0013].) As discussed in Section VIII.A.1, BDFT screws are fixation devices. Moskowitz 440 thus discloses "**[an] intervertebral combination internal screw guide and fixation apparatus**

	configured to be inserted into a disc space between a first vertebral body and a second vertebral body." Implantation of screw box 200 is designed to be used for fusion techniques, such as posterior lumbar interbody fusion (PLIF) or transforaminal lumbar interbody fusion (TLIF). (*Id.*, [0086].) To this end, screw box 200 also includes "holes 208 and hollow spaces allowing packaging with bone," which facilitates bone fusion. (*Id*., [0002], [0065].) Moskowitz 440's implant achieves fusion of adjacent vertebral bodies through its "transvertebral bone fusion screw apparatus" and eventual biological fusion. (*Id.*, [0002], [0009].) Moskowitz 440 thus discloses an apparatus with an internal screw guide that is configured "**to provide fusion of the first vertebral body to the second vertebral body via biological bone fusion and screw fusion**."

[1.a] "an intervertebral cage including: a top wall, a bottom wall, and sidewalls defining a fusion material space capable of receiving bone filling for the biological bone fusion;"	Moskowitz 440 discloses this limitation. Screw box 200 is a cage consistent with the '183 patent. As shown below, the '183 patent defines the box structure including screw guides and a cavity for filling with bone fusion material as an "intervertebral cage 10." (Ex. 1001, 7:15-17, 7:54-57, Fig. 2D.) As shown below, screw box 200 of Moskowitz 440 has the same structure as cage 10 of the '183 patent, including screw guides and a hollow space for packaging with bone. (Ex. 1005, [0065].) Moskowitz 440 thus discloses "**an intervertebral cage**." **738 Patent** **Moskowitz 440**  (Ex. 1001, Fig. 2D; Ex. 1005, Fig. 2B (both annotated).) As shown in figure 2B below, Moskowitz 440's screw box 200 has four walls – "**a top wall, a bottom wall, and sidewalls**" as Moskowitz defined them in related prosecution. The top wall is formed at the top of the cage where the screws enter the cage, and the bottom wall is formed opposite the top wall at the bottom-most area of the cage. Those four walls define a central space, as shown below. Moskowitz 440 discloses that its intervertebral device "can be filled with bone fusion material(s)" and specifically, that screw box 200 has hollow spaces "allowing packaging with bone." (Ex. 1005, [0002], [0065].) Therefore, this "space" is a "**fusion material space**" and is "**capable of receiving bone filling for the biological bone fusion**."

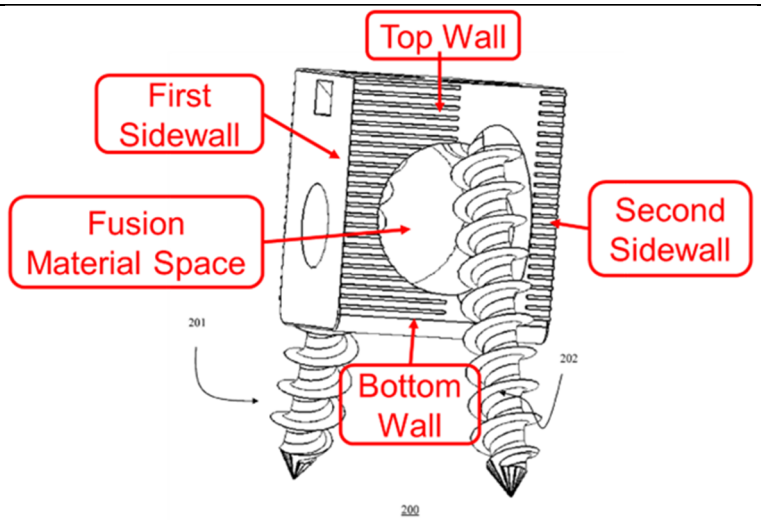
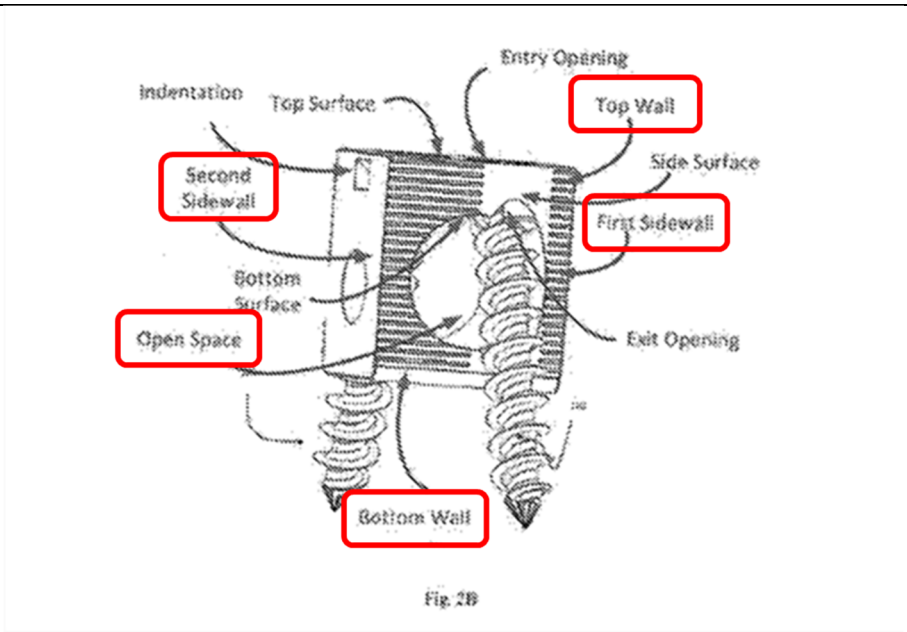


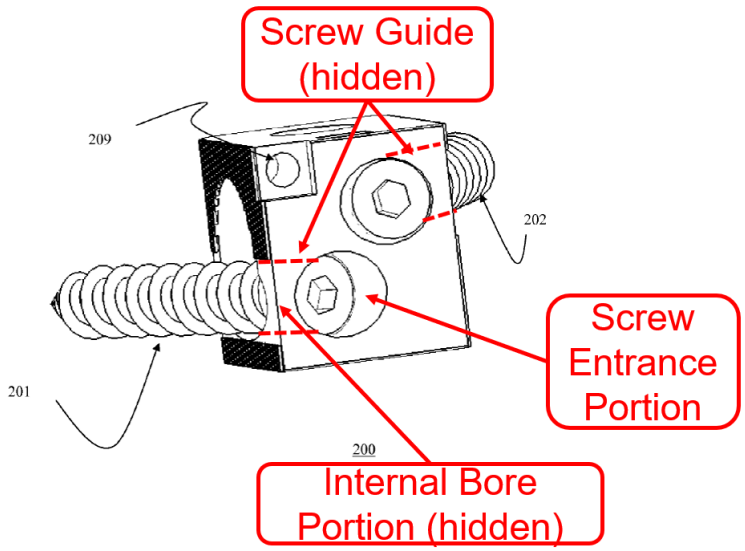
Fig. 2B

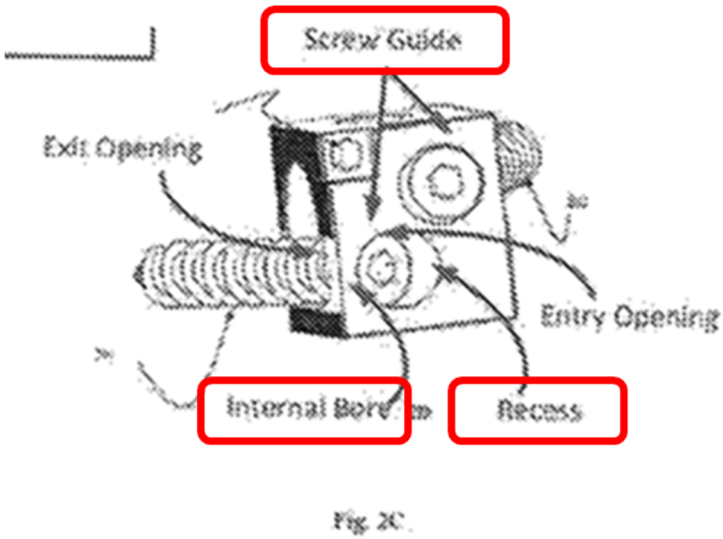
(Ex. 1005, Fig. 2B (annotated).)

The above analysis is consistent with how Moskowitz has previously defined these structures. During the prosecution of the related '849 Patent (Ex. 1043), which is a continuation of Moskowitz 440 and has the same figures, the examiner required that Moskowitz provided amended figures identifying the "top wall," "bottom wall," "sidewalls," and "open space" for figure 2B. (*Compare* Ex. 1043, 182 (excerpted and reproduced below), *with* Ex. 1005, Fig. 2B (reproduced above).) Those annotations apply equally to Moskowitz 440, which discloses "**a top wall, a bottom wall, and two sidewalls defining an open space**" based on Moskowitz's admissions in the '849 patent.



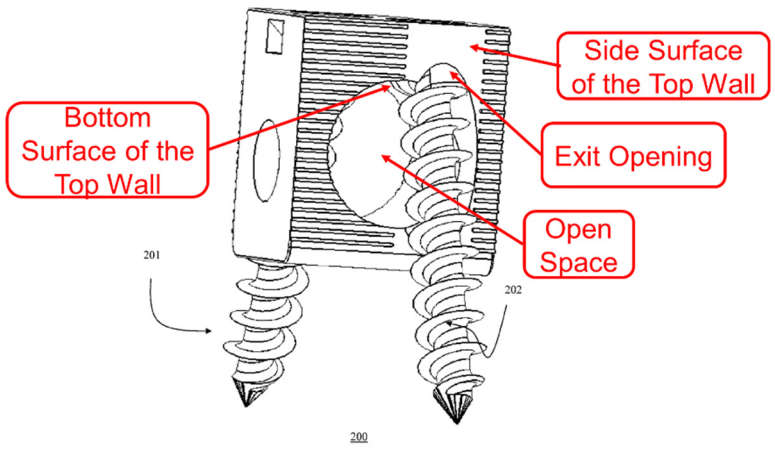
(Ex. 1043, 182 (excerpted and annotated).)

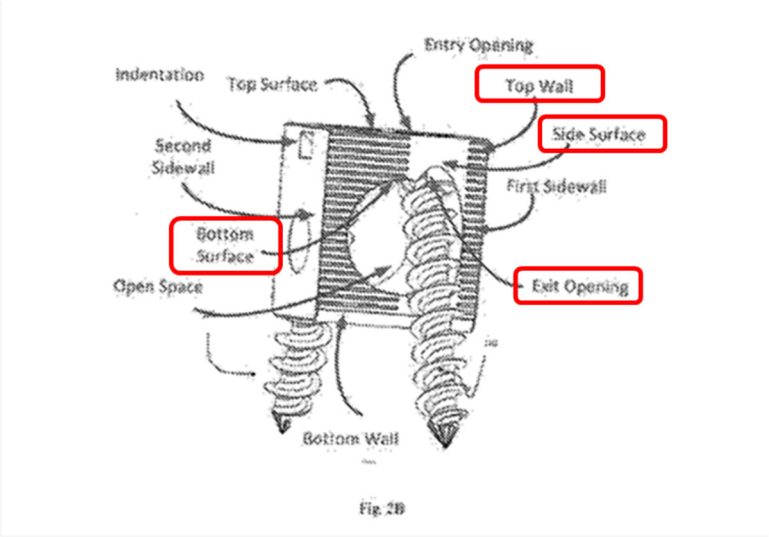
[1.b] "an internal screw guide having a screw entrance portion and an internal bore portion,"	Moskowitz 440 discloses this limitation. Moskowitz 440 discloses that the screw box "incorporates built-in screw and/or drill guides which allow the direct placement and insertion of two self drilling screws." (Ex. 1005, [0010].) In particular, screw box 200 has "self-contained internalized drill guides." (*Id.*, [0065], Fig. 2C (reproduced below).) Moskowitz 440 thus discloses "**an internal screw guide**." (*Id.*) As shown in figure 2C below, screws 201, 202, enter the screw guide (which is partially hidden) via a "**screw entrance portion**," where the screw head sits when the screw is fully inserted. Deeper into the internal screw guide than the screw entrance portion is an "**internal bore portion**" of the internal screw guide that receives the threaded portion of a screw. (*See id.*, Fig. 2C (reproduced below).[6]) As shown in figure 2C below, the implant features two "**internal screw guide[s]**," each of which receive a screw. Therefore, each of the internal screw guides has its own respective "**screw entrance portion**" and "**internal bore portion.**"  Fig. 2C (*Id.*, Fig. 2C (annotated).) This mapping of limitation [1.b] is consistent with Moskowitz's interpretation of figure 2C during prosecution of the related '849 patent. (*Compare* Ex. 1043, 182 (excerpted and reproduced below), *with* Ex. 1005, Fig. 2C (reproduced

	above).) As shown below, Moskowitz represented to the Office that figure 2C discloses a "**screw guide**," an "**internal bore**," and a "recess." The "recess" corresponds to the claimed "screw entrance portion" because, like the "screw entrance portion," it accommodates a screw head of the screw. Notably, claim 1 of the '183 patent requires the screw head to be "**in the screw entrance portion**." (Ex. 1001, 21:7-10.) During prosecution of the '849 patent, then-pending claim 21 recited a "recess sized and shaped to accommodate a screw head" (Ex. 1043, 161), and Moskowitz annotated figure 2C to show the "recess." (*Id*., 180, 182.) Thus, what Moskowitz now refers to as the "screw entrance portion" is no different than what the Moskowitz previously called the "recess."  Fig. 2C (Ex. 1043, 182 (excerpted and annotated).)

[6] The term "internal bore" or "internal bore portion" has no textual support in the '183 patent specification.

[1.c] "wherein the screw entrance portion is larger than and coaxial with the internal bore and is formed at least partially in a top surface of the top wall as viewed from the top of the intervertebral cage,"	Moskowitz 440 discloses this limitation, as I discussed above in Section VIII.A.2.

[1.d] "wherein the internal bore portion has an entry opening formed only in a top surface of the top wall as viewed from the top of the intervertebral cage and has an exit opening formed at least partially in a bottom surface of the top wall and at least partially in a side surface of the top wall;"	Moskowitz 440 discloses this limitation. As discussed in Appendix [1.b], the "**internal bore**" is the portion of the internal screw guide that fits the threaded portion of the screw. Therefore, the "**entry opening**" of the "**internal bore**" is where the screw first enters the internal bore when the screw is inserted. As discussed in Appendix [1.c], the outer surface of the "**top wall**" is the "**top surface**" of the top wall. Further, as shown below in figure 2B, opposite the top surface of the top wall is a "**bottom surface of the top wall**" that is exposed to the "**fusion material space**" as defined in Appendix [1.a]. The surface of the top wall adjacent to and extending between the "**top surface**" and "**bottom surface**" is a "**side surface**" of the top wall.  Fig. 2B (Ex. 1005, Fig. 2B (annotated).) The screws 201, 202 extend entirely through the internal bore. (*Id.*, Figs. 2A-2C.) Therefore, the internal bore has an "**exit opening**" where the screw exits the internal bore. As shown in figure 2B (reproduced above), the exit opening is angled and cuts through two planes of the top wall – the side and bottom surfaces of the top wall, as Moskowitz has defined them. The exit opening is "**formed at least partially in a bottom surface of the top wall and at least partially in a side surface of the top wall**."

	This mapping is consistent with Moskowitz's previous representations to the Office. As excerpted below, Moskowitz provided annotated figure 2B of the '849 patent, signifying Moskowitz's understanding of the "exit opening," "bottom surface of the top wall," and "side surface of the top wall." (Ex. 1043, 180, 182.) Moskowitz 440 thus discloses "**an exit opening formed at least partially in a bottom surface of the top wall and at least partially in a side surface of the top wall**."  (*Id.*, 182 (excerpted and annotated).) Moskowitz has also previously admitted that figures 2A-2C disclose limitation [1.d], including that "**the internal bore portion has an entry opening formed only in a top surface of the top wall as viewed from the top**." In particular, Moskowitz provided annotated figure 2C of the '849 patent specification, which is the same as figure 2C of Moskowitz 440, indicating what Moskowitz alleges is the "**entry opening**" and "**exit opening**" of the "**internal bore**." (Ex. 1043, 180, 182.)

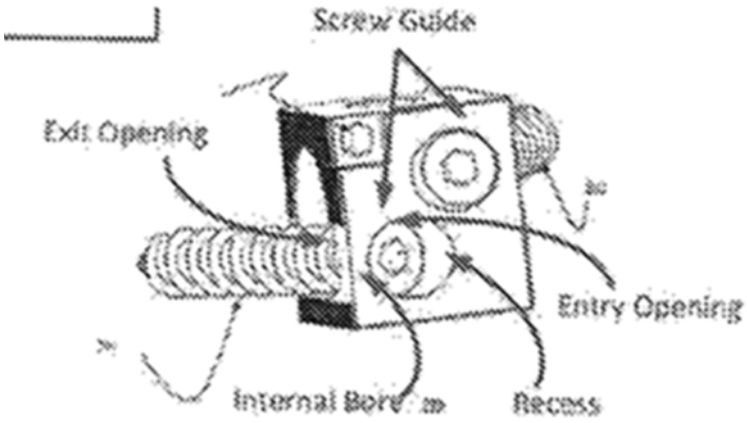
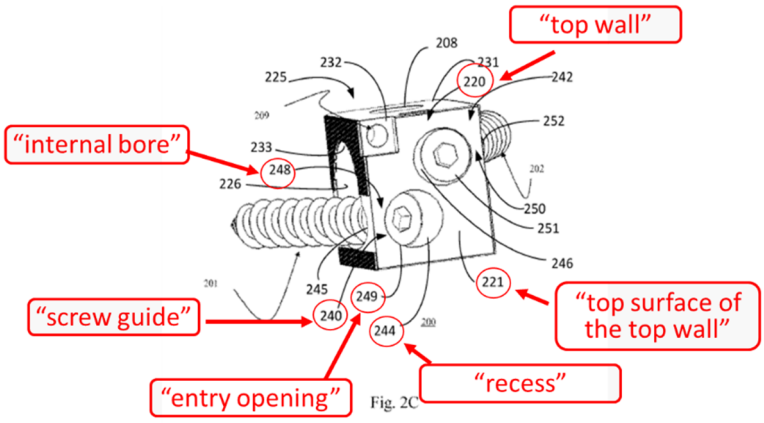


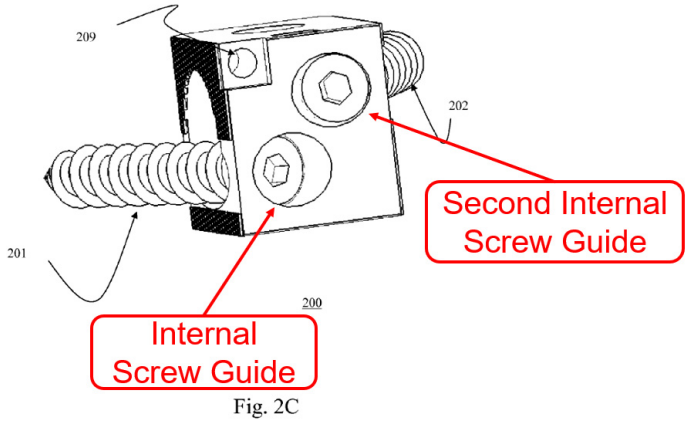
Fig. 2C

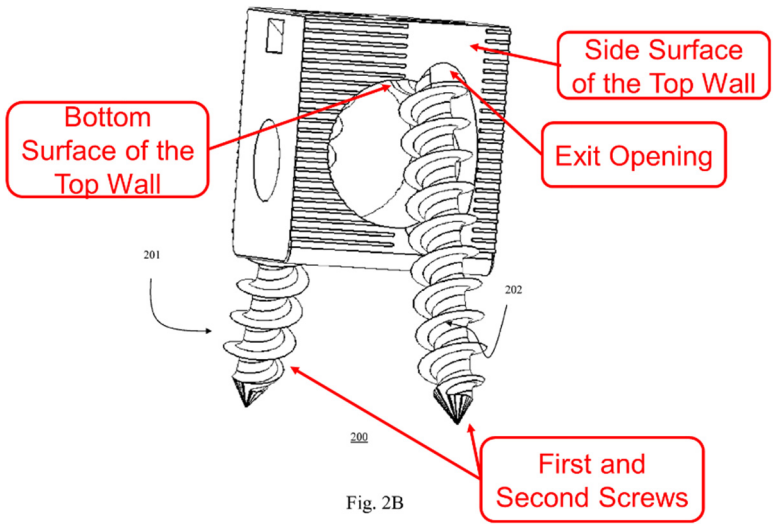
(*Id.*, 182 (excerpted).)

Moskowitz also added reference numerals as shown below to figure 2C to illustrate, *inter alia*, the claimed "**internal bore**," "**entry opening**," and "**exit opening**." (*Id*., 231, 240.) Moskowitz represented to the Patent Office that the embodiment of figures 2A-2C shows that the "***the entry opening of the internal bore [is] formed only in the top surface of the top wall***," and "***the exit opening [is] formed at least partially in the bottom surface of the top wall and at least partially in a side surface of the top wall***," as recited in then-pending claim 21. (*Id.*, 232 (claim 21) (emphases added), 244-245 ("the structures recited in the claims . . . appear in Figs. 2A-2C").) Based on Moskowitz's representations, figure 2C of Moskowitz 440 discloses limitation [1.d]. Because Moskowitz admitted that figures 2A-2C shows that the entry opening of the internal bore [is] formed only in the top surface of the top wall, he also necessarily admitted that this feature is true when viewed from the top because the view would not change the basic fact that the entry opening of the internal bore is formed only in the top surface of the top wall.



(Ex. 1043, 240 (annotated).)

[1.e] "a second internal screw guide having a second screw entrance portion and a second internal bore portion, wherein the second screw entrance portion is larger than and coaxial with the second internal bore and is formed at least partially in the top surface of the top wall as viewed from the top,"	Moskowitz 440 discloses this limitation. As discussed in Appendix [1.b], Moskowitz 440 discloses an implant with two "**internal screw guide[s]**," each of which has a "**screw entrance portion**" and an "**internal bore portion**." As shown in figure 2B below, screw box 200 of Moskowitz 440 is a substantially symmetrical implant and screws 201, 202 have the same structure so that the "**internal screw guide**" and "**second internal screw guide**" have the same features (though angled in opposing directions), such that the discussion in Appendix [1.c] showing the disclosure of "**wherein the screw entrance portion is larger than and coaxial with the internal bore and is formed at least partially in a top surface of the top wall as viewed from the top**" equally applies to the "**second internal screw guide**."  Fig. 2C (Ex. 1005, Fig. 2C (annotated).)

[1.f] "wherein the second internal bore portion has a second entry opening formed only in the top surface of the top wall as viewed from the top and has a second exit opening formed at least partially in the bottom surface of the top wall and at least partially in a second side surface of the top wall, and"	Moskowitz 440 discloses this limitation. As discussed in Appendix [1.e], the teachings in Moskowitz 440 regarding the "**internal bore portion**" also apply to the "**second internal bore portion**" such that Moskowitz 440 discloses "**the second internal bore portion has a second entry opening formed only in the top surface of the top wall as viewed from the top**." While the "**second exit opening**" is not visible in Moskowitz 440's figures, a POSITA would have understood that there is a "**second exit opening**" because as shown in figure 2A below, the second screw goes through the implant. Additionally, a POSITA would have understood that there is a "**second side surface of the top wall**" and, like the "**first exit opening [is] formed at least partially in the bottom surface of the top wall and at least partially in a side surface of the top wall**," the "**second exit opening [is] formed at least partially in the bottom surface of the top wall and at least partially in a second side surface of the top wall**," given the substantial symmetry of the device and opposing screw angles evident from figures 2B and 2C below.  Fig. 2B

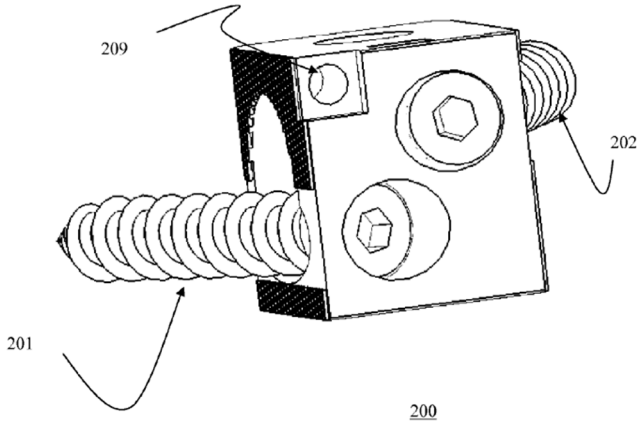
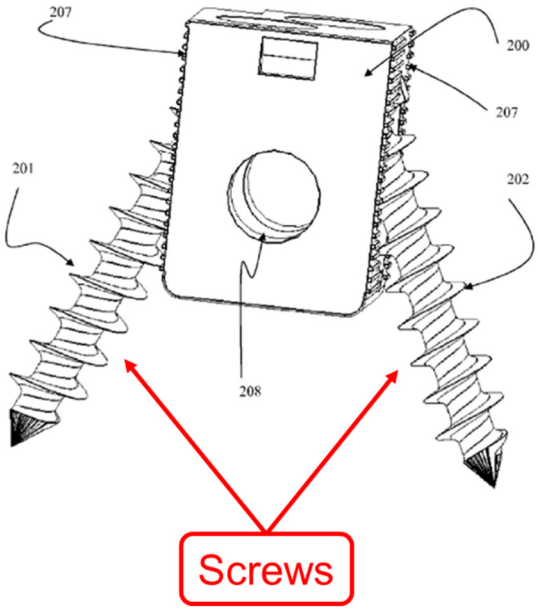
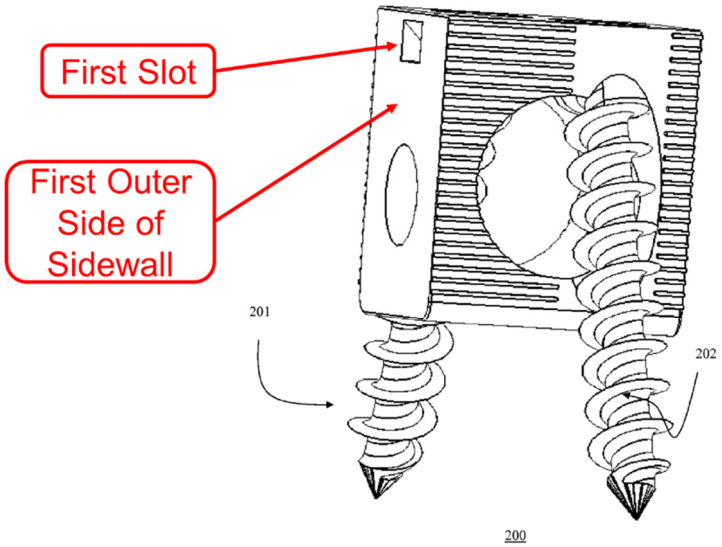


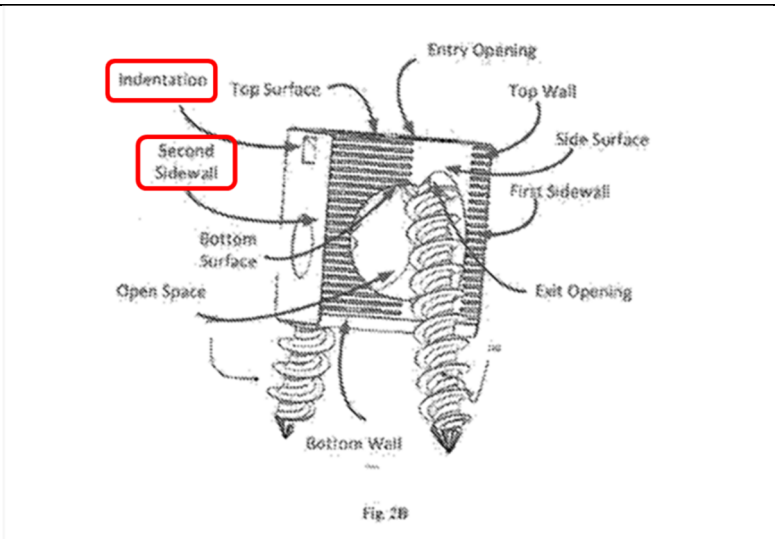
Fig. 2C

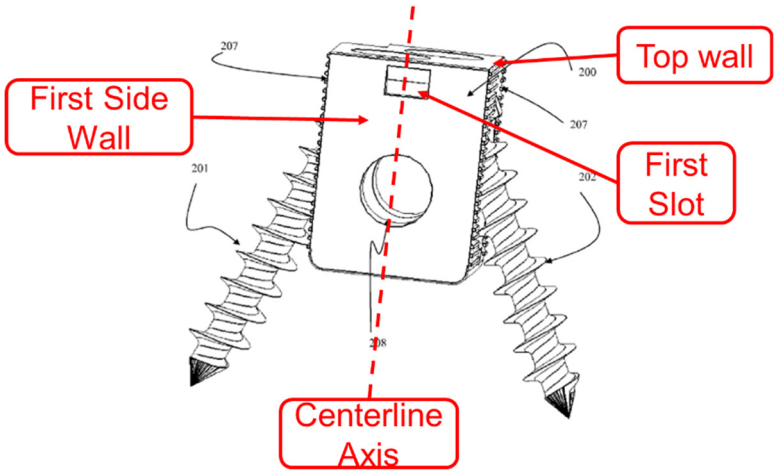
(Ex. 1005, Fig. 2B (annotated), Fig. 2C.)

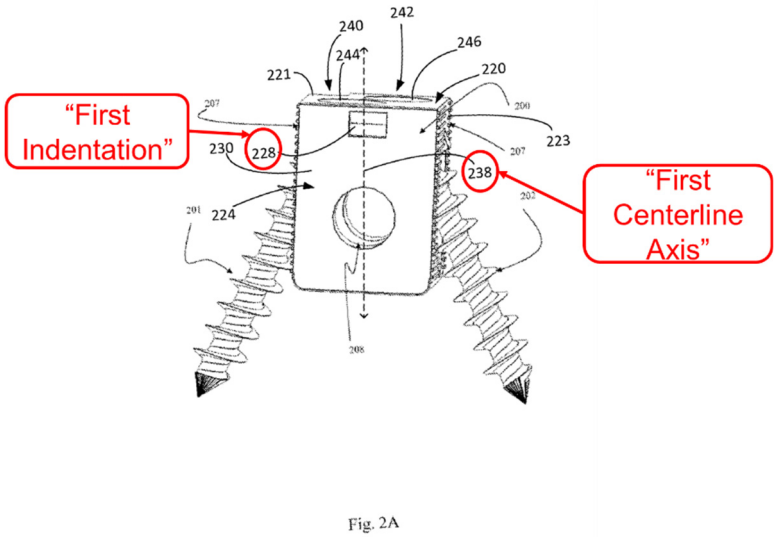
Moskowitz 440 thus discloses a device "**wherein the second internal bore portion has a second entry opening formed only in the top surface of the top wall as viewed from the top and has a second exit opening formed at least partially in the bottom surface of the top wall and at least partially in a second side surface of the top wall**," for reasons discussed above and in Appendix [1.d].

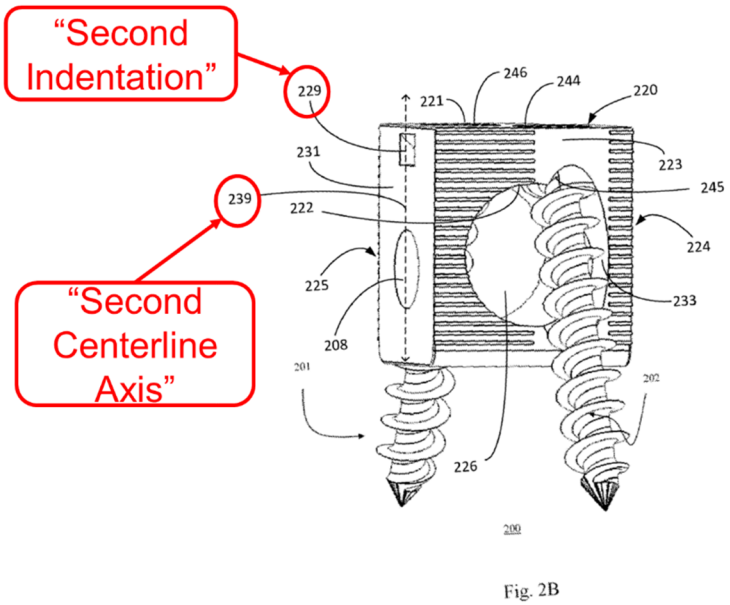
[1.g] "wherein the internal screw guide and the second internal screw guide are angled to orient a first screw member and a second member bi-directionally in opposite directions;"	Moskowitz 440 discloses this limitation. As discussed above in Appendix [1.b] and [1.e], Moskowitz 440's implant includes an "**internal screw guide**" and a "**second internal screw guide**." Moskowitz 440's implant also includes "BDFT screws 201 and 202" that are "**a first screw member and a second member**." (Ex. 1005, [0065].) The internal screw guides orient the screws because, as discussed in Appendix [1.pre], the internal screw guides "allow the direct placement and insertion" of the screws and have "built-in prescribed angles" to guide the screws. (*Id.,* [0010], [0013].) Moskowitz 440 further discloses that "screws 201 and 202 perforate [the adjacent vertebral bodies] and orient in opposing, superior and inferior directions." (*Id.*, [0065].) As discussed in Section VIII.A.1 and as shown in figure 2A reproduced below, the BDFT screws 201 and 202 are bi-directional such that they are angled in opposite directions. Thus, Moskowitz 440 discloses an implant "**wherein the internal screw guide and the second internal screw guide are angled to orient a first screw member and a second member screw bi-directionally in opposite directions**."  Fig. 2A (*Id.*, Fig. 2A (annotated).)

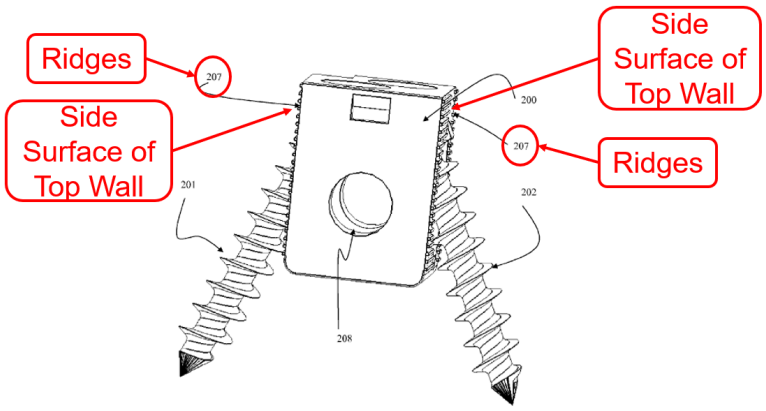
[1.h] "a first slot on a first outer side of a first sidewall of the sidewalls;"	Moskowitz 440 discloses this limitation. As shown in figure 2B, the "**sidewall**" as defined in Appendix [1.a] of Moskowitz 440's implant has a slot, *i.e.*, "**a first slot**" on its "**outer side**."  Fig. 2B (Ex. 1005, Fig. 2B (annotated).) As explained above in Appendix [1.a], Moskowitz provided annotated figure 2B of the '849 patent specification, which has the same figures as Moskowitz 440, indicating how Moskowitz defines certain features in the figure. For example, as shown in the excerpted image below, Moskowitz represented to the Office that figure 2B discloses an "indentation" in the "sidewall." (Ex. 1043, 180, 182.) A POSITA would have understood that an indentation is the same as a "**slot**" in the context of the boxes disclosed by the '183 patent and Moskowitz 440.

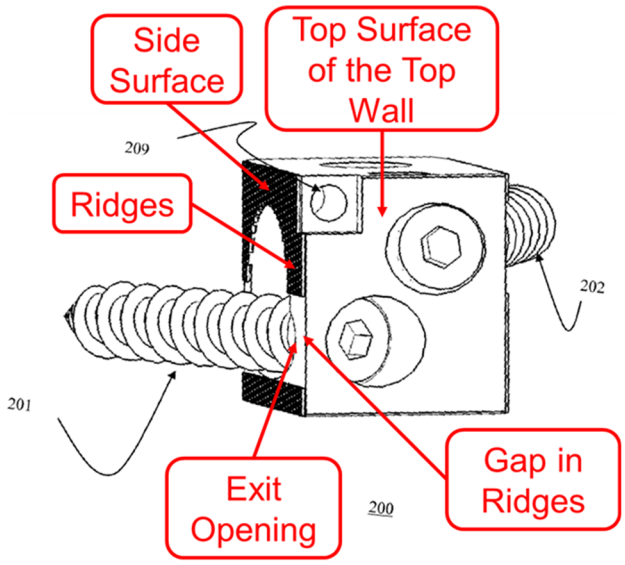
	 Fig. 2B (Ex. 1043, 182 (excerpted and annotated).)
[1.i] "a second slot on a second outer side of a second sidewall of the sidewalls, wherein the second slot is positioned opposite of the first slot;"	Moskowitz 440 discloses this limitation. As discussed in Appendix [1.h], Moskowitz discloses a "**first slot**" on a "**first sidewall**." Moskowitz 440's implant is substantially symmetrical, so a POSITA would understand there to be a slot in each of the sidewalls on their respective outer sides. Moskowitz 440 thus discloses "**a second slot on a second outer side of a second side wall of the sidewalls**." (*See also* Ex. 1043, 231.) As discussed in Appendix [1.a], the two sidewalls are on opposite sides of screw box 200 such that the "**second slot is positioned opposite of the first slot**."

[1.j] "wherein the first slot is positioned along a first centerline axis that bisects the first side wall and is positioned nearer a top of the intervertebral cage than a bottom of the intervertebral cage,"	Moskowitz 440 discloses this limitation. As discussed in Appendix [1.h]-[1.i], screw box 200 of Moskowitz 440 is a substantially symmetrical implant with slots on each of its two sidewalls. As shown in figure 2A below, the "**first slot**" is aligned along the center of the first side wall and is closer to the top surface of the top wall (as defined in Appendix [1.c]) than the bottom of the implant. Also, as shown in figure 2A, this "**centerline axis**" of the first side wall that aligns with the first slot, "**bisects the first side wall**." Moskowitz 440 thus discloses "**the first slot is positioned along a first centerline axis that bisects the first side wall and is positioned nearer a top of the intervertebral cage than a bottom of the intervertebral cage**."  Fig. 2A (Ex. 1005, Fig. 2A (annotated).) The interpretation depicted in the figure above is consistent with Moskowitz's representations to the Office during prosecution of the '849 patent. As discussed in Appendix [1.a], during the prosecution of the related '849 patent, Moskowitz provided an amended paragraph and amended figures. In the amended paragraph, Moskowitz described the "first indentation 228" and the "first centerline axis 238." (Ex. 1043, 231, 238.) Amended figure 2A from the '849 patent prosecution is excerpted and annotated accordingly below. Thus, as admitted

	by Moskowitz, figure 2A of Moskowitz 440 discloses limitation [1.j].  Fig. 2A (*Id.*, 238 (excerpted and annotated).)

[1.k] "wherein the second slot is positioned along a second centerline axis that bisects the second side wall and is positioned nearer the top of the intervertebral cage than the bottom of the intervertebral cage,"	Moskowitz 440 discloses this limitation. As discussed in Appendix [1,j], Moskowitz 440's implant is substantially symmetrical, so a POSITA would understand there to be identical slots in each of the sidewalls. As such, the analysis in Appendix [1.j] regarding the disclosure that the "**first slot is positioned along a first centerline axis that bisects the first side wall and is positioned nearer a top of the intervertebral cage than a bottom of the intervertebral cage"** also applies to this limitation. The analysis above is confirmed by Moskowitz's representations to the Office during the prosecution of the '849 patent showing Moskowitz's understanding that the sidewalls depicted in figures 2A-2C are identical. In Moskowitz's amended paragraph to the '849 specification, Moskowitz described "a second indentation 229" and a "second centerline axis 239." (Ex. 1043, 231, 239.) As shown in figure 2B of the '849 patent (which is identical to Moskowitz 440's figure 2B) below, Moskowitz's own understanding of its invention is that the two sidewalls and featured indentations are identical.  Fig. 2B (*Id.*, 239 (excerpted and annotated).) Moskowitz 440 thus discloses limitation [1.k].

[1.l] "wherein the side surface and the second side surface of the top wall are patterned with a plurality of surface features to create rough side surfaces,"	Moskowitz 440 discloses this limitation. As shown in figure 2A below, Moskowitz 440 discloses that the "[t]he superior and inferior edges include ridges 207 to facilitate integration and fusion with superior and inferior vertebral bodies." (Ex. 1005, [0065].) As discussed in Appendix [1.d] and [1.f], these ridged surfaces are the "**side surface**" and "**second side surface**." A POSITA would have understood that ridges 207 disclosed in Moskowitz 440 comprise a "**pattern**" of "a plurality of surface features" because there are multiple ridges, and that ridges 207 create a "**rough side surface**" as claimed in the '183 patent.  Fig. 2A (*Id.*, Fig. 2A (annotated).) Moskowitz 440 thus discloses an implant "**wherein the side surface and the second side surface of the top wall are patterned with a plurality of surface features to create rough side surfaces**."

[1.m] "wherein at least some of the plurality of surface features are positioned on the side surface between the top wall and the exit opening, and"[7]	Moskowitz 440 alone and in combination with Waugh discloses or suggests this limitation. As shown in figure 2C below, some of ridges 207, which make up the "**plurality of surface features**" (Appendix [1.l]), "**are positioned on the side surface between the top wall and the exit opening**" as those structures are defined in Appendix [1.a] and [1.d].  *Fig. 2C* (Ex. 1005, Fig. 2C (annotated).) Although figure 2C of Moskowitz 440 shows a gap in ridges 207 directly above the exit opening, the claim only requires that "at least some" of the "surface features are positioned on the side surface between the top wall and the exit opening." Because the top surface of the top wall is a surface that extends across the entire width of screw box 200, some of ridges 207 need only be between some area along the top surface of the top wall and the exit opening. The applicable ridges for this limitation are thus not limited to the portion of the top surface of the top wall that lies directly above the exit opening. Therefore, figure 2C discloses that at least some of these ridges lie between the top surface of the top wall and the exit opening. Additionally, in another embodiment, Moskowitz 440 shows some uninterrupted ridges across the entire width of the side

[7] Claim limitation [1.m] is awkwardly worded because it recites that at least some of the "surface features" must be positioned "on the side surface between the top wall and the exit opening," while claim limitation [1.d] expressly states that the "exit opening" is "formed at least partially in a bottom surface of the top wall." If the exit opening is formed at least partially in the top wall (limitation [1.d]), it is logically impossible for any structure to be positioned between the exit opening and the top wall. Therefore, I have been asked to interpret claim limitation [1.m] as reciting "wherein at least some of the plurality of surface features are positioned on the side surface between the **top surface of the** top wall and the exit opening."

surface between the top surface of the top wall and the exit opening, as shown in figure 1C below.

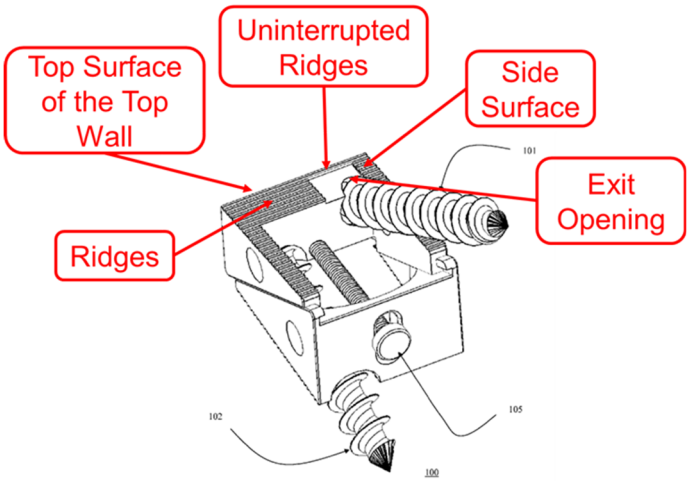


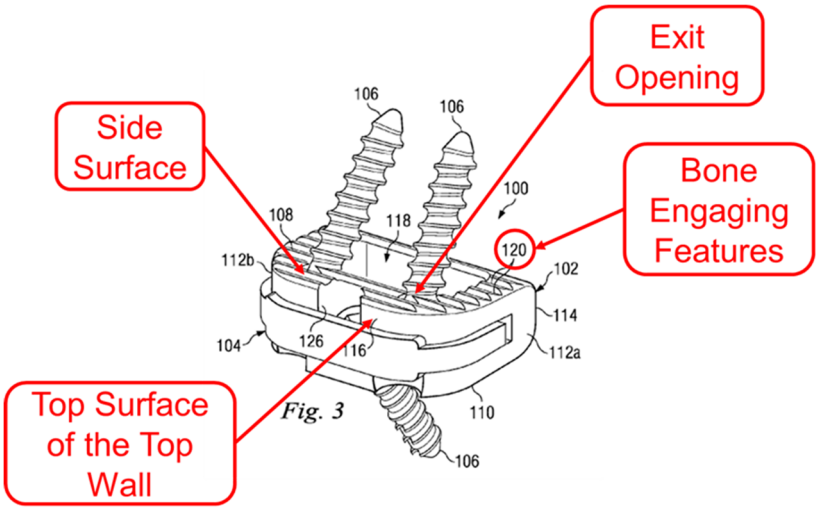
Fig. 1C

(*Id.*, Fig. 1C (annotated).)

Because Moskowitz 440 discloses that its ridges facilitate incorporation into and fusion with vertebral bodies (Ex. 1005, [0064]-[0065]), a POSITA would have understood that the arrangement of ridges with more of the side surface covered (like in Moskowitz 440's figure 1C) would have been preferred to promote fusion. Moskowitz 440 thus discloses limitation [1.m].

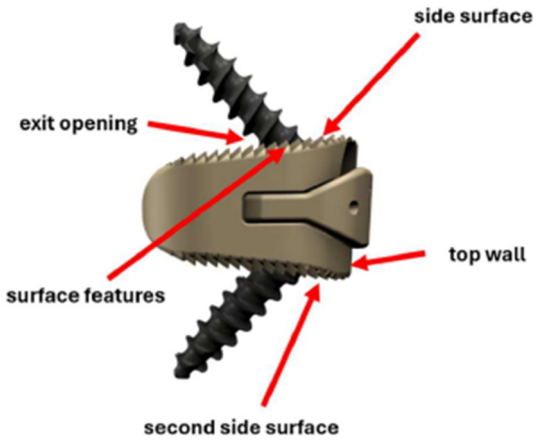
Waugh also discloses this limitation. As shown in Waugh's figure 3 below, Waugh discloses "bone engaging features 120 configured to reduce slipping or movement of the implant member 102 relative to the vertebrae 14, 16." (Ex. 1006, [0029].) As discussed above, a POSITA would have been motivated to use ridges across the entire width of the side surface in the Moskowitz 440 implant shown in figure 2C to hold the implant in its proper placement, which will lead to increased fusion with the adjacent vertebral body. A POSITA would have had a reasonable expectation of success in using Waugh's bone engaging features 120 with Moskowitz 440's screw box because they are like Moskowitz 440's ridges in structure, placement, and function, and a POSITA would have

had to simply extend the ridges depicted in Moskowitz 440's figure 2C.

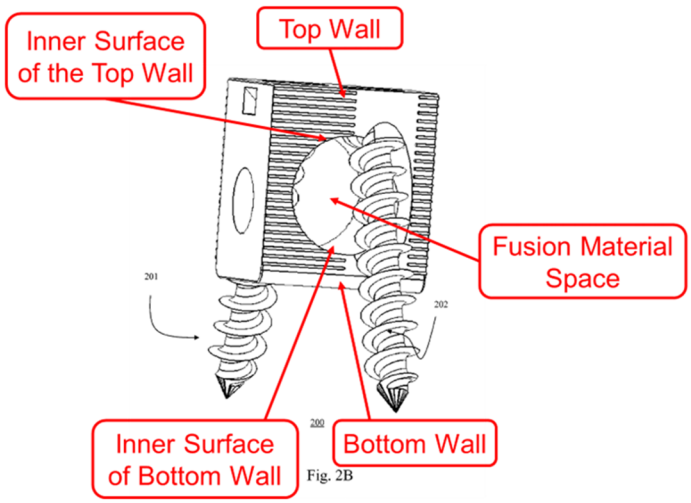


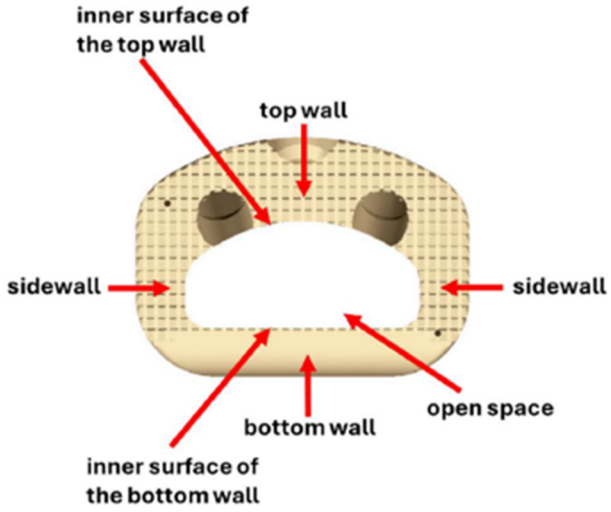
(Ex. 1006, Fig. 3 (annotated).)

The above mapping is consistent with Moskowitz's infringement contentions that were served in the Pending Litigation.



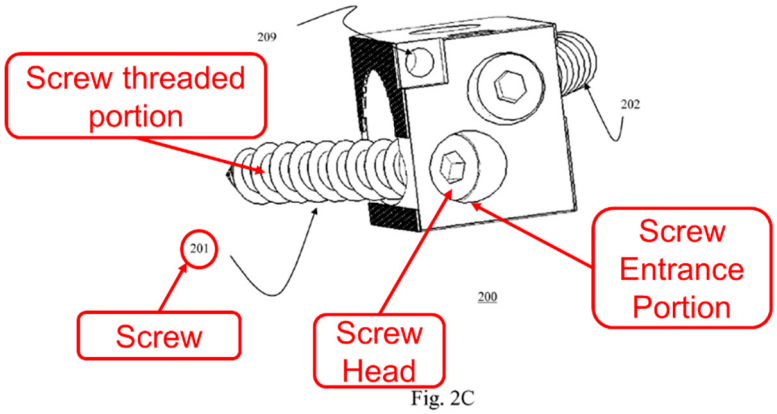
(Ex. 1059, 8 (excerpted).)

[1.n] "wherein the top wall, the bottom wall, and the sidewalls are integrally formed and the fusion material space for receiving bone graft material extends continuously from an inner surface of the top wall to an inner surface of the bottom wall;"	Moskowitz 440 discloses this limitation. As shown in figure 2B below, the walls of screw box 200 are all joined to form the unitary piece that is the box, such that "**the top wall, the bottom wall, and the sidewalls**" as defined in Appendix [1.a] above are "**integrally formed**." The open space that is the "**fusion material space**" is a circular hollow space that extends uninterruptedly about the inner surfaces of the screw box and entirely through it. (*See* Ex. 1005, Fig. 2B). Because this space is circular through the inner portion of the screw box, it "**extends continuously from an inner surface of the top wall to an inner surface of the bottom wall**."  (*Id.*, Fig. 2B (annotated).) The above mapping is consistent with Moskowitz's infringement contentions.



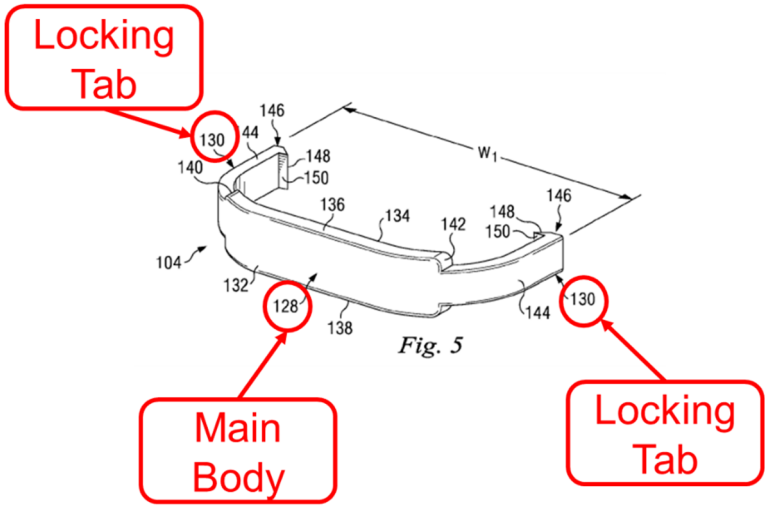
(Ex. 1059, 9 (excerpted).)

[1.o] "a first screw having a first screw head and a first screw shaft having a first screw threaded portion, wherein the screw entrance portion of the internal screw guide is sized large enough to receive at least part of the first screw head and wherein the internal bore portion of the internal screw guide is sized with a smaller diameter than the screw entrance portion and is sized to receive the first screw shaft of the first screw;"	Moskowitz 440 discloses this limitation. As discussed in Section VIII.A.1, Moskowitz 440 discloses "two BDFT screws," and as discussed in Appendix [1.b], Moskowitz 440 discloses two internal screw guides that house and guide the screws for placement in the vertebrae. As shown in figure 2C below, screws 201 and 202 each have a "**screw head**," the top portion of the screw, and a "**screw shaft having a [] screw threaded portion**," *i.e.*, the portion of the screw with a ridge wrapping around the screw. (Ex. 1005, Abstract.) Also shown in figure 2C below, screws 201 and 202 fit within and through the internal screw guide with the screw heads in the "**screw entrance portion**." Additionally, the heads of screws 201, 202 are depicted "**in the screw entrance portion[s]**." (*Id.*, Fig. 2C; *see supra*, Appendix [1.b].) A POSITA would have understood that Moskowitz 440 discloses an "**internal bore portion of the internal screw guide is sized with a smaller diameter than the screw entrance portion**." This smaller diameter internal portion serves to stop the screw from screwing entirely through the implant. Without a smaller internal bore portion, there would be nothing holding the screw to the implant and the implant could back out of the disc space after insertion of the screws. An implant without such a feature would go against the purpose of Moskowitz 440's screw box 200 to maintain disc space height and to link, interlock, and fuse the adjacent vertebrae (Ex. 1005, [0006], [0009].) That Moskowitz 440's screw heads and threaded portion of the screws appear to have approximately the same diameter does not affect this disclosure of an "**internal bore portion [having] . . . a smaller diameter than the screw entrance portion**." A POSITA would have understood that a screw shaft has two diameters, a major outer diameter measured by the diameter of the thread, and a minor diameter measured by the diameter of the inner core of the screw shaft. A POSITA would have also understood that so long as the diameter of the internal bore is larger than the minor diameter of the screw shaft, the screw

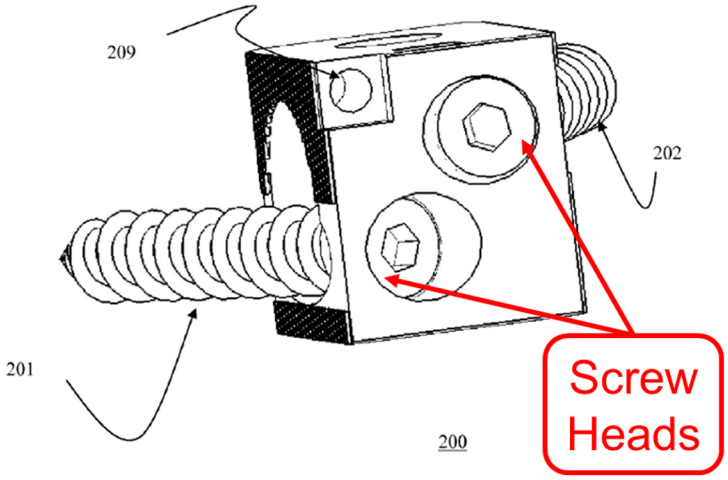
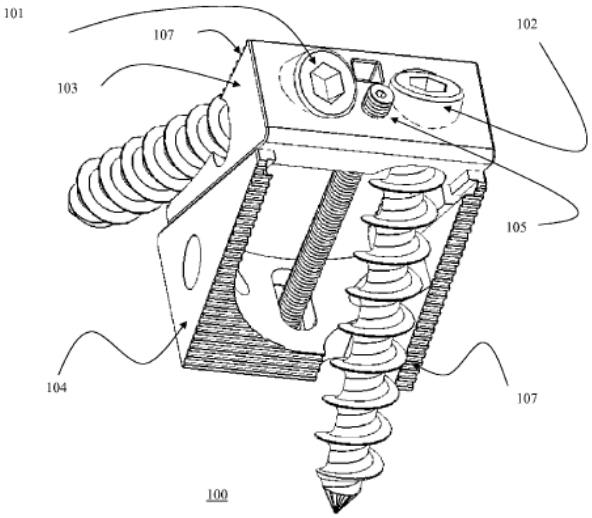
	shaft's larger major diameter would not prevent it from fitting within the internal bore. As discussed in Appendix [1.b], Moskowitz 440's "**internal bore portion . . . is sized to receive the first screw shaft of the first screw**." As explained in Appendix [1.b], Moskowitz's interpretation of the "**screw entrance portion**" is consistent with the above analysis.  Fig. 2C (Ex. 1005, Fig. 2C (annotated).) Moskowitz thus discloses limitation [1.o].

[1.p] "a second screw having a seconds [sic] screw head and a seconds [sic] screw threaded portion, wherein the second screw entrance portion of the second internal screw guide is sized large enough to receive at least part of the second screw head and wherein the second internal bore portion of the second internal screw guide is sized with a smaller diameter than the second screw entrance portion and is sized to receive the second screw shaft of the second screw; and"	Moskowitz 440 discloses this limitation. As discussed in Appendix [1.o], Moskowitz 440 discloses two screws that each fit within the internal screw guide in the same manner. Screws 201, 202 have the same structure and function as part of the BDFT screw construct. (Ex. 1005, Abstract, [0002], [0009], [0027], [0065], Figs. 2A-2C.) Therefore, the analysis in Appendix [1.o] regarding the "**first screw**" applies equally to the "**second screw**." Moskowitz 440 thus discloses limitation [1.p].

[1.q] "a screw locking bracket having a first end portion sized and positioned to be inserted in the first slot,"	Moskowitz 440 combined with Waugh discloses and suggests this limitation, as I discussed above in Sections VIII.B.2-3.
[1.r] "a second end portion sized and positioned to be inserted in the second slot and"	Moskowitz 440 combined with Waugh discloses and suggests this limitation. As discussed in Appendix [1.q], Waugh discloses a face plate 104 (*i.e.*, "screw locking bracket") with locking tabs 130 at both the first and second end portions that are inserted in slots in the sidewalls. The second of Waugh's two locking tabs 130 is thus "**a second end portion**." Also described in Appendix [1.q], is how a POSITA would have known that the locking tabs 130 of Waugh's face plate 104 could easily be used with Moskowitz 440's screw box via insertion into the slots in the sidewalls. Waugh thus discloses "**a second end portion sized and positioned to be inserted in the second slot**."

[1.s] "a central portion extending between the first end portion and the second end portion,"	Moskowitz 440 combined with Waugh discloses and suggests this limitation. As discussed in Appendix [1.q], Waugh's face plate 104 has a main body 128 with locking tabs 130 (*i.e.*, "**the first end portion and the second end portion**") at each end of the main body. As shown in figure 5 below, main body 128 therefore is "**a central portion extending between the first end portion and the second end portion**."  (Ex. 1006, Fig. 5 (annotated).)

[1.t] "wherein when the screw locking bracket is connected to the intervertebral cage with the first end portion in the first slot and the second end portion in the second slot, the central portion partially blocks the screw entrance portion and the second screw entrance portion so as to retain the first and second screws in the internal screw guide and the second internal screw guide while leaving at least a portion of each of the first and second screw heads at least partially visible through gaps between the screw locking bracket and the intervertebral cage."	Moskowitz 440 combined with Waugh discloses and suggests this limitation. As discussed in Appendix [1.q] and [1.r], the "**screw locking bracket**" disclosed in Waugh is "**connected to the intervertebral cage with the first end portion in the first slot and the second end portion in the second slot**." Waugh further explains that its faceplate 104 "at least partially cover[s] a ***plurality*** of anchor member apertures" 126. (Ex. 1006, [0007] (emphasis added).) As discussed in Appendix [1.q], Waugh's anchor members are screws. Further, Waugh's anchor member apertures are holes through which Waugh's screws enter the implant and in which the screw heads sit. (*Id.*, [0006], Fig. 4.) Therefore, Waugh's anchor member apertures are the same as the "**screw entrance portion**." (*See supra*, Appendix [1.b].) As shown in Fig. 3 below, when Waugh's faceplate 104 ("**the screw locking bracket**") is connected to Waugh's cage, main body 128 ("**the central portion**") partially blocks the anchor member apertures 126 ("**the screw entrance portions**"), "**while leaving at least a portion of each of the first and second screw heads at least partially visible through gaps between the screw locking bracket and the intervertebral cage**." Moreover, as shown in figure 1B of Moskowitz 440, screw heads can protrude above the top surface of the top wall. (Ex. 1005, Fig. 1B.) Thus, a POSA would have understood that when Waugh's face plate is combined with Moskowitz's implant, the face plate would contact the screw heads in some configurations where the screw heads protrude (like in figure 1B of Moskowitz 440) above the top surface of the implant depending on the thickness of the top wall. For example, a POSA may want to use a thinner top wall (like in figure 1B) because less implant material allows for more bone graft. A face plate covering such screws will leave a gap between the plate and the cage such that the protruding portion of the screws will be visible from that gap. In such a configuration, "**at least a portion of each of the first and second screw heads [will**

	be] partially visible through gaps between the screw locking bracket and the intervertebral cage.”  Fig. 2C  Fig. 1B (Ex. 1005, Figs. 2C (annotated), 1B.)

Furthermore, the '183 patent does not identify any benefit associated with having the face plate only partially cover the screw entrance portions. The feature is essentially a design choice and a POSITA would have understood that Waugh's design choice could be predictably applied to Moskowitz 440's implant. For example, a POSITA would decide between a design that covers more of the screw entrance portion to reduce the possibility of the screw backing out, or a design that covers less of the screw entrance portion to obtain other benefits, *e.g.*, save material and weight. Additionally, a POSITA designing an intervertebral implant with a screw locking bracket would have generally tried to use as little implant material as possible to maximize the amount of bone fusion (less implant material in the disc space allows for more bone graft/fusion), while maintaining the function of minimizing screw back-out. These considerations would have led a POSITA to a bracket that only partially blocks the screw entrance portions since full coverage of the screw entrance portions would not be necessary to prevent back-out.

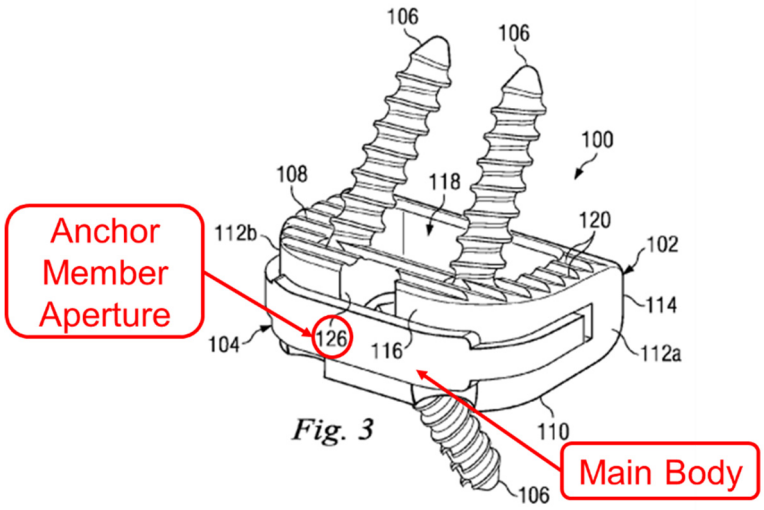
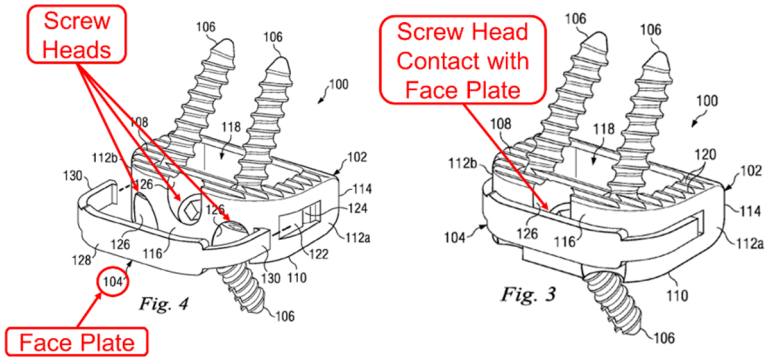


Fig. 3

(Ex. 1006, Fig. 3 (annotated).)

While figure 3 only shows the exposed portion for the center screw head, a POSITA would have understood that the face plate 104 similarly would only partially cover the other screws.

Claim 2

"The apparatus of claim 1, wherein the screw locking bracket abuts both the first and second screw heads when the screw locking bracket is connect [sic] to the intervertebral cage."	Moskowitz 440 combined with Waugh discloses and suggests this limitation. As discussed in Appendix [1.t], Waugh discloses that when face plate 104 ("**screw locking bracket**") is connected, it at least partially blocks the screw entrance portions where the screw heads sit. Waugh further discloses that face plate 104 "physically block[s] anchor member back-out" and inhibits the anchor members 106 from backing out by being physically located within the back-out path. (Ex. 1006, [0031]-[0032].) As Waugh recognizes, "[o]ver time . . . anchor members 106 may loosen slightly . . . [but] may be unable to back-out because they come into contact with the main body 128 of the faceplate 104." (*Id.*, [0059].) As discussed in Appendix [1.q], Waugh's anchor members are screws and as shown in figure 4 below, each of Waugh's screws has a screw head. Waugh discloses that when face plate 104 is attached, anchor members 106 are "unable to back-out because they come into contact with the main body 128 of the faceplate 104." (*Id.*) Figure 4 depicts Waugh's implant 102 and face plate 104 before face plate 104 has been attached. As shown in figure 4 below, the tops of Waugh's screw heads are exposed, such that when face plate 104 is attached, it contacts the screw heads. This contact is shown in figure 3 below for the center screw head and a POSITA would have understood that face plate 104 similarly contacts the other two screw heads. The Moskowitz-Waugh combination thus discloses "**the screw locking bracket abuts both the first and second screw heads when the screw locking bracket is connect [sic] to the intervertebral cage**." 

	(*Id*., Figs. 4, 3 (both annotated).) The above analysis would also apply to the combination of Moskowitz 440's screw box 200 and Waugh's face plate 104. Because face plate 104 functions by physically blocking the screws from backing out of vertebrae, a POSITA would have understood that face plate 104 would also contact the heads of Moskowitz 440's screws 201, 202 in the Moskowitz 440-Waugh combination. Additionally, as shown in Moskowitz 440 figure 2C below, just as in Waugh, the heads of screws 201, 202 have portions exposed to the top surface where the screw locking bracket, face plate 104, would sit when connected to the intervertebral cage, screw box 200. Moreover, as shown in figure 1B of Moskowitz 440, screw heads can protrude above the top surface of the top wall. (Ex. 1005, Fig. 1B.) Thus, a POSITA would have understood that when Waugh's face plate is combined with Moskowitz's implant, the face plate would contact the screw heads in some configurations where the screw heads protrude (like in figure 1B of Moskowitz 440) above the top surface of the implant depending on the thickness of the top wall. For example, a POSITA may want to use a thinner top wall (like in figure 1B) because less implant material allows for more bone graft.

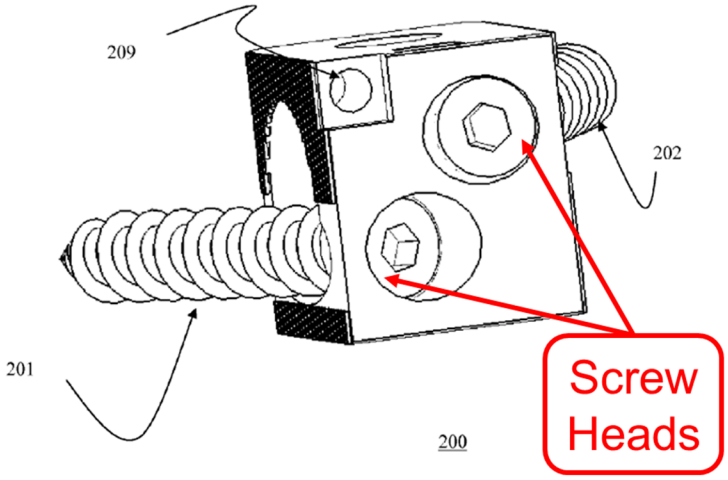


Fig. 2C

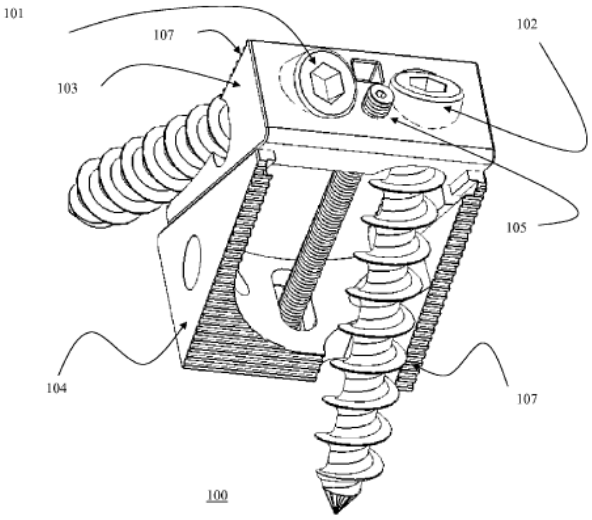
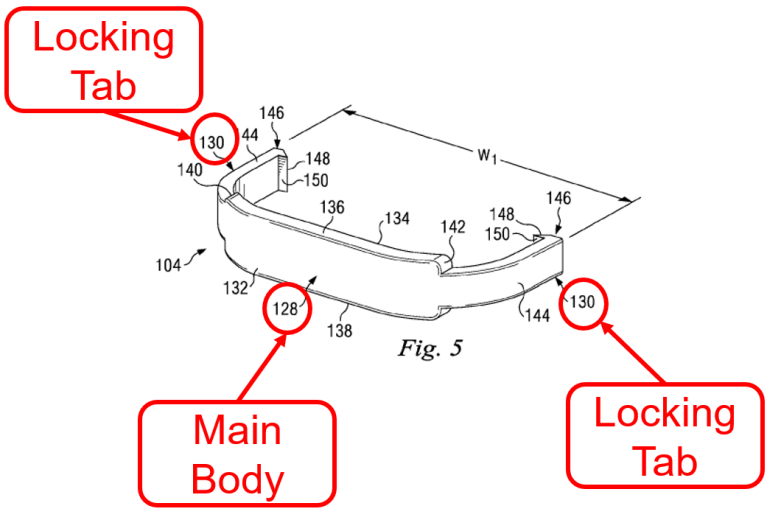
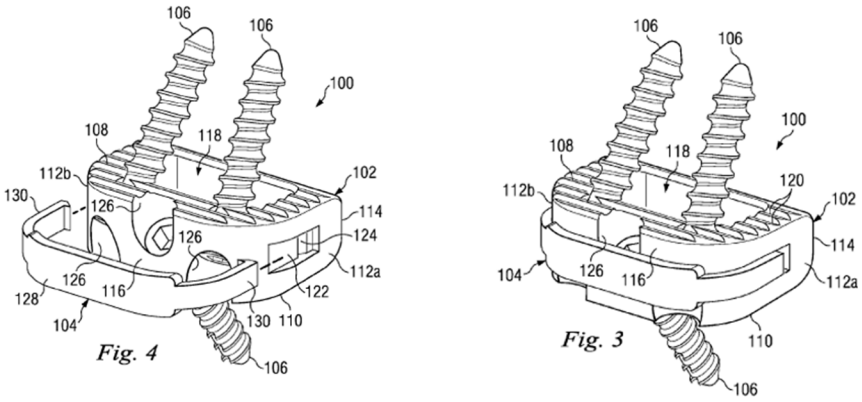
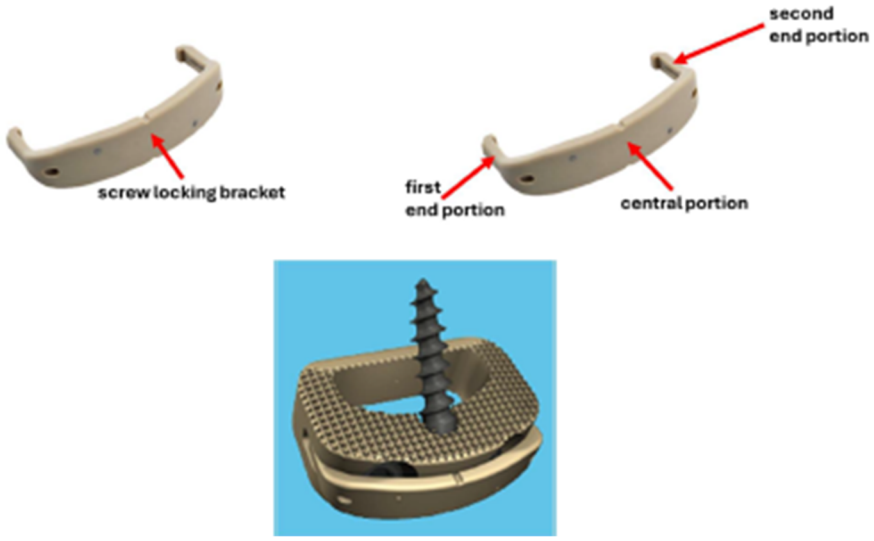


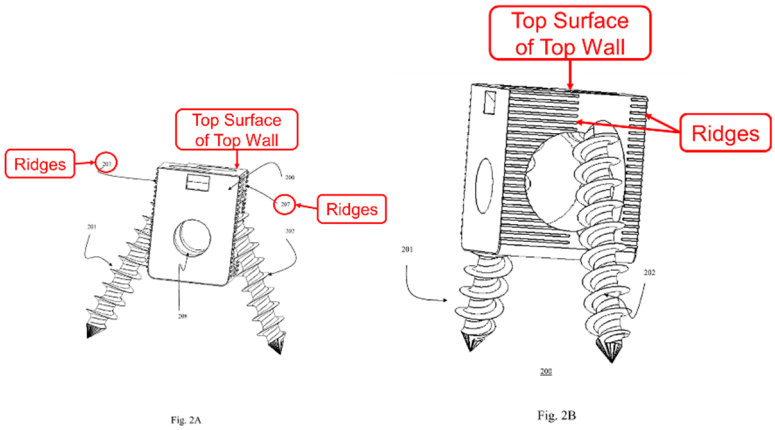
Fig. 1B

(Ex. 1005, Figs. 2C (annotated), 1B.)

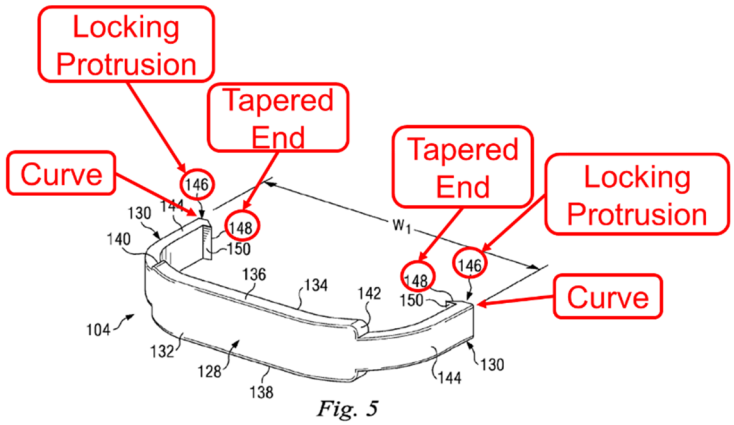
Claim 3

"The apparatus of claim 1, wherein the screw locking bracket is at least partially U-shaped such that the first and second end portions wrap at least partially around the first second sidewall s [sic]."	Moskowitz 440 combined with Waugh discloses and suggests this limitation. As discussed in Appendix [1.q], Waugh's "screw locking bracket" has locking tabs 130 at both ends of the main body 128. As shown in figure 5 below, Waugh's locking tabs 130 curve from main body 128 so that "**the screw locking bracket is at least partially U-shaped**."  (Ex. 1006., Fig. 5 (annotated).) The locking tabs 130 also partially wrap around the sidewalls.  (*Id.,* Fig. 4 (left), Fig. 5 (right).) The above mapping is consistent with Moskowitz's infringement contentions that were served in the Pending Litigation.

	 (Ex. 1059, 17 (excerpted).)
Claim 4	

"The apparatus of claim 1, wherein the plurality of surface features on the side surface and the second side surface are patterned all the way next to the top surface of the top wall so as to be adjacent the top surface of the top wall."	Moskowitz 440 discloses this limitation. As discussed in Appendix [1.l], Moskowitz 440's ridges 207 are a "**plurality of surface features on the side surface and the second side surface**," and as discussed in Appendix [1.c], the "**top surface of the top wall**" of Moskowitz 440's screw box 200 is the surface where the screws enter the screw guides. Further, as shown in figure 2A below, ridges 207 cover the entire height of each side surface up to the top surface of the top wall such that they "**are patterned all the way next to the top surface of the top wall so as to be adjacent the top surface of the top wall**."  (Ex. 1005, Figs. 2A-2B (both annotated).) Moskowitz 440 thus discloses "**wherein the plurality of surface features on the side surface and the second side surface are patterned all the way next to the top surface of the top wall so as to be adjacent the top surface of the top wall**."
Claim 6	

"The apparatus of claim 1, wherein the intervertebral cage is sized and configured for use in a patient's lumbar spine, the apparatus further comprising means for fusing superior and inferior lumbar vertebral bodies in conjunction with the intervertebral cage."	Moskowitz 440 discloses this limitation. Moskowitz 440 describes the figures 2A-2C embodiment as a "[l]umbar intervertebral non-expandable screw box" and discloses that screw box 200 "can be implanted via . . . posterior lumbar interbody fusion (PLIF) or posterior transforaminal lumbar interbody fusion (TLIF)." (Ex. 1005, [0040], [0065], [0086].) Because Moskowitz 440's screw box 200 is an intervertebral cage (*supra*, Appendix [1.a]), Moskowitz 440 discloses "**the intervertebral cage is sized and configured for use in a patient's lumbar spine**." As discussed in Section VII, the structure corresponding to the means recited in claim 6 is ridges that facilitate integration and fusion with superior and inferior vertebral bodies. As discussed in Appendix [1.l], Moskowitz 440's screw box 200 has ridges 207. Moskowitz 440 additionally discloses that "ridges 207 [] facilitate integration and fusion with superior and inferior vertebral bodies." Moskowitz 440 thus discloses "**means for fusing superior and inferior vertebral bodies in conjunction with the intervertebral cage**." Moskowitz 440 also discloses that its spacer "can be filled with bone fusion material(s)" (Ex. 1005, [0002]), and more specifically, that screw box 200 has "holes 208 and hollow spaces allowing packaging with bone." (*Id.*, [0065].)
Claim 8	

"The apparatus of claim 1, wherein the screw locking bracket comprises a first hook at the first end portion that curves inward to engage the first slot and a second hook at the second end portion that curves inward to engage the second slot."	Moskowitz 440 combined with Waugh discloses and suggests this limitation. Moskowitz 440 combined with Waugh discloses and suggests this limitation. As discussed in Appendix [3], Waugh's screw locking bracket has "locking protrusions 146." (Ex. 1006, [0033].) Locking protrusions 146 form "**a first hook at the first end portion**" and "**a second hook at the second end portion"** of **"the screw locking bracket**." As shown in figure 5 below, Waugh's curved locking protrusions 146 have tapered ends 148 that point towards the center of face plate 104, *i.e.*, "**curve[] inward to engage**" "**the first slot**" and "**the second slot**." (*Id.*; *Supra*, Appendix [1.t].) The Moskowitz-Waugh combination thus discloses claim 8.  *Fig. 5* (Ex. 1006, Fig. 5 (annotated).)
Claim 10	

"The apparatus of claim 1, wherein the screw locking bracket is configured to be press fit to the intervertebral cage."	The Moskowitz-Waugh combination discloses and suggests this limitation. To connect face plate 104 to implant member 102, Waugh discloses that advancement of face plate 104 onto implant member 102 leads to "the faceplate 104 snap[ping] onto the implant member 102 because the locking tabs 130 deform toward their original positions as the locking protrusions 146 at least partially snap into the connecting impressions 124." (Ex. 1006, [0058].) Because Waugh's face plate 104 connects to its cage via deforming and snapping onto it, Waugh discloses that "**the screw locking bracket is configured to be press fit to the intervertebral cage**." Combining Waugh's face plate 104 with Moskowitz 440's implant would not change this functionality. As discussed in Appendix [1.q], Waugh's face plate 104 could similarly fit into the slots on the lateral sides of Moskowitz 440's implant. A POSITA would have been capable of configuring Waugh's face plate 104 to fit the size and/or shape of Moskowitz 440's implant. (*Supra*, Appendix [1.q].) The Waugh-Moskowitz 440 combination thus discloses "**wherein the screw locking bracket is configured to be press fit to the intervertebral cage**."
Claim 11	

[11.pre] "A intervertebral combination internal screw guide and fixation apparatus configured to be inserted into a disc space between a first vertebral body and a second vertebral body and to provide fusion of the first vertebral body to the second vertebral body via biological bone fusion and screw fusion, the apparatus comprising:"	Moskowitz 440 discloses this limitation as discussed above for limitation [1.pre]. (*Supra*, Appendix [1.pre].)

[11.a] "an intervertebral cage including: a top wall, a bottom wall, and first and second sidewalls defining a fusion material space capable of receiving bone filling for the biological bone fusion;"	Moskowitz 440 discloses this limitation as discussed above for limitation [1.a]. (*Supra*, Appendix [1.a].)
[11.b] "an internal screw guide having a screw entrance portion and an internal bore portion,"	Moskowitz 440 discloses this limitation as discussed above for limitation [1.b]. (*Supra*, Appendix [1.b].)
[11.c] "wherein the screw entrance portion is larger than and coaxial with the internal bore and is formed at least partially in a top surface of the top wall as viewed from a top of the intervertebral cage,"	Moskowitz 440 discloses this limitation as discussed above for limitation [1.c]. (*Supra*, Appendix [1.c].)

[11.d] "wherein the internal bore portion has an entry opening formed only in a top surface of the top wall as viewed from the top of the intervertebral cage and has an exit opening formed at least partially in a bottom surface of the top wall and at least partially in a side surface of the top wall;"	Moskowitz 440 discloses this limitation as discussed above for limitation [1.d]. (*Supra*, Appendix [1.d].)

[11.e] "a second internal screw guide having a second screw entrance portion and a second internal bore portion, wherein the second screw entrance portion is larger than and coaxial with the second internal bore and is formed at least partially in the top surface of the top wall as viewed from the top,"	Moskowitz 440 discloses this limitation as discussed above for limitation [1.e]. (*Supra*, Appendix [1.e].)

[11.f] "wherein the second internal bore portion has a second entry opening formed only in the top surface of the top wall as viewed from the top of the intervertebral cage and has a second exit opening formed at least partially in the bottom surface of the top wall and at least partially in a second side surface of the top wall, and"	Moskowitz 440 discloses this limitation as discussed above for limitation [1.f]. (*Supra*, Appendix [1.f].)
[11.g] "wherein the internal screw guide and the second internal screw guide are angled to orient a first screw member and a second member bi-directionally in opposite directions;"	Moskowitz 440 discloses this limitation as discussed above for limitation [1.g]. (*Supra*, Appendix [1.g].)

[11.h] "a first slot extending at least partially into the first sidewall;"	Moskowitz 440 discloses this limitation as discussed above for limitation [1.h]. (*Supra*, Appendix [1.h].) Limitation [11.h] recites "**a first slot extending at least partially into a first sidewall**," whereas limitation [1.h] recites "**a first slot on a first outer side of a first sidewall**." Because the slot is an indentation, the first slot on the first wall disclosed in Appendix [1.h] also "**extend[s] at least partially into the first sidewall**."
[11.i] "a second slot extending at least partially into a second sidewall of the two sidewalls, wherein the second slot is positioned opposite of the first slot;"	Moskowitz 440 discloses this limitation as discussed above for limitation [1.i]. (*Supra*, Appendix [1.i].) Limitation [11.i] recites "**a second slot extending at least partially into a second sidewall**," whereas limitation [1.i] recites "**a second slot on a second outer side of a second sidewall**." As explained in Appendix [11.h], Moskowitz 440's second slot is also "**extend[s] at least partially into the second sidewall**."
[11.j] "wherein the first slot is positioned along a first centerline axis that bisects the first sidewall and is positioned nearer a top of the intervertebral cage than a bottom of the intervertebral cage,"	Moskowitz 440 discloses this limitation as discussed above for limitation [1.j]. (*Supra*, Appendix [1.j].)

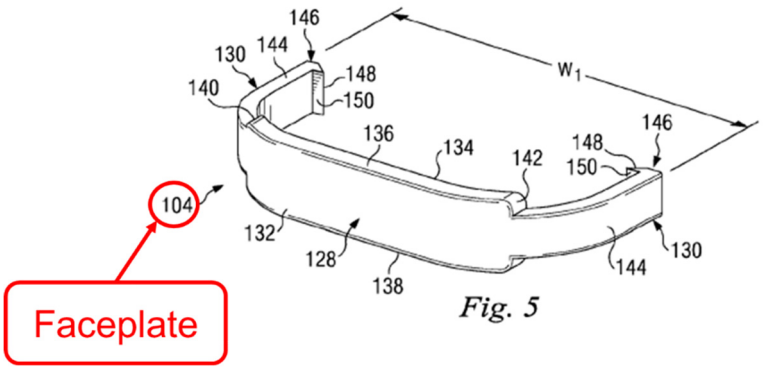
[11.k] "wherein the second slot is positioned along a second centerline axis that bisects the second sidewall and is positioned nearer the top of the intervertebral cage than the bottom of the intervertebral cage,"	Moskowitz 440 discloses this limitation as discussed above for limitation [1.k]. (*Supra*, Appendix [1.k].)
[11.l] "wherein the side surface and the second side surface of the top wall are patterned with a plurality of surface features to create rough side surfaces,"	Moskowitz 440 discloses this limitation as discussed above for limitation [1.l]. (*Supra*, Appendix [1.l].)
[11.m] "wherein at least some of the plurality of surface features are positioned on the side surface between the top wall and the exit opening, and"	Moskowitz 440 discloses this limitation as discussed above for limitation [1.m]. (*Supra*, Appendix [1.m].)

[11.n] "wherein the top wall, the bottom wall, and the sidewalls are integrally formed;"	Moskowitz 440 discloses this limitation as discussed above for limitation [1.n]. (*Supra*, Appendix [1.n].)
[11.o] "a first screw having a first screw head and a first screw shaft having a first screw threaded portion, wherein the screw entrance portion of the internal screw guide is sized large enough to receive at least part of the first screw head and wherein the internal bore portion of the internal screw guide is sized with a smaller diameter than the screw entrance portion and is sized to receive the first screw shaft of the first screw;"	Moskowitz 440 discloses this limitation as discussed above for limitation [1.o]. (*Supra*, Appendix [1.o].)

[11.p] "a second screw having a seconds [sic] screw head and a seconds [sic] screw threaded portion, wherein the second screw entrance portion of the second internal screw guide is sized large enough to receive at least part of the second screw head and wherein the second internal bore portion of the second internal screw guide is sized with a smaller diameter than the second screw entrance portion and is sized to receive the second screw shaft of the second screw; and"	Moskowitz 440 discloses this limitation as discussed above for limitation [1.p]. (*Supra*, Appendix [1.p].)

[11.q] "a screw locking bracket having a first end portion sized and positioned to be inserted into the first slot,"	Moskowitz 440 combined with Waugh discloses and suggests this limitation as discussed above for limitation [1.q]. (*Supra*, Appendix [1.q].)
[11.r] "a second end portion sized and positioned to be inserted in the second slot and"	Moskowitz 440 combined with Waugh discloses and suggests this limitation as discussed above for limitation [1.r]. (*Supra*, Appendix [1.r].)
[11.s] "a central portion extending between the first end portion and the second end portion,"	Moskowitz 440 combined with Waugh discloses and suggests this limitation as discussed above for limitation [1.s]. (*Supra*, Appendix [1.s].)

[11.t] "wherein when the screw locking bracket is connected to the intervertebral cage with the first end portion in the first slot and the second end portion in the second slot, the central portion partially blocks the screw entrance portion and the second screw entrance portion so as to retain the first and second screws in the internal screw guide and the second internal screw guide while leaving at least a portion of each of the first and second screw heads at least partially exposed via gaps between the screw locking bracket and the intervertebral cage,"	Moskowitz 440 combined with Waugh discloses and suggests this limitation as discussed above for limitation [1.t]. (*Supra*, Appendix [1.t].)

[11.u] "and wherein the screw locking bracket has a curvature such that first and second distal ends of the first and second end portions are positioned downward with respect to the central portion when the screw locking bracket is connected to the intervertebral cage."	The Moskowitz-Waugh combination discloses and suggests this limitation. As shown in figure 5 below, Waugh's faceplate 104 (*i.e.*, "**the screw locking bracket**") is curved, or "**has a curvature**."  *Fig. 5* (Ex. 1006, Fig. 5 (annotated).) As discussed in Appendix [1.q]-[1.r], Waugh's faceplate 104 has "**first and second end portions**" with locking tabs 130. Locking tabs 130 have portions farthest from the center of main body 128 (*i.e.*, "**first and second distal ends**"). As shown in figure 4, when faceplate 104 is connected to implant member 102, **the first and second distal ends** of locking tabs 130 **are positioned downward with respect to the central portion** in the sense that locking tabs 130 extend from the central portion—which covers the "top surface of the top wall" as defined in Appendix [1.c]—downward such that the "first and second distal ends" are positioned closer to the "bottom wall," also defined in Appendix [1.c].

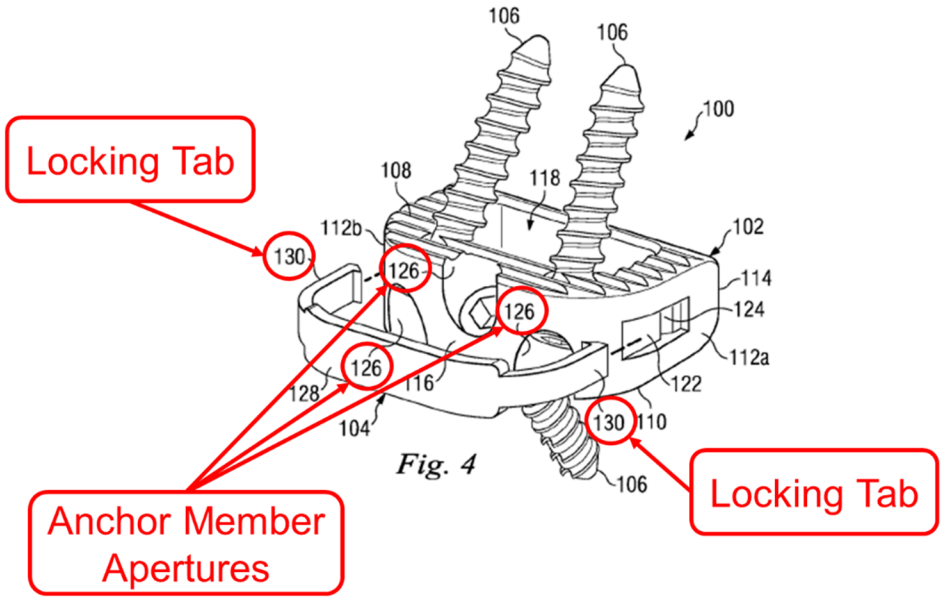
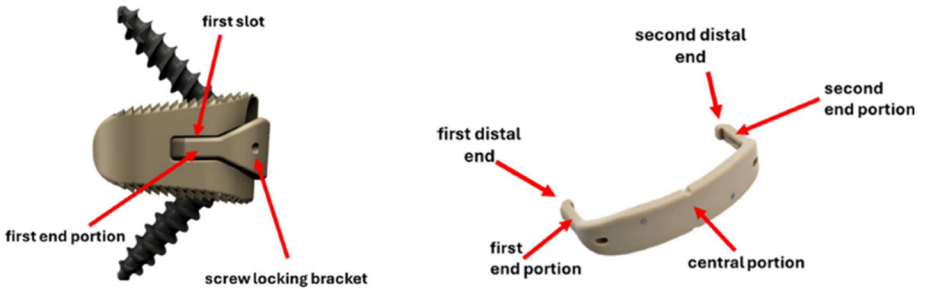


Fig. 4

(*Id.*, Fig. 4 (annotated).)

As discussed in Appendix [1.q], in the Moskowitz 440-Waugh combination, Waugh's faceplate 104 would connect to Moskowitz 440's screw box 200 in the same manner due to the similarities in size, placement, and function of slots in the sidewalls across the two implants. Because the central portion of Waugh's faceplate 104 would cover the top surface of the top wall (*see* Appendix [1.c]), and the end portions of Waugh's faceplate 104 would be positioned near the bottom wall (*see* Appendix [1.a]) when connected to the implant, the "**first and second distal ends of the first and second end portions are positioned downward with respect to the central portion when the screw locking bracket is connected to the intervertebral cage**."

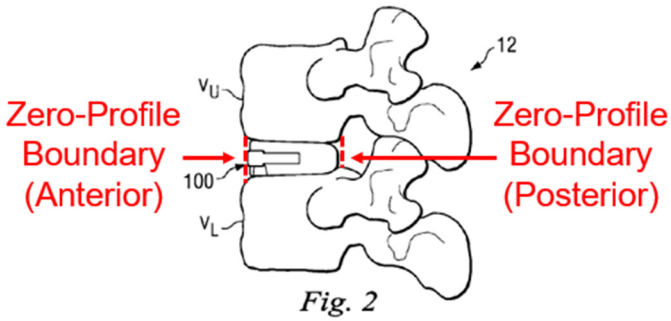
The above mapping is consistent with Moskowitz's infringement contentions that were served in the Pending Litigation.

	 (Ex. 1059, 41-42 (excerpted).)
Claim 12	
"The apparatus of claim 11, wherein the plurality of surface features on the side surface and the second side surface are patterned at locations next to the top surface."	Moskowitz 440 discloses this limitation as discussed above for claim 4. (*Supra*, Appendix [4].)
Claim 13	
"The apparatus of claim 11, and further comprising means for fusing superior and inferior vertebral bodies in conjunction with the intervertebral cage."	Moskowitz 440 discloses this limitation as discussed above for Claim 6. (*Supra*, Appendix [6].)

Claim 14	
"The apparatus of claim 11, wherein the intervertebral cage is sized and configured for use in a patient's lumbar spine, the apparatus further comprising means for fusing superior and inferior lumbar vertebral bodies in conjunction with the intervertebral cage."	Moskowitz 440 discloses this limitation as discussed above for Claim 6. (*Supra*, Appendix [6].)
Claim 18	

"The apparatus of claim 11, wherein the screw locking bracket contacts both the first and second screw heads when the screw locking bracket is connect [sic] to the intervertebral cage and wherein the screw locking bracket comprises a first hook at the first end portion that is sized to fit in the first slot and a second hook at the second end portion that is sized to fit in the second slot."	Moskowitz 440 combined with Waugh discloses and suggests this limitation as discussed above for Claims 2 and 8. (*Supra*, Appendix [2] and [8].)
Claim 19	

[19.pre] "A method of inserting a bi-directional fixating transvertebral (BDFT) screw/cage apparatus between a first vertebral body and a second vertebral body, the method including:"	Moskowitz 440 discloses this limitation. As discussed in Appendix [1.pre], Moskowitz 440 discloses "**a bi-directional fixating transvertebral (BDFT) screw/cage apparatus**." Moskowitz 440 further discloses methods of inserting this device "**between a first vertebral body and a second vertebral body**." (Ex. 1005, [0009], [0087]-[0094].)

[19.a] "inserting an intervertebral cage into a midline of a disc space between the first vertebral body and the second vertebral body until the intervertebral cage is one of flush and countersunk relative to the first vertebral body and the second vertebral body,"	Moskowitz 440 in combination with Waugh discloses and suggests this limitation. Moskowitz 440 discloses surgical methods for inserting screw box 200 ("**intervertebral cage**") where "a midline incision is made" before screw box 200 is inserted into the disc space, and where screw box 200 is "placed midline deeply." (Ex. 1005, [0087], [0093].) Moskowitz 440 thus discloses "**inserting an intervertebral cage into a midline of a disc space between the first vertebral body and the second vertebral body**." Waugh discloses the same limitation and additionally discloses that the cage is inserted "**until the intervertebral cage is one of flush and countersunk relative to the first vertebral body and the second vertebral body**." Waugh discloses that its cage is implanted in the disc space between two vertebrae through a midline incision, *i.e.*, "**into a midline of a disc space between the first vertebral body and the second vertebral body**." (Ex. 1006, [0056].) As shown in the figure below, and discussed further below, Waugh discloses that the intervertebral cage is "**one of flush and countersunk relative to the first vertebral body and the second vertebral body**." (*Id.*, [0027], Figs. 2-4.)  *Fig. 2* (*Id.*, Fig. 2 (annotated).) Waugh expressly states that the implantable device 100 "is capable of being entirely contained within the disc space." (*Id.*, [0036].) According to Waugh, "patient trauma [] can occur if organs and tissues are able to easily contact the implantable device outside the disc space." (*Id.*) Waugh's disclosure of the advantages of an implant that is contained entirely within the disc space is consistent with contemporaneous art and with a

	POSITA's understanding that reducing the protrusions beyond the disc space through a flush design reduces soft tissue irritation. (*Supra* Section V.C.) In view of the above teachings in Waugh and a POSITA's knowledge, a POSITA would have been motivated to combine the teachings of Moskowitz 440 and Waugh to configure and use Moskowitz 440's cage in a manner whereby Moskowitz 440's implant could reside entirely within the disc space *i.e.* a configuration where the cage is "**flush**" or "**countersunk**" with the adjacent vertebral bodies. This would have been a predictable design choice given the considerations described above in Moskowitz 440, Waugh, and the cited state-of-the-art references. (*See also supra* Section V.C (discussing Simpson's disclosures).) Moreover, a POSITA would have reasonably expected success in combining the disclosures of Moskowitz 440 and Waugh to allow inserting "**intervertebral cage**" in the disc space such that it is "**flush**" or "**countersunk**" relative to the adjacent vertebral bodies. Configuring Moskowitz 440's implant in this manner would not have required the design of Moskowitz 440's implant to be altered. Instead, a POSITA would only need to choose the dimensions of the cage that would allow the cage to fit entirely within the intervertebral space, a mere matter of routine experimentation or optimization of the implant, as evidenced by the similarity of Moskowitz 440's design with other implants like Simpson and Waugh. Indeed, intervertebral cages often come in multiple dimensions for this reason and the surgeon may pick the implant with the most suitable dimensions to fit the particular patient's vertebrae.

[19.b] "wherein the intervertebral cage includes: a top wall, a bottom wall, and sidewalls defining a fusion material space capable of receiving bone filling for the biological bone fusion;"	Moskowitz 440 discloses this limitation as discussed above for limitation [1.a]. (*Supra*, Appendix [1.a].)
[19.c] "an internal screw guide having a screw entrance portion and an internal bore portion,"	Moskowitz 440 discloses this limitation as discussed above for limitation [1.b]. (*Supra*, Appendix [1.b].)
[19.d] "wherein the screw entrance portion is larger than and coaxial with the internal bore and is formed at least partially in a top surface of the top wall as viewed from a top of the intervertebral cage,"	Moskowitz 440 discloses this limitation as discussed above for limitation [1.c]. (*Supra*, Appendix [1.c].)

[19.e] "wherein the internal bore portion has an entry opening formed only in a top surface of the top wall as viewed from the top of the intervertebral cage and has an exit opening formed at least partially in a bottom surface of the top wall and at least partially in a side surface of the top wall;"	Moskowitz 440 discloses this limitation as discussed above for limitation [1.d]. (*Supra*, Appendix [1.d].)

[19.f] "a second internal screw guide having a second screw entrance portion and a second internal bore portion, wherein the second screw entrance portion is larger than and coaxial with the second internal bore and is formed at least partially in the top surface of the top wall as viewed from the top,"	Moskowitz 440 discloses this limitation as discussed above for limitation [1.e]. (*Supra*, Appendix [1.e].)

[19.g] "wherein the second internal bore portion has a second entry opening formed only in the top surface of the top wall as viewed from the top of the intervertebral cage and has a second exit opening formed at least partially in the bottom surface of the top wall and at least partially in a second side surface of the top wall, and"	Moskowitz 440 discloses this limitation as discussed above for limitation [1.f]. (*Supra*, Appendix [1.f].)
[19.h] "wherein the internal screw guide and the second internal screw guide are angled to orient a first screw member and a second member bi-directionally in opposite directions;"	Moskowitz 440 discloses this limitation as discussed above for limitation [1.g]. (*Supra*, Appendix [1.g].)

[19.i] "a first slot extending at least partially into a first sidewall of the sidewalls;"	Moskowitz 440 discloses this limitation as discussed above for limitations [1.h] and [11.h]. (*Supra*, Appendix [1.h] and [11.h].)
[19.j] "a second slot extending at least partially into a second sidewall of the sidewalls, wherein the second slot is positioned opposite of the first slot;"	Moskowitz 440 discloses this limitation as discussed above for limitations [1.i] and [11.i]. (*Supra*, Appendix [1.i] and [11.i].)

[19.k] "wherein the first slot is positioned along a first centerline axis that bisects the first sidewall and is positioned nearer a top of the intervertebral cage than a bottom of the intervertebral cage,"	Moskowitz 440 discloses this limitation as discussed above for limitation [1.j]. (*Supra*, Appendix [1.j].)
[19.l] "wherein the second slot is positioned along a second centerline axis that bisects the second sidewall and is positioned nearer the top of the intervertebral cage than the bottom of the intervertebral cage,"	Moskowitz 440 discloses this limitation as discussed above for limitation [1.k]. (*Supra*, Appendix [1.k].)

[19.m] "wherein the side surface and the second side surface of the top wall are patterned with a plurality of surface features to create rough side surfaces,"	Moskowitz 440 discloses this limitation as discussed above for limitation [1.l]. (*Supra*, Appendix [1.l].)
[19.n] "wherein at least some of the plurality of surface features are positioned on the side surface between the top wall and the exit opening, and"	Moskowitz 440 discloses this limitation as discussed above for limitation [1.m]. (*Supra*, Appendix [1.m].)
[19.o] "wherein the top wall, the bottom wall, and the sidewalls are integrally formed; and"	Moskowitz 440 discloses this limitation as discussed above for limitation [1.n]. (*Supra*, Appendix [1.n].)

[19.p] "inserting a first screw into the internal screw guide of the intervertebral cage;"	Moskowitz 440 discloses this limitation. As discussed in Appendix [1.o], Moskowitz 440 discloses "**a first screw**" that fits within "**the internal screw guide of the intervertebral cage**." Moskowitz 440 further discloses that the "screw box incorporates built-in screw and/or drill guides which allow the direct placement and insertion of two self drilling screws." (Ex. 1005, [0010].) Moskowitz 440 thus discloses "**inserting a first screw into the internal screw guide of the intervertebral cage**."
[19.q] "inserting a second screw into the second internal screw guide of the intervertebral cage;"	Moskowitz 440 discloses this limitation. As discussed in Appendix [1.p], Moskowitz 440 discloses "**a second screw**" that fits within "**the second internal screw guide of the intervertebral cage**." As discussed in Appendix [19.p], Moskowitz 440 also discloses inserting "**a second screw into the second internal screw guide**."

[19.r] "screwing the first screw into the first vertebral body such that at least part of the first screw head is positioned in the screw entrance portion of the internal screw guide, at least part of the first screw shaft of the first screw is positioned in the internal bore, and at least part of the first screw threaded portion is positioned in the first vertebral body;"	Moskowitz 440 discloses this limitation. Moskowitz 440 discloses "insertion of two self drilling screws which are driven in two opposing directions into superior and inferior vertebral bodies, respectively," and that the "transvertebral screw is screwed into the vertebral body." (Ex. 1005, [0010], [0089].) Moskowitz 440 thus discloses "**screwing the first screw into the first vertebral body**." Additionally, as discussed in Appendix [1.o], "**at least part of the first screw head is positioned in the screw entrance portion of the internal screw guide**" and "**at least part of the first screw shaft of the first screw is positioned in the internal bore**." Moskowitz 440 also discloses that the internal screw guides (each having a screw entrance portion and internal bore, as discussed in Appendix [1.b] and [1.e]) "allow the direct placement and insertion of two self drilling screws . . . into superior and inferior vertebral bodies" (Ex. 1005, [0010]), such that Moskowitz 440 discloses "**screwing the first screw into the first vertebral body such that at least part of the first screw head is positioned in the screw entrance portion of the internal screw guide, at least part of the first screw shaft of the first screw is positioned in the internal bore, and at least part of the first screw threaded portion is positioned in the first vertebral body**."

[19.s] "screwing the second screw into the second vertebral body such that at least part of the second screw head is positioned in the second screw entrance portion of the second internal screw guide, at least part of the second screw shaft of the second screw is positioned in the second internal bore, and at least part of the second screw threaded portion is positioned in the second vertebral body; and"	Moskowitz 440 discloses this limitation. Moskowitz 440 discloses "insertion of two self drilling screws which are driven in two opposing directions into superior and inferior vertebral bodies, respectively." (Ex. 1005, [0010].) Moskowitz 440 thus discloses "**screwing the second screw into the second vertebral body**." Additionally, as discussed in Appendix [1.p], "**at least part of the second screw head is positioned in the second screw entrance portion of the second internal screw guide**," and "**at least part of the second screw shaft of the second screw is positioned in the second internal bore**." Moskowitz also discloses that when the second screw is in the second screw entrance portion and second internal bore, it also has at least part of the second screw "**positioned in the second vertebral body**," as discussed in Appendix [19.r]. Moskowitz 440 thus discloses limitation [19.s].

[19.t] "locking the first screw and the second screw in the intervertebral cage using a screw locking bracket coupled to the intervertebral cage by positioning a first end portion of the screw locking bracket in the first slot, a second end portion of the screw locking bracket in the second slot and a central portion of the screw locking bracket extending between the first end portion and the second end portion across at least part of the top surface of the top wall such that the central portion partially blocks the screw entrance portion and the second screw entrance	Moskowitz 440 combined with Waugh discloses this limitation as discussed above for limitation [1.t]. (*Supra*, Appendix [1.t].)

portion so as to retain the first and second screws in the internal screw guide and the second internal screw guide while leaving at least a portion of each of the first and second screw heads at least partially visible through gaps between the screw locking bracket and the intervertebral cage."	
Claim 20	
"The method of claim 19, and further comprising press fitting the screw locking bracket to the intervertebral cage."	Moskowitz 440 combined with Waugh discloses and suggests this limitation as discussed above for Claim 10. (*Supra*, Appendix [10].)