(12) **INTER PARTES REVIEW CERTIFICATE** (858th)
United States Patent
Curran et al.

(10) **Number: US 8,187,334 K1**
(45) **Certificate Issued: Feb. 22, 2018**

(54) **SYSTEM AND METHODS FOR SPINAL FUSION**

(75) Inventors: **Matthew Curran**; **Mark Peterson**; **Luiz Pimenta**

(73) Assignee: **NUVASIVE, INC.**

Trial Numbers:

IPR2013-00507 filed Aug. 14, 2013
IPR2013-00508 filed Aug. 14, 2013

Inter Partes Review Certificate for:

Patent No.: **8,187,334**
Issued: **May 29, 2012**
Appl. No.: **13/079,645**
Filed: **Apr. 4, 2011**

The results of IPR2013-00507 and IPR2013-00508 are reflected in this inter partes review certificate under 35 U.S.C. 318(b).

INTER PARTES REVIEW CERTIFICATE
U.S. Patent 8,187,334 K1
Trial No. IPR2013-00507
Certificate Issued Feb. 22, 2018

AS A RESULT OF THE INTER PARTES REVIEW PROCEEDING, IT HAS BEEN DETERMINED THAT:

Claim **18** is found patentable.

Claims **1-5**, **10**, **11**, **14**, **15** and **19-28** are cancelled.

* * * * *

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Paper 56
Entered: May 9, 2017

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MEDTRONIC, INC.,
Petitioner,

v.

NUVASIVE, INC.,
Patent Owner.

Case IPR2013-00508
Patent 8,187,334 B2

Before SALLY C. MEDLEY, LORA M. GREEN, and STEPHEN C. SIU, *Administrative Patent Judges.*

SIU, *Administrative Patent Judge.*

JUDGMENT

Granting Joint Motion to Terminate after Remand from the Court of Appeals for the Federal Circuit
35 U.S.C. § 317 and 37 C.F.R. §§ 42.72, 42.74

On April 26, 2017, the parties filed a Joint Motion to Terminate this proceeding (Paper 55), a true copy of the parties' settlement agreement (Ex. 2041), and a request to treat the settlement agreement as business confidential information under 35 U.S.C. § 317(b) and 37 C.F.R. § 42.74(c).

In the Joint Motion to Terminate this proceeding, the parties represent that they have settled their disputes regarding U.S. Patent 8,187,334 B2 ("the '334 patent"). Paper 55. The present *Inter Partes* Review was vacated-in-part and remanded to the Patent Trial and Appeal Board by the U.S. Court of Appeals for the Federal Circuit ("Federal Circuit"). *In Re: Nuvasive, Inc.*, Nos. 2015-1672, 2015-1673, slip op. at 16 (Fed. Cir. Nov. 9, 2016). We determine that it is appropriate to terminate this proceeding without rendering any further decisions. *See* 37 C.F.R. § 42.72.

ORDER

In consideration of the foregoing, it is hereby:

ORDERED that the parties' request to treat the settlement agreement (Ex. 2041) as business confidential information under 35 U.S.C. § 317(b) and 37 C.F.R. § 42.74(c) is GRANTED, and

FURTHER ORDERED that the Joint Motion to Terminate this proceeding is GRANTED, and this proceeding is hereby terminated.

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United States Court of Appeals for the Federal Circuit

IN RE: NUVASIVE, INC.,
Appellant

2015-1672, 2015-1673

Appeals from the United States Patent and Trademark Office, Patent Trial and Appeal Board in Nos. IPR2013-00507, IPR2013-00508.

Decided: November 9, 2016

MICHAEL T. ROSATO, Wilson, Sonsini, Goodrich & Rosati, PC, Seattle, WA, argued for appellant. Also represented by ANDREW SWANSON BROWN; RICHARD TORCZON, Washington, DC; GRACE J. PAK, PAUL DAVID TRIPODI, II, Los Angeles, CA.

JOSEPH MATAL, Office of the Solicitor, United States Patent and Trademark Office, Alexandria, VA, argued for intervenor Michelle K. Lee. Also represented by THOMAS W. KRAUSE, SCOTT WEIDENFELLER.

Before MOORE, WALLACH, and TARANTO, *Circuit Judges.*

TARANTO, *Circuit Judge.*

NuVasive, Inc. owns U.S. Patent No. 8,187,334, which describes and claims implants for spinal fusion surgery.

Medtronic, Inc.—which settled with NuVasive and has withdrawn from the present appeals—filed two petitions for inter partes review with the Patent and Trademark Office, which the Patent Trial and Appeal Board instituted as IPR2013-507 (IPR507) and IPR2013-508 (IPR508). The Board ultimately cancelled all but one of the challenged claims under 35 U.S.C. § 103, finding in one prior-art reference, *i.e.*, Michelson's U.S. Patent No. 5,860,973, a spinal fusion implant that meets two of the claim requirements of the '334 patent—having a length both greater than 40 mm and at least 2.5 times its width. *Medtronic, Inc. v. NuVasive, Inc.*, IPR2013-507, 2015 WL 996353 (PTAB Feb. 11, 2015) (*IPR507 Board Decision*); *Medtronic, Inc. v. NuVasive, Inc.*, IPR2013-508, 2015 WL 996354 (PTAB Feb. 11, 2015) (*IPR508 Board Decision*).

On appeal, NuVasive contends that it did not receive adequate notice of or opportunity to address that reading of Michelson and its consequences for the overall obviousness analysis. We agree in part. In IPR507, Medtronic's petition put NuVasive on notice that Medtronic was relying on particular portions of Michelson to teach the '334 patent's claimed long-and-narrow implants. In that proceeding, we see neither procedural nor other error in the Board's decision, and we therefore affirm. In IPR508, however, Medtronic's petition did not notify NuVasive of the assertions about the pertinent portions of Michelson that later became critical. In that proceeding, we conclude, the Board's ultimate reliance on that material, together with its refusal to allow NuVasive to respond fully once that material was called out, violated NuVasive's rights under the Administrative Procedure Act. Our affirmance in IPR507 resolves the unpatentability of the '334 patent's claims 1–5, 10, 11, 14, 15, and 19–28, but claims 16 and 17 are at issue only in IPR508. We vacate the Board's IPR508 decision and remand for further proceedings on claims 16 and 17.

I

The spinal fusion implant of the '334 patent is designed to be inserted between two vertebrae to replace a damaged or diseased intervertebral disc. '334 patent, col. 1, lines 29–36. The implant shares many features with prior-art implants, such as anti-migration teeth to hold the implant in place, *id.*, col. 2, lines 40–52, vertical holes (fusion apertures) to allow bone to grow through the implant, *id.*, col. 5, lines 36–40, and horizontal holes (visualization apertures) so that a doctor can see such bone growth, *id.*, col. 5, lines 54–66. Although the patent itself does not limit the methods of inserting the implant, its long-and-thin design is particularly suited to an approach from the side, through the psoas muscle, rather than from the front or back of the patient. *Id.*, col. 5, lines 29–35. The focus of the obviousness issue now on appeal is certain dimensions of the claimed implant, specifically, a length that is both greater than 40 mm and at least 2.5 times the maximum width. The relevant part of claim 1, the only independent claim, reads:

> 1. A spinal fusion implant of non-bone construction positionable within an interbody space between a first vertebra and a second vertebra . . .
>
> wherein said implant has a **longitudinal length greater than 40 mm** extending from a proximal end of said proximal wall to a distal end of said distal wall;
>
> wherein a central region of said implant includes portions of the first and second sidewalls positioned generally centrally between the proximal wall and the distal wall, at least a portion of the central region defining a maximum lateral width of said implant extending from said first sidewall to said second sidewall, **wherein said longitudinal length is at least two and half [sic]**

> **times greater than said maximum lateral width . . . .**

'334 patent, col. 12, line 32, through col. 13, line 4 (emphases added).

NuVasive asserted the '334 patent against Medtronic in *Warsaw Orthopedic, Inc. v. NuVasive, Inc.*, No. 3:12-cv-02738-CAB-MDD (S.D. Cal.). Medtronic thereafter filed two separate petitions for inter partes review of the '334 patent under 35 U.S.C. §§ 311–319.[1]

Medtronic's petition in what became IPR507 relied primarily on U.S. Patent Application Publication No. 2002/0165550 (published Nov. 7, 2002) (Frey), which teaches an implant whose length is at least 2.5 times the width. As relevant here, Medtronic argued that it would have been obvious to modify Frey to have a length greater than 40 mm, as taught by Michelson. But in one brief passage, Medtronic's petition went further. In pointing out that Michelson also teaches many of the '334 limitations, Medtronic stated that "[l]ike Frey, Michelson discloses example lateral fusion implants having an elongated shape" and "dimensions that are longer than wide," citing Michelson, col. 10, line 6, through col. 11, line 15. J.A. 172. That cited range includes a discussion of Michelson's Figure 18, which shows an "alternative embodiment . . . 1000 . . . similar to the spinal fusion implant 900, but [which] has a narrower width such that more than one spinal fusion implant 1000 may be combined in a modular fashion for insertion within the disc space D between the adjacent vertebrae." Michelson, col. 10, lines 48–55.

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[1] Medtronic separately sought review of NuVasive's U.S. Patent No. 8,361,156. The Board decision in that review, IPR2013-506, is before this court in *In re NuVasive*, No. 2015-1670.

Medtronic's petition in what became IPR508 relied primarily on the Synthes Vertebral Spacer-PR Brochure, Synthes Spine 2002 (SVS-PR), and the Telamon Verte-Stack PEEK Vertebral Body Spacer Brochure and the accompanying Telamon Posterior Impacted Fusion Devices Guide 2003 (jointly, Telamon), which teach implants whose lengths are at least 2.5 times their widths. Medtronic argued that it would have been obvious to modify either SVS-PR or Telamon to have lengths greater than 40 mm, as taught by Michelson. But in the SVS-PR/Telamon petition, unlike the Frey petition, Medtronic did not include an assertion about or citation to material encompassing Michelson's Figure 18.

In response to Medtronic's petitions, the Board, exercising institution authority delegated by the PTO Director, 37 C.F.R. §§ 42.4, 42.108, determined that there was a reasonable likelihood that Medtronic would establish, by a preponderance of the evidence, that claims 1–5, 10, 11, 14, 15, and 18–28 would have been obvious over Frey, in view of Michelson. On that basis, the Board instituted IPR507. The Board made comparable determinations as to claims 1–5, 10, 11, and 14–28 based on either SVS-PR or Telamon, in view of Michelson and U.S. Patent Application Publication No. 2003/0028249 (published Feb. 6, 2003) (Baccelli). On that basis, the Board instituted IPR508. The two proceedings involve all the same claims apart from claims 16 and 17, which are the subject of IPR508, but not IPR507.

When NuVasive filed its Patent Owner Responses, it argued that no single reference taught an implant that was both longer than 40 mm and had a length at least 2.5 times its width. NuVasive pointed to Michelson's Figures 16 (showing long-and-wide rectangular implant 900), 19 (showing a plurality of "narrower" implants 1000 lined up in the disc space), and 20 (showing another long-and-wide rectangular implant), as evidence that a person of ordinary skill reading Michelson would size an implant to be

both long and wide (not long and narrow) in order to maximize the surface area of contact with the vertebrae, as taught by Michelson. NuVasive further argued that there was no reason for a person of skill in the art to combine the length of Michelson with the length-to-width ratio of the primary references, because doing so would make the resulting implant an unsuitable size for the intended insertion path of the primary references, which NuVasive contends were inserted from the front or back, not the side.

In its replies, Medtronic pointed to Michelson's Figure 18 specifically and argued that it disclosed an implant whose length was greater than 40 mm and at least 2.5 times its width.

NuVasive objected to Medtronic's argument regarding Michelson's Figure 18, which it contended was a new ground of invalidity asserted for the first time on reply. It requested leave to file motions to strike or, alternatively, surreplies, which the Board denied. NuVasive also attempted to address the matter at oral argument, but the Board refused to allow NuVasive to make substantive arguments in response. When Medtronic made arguments relating to Michelson's Figure 18 in its rebuttal time, NuVasive objected again, but the Board assured NuVasive that it understood NuVasive's position and would consider the propriety of Medtronic's arguments when making a final decision.

The Board ultimately held, in IPR507, that claims 1–5, 10, 11, 14, 15, and 19–28 would have been obvious over Frey and Michelson, but it upheld claim 18. In IPR508, the Board held that claims 1–5, 10, 11, 14–17, and 19–28 would have been obvious over either SVS-PR or Telamon in view of Baccelli and Michelson, but it upheld claim 18.

The Board's decisions relied heavily on its findings that Michelson, by itself, discloses both disputed dimensional limitations in a single implant—one whose length

is both greater than 40 mm and at least 2.5 times its width—so that no combining of references was needed to arrive at an implant that meets both requirements. Thus, in IPR507, the Board never found that Frey teaches an implant with a length at least 2.5 times the width. Rather, it found that if one combined (1) Michelson's teaching that the preferred overall width of the implant was 26 mm with (2) Michelson's teaching that at least two "narrower" implants could be combined to fit that space, then at least one of the "narrower" implants would be at most 13 mm wide, which is less than the preferred length (42 mm) divided by 2.5. *IPR507 Board Decision* at *5. On that basis, the Board concluded that "it would have been obvious to one of ordinary skill in the art to have provided an implant with a length of greater than 40 mm (e.g., 42 mm) and at least 2.5 times the width." *Id.* at *6.

Similarly, in IPR508, the Board did not find that SVS-PR or Telamon discloses an implant whose length is at least 2.5 times its width. Rather it "credit[ed] the testimony [submitted along with Medtronic's reply] of Petitioner's Declarant (Dr. Richard A. Hynes) that Michelson discloses a spinal implant with a length that is greater than 40mm and at least 2.5 times the width," made the same calculations it made in IPR507, and came to the same conclusion verbatim. *IPR508 Board Decision* at *4.

NuVasive appeals. Medtronic had cross-appealed from the Board's decisions regarding claim 18, but Medtronic later withdrew, and we dismissed, the cross-appeals (Nos. 2015-1674, -1712). The Director of the PTO intervened to defend the Board's rulings against NuVasive's inadequate-process challenges. We have jurisdiction under 28 U.S.C. § 1295(a)(4)(A).

II

Under the Administrative Procedure Act, we must "hold unlawful and set aside agency action . . . not in accordance with law [or] . . . without observance of proce-

dure required by law." 5 U.S.C. § 706. In the non-IPR setting, we have made clear that whether a ground the Board relied on was "new," requiring a new opportunity to respond, is a question of law, subject to de novo review. *See In re Stepan Co.*, 660 F.3d 1341, 1343 (Fed. Cir. 2011). No different standard of review is called for on the closely related issue in the IPR context. *See Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1080 (Fed. Cir. 2015) (noting similarity of issues). Obviousness is a question of law based on underlying determinations of fact. *See, e.g., id.* at 1073. We review the Board's conclusions of law de novo and its findings of fact for substantial evidence. *Id.*

We first address NuVasive's procedural challenges to the Board's reliance on Michelson's Figure 18 in the two IPRs. We then address NuVasive's remaining challenges.

A

"A patent owner in [NuVasive's] position is undoubtedly entitled to notice of and a fair opportunity to meet the grounds of rejection," based on due-process and APA guarantees. *Belden,* 805 F.3d at 1080. "For a formal adjudication like the inter partes review considered here, the APA imposes particular requirements on the PTO. The agency must 'timely inform[]' the patent owner of 'the matters of fact and law asserted,' 5 U.S.C. § 554(b)(3), must provide 'all interested parties opportunity for the submission and consideration of facts [and] arguments . . . [and] hearing and decision on notice,' *id.* § 554(c), and must allow 'a party . . . to submit rebuttal evidence . . . as may be required for a full and true disclosure of the facts,' *id.* § 556(d)." *Dell Inc. v. Acceleron, LLC*, 818 F.3d 1293, 1301 (Fed. Cir. 2016) (alterations in original). While "the rules and practices of the Board *generally* protect against loss of patent rights without the required notice and opportunity to respond," *Belden*, 805 F.3d at 1080 (emphasis added), those rules and practices protect against such loss in a given case only when, upon a proper re-

quest, the PTO actually provides the opportunities required by the APA and due process.

1

Although the Board is not limited to citing only portions of the prior art specifically drawn to its attention, in this case it is clear that the Board treated Michelson's Figure 18 as an essential part of its obviousness findings identifying claim elements in the prior art. It relied on Michelson's Figure 18 and nothing else for a prior-art disclosure of an implant having a length that is greater than 40 mm and at least 2.5 times its width. The Board made no findings that another reference disclosed an implant having both those characteristics. Nor did it find that such dimensions would have been obvious even if not found together in a single piece of prior art. Nor, indeed, did the Board find a prior-art implant having a length at least 2.5 times its width and then explain the obviousness of a combination of that limitation with the distinct requirement of sufficient length.

We are in no position to treat the Board's finding about Michelson's Figure 18 as immaterial given the limited other findings so far made by the Board. Nor can this factual finding be analogized to others that merely reinforce the meaning of another prior-art disclosure. Thus, the Figure 18 finding did not "merely serve[] to describe the state of the art [at the time of the invention]," informing the understanding of another, separate prior-art disclosure of a claim limitation. *Genzyme Therapeutic Prods. Ltd. v. Biomarin Pharm. Inc.*, 825 F.3d 1360, 1368–69 (Fed. Cir. 2016) (finding that the Board did not violate the APA by citing references not part of the combinations set forth in the institution decisions where those references "merely served to describe the state of the art [at the time of invention]," and were "not among the prior art references that the Board relied upon to establish any claim limitations"); *Belden*, 805 F.3d at 1079 (noting that

certain explanatory evidence was not "necessary to the prima facie case").

Under the APA's standards, NuVasive was entitled to an adequate opportunity to respond to this asserted fact about Michelson. And under the APA's fact-specific standard, common sense, and this court's precedent, that entitlement was not lessened in this case by virtue of the opportunity NuVasive had to respond to *other* factual assertions about Michelson. In *Dell*, we held that an opportunity to respond was needed when the petitioner, to make its anticipation showing, newly pointed to a previously unmentioned portion of the allegedly anticipatory prior-art patent, even though it had earlier focused extensively on other portions of that prior-art patent. 818 F.3d at 1301. In the related, non-IPR context, we have relied on the APA's requirements to find a "new ground" where "the thrust of the rejection" has changed, even when the new ground involved the same prior art as earlier asserted grounds of invalidity. *In re Leithem*, 661 F.3d 1316, 1319 (Fed. Cir. 2011). Here, the assertion about Figure 18 on which the Board ultimately relied is sufficiently distinct from Medtronic's other assertions about Michelson that NuVasive was entitled to the APA-required opportunity to respond to it.

2

In IPR507, NuVasive had that opportunity. There is no dispute that NuVasive's Patent Owner Response was an adequate opportunity to respond *if* Medtronic's petition put NuVasive on notice of the assertion about Figure 18. In IPR507, we conclude that the notice was at least minimally sufficient.

In IPR507, Medtronic's petition cited the Michelson text that specifically discusses Figure 18 in addition to nearby figures in Michelson. The petition did so in asserting that the text shows "longer than wide" implants. J.A. 172. The only limitation in the '334 patent addressing a

comparison of length to width is the one requiring length at least 2.5 times width. It is true that Medtronic did not make a clear or direct reference to that limitation or a clear or direct assertion that the 2.5 ratio is shown in Michelson, in Figure 18 or elsewhere. But we think that the citation of the text discussing Figure 18, plus the reference to "longer than wide" implants, should have put NuVasive on notice that it was obliged to use its Patent Owner Response to address Figure 18 and its relationship to the length/width ratio claim limitation.

3

IPR508 is different. In that proceeding, Medtronic did not include in its petition the same citations to or assertions about the Michelson passage that it included in the IPR507 petition. In IPR508, unlike IPR507, there was no notice of the Figure 18 point before NuVasive filed its Patent Owner Response. The opportunity to file that Response therefore did not provide the required opportunity to address the factual assertion about Figure 18 on which the Board ultimately relied.

Despite the consolidated hearing in the two proceedings, the Board treated each inter partes review as a separate, distinct proceeding, and it issued separate final written decisions, independently invalidating some of the same claims based on different mixes of prior art. The Director has furnished no persuasive basis on which we are prepared to hold that a (barely sufficient) notice in one proceeding constituted an obligation-triggering notice in the other proceeding in which a comparable notice was missing. Nor do we see a basis for concluding that the Board could rely on the Figure 18 point in IPR508, where no sufficient notice was given, just because NuVasive chose, in cut-and-paste fashion, to include highly similar discussions of Michelson in its Patent Owner Responses in the two proceedings. We note that neither of NuVasive's Responses addresses Figure 18, even while they do

address some of the content of the Michelson passage cited by Medtronic in the IPR507 petition.[2]

Not until Medtronic's Reply, after NuVasive's Patent Owner Response, was NuVasive given fair notice in IPR508 of the Figure 18 factual assertion on which the Board eventually relied. But at no point after the Reply did the Board give NuVasive the required opportunity to respond to that point. Despite requests from NuVasive, the Board refused to permit NuVasive to file a surreply or even to address the matter during oral argument.

The Director points out that, although NuVasive was prohibited from filing a motion to strike or a surreply, it was permitted to cross-examine Dr. Hynes, the relevant expert for Medtronic, and to file "observations" on the cross-examination. We have identified such observations as among the vehicles available to protect against APA violations, but we have not declared that vehicle always sufficient to ensure the required opportunity to respond. *Belden*, 805 F.3d at 1081. Here, the opportunity to file observations was not enough. "Observations" are not a vehicle for submitting new evidence, including new expert declarations, by the patent owner. Indeed, the permitted content and format of observations are tightly circumscribed, *see* Office Patent Trial Practice Guide, 77 Fed.

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[2] What NuVasive said in its Responses was enough to allow the Board to conclude that Medtronic's Reply assertions about Figure 18 came within the rule that "[a] reply may only respond to arguments raised in the corresponding opposition, patent owner preliminary response, or patent owner response." 37 C.F.R. § 42.23(b). But satisfying that rule does not mean that the pre-Response notice was sufficient. *See In re Biedermann*, 733 F.3d 329, 338 (Fed. Cir. 2013) ("A new ground of rejection is not negated by the fact that the Board is responding to an appellant's argument.").

Reg. 48,756, 48,768 (Aug. 14, 2012), and here the Board rejected portions of NuVasive's observations for being too argumentative. We cannot view "observations" as a substitute for the opportunity to present arguments and evidence.

B

1

Finding no procedural violation in IPR507, we consider NuVasive's remaining arguments against the Board's obviousness ruling in that IPR. NuVasive contends that the Board impermissibly relied on speculation to find that Michelson taught an implant whose length is 2.5 times its width and that the Board did not sufficiently find a reason to combine Michelson with the primary references. We reject those contentions.

As to what Michelson discloses: Far from relying on speculation, the Board had a solid basis in Medtronic's argument and in Michelson itself for finding that Figure 18 disclosed an implant having both the length and width characteristics at issue. The Board "base[d] its decision on arguments that were advanced by a party," *In re Magnum Oil Tools Int'l, Ltd.*, 829 F.3d 1364, 1381 (Fed. Cir. 2016), and, "[i]n the circumstances here," could permissibly "rely on its own reading of [Michelson]—supported by the Petition's observations about it"—to find that the claim-required implant characteristics were disclosed, *Belden*, 805 F.3d at 1074.

Medtronic pointed the Board to Figure 18 and the corresponding description as supporting the proposition that Michelson disclosed longer-than-wide implants. Michelson's specification expressly states that the preferred length of embodiment 900 was 42 mm and the preferred width was 26 mm. Michelson, col. 10, lines 42–47. It then states that "spinal fusion implant 1000 is similar to the spinal fusion implant 900, but has a narrower width

such that more than one spinal fusion implant 1000 may be combined in a modular fashion for insertion within the disc space." *Id.*, col. 10, lines 50–55. Figure 18 shows implant 1000, and Figure 19 shows three implant 1000s lined up in the disk space. *Id.*, Figures 18 & 19. Even if Figure 19 were taken as showing only two implants (its point is to show more than one), this is substantial, and anything but speculative, evidence from which to infer that at least one of the set of "narrower" implants must be at most 13 mm wide (at its maximum), which is less than the preferred length (42 mm) divided by 2.5 (16.8 mm).

As to reasons to combine: The Board did not have to find a reason that a relevant artisan would combine the length of an implant from one prior-art reference with the length-to-width ratio of an implant from another reference, because it found that Michelson disclosed an implant meeting both limitations. Although the Board did not make findings as to whether any of the other claim limitations (such as fusion apertures or anti-migration teeth) are disclosed in the prior art, it did not have to: NuVasive did not present arguments about those limitations to the Board.

NuVasive's arguments before the Board focused only on the dimensions of the implant—(1) that it would not have been obvious to modify Frey to have a length greater than 40 mm because it would make Frey unsuitable for its intended path of insertion, (2) that it would not have been obvious to lengthen Frey to be longer than the intra-annulus region in which Frey was intended to sit, and (3) that if a skilled artisan had undertaken to modify Frey according to Michelson, the resulting implant would have been long and wide (not long and narrow) because Michelson stresses the importance of maximizing surface-area contact with the vertebrae. Substantial evidence supports the Board's specific findings that (1) "a spinal implant measuring up to 45 mm in length" would not render Frey "inoperable" for its intended purpose, even if Frey were

limited to use in transforaminal lumbar interbody fusion (TLIF) procedures, *IPR507 Board Decision* at *4; (2) an implant could be longer than 40 mm and not violate the teaching of Frey that it fit within the inner-annulus region, *id.* at *4–5; and (3) Michelson in fact teaches the relevant long-and-narrow implants, *id.* at *5. This was sufficient to make an affirmative, supported case for the obviousness of the challenged '334 claims, given the limited arguments presented by NuVasive. The Board, having found the only disputed limitations together in one reference, was not required to address undisputed matters.

In particular, NuVasive argues on appeal (1) that a skilled artisan would never have made a long-and-narrow implant for any use other than as a component to be assembled into a single, oversized, modular implant; (2) that, given the state of modular implants at the time of the invention, no one would have tried to make one; and (3) that the boomerang-shaped Frey implant would not have been suitable to be modified to be modular. But NuVasive did not present any meaningful argument to that effect to the Board. The Board cannot be faulted for not addressing such an argument where, as we have determined for IPR507, NuVasive was on notice, before it filed its Patent Owner Response, that Michelson's Figure 18 could be used to disclose the dimensional limitations of the '334 patent and therefore was on notice that those dimensions might be combined with other prior-art references.

2

In IPR508, we have found a procedural violation. That finding does not support reversal of the Board's cancellations. Rather, it warrants a remand for further proceedings.

NuVasive relies on the Board's statements finding inadequate Medtronic's showings with respect to claim 18,

which requires particular dimensions—namely, a length greater than 40 mm and a maximum width of 18 mm. *See IPR508 Board Decision* at *8; *see also IPR507 Board Decision* at *6. But those statements do not entail a failure of proof of obviousness as to claims lacking the particular dimensional requirements of claim 18. They do not decide more generally that it would not have been obvious to combine "one dimension from one implant with a second dimension from another implant." Resp. & Reply Br. 30–31; *see id.* at 39–40. Nor do they preclude the Board from considering the import of Michelson's Figure 18 after giving NuVasive a full opportunity to submit additional evidence and arguments on that point. *See In re Kumar*, 418 F.3d 1361, 1367–69 (Fed. Cir. 2005).

CONCLUSION

For the foregoing reasons, we affirm the Board's final written decision in IPR2013-507, invalidating claims 1–5, 10, 11, 14, 15, and 19–28 and upholding claim 18. We vacate the Board's decision in IPR2013-508 and remand for further proceedings regarding claims 16 and 17 in accordance with this opinion.

No costs.

AFFIRMED IN PART, VACATED IN PART, AND REMANDED

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

2015-1672, -1673

In re: NUVASIVE, INC.,
Appellant

Appeals from the United States Patent and Trademark Office in Nos. IPR2013-00507, IPR2013-00508.

MANDATE

In accordance with the judgment of this Court, entered November 9, 2016, and pursuant to Rule 41(a) of the Federal Rules of Appellate Procedure, the formal mandate is hereby issued.

FOR THE COURT

/s/ Peter R. Marksteiner
Peter R. Marksteiner
Clerk of Court

cc: Andrew Swanson Brown
Thomas W. Krause
Joseph Matal
Grace J. Pak
Michael T. Rosato
Richard Torczon
Paul David Tripodi II
United States Patent and Trademark Office
Scott Weidenfeller

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1
Stylesheet Version v1.2

EPAS ID: PAT3962842

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	NOTICE OF GRANT OF SECURITY INTEREST IN PATENTS

CONVEYING PARTY DATA

Name	Execution Date
NUVASIVE, INC.	02/08/2016
IMPULSE MONITORING, INC.	02/08/2016

RECEIVING PARTY DATA

Name:	BANK OF AMERICA, N.A., AS ADMINISTRATIVE AGENT
Street Address:	530 LYTTON AVENUE
City:	PALO ALTO
State/Country:	CALIFORNIA
Postal Code:	94301

PROPERTY NUMBERS Total: 535

Property Type	Number
Patent Number:	D652921
Patent Number:	D652922
Patent Number:	D652519
Patent Number:	D666292
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Patent Number:	D733303
Application Number:	29508745
Patent Number:	D671645
Application Number:	29438216

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Patent Number:	D599019
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Application Number:	62294990
Application Number:	62294992
Application Number:	62295008
Application Number:	15044947
Application Number:	15048928
Application Number:	62302725

CORRESPONDENCE DATA

Fax Number: (704)444-8857

Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.

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Email: twitcher@mcguirewoods.com
Correspondent Name: TERRY L. WITCHER, PARALEGAL
Address Line 1: MCGUIREWOODS LLP
Address Line 2: 201 N. TRYON STREET, SUITE 3000
Address Line 4: CHARLOTTE, NORTH CAROLINA 28202

ATTORNEY DOCKET NUMBER:	2068279-3006
NAME OF SUBMITTER:	TERRY L. WITCHER, PARALEGAL
SIGNATURE:	/s/ Terry L. Witcher
DATE SIGNED:	07/14/2016
	This document serves as an Oath/Declaration (37 CFR 1.63).

Total Attachments: 49

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NOTICE OF GRANT OF SECURITY INTEREST IN PATENTS

United States Patent and Trademark Office

Ladies and Gentlemen:

Please be advised that pursuant to the Security and Pledge Agreement dated as of February 8, 2016 (as amended, modified, extended, restated, renewed, replaced, or supplemented from time to time, the "Agreement") by and among the Grantors party thereto (each an "Grantor" and collectively, the "Grantors") and Bank of America, N.A., as administrative agent (the "Administrative Agent") for the Secured Parties referenced therein, the undersigned Grantor has granted a continuing security interest in and continuing lien upon the patents and patent applications shown on Schedule 1 attached hereto to the Administrative Agent for the ratable benefit of the Secured Parties.

Each of the undersigned Grantors and the Administrative Agent, on behalf of the Secured Parties, hereby acknowledge and agree that the security interest in the foregoing patents and patent applications (a) may only be terminated in accordance with the terms of the Agreement and (b) is not to be construed as an assignment of any patent or patent application.

Very truly yours,

GRANTORS:

NUVASIVE, INC.
IMPULSE MONITORING, INC.

By:_____
Name: Jeremie Sylvain
Title: Authorized Signatory

Acknowledged and Accepted:

BANK OF AMERICA, N.A., as Administrative Agent

By: _____
Name: Tiffany Shin
Title: Assistant Vice President

Schedule 1

See attached.

Reference	Name/Title	Current Owner	CC	Appl. No.	Filing Date	Reg. No.	Reg. Date	Notes	Case Status
PD0023DES1	Dilator	NuVasive, Inc.	US	29/360,368	2010-04-23	D652,921	2012-01-24		Registered
PD0023DES2	Dilator	NuVasive, Inc.	US	29/360,369	2010-04-23	D652,922	2012-01-24		Registered
PD0023DES3	Dilator	NuVasive, Inc.	US	29/360,370	2010-04-23	D652,519	2012-01-17		Registered
PD0023DES4	Dilator	NuVasive, Inc.	US	29/411,162	2012-01-17	D666,292	2012-08-28		Registered
PD0023DES5	Dilator	NuVasive, Inc.	US	29/411,651	2012-01-24	D666,293	2012-08-28		Registered
PD0023DES6	Dilator	NuVasive, Inc.	US	29/411,652	2012-01-24	D666,294	2012-08-28		Registered
PD0074DES1	Intervertebral Implant		US	29/176,060	2003-02-14	D493,533	2004-07-27	No assignment	Registered
PD0074EPDES1	Intervertebral Implant	NuVasive, Inc.	EM	000069562	2003-08-14	000069562	2003-12-09		Registered
PD0099DES1	Graphic User Interface for a Medical Monitor		US	29/192,063	2003-10-17	D533,875	2006-12-19	Assignment from inventors in progress	Registered
PD0099DES3	Graphical User Interface for a Medical Monitor		US	29/399,922	2011-08-19	D752,646	2016-03-29	Assignment from inventors in progress	Registered
PD0099DES4	Graphic User Interface for a Medical Monitor		US	29/559,163	2016-03-24			Assignment from inventors in progress	Pending
PD0104DES1	Intervertebral Implant	NuVasive, Inc.	US	29/227,372	2005-04-11	D530,423	2006-10-17		Registered
PD0104DES2	Intervertebral Implant	NuVasive, Inc.	US	29/306,656	2009-02-28	D594,986	2009-06-23		Registered
PD0137DES1	Electrode Connector	NuVasive, Inc.	US	29/362,506	2010-05-26	D639,741	2011-06-14		Registered
PD0137DES2	Electrode Connector	NuVasive, Inc.	US	29/362,507	2010-05-26	D639,243	2011-06-07		Registered
PD0162DES1	Spinal Fusion Implant	NuVasive, Inc.	US	29/381,796	2010-12-22	D708,747	2014-07-08		Registered
PD0163DES1	Intervertebral Implant	NuVasive, Inc.	US	29/439,479	2012-12-11	D733,303	2015-06-30		Registered
PD0197DES1	Favored Angle Screw	NuVasive, Inc.	US	29/508,745	2014-11-10				Pending
PD0225DES1	Intervertebral Implant	NuVasive, Inc.	US	29/376,166	2010-10-01	D671,645	2012-11-27		Registered
PD0225DES2	Intervertebral Implant	NuVasive, Inc.	US	29/438,216	2012-11-27				Pending
PD0228DES1	Spinal Fusion Implant	NuVasive, Inc.	US	29/304,928	2008-03-10	D599,019	2009-08-25		Registered
PD0251DES1	Spinal Implant Insertion System	NuVasive, Inc.	US	29/496,752	2014-07-16				Pending
PD0256DES1	Surgical Fixation System	NuVasive, Inc.	US	29/545,063	2015-11-09				Pending
PD0268DES1	Spinal Fusion Implant	NuVasive, Inc.	US	29/474,062	2014-05-15				Pending
PD0271DES1	Spinal Fusion Implant	NuVasive, Inc.	US	29/479,802	2014-01-20				Pending
PD0291DES1	Spinal Fusion Implant	NuVasive, Inc.	US	29/475,314	2013-12-02	D731,063	2015-06-02		Registered
PD0313DES1	Bone Plate	NuVasive, Inc.	US	29/446,437	2013-02-22	D734,853	2015-07-21		Registered
PD0313DES2	Bone Plate	NuVasive, Inc.	US	29/446,441	2013-02-22				Pending
PD0314DES1	Intervertebral Implant	NuVasive, Inc.	US	29/427,492	2012-07-18	D711,537	2014-08-19		Registered
PD0330DES1	Intervertebral Implant	NuVasive, Inc.	US	29/326,326	2008-10-15	D621,509	2010-08-10		Registered
PD0330DES2	Intervertebral Implant	NuVasive, Inc.	US	29/367,504	2010-08-09	D674,092	2013-01-08		Registered

PD0330DES4	Intervertebral Implant	NuVasive, Inc.	US	29/448,485	2013-03-12	D735,336	2015-07-28		Registered
PD0330DES5	Intervertebral Implant	NuVasive, Inc.	US	29/532,085	2015-07-01	D750,252	2016-02-23		Registered
PD0330DES6	Intervertebral Implant	NuVasive, Inc.	US	29/555,472	2016-02-22				Pending
PD0338DES1	Spinal Fusion Implant	NuVasive, Inc.	US	29/486,401	2014-03-28	D741,488	2015-10-20		Registered
PD0338DES2	Spinal Fusion Implant	NuVasive, Inc.	US	29/543,139	2015-10-21				Pending
PD0342DES1	Spinal Distraction Instrument	NuVasive, Inc.	US	29/393,737	2011-06-08	D656,610	2012-03-27		Registered
PD0356DES1	Spinal Implant	NuVasive, Inc.	US	29/369,140	2010-09-02	D658,761	2012-05-01		Registered
PD0356DES2	Spinal Implant	NuVasive, Inc.	US	29/419,794	2012-05-01	D685,475	2013-07-02		Registered
PD0426DES1	Spinous Process Plate	NuVasive, Inc.	US	29/489,679	2014-05-01				Pending
PD0438DES1	Intervertebral Impalnt	NuVasive, Inc.	US	29/459,170	2013-06-26	D725,270	2015-03-24		Registered
PD0470DES1	Retractor Blade	NuVasive, Inc.	US	29/530,069	2015-06-12				Pending
PD0488DES1	Intervertebral Implant	NuVasive, Inc.	US	29/405,583	2011-11-03	D675,320	2013-01-29		Registered
PD0488DES2	Intervertebral Implant	NuVasive, Inc.	US	29/444,346	2013-01-29	D696,402	2013-12-24		Registered
PD0488DES3	Intervertebral Implant	NuVasive, Inc.	US	29/477,585	2013-12-23	D747,485	2016-01-12		Registered
PD0488DES4	Intervertebral Implant	NuVasive, Inc.	US	29/551,272	2016-01-12				Pending
PD0489DES1	Intervertebral Implant	NuVasive, Inc.	US	29/405,584	2011-11-03	D721,808	2015-01-27		Registered
PD0489DES2	Intervertebral Implant	NuVasive, Inc.	US	29/515,792	2015-01-27				Pending
PD0499DES1	Intervertebral Implant	NuVasive, Inc.	US	29/438,314	2012-11-28	D731,061	2015-06-02	Co-ownership, no assignment from Troy Walters	Registered
PD0561DES1	Surgical Instrument	NuVasive, Inc.	US	29/460,276	2013-07-09				Pending
PD0577DES1	Intervertebral Implant	NuVasive, Inc.	US	29/469,512	2013-10-10	D745,159	2015-12-08		Registered
PD0577DES2	Intervertebral Implant	NuVasive, Inc.	US	29/547,760	2015-12-07				Pending
PD0610DES1	Anterior Cervical Bone Plate	NuVasive, Inc.	US	29/504,658	2014-10-08				Pending
PD0619DES1	Combined Intradiscal Insertion Tool and Intradiscal Shim	NuVasive, Inc.	US	29/508,821	2014-11-11				Pending
PD0620DES1	Intervertebral Implant	NuVasive, Inc.	US	29/509,736	2014-11-20				Pending
PD0669DES1	Interspinous Process Spacer	NuVasive, Inc.	US	29/550,016	2015-12-30				Pending
PU0007US1	Nerve Surveillance Cannulae Systems	NuVasive, Inc.	US	09/325,998	1999-06-04	6,564,078	2003-05-13	Security Interest	Registered
PU0007US10	Surgical Access and Nerve Surveillance	NuVasive, Inc.	US	14/622,600	2015-02-13				Pending
PU0007US2	Nerve Surveillance Cannulae Systems	NuVasive, Inc.	US	10/431,619	2003-05-07	7,079,883	2006-07-18		Registered
PU0007US4	Nerve Surveillance Cannulae Systems	NuVasive, Inc.	US	11/982,254	2007-10-31	7,962,191	2011-06-14		Registered

PU0007US5	Nerve Surveillance Cannulae Systems	NuVasive, Inc.	US	11/982,250	2007-10-31	7,693,562	2010-04-06		Registered
PU0007US7	Surgical Access and Nerve Surveillance	NuVasive, Inc.	US	13/160,477	2011-06-14	8,165,653	2012-04-24		Registered
PU0007US8	Surgical Access and Nerve Surveillance	NuVasive, Inc.	US	13/494,908	2012-06-12	8,489,170	2013-07-16		Registered
PU0007US9	Surgical Access and Nerve Surveillance	NuVasive, Inc.	US	13/943,725	2013-07-16	9,014,776	2015-04-21		Registered
PU0008US1	Image Intensifier Reticle System	NuVasive, Inc.	US	09/326,740	1999-06-04	6,266,394	2001-07-24		Registered
PU0013US1	Method of Replacing Nucleus Pulposus and Repairing the Intervertebral Disk	NuVasive, Inc.	US	09/274,217	1999-03-23	6,183,518	2001-02-06		Registered
PU0014US1	Surgical Access System and Related Methods	NuVasive, Inc.	US	10/789,797	2004-02-27	7,819,801	2010-10-26		Registered
PU0014US2	Surgical Access System and Related Methods	NuVasive, Inc.	US	12/632,373	2009-12-07	7,892,173	2011-02-22		Registered
PU0014US3	Surgical Access System and Related Methods	NuVasive, Inc.	US	13/030,798	2011-02-18	8,303,498	2012-11-06		Registered
PU0014US4	Surgical Access System and Related Methods	NuVasive, Inc.	US	13/668,504	2012-11-05	8,550,994	2013-10-08		Registered
PU0014US5	Surgical Access System and Related Methods	NuVasive, Inc.	US	13/756,951	2013-02-01	8,696,559	2014-04-15		Registered
PU0014US6	Surgical Access System and Related Methods	NuVasive, Inc.	US	14/171,347	2014-02-03				Pending
PU0015US1	Annulotomy Closure Device	NuVasive, Inc.	US	09/663,250	2000-09-15	6,964,674	2005-11-15		Registered
PU0015US2	Annulotomy Closure Device and Related Methods	NuVasive, Inc.	US	11/078,541	2005-03-11	7,901,430	2011-03-08		Registered
PU0015US3	Annulotomy Closure Device and Related Methods	NuVasive, Inc.	US	11/982,253	2007-10-31	7,883,527	2011-02-08		Registered
PU0015US4	Annulotomy Closure Device and Related Methods	NuVasive, Inc.	US	11/981,859	2007-10-31	9,277,903	2016-03-08		Registered
PU0015US5	Annulotomy Closure Device and Related Methods	NuVasive, Inc.	US	15/063,249	2016-03-07				Pending
PU0021US1	Bone Graft Harvester	NuVasive, Inc.	US	09/717,838	2000-11-21	6,764,452	2004-07-20		Registered
PU0023US1	Surgical Access System and Related Methods	NuVasive, Inc.	US	10/608,362	2003-06-26	7,582,058	2009-09-01		Registered
PU0023US10	Surgical Access System and Related Methods	NuVasive, Inc.	US	14/297,438	2014-06-05				Pending
PU0023US11	Surgical Access System and Related Methods	NuVasive, Inc.	US	14/297,369	2014-06-05				Pending

PU0023US2	Surgical Access System and Related Methods	NuVasive, Inc.	US	12/428,081	2009-04-22	7,935,051	2011-05-03		Registered
PU0023US3	Surgical Access System and Related Methods	NuVasive, Inc.	US	12/635,418	2009-12-10	8,192,356	2012-06-05		Registered
PU0023US4	Surgical Access System and Related Methods	NuVasive, Inc.	US	12/649,604	2009-12-30	8,182,423	2012-05-22		Registered
PU0023US5	Surgical Access System and Related Methods	NuVasive, Inc.	US	12/650,336	2009-12-30	8,187,179	2012-05-29		Registered
PU0023US6	Surgical Access System and Related Methods	NuVasive, Inc.	US	13/466,398	2012-05-08	8,672,840	2014-03-18		Registered
PU0023US7	Surgical Access System and Related Methods	NuVasive, Inc.	US	13/757,035	2013-02-01	8,708,899	2014-04-29		Registered
PU0023US8	Surgical Access System and Related Methods	NuVasive, Inc.	US	13/865,598	2013-04-18	8,915,846	2014-12-23		Registered
PU0023US9	Surgical Access System and Related Methods	NuVasive, Inc.	US	14/263,797	2014-04-28				Pending
PU0025AU1	System and Methods for Performing Percutaneous Pedicle Integrity Assessments	NuVasive, Inc.	AU	2002353954	2002-10-30	2002353954	2008-11-13		Registered
PU0025AU2	System and Methods for Performing Percutaneous Pedicle Integrity Assessments	NuVasive, Inc.	AU	2008240341	2002-10-30	2008240341 B2	2012-07-19		Registered
PU0025DE1	System and Methods for Performing Percutaneous Pedicle Integrity Assessments	NuVasive, Inc.	DE	02789358.5	2002-10-30	60238861.9-08	2011-01-05		Registered
PU0025GB1	System and Methods for Performing Percutaneous Pedicle Integrity Assessments	NuVasive, Inc.	GB	02789358.5	2002-10-30	1450681	2011-01-05		Registered
PU0025JP1	System and Methods for Performing Percutaneous Pedicle Integrity Assessments	NuVasive, Inc.	JP	2003-539520	2002-10-30	4340153	2009-07-10		Registered
PU0025US1	System and Methods for Performing Percutaneous Pedicle Integrity Assessments	NuVasive, Inc.	US	10/836,105	2002-10-30	7,664,544	2010-02-16		Registered
PU0025US2	System and Methods for Performing Percutaneous Pedicle Integrity Assessments	NuVasive, Inc.	US	12/427,612	2009-04-21				Pending
PU0027AU2	System and Methods for Determining Direction to a Nerve	NuVasive, Inc.	AU	2008200066	2003-01-15	2008200066	2012-01-12		Registered
PU0027EP1	System and Methods for Determining Direction to a Nerve	NuVasive, Inc.	EP	03710727.3	2003-01-15				Pending

PU0027JP1	System and Methods for Determining Direction to a Nerve	NuVasive, Inc.	JP	2004-566886	2003-01-15	4397817	2009-10-30		Registered
PU0027US1	System and Methods for Determining Direction to a Nerve	NuVasive, Inc.	US	11/182,545	2003-01-15	8,147,421	2012-04-03		Registered
PU0027US3	System and Methods for Determining Direction to a Nerve	NuVasive, Inc.	US	14/865,683	2015-09-25				Pending
PU0028AU1	Electromyography System	NuVasive, Inc.	AU	22517/01	2000-11-24	779567	2005-05-26		Registered
PU0028EP1	Electromyography System	NuVasive, Inc.	EP	00986240.0	2000-11-24				Pending
PU0028JP1	Electromyography System	NuVasive, Inc.	JP	2001-539347	2000-11-24	4854900	2011-11-04		Registered
PU0028US1	Electromyography System	NuVasive, Inc.	US	09/722,070	2000-11-24	7,470,236	2008-12-30		Registered
PU0028US10	Electromyography System	NuVasive, Inc.	US	13/726,110	2012-12-22	8,958,869	2015-02-17		Registered
PU0028US11	Electromyography System	NuVasive, Inc.	US	14/622,585	2015-02-13				Pending
PU0028US2	Electromyography System	NuVasive, Inc.	US	10/830,189	2004-04-21	7,963,927	2011-06-21		Registered
PU0028US3	Electromyography System	NuVasive, Inc.	US	11/894,987	2007-08-21	8,562,539	2013-10-22		Registered
PU0028US4	Electromyography System	NuVasive, Inc.	US	11/981,889	2007-10-31	8,641,638	2014-02-04		Registered
PU0028US5	Electromyography System	NuVasive, Inc.	US	11/982,238	2007-10-31	7,991,463	2011-08-02		Registered
PU0028US8	Electromyography System	NuVasive, Inc.	US	13/196,784	2011-08-02	8,337,410	2012-12-25		Registered
PU0029US1	Surgical Access System and Related Methods	NuVasive, Inc.	US	10/682,568	2003-10-08	8,137,284	2012-03-20		Registered
PU0029US2	Surgical Access System and Related Methods	NuVasive, Inc.	US	12/650,271	2009-12-30	8,192,357	2012-06-05		Registered
PU0029US3	Surgical Access System and Related Methods	NuVasive, Inc.	US	13/486,093	2012-06-01	8,512,235	2013-08-20		Registered
PU0029US4	Surgical Access System and Related Methods	NuVasive, Inc.	US	13/756,908	2013-02-01	8,679,006	2014-03-25		Registered
PU0029US5	Sugical Access System and Related Methods	NuVasive, Inc.	US	14/018,173	2013-09-04	8,663,100	2014-03-04		Registered
PU0029US6	Surgical Access System and Related Methods	NuVasive, Inc.	US	14/195,227	2014-03-03	8,956,283	2015-02-17		Registered
PU0029US7	Surgical Access System and Related Methods	NuVasive, Inc.	US	14/599,237	2015-01-16	9,204,871	2015-12-08		Registered
PU0029US8	Surgical Access System and Related Methods	NuVasive, Inc.	US	14/959,454	2015-12-04				Pending
PU0029US9	Surgical Access System and Related Methods	NuVasive, Inc.	US	15/059,215	2016-03-02				Pending
PU0032US1	System and Methods for Cervical Spinal Fusion	NuVasive, Inc.	US	10/283,429	2002-10-29	6,923,814	2005-08-02		Registered
PU0038AU1	Spinal Alignment Apparatus and Methods	NuVasive, Inc.	AU	2002252625	2002-03-26	2002252625	2007-10-11		Registered

PU0038US1	Spinal Alignment Apparatus and Methods	NuVasive, Inc.	US	10/105,971	2002-03-25	6,802,844	2004-10-12		Registered
PU0039US1	Surgical Access System and Related Methods	NuVasive, Inc.	US	10/759,811	2004-01-16	7,691,057	2010-04-06		Registered
PU0039US10	Surgical Access System and Related Methods	NuVasive, Inc.	US	13/856,648	2013-04-04	8,602,982	2013-12-10		Registered
PU0039US11	Surgical Access System and Related Methods	NuVasive, Inc.	US	13/955,950	2013-07-31	8,753,270	2014-06-17		Registered
PU0039US12	Surgical Access System and Related Methods	NuVasive, Inc.	US	14/018,209	2013-09-04	8,747,307	2014-06-10		Registered
PU0039US13	Surgical Access System and Related Methods	NuVasive, Inc.	US	14/287,982	2014-05-27	9,301,743	2016-04-05		Registered
PU0039US14	Surgical Access System and Related Methods	NuVasive, Inc.	US	15/058,083	2016-03-01				Pending
PU0039US2	Surgical Access System and Related Methods	NuVasive, Inc.	US	12/636,860	2009-12-14	8,403,841	2013-03-26		Registered
PU0039US3	Surgical Access System and Related Methods	NuVasive, Inc.	US	12/650,123	2009-12-30	8,114,019	2012-02-14		Registered
PU0039US4	Surgical Access System and Related Methods	NuVasive, Inc.	US	12/650,301	2009-12-30	8,133,173	2012-03-13		Registered
PU0039US5	Surgical Access System and Related Methods	NuVasive, Inc.	US	12/725,685	2010-03-17	8,172,750	2012-05-08		Registered
PU0039US6	Surgical Access System and Related Methods	NuVasive, Inc.	US	12/984,368	2011-01-04	8,439,832	2013-05-14		Registered
PU0039US7	Surgical Access System and Related Methods	NuVasive, Inc.	US	13/417,499	2012-03-12	8,343,046	2013-01-01		Registered
PU0039US8	Surgical Access System and Related Methods	NuVasive, Inc.	US	13/466,531	2012-05-08	8,523,768	2013-09-03		Registered
PU0039US9	Surgical Access System and Related Methods	NuVasive, Inc.	US	13/756,883	2013-02-01	8,562,521	2013-10-22		Registered
PU0040US1	Hinged Anterior Thoracic/Lumbar Plate	NuVasive, Inc.	US	10/108,287	2002-03-27	6,764,489	2004-07-20		Registered
PU0040US2	Hinged Anterior Thoracic/Lumbar Plate	NuVasive, Inc.	US	10/860,850	2004-06-03	7,341,590	2008-03-11		Registered
PU0042AU2	Nerve Proximity and Status Detection System and Method	NuVasive, Inc.	AU	2007200123	2001-06-08	2007200123	2008-11-13		Registered
PU0042JP1	Nerve Proximity and Status Detection System and Method	NuVasive, Inc.	JP	2002-501334	2001-06-08	5405706	2013-11-08		Registered
PU0042US1	Nerve Proximity and Status Detection System and Method	NuVasive, Inc.	US	09/590,632	2000-06-08	6,466,817	2002-10-15		Registered

PU0042US2	Nerve Proximity and Status Detection System and Method	NuVasive, Inc.	US	10/271,388	2002-10-14	7,177,677	2007-02-13		Registered
PU0050CH2	Stackable Interlocking Intervertebral Suport System	NuVasive, Inc.	CH	07025241.6	2001-07-13	1929978	2013-01-23		Registered
PU0050DE2	Stackable Interlocking Intervertebral Suport System	NuVasive, Inc.	DE	07025241.6	2001-07-13	1929978	2013-01-23		Registered
PU0050GB2	Stackable Interlocking Intervertebral Suport System	NuVasive, Inc.	GB	07025241.6	2001-07-13	1929978	2013-01-23		Registered
PU0050US1	Stackable Interlocking Intervertebral Support System	NuVasive, Inc.	US	09/904,179	2001-07-11	6,852,126	2005-02-08		Registered
PU0050US2	Stackable Spinal Support System and Related Methods	NuVasive, Inc.	US	11/053,016	2005-02-08	7,887,568	2011-02-15		Registered
PU0050US3	Stackable Spinal Support System	NuVasive, Inc.	US	11/981,858	2007-10-31	8,460,384	2013-06-11		Registered
PU0050US4	Stackable Spinal Support System	NuVasive, Inc.	US	11/982,251	2007-10-31	8,475,496	2013-07-02		Registered
PU0050US5	Stackable Interlocking Intervertebral Suport System	NuVasive, Inc.	US	13/915,554	2013-06-11	9,101,484	2015-08-11		Registered
PU0050US6	Stackable Interlocking Intervertebral Suport System	NuVasive, Inc.	US	14/823,315	2015-08-11				Pending
PU0052US1	Nerve Movement and Status Detection System and Method	NuVasive, Inc.	US	09/877,713	2001-06-08	6,500,128	2002-12-31		Registered
PU0054US1	System and Method for Performing Spinal Fixation	NuVasive, Inc.	US	11/031,506	2005-01-06	7,833,251	2010-11-16		Registered
PU0055US1	Bone Allograft Packaging System	NuVasive, Inc.	US	09/687,611	2000-10-11	6,739,112	2004-05-25		Registered
PU0055US2	Method of Packaging a bone allograft intended for a Spinal Fusion Procedure	NuVasive, Inc.	US	10/854,663	2004-05-25	7,162,850	2007-01-16		Registered
PU0059US1	Tissue Discrimination and Applications in Medical Proceudres	NuVasive, Inc.	US	09/860,648	2001-05-18	6,760,616	2004-07-06		Registered
PU0059US2	Tissue Discrimination and Applications in Medical Proceudres	NuVasive, Inc.	US	10/812,038	2004-03-29	7,050,848	2006-05-23		Registered
PU0059US4	Tissue Discrimination and Applications in Medical Proceudres	NuVasive, Inc.	US	12/609,004	2009-10-29	8,090,436	2012-01-03		Registered
PU0059US5	Tissue Discrimination and Applications in Medical Proceudres	NuVasive, Inc.	US	13/221,192	2011-08-30				Pending
PU0062AU2	System and Methods for Determining Nerve Proximity, Direction, and Pathology During Surgery	NuVasive, Inc.	AU	2008202081	2002-07-11	2008202081	2011-09-08		Registered
PU0062AU3	System and Methods for Determining Nerve Proximity,	NuVasive, Inc.	AU	2011202118	2002-07-11	2011202118	2013-08-29		Registered

	Direction, and Pathology During Surgery								
PU0062AU4	System and Methods for Determining Nerve Proximity, Direction, and Pathology During Surgery	NuVasive, Inc.	AU	2013204803	2002-07-11	2013204803 B2	2015-11-05		Registered
PU0062AU5	System and Methods for Determining Nerve Proximity, Direction, and Pathology During Surgery	NuVasive, Inc.	AU	2015246103	2002-07-11				Pending
PU0062EP1	System and Methods for Determining Nerve Proximity, Direction, and Pathology During Surgery	NuVasive, Inc.	EP	02756464.0	2002-07-11				Pending
PU0062JP1	System and Methods for Determining Nerve Proximity, Direction, and Pathology During Surgery	NuVasive, Inc.	JP	2003-511700	2002-07-11	4295086	2009-04-17		Registered
PU0062US1	System and Methods for Determining Nerve Proximity, Direction, and Pathology During Surgery	NuVasive, Inc.	US	10/754,899	2002-07-11	8,068,912	2011-11-29		Registered
PU0062US2	System and Methods for Determining Nerve Proximity, Direction, and Pathology During Surgery	NuVasive, Inc.	US	12/711,937	2010-02-24	7,920,922	2011-04-05		Registered
PU0062US3	System and Methods for Determining Nerve Proximity, Direction, and Pathology During Surgery	NuVasive, Inc.	US	12/434,303	2009-05-01	8,050,769	2011-11-01		Registered
PU0062US4	System and Methods for Determining Nerve Proximity, Direction, and Pathology During Surgery	NuVasive, Inc.	US	13/080,493	2011-04-05	8,055,349	2011-11-08		Registered
PU0062US5	System and Methods for Determining Nerve Proximity, Direction, and Pathology During Surgery	NuVasive, Inc.	US	13/292,065	2011-11-08	8,634,904	2014-01-21		Registered
PU0062US6	System and Methods for Determining Nerve Proximity, Direction, and Pathology During	NuVasive, Inc.	US	13/465,666	2012-05-07	8,812,116	2014-08-19		Registered

	Surgery								
PU0062US7	System and Methods for Determining Nerve Proximity, Direction, and Pathology During Surgery	NuVasive, Inc.	US	13/767,355	2013-02-14	9,037,250	2015-05-19		Registered
PU0062US8	System and Methods for Determining Nerve Proximity, Direction, and Pathology During Surgery	NuVasive, Inc.	US	14/687,745	2015-04-15				Pending
PU0063US1	Spinal Implant Inserter, Implant, and Method	NuVasive, Inc.	US	10/264,307	2002-10-02	7,776,049	2010-08-17		Registered
PU0064US1	Vertebral Endplate Decorticator and Osteophyte Resector	NuVasive, Inc.	US	09/168,306	1998-10-07	6,030,401	2000-02-29		Registered
PU0067US1	Interlocking Spinal Inserts	NuVasive, Inc.	US	09/320,236	1999-05-26	6,251,140	2001-06-26		Registered
PU0070US1	Methods for Separating and Stabilizing Adjacent Vertebrae	NuVasive, Inc.	US	09/320,161	1999-05-26	6,290,724	2001-09-18		Registered
PU0071EP1	Systems and Methods for Performing Surgery Procedures and Assessments	NuVasive, Inc.	EP	02778359.6	2002-09-25				Pending
PU0071EP2	Systems and Methods for Performing Surgery Procedures and Assessments	NuVasive, Inc.	EP	12001129.1	2002-09-25				Pending
PU0071US1	System and Methods for Performing Surgical Procedures and Assessments	NuVasive, Inc.	US	10/809,280	2002-09-25	7,522,953	2009-04-21		Registered
PU0071US10	Systems and Methods for Performing Surgical Procedures and Assessments	NuVasive, Inc.	US	13/763,816	2013-02-11	8,738,123	2014-05-27		Registered
PU0071US11	Systems and Methods for Performing Surgical Procedures and Assessments	NuVasive, Inc.	US	14/278,862	2014-05-15	8,977,352	2015-03-10		Registered
PU0071US12	Systems and Methods for Performing Surgical Procedures and Assessments	NuVasive, Inc.	US	14/618,438	2015-02-10				Pending
PU0071US3	System and Methods for Performing Surgical Procedures and Assessments	NuVasive, Inc.	US	12/423,559	2009-04-14	8,005,535	2011-08-23		Registered
PU0071US4	System and Methods for Performing Surgical Procedures and Assessments	NuVasive, Inc.	US	12/426,792	2009-04-20	8,027,716	2011-09-27		Registered
PU0071US5	System and Methods for	NuVasive, Inc.	US	12/628,549	2009-12-01	8,000,782	2011-08-16		Registered

	Performing Surgical Procedures and Assessments								
PU0071US6	System and Methods for Performing Surgical Procedures and Assessments	NuVasive, Inc.	US	13/210,977	2011-08-16	8,265,744	2012-09-11		Registered
PU0071US7	System and Methods for Performing Surgical Procedures and Assessments	NuVasive, Inc.	US	13/215,791	2011-08-23	8,244,343	2012-08-14		Registered
PU0071US8	System and Method for Performing Surgical Procedures and Assessments	NuVasive, Inc.	US	13/568,236	2012-08-07	8,548,579	2013-10-01		Registered
PU0071US9	Systems and Methods for Performing Surgical Procedures and Assessments	NuVasive, Inc.	US	13/762,624	2013-02-08	8,768,450	2014-07-01		Registered
PU0072US1	Systems and Methods for Removing Body Tissue	NuVasive, Inc.	US	10/527,538	2002-09-11	7,722,613	2010-05-25		Registered
PU0074US2	Intervertebral Implant and Related Methods	NuVasive, Inc.	US	10/367,441	2003-02-14	7,527,649	2009-05-05		Registered
PU0089US1	System and Methods for Performing Transforaminal Lumbar Interbody Fusion	NuVasive, Inc.	US	10/887,542	2004-07-07	7,905,886	2011-03-15		Registered
PU0090US2	Bone Blocks and Methods for Inserting Bone Blocks into Intervertebral Spaces	NuVasive, Inc.	US	10/032,121	2001-12-21	6,887,248	2005-05-03		Registered
PU0090US3	Spinal Implants and Methods for Inserting Spinal Implants Into Intervertebral Spaces	NuVasive, Inc.	US	11/121,394	2005-05-03	7,776,094	2010-08-17		Registered
PU0092AU1	Systems and Methods for Performing Dynamic Pedicle Integrity Assessments	NuVasive, Inc.	AU	2004263152	2004-08-05	2004263152	2009-12-10		Registered
PU0092EP1	Systems and Methods for Performing Dynamic Pedicle Integrity Assessments	NuVasive, Inc.	EP	04780392.9	2004-08-05				Pending
PU0092JP1	Systems and Methods for Performing Dynamic Pedicle Integrity Assessments	NuVasive, Inc.	JP	2006-522771	2004-08-05	4436836	2010-01-08		Registered
PU0092US1	Systems and Methods for Performing Dynamic Pedicle Integrity Assessments	NuVasive, Inc.	US	11/061,184	2004-08-05	7,657,308	2010-02-02		Registered
PU0092US2	Systems and Methods for Performing Dynamic Pedicle	NuVasive, Inc.	US	12/699,017	2010-02-02	8,255,044	2012-08-28		Registered

	Integrity Assessments								
PU0095AU1	Surgical Access System and Related Methods	NuVasive, Inc.	AU	2004275877	2004-09-27	2004275877	2008-12-18		Registered
PU0095AU2	Surgical Access System and Related Methods	NuVasive, Inc.	AU	2008251999	2004-09-27	2008251999	2011-11-03		Registered
PU0095AU3	Surgical Access System and Related Methods	NuVasive, Inc.	AU	2011239260	2004-09-27	2011239260	2013-09-12		Registered
PU0095AU4	Surgical Access System and Related Methods	NuVasive, Inc.	AU	2013204802	2004-09-27	2013204802			Pending
PU0095AU5	Surgical Access System and Related Methods	NuVasive, Inc.	AU	2016200573	2004-09-27				Pending
PU0095EP1	Surgical Access System and Related Methods	NuVasive, Inc.	EP	04785182.9	2004-09-27				Pending
PU0095JP1	Surgical Access System and Related Methods	NuVasive, Inc.	JP	2006-528306	2004-09-27	4463819	2010-02-26		Registered
PU0095JP2	Surgical Access System and Related Methods	NuVasive, Inc.	JP	2009-284152	2004-09-27	5124556	2012-11-02		Registered
PU0095JP3	Surgical Access System and Related Methods	NuVasive, Inc.	JP	2012-084693	2004-09-27	5689846	2015-02-06		Registered
PU0095JP4	Surgical Access System and Related Methods	NuVasive, Inc.	JP	2013-254978	2004-09-27				Pending
PU0095US10	Surgical Access System and Related Methods	NuVasive, Inc.	US	14/299,800	2014-06-09	8,942,801	2015-01-27		Registered
PU0095US11	Surgical Access System and Related Methods	NuVasive, Inc.	US	14/300,003	2014-06-09	8,821,396	2014-09-02		Registered
PU0095US12	Surgical Access System and Related Methods	NuVasive, Inc.	US	14/449,313	2014-08-01	8,945,004	2015-02-03		Registered
PU0095US13	Surgical Access System and Related Methods	NuVasive, Inc.	US	14/598,043	2015-01-15				Pending
PU0095US14	Surgical Access System and Related Methods	NuVasive, Inc.	US	14/599,313	2015-01-16	9,265,493	2016-02-23		Registered
PU0095US15	Surgical Access System and Related Methods	NuVasive, Inc.	US	14/994,640	2016-01-13				Pending
PU0095US2	Surgical Access System and Related Methods	NuVasive, Inc.	US	11/789,284	2007-04-23	8,016,767	2011-09-13		Registered
PU0095US3	Surgical Access System and Related Methods	NuVasive, Inc.	US	12/623,016	2009-11-20	8,355,780	2013-01-15		Registered
PU0095US4	Surgical Access System and Related Methods	NuVasive, Inc.	US	12/650,776	2009-12-31	8,388,527	2013-03-05		Registered
PU0095US5	Surgical Access System and	NuVasive, Inc.	US	13/742,268	2013-01-15	8,556,808	2013-10-15		Registered

	Related Methods								
PU0095US6	Surgical Access System and Related Methods	NuVasive, Inc.	US	13/743,673	2013-01-17	8,500,634	2013-08-06		Registered
PU0095US7	Surgical Access System and Related Methods	NuVasive, Inc.	US	13/954,550	2013-07-30	8,628,469	2014-01-14		Registered
PU0095US8	Surgical Access System and Related Methods	NuVasive, Inc.	US	14/052,271	2013-10-11	8,764,649	2014-07-01		Registered
PU0095US9	Surgical Access System and Related Methods	NuVasive, Inc.	US	14/153,777	2014-01-13	8,753,271	2014-06-17		Registered
PU0098US1	Surgical Access System and Related Methods	NuVasive, Inc.	US	10/967,668	2004-10-18	7,905,840	2011-03-15		Registered
PU0098US2	Surgical Access System and Related Methods	NuVasive, Inc.	US	12/635,869	2009-12-11	8,303,515	2012-11-06		Registered
PU0098US3	Surgical Access System and Related Methods	NuVasive, Inc.	US	12/983,627	2011-01-03	8,591,432	2013-11-26		Registered
PU0098US4	Surgical Access System and Related Methods	NuVasive, Inc.	US	14/066,098	2013-10-29				Pending
PU0098US5	Surgical Access Sysem and Related Methods	NuVasive, Inc.	US	15/071,540	2016-03-16				Pending
PU0104US1	Systems and Methods for Spinal Fusion	NuVasive, Inc.	US	11/093,409	2005-03-29	7,918,891	2011-04-05		Registered
PU0104US10	Systems and Methods for Spinal Fusion	NuVasive, Inc.	US	14/921,760	2015-10-23				Pending
PU0104US2	Systems and Methods for Spinal Fusion	NuVasive, Inc.	US	13/079,645	2011-04-04	8,187,334	2012-05-29		Registered
PU0104US3	Systems and Methods for Spinal Fusion	NuVasive, Inc.	US	13/440,062	2012-04-05	8,246,686	2012-08-21		Registered
PU0104US4	Systems and Methods for Spinal Fusion	NuVasive, Inc.	US	13/441,092	2012-04-06	8,361,156	2013-01-29		Registered
PU0104US5	Systems and Methods for Spinal Fusion	NuVasive, Inc.	US	13/747,765	2013-01-23	8,608,804	2013-12-17		Registered
PU0104US6	Systems and Methods for Spinal Fusion	NuVasive, Inc.	US	13/748,925	2013-01-24	8,574,301	2013-11-05		Registered
PU0104US7	Systems and Methods for Spinal Fusion	NuVasive, Inc.	US	14/066,285	2013-10-29	8,685,105	2014-04-01		Registered
PU0104US8	Systems and Methods for Spinal Fusion	NuVasive, Inc.	US	14/171,484	2014-02-03	8,814,940	2014-08-26		Registered
PU0104US9	Systems and Methods for Spinal Fusion	NuVasive, Inc.	US	14/314,823	2014-06-25	9,180,021	2015-11-10		Registered
PU0116US2	Neurophysiological Apparatus and	NuVasive, Inc.	US	12/359,269	2009-01-23	9,131,947	2015-09-15		Registered

	Procedures								
PU0116US3	Neurophysiological Apparatus and Procedures	NuVasive, Inc.	US	14/855,156	2015-09-15				Pending
PU0118EP1	System and Method for Performing Spinal Fixation	NuVasive, Inc.	EP	05797710.0	2005-09-08				Pending
PU0118US1	System and Method for Performing Spinal Fixation	NuVasive, Inc.	US	11/667,365	2007-05-08				Pending
PU0120US1	System and Methods for Assessing the Neuromuscular Pathway Prior to Nerve Testing	NuVasive, Inc.	US	11/665,038	2005-10-07	8,538,539	2013-09-17		Registered
PU0120US2	System and Methods for Assessing the Neuromuscular Pathway Prior to Nerve Testing	NuVasive, Inc.	US	14/029,606	2013-09-17	8,989,866	2015-03-24		Registered
PU0121US1	Surgical Access System and Related Methods	NuVasive, Inc.	US	11/529,928	2006-09-29	8,876,904	2014-11-04		Registered
PU0121US2	Surgical Access System and Related Methods	NuVasive, Inc.	US	11/665,039	2005-10-11				Pending
PU0121US3	Surgical Access System and Related Methods	NuVasive, Inc.	US	14/526,379	2014-10-28				Pending
PU0131US1	Surgical Access System and Related Methods	NuVasive, Inc.	US	11/344,711	2006-01-31	7,785,253	2010-08-31		Registered
PU0132US1	System and Methods for Monitoring During Anterior Surgery	NuVasive, Inc.	US	11/883,710	2006-02-02	8,568,331	2013-10-29		Registered
PU0133DE1	System and Methods for Performing Neurophysiologic Assessments During Surgery	NuVasive, Inc.	DE	06720282.0	2006-02-02	1846094	2011-10-05		Registered
PU0133EP2	System and Methods for Performing Neurophysiologic Assessments During Surgery	NuVasive, Inc.	EP	11176972.5	2006-02-02				Pending
PU0133GB1	System and Methods for Performing Neurophysiologic Assessments During Surgery	NuVasive, Inc.	GB	06720282.0	2006-02-02	1846094	2011-10-05		Registered
PU0133US1	System and Methods for Performing Neurophysiologic Assessments During Surgery	NuVasive, Inc.	US	11/883,709	2006-02-02				Pending
PU0135US1	Slideable Bone Plate System	NuVasive, Inc.	US	10/427,592	2003-05-01	6,945,973	2005-09-20		Registered
PU0135US2	Slidable Bone Plate System	NuVasive, Inc.	US	11/231,493	2005-09-20	8,262,705	2012-09-11		Registered
PU0140US1	Insulated Pedicle Access System and Related Methods	NuVasive, Inc.	US	11/448,237	2006-06-06	7,942,826	2011-05-17		Registered

PU0140US2	Insulated Pedicle Access System and Related Methods	NuVasive, Inc.	US	13/109,981	2011-05-17	8,784,330	2014-07-22		Registered
PU0140US3	Insulated Pedicle Access System and Related Methods	NuVasive, Inc.	US	14/338,154	2014-07-22				Pending
PU0147US1	Multi-Channel Stimulation Threshold Detection Algorithm for Use in Neurophysiology Monitoring	NuVasive, Inc.	US	11/994,409	2006-09-22	8,206,312	2012-06-26		Registered
PU0147US2	Neurophysiology Monitoring System Configured for Rapid Stimulation Threshold Acquisition	NuVasive, Inc.	US	13/533,919	2012-06-26	8,500,653	2013-08-06		Registered
PU0147US4	Multi-Channel Stimulation Threshold Detection Algorithm for Use with Neurophysiology Monitoring Systems	NuVasive, Inc.	US	14/959,850	2015-12-04				Pending
PU0151EP1	Total Disc Replacement System and Related Methods	NuVasive, Inc.	EP	06788651.5	2006-07-28				Pending
PU0151US1	Total Disc Replacement System and Related Methods	NuVasive, Inc.	US	11/989,686	2006-07-28	8,328,851	2012-12-11		Registered
PU0151US2	Total Disc Replacement System and Related Methods	NuVasive, Inc.	US	13/711,561	2012-12-11	8,870,960	2014-10-28		Registered
PU0151US3	Total Disc Replacement System and Related Methods	NuVasive, Inc.	US	14/525,440	2014-10-28	9,168,149	2015-10-27		Registered
PU0151US4	Total Disc Replacement System and Related Methods	NuVasive, Inc.	US	14/924,385	2015-10-27				Pending
PU0152AU1	Surgical Trajectory Monitoring System and Related Methods	NuVasive, Inc.	AU	2007254173	2007-05-17	2007254173	2013-11-07		Registered
PU0152EP1	Surgical Trajectory Monitoring System and Related Methods	NuVasive, Inc.	EP	07777170.7	2007-05-17				Pending
PU0152US1	Surgical Trajectory Monitoring System and Related Methods	NuVasive, Inc.	US	12/301,233	2007-05-17	8,442,621	2013-05-14	In progress to remove incorrect assignment info	Registered
PU0154US1	Spinal Fusion Implant	NuVasive, Inc.	US	11/488,744	2006-07-17	7,867,277	2011-01-11		Registered
PU0154US2	Spinal Fusion Implant and Related Methods	NuVasive, Inc.	US	13/004,474	2011-01-11	9,226,834	2016-01-05		Registered
PU0155US3	Methods and Apparatus for Treating Spinal Stenosis	NuVasive, Inc.	US	14/601,224	2015-01-20				Pending
PU0157US1	System and Methods for Treating Spinal Deformities	NuVasive, Inc.	US	11/490,995	2006-07-20	8,147,521	2012-04-03		Registered
PU0157US2	Systems and Methods for Treating Spinal Deformities	NuVasive, Inc.	US	13/438,828	2012-04-03	8,652,177	2014-02-18		Registered

PU0157US3	Systems and Methods for Treating Spinal Deformities	NuVasive, Inc.	US	14/183,198	2014-02-18				Pending
PU0158US1	System and Methods for Performing Neurophysiologic Assessments with Pressure Monitoring	NuVasive, Inc.	US	11/490,717	2006-07-20	8,740,783	2014-06-03		Registered
PU0158US3	System and Methods for Performing Neurophisologic Assessments with Pressure Monitoring	NuVasive, Inc.	US	14/294,304	2014-06-03				Pending
PU0163US1	Spinal Fusion Implant and Related Methods	NuVasive, Inc.	US	11/525,674	2006-09-22	7,815,682	2010-10-19		Registered
PU0168US1	System and Methods for Performing Pedicle Integrity Assessments of the Thoracic Spine	NuVasive, Inc.	US	11/994,411	2006-09-22	8,591,431	2013-11-26		Registered
PU0170US1	Spinal Implant	NuVasive, Inc.	US	09/104,422	1998-06-25	6,093,205	2000-07-25		Registered
PU0180US1	Methods and Apparatus for Treating Spinal Stenosis	NuVasive, Inc.	US	11/540,318	2006-09-28	8,167,915	2012-05-01		Registered
PU0184US1	System and Methods for Nerve Monitoring	NuVasive, Inc.	US	11/528,981	2006-09-27	8,568,317	2013-10-29		Registered
PU0184US3	System and Methods for Nerve Monitoring	NuVasive, Inc.	US	14/881,091	2015-10-12				Pending
PU0190US1	Spinal Fusion Implant and Related Methods	NuVasive, Inc.	US	11/891,581	2007-08-09	8,114,162	2012-02-14		Registered
PU0191US1	Methods and Apparatus for Spinal Fusion	NuVasive, Inc.	US	11/634,440	2006-12-05	7,887,595	2011-02-15		Registered
PU0193US1	Surgical Access System and Related Methods	NuVasive, Inc.	US	11/653,173	2007-01-11	8,313,430	2012-11-20		Registered
PU0193US2	Surgical Access System and Related Methods	NuVasive, Inc.	US	13/682,719	2012-11-20	8,827,900	2014-09-09		Registered
PU0194US1	Surgical Access System and Related Methods	NuVasive, Inc.	US	11/652,705	2007-01-12	9,259,144	2016-02-16		Registered
PU0197AU1	Surgical Fixation System and Related Methods	NuVasive, Inc.	AU	2008316641	2008-10-24	AU 2008316641 B2	2015-09-10		Registered
PU0197CN1	Surgical Fixation System and Related Methods	NuVasive, Inc.	CN	200880122485.4	2008-10-24	ZL200880122485.4	2012-09-05		Registered
PU0197JP1	Surgical Fixation System and Related Methods	NuVasive, Inc.	JP	2010531301	2008-10-24	5599316	2014-08-22		Registered
PU0201JP1	Textile Prosthesis	NuVasive, Inc.; Ellis Developments	JP	2002-533772	2001-10-11	4083008	2008-02-22	Jointly owned	Registered

		Limited							
PU0201US1	Textile Prosthesis	NuVasive, Inc.; Ellis Developments Limited	US	10/398,883	2001-10-11	7,338,531	2008-03-04	Jointly owned	Registered
PU0201US2	Textile Prosthesis	NuVasive, Inc.; Ellis Developments Limited	US	12/042,311	2008-03-04	7,828,855	2010-11-09	Jointly owned	Registered
PU0202CH1	Connector Comprising Filaments	NuVasive, Inc.; Ellis Developments Limited	CH	01974486.1	2001-10-11	1326547	2007-01-24	Jointly owned	Registered
PU0202DE1	Connector Comprising Filaments	NuVasive, Inc.; Ellis Developments Limited	DE	01974486.1	2001-10-11	601 26 299.9	2007-01-24	Jointly owned	Registered
PU0202FR1	Connector Comprising Filaments	NuVasive, Inc.; Ellis Developments Limited	FR	01974486.1	2001-10-11	1326547	2007-01-24	Jointly owned	Registered
PU0202GB1	Connector Comprising Filaments	NuVasive, Inc.; Ellis Developments Limited	GB	01974486.1	2001-10-11	1326547	2007-01-24	Jointly owned	Registered
PU0202IE1	Connector Comprising Filaments	NuVasive, Inc.; Ellis Developments Limited	IE	01974486.1	2001-10-11	1326547	2007-01-24	Jointly owned	Registered
PU0202JP1	Connector	NuVasive, Inc.; Ellis Developments Limited	JP	2002-533755	2001-10-11	4083007	2008-02-22	Jointly owned	Registered
PU0202US1	Connector	NuVasive, Inc.; Ellis Developments Limited	US	10/399,016	2001-10-11	7,214,225	2007-05-08	Jointly owned, assignment from inventors in progress	Registered
PU0215US1	Embroidery Using Soluble Thread	NuVasive, Inc.	US	12/442,944	2007-09-25	8,074,591	2011-12-13		Registered
PU0216US1	Gravity Dependent Pedicle Screw Tap Hole Guide	NuVasive, Inc.	US	10/103,079	2002-03-21	6,638,281	2003-10-28		Registered
PU0216US4	Gravity Dependent Pedicle Screw	NuVasive, Inc.	US	11/034,594	2005-01-13	7,611,522	2009-11-03		Registered

	Tap Hole Guide								
PU0220US1	Methods and Apparatus for Treating Spinal Stenosis		US	11/891,582	2007-08-09	8,834,526	2014-09-16	Non-signing inventor, no assignment	Registered
PU0228US1	System and Methods for Spinal Fusion	NuVasive, Inc.	US	12/044,917	2008-03-07	8,673,005	2014-03-18		Registered
PU0228US2	System and Methods for Spinal Fusion	NuVasive, Inc.	US	14/193,886	2014-02-28	9,186,261	2015-11-17		Registered
PU0228US3	System and Methods for Spinal Fusion	NuVasive, Inc.	US	14/931,351	2015-11-03				Pending
PU0242AU1	Neurophysiologic Monitoring System	NuVasive, Inc.	AU	2008236665	2008-04-03	2008236665 B2	2013-12-05		Registered
PU0242AU2	Neurophysiologic Monitoring System	NuVasive, Inc.	AU	2013204806	2008-04-03	2013204806 B2	2015-10-29		Registered
PU0242EP1	Neurophysiologic Monitoring System	NuVasive, Inc.	EP	08742578.1	2008-04-03				Pending
PU0242US1	Neurophysiologic Monitoring System	NuVasive, Inc.	US	12/080,630	2008-04-03	8,255,045	2012-08-28		Registered
PU0242US2	Neurophysiologic Monitoring System	NuVasive, Inc.	US	13/597,160	2012-08-28	9,295,396	2016-03-29		Registered
PU0242US3	Neurophysiologic Monitoring System	NuVasive, Inc.	US	15/080,500	2016-03-24				Pending
PU0243US1	Implants and Methods for Spinal Fusion	NuVasive, Inc.	US	12/380,693	2009-03-02	8,083,796	2011-12-27		Registered
PU0243US2	Implants and Methods for Spinal Fusion	NuVasive, Inc.	US	13/337,967	2011-12-27	9,168,152	2015-10-27		Registered
PU0243US3	Implants and Methods for Spinal Fusion	NuVasive, Inc.	US	14/924,490	2015-10-27				Pending
PU0249US1	Spinal Impant Installation Device	NuVasive, Inc.	US	12/378,685	2009-02-17	8,343,163	2013-01-01		Registered
PU0257US1	Textile-Based Plate Implant And Related Methods	NuVasive, Inc.	US	12/274,345	2008-11-19	8,591,584	2013-11-26		Registered
PU0258US1	Textile-Based Surgical Implant and Related Methods	NuVasive, Inc.	US	12/416,048	2009-03-31	8,377,135	2013-02-19		Registered
PU0261US1	Vertebral Distraction Assembly and Related Methods	NuVasive, Inc.	US	12/378,936	2009-02-20	8,372,081	2013-02-12		Registered
PU0264US1	Surgical Fixation System and Related Methods	NuVasive, Inc.	US	12/364,507	2009-02-02				Pending
PU0265AU1	Surgical Trajectory Monitoring System and Related Methods	NuVasive, Inc.	AU	2008317311	2008-10-24	2008317311	2013-10-17		Registered
PU0265DE1	Surgical Trajectory Monitoring System and Related Methods	NuVasive, Inc.	DE	112008002851.6	2008-10-24				Pending

PU0265US1	Surgical Trajectory Monitoring System and Related Methods	NuVasive, Inc.	US	12/739,950	2008-10-24	9,119,572	2015-09-01		Registered
PU0265US2	Surgical Trajectory Monitoring System and Related Methods	NuVasive, Inc.	US	14/841,270	2015-08-31				Pending
PU0269US1	Spinal Surgical Implant and Related Methods	NuVasive, Inc.	US	12/317,867	2008-12-29	9,101,491	2015-08-11		Registered
PU0269US2	Spinal Surgical Implant and Related Methods	NuVasive, Inc.	US	14/823,329	2015-08-11				Pending
PU0270US1	Systems and Methods for Holding and Implanting Bone Anchors	NuVasive, Inc.	US	12/322,815	2009-02-06	8,439,922	2013-05-14		Registered
PU0270US2	Systems and Methods for Holding and Implanting Bone Anchors	NuVasive, Inc.	US	13/894,355	2013-05-14	9,192,415	2015-11-24		Registered
PU0270US3	Systems and Methods for Holding and Implanting Bone Anchors	NuVasive, Inc.	US	14/947,461	2015-11-20				Pending
PU0276US1	Systems and Methods for Spinous Process Fixation	NuVasive, Inc.	US	12/412,354	2009-03-26	8,343,190	2013-01-01		Registered
PU0280US9	Surgical Fixation Systems and Related Methods	NuVasive, Inc.	US	13/647,331	2012-10-08	9,060,813	2015-06-23		Registered
PU0285US1	Surgical Access System and Related Methods	NuVasive, Inc.	US	12/577,661	2009-10-12	9,044,280	2015-06-02		Registered
PU0285US2	Surgical Access System and Related Methods	NuVasive, Inc.	US	14/727,676	2015-06-01				Pending
PU0301US1	Anchors for Spinal Fixation and Correcting Spinal Deformity	NuVasive, Inc.	US	12/803,510	2010-06-28	8,506,598	2013-08-13		Registered
PU0303US1	Systems and Methods for Treating Spinal Stenosis	NuVasive, Inc.	US	12/578,577	2009-10-13	8,292,923	2012-10-23		Registered
PU0305US1	System and Method for Performing Spinal Fixation	NuVasive, Inc.	US	12/535,671	2009-08-04	8,480,712	2013-07-09		Registered
PU0309AU1	Cancellous Bone Treated with Collagenase and Essentially Free of Blood Cells	NuVasive, Inc.	AU	2007250080	2007-05-02	2007250080	2011-12-01		Registered
PU0309CN1	Cancellous Bone Treated with Collagenase and Essentially Free of Blood Cells	NuVasive, Inc.	CN	200780016495.5	2007-05-02	ZL200780016495.5	2011-08-10		Registered
PU0309US1	Cancellous Bone Treated with Collagenase and Essentially Free of Blood Cells	NuVasive, Inc.	US	11/799,606	2007-05-02	8,460,860	2013-06-11		Registered
PU0309US2	Cancellous Bone Product Including Viable Osteogenic Cells	NuVasive, Inc.	US	13/915,569	2013-06-11				Pending
PU0311US1	Cancellous bone treated with collagenase and essentially free of	NuVasive, Inc.	US	12/150,513	2008-04-28				Pending

	blood cells								
PU0315US2	Malleable, Cryopreserved Osteogenic Compositions with Viable Cells	NuVasive, Inc.	US	13/918,723	2013-06-14				Pending
PU0317AU2	Neurophysiologic Monitoring System and Related Methods	NuVasive, Inc.	AU	2015258176	2009-10-15				Pending
PU0317EP1	Neurophysiologic Monitoring System and Related Methods	NuVasive, Inc.	EP	09820909.1	2009-10-15				Pending
PU0317JP1	Neurophysiologic Monitoring System and Related Methods	NuVasive, Inc.	JP	2011-532087	2009-10-15				Pending
PU0317JP2	Neurophysiologic Monitoring System and Related Methods	NuVasive, Inc.	JP	2015-011482	2009-10-15				Pending
PU0317US1	Neurophysiologic Monitoring System and Related Methods	NuVasive, Inc.	US	13/124,608	2009-10-15				Pending
PU0329US1	Surgical Fixation System and Related Methods	NuVasive, Inc.	US	12/579,397	2009-10-14	8,328,856	2012-12-11		Registered
PU0333US1	System and Methods for performing Neurophysiologic Assessments	NuVasive, Inc.	US	12/626,880	2009-11-27	8,401,632	2013-03-19		Registered
PU0334AU1	Polyaxial Bone Screw with Compound Articulation		AU	2006244276	2006-03-30	2006244276 B2	2009-07-16	Jackson assignment in progress	Registered
PU0334CA1	Polyaxial Bone Screw with Compound Articulation		CA	PCT/US2006/012650	2006-03-30	2607157C	2011-09-20	Jackson assignment in progress	Registered
PU0334EP1	Polyaxial Bone Screw with Compound Articulation		EP	06740553.1	2006-03-30			Jackson assignment in progress	Pending
PU0334US1	Polyaxial Bone Screw with Compound Articulation	NuVasive, Inc.	US	11/126,965	2005-05-10	7,476,239	2009-01-13		Registered
PU0335US2	Systems and Methods for Performing Spinal Fusion Surgery	NuVasive, Inc.	US	13/831,711	2013-03-15	8,876,851	2014-11-04		Registered
PU0335US3	System and Methods for Performing Spinal Fusion Surgery	NuVasive, Inc.	US	14/532,316	2014-11-04				Pending
PU0338US1	Spinal Fusion Implant and Related Methods	NuVasive, Inc.	US	12/329,195	2008-12-05	8,623,088	2014-01-07		Registered
PU0340US1	Cross-Connector and Related Methods	NuVasive, Inc.	US	13/118,323	2011-05-27	9,198,696	2015-12-01		Registered
PU0342US2	Spinal Fusion Cage with Removable Planar Elements	NuVasive, Inc.	US	12/367,487	2009-02-06	8,088,163	2012-01-03		Registered
PU0342US3	Spinal Fusion Cage with Removable Planar Elements	NuVasive, Inc.	US	13/473,366	2012-05-16	8,292,960	2012-10-23		Registered
PU0342US4	Spinal Fusion Cage with Removable Planar Elements	NuVasive, Inc.	US	13/657,289	2012-10-22	8,715,355	2014-05-06		Registered

PU0346US1	Connective Tissue Regeneration Using Human Mesenchymal Stem Cell Preparation	Osiris Therapeutics, Inc.	US	08/420,297	1995-04-11	5,811,094	1998-09-22	Mesoblast International SARL	Registered
PU0347AU1	Uses for Non-Autologous Mesenchymal Stem Cells	Osiris Therapeutics, Inc.	AU	1999029042	1998-03-13	749675	2002-07-04		Registered
PU0347US1	Uses for Non-Autologous Mesenchymal Stem Cells	Osiris Therapeutics, Inc.	US	09/314,855	1999-03-12	6,355,239	2002-03-12	Mesoblast International SARL	Registered
PU0348AU1	Regeneration and Augmentation of Bone Using Mesenchymal Stem Cells	Osiris Therapeutics, Inc.	AU	24622/97	1997-04-17	731468	2001-07-26		Registered
PU0348US1	Regeneration and Augmentation of Bone Using Mesenchymal Stem Cells	Osiris Therapeutics, Inc.	US	09/042,275	1998-03-13	6,541,024	2003-04-01	Mesoblast International SARL	Registered
PU0348US2	Regeneration and Augmentation of Bone Using Mesenchymal Stem Cells	Osiris Therapeutics, Inc.	US	09/840,284	2002-06-26	6,863,900	2005-03-08	Mesoblast International SARL	Registered
PU0349US1	Vertebral Body Replacement	NuVasive, Inc.	US	12/661,206	2010-03-12				Pending
PU0349US3	Vertebral Body Replacement	NuVasive, Inc.	US	14/744,470	2015-06-19				Pending
PU0350US1	Systems and Methods for Neurophysiologic Monitoring	NuVasive, Inc.	US	12/908,876	2010-10-20				Pending
PU0351US1	Fracture Reduction Device and Methods	NuVasive, Inc.	US	13/184,576	2011-07-18	9,144,501	2015-09-29		Registered
PU0352US3	Polyaxial Bone Screw Assembly	NuVasive, Inc.	US	13/311,490	2011-12-05	8,876,869	2014-11-04		Registered
PU0353US1	Method and Apparatus for Performing Spine Surgery	NuVasive, Inc.	US	12/799,021	2010-04-16	8,287,597	2012-10-16		Registered
PU0353US2	Methods and Apparatus for Performing Spine Surgery	NuVasive, Inc.	US	13/653,335	2012-10-16	8,920,500	2014-12-30		Registered
PU0353US3	Methods and Apparatus for Performing Spine Surgery	NuVasive, Inc.	US	14/578,215	2014-12-19	9,192,482	2015-11-24		Registered
PU0353US4	Methods and Apparatus for Performing Spine Surgery	NuVasive, Inc.	US	14/918,137	2015-10-20				Pending
PU0356GB1	Laminoplasy Bone Plate System and Template Tool	NuVasive, Inc.	GB	1204773.4	2010-10-04	2486608	2016-03-30		Registered
PU0356US1	Bone Plate System and Related Methods	NuVasive, Inc.	US	13/499,659	2010-10-04	9,211,148	2015-12-15		Registered
PU0356US2	Bone Plate System and Related Methods	NuVasive, Inc.	US	14/970,299	2015-12-15				Pending
PU0357US1	Systems and Methods for	NuVasive, Inc.	US	12/945,821	2010-11-12	8,986,349	2015-03-24		Registered

	Correcting Spinal Deformities								
PU0357US2	Systems and Methods for Correcting Spinal Deformities	NuVasive, Inc.	US	14/667,619	2015-03-24				Pending
PU0358AU1	Method and Apparatus for Performing Spinal Surgery	NuVasive, Inc.	AU	2010318704	2010-11-10	2010318704	2015-10-22		Registered
PU0358AU2	Method and Apparatus for Performing Spinal Surgery	NuVasive, Inc.	AU	2015238910	2010-11-10				Pending
PU0358CN1	Retractor System (as amended)	NuVasive, Inc.	CN	201080061149.0	2010-11-10				Pending
PU0358DE1	Method and Apparatus for Performing Spinal Surgery	NuVasive, Inc.	DE	112010004338.8	2010-11-10				Pending
PU0358GB1	Method and Apparatus for Performing Spinal Surgery	NuVasive, Inc.	GB	1209824.0	2010-11-10	2488284 B	2015-12-09		Registered
PU0358GB2	Method and Apparatus for Performing Spinal Surgery	NuVasive, Inc.	GB	1519048.1	2010-11-10				Pending
PU0358JP1	Method and Apparatus for Performing Spinal Surgery	NuVasive, Inc.	JP	2012-538806	2010-11-10	5844737	2015-11-27		Registered
PU0358US1	Method and Apparatus for Performing Spine Surgery	NuVasive, Inc.	US	12/927,415	2010-11-10	8,357,184	2013-01-22		Registered
PU0358US2	Method and Apparatus for Performing Spinal Fusion Surgery	NuVasive, Inc.	US	13/204,573	2011-08-05	8,435,269	2013-05-07		Registered
PU0358US3	Method and Apparatus for Performing Spinal Surgery	NuVasive, Inc.	US	13/509,045	2010-11-10	9,050,146	2015-06-09		Registered
PU0358US4	Method and Apparatus for Performing Spinal Surgery	NuVasive, Inc.	US	13/204,583	2011-08-05	8,535,320	2013-09-17		Registered
PU0358US6	Method and Apparatus for Performing Spinal Surgery	NuVasive, Inc.	US	14/029,724	2013-09-17				Pending
PU0360BR1	Prosthetic Joint of Cervical Intervertebral Discs	Cervitech, Inc.	BR	PI0302378-8	2003-04-07	PI0302378-8	2013-06-04		Registered
PU0360CN1	Prosthetic Joint of Cervical Intervertebral Discs	Cervitech, Inc.	CN	200480009386.7	2004-02-17	ZL200480009386.7	2010-03-24		Registered
PU0360JP1	Prosthetic Joint of Cervical Intervertebral Discs	Cervitech, Inc.	JP	2006-504429	2004-02-17	4617294	2010-10-29		Registered
PU0360KR1	Prosthetic Joint of Cervical Intervertebral Discs	Cervitech, Inc.	KR	10-2005-7018979	2004-02-17	10-1134262	2012-03-30		Registered
PU0360US1	Cervical Intervertebral Disk Prosthesis	Cervitech, Inc.	US	10/407,946	2003-04-07	8,012,212	2011-09-06		Registered
PU0360US2	Method for Implanting an Intervertebral Disk Prosthesis	Cervitech, Inc.	US	11/282,604	2005-11-21	8,147,551	2012-04-03		Registered
PU0360US3	Cervical Intervertebral Prosthesis	Cervitech, Inc.	US	13/438,694	2012-04-03	8,591,586	2013-11-26		Registered
PU0362IL1	Intervertebral Disk Prosthesis	Cervitech, Inc.	IL	172608	2004-06-16	172608	2011-06-29		Registered

PU0362US1	Intervertebral Disk Prosthesis	Cervitech, Inc.	US	10/623,803	2003-07-22	7,722,673	2010-05-25		Registered
PU0363US2	Insertion Instrument for Cervical Prostheses	Cervitech, Inc.	US	11/155,597	2005-06-20	7,569,067	2009-08-04		Registered
PU0364MX1	Arrangement of a Cervical Prosthesis and Insertion Instrument	Cervitech, Inc.	MX	PA/a/2006/000546	2004-02-04	258142	2008-06-24		Registered
PU0364US1	Multi-Part Cervical Endoprosthesis with Insertion	Cervitech, Inc.	US	10/619,179	2003-07-15	7,320,689	2008-01-22		Registered
PU0365MX1	Set of Cervical Intervertebral Prostheses	Cervitech, Inc.	MX	PA/a/2006/004175	2004-08-13				Pending
PU0365US1	Set of Cervical Intervertebral Prostheses	Cervitech, Inc.	US	10/687,933	2003-10-20	7,628,813	2009-12-08		Registered
PU0368US1	Bone Separator	Cervitech, Inc.	US	10/567,966	2005-04-05	7,927,337	2011-04-19		Registered
PU0368US2	Bone Separator	Cervitech, Inc.	US	13/037,073	2011-02-28	9,072,504	2015-07-07		Registered
PU0369AU1	Intervertebral Prosthesis with Self-Tapping Fixing Projections	Cervitech, Inc.	AU	2006261207	2006-06-20	2006261207 B2	2012-07-26		Registered
PU0369BR1	Intervertebral Prosthesis with Self-Tapping Fixing Projections	Cervitech, Inc.	BR	PI0612284-1	2006-06-20				Pending
PU0369CN1	Intervertebral Prosthesis with Self-Tapping Fixing Projections	Cervitech, Inc.	CN	200680022473.5	2006-06-20	ZL200680022473.5	2010-11-24		Registered
PU0369DE2	Intervertebral Prosthesis with Self-Tapping Fixing Projections	Cervitech, Inc.	DE	06754460.1	2006-06-20	50 2006 010 480.6	2011-10-26		Registered
PU0369GB2	Intervertebral Prosthesis with Self-Tapping Fixing Projections	Cervitech, Inc.	GB	06754460.1	2006-06-20	1893136	2011-10-26		Registered
PU0369IL1	Intervertebral Prosthesis with Self-Tapping Fixing Projections	Cervitech, Inc.	IL	185183	2006-06-20	185183	2012-09-29		Registered
PU0369IN1	Intervertebral Prosthesis with Self-Tapping Fixing Projections	Cervitech, Inc.	IN	354/CHENP/2008	2006-06-20	271537	2016-02-24		Registered
PU0369JP1	Intervertebral Prosthesis with Self-Tapping Fixing Projections	Cervitech, Inc.	JP	2008-517399	2006-06-20	4764480	2011-06-17		Registered
PU0369KR1	Intervertebral Prosthesis with Self-Tapping Fixing Projections	Cervitech, Inc.	KR	10-2008-7001577	2006-06-20	10-1356241	2014-01-21		Registered
PU0369MX1	Intervertebral Prosthesis with Self-Tapping Fixing Projections	Cervitech, Inc.	MX	MX/a/2007/013283	2006-06-20	288458	2011-07-18		Registered
PU0369NZ1	Intervertebral Prosthesis with Self-Tapping Fixing Projections	Cervitech, Inc.	NZ	561232	2006-06-20	561232	2011-06-07		Registered
PU0369TW1	Intervertebral Prosthesis with Self-Tapping Fixing Projections	Cervitech, Inc.	TW	95121675	2006-06-16	I400066	2013-07-01		Registered
PU0369US2	Intervertebral Prosthesis with Self-Tapping Fixing Projections	Cervitech, Inc.	US	12/753,031	2010-04-01	8,721,725	2014-05-13		Registered

PU0369ZA1	Intervertebral Prosthesis with Self-Tapping Fixing Projections	Cervitech, Inc.	ZA	2007/07589	2006-06-20	2007/07589	2008-10-29		Registered
PU0371CN1	Cervical Intervertebral Prosthesis	Cervitech, Inc.	CN	03805695.X	2003-02-21	ZL03805695.X	2009-09-09		Registered
PU0371IL1	Cervical Intervertebral Prosthesis	Cervitech, Inc.	IL	163560	2003-02-21	163560	2011-03-01		Registered
PU0371KR1	Cervical Intervertebral Prosthesis	Cervitech, Inc.	KR	10-2004-7014210	2003-02-21	10-0961020	2010-05-25		Registered
PU0371US1	Cervical Intervertebral Prosthesis	Cervitech, Inc.	US	10/349,183	2003-01-23	7,267,691	2007-09-11		Registered
PU0374AU1	Instrument for the Insertion of an Intervertebral Articular Prosthesis	Cervitech, Inc.	AU	2004296536	2004-11-24	2004296536	2010-08-12		Registered
PU0374CN1	Instrument for the Insertion of an Intervertebral Articular Prosthesis	Cervitech, Inc.	CN	200480036660.X	2004-11-24	200480036660.X	2008-07-30		Registered
PU0374DE1	Instrument for the Insertion of an Intervertebral Articular Prosthesis	Cervitech, Inc.	DE	04798069.3	2004-11-24	1694215	2010-01-13		Registered
PU0374GB1	Instrument for the Insertion of an Intervertebral Articular Prosthesis	Cervitech, Inc.	GB	04798069.3	2004-11-24	1694215	2010-01-13		Registered
PU0374US1	Instrument Set for Fitting an Intervertebral Joint Prosthesis	Cervitech, Inc.	US	10/731,432	2003-12-10	7,527,629	2009-05-05		Registered
PU0374ZA1	Instrument for the Insertion of an Intervertebral Articular Prosthesis	Cervitech, Inc.	ZA	2006/05651	2004-11-24	2006/5651	2007-10-31		Registered
PU0377KR1	Prosthesis for Partial Replacement of a Vertebral Body	Cervitech, Inc.	KR	10-2006-7027546	2005-05-18				Pending
PU0377US1	Prosthesis for Partial Replacement of a Vertebral Body	Cervitech, Inc.	US	11/125,313	2005-05-10	8,070,812	2011-12-06		Registered
PU0377US2	Prosthesis for Partial Replacement of a Vertebral Body	Cervitech, Inc.	US	13/295,966	2011-11-14	8,409,285	2013-04-02		Registered
PU0378US2	Prosthesis for Bridging a Vertebral Body	Cervitech, Inc.	US	12/683,919	2010-01-07	8,192,493	2012-06-05		Registered
PU0386GB2	Intervertebral Prosthesis	Cervitech, Inc.	GB	02782913.4	2002-10-15	1482875	2009-03-11		Registered
PU0386ZA1	Intervertebral Prosthesis	Cervitech, Inc.	ZA	2004/7101	2002-10-15	2004/7101	2005-08-31		Registered
PU0387US1	Medical Implant with a Secured Bone Screw	Cervitech, Inc.	US	10/349,175	2003-01-23	7,160,303	2007-01-09		Registered
PU0392US1	Systems and Methods for Vessel Avoidance During Spine surgery	NuVasive, Inc.	US	12/848,950	2010-08-02	8,983,567	2015-03-17		Registered
PU0393US1	Spinal Cross Connector	NuVasive, Inc.	US	12/826,590	2010-06-29	8,246,657	2012-08-21		Registered
PU0406US1	Insulated Pedicle Access System and Related Methods	NuVasive, Inc.	US	12/945,705	2010-11-12				Pending
PU0407AU1	Surgical Access System and Related Methods	NuVasive, Inc.	AU	2010318711	2010-11-12	2010318711	2014-08-28		Registered
PU0407DE1	Surgical Access System and Related Methods	NuVasive, Inc.	DE	112010004350.7	2010-11-12				Pending

PU0407GB1	Surgical Access System	NuVasive, Inc.	GB	1209825.7	2010-11-12	2493810	2013-07-03		Registered
PU0407US1	Surgical Access System and Related Methods	NuVasive, Inc.	US	13/509,064	2010-11-12	9,138,217	2015-09-22		Registered
PU0409US1	Spinal Fusion Implants and Related Methods	NuVasive, Inc.	US	12/945,787	2010-11-12	8,740,983	2014-06-03		Registered
PU0417US1	Neurophysiologic Monitoring	NuVasive, Inc.	US	13/236,600	2011-09-19				Pending
PU0418US1	Fracture Reduction Device and Methods	NuVasive, Inc.	US	13/184,574	2011-07-18	8,795,369	2014-08-05		Registered
PU0420US1	Method and Apparatus for Performing Spine Surgery	NuVasive, Inc.	US	13/077,977	2011-03-31				Pending
PU0422US0	Method and Apparatus for Computerized Surgery	NuVasive, Inc.	US	09/948,940	2001-09-07	7,338,526	2008-03-04		Registered
PU0422US10	Methods and Apparatus for Computerized Surgery	NuVasive, Inc.	US	14/698,667	2015-04-28				Pending
PU0422US2	Method and Apparatus for Computerized Surgery	NuVasive, Inc.	US	11/929,114	2007-10-30	9,017,313	2015-04-28		Registered
PU0422US3	Method and Apparatus for Computerized Surgery	NuVasive, Inc.	US	11/928,940	2007-10-30				Pending
PU0422US4	Method and Apparatus for Computerized Surgery	NuVasive, Inc.	US	11/929,070	2007-10-30				Pending
PU0422US8	Spinal Implant System	NuVasive, Inc.	US	13/428,875	2012-03-23	8,747,476	2014-06-10		Registered
PU0422US9	Spinal Implant System	NuVasive, Inc.	US	14/299,203	2014-06-09				Pending
PU0424US2	Interbody Fusion Implant and Related Methods	NuVasive, Inc.	US	13/949,174	2013-07-23				Pending
PU0428AU1	Surgical Access System and Related Methods	NuVasive, Inc.	AU	2011293853	2011-08-23	2011293853	2015-11-19		Registered
PU0428AU2	Surgical Access System and Related Methods	NuVasive, Inc.	AU	2015252096	2011-08-23				Pending
PU0428CN1	Surgical Access System and Related Methods	NuVasive, Inc.	CN	201180050236.0	2011-08-23				Pending
PU0428DE1	Surgical Access System and Related Methods	NuVasive, Inc.	DE	112011102801.6	2011-08-23				Pending
PU0428GB1	Surgical Access System and Related Methods	NuVasive, Inc.	GB	1302945.9	2011-08-23				Pending
PU0428JP1	Surgical Access System and Related Methods	NuVasive, Inc.	JP	2013-525897	2011-08-23	5763194	2015-06-19		Registered
PU0428JP2	Surgical Access System and Related Methods	NuVasive, Inc.	JP	2014-185179	2011-08-23				Pending
PU0428JP3	Surgical Access System and Related Methods	NuVasive, Inc.	JP	2015-199428	2011-08-23				Pending

PU0428US1	Surgical Access System and Related Methods	NuVasive, Inc.	US	13/821,224	2011-08-23				Pending
PU0436US1	Spinal Implants, Instruments and Related Methods	NuVasive, Inc.	US	12/945,789	2010-11-12	8,840,668	2014-09-23	In progress to remove incorrect assignment info	Registered
PU0443US1	Lateral Fixation Constructs and Related Methods	NuVasive, Inc.	US	13/415,769	2012-03-08	8,992,579	2015-03-31		Registered
PU0447DE1	Spinal Implants for Rotationally Adjusting Vertebrae	NuVasive, Inc.	DE	112012000567.8	2012-01-25				Pending
PU0447US1	Spinal Implants for Rotationally Adjusting Vertebrae	NuVasive, Inc.	US	13/950,277	2013-07-24				Pending
PU0448US1	Spinal Fixation System and Related Methods	NuVasive, Inc.	US	13/361,855	2012-01-30	8,940,030	2015-01-27		Registered
PU0448US2	Spinal Fusion Implant and Related Methods	NuVasive, Inc.	US	14/606,501	2015-01-27				Pending
PU0449US1	Implant Installation Assembly and Related Methods	NuVasive, Inc.	US	13/411,465	2012-03-02	8,840,622	2014-09-23		Registered
PU0450US2	Filter Device	NuVasive, Inc.	US	14/735,128	2015-06-09				Pending
PU0453US1	Posterior Cervical Fixation System	NuVasive, Inc.	US	13/410,213	2012-03-01				Pending
PU0454US1	Vertebral Body Replacement and Insertion Methods	NuVasive, Inc.	US	13/425,380	2012-03-20				Pending
PU0455US1	Minimally Invasive Spinal Fixation System and Related Methods	NuVasive, Inc.	US	13/456,210	2012-04-25	9,198,698	2015-12-01		Registered
PU0455US2	Minimally Invasive Spinal Fixation System and Related Methods	NuVasive, Inc.	US	14/949,280	2015-11-23				Pending
PU0457US1	Spinal Fixation Anchor	NuVasive, Inc.	US	13/371,370	2012-02-10	9,198,692	2015-12-01		Registered
PU0458US1	Method and Apparatus for Performing Spinal Fusion Surgery	NuVasive, Inc.	US	13/469,076	2012-05-10	9,307,972	2016-04-12		Registered
PU0467US1	Surgical Access System and Related Methods	NuVasive, Inc.	US	13/434,845	2012-03-29				Pending
PU0468BR1	System and Method for Designing and Forming a Surgical Implant	NuVasive, Inc.	BR	PI0911078-0	2009-04-03				Pending
PU0468CN1	System and Method for Designing and Forming a Surgical Implant	NuVasive, Inc.	CN	200980115946.X	2009-04-03	CN102036615B	2014-08-13		Registered
PU0468CN2	System and Method for Designing and Forming a Surgical Implant	NuVasive, Inc.	CN	201410335982.X	2009-04-03				Pending
PU0468EP1	System and Method for Designing and Forming a Surgical Implant	NuVasive, Inc.	EP	09727829.5	2009-04-03				Pending
PU0468IN1	System and Method for Designing and Forming a Surgical Implant	NuVasive, Inc.	IN	6294/CHENP/2010	2009-04-03				Pending

PU0468JP1	System and Method for Designing and Forming a Surgical Implant	NuVasive, Inc.	JP	2011-503207	2009-04-03	5572898	2014-07-11			Registered
PU0468KR1	System and Method for Designing and Forming a Surgical Implant	NuVasive, Inc.	KR	10-2010-7024634	2009-04-03					Pending
PU0468US2	System and Method for Designing and Forming a Surgical Implant	NuVasive, Inc.	US	12/246,581	2008-10-07	7,957,831	2011-06-07			Registered
PU0468US3	System and Method for Designing and Forming a Surgical Implant	NuVasive, Inc.	US	12/417,937	2009-04-03	8,549,888	2013-10-08			Registered
PU0468US4	System and Method for Designing and Forming a Surgical Implant	NuVasive, Inc.	US	14/049,183	2013-10-08					Pending
PU0469US1	Tissue Retractor and Related Methods	NuVasive, Inc.	US	13/457,484	2012-04-26	8,900,137	2014-12-02			Registered
PU0469US2	Cervical Retractor	NuVasive, Inc.	US	13/507,111	2012-06-04	8,974,381	2015-03-10			Registered
PU0470US1	Systems and Methods for Performing Spine Surgery	NuVasive, Inc.	US	13/601,986	2012-08-31	9,113,853	2015-08-25			Registered
PU0470US2	Tissue Retraction System and Related Methods	NuVasive, Inc.	US	14/794,709	2015-07-08					Pending
PU0472US2	Osteoinductive Calcium Phosphates	Progentix Orthobiology B.V.	US	12/607,874	2009-10-28	7,942,934	2011-05-17			Registered
PU0472US3	Osteoinductive Calcium Phosphates	Progentix Orthobiology B.V.	US	14/792,305	2015-07-06					Pending
PU0475US1	Vertebral Body Replacement	NuVasive, Inc.	US	14/177,100	2014-02-10					Pending
PU0479US1	Minimally Invasive Facet Release	NuVasive, Inc.	US	13/684,492	2012-11-23					Pending
PU0483US1	Tissue Regeneration	Progentix Orthobiology B.V.	US	11/298,208	2005-12-08	8,071,083	2011-12-06			Registered
PU0484US1	Spinal Cross-Connector	NuVasive, Inc.	US	13/410,218	2012-03-01	9,247,964	2016-02-02			Registered
PU0484US2	Spinal Cross-Connector	NuVasive, Inc.	US	14/977,532	2015-12-21					Pending
PU0487US2	Resorbable Hollow Devices for Implantation and Delivery of Therapeutic Agents	NuVasive, Inc.	US	12/424,140	2009-04-15					Pending
PU0491US1	Systems and Methods for Performing Spine Surgery	NuVasive, Inc.	US	13/663,459	2012-10-29					Pending
PU0492US1	Spinal Fusion Implants and Related Methods	NuVasive, Inc.	US	13/648,253	2012-10-09					Pending
PU0493AU1	Method of Improving the Osteoinductivity of Calcium Phosphate	Progentix Orthobiology B.V.	AU	PCT/NL2006/000210	2006-04-21	2006241047	2011-06-02			Registered

PU0493DE1	Method of Improving the Osteoinductivity of Calcium Phosphate	Progentix Orthobiology B.V.	DE	06733017.5	2006-04-21	1877107	2009-07-24		Registered
PU0493GB1	Method of Improving the Osteoinductivity of Calcium Phosphate	Progentix Orthobiology B.V.	GB	06733017.5	2006-04-21	1877107	2009-07-24		Registered
PU0493JP1	Method of Improving the Osteoinductivity of Calcium Phosphate	Progentix Orthobiology B.V.	JP	2008-555181	2006-04-21				Pending
PU0493US1	Method of Improving the Osteoinductivity of Calcium Phosphate	Progentix Orthobiology B.V.	US	11/919,390	2009-08-31	8,460,685	2013-06-11		Registered
PU0495US1	Expandable Spinal Fusion Implants and Related Methods	NuVasive, Inc.	US	13/665,787	2012-10-31	9,198,765	2015-12-01		Registered
PU0495US2	Expandable Spinal Fusion Implants and Related Methods	NuVasive, Inc.	US	14/918,197	2015-10-20				Pending
PU0496US1	Surgical Fixation System and Related Methods	NuVasive, Inc.	US	13/666,933	2012-11-01				Pending
PU0500US1	Spinal Fusion Implants and Related Methods	NuVasive, Inc.	US	13/668,209	2012-11-02				Pending
PU0504US1	Bi-Cortical Screw Fixation	NuVasive, Inc.	US	13/771,076	2013-02-19	8,936,626	2015-01-20		Registered
PU0505US2	System, Method and Computer Program Product For Real Time Monitoring, Assignment and Balancing of Professional Oversight	Impulse Monitoring, Inc.	US	12/332,728	2008-12-11				Pending
PU0509US1	Systems and Methods for Performing Neurophysiologic Monitoring During Spine Surgery	NuVasive, Inc.	US	13/761,039	2013-02-06				Pending
PU0510US1	Systems and Methods for Performing Neurophysiologic Monitoring during Spine Surgery	NuVasive, Inc.	US	13/761,098	2013-02-06	9,066,701	2015-06-30		Registered
PU0517US1	Systems and Methods for Performing Spinal Surgery	NuVasive, Inc.	US	13/815,643	2013-03-12				Pending
PU0518US1	Directional Dilator for Intraoperative Monitoring	NuVasive, Inc.	US	13/830,508	2013-03-14				Pending
PU0519US1	Systems and Methods for Promoting Sacroiliac Joint Fusion	NuVasive, Inc.	US	13/830,028	2013-03-14				Pending
PU0521US2	Osteoinductive Bone Graft Substitute	NuVasive, Inc.	US	14/697,443	2015-04-27	9,272,072	2016-03-01		Registered
PU0521US3	Osteoinductive Bone Graft Substitute	NuVasive, Inc.	US	15/057,879	2016-03-01				Pending

PU0523US1	Devices and Methods for Inter-Vertebral Orthopedic Device Placement	NuVasive, Inc.	US	11/613,146	2006-12-19	8,002,802	2011-08-23		Registered
PU0524US1	Spinal Stabilization Systems and Methods of Use	NuVasive, Inc.	US	12/072,695	2008-02-26	7,842,074	2010-11-30		Registered
PU0524US2	Spinal Stabilization Systems and Methods of Use	NuVasive, Inc.	US	12/790,754	2010-05-28	8,801,757	2014-08-12		Registered
PU0524US3	Spinal Stabilization Systems and Methods of Use	NuVasive, Inc.	US	14/458,164	2014-08-12				Pending
PU0527US1	Systems and Methods for Performing Spine Surgery	NuVasive, Inc.	US	13/831,696	2013-03-15	9,060,815	2015-06-23		Registered
PU0527US2	Systems and Methods for Performing Spine Surgery	NuVasive, Inc.	US	14/748,048	2015-06-23				Pending
PU0529US1	Expandable Spinal Fusion Implant, Related Instruments and Methods	NuVasive, Inc.	US	14/060,558	2013-10-22				Pending
PU0530US1	Neurophysiologic Monitoring System and Related Methods	NuVasive, Inc.	US	14/060,561	2013-10-22				Pending
PU0531US1	Malleable, Cryopreserved Osteogenic Compositions with Viable Cells	NuVasive, Inc.	US	14/066,589	2013-10-29				Pending
PU0542US1	Implants and Methods for Treating Spinal Disorders	NuVasive, Inc.	US	13/694,105	2012-10-25	8,758,411	2014-06-24		Registered
PU0543US1	Systems and Methods for Performing Neurophysiologic Monitoring During Spine Surgery	NuVasive, Inc.	US	14/073,772	2013-11-06				Pending
PU0543US2	Systems and Methods for Performing Neurophysiologic Monitoring During Spine Surgery	NuVasive, Inc.	US	14/535,318	2014-11-06				Pending
PU0544US1	Systems and Methods for Performing Neurophysiologic Monitoring During Spine Surgery	NuVasive, Inc.	US	13/830,120	2013-03-14				Pending
PU0549US1	Waveform Marker Placement Algorithm For Use in Neurophysiologic Monitoring	NuVasive, Inc.	US	14/178,176	2014-02-11				Pending
PU0550US1	Spinal Alignment Frame	NuVasive, Inc.	US	14/214,099	2014-03-14				Pending
PU0552US1	Expandable Intervertebral Implant and Methods of Use Thereof	NuVasive, Inc.	US	14/217,358	2014-03-17				Pending
PU0553US1	Compounds and Matrices For Use In Bone Growth and Repair	NuVasive, Inc.	US	14/216,156	2014-03-17				Pending
PU0554US1	Spine Balance Assessment	NuVasive, Inc.	US	14/216,411	2014-03-17				Pending

PU0555US1	Rod Reduction Assembly and Related Methods	NuVasive, Inc.	US	14/217,101	2014-03-17				Pending
PU0558US1	Magnetic Spinal Implant for PLIF/TLIF Procedures	NuVasive, Inc.	US	13/874,274	2013-04-30				Pending
PU0559US1	Expandable Spinal Fusion Implant and Related Methods	NuVasive, Inc.	US	14/285,590	2014-05-22				Pending
PU0563AU1	Magnetic Targeting System and Method of Using the Same	NuVasive, Inc.	AU	2008350872	2008-02-21	2008350872	2015-01-08		Registered
PU0563CN1	Magnetic Targeting System and Method of Using the Same	NuVasive, Inc.	CN	200880127333.3	2008-02-21	ZL 200880127333.3	2015-06-17		Registered
PU0563CN2	Magnetic Targeting System for Facilitating Navigation	MagRod, LLC	CN	200980127694.2	2009-06-10	ZL200980127694.2	2013-11-06		Registered
PU0563EP1	Magnetic Targeting System and Method of Using the Same	NuVasive, Inc.	EP	08730366.5	2008-02-21				Pending
PU0563IN1	Magnetic Targeting System and Method of Using the Same	MagRod, LLC	IN	6552/DELNP/2010	2008-02-21				Pending
PU0563JP1	Magnetic Targeting System and Method of Using the Same	MagRod, LLC	JP	2010-547604	2008-02-21	5403763	2013-11-08		Registered
PU0563KR1	Magnetic Targeting System and Method of Using the Same	NuVasive, Inc.	KR	10-2010-7020596	2008-02-21	10-1472847	2014-12-09		Registered
PU0563MX1	Magnetic Targeting System and Method of Using the Same	MagRod, LLC	MX	MX/a/2010/009218	2008-02-21				Pending
PU0563NZ1	Magnetic Targeting System and Method of Using the Same	NuVasive, Inc.	NZ	587467	2008-02-21	587467	2013-09-03		Registered
PU0563RE1	Magnetic Targeting System and Method of Using the Same	NuVasive, Inc.	US	14/152,985	2014-01-10	RE45,436	2015-03-24		Registered
PU0563RE2	Magnetic Targeting System and Method of Using the Same	NuVasive, Inc.	US	14/152,987	2014-01-10	RE45,659	2012-01-10		Registered
PU0563RE3	Magnetic Targeting System and Method of Using the Same	NuVasive, Inc.	US	14/667,599	2015-03-24				Pending
PU0563RE4	Magnetic Targeting System and Method of Using the Same	NuVasive, Inc.	US	14/842,745	2015-09-01				Pending
PU0563US2	Magnetic Targeting System and Method of Using the Same	NuVasive, Inc.	US	12/157,397	2008-06-10	7,976,546	2011-07-12		Registered
PU0563US4	Magnetic Targeting System and Method of Using the Same	NuVasive, Inc.	US	12/728,818	2010-03-22	8,092,461	2012-01-10		Registered
PU0563US5	Magnetic Targeting System and Method of Using the Same	NuVasive, Inc.	US	13/151,756	2011-06-02	8,366,715	2013-02-05		Registered
PU0563US6	Magnetic Targeting System and Method of Using the Same	NuVasive, Inc.	US	13/313,528	2011-12-07	8,317,801	2012-11-27		Registered

PU0563US7	Magnetic Targeting System and Method of Using the Same	NuVasive, Inc.	US	13/313,765	2011-12-07	8,333,771	2012-12-18		Registered
PU0564US1	Reversibly Deformable Implant	NuVasive, Inc.	US	11/462,609	2006-08-04	7,758,649	2010-07-20		Registered
PU0565US1	Connecting Rod for Bone Anchors Having a Bioresorbable Tip	NuVasive, Inc.	US	11/462,566	2006-08-04	8,439,952	2013-05-14		Registered
PU0566CN1	Implant Equipped for Nerve Location and Method of Use	Integrity Intellect Inc.	CN	200880127332.9	2008-02-21	ZL 200880127332.9	2014-03-12		Registered
PU0566US1	Implant Equipped for Nerve Location and Method of Use	NuVasive, Inc.	US	11/534,129	2006-09-21	7,981,144	2011-07-19		Registered
PU0567US1	Systems and Methods for Inserting Cross-Connectors	NuVasive, Inc.	US	14/052,015	2013-10-11				Pending
PU0568AU1	Vertebral Disc Prosthesis	NuVasive, Inc.	AU	2006230808	2006-04-06	2006230808	2012-05-03		Registered
PU0568CN1	Vertebral Disc Prosthesis		CN	200680019708.5	2006-04-06	101222887 B	2012-11-07	Filed in inventor name	Registered
PU0568EP1	Vertebral Disc Prosthesis	NuVasive, Inc.	EP	06721339.7	2006-04-06				Pending
PU0568KR1	Vertebral Disc Prosthesis	NuVasive, Inc.	KR	10-2007-7025789	2006-04-06	1360150	2014-02-03		Registered
PU0568US2	Vertebral Disc Prosthesis	NuVasive, Inc.	US	14/032,143	2013-09-19	9,138,329	2015-09-22		Registered
PU0568US3	Vertebral Disc Prosthesis	NuVasive, Inc.	US	14/827,972	2015-08-17				Pending
PU0569AU1	Method of Reducing Loading Failure for a Prosthetic Component	NuVasive, Inc.	AU	2006308801	2006-11-02	2006308801	2012-07-05		Registered
PU0569AU3	Method of Reducing Loading Failure for a Prosthetic Component	NuVasive, Inc.	AU	2014280965	2006-11-02				Pending
PU0569CN1	Method of Reducing Loading Failure for a Prosthetic Component		CN	200680046378.9	2006-11-02	101340863 B	2013-04-03	Filed in inventor name	Registered
PU0569EP1	Method of Reducing Loading Failure for a Prosthetic Component	NuVasive, Inc.	EP	06804463.5	2006-11-02				Pending
PU0569KR1	Method of Reducing Loading Failure for a Prosthetic Component	NuVasive, Inc.	KR	10-2008-7013434	2006-11-02	1360188	2014-02-03		Registered
PU0569US1	Method of Reducing Loading Failure for a Prosthetic Component	NuVasive, Inc.	US	12/084,471	2006-11-02				Pending
PU0572US1	Magnetically Connectable Interbody Spinal Implat Devices	NuVasive, Inc.	US	14/216,509	2014-03-17				Pending
PU0573US1	Spinal Fusion Implant with Reducible Graft Aperture	NuVasive, Inc.	US	14/457,108	2014-08-11				Pending
PU0574US1	Orthopedic Screw Insert	NuVasive, Inc.	US	12/009,441	2008-01-18	8,221,479	2012-07-17		Registered
PU0574US2	Orthopedic Screw Insert	NuVasive, Inc.	US	13/524,968	2012-06-15	8,951,293	2015-02-10		Registered
PU0575US1	Bone Anchor with Offset Rod Connector	NuVasive, Inc.	US	14/510,107	2014-10-08				Pending
PU0576US1	Systems and Methods for		US	14/511,038	2014-10-09			Assignment from	Pending

	Performing Spine Surgery							inventors in progress	
PU0582US1	Spinal Fusion Implant and Related Methods	NuVasive, Inc.	US	14/594,272	2015-01-12				Pending
PU0583US1	Oblique TLIF Implant and Related Methods	NuVasive, Inc.	US	14/597,085	2015-01-14				Pending
PU0589US1	Minimally Invasive Spinal Fixation System and Related Methods	NuVasive, Inc.	US	14/631,839	2015-02-25				Pending
PU0591US1	Method for Placing Minimally Invasive Pedicle Screws	NuVasive, Inc.	US	14/727,831	2015-06-01				Pending
PU0598US1	Posterior Cervical Fusion System and Techniques	NuVasive, Inc.	US	13/503,050	2010-10-21	9,204,906	2015-12-08		Registered
PU0598US2	System and Method for Posterior Cervical Fusion	NuVasive, Inc.	US	14/623,988	2015-02-17				Pending
PU0600US1	Spinal Fixation Constructs and Related Methods	NuVasive, Inc.	US	14/703,852	2015-05-04				Pending
PU0603AU1	Surgical Retractor System and Methods of Use	NuVasive, Inc.	AU	2012299061	2012-08-17				Pending
PU0603CN1	Surgical Retractor System and Methods of Use	NuVasive, Inc.	CN	201280044606.4	2012-08-17				Pending
PU0603EP1	Surgical Retractor System and Methods of Use	NuVasive, Inc.	EP	12826211.0	2012-08-17				Pending
PU0603JP1	Surgical Retractor System and Methods of Use	NuVasive, Inc.	JP	2014-526262	2012-08-17				Pending
PU0603US1	Surgical Retractor System and Methods of Use	NuVasive, Inc.	US	14/239,528	2012-08-17				Pending
PU0607US1	Minimally Disruptive Retractor and Associated Methods for Spinal Surgery	NuVasive, Inc.	US	14/756,198	2015-08-14				Pending
PU0607WO1	Minimally Disruptive Retractor and Methods	NuVasive, Inc.	WO	PCT/US2015/000084	2015-08-14				Pending
PU0608US1	Lordotic Expandable Interbody Implant	NuVasive, Inc.	US	14/456,640	2014-08-11				Pending
PU0609US1	Systems and Methods for Performing Neurophysiologic Monitoring	NuVasive, Inc.	US	14/856,525	2015-09-16				Pending
PU0611US1	Adjustable Iliac Connector	NuVasive, Inc.	US	14/856,467	2015-09-16				Pending
PU0612AU1	Surgical Spinal Correction		AU	PCT/US2014/059974	2014-10-09			Assignment from inventors in progress	Pending
PU0612CN1	Surgical Spinal Correction		CN	PCT/US2014/059974	2014-10-09			Assignment from inventors in progress	Pending

PU0612EP1	Surgical Spinal Correction		EP	PCT/US2014/059974	2014-10-09			Assignment from inventors in progress	Pending
PU0612JP1	Surgical Spinal Correction		JP	PCT/US2014/059974	2014-10-09			Assignment from inventors in progress	Pending
PU0612US1	Surgical Spinal Correction		US	PCT/US2014/059974	2014-10-09			Assignment from inventors in progress	Pending
PU0612WO1	Surgical Spinal Correction		WO	PCT/US2014/059974	2014-10-09			Assignment from inventors in progress	Pending
PU0614WO1	Systems and Methods for Performing Neurophysiologic Monitoring During Spine Surgery		WO	PCT/US2014/064449	2014-11-06			Assignment from inventors in progress	Pending
PU0616US1	Systems and Methods for Performing Spine Surgery	NuVasive, Inc.	US	14/887,245	2015-10-19				Pending
PU0617USP2	Pedicle Screw Biomechanical Strength Intraoperative Assessment System and Method		US	62/252,248	2015-11-06			Provisional	Pending
PU0622USP	Anterior Spinal Column Reduction Instrument and Methods		US	62/175,624	2015-06-15			Provisional	Pending
PU0623USP	Adjustable Depth Drill Guide		US	62/271,719	2015-12-28			Provisional	Pending
PU0625US1	Method and Apparatus for Performing Spine Surgery		US	15/000,033	2016-01-19			Assignment from inventors in progress	Pending
PU0626USP2	Systems and Methods for Performing Spine Surgery		US	62/278,873	2016-01-14			Provisional	Pending
PU0627US1	Systems and Methods for Planning, Performing, and Assessing Spinal Correction During Surgery		US	15/045,084	2016-02-16			Assignment from inventors in progress	Pending
PU0628US1	Systems and Methods for Facilitating Surgical Procedures		US	15/047,049	2016-02-18			Assignment from inventors in progress	Pending
PU0630US1	Rod Reduction Assemblies and Related Methods	NuVasive, Inc.	US	14/634,729	2015-02-28				Pending
PU0632USP	Porous Interbody Implant with Contoured Surfaces		US	62/148,622	2015-04-16			Provisional	Pending
PU0632USP2	Spinal Fusion Implant		US	62/268,430	2015-12-16			Provisional	Pending
PU0633USP	Expandable Lordosis Intervertebral Implant		US	62/160,544	2015-05-12			Provisional	Pending
PU0633USP2	Expandable Lordosis Intervertebral Implant		US	62/190,251	2015-07-09			Provisional	Pending

PU0634USP	Methods and Instruments for Performing Leveraged Reduction During Single Position Spine Surgery		US	62/165,078	2015-05-21			Provisional	Pending
PU0635WO1	Systems and Methods for Planning, Performing, and Assessing Spinal Correction During Surgery		WO	PCT/US2015/036301	2015-06-17			Assignment from inventors in progress	Pending
PU0636USP	Planar and Work Rod Correction System and Tecnique		US	62/261,737	2015-12-01			Provisional	Pending
PU0638USP	Deformity Correction Pelvic Tilt Frame and Pelvic Tilt Assessment Feature		US	62/261,186	2015-11-30			Provisional	Pending
PU0640US1	Vertebral Anchor	NuVasive, Inc.	US	11/850,393	2007-09-05	8,177,816	2012-05-15		Registered
PU0641US1	Expandable Support Device and Method of Use	NuVasive, Inc.	US	12/780,744	2010-05-14	8,382,842	2013-02-26		Registered
PU0644US1	Orthopedic Implant Rod Reduction Tool Set and Method		US	10/789,134	2004-02-27	7,470,279	2008-12-30	Jackson assignment in progress	Registered
PU0645AU1	Orthopedic Implant Rod Reduction Tool Set and Method		AU	2004317551	2004-09-29	2004317551	2009-03-19	Jackson assignment in progress	Registered
PU0645CA1	Orthopedic Implant Rod Reduction Tool Set and Method		CA	PCT/US2004/031860	2004-09-29	2555868	2011-09-06	Jackson assignment in progress	Registered
PU0645US1	Orthopedic Implant Rod Reduction Tool Set and Method		US	10/789,149	2004-02-27	7,160,300	2007-01-09	Jackson assignment in progress	Registered
PU0645US10	Method for Implanting a Rod Implant Along a Spine of a Patient		US	14/245,828	2014-04-04	9,173,682	2015-11-03	Jackson assignment in progress	Registered
PU0645US11	Method for Implanting a Rod Implant Along a Spine of a Patient		US	14/553,246	2014-11-25			Jackson assignment in progress	Pending
PU0645US12	System for Implanting a Rod Implant Along a Spine of a Patient		US	14/553,327	2014-11-25			Jackson assignment in progress	Pending
PU0645US13	System for Implanting a Rod Implant Along a Spine of a Patient		US	14/553,408	2014-11-25			Jackson assignment in progress	Pending
PU0645US14	System for Implanting a Rod Implant Along a Spine of a Patient		US	14/553,471	2014-11-25			Jackson assignment in progress	Pending
PU0645US15	Orthopedic Implant Rod Reduction Tool Set and Method		US	14/738,195	2015-06-12			Jackson assignment in progress	Pending
PU0645US2	Orthopedic Implant Rod Reduction Tool Set and Method		US	12/220,185	2008-07-22	8,162,948	2012-04-24	Jackson assignment in progress	Registered
PU0645US3	Orthopedic Implant Rod Reduction Tool Set and Method		US	12/454,152	2009-05-13	8,292,892	2012-10-23	Jackson assignment in progress	Registered

PU0645US4	Orthopedic Implant Rod Reduction Tool Set and Method		US	12/584,413	2009-09-04	8,100,915	2012-01-24	Jackson assignment in progress	Registered
PU0645US5	Orthopedic Implant Rod Reduction Tool Set and Method		US	13/374,932	2012-01-24	8,377,067	2013-02-19	Jackson assignment in progress	Registered
PU0645US6	Orthopedic Implant Rod Reduction Tool Set and Method		US	13/573,660	2012-10-02	9,055,978	2015-06-16	Jackson assignment in progress	Registered
PU0645US7	Bone Anchor Configured to Anchor an Elongated Implant to a Patient Bone		US	14/245,660	2014-04-04			Jackson assignment in progress	Pending
PU0645US8	Method for Implanting an Elongated Implant Along a Spine of a Patient		US	14/245,728	2014-04-04	9,101,415	2015-08-11	Jackson assignment in progress	Registered
PU0645US9	System for Anchoring an Elongated Implant to a Vertebra of a Patient Spine		US	14/245,775	2014-04-04			Jackson assignment in progress	Pending
PU0646US1	Spinal Fixation Tool Attachment Structure		US	11/272,508	2005-11-10	9,050,148	2015-06-09	Jackson assignment in progress	Registered
PU0646US2	Spinal Fixation Tool Attachment Structure		US	14/601,834	2015-01-21			Jackson assignment in progress	Pending
PU0647US1	Dynamic Stabilization Assemblies, Tool Set and Method		US	11/328,481	2006-01-09	7,862,587	2011-01-04	Jackson assignment in progress	Registered
PU0647US2	Dynamic Stabilization Assemblies, Tool Set and Method		US	12/927,673	2010-11-19	9,216,039	2015-12-22	Jackson assignment in progress	Registered
PU0647US3	Dynamic Stabilization Assemblies, Tool Set and Method		US	14/482,562	2014-09-10			Jackson assignment in progress	Pending
PU0648US1	Tool System for Dynamic Spinal Implants		US	11/999,689	2007-12-06	8,066,739	2011-11-29	Jackson assignment in progress	Registered
PU0648US2	Tool System for Dynamic Spinal Implants		US	13/373,735	2011-11-28	8,894,657	2014-11-25	Jackson assignment in progress	Registered
PU0648US3	Tool System for Dynamic Spinal Implants		US	13/901,672	2013-05-24			Jackson assignment in progress	Pending
PU0648US4	Tool System for Dynamic Spinal Implants		US	14/549,201	2014-11-20			Jackson assignment in progress	Pending
PU0649US1	Orthopedic Implant Rod Reduction Tool Set and Method		US	13/815,933	2013-03-15	9,050,139	2015-06-09	Jackson assignment in progress	Registered
PU0649US2	Orthopedic Implant Rod Reduction Tool Set and Method		US	14/733,222	2015-06-08			Jackson assignment in progress	Pending
PU0650US1	Spinal FixationTool Set and Method		US	14/041,552	2013-09-30			Jackson assignment in progress	Pending
PU0651US1	Spinal Fixation Tool Set and Method		US	10/996,289	2004-11-23	8,152,810	2012-04-10	Jackson assignment in progress	Registered

PU0651US2	Spinal Fixation Tool Set and Method		US	11/541,321	2006-09-29	8,273,089	2012-09-25	Jackson assignment in progress	Registered
PU0651US3	Spinal Fixation Tool Set and Method		US	12/924,223	2010-09-23	9,211,150	2015-12-15	Jackson assignment in progress	Registered
PU0651US4	Spinal Fixation Tool Set and Method		US	13/507,471	2012-06-29			Jackson assignment in progress	Pending
PU0652AU1	Poly Axial Bone Screw With Spherical Capture, Compression and Alignment and Retention Structures		AU	2008226963	2008-03-06	2008226963 B2	2011-09-06	Jackson assignment in progress	Registered
PU0652DE1	Poly Axial Bone Screw With Spherical Capture, Compression and Alignment and Retention Structures		DE	08726468.5	2008-03-06	2129310 B1	2012-09-05	Jackson assignment in progress	Registered
PU0652GB1	Poly Axial Bone Screw With Spherical Capture, Compression and Alignment and Retention Structures		GB	08726468.5	2008-03-06	2129310 B1	2012-09-05	Jackson assignment in progress	Registered
PU0652JP1	Poly Axial Bone Screw With Spherical Capture, Compression and Alignment and Retention Structures		JP	2013-001793	2008-03-06			Jackson assignment in progress	Pending
PU0652US1	Polyaxial Bone Screw With Spherical Capture, Compression and Alignment and Retention Structures		US	12/072,354	2008-02-26			Jackson assignment in progress	Pending
PU0652US2	Polyaxial Bone Screw With Spherical Capture, Compression Insert and Alignment and Retention Structures		US	13/507,822	2012-07-31			Jackson assignment in progress	Pending
PU0653BR1	Polyaxial Bone Anchor With Compound Articulation and Pop-On Shank		BR	PCT/US2012/000147	2012-03-16			Jackson assignment in progress	Pending
PU0653CN1	Polyaxial Bone Anchor With Compound Articulation and Pop-On Shank		CN	PCT/US2012/000147	2012-03-16			Jackson assignment in progress	Pending
PU0653JP1	Polyaxial Bone Anchor With Compound Articulation and Pop-On Shank		JP	2014-501061	2012-03-16			Jackson assignment in progress	Pending
PU0653US1	Polyaxial Bone Anchor With Compound Articulation and Pop-		US	13/385,997	2012-03-20			Jackson assignment in progress	Pending

	On Shank								
PU0658US1	Systems and Methods for Performing Spine Surgery	NuVasive, Inc.	US	14/887,246	2015-10-19				Pending
PU0659USP	Spinal Compression Instrument and Related Methods		US	62/262,491	2015-12-03			Provisional	Pending
PU0661USP	Bone Anchor with Increased Angulation Housing		US	62/262,530	2015-12-03			Provisional	Pending
PU0663USP	Pressue-Based Motion Detection for Spine Surgery		US	62/257,158	2015-11-18			Provisional	Pending
PU0665USP	Bone Anchor with Deployable Purchase Element		US	62/306,201	2016-03-10			Provisional	Pending
PU0666USP	Integral Double Rod Spinal Construct		US	62/298,279	2016-02-22			Provisional	Pending
PU0667USP	Immunomodulation with implantation of cellular allograft		US	62/263,945	2015-12-07			Provisional	Pending
PU0668USP	3D Visualization During Surgery with Reduced Radiation Exposure		US	62/266,888	2015-12-14			Provisional	Pending
PU0668USP2	3D Visualization During Surgery with Reduced Radiation Exposure		US	62/307,942	2016-03-14			Provisional	Pending
PU0669USP	Midline Spinous Process Allograft		US	62/272,618	2015-12-29			Provisional	Pending
PU0670USP	Spinous Process Plate System		US	62/273,350	2015-12-30			Provisional	Pending
PU0672USP	Visual, Audible, Tactile Feedback Mechanism		US	62/273,377	2015-12-30			Provisional	Pending
PU0672USP2	Interfixated Interbody Guide		US	62/273,445	2015-12-31			Provisional	Pending
PU0673USP	Expandable Trial Implant		US	62/273,390	2015-12-30			Provisional	Pending
PU0673USP2	Cranial/Caudal Expandable Lordosis Spinal Implant		US	62/273,441	2015-12-31			Provisional	Pending
PU0674USP	Anterolateral Implant Inserter		US	62/273,443	2015-12-31			Provisional	Pending
PU0675USP	Systems and Methods for Performing Spine Surgery		US	62/286,166	2016-01-22			Provisional	Pending
PU0678USP	Disc Preparation Confirmation Tool		US	62/294,505	2016-02-12			Provisional	Pending
PU0679USP	Magnetically Activated Deployable Fixation Interbody Device		US	62/294,884	2016-02-12			Provisional	Pending
PU0680USP	Magnetically Actuated Instruments		US	62/294,979	2016-02-12			Provisional	Pending
PU0681USP	Post-Operatively Adjustable Angled Rod		US	62/294,988	2016-02-12			Provisional	Pending
PU0682USP	Post-Operatively Adjustable Tension Devices		US	62/294,975	2016-02-12			Provisional	Pending
PU0683USP	Magnetically Actuateable Rod Insertion for Minimally Invasive Surgery		US	62/295,001	2016-02-12			Provisional	Pending

PU0684USP	Systems and Methods for Spinous Process Fixation		US	62/294,422	2016-02-12			Provisional	Pending
PU0685USP	Systms and Methods for an Interspinous Spacer		US	62/294,440	2016-02-12			Provisional	Pending
PU0687USP	Surgical Fixation System and Related Methods		US	62/294,989	2016-02-12			Provisional	Pending
PU0688USP	Systems and Methods for Performing Spine Surgery		US	62/294,990	2016-02-12			Provisional	Pending
PU0689USP	Magnetic Disc Prosthesis		US	62/294,992	2016-02-12			Provisional	Pending
PU0690USP	Magnetically Actuated Expandable Interbody Device		US	62/295,008	2016-02-13			Provisional	Pending
PU0692US1	Systems and Methods for Planning, Performing, and Assessing Spinal Correction During Surgery		US	15/044,947	2016-02-16				Pending
PU0693US1	Expandable Rod System To Treat Scoliosis and Method of Using the Same	Ellipse Technologies, Inc.	US	11/172,678	2005-06-30	7,955,357	2011-06-07		Registered
PU0693US2	Expandable Rod System To Treat Scoliosis and Method of Using the Same	Ellipse Technologies, Inc.	US	12/421,569	2009-04-09	8,343,192	2013-01-01		Registered
PU0693US3	Expandable Rod System To Treat Scoliosis and Method of Using the Same	Ellipse Technologies, Inc.	US	13/691,530	2012-11-30	8,852,236	2014-10-07		Registered
PU0693US4	Expandable Rod System To Treat Scoliosis and Method of Using the Same	Ellipse Technologies, Inc.	US	14/321,386	2014-07-01				Pending
PU0693US5	Expandable Rod System To Treat Scoliosis and Method of Using the Same	Ellipse Technologies, Inc.	US	14/601,999	2015-01-21	9,011,499	2015-04-21		Registered
PU0694DE1	Gastrointestinal Restriction Device	Ellipse Technologies, Inc.	DE	08730778.1	2008-02-26	2114258	2014-06-25		Registered
PU0694EP2	Gastrointestinal Restriction Device	Ellipse Technologies, Inc.	EP	14168308.6	2008-02-26				Pending
PU0694FR1	Gastrointestinal Restriction Device	Ellipse Technologies, Inc.	FR	08730778.1	2008-02-26	2114258	2014-06-25		Registered
PU0694GB1	Gastrointestinal Restriction Device	Ellipse Technologies, Inc.	GB	08730778.1	2008-02-26	2114258	2014-06-25		Registered

PU0694US1	Gastrointestinal Restriction Device	Ellipse Technologies, Inc.	US	11/760,482	2007-06-08	7,862,502	2011-01-04		Registered
PU0694US2	Gastrointestinal Restriction Device	Ellipse Technologies, Inc.	US	12/259,965	2008-10-28	7,981,025	2011-07-19		Registered
PU0694US3	Gastrointestinal Restriction Device	Ellipse Technologies, Inc.	US	13/158,117	2011-06-10	8,715,159	2014-05-06		Registered
PU0694US4	Gastrointestinal Restriction Device	Ellipse Technologies, Inc.	US	13/649,977	2012-10-11	8,808,163	2014-08-19		Registered
PU0694US5	Gastrointestinal Restriction Device	Ellipse Technologies, Inc.	US	14/328,568	2014-07-10				Pending
PU0694US6	Gastrointestinal Restriction Device	Ellipse Technologies, Inc.	US	14/668,901	2015-03-25	9,271,857	2016-03-01		Registered
PU0694US7	Gastrointestinal Restriction Device	Ellipse Technologies, Inc.	US	14/920,709	2015-10-22				Pending
PU0695US1	Implant System with Resonant-Driven Actuator	Ellipse Technologies, Inc.	US	11/760,488	2007-06-08	8,246,533	2012-08-21		Registered
PU0696CA1	Skeletal Manipulation System	Ellipse Technologies, Inc.	CA	2703562	2008-10-13				Pending
PU0696CN1	Skeletal Manipulation System	Ellipse Technologies, Inc.	CN	200880121423.1	2008-10-13	ZL200880121423.1	2012-11-21		Registered
PU0696CN2	Skeletal Manipulation System	Ellipse Technologies, Inc.	CN	201210404498.9	2008-10-13	ZL201210404498.9	2015-03-04		Registered
PU0696EP1	Skeletal Manipulation System	Ellipse Technologies, Inc.	EP	08845847.6	2008-10-13				Pending
PU0696JP2	Skeletal Manipulation System	Ellipse Technologies, Inc.	JP	2014-081308	2008-10-13	5860496	2015-12-25		Registered
PU0696JP3	Skeletal Manipulation System	Ellipse Technologies,	JP	2015-178762	2008-10-13				Pending

		Inc.							
PU0696US3	Skeletal Manipulation System and Method	Ellipse Technologies, Inc.	US	12/121,499	2008-05-15	8,057,472	2011-11-15		Registered
PU0696US4	Skeletal Manipulation Method	Ellipse Technologies, Inc.	US	13/277,980	2011-10-20	8,419,734	2013-04-16		Registered
PU0696US5	Skeletal Manipulation Method	Ellipse Technologies, Inc.	US	13/849,405	2013-03-22	9,271,781	2016-03-01		Registered
PU0696US6	Skeletal Manipulation Method	Ellipse Technologies, Inc.	US	14/629,426	2015-02-23	9,179,960	2015-11-10		Registered
PU0696US7	Skeletal Manipulation Method	Ellipse Technologies, Inc.	US	14/880,980	2015-10-12				Pending
PU0697US2	Adjustable Implant System	Ellipse Technologies, Inc.	US	13/625,725	2012-09-24	9,198,755	2015-12-01		Registered
PU0697US3	Adjustable Implant System	Ellipse Technologies, Inc.	US	14/885,749	2015-10-16				Pending
PU0698US1	External Adjustment Device for Distraction Device	Ellipse Technologies, Inc.	US	12/615,855	2009-11-10	8,382,756	2013-02-26		Registered
PU0698US2	External Adjustment Device for Distraction Device	Ellipse Technologies, Inc.	US	13/747,028	2013-01-22	9,192,411	2015-11-24		Registered
PU0698US3	External Adjustment Device	Ellipse Technologies, Inc.	US	14/885,227	2015-10-16				Pending
PU0699CN1	Spinal Distraction System	Ellipse Technologies, Inc.	CN	201080008758.X	2010-02-10	ZL201080008758.X	2015-09-16		Registered
PU0699CN2	Spinal Distraction System	Ellipse Technologies, Inc.	CN	201510509680.4	2010-02-10				Pending
PU0699CN3	Spinal Distraction System	Ellipse Technologies, Inc.	CN	20150509301.1	2010-02-10				Pending
PU0699EP1	Spinal Distraction System	Ellipse	EP	10744153.7	2010-02-10				Pending

		Technologies, Inc.							
PU0699JP1	Spinal Distraction System	Ellipse Technologies, Inc.	JP	2011-551126	2010-02-10				Pending
PU0699US1	Non-Invasive Adjustable Distraction System	Ellipse Technologies, Inc.	US	12/391,109	2009-02-23	8,197,490	2012-06-12		Registered
PU0699US2	Non-Invasive Adjustable Distraction System	Ellipse Technologies, Inc.	US	13/477,945	2012-05-22	8,974,463	2015-03-10		Registered
PU0699US3	Non-Invasive Adjustable Distraction System	Ellipse Technologies, Inc.	US	14/332,286	2014-07-15				Pending
PU0700US1	Interspinous Process Device and Method	Ellipse Technologies, Inc.	US	12/761,141	2010-04-15				Pending
PU0701AU1	Bone Growth Device and Method	Ellipse Technologies, Inc.	AU	2010289288	2010-09-03				Pending
PU0701CN1	Bone Growth Device and Method	Ellipse Technologies, Inc.	CN	201080039442.7	2010-09-03	ZL2010-80039442.7	2015-09-09		Registered
PU0701CN2	Bone Growth Device and Method	Ellipse Technologies, Inc.	CN	2015104847223	2010-09-03				Pending
PU0701CN3	Bone Growth Device and Method	Ellipse Technologies, Inc.	CN	201510484965.7	2010-09-03				Pending
PU0701EP1	Bone Growth Device and Method	Ellipse Technologies, Inc.	EP	10814570.7	2010-09-03				Pending
PU0701JP1	Bone Growth Device and Method	Ellipse Technologies, Inc.	JP	2012-528095	2010-09-03	5751642	2015-05-29		Registered
PU0701JP2	Bone Growth Device and Method	Ellipse Technologies, Inc.	JP	2015-098790	2010-09-03				Pending
PU0701KR1	Bone Growth Device and Method	Ellipse Technologies, Inc.	KR	10-2012-7008627	2010-09-03				Pending

PU0701RU1	Bone Growth Device and Method	Ellipse Technologies, Inc.	RU	2012112925	2010-09-03				Pending
PU0701RU2	Bone Growth Device and Method	Ellipse Technologies, Inc.	RU	2016101629	2010-09-03				Pending
PU0701US1	Bone Growth Device and Method	Ellipse Technologies, Inc.	US	12/875,585	2010-09-03	8,449,543	2013-05-28		Registered
PU0701US2	Bone Growth Device and Method	Ellipse Technologies, Inc.	US	13/892,182	2013-05-10				Pending
PU0702US1	External Adjustment Device for Distraction Device	Ellipse Technologies, Inc.	US	13/172,598	2011-06-29	9,248,043	2016-02-02		Registered
PU0702US2	External Adjustment Device for Distraction Device	Ellipse Technologies, Inc.	US	14/995,503	2016-01-14				Pending
PU0704US1	Maintenance Feature in Magnetic Implant	Ellipse Technologies, Inc.	US	13/198,571	2011-08-04	8,734,488	2014-05-27		Registered
PU0704US2	Maintenance Feature in Magnetic Implant	Ellipse Technologies, Inc.	US	14/250,313	2014-04-10	9,186,183	2015-11-17		Registered
PU0704US3	Maintenance Feature in Magnetic Implant	Ellipse Technologies, Inc.	US	14/883,485	2015-10-14				Pending
PU0705US1	System and Method for Altering Rotational Alignment of Bone Sections	Ellipse Technologies, Inc.	US	13/370,966	2012-02-10	8,715,282	2014-05-06		Registered
PU0705US2	Variable Length Device and Method	Ellipse Technologies, Inc.	US	13/371,012	2012-02-10	8,852,187	2014-10-07		Registered
PU0705US3	System and Method for Altering Rotational Alignment of Bone Sections	Ellipse Technologies, Inc.	US	14/146,336	2014-01-02				Pending
PU0705US4	Variable Length Device and Method	Ellipse Technologies, Inc.	US	14/667,620	2015-03-24				Pending
PU0706DE1	Devices and Methods for Non-Invasive Implant Length Sensing	Ellipse Technologies,	DE	112012004130.5	2012-10-02				Pending

		Inc.							
PU0706US1	Devices and Methods for Non-Invasive Implant Length Sensing	Ellipse Technologies, Inc.	US	13/253,065	2011-10-04				Pending
PU0707US6	Spinal Distraction System	Ellipse Technologies, Inc.	US	13/730,773	2012-12-28				Pending
PU0708US1	Adjustable Magnetic Devices and Methods of Using Same	Ellipse Technologies, Inc.	US	14/355,202	2012-10-31				Pending
PU0708US2	Adjustable Magnetic Devices and Methods of Using Same	Ellipse Technologies, Inc.	US	14/301,238	2014-06-10				Pending
PU0708US3	Adjustable Magnetic Devices and Methods of Using Same	Ellipse Technologies, Inc.	US	14/449,761	2014-08-01				Pending
PU0709DE1	Devices and Methods for Detection of Slippage of Magnetic Coupling in Implantable Medical Devices	Ellipse Technologies, Inc.	DE	112013002825.5	2013-06-04				Pending
PU0709US1	Devices and Methods for Detection of Slippage of Magnetic Coupling in Implantable Medical Devices	Ellipse Technologies, Inc.	US	13/490,107	2012-06-06	9,078,711	2015-07-14		Registered
PU0709US2	Devices and Methods for Detection of Slippage of Magnetic Coupling in Implantable Medical Devices	Ellipse Technologies, Inc.	US	14/737,192	2015-06-11				Pending
PU0710US1	Magnetic Implants with Improved Anatomical Compatibility	Ellipse Technologies, Inc.	US	13/525,058	2012-06-15				Pending
PU0711US1	Intramedullary Implant for Replacing Lost Bone	Ellipse Technologies, Inc.	US	13/655,246	2012-10-18	9,044,281	2015-06-02		Registered
PU0711US2	Implantable Dynamic Apparatus Having an Anti Jamming Feature	Ellipse Technologies, Inc.	US	14/451,190	2014-08-04				Pending
PU0712US1	Distraction Devices and Method of Assembling the Same	Ellipse Technologies, Inc.	US	13/791,430	2013-03-08	9,179,938	2015-11-10		Registered
PU0712US2	Systems and Methods for Ultrasonic Detection of Device Distraction	Ellipse Technologies, Inc.	US	14/863,019	2015-09-23				Pending
PU0713AU1	Adjustable Devices for Treating	Ellipse	AU	2013338218	2013-10-28				Pending

	Arthritis of the Knee	Technologies, Inc.							
PU0713BR1	Adjustable Devices for Treating Arthritis of the Knee	Ellipse Technologies, Inc.	BR	112015009446.5	2013-10-28				Pending
PU0713CA1	Adjustable Devices for Treating Arthritis of the Knee	Ellipse Technologies, Inc.	CA	2889768	2013-10-28				Pending
PU0713CN1	Adjustable Devices for Treating Arthritis of the Knee	Ellipse Technologies, Inc.	CN	2013800689268	2013-10-28				Pending
PU0713EP1	Adjustable Devices for Treating Arthritis of the Knee	Ellipse Technologies, Inc.	EP	13850787.6	2013-10-28				Pending
PU0713IN1	Adjustable Devices for Treating Arthritis of the Knee	Ellipse Technologies, Inc.	IN	3762/DELNP/2015	2013-10-28				Pending
PU0713RU1	Adjustable Devices for Treating Arthritis of the Knee	Ellipse Technologies, Inc.	RU	2015120291	2013-10-28				Pending
PU0713US1	Adjustable Devices for Treating Arthritis of the Knee	Ellipse Technologies, Inc.	US	14/065,342	2013-10-28				Pending
PU0713US2	Adjustable Devices for Treating Arthritis of the Knee	Ellipse Technologies, Inc.	US	14/379,742	2013-10-28				Pending
PU0714US1	Noninvasively Adjustable Suture Anchors	Ellipse Technologies, Inc.	US	14/447,391	2014-07-30				Pending
PU0715US1	Adjustable Spinal Implant	Ellipse Technologies, Inc.	US	14/511,084	2014-10-09				Pending
PU0716US1	Methods and Apparatus for Bone Reshaping	Ellipse Technologies, Inc.	US	14/512,119	2014-10-10				Pending
PU0716WO1	Methods and Apparatus for Bone Reshaping	Ellipse Technologies, Inc.	WO	PCT/US2014/060131	2014-10-10				Pending
PU0717US1	System for Informational Magnetic Feedback in Adjustable Implants	Ellipse Technologies, Inc.	US	14/698,665	2015-04-28				Pending

PU0717US2	System for Informational Magnetic Feedback in Adjustable Implants	Ellipse Technologies, Inc.	US	14/932,904	2015-11-04				Pending
PU0717WO1	System for Informational Magnetic Feedback in Adjustable Implants	Ellipse Technologies, Inc.	WO	PCT/US2015/028079	2015-04-28				Pending
PU0717WO2	System for Informational Magnetic Feedback in Adjustable Implants	Ellipse Technologies, Inc.	WO	PCT/US2015/059102	2015-11-04				Pending
PU0718WO1	Remotely Adjustable Interactive Bone Reshaping	Ellipse Technologies, Inc.	WO	PCT/US2015/057010	2015-10-22				Pending
PU0719US1	Systems and Methods for Distraction	Ellipse Technologies, Inc.	US	14/981,762	2015-12-28				Pending
PU0719WO1	Systems and Methods for Distraction	Ellipse Technologies, Inc.	WO	PCT/U2015/000283	2015-12-23				Pending
PU0720US1	Systems and Methods for Vertebral Adjustment	NuVasive, Inc.	US	15/048,928	2016-02-19				Pending
PU0720WO1	Systems and Methods for Vertebral Adjustment	NuVasive, Inc.	WO	PCT/US2016/018797	2016-02-19				Pending
PU0721USP	Adjustable Devices for Treating Arthritis of the Knee	Ellipse Technologies, Inc.	US	62/242,931	2015-10-16				Pending
PU0722USP	Systems and Methods for Treatment of Incontinence	Ellipse Technologies, Inc.	US	62/249,059	2015-10-30				Pending
PU0723USP	External Adjustment Device for Distraction Device	Ellipse Technologies, Inc.	US	62/265,430	2015-12-10				Pending
PU0723USP2	Adjustment Device for Distraction	Ellipse Technologies, Inc.	US	62/276,196	2016-01-07				Pending
PU0724USP	Systems and Methods for Bone Transport	Ellipse Technologies, Inc.	US	62/288,348	2016-01-28				Pending
PU0725USP	Systems and Methods for Controlling Multiple Surgical Variables	Ellipse Technologies, Inc.	US	62/293,755	2016-02-10				Pending
PU0737USP	Systems and Methods for Sagittal		US	62/302,725	2016-03-02			Provisional	Pending

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571-272-7822

Paper 50
Date: June 9, 2015

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MEDTRONIC, INC.,
Petitioner,

v.

NUVASIVE, INC.,
Patent Owner.

Case IPR2013-00507
Patent 8,187,334 B2

Before PATRICK E. BAKER, *Trial Paralegal.*

ERRATA

The February 11, 2015, Final Written Decision (hereinafter "Decision") is revised as follows to correct the following error:

On pages 2 and 13 of the Decision, the claims subject to the Decision was listed as "claims 1–5, 10, 11, 14–17, and 19–28"; however, the Board declined to institute trial as to claims 16 and 17. Paper 7.

Therefore, the subject claims as listed on pages 2 and 13 of the Decision is withdrawn and replaced with the following new listing:

claims 1–5, 10, 11, 14, 15, and 19–28

All other portions of the Decision remain unchanged. Any confusion

caused by the above-noted error is regrettable.

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MEDTRONIC, INC.
Petitioner

v.

NUVASIVE, INC.
Patent Owner

Case IPR2013-00508
Patent Number: 8,187,334

PATENT OWNER NUVASIVE, INC.'S NOTICE OF APPEAL TO THE UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

Pursuant to 37 C.F.R. § 90.2(a) and 35 U.S.C. §§ 141(c) and 142, NuVasive, Inc. ("Patent Owner") respectfully gives Notice that it hereby appeals to the United States Court of Appeals for the Federal Circuit the February 11, 2015 Final Written Decision of the Patent Trial and Appeal Board ("Board") in IPR2013-00508 that claims 1-5, 10-11, 14-17, and 19-28 of U.S. Patent No. 8,187,334 ("the '334 patent") are unpatentable, and from all other underlying orders, decisions, rulings, and opinions that are adverse to Patent Owner. Patent Owner received the Final Written Decision electronically on the day the decision was entered.

For the limited purpose of providing the Director with the information specified in 37 C.F.R. § 90.2(a)(3)(ii), issues on Patent Owner's appeal may include the Board's determination that claims 1-5, 10-11, 14-17, and 19-28 of the '334 patent have been shown to be unpatentable under 35 U.S.C. § 103 in view of the grounds of unpatentability identified in the Board's Final Written Decision, challenges to any findings supporting that determination, the Board's failure to properly consider evidence of record, the Board's legal errors in undertaking the obviousness analysis, the Board's findings that conflict with the evidence of record and are not supported by substantial evidence, the Board's findings with respect to objective indicia of non-obviousness , and other issues decided adversely to Patent Owner.

Simultaneous with this filing and in accordance with 37 C.F.R. § 90.2(a)(1), this Notice of Appeal is filed with the Director of the United States Patent and Trademark Office, filed with the Board, and served upon Petitioner in accordance with 37 C.F.R. § 42.6(e). In addition, this Notice of Appeal, along with the required fees,

are being filed with the Clerk's Office for the United States Court of Appeals for the Federal Circuit in accordance with Fed. Cir. R. 15(a)(1).

Respectfully Submitted,

Dated: April 15, 2015

/Michael T. Rosato/
Michael T. Rosato
Reg. No. 52,182

CERTIFICATE OF FILING

I hereby certify that, in addition to being filed electronically through the Patent Trial and Appeal Board's PRPS, the foregoing "Patent Owner Nuvasive, Inc.'s Notice of Appeal to the United States Court of Appeals for the Federal Circuit" was filed by Express Mail on this 15th day of April, 2015, with the Director of the United States Patent and Trademark Office, at the following address:

Director of the United States Patent and Trademark Office
c/o Office of the General Counsel, United States Patent and Trademark Office
P.O. Box 1450
Alexandria, Virginia 22313-1450

CERTIFICATE OF FILING

I hereby certify that a true and correct copy of the foregoing "Patent Owner Nuvasive, Inc.'s Notice of Appeal to the United States Court of Appeals for the Federal Circuit" was filed electronically by CM/ECF on this 15th day of April, 2015, with the Clerk's Office of the United States Court of Appeals for the Federal Circuit, at the following address:

United States Court of Appeals for the Federal Circuit
717 Madison Place, N.W., Suite 401
Washington, D.C. 20439

CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. §§ 42.6(e), this is to certify that I caused to be served a true and correct copy of the foregoing "Patent Owner Nuvasive, Inc.'s Notice of Appeal to the United States Court of Appeals for the Federal Circuit" on the Petitioner at the correspondence address of the Petitioner as follows:

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Paper 43
Date: February 11, 2015

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MEDTRONIC, INC.,
Petitioner,

v.

NUVASIVE, INC.,
Patent Owner.

Case IPR2013-00507
Patent 8,187,334 B2

Before SALLY C. MEDLEY, LORA M. GREEN, and STEPHEN C. SIU, *Administrative Patent Judges.*

SIU, *Administrative Patent Judge.*

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

I. BACKGROUND

Medtronic, Inc. ("Petitioner") filed a Petition (Paper 1) ("Pet.") seeking *inter partes* review of claims 1–5, 10, 11, and 14–28 of U.S. Patent No. 8,187,334 B2 (Ex. 1013, "the '334 patent") pursuant to 35 U.S.C. §§ 311–319. On February 13, 2014, the Board instituted an *inter partes* review of claims 1–5, 10, 11, and 14–28 (Paper 7) ("Dec. on Inst.").

Subsequent to institution, Nuvasive, Inc. ("Patent Owner") filed a Patent Owner Response (Paper 17) ("PO Resp."), and Petitioner filed a Reply (Paper 24) ("Pet. Reply"). Patent Owner also filed a Motion to Exclude Evidence. Paper 34. Petitioner filed an Opposition to Patent Owner's Motion to Exclude (Paper 37) ("Opp."), and Patent Owner filed a Reply (Paper 41) ("PO Reply"). An Oral Hearing was conducted on November 18, 2014, pursuant to Requests for Oral Argument filed by Petitioner (Paper 28) and Patent Owner (Paper 29). Patent Owner also filed a Motion for Observation on certain cross-examination testimony of Petitioner's declarant, Richard A. Hynes, M.D. (Paper 35, "Hynes Obs.") and a Motion for Observation on certain cross-examination testimony of Petitioner's declarant, Loic Josse (Paper 34, "Josse Obs."). Petitioner filed a Response to each of Patent Owner's Motions for Observation (Paper 39, "Hynes Obs. Resp."; Paper 40, "Josse Obs. Resp.").

The Board has jurisdiction under 35 U.S.C. § 6(c). This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons that follow, we determine that Petitioner has shown by a preponderance of the evidence that claims 1–5, 10, 11, 14–17, and 19–28 of the '334 patent are unpatentable, but has not shown by a preponderance of the evidence that claim 18 of the '334 patent is unpatentable.

A. The '334 Patent

The '334 patent describes a spinal fusion system, including a spinal fusion implant and an insertion instrument. Ex. 1013, 5:6–9. The spinal fusion implant is introduced into the disc space via a lateral approach to the spine or via a posterior, anterior, antero-lateral, or postero-lateral approach,

and is made from a radiolucent material, such as PEEK (poly-ether-ether-ketone). *Id.* at 5:10–15, 5:29–33. In one embodiment, the spinal fusion implant has a width ranging between 9 and 18 mm and a length ranging between 25 and 44 mm. *Id.* at 5:17–19.

B. Illustrative Claim

Claim 1 is illustrative of the claimed subject matter of the '334 patent, and is reproduced as follows:

> 1. A spinal fusion implant of non-bone construction positionable within an interbody space between a first vertebra and a second vertebra, said implant comprising:
>
> an upper surface including anti-migration elements to contact said first vertebra when said implant is positioned within the interbody space, a lower surface including anti-migration elements to contact said second vertebra when said implant is positioned within the interbody space, a distal wall, a proximal wall, a first sidewall and a second sidewall, said distal wall, proximal wall, first sidewall, and second sidewall comprising a radiolucent material;
>
> wherein said implant has a longitudinal length greater than 40 mm extending from a proximal end of said proximal wall to a distal end of said distal wall;
>
> wherein a central region of said implant includes portions of the first and second sidewalls positioned generally centrally between the proximal wall and the distal wall, at least a portion of the central region defining a maximum lateral width of said implant extending from said first sidewall to said second sidewall, wherein said longitudinal length is at least two and halftimes greater than said maximum lateral width;
>
> at least a first fusion aperture extending through said upper surface and lower surface and configured to permit bone growth between the first vertebra and the second vertebra when said implant is positioned within the interbody space, said first fusion aperture having: a longitudinal aperture length extending generally parallel to the longitudinal length of said implant, and a lateral aperture width extending between said first sidewall to said second sidewall, wherein

the longitudinal aperture length is greater than the lateral aperture width; and

at least three radiopaque markers; wherein a first of the at least three radiopaque markers is at least partially positioned in said distal wall, a second of said at least three radiopaque markers is at least partially positioned in said proximal wall, and a third of said at least three radiopaque markers is at least partially positioned in said central region.

C. Instituted Challenge

This *inter partes* review involves the following ground of unpatentability:

Reference(s)	Basis	Claims challenged
Frey[1] and Michelson[2]	§103	1–5, 10, 11, 14, 15, and 18–28

D. Claim Interpretation

The parties appear to agree on the interpretation of claim terms of the '334 patent. Having considered whether the construction set forth in the Decision to Institute should be changed in light of evidence introduced during trial, we are not persuaded any modification is necessary. Therefore, we maintain the constructions set forth in the Decision to Institute and determine that no other express constructions are necessary. *See* Dec. on Inst. 4-5.

[1] Frey, US 2002/0165550 A1, filed Nov. 7, 2001 (Ex. 1103).
[2] Michelson, US 5,860,973, issued Jan. 19, 1999 (Ex. 1105).

II. ANALYSIS

A. Frey and Michelson

We conclude that Petitioner has shown by a preponderance of the evidence that all of the limitations of claims 1–5, 10, 11, 14, 15, and 19–28 are taught or suggested by the combination of Frey and Michelson. Pet. 52–56. Claim 1 recites an implant that "has a longitudinal length greater than 40 mm" and that the longitudinal length (that is greater than 40 mm) is "at least two and a half times greater than the maximum lateral width." Claims 2–5, 10, 11, and 14–28 depend from claim 1.

Petitioner argues that "Frey provides that the length of the implant is 'sufficient to span the disc space'" and discloses "using the disclosed implant in lateral . . . approaches to the disc space." Pet. 53, 54 (citing Ex. 1003 ¶ 0130). Petitioner also argues that Michelson discloses "a spinal fusion implant – that is used in a lateral . . . fashion . . . that has a longitudinal length greater than 40 mm." Pet. 56 (citing Michelson 10:41–46). Hence, Petitioner argues that it would have been obvious to one of ordinary skill in the art, given Frey's laterally inserted spinal implant, to have provided that the laterally inserted spinal implant measures greater than 40 mm in length, as disclosed by Michelson.

Patent Owner argues that it would not have been obvious to combine the teachings of Frey and Michelson to achieve an implant with a length greater than 40 mm as disclosed by Michelson because "the proposed modification would render the resulting implant inoperable for Frey's intended purpose." PO Resp. 27 (citing Ex. 2020 ¶¶ 108, 109). Patent Owner further characterizes the "intended purpose" of Frey to be "to provide

the capability for posterolateral TLIF procedure." PO Resp. 30. However, Frey discloses "spinal surgery from a unilateral posterior approach, a lateral approach, an oblique approach, and through laparoscopic or endoscopic instruments from any of a variety of angles or approaches to the spine." Ex. 1003 ¶ 184. Given that Frey discloses spinal surgery performed "from any of a variety of angles or approaches," and not just from the posterolateral approach, we are not persuaded by Patent Owner that the "intended purpose" of Frey is to perform spinal surgery from a posterolateral approach, specifically.

Rather, Frey discloses that "spinal discs may be displaced or damaged" and "may result in nerve damage, pain, numbness, muscle weakness, and even paralysis." Ex. 1003 ¶ 3. According to Frey, these issues are addressed by "surgical correction of a collapsed disc space" by "discectomy . . . often followed by restoration of normal disc space height and bony fusion of the adjacent vertebrae to maintain the disc space height." *Id.* Hence, the "intended purpose" of the implant of Frey, as explicitly disclosed by Frey, is to correct surgically a collapsed disc space, to restore normal disc space height, and to provide bony fusion of the adjacent vertebrae. We disagree with Patent Owner that incorporating Michelson, which discloses an implant that "engage[s] more of the adjacent vertebrae," (Ex. 1105, 3:49–50) would have rendered the resulting implant inoperable for Frey's intended purpose of surgically correcting a collapsed disc space or providing bony fusion of the adjacent vertebrae.

Even if the "intended purpose" of Frey is to practice a "TLIF procedure," as Patent Owner contends, we are not persuaded by Patent Owner's argument that an implant measuring greater than 40 mm in length

would be inoperable in a "TLIF procedure." As Petitioner explains, U.S. Patent No. 7,815,682 (the '682 patent) demonstrates that when performing "Transforaminal lumbar interbody fusion (TLIF) procedures," one of ordinary skill in the art may employ a spinal implant with "a length ranging between 20 and 45 mm." Pet. Resp. 6 (citing, Ex. 1028, 1:37–38; 4:45). The '682 patent does not disclose that the use of a spinal implant measuring up to 45 mm in length would render the "TLIF procedure" inoperable.

Patent Owner argues that "it would still not be obvious to enlarge the boomerang implant of Frey to exceed 40 mm because such boomerang implants are sized and shaped to sit within a portion of the intra-annulus region of the disc space inside the annulus" and that a spinal implant measuring greater than 40 mm in length presumably would extend beyond the "intra-annulus region of the disc space inside the annulus." PO Resp. 32 (citing Ex. 2020 ¶¶ 98, 100, 108). However, even if Patent Owner is correct that the implant of Frey is a "boomerang" implant, Patent Owner provides insufficient evidence that a boomerang implant must fit within the "intra-annulus region of the disc space" or that even if an implant is restricted to the "intra-annulus region of the disc space," that such an implant could not measure greater than 40 mm in length.

Patent Owner's declarant (Dr. Hansen A. Yuan) testifies that, "[i]n my experience, [boomerang] implants, like those described in Frey, are generally positioned within a portion of the intra-annulus region within the disc annulus." Ex. 2020 ¶ 98. Even if positioned and restricted to being completely within the intra-annulus region was a requirement of implants "like those described in Frey," as Dr. Yuan testifies (Ex. 2020 ¶ 98), neither Patent Owner nor Dr. Yuan demonstrates that an implant measuring greater

than 40 mm in length must extend beyond the intra-annulus region (i.e., would not fit within the intra-annulus region). In any event, Dr. Yuan merely testifies that "[i]n my experience, [boomerang] implants, like those described in Frey, are generally positioned within a portion of the intra-annulus region within the disc annulus." Ex. 2020 ¶ 98. Even if implants similar to those disclosed by Frey "generally" are positioned within a certain region, Dr. Yuan does not assert or demonstrate persuasively that such implants are required to be so positioned. We are not persuaded by Patent Owner's argument.

Dr. Yuan further testifies that he "see[s] no description in Frey as to how one of skill in the art would insert the Frey device using a 'lateral approach'." Ex. 2020 ¶ 100. However, as Petitioner explains, Michelson discloses "an implant inserted laterally." Pet. 54. We are not persuaded by Patent Owner's argument.

Patent Owner argues that "[i]f it were obvious . . . to size such boomerang implants to exceed 40 mm . . . Medtronic would offer such implants. It does not." PO Resp. 35. We are not persuaded by Patent Owner's argument because "the test [for obviousness] is what the combined teachings of those references would have suggested to those of ordinary skill in the art." *In re Keller*, 642 F.2d 413, 425 (CCPA 1981). As such, we do not see the relevance of whether Medtronic offers a particular type of implant for sale or not.

Patent Owner also argues that the combination of Frey and Michelson fails to disclose or suggest "longitudinal length is at least two and half times greater than said maximum lateral width" and that "if one were to modify Frey according to the dimensions of Michelson, the resulting implant would

have a length between 32-50 mm ***and*** a width between 24-32 mm." PO Resp. 38, 39 (citing Ex. 1013, claim 1; Ex. 1005, 10:41–46). Patent Owner further argues that "Michelson discloses no implant that is both long (over 40 mm) and narrow (length at least 2.5 times width)." PO Resp. 41. However, Michelson expressly discloses an implant "with 42 mm being the preferred length" and a width that "approximates the depth of the vertebrae," that measures "in the range of 24 mm to 32 mm," with "the preferred width being 26 mm." Ex. 1005, 10:40–41, 44–47. In other words, Michelson discloses that an implant with a preferred width of 26 mm (or between 24 mm and 32 mm) would approximate the depth of the vertebrae. In one embodiment of Michelson, one implant "has a narrower width such that more than one spinal fusion implant . . . may be combined . . . for insertion within the disc space." Ex. 1005, 10:52–54. For example, if the total width of at least two spinal fusion implants measures 26 mm (i.e., the depth of the vertebrae), then each implant would measure 26 mm/2 implants = 13 mm, which, when multiplied by a factor of 2.5, would be less than the length of the implant (e.g., preferably 42 mm).

Thus, it would have been obvious to one of ordinary skill in the art to have provided an implant with a length of greater than 40 mm (e.g., 42 mm) and at least 2.5 times the width, as recited in claim 1.

Claim 18 depends from claim 1 and further recites that the maximum lateral width of the implant is approximately 18 mm. Petitioner argues that Michelson discloses an implant that "would have a . . . maximum lateral width in the range of 14 to 26 mm." Pet. 57 (citing Ex. 1005, 7:26–30). Patent Owner, however, points out that, "Michelson discloses no implant that is longer than 40 mm *and* has a width of 18mm." PO Resp. 42 (citing

Ex. 2020 ¶¶ 94, 110–112). Instead, even if the cited implant of Michelson has a maximum width of 18 mm, as argued by Petitioner, Michelson discloses that the implant measures 12-30 mm in length, which is less than 40 mm, in contrast to the requirement of claim 18 of an implant length that is greater than 40 mm. Nor does Petitioner articulate reasoning, with some rational underpinning, to support the conclusion that it would have been obvious to one of ordinary skill in the art to have modified Michelson's implant to have a length greater than 40 mm and a maximum width of 18 mm.

Petitioner also asserts Michelson incorporates by reference U.S. Patent No. 5,772,661 (Ex. 1046, "Michelson '661") and U.S. Patent No. 5,484,437 (Ex. 1048, "Michelson '437") and argues that "Michelson '661"discloses an implant with a maximum width of 18 mm. *See* Pet. 57–58. Michelson '661 discloses an implant with a width "in the range of 10 mm to 30 mm." Ex. 1046, 10:31. Even if Michelson '661 discloses an implant with a maximum width of 18 mm (as within the range of 10 mm to 30 mm), Michelson '661 discloses that the length of the implant is "less than the known transverse width W (side to side) of the vertebrae T7 and T8." Ex. 1046, 10:21–23. Petitioner does not assert, or demonstrate sufficiently, that the "known transverse width W (side to side) of the vertebrae T7 and T8" (corresponding to the length of the implant) is greater than 40 mm, as required by claim 18. Nor does Petitioner articulate reasoning, with some rational underpinning, to support the conclusion that it would have been obvious to one of ordinary skill in the art to have modified the cited implant to have a length greater than 40 mm.

Petitioner also cites U.S. Patent No. 5,484,437 (Ex. 1048, "Michelson '437") as disclosing an implant with a maximum width of 18 mm. *See* Pet. 57–58. Even if Michelson '437 discloses an implant with a maximum width of 18 mm, Petitioner does not assert, or demonstrate sufficiently, that Michelson '437 also discloses that the implant with a maximum width of 18 mm measures greater than 40 mm in length, as required by claim 18. Nor does Petitioner articulate reasoning, with some rational underpinning, to support the conclusion that it would have been obvious to one of ordinary skill in the art to have modified the cited implant to have a length greater than 40 mm.

B. Secondary Considerations

Patent Owner argues "the evidence of commercial success here and its nexus to the claimed invention is sufficient to overcome [the proposed ground of unpatentability]" and that "the detailed testimony establishes a nexus between NuVasive's CoRoent XL implants and the invention of the ''334 patent . . . proves the commercial success of the product." PO Resp. 44.

We recognize that evidence of secondary considerations must always be considered en route to the determination of obviousness, but its existence alone does not control the conclusion of obviousness. *Richardson-Vicks v. Upjohn Co.*, 122 F.3d 1476, 1483 (Fed. Cir. 1997). The weight given to evidence of secondary considerations is dependent upon whether there is a nexus between the merits of the claimed invention and the evidence offered. *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1539 (Fed. Cir. 1983).

Even assuming that NuVasive's CoRoent XL implant experienced "commercial success," as Patent Owner asserts, Patent Owner has not demonstrated sufficiently that there is a nexus between the merits of the *claimed* invention and the evidence offered. For example, Patent Owner argues that NuVasive "pioneered the market for lateral, trans-psoas interbody fusion surgeries," (PO Resp. 44) but fails to demonstrate sufficiently that any of the disputed claims recite "lateral, trans-psoas interbody fusion surgeries." We are not persuaded by Patent Owner's arguments.

C. Motion to Exclude

In its Motion to Exclude, Patent Owner seeks to exclude the Declaration of Loic Josse (Ex. 1116, "Josse Declaration"). We did not rely on the Josse Declaration in this decision. Therefore, Patent Owner's motion to exclude is *dismissed* as *moot*.

D. Motion for Observation

Patent Owner's observations are directed to the cross-examination testimony of Richard A. Hynes, M.D. (Ex. 35), who was cross-examined after Petitioner filed its Reply. We have considered Patent Owner's observations and Petitioner's responses in rendering our decision, and have accorded the testimony the appropriate weight as explained above. *See* Obs. 1–10.

Patent Owner also submits observations to the cross-examination testimony of Loic Josse (Ex. 34). As previously discussed, we did not rely

on the Josse Declaration in this decision. Therefore, we have not considered Patent Owner's observations directed to the cross-examination testimony of Loic Josse.

ORDER

Petitioner has demonstrated, by a preponderance of the evidence, that claims 1–5, 10, 11, 14–17, and 19–28 are unpatentable over Frey and Michelson under 35 U.S.C. § 103(a). Petitioner has not demonstrated, by a preponderance of the evidence, that claim 18 is unpatentable over Frey and Michelson under 35 U.S.C. § 103(a).

In consideration of the foregoing, it is hereby:

ORDERED that claims 1–5, 10, 11, 14–17, and 19–28 of the '334 patent have been shown to be unpatentable;

FURTHER ORDERED that Patent Owner's Motion to Exclude is *dismissed.*

This is a final decision. Parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

IPR2013-00507
Patent 8,187,334 B2

PETITIONER:

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Paper 48
Date: February 11, 2015

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MEDTRONIC, INC.,
Petitioner,

v.

NUVASIVE, INC.,
Patent Owner.

Case IPR2013-00508
Patent 8,187,334 B2

Before SALLY C. MEDLEY, LORA M. GREEN, and STEPHEN C. SIU, *Administrative Patent Judges.*

SIU, *Administrative Patent Judge.*

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

I. BACKGROUND

Medtronic, Inc. ("Petitioner") filed a Petition (Paper 1) ("Pet.") seeking *inter partes* review of claims 1–5, 10, 11, and 14–28 of U.S. Patent No. 8,187,334 B2 (Ex. 1115, "the '334 patent") pursuant to 35 U.S.C. §§ 311–319. On February 13, 2014, the Board instituted an *inter partes* review of claims 1–5, 10, 11, and 14–28 (Paper 7) ("Dec. on Inst.").

Subsequent to institution, Nuvasive, Inc. ("Patent Owner") filed a Patent Owner Response (Paper 21) ("PO Resp."), and Petitioner filed a Reply (Paper 28) ("Pet. Reply"). Patent Owner also filed a Motion to Exclude Evidence (Paper 34). Petitioner filed an Opposition to Patent Owner's Motion to Exclude (Paper 41) ("Opp."), and Patent Owner filed a Reply (Paper 46) ("PO Reply"). An Oral Hearing was conducted on November 18, 2014, pursuant to Requests for Oral Argument filed by Petitioner (Paper 32) and Patent Owner (Paper 33). Patent Owner also filed a Motion for Observation on certain cross-examination testimony of Petitioner's declarant, Richard A. Hynes, M.D. (Paper 38, "Hynes Obs.") and a Motion for Observation on certain cross-examination testimony of Petitioner's declarant, Loic Josse (Paper 39, "Josse Obs."). Petitioner filed a Response to each of Patent Owner's Motions for Observation (Paper 44, "Hynes Obs. Resp."; Paper 45, "Josse Obs. Resp.").

The Board has jurisdiction under 35 U.S.C. § 6(c). This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons that follow, we determine that Petitioner has shown by a preponderance of the evidence that claims 1–5, 10, 11, 14–17, and 19–28 of the '334 patent are unpatentable, but has not shown by a preponderance of the evidence that claim 18 of the '334 patent is unpatentable.

A. The '334 Patent

The '334 patent describes a spinal fusion system, including a spinal fusion implant and an insertion instrument. Ex. 1115, 5:6–9. The spinal fusion implant is introduced into the disc space via a lateral approach to the spine or via a posterior, anterior, antero-lateral, or postero-lateral approach,

and is made from a radiolucent material, such as PEEK (poly-ether-ether-ketone). *Id.* at 5:10–15, 5:29–33. In one embodiment, the spinal fusion implant has a width ranging between 9 and 18 mm and a length ranging between 25 and 44 mm. *Id.* at 5:17–19.

B. Illustrative Claim

Claim 1 is illustrative of the claimed subject matter of the '334 patent, and is reproduced as follows:

> 1. A spinal fusion implant of non-bone construction positionable within an interbody space between a first vertebra and a second vertebra, said implant comprising:
>
> an upper surface including anti-migration elements to contact said first vertebra when said implant is positioned within the interbody space, a lower surface including anti-migration elements to contact said second vertebra when said implant is positioned within the interbody space, a distal wall, a proximal wall, a first sidewall and a second sidewall, said distal wall, proximal wall, first sidewall, and second sidewall comprising a radiolucent material;
>
> wherein said implant has a longitudinal length greater than 40 mm extending from a proximal end of said proximal wall to a distal end of said distal wall;
>
> wherein a central region of said implant includes portions of the first and second sidewalls positioned generally centrally between the proximal wall and the distal wall, at least a portion of the central region defining a maximum lateral width of said implant extending from said first sidewall to said second sidewall, wherein said longitudinal length is at least two and halftimes greater than said maximum lateral width;
>
> at least a first fusion aperture extending through said upper surface and lower surface and configured to permit bone growth between the first vertebra and the second vertebra when said implant is positioned within the interbody space, said first fusion aperture having: a longitudinal aperture length extending generally parallel to the longitudinal length of said implant, and

a lateral aperture width extending between said first sidewall to said second sidewall, wherein the longitudinal aperture length is greater than the lateral aperture width; and

at least three radiopaque markers; wherein a first of the at least three radiopaque markers is at least partially positioned in said distal wall, a second of said at least three radiopaque markers is at least partially positioned in said proximal wall, and a third of said at least three radiopaque markers is at least partially positioned in said central region.

C. Instituted Challenge

This *inter partes* review involves the following grounds of unpatentability:

Reference(s)	Basis	Claims challenged
Baccelli,[1] Michelson,[2] and SVS[3]	§103	1–5, 10, 11, and 14–28
Baccelli, Michelson, and Telamon[4]	§103	1–5, 10, 11, and 14–28

D. Claim Interpretation

The parties appear to agree on the interpretation of claim terms of the '334 patent. Having considered whether the construction set forth in the Decision to Institute should be changed in light of evidence introduced during trial, we are not persuaded any modification is necessary. Therefore,

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[1] Baccelli, US 2003/0028249 A1, filed Feb. 6, 2003 (Ex. 1104).
[2] Michelson, US 5,860,973, issued Jan. 19, 1999 (Ex. 1105).
[3] Synthes Vertebral Spacer – PR Brochure, Synthes Spine 2002 ("SVS", Ex. 1106).
[4] Medtronic Sofamor Danek, Telamon, Verte-Stack PEEK Vertebral Body Spacer, ©2003 Medtronic Sofamor Danek USA, Inc (Ex. 1107); and Telamon, Posterior Impacted Devices, ©2003 Medtronic Sofamor Danek USA, Inc. (Ex. 1108) (collectively, "Telamon").

we maintain the constructions set forth in the Decision to Institute and determine that no other express constructions are necessary. *See* Dec. on Inst. 5-6.

II. ANALYSIS

A. Baccelli, Michelson, and One of SVS or Telamon (Claims 1–5, 10, 11, and 14–28)

We conclude that Petitioner has shown by a preponderance of the evidence that all of the limitations of claims 1–5, 10, 11, 14–17, and 19–28 are taught or suggested by the combination of Bacelli, Michelson, and one of SVS or Telamon. Pet. 14–60. Claim 1 recites an implant that "has a longitudinal length greater than 40 mm" and that the longitudinal length (that is greater than 40 mm) is "at least two and a half times greater than the maximum lateral width." Claims 2–5, 10, 11, and 14–28 depend from claim 1.

Petitioner argues that "the SVS-PR [implant] has a longitudinal length at least two and half times greater than the maximum lateral width," that "the Telamon [implant] has a 10 mm width, and may have a length of 26 mm [which provides an implant with a longitudinal length at least two and a half times greater than the maximum lateral width]," and that "a skilled artisan . . . inclined to provide an implant for lateral insertion . . . would have been taught by Michelson to make the length of the implant 40 mm or greater" at least in order "to provide more stable support for the vertebra" and because doing so "represents nothing more than an application-specific

dimensional optimization in accordance with the prior art." Pet. 18, 20, 21, 42–44 (citing Ex. 1101 ¶72).

Patent Owner argues that Michelson fails to disclose or suggest an implant with a longitudinal length at least two and a half times greater than the maximum lateral width, "discloses no reason to size an implant to be greater than 40 mm and also narrow," "never suggests that a narrow, 40mm implant would be beneficial or even acceptable," and "did not recognize the benefits of the claimed dimensions." PO Resp. 42–43 (citing Ex. 2020, 24, 117–120). In addition, according to Patent Owner, Michelson discloses "oversized" implants and "discloses no implant that is both long (over 40 mm) and narrow (length at least 2.5 times width)." PO Resp. 43–44 (citing Ex. 1101 ¶ 150; Ex. 2020 ¶¶ 94, 117–119). In addition, Patent Owner's Declarant, Dr. Barton Yuan, testifies that "the '334 patent presents novel dimensions and length-to-width proportions for implants that are greater than 40mm in length that had not been contemplated before . . . ." Ex. 2020 ¶ 47.

However, we credit the testimony of Petitioner's Declarant (Dr. Richard A. Hynes) that Michelson discloses a spinal implant with a length that is greater than 40mm and at least 2.5 times the width. For example, Dr. Hynes testifies that Michelson discloses spinal implants that measure greater than 40mm in length (e.g., 44mm) that is at least 2.5 times the width of the implant (e.g., the width measuring 17mm, which is less than 44mm/2.5 = 17.6mm). Ex. 1157 ¶ 12 (citing Ex. 1118).

In addition, Michelson expressly discloses an implant "with 42 mm being the preferred length" and a width that "approximates the depth of the vertebrae," that measures "in the range of 24 mm to 32 mm," with "the

preferred width being 26 mm." Ex. 1105, 10:40–41, 10:44–47. In other words, Michelson discloses that an implant with a preferred width of 26 mm (or between 24 mm and 32 mm) would approximate the depth of the vertebrae. In one embodiment of Michelson, one implant "has a narrower width such that more than one spinal fusion implant . . . may be combined . . . for insertion within the disc space." *Id.* at 10:52–54. For example, if the total width of at least two spinal fusion implants measures 26 mm (i.e., the depth of the vertebrae), then each implant would measure 26 mm/2 implants = 13 mm, which, when multiplied by a factor of 2.5, would be less than the length of the implant (e.g., preferably 42 mm).

Thus, it would have been obvious to one of ordinary skill in the art to have provided an implant with a length of greater than 40 mm (e.g., 42 mm) and at least 2.5 times the width, as recited in claim 1.

Patent Owner argues that "[i]f the size of the SVS-PR PLIF implant were increased according to the dimensions disclosed by Michelson, the . . . width would be increased from 8 mm . . . to between 24 to 32 mm" and that "if the size of the Telamon PLIF implant were increased according to these dimensions disclosed by Michelson, the . . . width would be increased from 10 mm . . . to between 24 to 32 mm." PO Resp. 31. However, Patent Owner does not explain sufficiently why one of ordinary skill in the art would have increased the width of either the SVS or Telamon implant to 24–32 mm based on Michelson. On the contrary, as argued by Petitioner[5] and

[5] Petitioner argues that "as best exemplified in Figure 18, Michelson discloses long and narrow implants used for lumbar fusion. *See* Ex. 1157 ¶ 28. One of ordinary skill in the art would have understood that the implant 1000 disclosed a width in the range of 12 mm to 16 mm, or smaller, than implant 900, which is described as having a width "in the range of 24 mm to

as previously discussed, Michelson discloses an implant with a length greater than 40 mm and a width such that the total combined width of at least two of such implants would approximate the depth of the vertebrae of approximately 26 mm. Hence, Michelson discloses at least one example in which the width of an implant would be 13 mm with a length of 42 mm. Michelson further discloses that the implant(s) should "be small enough so as to fit into the same limited spinal width." Ex. 1105, 2:51–52. If the width of an implant was increased to 24–32 mm, as suggested by Patent Owner, then the total combined width of the combination of more than one implant as disclosed in Michelson would be 48–64 mm, which would exceed the approximate size of the intervertebral space of 26 mm, also as disclosed by Michelson. As Patent Owner points out, one of ordinary skill in the art would not have considered expanding the size of spinal implants beyond the confines of the intervertebral space because doing so may "compromise[e] the spinal cord, or nerve roots residing in the canal, potentially resulting in paralysis." PO Resp. 37.

Patent Owner argues that it would not have been obvious to one of ordinary skill in the art to have combined the teachings of either SVS or Telamon with Michelson because the implants of SVS or Telamon are both implants "designed with the intended purpose of use in PLIF procedures" but the implants of Michelson are "laterally inserted implants [as opposed to PLIF implants]" such that combining the teachings of either SVS or Telamon with that of Michelson (which, according to Patent Owner,

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32 mm." *See* Ex. 1105, 10:41–44; Ex. 1157 ¶ 28; *see also* Ex. 1148, 14:9–14 (disclosing tube, larger than implant, used to create space for implant "with 20 mm being the preferred outer diameter [of the tube]. . . ."); *id.* at 10:30–34."

discloses lateral implantation with an implant greater than 40 mm in length) "would fully eliminate SVS-PR's and Telamon's specifically intended insertion path and usage, rendering it inoperable for its intended purpose as a PLIF implant." PO Resp. 32–33, 35–37 (citing Ex. 2020 ¶¶ 82–83, 85, 87–88, 113–114).

SVS discloses that "[t]he Vertebral Spacer is a vertebral body replacement device intended for use in the thoracolumbar spine (T1-L5) to replace a collapsed, damaged, or unstable vertebral body due to tumor or trauma (i.e., fracture)." Ex. 1106, 1. Hence, the "intended purpose" of the implant of SVS is to replace components within vertebrae. Telamon discloses a process of inserting an implant into an intervertebral space to achieve "decompression of the neural elements" and "satisfactory immobilization of the grafted interspace." Ex. 1108, 9. Hence, the "intended purpose" of the implant of Telamon is to achieve immobilization of the grafted interspace (and/or decompression of neural elements). We disagree with Patent Owner that Michelson, which discloses an implant that "engage[s] more of the adjacent vertebrae," (Ex. 1105, 3:49–50) would have "fully eliminated" the purpose of the SVS or Telamon implants of replacing collapsed, damaged, or unstable intervertebral components or immobilizing the interspace. Instead, the intended purpose of Michelson (a spinal fusion implant) appears to be the same as the intended purpose of either of SVS or Telamon, i.e., to achieve immobilization of the grafted interspace, for example. We are not persuaded by Patent Owner's argument.

Patent Owner argues that "using a 41 mm implant in a PLIF procedure would be extremely dangerous to the patient, risking paralysis or death" due to "the location of blood vessels and the spinal cord" and that "no

responsible surgeon would insert a 41 mm implant [of Michelson] in the PLIF approach intended by Telamon . . . and SVS." PO Resp. 38, 40 (citing Ex. 2020, 114–116). Hence, Patent Owner contends that "Michelson . . . specifically teaches away from inserting a posterior implant large enough to extend out of the disc space." PO Resp. 38–39 (citing Ex. 1105, 2:7–12). As previously described, the Petitioner argues that SVS and Telamon both disclose spinal implants and that "a skilled artisan . . . inclined to provide an implant for lateral insertion . . . would have been taught by Michelson to make the length of the implant 40 mm or greater" at least in order "to provide more stable support for the vertebra" and because doing so "represents nothing more than an application-specific dimensional optimization in accordance with the prior art." Pet. 18, 20, 21, 42–44 (citing Ex. 1101 ¶ 72). Hence, even assuming to be true Patent Owner's contention that "no responsible surgeon would insert a 41 mm implant in the PLIF approach," we are not persuaded by Patent Owner's argument because one of ordinary skill in the art, based on Michelson, would have inserted the "41 mm implant" laterally and not posteriorly. PO Resp. 38, 40 (citing Ex. 2020, 114–116).

In any event, Petitioner submits evidence supporting the contention that the insertion of implants measuring over 40 mm in length via a posterior approach is practiced safely in the art and, therefore, we are not persuaded by Patent Owner that "no responsible surgeon would insert" an implant measuring greater than 40 mm in length posteriorly. For example, Petitioner explains that Tohmeh (US Patent No. 8,623,088 B1 – Ex. 1131) discloses a spinal implant measuring up to 45 mm in length and "approaches a patient's spine posteriorly." Pet. Reply 5 (citing Ex. 1131, 5:32–35); Ex. 1131, 4:3.

Tohmeh does not disclose that such a practice would be "extremely dangerous to the patient, risking paralysis or death." In addition, as Petitioner explains, Patent Owner's Declarant (Dr. Yuan) testifies that a spinal implant measuring greater than 40 mm in length would fit within the circumference of the intervertebral space. Pet. Reply 5 (citing Ex. 1173, 244–245).

Claim 1 recites an implant including a radiopaque marker at least partially positioned in the central region of the implant (i.e., portions of the first and second sidewalls positioned generally centrally between the proximal and distal walls). Claim 16 further recites a radiopaque marker positioned in the central region. Petitioner argues that Baccelli discloses "a third radiopaque marker that is at least partially positioned in said central region." Pet. 22 (citing Ex. 1104, ¶ 41). Baccelli discloses "spikes" that are disposed "about the sagittal midplane" and is "made of a material that is opaque to X-rays." Ex. 1104 ¶¶ 41, 50–51.

Patent Owner argues that "it is not obvious to add the spikes 24 of Baccelli to the PLIF implants of SVS-PR and Telamon because such spikes are unsuitable for PLIF procedures" and that "Baccelli's elongated metal fixation spikes . . . could not be safely inserted in a PLIF procedure . . . because the vertebrae cannot be distract[ed] to the same degree as in an anterior procedure and the spikes would prevent or cause undesirable damage during impaction." PO Resp. 47, 55 (citing Ex. 2020 ¶ 125). Patent Owner's Declarant (Dr. Yuan) testifies that he is of the belief that "the vertebrae cannot be distracted . . . from a posterior approach due to a number of anatomic structures" and that, based on this alleged inability to distract the vertebrae in a posterior approach, "the protruding metal spikes 24 [of

Baccelli] would substantially impair posterior insertion" of an implant. Ex. 2020 ¶ 125. Dr. Yuan, however, does not provide sufficient evidence supporting the contention that the vertebrae "cannot be distracted . . . from a posterior approach." In fact, Dr. Yuan also testifies that during insertion of a spinal implant via a posterior lateral approach, the surgeon may "distract [the vertebrae] probably a couple of millimeters." Ex. 1173, 45. Dr. Yuan does not testify that distracting the vertebrae by "a couple of millimeters" would be insufficient when using "protruding metal spikes."

Patent Owner argues that it would not have been obvious to one of ordinary skill in the art to have combined the teachings of the cited references because various implants "include[] no radiopaque markers in the central region." PO Resp. 46. We are not persuaded by Patent Owner's argument because the question is whether it would have been obvious to one of ordinary skill in the art to combine the cited references and not whether any specific implants on the market contain a radiopaque marker in a central region or not.

Patent Owner argues that "Baccelli . . . describes no reason why radiopaque markers should be added to a PLIF implant [purportedly of SVS or Telamon] in any particular location, let alone in the central region of such PLIF implants" and that Petitioner's Declarant (Dr. Hynes) "never explains why one would add a pair of markers to the central region for such PLIF implants, and certainly does not cite any evidence supporting what he proposes was 'common sense' in 2004 or ever." PO Resp. 48–50 (citing Ex. 1101 ¶ 100; Ex. 2020 ¶¶ 124, 126). We are not persuaded by Patent Owner's argument because, as Petitioner explains, Baccelli discloses radiopaque markers in the central region of a spinal implant.

Patent Owner argues that it would not have been obvious to one of ordinary skill in the art "to add a pair of radiopaque markers to the central region" of an implant because, according to Patent Owner, to do so "would add no meaningful 'additional information' . . . and would increase the likelihood of confusing surgeons." PO Resp. 51 (citing Ex. 2020 ¶¶ 124, 126; Ex. 2013, 163:23 – 164:25). We credit the testimony of Patent Owner's Declarant (Dr. Yuan) that one of ordinary skill in the art would have understood that an implant that "includes two radiopaque markers in the central region [would provide] . . . better align[ment of] the implant" and "also allows a surgeon to see in an anterior-to-posterior x-ray view whether the implant is askew and the degree to which the implant is askew." Ex. 2020 ¶ 64. Given the relative level of skill in the art, we agree with Dr. Yuan that the use of markers to improve x-ray visualization of the alignment of implants, for example, would have been well within the purview of one of ordinary skill in the art at the time of the invention. Hence, we are not persuaded by Patent Owner's contention that "a pair of radiopaque markers to the central region" of an implant would "add no meaningful 'additional information.'"

Also, we are not persuaded by Patent Owner's argument that it would not have been obvious to one of ordinary skill in the art to use a radiopaque marker in the central region of an implant because doing so would confuse surgeons (or those of ordinary skill in the art). Patent Owner's Declarant (Dr. Yuan) testifies that one "complication with using markers . . . is that the implant can have too many of them." Ex. 2020 ¶ 45. Dr. Yuan, however, does not assert or provide sufficient evidence that the specific use of a radiopaque marker in the central region would by "too many" as to result in

confusion or whether such alleged resulting confusion (if any) would be excessive or prohibitive. PO Resp. 54 (citing Ex. 2020 ¶ 45).

Dr. Yuan also testifies that the use of a radiopaque marker in the central region of an implant "could cause problems, including possibly providing confusing imaging information to the surgeon." PO Resp. 54 (citing Ex. 2020 ¶ 124). Dr. Yuan, however, provides insufficient evidence in support of this contention. For example, Dr. Yuan does not provide persuasive evidence supporting the contention that "problems" would arise in the use of a radiopaque marker in the central region of an implant, the nature and extent of any potential "problems," or how any such problems would "confuse" one of ordinary skill in the art and to what extent. Indeed, as previously discussed, Baccelli discloses radiopaque markers in the central region of an implant and does not disclose that one of ordinary skill in the art is confused by such an arrangement.

Patent Owner further argues that Petitioner's Declarant (Dr. Hynes) testifies that it would not have been obvious to one of ordinary skill in the art to have incorporated a radiopaque marker in the central region of an implant because doing so would be "a possible source of confusion." PO Resp. Br. 54 (citing Ex. 2013, 163:23–164:19). However, Dr. Hynes merely testifies that using "the wrong marker" in "the wrong place" may "create[] confusion sometimes." Ex. 2013, 164:11, 12–13. Neither Patent Owner, nor Dr. Hynes, asserts, or demonstrates sufficiently to overcome Petitioner's contrary showing, that the general use of a radiopaque marker in the central region of an implant, as required by the claimed invention, would be using "the wrong marker" that is in "the wrong place." On the contrary, Baccelli discloses the use of such a marker in the central region of an implant, thus

suggesting to one of ordinary skill in the art that such a marker would not have been "wrong" and that the central region would not have been a "wrong place" for such a marker. We are not persuaded by Patent Owner's arguments.

Claim 18 depends from claim 1 and further recites that the maximum lateral width of the implant is approximately 18 mm. Petitioner argues that Michelson discloses an implant "having a maximum lateral width in the range of 14 to 26 mm." Pet. 32 (citing Ex. 1105, 7:26–30). Patent Owner, however, points out that, "Michelson discloses no implant that is longer than 40 mm *and* has a width of 18mm." PO Resp. 57 (citing Ex. 2020 ¶¶ 94, 119). Instead, even assuming that the cited implant of Michelson has a maximum width of 18 mm, as argued by Petitioner, Michelson discloses that the implant measures 12–30 mm in length, which is less than 40 mm, in contrast to the requirement of claim 18 of an implant length that is greater than 40 mm. Nor does Petitioner articulate reasoning with some rational underpinning to support the conclusion that it would have been obvious to one of ordinary skill in the art to have modified Michelson's implant to have a length greater than 40 mm.

Petitioner also asserts Michelson incorporates by reference U.S. Patent No. 5,772,661 (Ex. 1046, "Michelson '661") and U.S. Patent No. 5,484,437 (Ex. 1048, "Michelson '437") and argues that "Michelson '661" discloses an implant with a maximum width of 18 mm. *See* Pet. 32. Michelson '661 discloses an implant with a width "in the range of 10 mm to 30 mm." Ex. 1148, 10:31. Even assuming that Michelson '661 discloses an implant with a maximum width of 18 mm (as within the range of 10 mm to 30 mm), Michelson '661 discloses that the length of the implant is "less than

the known transverse width W (side to side) of the vertebrae T7 and T8." Ex. 1148, 10:21–23. Petitioner does not assert or demonstrate sufficiently that the "known transverse width W (side to side) of the vertebrae T7 and T8" (corresponding to the length of the implant) is greater than 40 mm, as required by claim 18. Nor does Petitioner articulate reasoning with some rational underpinning to support the conclusion that it would have been obvious to one of ordinary skill in the art to have modified the cited implant to have a length greater than 40 mm.

Petitioner also cites U.S. Patent No. 5,484,437 (Ex. 1150, "Michelson '437") as disclosing an implant with a maximum width of 18 mm. *See* Pet. 32–33. Even assuming that Michelson '437 discloses an implant with a maximum width of 18 mm, Petitioner does not assert or demonstrate sufficiently that Michelson '437 also discloses that the implant with a maximum width of 18 mm measures greater than 40 mm in length, as required by claim 18. Nor does Petitioner articulate reasoning with some rational underpinning to support the conclusion that it would have been obvious to one of ordinary skill in the art to have modified the cited implant to have a length greater than 40 mm.

B. Secondary Considerations

Patent Owner argues that "detailed testimony establishes a nexus between NuVasive's CoRoent XL implants and the invention of the '334 patent, and proves the commercial success of the product after NuVasive pioneered the market for lateral, trans-psoas interbody fusion surgeries with the CoRoent XL implant." PO Resp. 59 (citing Ex. 2020, 53–63; Ex. 2030, 7–10, App. A, Section III.D).

We recognize that evidence of secondary considerations must always be considered en route to the determination of obviousness, but its existence alone does not control the conclusion of obviousness. *Richardson-Vicks v. Upjohn Co.*, 122 F.3d 1476, 1483 (Fed. Cir. 1997). The weight given to evidence of secondary considerations is dependent upon whether there is a nexus between the merits of the claimed invention and the evidence offered. *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1539 (Fed. Cir. 1983).

Even assuming that NuVasive's CoRoent XL implant experienced "commercial success," as Patent Owner asserts, Patent Owner has not demonstrated sufficiently that there is a nexus between the merits of the *claimed* invention and the evidence offered. For example, Patent Owner argues that NuVasive "pioneered the market for lateral, trans-psoas interbody fusion surgeries," (PO Resp. 59) but fails to demonstrate sufficiently that any of the disputed claims recite "lateral, trans-psoas interbody fusion surgeries." We are not persuaded by Patent Owner's arguments.

C. Motion to Exclude

In its Motion to Exclude, Patent Owner seeks to exclude the Declaration of Loic Josse (Ex. 1116, "Josse Declaration"). We did not rely on the Josse Declaration in this decision. Therefore, Patent Owner's motion to exclude is dismissed as moot.

D. Motion for Observation

Patent Owner's observations are directed to the cross-examination testimony of Richard A. Hynes, M.D. (Ex. 38), who was cross-examined after Petitioner filed its Reply. We have considered Patent Owner's

observations and Petitioner's responses in rendering our decision, and have accorded the testimony the appropriate weight as explained above. *See* Obs. 1–9.

Patent Owner also submits observations to the cross-examination testimony of Loic Josse (Ex. 39). As previously discussed, we did not rely on the Josse Declaration in this decision. Therefore, we have not considered Patent Owner's observations directed to the cross-examination testimony of Loic Josse.

ORDER

Petitioner has demonstrated, by a preponderance of the evidence, that claims 1–5, 10, 11, 14–17, and 19–28 are unpatentable over Baccelli, Michelson, and any one of SVS or Telamon under 35 U.S.C. § 103(a). Petitioner has not demonstrated, by a preponderance of the evidence, that claim 18 is unpatentable over Baccelli, Michelson, and any one of SVS or Telamon under 35 U.S.C. § 103(a).

In consideration of the foregoing, it is hereby:

ORDERED that claims 1–5, 10, 11, 14–17, and 19–28 of the '334 patent have been shown to be unpatentable;

FURTHER ORDERED that Patent Owner's Motion to Exclude is *dismissed.*

This is a final decision. Parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

IPR2013-00508
Patent 8,187,334 B2

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Paper 7
Date: February 13, 2014

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MEDTRONIC, INC.
Petitioner

v.

NUVASIVE, INC.
Patent Owner

Case IPR2013-00507
U.S. Patent No. 8,187,334 B2

Before SALLY C. MEDLEY, LORA M. GREEN, and STEPHEN C. SIU, *Administrative Patent Judges.*

SIU, *Administrative Patent Judge.*

DECISION
Institution of *Inter Partes* Review
37 C.F.R. § 42.108

I. BACKGROUND

A. Background

Medtronic, Inc. ("Petitioner") filed a petition requesting an *inter partes* review of claims 1-5, 10, 11, and 14-28 of U.S. Patent No. 8,187,334 B2 ("the '334 patent," Ex. 1013) pursuant to 35 U.S.C. §§ 311-319. Paper 1 ("Pet."). NuVasive, Inc. ("Patent Owner") filed a preliminary response ("Prelim. Resp."). Paper 6. We have jurisdiction under 35 U.S.C. § 314. The standard for instituting an *inter partes* review is set forth in 35 U.S.C. § 314(a), which provides:

> THRESHOLD – The Director may not authorize an inter partes review to be instituted unless the Director determines that the information presented in the petition filed under section 311 and any response filed under section 313 shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.

We determine based on the record that Petitioner has shown, under 35 U.S.C. § 314(a), that there is a reasonable likelihood that it would prevail with respect to at least one of the challenged claims.

Petitioner relies on the following prior art:

US 2002/0165550 A1 (Frey)	Nov. 7, 2002	Ex. 1003
US 2003/0028249 A1 (Baccelli)	Feb. 6, 2003	Ex. 1004
US 5,860,973 (Michelson)	Jan. 19, 1999	Ex. 1005
US 2003/0100950 A1 (Moret)	May 29, 2003	Ex. 1006
US 2003/0139813 A1 (Messerli)	Jul. 24, 2003	Ex. 1007

Petitioner contends that the challenged claims are unpatentable under 35 U.S.C § 103(a) based on the following specific grounds (Pet. 3):

Reference(s)	Basis	Claims challenged
Frey	§ 102(b)	1-3, 10, 14, 15, and 19-28
Frey and Baccelli	§ 103(a)	1-5, 10, 11, 14-17, and 19-28
Frey and Messerli	§ 103(a)	1-3, 10, 14, 15, and 19-28
Frey and Michelson	§ 103(a)	1-5, 10, 11, 14, 15, and 18-28
Frey and Moret	§ 103(a)	1-3, 10, 14, 15, and 19-28

B. The '334 patent

The '334 patent describes a spinal fusion system, including a spinal fusion implant and an insertion instrument. Ex. 1013, col. 5, ll. 6-9. The spinal fusion implant is introduced into the disc space via a lateral approach to the spine or via a posterior, anterior, antero-lateral, or postero-lateral approach, and is made from a radiolucent material, such as PEEK (poly-ether-ether-ketone). *Id.* at col. 5, ll. 10-15 and 29-33. In one embodiment, the spinal fusion implant has a width ranging between 9 and 18 mm and a length ranging between 25 and 44 mm. *Id.* at col. 5, ll. 17-19.

Claim 1 of the '334 patent is reproduced below:

> 1. A spinal fusion implant of non-bone construction positionable within an interbody space between a first vertebra and a second vertebra, said implant comprising:
>
> an upper surface including anti-migration elements to contact said first vertebra when said implant is positioned within the interbody space, a lower surface including anti-migration elements to contact said second vertebra when said implant is positioned within the interbody space, a distal wall, a proximal wall, a first sidewall and a second sidewall, said distal wall, proximal wall, first sidewall, and second sidewall comprising a radiolucent material;

wherein said implant has a longitudinal length greater than 40 mm extending from a proximal end of said proximal wall to a distal end of said distal wall;

wherein a central region of said implant includes portions of the first and second sidewalls positioned generally centrally between the proximal wall and the distal wall, at least a portion of the central region defining a maximum lateral width of said implant extending from said first sidewall to said second sidewall, wherein said longitudinal length is at least two and halftimes greater than said maximum lateral width;

at least a first fusion aperture extending through said upper surface and lower surface and configured to permit bone growth between the first vertebra and the second vertebra when said implant is positioned within the interbody space, said first fusion aperture having: a longitudinal aperture length extending generally parallel to the longitudinal length of said implant, and a lateral aperture width extending between said first sidewall to said second sidewall, wherein the longitudinal aperture length is greater than the lateral aperture width; and

at least three radiopaque markers; wherein a first of the at least three radiopaque markers is at least partially positioned in said distal wall, a second of said at least three radiopaque markers is at least partially positioned in said proximal wall, and a third of said at least three radiopaque markers is at least partially positioned in said central region.

According to Petitioner, the '334 patent is the subject of co-pending district court litigation, *Warsaw Orthopedic, Inc. v. NuVasive, Inc.*, originally filed in the Northern District of Indiana, Case No. 3:12-cv-00438-JD-CAN, on August 17, 2012, and transferred to the Southern District of California on November 8, 2012, as Case No. 3:12-cv-02738-CAB-MDD. *See* Pet. 1. Petitioner has filed a second petition seeking *inter partes* review of the '334 patent (IPR2013-00508) and two additional petitions seeking *inter partes* review of related U.S. Patent No. 8,361,156 B2 (IPR2013-00504 and IPR2013-00506).

C. Claim Interpretation

Consistent with the statute and the legislative history of the Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284, 329 (2011) ("AIA"), the Patent Trial and Appeal Board ("Board") interprets claim terms by applying the broadest reasonable construction in the context of the Specification in which the claims reside. 37 C.F.R. § 42.100(b); *see* Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,766 (Aug. 14, 2012.)

Under the broadest reasonable interpretation standard, claim terms are given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art in the context of the entire disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). Any special definition for a claim term must be set forth in the specification with reasonable clarity, deliberateness, and precision. *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994). In this regard, however, we are careful not to read a particular embodiment appearing in the written description into the claim if the claim language is broader than the embodiment. *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993).

Petitioner provides a construction for each of "distal wall / proximal wall" (claim 1), "releasably mate" (claim 3), "longitudinal length" (claim 11), "extend generally perpendicular to said longitudinal length" (claim 11), "elongate body" (claims 14 and 17), "generally rectangular and generally oblong in shape" (claim 23), "lateral width of the distal end of said distal wall / a lateral width of said proximal end of said proximal wall" (claim 24), and "oriented generally parallel to a height of the implant" (claim 17 recites an elongate body oriented generally perpendicular to said longitudinal length and entirely through a height of said

proximal wall). Pet. 4-7. Patent Owner does not provide a construction for any of these terms.

Petitioner's proposed constructions for the above-mentioned claim terms appear to take into account the plain meaning of the terms and their usage in the specification. We, therefore, adopt Petitioner's proposed constructions for the above-mentioned claim terms for purposes of this decision.

II. ANALYSIS

A. Cited References

a. Overview of Frey

Frey discloses a spinal implant that "has a length sufficient to span the disc space from the distal portion . . . to the proximal portion." Ex. 1003 ¶ [0130]. The implant has grooves to increase frictional resistance between adjacent vertebrae (*id.* at ¶ [0153]) and may be inserted "from a postero-lateral or uni-lateral approach into the disc space" or can be inserted via "other approaches to the disc space, such as lateral, anterior or antero-lateral approaches." *Id.* at ¶ [0150].

b. Overview of Baccelli

Baccelli discloses an intervertebral implant. Ex. 1004 ¶ [0001]. The implant has a front wall (*id.* at ¶ [0036], Fig. 8 – element 4b) that contains an orifice (*id.* at ¶ [0039], Fig. 8 – element 18) into which a threaded endpiece is connected for placing the implant into position between vertebrae. *Id.* at ¶¶ [0044] – [0045].

The implant is made of a material that is transparent to X-rays, such as PEEK. *Id.* at ¶ [0050]. One or more markers that are opaque to X-rays may be

used to identify the position and/or the presence of the implant when X-rays are taken. *Id.* The radiopaque (i.e., a material that is opaque to X-rays) markers may be positioned within the anterior (i.e., proximal) wall and/or the posterior (i.e., distal) wall of the implant. *Id.* at Figs. 1-4, 8, and 9.

The implant may further include spikes positioned symmetrically about the sagittal midplane and extending in the frontal midplane in a vertical axis. *Id.* at ¶ [0041], Figs. 1-5, 8, and 9. The spikes may be made of a radiopaque material. *Id.* at ¶ [0051].

c. Overview of Michelson

Michelson discloses a translateral spinal fusion implant. Ex. 1005, col.5, ll. 44-45. In one embodiment, the implant has "a length in the range of 32 mm to 50 mm, with 42 mm being the preferred length." *Id.* at col.10, ll. 46-47. The implant may also have "a maximum diameter in the range of 14-26 mm, with the preferred diameter being 20 mm." *Id.* at col. 7, ll. 28-30.

d. Overview of Messerli

Messerli discloses a spinal implant that "range[s] from about 26 to about 32 mm in length, and [has] a width from about 9 to 11 mm." Ex. 1007 ¶ [0055].

e. Overview of Moret

Moret discloses an intervertebral implant that contains a marker of high density metal that permits the implant to be "observed and assessed during the operation by means of an image intensifier." Ex. 1006 ¶ [0026].

B. Anticipation by Frey

Petitioner asserts that claims 1-3, 10, 14, 15, and 19-28 are anticipated by Frey. Pet. 3. Claim 1 recites that the implant has a longitudinal length greater than 40 mm. Petitioner argues that Frey discloses an implant that is "sufficient to span the disc space." Pet. 20 (citing Ex. 1003 ¶ 0130). Petitioner also argues that the average width of the body of a vertebrae is greater than 40 mm at L3, L4, and L5. Pet. 20 (citing S. H. Zhou, et al., *Geometrical Dimensions of the Lower Lumbar Vertebrae – Analysis of Data from Digitised CT Images*, 9 EUR SPINE J. 242-248 (2000), "Zhou," Ex. 1012).

As Patent Owner explains, however, Petitioner does not demonstrate sufficiently that Frey discloses an implant that has a longitudinal length greater than 40 mm, as required by claim 1, either expressly or inherently. In addition, even assuming that Zhou discloses average widths of vertebrae as being greater than 40 mm, as Petitioner contends, Petitioner has not demonstrated persuasively that the width of a disc space of Frey is also greater than 40 mm. In other words, Petitioner does not show adequately that Zhou discloses that disc spaces (as opposed to vertebral bodies) are larger than 40 mm. Nor does Petitioner provide sufficient evidence to show that the implant of Frey spans the entire dimension of a disc space that measures greater than 40 mm in length. Indeed, Frey appears to disclose that the implant does not span the entire width of the vertebral body and does not disclose the measurement of the portion(s) of the body of the vertebrae that the implant does not span (much less the length of the portion of the vertebra body that the implant does span). *See e.g.*, Ex. 1003, Fig. 47.

C. Obviousness over Frey and any one of Baccelli, Messerli, or Moret

Petitioner asserts that claims 1-3, 10, 14, 15, and 19-28 are obvious over Frey and any one of Messerli or Moret, and that claims 1-5, 10, 11, 14-17, and 19-28 are obvious over Frey and Baccelli. Pet. 3. Petitioner does not demonstrate that any of Baccelli, Messerli, or Moret make up for the deficiency noted above with respect to Frey by disclosing an implant that has a longitudinal length greater than 40 mm, as required by claim 1.

D. Obviousness over Frey and Michelson

Petitioner asserts that claims 1-5, 10, 11, 14, 15, and 18-28 are obvious over Frey and Michelson. Pet. 3. In support of this asserted ground of unpatentability, Petitioner provides explanations as to how each claim limitation is disclosed or suggested by Frey and Michelson and, based on the current record, articulates sufficient reasoning with a rational underpinning to justify support for the conclusion of obviousness. *See* Pet. 52-58. Upon consideration of Petitioner's analysis and supporting evidence, and taking into account Patent Owner's preliminary response, we determine that Petitioner's contentions have merit. On this record, we conclude that Petitioner has demonstrated that there is a reasonable likelihood that it would prevail with respect to obviousness of claims 1-5, 10, 11, 14, 15, and 18-28 over Frey and Michelson.

Claim 1 recites that the implant "has a longitudinal length greater than 40 mm extending from a proximal end of said proximal wall to a distal end of said distal wall." As Petitioner explains, "Michelson discloses a spinal fusion implant . . . that has a longitudinal length greater than 40 mm." Pet. 56. Patent Owner argues that it would not have been obvious to one of ordinary skill in the art

to have combined the teachings of Michelson with that of Frey because, according to Patent Owner, such a combination would have rendered the Frey implant "inoperable for its intended purpose" and "would require 'a change in the basic principle under which the [Frey] construction was designed to operate.'" Prelim. Resp. 14, 17 (citations omitted).

In particular, Patent Owner argues that "modifying Frey's implant . . . to be greater than 40 mm [as disclosed by Michelson] would fully eliminate Frey's most preferred insertion path, thereby rendering it inoperable for Frey's intended purpose." Prelim. Resp. 15. Patent Owner contends that such a modification "would reconstruct [Frey's] implant so that its leading end would impinge upon the anterior wall of the disc annulus well before the trailing end reaches the disc space, thereby requiring unsafe damage/impingement upon the transverse process, the superior articular process, the spinal canal, and other portions of the spine." Prelim. Resp. 15-16.

Frey does not disclose specific dimensions of the body of the vertebrae or disc space. Therefore, the measurement of the disc space or vertebral body in Frey is not known and, therefore, without additional evidence it is not known whether the distance from the posterior to anterior edges of the disc space in Frey is less than, equal to, or greater than 40 mm, for example. Patent Owner does not provide evidence sufficient to show that using an implant that is greater than 40 mm in length would, in fact, result in "unsafe damage/impingement upon the transverse process, the superior articular process, the spinal canal, and other portions of the spine," the distance between the point of insertion of the implant and the anterior aspect of the disc not being disclosed in Frey.

Even assuming that the distance between the point of insertion of the implant and the anterior aspect of the disc space was disclosed by Frey as being

less than 40 mm, Patent Owner provides insufficient evidence to demonstrate that, with respect to the level of ordinary skill in the art, maneuvering the implant to prevent damage or impingement to the transverse process, superior articular process, spinal canal or other portions of the spine would have been uniquely challenging or difficult. *See Leapfrog Enters., Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1162 (Fed. Cir. 2007) (citing *KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 418 (2007)). Indeed, Michelson discloses an implant with a length that is greater than 40 mm and does not disclose that inserting such an implant results in the alleged damage or impingement. Hence, Michelson demonstrates that it would have been obvious to one of ordinary skill in the art to have inserted an implant measuring greater than 40 mm in length without unsafe damage or impingement upon the transverse process, the superior articular process, the spinal canal, or other portions of the spine.

Patent Owner argues that Michelson discloses inserting an implant into an intervertebral space laterally, but that Frey discloses inserting an implant into an intervertebral space posteriorly, and that inserting the implant of Frey into an intervertebral space laterally (instead of posteriorly) would produce a "result [that] is entirely contrary to Frey's principle purpose of providing a solution for a 'posterior lateral approach to the disc space . . .'." Prelim. Resp. 18. However, as noted previously, Frey explicitly discloses inserting an implant into an intervertebral space using "other approaches . . . such as lateral . . . ." Ex. 1003, ¶ [0150]. Patent Owner does not explain adequately how an approach of inserting an implant that is explicitly disclosed by Frey is contrary to the intended purpose (or principle of operation) of Frey.

Even assuming that it would have been impossible for one of ordinary skill in the art to have inserted an implant measuring greater than 40 mm in length into

an intervertebral space via a posterior approach without resultant damage or impingement, as Patent Owner contends, Frey alternatively discloses inserting an implant into an intervertebral space via a lateral approach, the same orientation of insertion of an implant described by Michelson. Patent Owner appears to agree that one of ordinary skill in the art would have understood that it was obvious to insert safely a spinal implant with a length greater than 40 mm using a lateral approach. Hence, contrary to Patent Owner's contention, Frey would not be rendered "inoperable" even under Patent Owner's hypothesized scenario because Frey could still be "operable" to insert the spinal implant measuring greater than 40 mm in length via a lateral approach (an approach explicitly disclosed by both Frey and Michelson).

With respect to claim 21, Petitioner explains that the upper and lower surfaces of the implant disclosed by Frey are generally parallel. Pet. 29 (citing Ex. Frey, Fig. 62). Patent Owner argues that "the upper and lower surfaces of Frey's implant . . . are not generally parallel." Prelim. Resp. 20. Claim 21, which depends from claim 1, recites that the "upper and lower surfaces are generally parallel to one another." Patent Owner argues that Petitioner asserts that the upper and lower surfaces of the Frey implant "are generally parallel to [each other]" but also argues separately, with respect to claim 22 which depends from claim 1, that the upper and lower surfaces are "generally angled relative to one another." Prelim. Resp. 19-21.

On this record, we are not persuaded that the upper and lower surfaces are oriented relative to one another in such a way that one of ordinary skill in the art would have considered the surfaces not to be "generally" parallel to one another, as recited in claim 21, and "generally" angled relative to one another, as recited in claim 22. For example, we agree with Petitioner that one of ordinary skill in the

art would have understood that the upper and lower surfaces are "generally" parallel to each other at least because the general overall relative positions of the upper and lower surfaces are oriented in approximately the same direction in at least one aspect.

Patent Owner points out that the upper and lower surfaces of the implant of Frey, when considered from the rear aspect of the implant, appears to be generally parallel to each other but that the upper and lower surfaces of the implant of Frey, when considered from the side aspect of the implant appears to be generally angled relative to each other. Prelim. Resp. 19-21. Patent Owner does not demonstrate sufficiently that claim 21 requires the upper and lower surfaces of the implant to be generally parallel in all aspects.

Claim 21 recites that the upper and lower surfaces of the implant are "generally" parallel to each other and does not require that the upper and lower surfaces of the implant are strictly parallel to each other in every aspect. Similarly, claim 22 recites that the upper and lower surfaces of the implant are "generally" angled relative to one another and does not require that the upper and lower surfaces of the implant are angled relative to each other in every aspect. Indeed, both claims 21 and 22 recite that the upper and lower surfaces are "generally" oriented relative to one another in a particular manner. Thus, an upper surface that is generally parallel in at least some aspects to a lower surface meets the claim 21 limitation. Moreover, an upper and lower surface that are generally angled relative to one another in at least some aspect meets the claim 22 limitation. Thus, we disagree with Patent Owner's argument that Petitioner's reliance on a single embodiment showing both generally parallel and generally angled surfaces is improper.

III. CONCLUSION

For the foregoing reasons, we determine that the information presented in the Petition establishes that there is a reasonable likelihood that Petitioner would prevail with respect to claims 1-5, 10, 11, 14, 15, and 18-28 under 35 U.S.C. § 103(a) as obvious over Frey and Michelson.

The information presented in the petition does not, however, establish that there is a reasonable likelihood that Petitioner would prevail with respect to claims 1-3, 10, 14, 15, and 19-28 under 35 U.S.C. § 102(b) as anticipated by Frey; claims 1-5, 10, 11, 14-17, and 19-28 under 35 U.S.C. § 103(a) as obvious over Frey and Baccelli; and claims 1-3, 10, 14, 15, and 19-28 under 35 U.S.C. § 103(a) as obvious over Frey and any one of Messerli or Moret.

IV. ORDER

For the reasons given, it is

ORDERED that the petition is granted as to claims 1-5, 10, 11, 14, 15, and 18-28 under 35 U.S.C. § 103(a) as obvious over Frey and Michelson.

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(a), *inter partes* review of the '334 patent is hereby instituted commencing on the entry date of this Order, and pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial.

FURTHER ORDERED that an initial conference call with the Board is scheduled for Thursday, February 27, 2014 at 3PM. The parties are directed to the Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,765-66 (Aug. 14, 2012), for guidance in preparing for the initial conference call, and should be

prepared to discuss any proposed changes to the Scheduling Order entered herewith and any motions the parties anticipate filing during the trial.

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Paper 7
Date: February 13, 2014

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MEDTRONIC, INC.
Petitioner

v.

NUVASIVE, INC.
Patent Owner

Case No. IPR2013-00508
U.S. Patent No. 8,187,334 B2

Before SALLY C. MEDLEY, LORA M. GREEN, and STEPHEN C. SIU, *Administrative Patent Judges.*

SIU, *Administrative Patent Judge.*

DECISION
Institution of *Inter Partes* Review
37 C.F.R. § 42.108

I. BACKGROUND

A. Background

Medtronic, Inc. ("Petitioner") filed a petition requesting an *inter partes* review of claims 1-5, 10, 11, and 14-28 of U.S. Patent No. 8,187,334 B2 ("the '334 patent," Ex. 1115) pursuant to 35 U.S.C. §§ 311-319. Paper 1 ("Pet."). NuVasive, Inc. ("Patent Owner") filed a preliminary response ("Prelim. Resp."). Paper 6. We have jurisdiction under 35 U.S.C. § 314. The standard for instituting an *inter partes* review is set forth in 35 U.S.C. § 314 (a) which provides:

> THRESHOLD -- The Director may not authorize an inter partes review to be instituted unless the Director determines that the information presented in the petition filed under section 311 and any response filed under section 313 shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.

We determine based on the record that Petitioner has shown, under 35 U.S.C. § 314(a), that there is a reasonable likelihood that it would prevail with respect to at least one of the challenged claims.

Petitioner relies on the following prior art:

US 2002/0165550 A1 (Frey)	Nov. 7, 2002	Ex. 1103
US 2003/0028249 A1(Baccelli)	Feb. 6, 2003	Ex. 1104
US 5,860,973 (Michelson)	Jan. 19, 1999	Ex. 1005

Synthes Vertebral Spacer – PR Brochure, Synthes Spine 2002 ("SVS"; Ex. 1106).

Medtronic Sofamor Daneek, Telamon, Verte-Stack PEEK Vertebral Body spacer (Ex. 1107); and Telamon, Posterior Impacted Fusion Devices, 2003 (Ex. 1108) (collectively, "Telamon").

Petitioner contends that the challenged claims are unpatentable under 35 U.S.C § 103(a) based on the following specific grounds (Pet. 3):

Reference(s)	Basis	Claims challenged
SVS and Frey, Baccelli, and/or Michelson or Telamon	§ 103	1-5, 10, 11, and 14-28
Telamon and Frey, Baccelli, and/or Michelson or SVS	§ 103	1-5, 10, 11, and 14-28

B. The '334 patent

The '334 patent describes a spinal fusion system, including a spinal fusion implant and an insertion instrument. Ex. 1115, col.5, ll. 6-9. The spinal fusion implant is introduced into the disc space via a lateral approach to the spine or via a posterior, anterior, antero-lateral, or postero-lateral approach, and is made from a radiolucent material, such as PEEK (poly-ether-ether-ketone). *Id.* at col.5, ll. 10-15 and 29-33. In one embodiment, the spinal fusion implant has a width ranging between 9 and 18 mm and a length ranging between 25 and 44 mm. *Id.* at col.5, ll. 17-19.

Claim 1 of the '334 patent is reproduced below:

> 1. A spinal fusion implant of non-bone construction positionable within an interbody space between a first vertebra and a second vertebra, said implant comprising:
>
> an upper surface including anti-migration elements to contact said first vertebra when said implant is positioned within the interbody space, a lower surface including anti-migration elements to contact said second vertebra when said implant is positioned within the interbody space, a distal wall, a proximal wall, a first sidewall and a second sidewall, said distal wall, proximal wall, first sidewall, and second sidewall comprising a radiolucent material;

wherein said implant has a longitudinal length greater than 40 mm extending from a proximal end of said proximal wall to a distal end of said distal wall;

wherein a central region of said implant includes portions of the first and second sidewalls positioned generally centrally between the proximal wall and the distal wall, at least a portion of the central region defining a maximum lateral width of said implant extending from said first sidewall to said second sidewall, wherein said longitudinal length is at least two and halftimes greater than said maximum lateral width;

at least a first fusion aperture extending through said upper surface and lower surface and configured to permit bone growth between the first vertebra and the second vertebra when said implant is positioned within the interbody space, said first fusion aperture having: a longitudinal aperture length extending generally parallel to the longitudinal length of said implant, and a lateral aperture width extending between said first sidewall to said second sidewall, wherein the longitudinal aperture length is greater than the lateral aperture width; and

at least three radiopaque markers; wherein a first of the at least three radiopaque markers is at least partially positioned in said distal wall, a second of said at least three radiopaque markers is at least partially positioned in said proximal wall, and a third of said at least three radiopaque markers is at least partially positioned in said central region.

According to the Petitioner, the '334 patent is presently the subject of co-pending district court litigation, *Warsaw Orthopedic, Inc. v. NuVasive, Inc.*, originally filed in the Northern District of Indiana, Case No. 3:12-cv-00438-JD-CAN on August 17, 2012, and transferred to the Southern District of California on November 8, 2012, as Case No. 3:12-cv-02738-CAB-MDD. *See* Pet. 1. Petitioner has filed a second petition seeking *inter partes* review of the '334 patent (IPR2013-00507) and two additional petitions seeking *inter partes* review of related U.S. Patent No. 8,361,156 B2 (IPR2013-00504 and IPR2013-00506).

C. Claim Interpretation

Consistent with the statute and the legislative history of the Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284, 329 (2011) ("AIA"), the Board interprets claim terms by applying the broadest reasonable construction in the context of the Specification in which the claims reside. 37 C.F.R. § 42.100(b); *see* Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,766 (Aug. 14, 2012.)

Under the broadest reasonable interpretation standard, claim terms are given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art in the context of the entire disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). Any special definition for a claim term must be set forth in the specification with reasonable clarity, deliberateness, and precision. *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994). In this regard, however, we are careful not to read a particular embodiment appearing in the written description into the claim if the claim language is broader than the embodiment. *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993).

Petitioner provides a construction for each of "distal wall / proximal wall" (claim 1), "releasably mate" (claim 3), "longitudinal length" (claim 1), "extend generally perpendicular to said longitudinal length" (claim 11), "elongate body" (claims 14 and 17), "generally rectangular and generally oblong in shape" (claim 23), "lateral width of the distal end of said distal wall / a lateral width of said proximal end of said proximal wall" (claim 24), "and "oriented generally parallel to a height of the implant" (claim 17 recites an elongate body oriented generally perpendicular to said longitudinal length and entirely through a height of said

proximal wall). Pet. 4-7. Patent Owner does not provide a construction for any of these terms.

Petitioner's proposed construction for the above-mentioned claim terms appears to take into account the plain meaning of the terms and their usage in the specification. We, therefore, adopt Petitioner's proposed construction for the above-mentioned claim terms for purposes of this decision.

II. ANALYSIS

A. Cited References

a. Overview of SVS

SVS discloses a vertebral spacer (or spinal implant) made of a radiolucent polymer that allows fusion to occur through the implant. In one embodiment, the implant measures 22 mm depth x 8 mm width and includes two radiopaque marker pins. Ex. 1106, pp. 1-2.

b. Overview of Baccelli

Baccelli discloses an intervertebral implant. Ex. 1104 ¶ [0001]. The implant has a front wall (*id.* at ¶ [0036], Fig. 8 – element 4b) that contains an orifice (*id.* at ¶ [0039], Fig. 8 – element 18) into which a threaded endpiece is connected for placing the implant into position between vertebrae. *Id.* at ¶¶ [0044] – [0045].

The implant is made of a material that is transparent to X-rays, such as PEEK. *Id.* at ¶ [0050]. One or more markers that are opaque to X-rays may be used to identify the position and/or the presence of the implant when X-rays are taken. *Id.* The radiopaque (i.e., a material that is opaque to X-rays) markers may

be positioned within the anterior (i.e., proximal) wall and/or the posterior (i.e., distal) wall of the implant. *Id.* at Figs. 1-4, 8, and 9.

The implant may further include spikes positioned symmetrically about the sagittal midplane and extending in the frontal midplane in a vertical axis. *Id.* ¶[0041], Figs. 1-5, 8, and 9. The spikes may be made of a radiopaque material. *Id.* at ¶ [0051].

c. Overview of Michelson

Michelson discloses a translateral spinal fusion implant. Ex. 1105 col.5, ll. 44-45. In one embodiment, the implant has "a length in the range of 32 mm to 50 mm, with 42 mm being the preferred length." *Id.* at col.10, ll. 46-47. The implant may also have "a maximum diameter in the range of 14-26 mm, with the preferred diameter being 20 mm." *Id.* col.7, ll. 28-30.

d. Overview of Telamon

Telamon discloses a radiolucent spinal implant measuring 22-26 mm length by 10 mm width. Ex. 1107, p. 2. The implant further includes radiographic markers. *Id.*

B. Obviousness over Baccelli, Michelson, and any one of SVS or Telamon

Petitioner asserts that claims 1-5, 10, 11, and 14-28 are obvious under 35 U.S.C. § 103(a) over Baccelli, Michelson, and any one of SVS or Telamon. Pet. 3. In support of these asserted grounds of unpatentability, Petitioner provides explanations as to how each claim limitation is disclosed or suggested by Baccelli, Michelson, and any one of SVS or Telamon and, based on the current record,

articulates sufficient reasoning with a rational underpinning to justify support for the conclusion of obviousness. *See* Pet. 14-60. Upon consideration of Petitioner's analysis and supporting evidence, and taking into account Patent Owner's preliminary response, we determine that Petitioner's contentions have merit. On this record, we conclude that Petitioner has demonstrated that there is a reasonable likelihood that it would prevail with respect to obviousness of claims 1-5, 10, 11, and 14-28 over Baccelli, Michelson, and any one of SVS or Telamon.

Precise relief

Patent Owner argues that Petitioner fails to state "the precise relief requested," pursuant to 37 C.F.R. § 42.22, because, according to Patent Owner, multiple combinations of references are included in each of Petitioner's listed grounds of unpatentability. *See*, e.g., Prelim. Resp. 9-10. Patent Owner does not demonstrate persuasively, however, that merely including multiple combinations of references within one listed ground of unpatentability is insufficiently precise for purposes of determining the specific proposed ground of unpatentability. We note that Petitioner states with sufficient specificity the references involved in the proposed ground of unpatentability and provides claim charts that describe, with sufficient precision, the relied upon reference for each claim limitation. *See* e.g., Pet. 19-60.

Public availability of References (SVS and Telamon)

Patent Owner argues that neither the SVS reference nor the Telamon reference is a prior art publication because, according to Patent Owner, Petitioner has not shown that the SVS and Telamon references "had been 'disseminated or otherwise made available to the extent that persons interested and ordinarily skilled

in the subject matter or art, exercising reasonable diligence, can locate it'." Prelim. Resp. 14, citing *In re Wyer*, 655 F.2d 211, 226 (CCPA 1981).

In particular, regarding the SVS reference, Patent Owner argues that Petitioner states that the SVS reference was publicly available as of May 2002 (*see* e.g., Pet. 3-4) but that Petitioner's declarant (Dr. Richard Hynes, Hynes Declaration, Ex. 1101) states that the SVS reference was publicly available as of a different date, namely June 2002. Prelim. Resp. 15, citing Hynes Declaration, ¶52. We note that both May 2002 and June 2002 predate the presumed priority date of the '334 patent of March 29, 2004. Patent Owner does not explain sufficiently how the SVS reference being publicly available in either May or June of 2002 demonstrates that the SVS reference was not publicly available prior to the presumed priority date of the '334 patent.

Regarding the Telamon reference, Patent Owner argues that the Telamon reference is "limited only to Medtronic's customers and employees" and "not 'publicly posted' for access by ordinary members of the public seeking a copy." Prelim. Resp. 16 (citations omitted). Petitioner's declarant states that the Telamon reference was "published and publicly available at least as early as August of 2003" (Phelps Declaration, Ex. 1102, ¶ 3) and provides a memorandum announcing the release of the "Telamon Verte-Stack PEEK Vertebral Body Spacer," including an apparent date of August 2003. Ex. 1102, Appendix B.

Patent Owner asserts that the Telamon reference was only available "at a password-protected website" that was "limited only to Medtronic's customers and employees," in which "access [of the website containing the Telamon reference] without authorization is a violation of state and federal law," and that, with respect to the memorandum (Ex. 1102, Appendix B), only "*Medtronic employees* receive copies of Telamon materials." Prelim. Resp. 16-17 (citations omitted).

At this preliminary phase of the proceedings, although Petitioner's evidence pertaining to the public availability of the Telamon reference is somewhat general, Petitioner has provided evidence to a degree that is sufficient, at least, to demonstrate a reasonable likelihood that Petitioner will prevail.

SVS or Telamon in combination with Michelson

Claim 1 recites that the implant "has a longitudinal length greater than 40 mm extending from a proximal end of said proximal wall to a distal end of said distal wall." Ex. 1115, col.12, ll. 44-46. As Petitioner explains, "Michelson provide[s] that a spinal fusion implant may have a longitudinal length that is greater than 40 mm." Pet. 20 (citation omitted). Patent Owner argues that it would not have been obvious to one of ordinary skill in the art to have combined the teachings of Michelson with that of SVS or Telamon because, according to Patent Owner, such a combination would have rendered "the primary reference . . . 'inoperable for its intended purpose'" and "would require 'a change in the basic principle under which the [SVS or Telamon implant] construction was designed to operate.'" Prelim. Resp. 25, 29 (citation omitted).

In particular, Patent Owner argues that the "proposed modification to [the SVS or Telamon implant] would reconstruct the posterior insertion implant so that its leading end would penetrate through the annulus on the anterior aspect of the disc and dangerously protrude from the anterior of the spine." Prelim. Resp. 27. Specific dimensions of the body of the vertebrae, or disc space, in either the SVS or the Telamon reference are not provided. The measurement of the disc space, or vertebral body, in Telamon, for example, is not known and it is, therefore, not known, without additional evidence, if the distance from the posterior to anterior edges of the disc space in Telamon is less than, equal to, or greater than 40 mm, for

example. Patent Owner does not provide evidence sufficient to show that using an implant that is greater than 40 mm in length would, in fact, "penetrate through the annulus on the anterior aspect of the disc," the distance between the point of insertion of the implant and the anterior aspect of the disc being unknown in Telamon.

Even assuming that the distance between the point of insertion of the implant and the anterior aspect of the disc was disclosed by Telamon as being less than 40 mm, Patent Owner provides insufficient evidence to demonstrate that, with respect to the level of ordinary skill in the art, maneuvering the implant to prevent damage to the annulus on the anterior aspect of the disc would have been uniquely challenging or difficult. *See Leapfrog Enters., Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1162 (Fed. Cir. 2007) (citing *KSR Int'l Co. v. Teleflex, Inc.* , 550 U.S. 398, 418 (2007)). Indeed, Michelson discloses an implant with a length that is greater than 40 mm and does not disclose that inserting such an implant results in damage to the annulus on the anterior aspect of the disc. Hence, Michelson demonstrates that it would have been obvious to one of ordinary skill in the art to have inserted an implant measuring at least 40 mm in length without damage to the annulus on the anterior aspect of the disc.

With respect to SVS, Patent Owner provides similar arguments that inserting an implant measuring greater than 40 mm in length via the posterior aspect of the vertebrae results in rupture of the annulus on the anterior aspect of the disc. *See* e.g., Prelim. Resp. 27-28. We note that SVS discloses a spinal implant but does not disclose that the spinal implant is inserted via a posterior approach. Patent Owner does not demonstrate sufficiently that SVS discloses any particular approach to inserting the spinal implant, much less that the implant must be inserted via the posterior aspect of the vertebrae.

Claims 21 and 22

With respect to claim 21, Patent Owner argues that "the upper and lower surfaces of each of the [SVS and Telamon implants] are not generally parallel to one another." Prelim. Resp. 32. Claim 21 recites that the "upper and lower surfaces are generally parallel to one another." In particular, Patent Owner argues that Petitioner argues that the upper and lower surfaces of the SVS implant "are generally parallel to each other," but also argues separately, with respect to claim 22, which depends from claim 1, that the upper and lower surfaces "generally angle [relative] to one another." Prelim. Resp. 31, citing Pet. 35.

Petitioner indicates that the upper and lower surfaces of the implant disclosed by SVS are generally parallel. The upper and lower surfaces of the implant of SVS are convex shaped and are not strictly parallel to each other given the curved shapes of the surfaces. We agree with Petitioner, however, that one of ordinary skill in the art would have understood that the upper and lower surfaces are "generally" parallel to each other at least because the general overall relative positions of the curved upper and lower surfaces are oriented in approximately the same direction. Patent Owner does not provide sufficient evidence demonstrating that the upper and lower surfaces of the implant of SVS are not oriented in approximately the same direction and are, therefore, not "generally parallel to one another."

As discussed above, the upper and lower surfaces of the implant of SVS are curvilinear. Therefore, the upper and lower surfaces of the implant of SVS contain portions that generally angle relative to one another (e.g., at various curved portions of the surfaces). We are not persuaded that the upper and lower surfaces

of the SVS implant are not "generally angled relative to one another," as recited in claim 22.

Thus, an upper surface that is generally parallel in at least some aspects to a lower surface meets the claim 21 limitation. Moreover, an upper and lower surface that are generally angled relative to one another in at least some aspect meets the claim 22 limitation. Thus, we disagree with Patent Owner's argument that Petitioner's reliance on a single embodiment showing both generally parallel and generally angled surfaces is improper.

C. Other asserted grounds of unpatentability

Petitioner alleges additional grounds of unpatentability of claims 1-5, 10, 11, and 14-28 based on alternative combinations of SVS, Telamon, Frey, Baccelli, and Michelson. These additional (alternate) grounds are redundant to the grounds based on Baccelli, Michelson and any one of SVS or Telamon, on which we have instituted a trial, as explained above with respect to these claims. We do not authorize *inter partes* review on those additional redundant grounds. *See* 37 C.F.R. § 42.108.

III. CONCLUSION

We institute an *inter partes* review of claims 1-5, 10, 11, and 14-28 under 35 U.S.C. § 103(a) as obvious over Baccelli, Michelson, and any one of SVS or Telamon.

IV. ORDER

For the reasons given, it is

ORDERED that pursuant to 35 U.S.C. § 314(a), *inter partes* review of the '334 patent is hereby instituted commencing on the entry date of this Order, and pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial.

FURTHER ORDERED that the trial is limited to the grounds and claims identified above in the Conclusion. No other grounds are authorized as to these claims.

FURTHER ORDERED that an initial conference call with the Board is scheduled for Thursday, February 27, 2014 at 3PM. The parties are directed to the Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,765-66 (Aug. 14, 2012), for guidance in preparing for the initial conference call, and should be prepared to discuss any proposed changes to the Scheduling Order entered herewith and any motions the parties anticipate filing during the trial.

PETITIONER:

Jeff E. Schwartz
Seth A. Kramer
Fox Rothschild LLP
jeschwartz@foxrothschild.com
skramer@foxrothschild.com

PATENT OWNER:

Stephen R. Schaefer
Michael T. Hawkins
Fish & Richardson P.C.
Schaefer@fr.com
Hawkins@fr.com
IPR13958-0117IP2@fr.com

UNITED STATES PATENT AND TRADEMARK OFFICE
Certificate

Patent No. 8,187,334 B2 Patented: May 29, 2012

On petition requesting issuance of a certificate for correction of inventorship pursuant to 35 U.S.C. 256, it has been found that the above identified patent, through error and without any deceptive intent, improperly sets forth the inventorship.

Accordingly, it is hereby certified that the correct inventorship of this patent is: Matthew Curran, Carlsbad, CA (US); Mark Peterson, Medford, OR (US); and Luiz Pimenta, Sao Paulo (BR).

Signed and Sealed this Eighteenth Day of June 2013.

EDUARDO C. ROBERT
Supervisory Patent Examiner
Art Unit 3733
Technology Center 3700

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
13/079,645	04/04/2011	3733	2140	104US2	26	2

CONFIRMATION NO. 1151

CORRECTED FILING RECEIPT

26191
FISH & RICHARDSON P.C. (TC)
PO BOX 1022
MINNEAPOLIS, MN 55440-1022

Date Mailed: 06/03/2013

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Matthew Curran, Carlsbad, CA;
Mark Peterson, Medford, OR;
Luiz Pimenta, Sao Paulo, BRAZIL;

Applicant(s)

Matthew Curran, Carlsbad, CA;
Mark Peterson, Medford, OR;
Luiz Pimenta, Sao Paulo, BRAZIL;

Power of Attorney: The patent practitioners associated with Customer Number 26191

Domestic Priority data as claimed by applicant

This application is a CON of 11/093,409 03/29/2005 PAT 7918891
which claims benefit of 60/557,536 03/29/2004

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

If Required, Foreign Filing License Granted: 04/13/2011
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/079,645**
Projected Publication Date: Not Applicable
Non-Publication Request: No
Early Publication Request: No

Title

SYSTEM AND METHODS FOR SPINAL FUSION

Preliminary Class

623

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications:

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

SelectUSA

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/079,645	04/04/2011	Matthew Curran	104US2	1151

26191 7590 05/29/2013
FISH & RICHARDSON P.C. (TC)
PO BOX 1022
MINNEAPOLIS, MN 55440-1022

EXAMINER	
BRAY, STUART SAMUEL	
ART UNIT	PAPER NUMBER
3733	

NOTIFICATION DATE	DELIVERY MODE
05/29/2013	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATDOCTC@fr.com

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

In re Patent No. 8,187,334 CURRAN ET AL.	:	
Issue Date: May 29, 2012	:	**DECISION GRANTING**
Appl No.: 13/079,645	:	**PETITION**
Filed: April 04, 2011	:	*37 CFR 1.324*
For: SYSTEM AND METHODS FOR SPINAL FUSION	:	
	:	
	:	
	:	

This is a decision on the petition filed April 17, 2013 to correct inventorship under 37 CFR 1.324.

The petition is granted.

The patented file is being forwarded to Certificate of Corrections Branch for issuance of a certificate naming only the actual inventor or inventors.

/Eduardo C. Robert/

EDUARDO C. ROBERT
Supervisory Patent Examiner
Art Unit 3733
Technology Center ***

FISH & RICHARDSON P.C. (TC)
PO BOX 1022
MINNEAPOLIS, MN 55440-1022

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

DATE: May 22, 2013
TO: Certificates of Correction Branch
FROM: EDUARDO C. ROBERT
SPE, Art Unit 3733
SUBJECT: REQUEST FOR CERTIFICATE OF CORRECTION

Please issue a Certificate of Correction in U. S. Letters Patent No. 8,187,334 as specified on the attached Certificate.

/Eduardo C. Robert/

EDUARDO C. ROBERT, SPE
Art Unit 3733

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE

Patent No. 8,187,334
Patented: May 29, 2012

On petition requesting issuance of a certificate for correction of inventorship pursuant to 35 U.S.C. 256, it has been found that the above identified patent, through error and without deceptive intent, improperly sets forth the inventorship. Accordingly, it is hereby certified that the correct inventorship of this patent is:

Matthew Curran, Carlsbad, CA; Mark Peterson, Medford, OR; Luiz Pimenta, Sao Paulo, Brasil

/Eduardo C. Robert/

EDUARDO C. ROBERT
Supervisory Patent Examiner
Art Unit 3733

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

DATE: May 23, 2013
TO: Certificates of Correction Branch
FROM: EDUARDO C. ROBERT
SPE, Art Unit 3733
SUBJECT: REQUEST FOR CERTIFICATE OF CORRECTION

Please issue a Certificate of Correction in U. S. Letters Patent No. 8,187,334 as specified on the attached Certificate.

/Eduardo C. Robert/

EDUARDO C. ROBERT, SPE
Art Unit 3733

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE

Patent No. 8,187,334
Patented: May 29, 2012

On petition requesting issuance of a certificate for correction of inventorship pursuant to 35 U.S.C. 256, it has been found that the above identified patent, through error and without deceptive intent, improperly sets forth the inventorship. Accordingly, it is hereby certified that the correct inventorship of this patent is:

Matthew Curran, Carlsbad, CA; Mark Peterson, Medford, OR; Luiz Pimenta, Sao Paulo, Brasil

/Eduardo C. Robert/

EDUARDO C. ROBERT
Supervisory Patent Examiner
Art Unit 3733

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

In re Patent No. 8,187,334 CURRAN ET AL.
Issue Date: May 29, 2012
Appl No.: 13/079,645
Filed: April 04, 2011
For: SYSTEM AND METHODS FOR SPINAL FUSION

DECISION GRANTING PETITION
37 CFR 1.324

This is a decision on the petition filed April 17, 2013 to correct inventorship under 37 CFR 1.324.

The petition is granted.

The patented file is being forwarded to Certificate of Corrections Branch for issuance of a certificate naming only the actual inventor or inventors.

/Eduardo C. Robert/

EDUARDO C. ROBERT
Supervisory Patent Examiner
Art Unit 3733
Technology Center ***

FISH & RICHARDSON P.C. (TC)
PO BOX 1022
MINNEAPOLIS, MN 55440-1022

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	: Matthew Curran et al.	Art Unit	: 3733
Patent No.	: 8,187,334	Examiner	: Stuart Samuel Bray
Issue Date	: May 29, 2012	Conf. No.	: 1151
Serial No.	: 13/079,645		
Filed	: April 4, 2011		
Title	: SYSTEMS AND METHODS FOR SPINAL FUSION		

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

PETITION TO CORRECT INVENTORSHIP
UNDER 37 C.F.R. § 1.324(a)

Applicant requests correction of inventorship for the above-captioned issued patent by the addition of the following inventor:

LUIZ PIMENTA

Applicant submits herewith the following:

1) Inventor's Declaration to Correct Inventorship by LUIZ PIMENTA;

2) Declarations by current named Inventors: MATTHEW CURRAN and MARK PETERSON;

3) Consent of Assignee to Correct Inventorship;

4) Certificate Under 37 C.F.R. §3.73(b); and

5) Certificate of Correction.

Please apply the $230 ($130 in payment for the petition fee of §1.20(b), $100 in payment for the Certificate of Correction fee of §1.20(a)) and any other charges or credits to Deposit Account No. 06-1050, referencing Attorney Docket No. 13958-0099001.

Date: April 17, 2013

/Michael T. Hawkins/
Michael T. Hawkins
Reg. No. 57,867

Customer Number 26191
Fish & Richardson P.C.
Telephone: (612) 335-5070
Facsimile: (877) 769-7945

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	: NuVasive, Inc.	Art Unit	: 3733
Patent No.	: 8,187,334	Examiner	: Stuart Samuel Bray
Issue Date	: May 29, 2012	Conf. No.	: 1151
Serial No.	: 13/079,645		
Filed	: April 4, 2011		
Title	: SYSTEMS AND METHODS FOR SPINAL FUSION		

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

CONSENT OF ASSIGNEE TO CORRECT INVENTORSHIP

As an officer of the concern to which the noted application has been assigned, I hereby consent to the correction of inventorship of this issued patent from the naming of MATTHEW CURRAN and MARK PETERSON to the naming of MATTHEW CURRAN, MARK PETERSON, and LUIZ PIMENTA.

Respectfully submitted,

Date: 4/16/13

Jonathan Spangler, Esq.
Vice President and Chief Patent Counsel
NuVasive, Inc.
7475 Lusk Boulevard
San Diego, CA 92121

Customer Number 26191
Fish & Richardson P.C.
Telephone: (612) 335-5070
Facsimile: (877) 769-7945

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	: Matthew Curran et al.	Art Unit	: 3733
Patent No.	: 8,187,334	Examiner	: STUART SAMUEL BRAY
Issue Date	: May 29, 2012	Conf. No.	: 1151
Serial No.	: 13/079,645		
Filed	: April 4, 2011		
Title	: SYSTEMS AND METHODS FOR SPINAL FUSION		

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

CERTIFICATE UNDER 37 CFR §3.73(b)

Under 37 CFR §3.73(b) NUVASIVE, INC., a corporation, certifies that it is the assignee of the entire right, title and interest in the patent application identified above by virtue of assignments from the inventors of the patent application identified above. The assignments were recorded in the Patent and Trademark Office at

Reel 028056, Frame 0268 on April 17, 2012; and

Reel 030212, Frame 0928 on April 15, 2013.

The undersigned, whose title is supplied below, is empowered to act on behalf of the assignee.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief and believed to be true; and further 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 and that such willful false statements may jeopardize the validity of the application or any patents issued thereon.

Respectfully submitted,

Date: 4/16/13

Jonathan Spangler, Esq.
Vice President and Chief Patent Counsel of
NuVasive, Inc.

Customer Number 26191
Fish & Richardson P.C.
Telephone: (612) 335-5070
Facsimile: (877) 769-7945

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	: NuVasive, Inc.	Art Unit	: 3733
Patent No.	: 8,187,334	Examiner	: Stuart Samuel Bray
Issue Date	: May 29, 2012	Conf. No.	: 1151
Serial No.	: 13/079,645		
Filed	: April 4, 2011		
Title	: SYSTEMS AND METHODS FOR SPINAL FUSION		

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

INVENTOR'S DECLARATION TO CORRECT INVENTORSHIP

I, MARK PETERSON declare:

1. That I am an original named inventor of the noted patent application.

2. That through error, without any deceptive intention on my part or that of any actual inventor, the above-captioned application was filed naming MATTHEW CURRAN and MARK PETERSON, rather than MATTHEW CURRAN, MARK PETERSON and LUIZ PIMENTA. This error was discovered after the application was filed.

3. That I hereby consent to the correction of inventorship to include LUIZ PIMENTA, as described in paragraph 2, hereinabove.

4. That all statements made herein of my own knowledge and true and that all statements made on information and belief are believed to be true and further that these statements are 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 and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: 4/7/13

MARK PETERSON
840 Royal Avenue, Suite #1
Medford, OR 97504
United States

Fish & Richardson P.C.
3200 RBC Plaza
60 South Sixth Street
Minneapolis, Minnesota 55402
Telephone: (612) 335-5070
Facsimile: (612) 288-9696

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	: NuVasive, Inc.	Art Unit	: 3733
Patent No.	: 8,187,334	Examiner	: Stuart Samuel Bray
Issue Date	: May 29, 2012	Conf. No.	: 1151
Serial No.	: 13/079,645		
Filed	: April 4, 2011		
Title	: SYSTEMS AND METHODS FOR SPINAL FUSION		

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

INVENTOR'S DECLARATION TO CORRECT INVENTORSHIP

I, MATTHEW CURRAN hereby declare:

1. That I am an original named inventor of the noted patent application.

2. That through error, without any deceptive intention on my part or that of any actual inventor, the above-captioned application was filed naming MATTHEW CURRAN and MARK PETERSON, rather than MATTHEW CURRAN, MARK PETERSON and LUIZ PIMENTA. This error was discovered after the application was filed.

3. That I hereby consent to the correction of inventorship to include LUIZ PIMENTA, as described in paragraph 2, hereinabove.

4. That all statements made herein of my own knowledge and true and that all statements made on information and belief are believed to be true and further that these statements are 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 and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: 7/27/13

MATTHEW CURRAN
3218 Rancho Quartillo
Carlsbad, CA 92009
United States

Fish & Richardson P.C.
3200 RBC Plaza
60 South Sixth Street
Minneapolis, Minnesota 55402
Telephone: (612) 335-5070
Facsimile: (612) 288-9696

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	: NuVasive, Inc.	Art Unit	: 3733
Patent No.	: 8,187,334	Examiner	: Stuart Samuel Bray
Issue Date	: May 29, 2012	Conf. No.	: 1151
Serial No.	: 13/079,645		
Filed	: April 4, 2011		
Title	: SYSTEMS AND METHODS FOR SPINAL FUSION		

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

INVENTOR'S DECLARATION TO CORRECT INVENTORSHIP

I, LUIZ PIMENTA hereby declare:

1. That I am an original named inventor of the noted patent application.

2. That through error, without any deceptive intention on my part or that of any actual inventor, the above-captioned application was filed naming MATTHEW CURRAN and MARK PETERSON, rather than MATTHEW CURRAN, MARK PETERSON and LUIZ PIMENTA. This error was discovered after the application was filed.

3. That all statements made herein of my own knowledge and true and that all statements made on information and belief are believed to be true and further that these statements are 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 and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: 03/05/13

LUIZ PIMENTA
Rua Vergueiro,1.421 – Top Towers Offices
Torre Sul – Sala 305 | Paraíso, 04101-000
São Paulo/Brasil

Fish & Richardson P.C.
3200 RBC Plaza
60 South Sixth Street
Minneapolis, Minnesota 55402
Telephone: (612) 335-5070
Facsimile: (612) 288-9696

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	: Matthew Curran et al.	Art Unit	: 3733
Patent No.	: 8,187,334	Examiner	: STUART SAMUEL BRAY
Issue Date	: May 29, 2012	Conf. No.	: 1151
Serial No.	: 13/079,645		
Filed	: April 4, 2011		

Title : SYSTEMS AND METHODS FOR SPINAL FUSION

Attn.: Certificate of Corrections Branch
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF REQUEST FOR CERTIFICATE OF CORRECTION

Applicant hereby requests that a certificate of correction be issued for the above patent in accordance with the attached request.

One or more of the errors sought to be corrected were made by Applicants, therefore please apply the $100 required fee of 37 CFR §1.20(a) together with any other charges or credits to Deposit Account 06-1050, referencing the above attorney docket number.

Respectfully submitted,

Date: April 17, 2013

/Michael T. Hawkins/
Michael T. Hawkins
Reg. No. 57,867

Customer Number 26191
Fish & Richardson P.C.
Telephone: (612) 335-5070
Facsimile: (877) 769-7945

60825542.doc

PTO/SB/44 (09-07)
Approved for use through 08/31/2013. OMB 0651-0033
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

(Also Form PTO-1050)

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 8,187,334

APPLICATION NO.: 13/079,645

ISSUE DATE: : May 29, 2012

INVENTOR(S) : Matthew Curran

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Title Page, Inventors, please insert -- Luiz Pimenta, Sao Paulo, Brasil --

MAILING ADDRESS OF SENDER (Please do not use customer number below):

Minneapolis Minneapolis, Minnesota 55402

Electronic Patent Application Fee Transmittal

Application Number:	13079645
Filing Date:	04-Apr-2011
Title of Invention:	SYSTEM AND METHODS FOR SPINAL FUSION
First Named Inventor/Applicant Name:	Matthew Curran
Filer:	Michael T. Hawkins/Beth Bauer
Attorney Docket Number:	104US2

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Certificate of Correction	1811	1	100	100
Processing Fee Correcting Inventorship	1816	1	130	130

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**230**

Electronic Acknowledgement Receipt

EFS ID:	15543814
Application Number:	13079645
International Application Number:	
Confirmation Number:	1151
Title of Invention:	SYSTEM AND METHODS FOR SPINAL FUSION
First Named Inventor/Applicant Name:	Matthew Curran
Customer Number:	26191
Filer:	Michael T. Hawkins/Beth Bauer
Filer Authorized By:	Michael T. Hawkins
Attorney Docket Number:	104US2
Receipt Date:	17-APR-2013
Filing Date:	04-APR-2011
Time Stamp:	16:06:27
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$230
RAM confirmation Number	3050
Deposit Account	061050
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)

1	Request under Rule 48 correcting inventorship	099001pet.pdf	62456 5430c9e2f630888b8205bdaca405e102d2b10b45	no	1
Warnings:					
Information:					
2	Oath or Declaration filed	0099001Pimentadec2.pdf	79436 2cb2c9bc7c654a24b18173fcb0f233da56285d6d	no	1
Warnings:					
Information:					
3	Oath or Declaration filed	0099001Currandec2.pdf	102893 2efed795c3283d78508f0c202cf87a27cd1d3b64	no	1
Warnings:					
Information:					
4	Oath or Declaration filed	0099001Peterson2.pdf	122123 ebcf2bfd02cf1f4f686fd654a23736f7ea9452e6	no	1
Warnings:					
Information:					
5	Request under Rule 48 correcting inventorship	099001Assignee2.pdf	62748 b2e8686f7ac3c00a544ce8a5c100cd1c26377c8b	no	1
Warnings:					
Information:					
6	Assignee showing of ownership per 37 CFR 3.73.	099001cert2.pdf	76028 03953fcb8dbdbccd6c9f1ba2c0ad11435beb3024	no	1
Warnings:					
Information:					
7	Request for Certificate of Correction	reqcoc.pdf	126004 d105148f9c52d8d8fb70e99f532d82f64196f21b	no	2
Warnings:					
Information:					
8	Fee Worksheet (SB06)	fee-info.pdf	31815 0e48199664d9df89e31b1ca378eacf9ebdf82976	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	663503		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Document code: WFEE

United States Patent and Trademark Office
Sales Receipt for Accounting Date: 05/22/2013

ABALINAN SALE #00000020 Mailroom Dt: 04/17/2013 061050 13079645
01 FC : 1053 140.00 DA

Document code: WFEE

United States Patent and Trademark Office
Sales Receipt for Accounting Date: 05/22/2013

ABALINAN ADJ #00000016 Mailroom Dt: 04/17/2013
Seq No: 3050 Sales Acctg Dt: 04/18/2013 061050 13079645
02 FC : 1816 130.00 CR

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO.	: 8,187,334 B2
APPLICATION NO.	: 13/079645
DATED	: May 29, 2012
INVENTOR(S)	: Matthew Curran and Mark Peterson

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 13, Line 46 (Claim 15), delete "aid" and insert -- said --, therefor.

Signed and Sealed this
Seventh Day of August, 2012

David J. Kappos

David J. Kappos
Director of the United States Patent and Trademark Office

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	: Matthew Curran et al.	Art Unit	: 3733
Patent No.	: 8,187,334	Examiner	: STUART SAMUEL BRAY
Issue Date	: May 29, 2012	Conf. No.	: 1151
Serial No.	: 13/079,645		
Filed	: April 4, 2011		

Title : SYSTEMS AND METHODS FOR SPINAL FUSION

Attn.: Certificate of Corrections Branch
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF REQUEST FOR CERTIFICATE OF CORRECTION

Applicant hereby requests that a certificate of correction be issued for the above patent in accordance with the attached request.

One or more of the errors sought to be corrected were made by applicant. The fees in the amount of $100 are being paid concurrently herewith.

Please apply any other necessary charges or credits to Deposit Account 06- 1050, referencing the above attorney docket number.

Respectfully submitted,

Date: June 18, 2012

/Michael T. Hawkins/
Michael T. Hawkins
Reg. No. 57,867

Customer Number 26191
Fish & Richardson P.C.
Telephone: (612) 335-5070
Facsimile: (877) 769-7945

60776921.doc

Staple Here Only

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. .: 8,187,334

APPLICATION NO .: 13/079,645

DATED .: MAY 29, 2012

INVENTOR(S) .: MATTHEW CURRAN AND MARK PETERSON

It is certified that an error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 13, Line 46 (Claim 15), delete “aid” and insert - - said - -, therefor.

MAILING ADDRESS OF SENDER:

Michael T. Hawkins
Fish & Richardson P.C.
P.O. Box 1022
Minneapolis, Minnesota 55440-1022

Electronic Patent Application Fee Transmittal

Application Number:	13079645
Filing Date:	04-Apr-2011
Title of Invention:	SYSTEM AND METHODS FOR SPINAL FUSION
First Named Inventor/Applicant Name:	Matthew Curran
Filer:	Michael T. Hawkins/Kayla Olson
Attorney Docket Number:	104US2

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Certificate of correction	1811	1	100	100
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
			Total in USD ($)	**100**

Electronic Acknowledgement Receipt

EFS ID:	13037898
Application Number:	13079645
International Application Number:	
Confirmation Number:	1151
Title of Invention:	SYSTEM AND METHODS FOR SPINAL FUSION
First Named Inventor/Applicant Name:	Matthew Curran
Customer Number:	26191
Filer:	Michael T. Hawkins/Kayla Olson
Filer Authorized By:	Michael T. Hawkins
Attorney Docket Number:	104US2
Receipt Date:	18-JUN-2012
Filing Date:	04-APR-2011
Time Stamp:	14:09:19
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$100
RAM confirmation Number	365
Deposit Account	061050
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)

1	Request for Certificate of Correction	TransCOC.pdf	109283 85f277e27e62a832eada7675bff25b99cf77e560	no	2
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30180 03a5eb4bb425207b4e731a74adea344b4692e103	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	139463	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

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New International Application Filed with the USPTO as a Receiving Office

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UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/079,645	05/29/2012	8187334	104US2	1151

26191 7590 05/09/2012

FISH & RICHARDSON P.C. (TC)
PO BOX 1022
MINNEAPOLIS, MN 55440-1022

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Matthew Curran, Carlsbad, CA;
Mark Peterson, Medford, OR;

PTO/SB/08a (01-08)
Approved for use through 05/31/2008. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

	Complete if Known
Application Number	13/079,645
Filing Date	April 4, 2011
First Named Inventor	Matthew Curran
Art Unit	3733
Examiner Name	Stuart Samuel Bray

Sheet	**2**	**of**	**8**	**Attorney Docket No:** 104US2

Change(s) applied to document,
/C.M.V./
4/26/2012

US PATENT DOCUMENTS

Examiner Initial *	Cite No	Document Number	Publication Date	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		5,284,153	Feb 8, 1994	Raymond, S.A., et al.	
		5,290,494	Mar 1, 1994	Coombes, et al.	
		5,300,076	Apr. ~~May~~ 5, 1994	Leriche	
		5,304,210	Apr 19, 1994	Crook	
		5,306,307	Apr 26, 1994	Senter, et al.	
		5,306,309	Apr 26, 1994	Wagner, et al.	
		5,322,505	Jun 21, 1994	Krause, Kenneth W., et al.	
		5,334,205	Aug 2, 1994	Cain	
		5,336,223	Aug 9, 1994	Rogers	
		5,364,400	Nov 15, 1994	Rego, Jr., et al.	
		5,395,372	Mar 7, 1995	Holt, et al.	
		5,397,363	Mar 14, 1995	Gelbard	
		5,397,364	Mar 14, 1995	Kozak	
		5,405,391	Apr 11, 1995	Henderson, et al.	
		5,413,602	May 9, 1995	Metz-Stavenhagen	
		5,425,772	Jun 20, 1995	Brantigan	
		5,431,658	Jul 11, 1995	Moskovich	
		5,443,514	Aug 22, 1995	Steffee	
		5,443,515	Aug 22, 1995	Cohen, et al.	
		5,445,639	Aug 29, 1995	Kuslich, et al.	
		5,454,811	Oct 3, 1995	Huebner	
		5,458,638	Oct 17, 1995	Kuslich, et al.	
		5,484,403	Jan 16, 1996	Yoakum, et al.	
		5,484,437	Jan 16, 1996	Michelson, Gary K.	
		5,489,307	Feb 6, 1996	Kuslich, et al.	
		5,489,308	Feb 6, 1996	Kuslich, et al.	
		5,514,180	May 7, 1996	Heggeness, M.H., et al.	
		5,522,879	Jun 4, 1996	Scopelianos	
		5,522,899	Jun 4, 1996	Michelson	
		5,524,624	Jun 11, 1996	Tepper, et al.	
		5,527,312	Jun 18, 1996	Ray	
		5,534,030	Jul 9, 1996	Navarro, et al.	
		5,540,688	Jul 30, 1996	Navas, Fernand	
		5,545,222	Aug 13,1996	Bonutti	
		5,562,736	Oct 8, 1996	Ray, et al.	
		5,565,005	Oct. 15, 1996	Erickson, et al.	
		5,571,190	Nov 5, 1996	Ulrich	

EXAMINER **DATE CONSIDERED**

Substitute Disclosure Statement Form (PTO-1449)
* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional) 2 Applicant is to place a check mark here if English language Translation is attached

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /S.B./

PTO/SB/08a (01-08)
Approved for use through 05/31/2008. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

	Complete if Known
Application Number	13/079,645
Filing Date	April 4, 2011
First Named Inventor	Matthew Curran
Art Unit	3733
Examiner Name	Stuart Samuel Bray

Sheet	**1**	**of**	**8**	**Attorney Docket No:** 104US2

Change(s) applied to document, /C.M.V./ 4/26/2012

US PATENT DOCUMENTS

Examiner Initial *	Cite No	Document Number	Publication Date	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		2002/0058950	May 16, 2002	Winterbottom, et al.	
		2003/0105528	Jun 5, 2003	Shimp, et al.	
		3,486,505	Dec 30, 1969	Morrison, Gordon M.	
		3,518,993	Jul 7, 1970	Blake, Lawrence W.	
		3,604,487	Sep 14, 1971	Gilbert, Richard S.	
		3,745,995	Jul 17, 1973	Kraus	
		3,848,601	Nov 19, 1974	Ma, et al.	
		3,867,728	Feb 25, 1975	Stubstad, et al.	
		4,026,304	May 31, 1977	Levy	
		4,026,305	May 31, 1977	Brownlee, et al.	
		~~4,454,374~~	Oct 8, 1985	Jacobson	4545374
		4,501,269	Feb 26, 1985	Bagby	
		4,646,738	Mar 3, 1987	Trott, Arthur F.	
		4,657,550	Apr 14, 1987	Daher	
		4,743,256	May 10, 1988	Brantigan	
		4,781,591	Nov 1, 1988	Allen	
		4,834,757	May 30, 1989	Brantigan	
		4,877,020	Oct 31, 1989	Vich	
		4,878,915	Nov 7, 1989	Brantigan	
		4,932,975	Jun 12, 1990	Main, et al.	
		4,950,296	Aug 21, 1990	McIntyre, J. L.	
		4,961,740	Oct 9, 1990	Ray, et al.	
		4,962,766	Oct 16, 1990	Herzon, G.D.	
		5,015,247	May 14, 1991	Michelson	
		5,026,373	Jun 25, 1991	Ray, et al.	
		5,047,055	Sep 10, 1991	Bao et al.	
		5,055,104	Oct 8, 1991	Ray	
		5,062,845	Nov 5, 1991	Kuslich, et al.	
		5,071,437	Dec 10, 1991	Steffee	
		5,092,572	Mar 3, 1992	Litwak, et al.	
		5,133,717	Jul 28, 1992	Chopin	
		5,133,755	Jul 28, 1992	Brekke	
		5,171,278	Dec 15, 1992	Pisharodi	
		5,192,327	Mar 9, 1993	Brantigan, John W.	
		5,217,497	Jun 8, 1993	Mehdian	
		5,263,953	Nov 23, 1993	Bagby	
		5,269,785	Dec 14, 1993	Bonutti	

EXAMINER **DATE CONSIDERED**

Substitute Disclosure Statement Form (PTO-1449)
* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional) 2 Applicant is to place a check mark here if English language Translation is attached

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /S.B./

Issue Classification

Application/Control No.	Applicant(s)/Patent Under Reexamination
13079645	CURRAN ET AL.
Examiner	**Art Unit**
STUART S BRAY	3733

ORIGINAL		INTERNATIONAL CLASSIFICATION	
CLASS	SUBCLASS	CLAIMED	NON-CLAIMED
623	17.16	A 6 1 F 2 / 44 (2006.01.01)	

CROSS REFERENCE(S)

CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
	1		17	5	33	25	49								
	2		18	18	34	26	50								
	3		19	19	35	27	51								
	4		20	20	36	14	52								
	5		21	21	37	15	53								
	6		22	22	38	28	54								
	7		23	23	39										
	8		24	6	40										
	9		25	7	41										
	10		26	8	42										
	11	1	27	9	43										
	12	16	28	10	44										
	13	17	29	11	45										
	14	2	30	12	46										
	15	3	31	13	47										
	16	4	32	24	48										

/STUART S BRAY/ Examiner.Art Unit 3733	04/05/2012	**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	28	
/EDUARDO C ROBERT/ Supervisory Patent Examiner.Art Unit 3733	04/06/2012	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	27	2

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13079645	CURRAN ET AL.
	Examiner	**Art Unit**
	STUART S BRAY	3733

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	03/13/2012	04/05/2012							
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Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13079645	CURRAN ET AL.
	Examiner	**Art Unit**
	STUART S BRAY	3733

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
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14	52		=							
15	53		=							
28	54		=							

Issue Classification

Application/Control No.	Applicant(s)/Patent Under Reexamination
13079645	CURRAN ET AL.
Examiner	**Art Unit**
STUART S BRAY	3733

ORIGINAL		INTERNATIONAL CLASSIFICATION										
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623	17.16	A	6	1	F	2 / 44 (2006.01.01)						

CROSS REFERENCE(S)					
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Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
	1		17	5	33	25	49								
	2		18	18	34	26	50								
	3		19	19	35	27	51								
	4		20	20	36	14	52								
	5		21	21	37	15	53								
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	14	2	30	12	46										
	15	3	31	13	47										
	16	5	32	24	48										

/STUART S BRAY/ Examiner.Art Unit 3733	04/05/2012	**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	28	
/EDUARDO C ROBERT/ Supervisory Patent Examiner.Art Unit 3733	04/06/2012	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	27	2

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13079645	CURRAN ET AL.
	Examiner	**Art Unit**
	STUART S BRAY	3733

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	03/13/2012	04/05/2012							
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Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13079645	CURRAN ET AL.
	Examiner	**Art Unit**
	STUART S BRAY	3733

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
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25	49		=							
26	50		=							
27	51		=							
14	52		=							
15	53		=							
28	54		=							

PART B – FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571) 273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 4 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Legibly mark-up with any corrections or use Block 1)

26191 7590 04/17/2012

FISH & RICHARDSON P.C.
P.O. Box 1022
Minneapolis, MN 55440-1022

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/079,645	**04/04/2011**	**Matthew Curran**	**13958-0099001**	**1151**

TITLE OF INVENTION: **SYSTEMS AND METHODS FOR SPINAL FUSION**

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	**NO**	**$1740**	$300	**$2040**	**07/17/2012**

EXAMINER	ART UNIT	CLASS-SUBCLASS
BRAY, STUART SAMUEL	**3733**	**623-017160**

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

[ ] Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

[ ] "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1. **Fish & Richardson P.C.**
2. _____
3. _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. Inclusion of assignee data is only appropriate when an assignment has been previously submitted to the USPTO or is being submitted under separate cover. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE (CITY and STATE OR COUNTRY)

NuVasive, Inc. **San Diego, CA**

Please check the appropriate assignee category or categories (will not be printed on the patent): [ ] individual [X] corporation or other private group entity [ ] government

4a. The following fee(s) are enclosed:
[X] Issue Fee
[X] Publication Fee (No small entity discount permitted)
[ ] Advance Order - # of Copies _____

4b. Payment of Fee(s):
[ ] A check in the amount of the fee(s) is enclosed.
[ ] Payment by credit card. Form PTO-2038 is attached.
[X] The Director is hereby authorized to charge the required fee(s), or credit any overpayment, to Deposit Account Number 06-1050 (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

[ ].a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. [ ]b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

The Director of the USPTO is requested to apply the Issue Fee and Publication Fee (if any) or to re-apply any previously paid issue fee to the application identified above.
NOTE: The issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant, a registered agent or; or the assignee or other party in interest as shown by the records of the Untied States Patent and Trademark Office.

(Authorized Signature) /Michael T. Hawkins/ (Date) **April 18, 2012**

Typed or Printed Name **Michael T. Hawkins** Registration No. 57,867

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

TRANSMIT THIS FORM WITH FEE(S)

Electronic Patent Application Fee Transmittal

Application Number:	13079645
Filing Date:	04-Apr-2011
Title of Invention:	SYSTEM AND METHODS FOR SPINAL FUSION
First Named Inventor/Applicant Name:	Matthew Curran
Filer:	Michael T. Hawkins/Kayla Olson
Attorney Docket Number:	104US2

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl issue fee	1501	1	1740	1740
Publ. Fee- early, voluntary, or normal	1504	1	300	300

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**2040**

Electronic Acknowledgement Receipt

EFS ID:	12567528
Application Number:	13079645
International Application Number:	
Confirmation Number:	1151
Title of Invention:	SYSTEM AND METHODS FOR SPINAL FUSION
First Named Inventor/Applicant Name:	Matthew Curran
Customer Number:	26191
Filer:	Michael T. Hawkins/Elizabeth Doherty
Filer Authorized By:	Michael T. Hawkins
Attorney Docket Number:	104US2
Receipt Date:	18-APR-2012
Filing Date:	04-APR-2011
Time Stamp:	12:30:02
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$2040
RAM confirmation Number	9924
Deposit Account	061050
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)

1	Post Allowance Communication - Incoming	ResponseNOA.pdf	62789 70a03ee5a45be1198600729880fb94fff1153f22	no	1
Warnings:					
Information:					
2	Issue Fee Payment (PTO-85B)	IFTransmittal.pdf	89101 e662f6122187d71adfa086dace1c503c7d5892ce	no	1
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	31931 156184b6df7a85617fb817752937a407f80285b2	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	183821		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	: Matthew Curran et al.	Art Unit	: 3733
Serial No.	: 13/079,645	Examiner	: STUART SAMUEL BRAY
Filed	: April 4, 2011	Confirmation No.:	1151
		Notice of Allowance Date:	April 17, 2012
Title	: SYSTEMS AND METHODS FOR SPINAL FUSION		

MAIL STOP ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RESPONSE TO NOTICE OF ALLOWANCE

In response to the Notice of Allowance mailed April 17, 2012, enclosed is a completed issue fee transmittal form PTOL-85b. Applicant recognizes that in accordance with M.P.E.P. § 1302.14, the Examiner's reasons for allowance need not set forth all of the details as to why the claims are allowed. In the above-referenced application, Applicant does not concede that the Examiner's stated reasons for allowance are the only reasons for which the claims are allowable. Applicant agrees that the particular combination of claim elements identified in the Examiner's reasons for allowance are not disclosed or suggested by the prior art of record, yet the claims are patentable for other reasons—including the inventive combination of all of the recited claim elements.

The issue fee and publication fees in the amount of $2040 are being paid concurrently herewith. In addition, please apply any other necessary charges or credits to Deposit Account 06-1050, referencing the above attorney docket number.

Respectfully submitted,

Date: April 18, 2012

/Michael T. Hawkins/
Michael T. Hawkins
Reg. No. 57,867

Customer Number 26191
Fish & Richardson P.C.
Telephone: (612) 335-5070
Facsimile: (877) 769-7945

60765819.doc

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

26191 7590 04/17/2012
FISH & RICHARDSON P.C. (TC)
PO BOX 1022
MINNEAPOLIS, MN 55440-1022

EXAMINER
BRAY, STUART SAMUEL

ART UNIT	PAPER NUMBER
3733	

DATE MAILED: 04/17/2012

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/079,645	04/04/2011	Matthew Curran	104US2	1151

TITLE OF INVENTION: SYSTEM AND METHODS FOR SPINAL FUSION

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1740	$300	$0	$2040	07/17/2012

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

26191 7590 04/17/2012
FISH & RICHARDSON P.C. (TC)
PO BOX 1022
MINNEAPOLIS, MN 55440-1022

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/079,645	04/04/2011	Matthew Curran	104US2	1151

TITLE OF INVENTION: SYSTEM AND METHODS FOR SPINAL FUSION

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1740	$300	$0	$2040	07/17/2012

EXAMINER	ART UNIT	CLASS-SUBCLASS
BRAY, STUART SAMUEL	3733	623-017160

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:
- ❑ Issue Fee
- ❑ Publication Fee (No small entity discount permitted)
- ❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ❑ A check is enclosed.
- ❑ Payment by credit card. Form PTO-2038 is attached.
- ❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ❑ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.
- ❑ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/079,645	04/04/2011	Matthew Curran	104US2	1151

26191 7590 04/17/2012
FISH & RICHARDSON P.C. (TC)
PO BOX 1022
MINNEAPOLIS, MN 55440-1022

EXAMINER	
BRAY, STUART SAMUEL	
ART UNIT	PAPER NUMBER
3733	

DATE MAILED: 04/17/2012

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 0 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 0 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No.	Applicant(s)	
	13/079,645	CURRAN ET AL.	
	Examiner	Art Unit	
	STUART S. BRAY	3733	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *Amendment 4/4/2012*.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☒ The allowed claim(s) is/are *27-54*.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 3/23/2012 3/29/2012
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date *20120405* .
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

/STUART S BRAY/ Examiner, Art Unit 3733	/EDUARDO C. ROBERT/ Supervisory Patent Examiner, Art Unit 3733

Examiner-Initiated Interview Summary	Application No.	Applicant(s)	
	13/079,645	CURRAN ET AL.	
	Examiner	Art Unit	
	STUART S. BRAY	3733	

All participants (applicant, applicant's representative, PTO personnel):

(1) *STUART S. BRAY*.

(3) *Michael Hawkins*.

(2) _____.

(4) _____.

Date of Interview: *05 April 2012*.

Type: ☒ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☒ No.
If Yes, brief description: _____.

Issues Discussed ☐101 ☐112 ☐102 ☐103 ☒Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: *54*.

Identification of prior art discussed: *parent application 11/093409 now patent 7,918,891*.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

Examiner contacted Applicant's representative to discuss differences between the present claims and the allowed claims in the parent application. Atty Hawkins identified several structural differences in claim 27, regarding the length and width of the central portion and the longitudinal length of the aperture that are not claimed in the parent application. Examiner also pointed out a dependency problem with claim 54. Atty Hawkins agreed to an Examiner's Amendment changing the dependency of claim 54 in order to place the application in condition for allowance. .

Applicant recordation instructions: It is not necessary for applicant to provide a separate record of the substance of interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

/STUART S BRAY/ Examiner, Art Unit 3733	

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Michael Hawkins on 4/5/2012.

In claim 27,

Line 14, - - greater than 40mm - - is **inserted** between "a longitudinal length" and "extending from a proximal end".

In claim 54,

Line 1, "claim 54" is **replaced with** - - claim 27 - -.

REASONS FOR ALLOWANCE

The following is an examiner's statement of reasons for allowance: the claims in the instant application have not been rejected using prior art because no reference or reasonable combination thereof could be found which disclose or suggest a spinal fusion implant comprising upper and lower surfaces with anti-migration elements, distal, proximal, and side walls comprising radiolucent materials, a first fusion aperture with a longitudinal length extending parallel to the longitudinal length of the implant, the central

portion defines a maximum lateral width between first and second sidewall, and at least three radiopaque markers, as set forth in claim 27.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to STUART S. BRAY whose telephone number is (571)270-7648. The examiner can normally be reached on Mon-Thurs 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, ***please contact the examiner's supervisor, Eduardo C. Robert, at* 571-272-4719**. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

If there are any inquiries that are not being addressed by first contacting the Examiner or the Supervisor, you may send an email inquiry to TC3700_Workgroup_D_Inquiries@uspto.gov.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/STUART S BRAY/
Examiner, Art Unit 3733

/EDUARDO C. ROBERT/

Supervisory Patent Examiner, Art Unit 3733

Notice of References Cited	Application/Control No. 13/079,645	Applicant(s)/Patent Under Reexamination CURRAN ET AL.	
	Examiner STUART S. BRAY	Art Unit 3733	Page 1 of 1

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*	B	US-4,349,921	09-1982	Kuntz, J. David	623/17.16
*	C	US-5,797,917	08-1998	Boyd et al.	606/99
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	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

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*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet	**1**	**of**	**8**

Complete if Known

Application Number	13/079,645
Filing Date	April 4, 2011
First Named Inventor	Matthew Curran
Art Unit	3733
Examiner Name	Stuart Samuel Bray
Attorney Docket No:	104US2

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Examiner Initial *	Cite No	Document Number	Publication Date	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
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Art Unit	3733
Examiner Name	Stuart Samuel Bray
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Sheet	**6**	**of**	**8**	**Attorney Docket No:** 104US2

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Examiner Initials*	Cite No	Foreign Patent Document	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[2]
		CA 2015507	Jan 5, 1999	Kuslich, et al.		
		EP 0369603	May 23, 1990	Ray		
		EP 0517030	May 19, 1992	Siebels		
		EP 0667127	Aug 16, 1995	Sanders		
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		EP 0737448	Oct 16, 1996	Jackson, et al.		
		EP 0796593	Sep 24, 1997	Mitchell, et al.		
		EP 0809974	Apr 15, 1998	Benzel, et al.		
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		EP 0811356	Apr 15, 1998	Glascott, et al.		
		EP 0880938	Feb 12, 1998	Castro, et al.		
		WO 00/45712	Aug 10, 2000	Steiner, et al.		
		WO 00/45713	Aug 10, 2000	Steiner, et al.		
		WO 01/41681	Jun 14, 2001	Corwall, et al.		
		WO 01/49333	Jul 12, 2001	Shimp, et al.		
		WO 90/00037	Jan 11, 1990	Michelson		
		WO 91/06261	May 16, 1992	Ray, Charles, et al.		
		WO 92/14423	Sep 3, 1992	Pisharodi		

EXAMINER **DATE CONSIDERED**

Substitute Disclosure Statement Form (PTO-1449)

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional) 2 Applicant is to place a check mark here if English language Translation is attached

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /S.B./

PTO/SB/08a (01-08)
Approved for use through 05/31/2008. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Complete if Known	
Application Number	13/079,645
Filing Date	April 4, 2011
First Named Inventor	Matthew Curran
Art Unit	3733
Examiner Name	Stuart Samuel Bray

Sheet	**7**	**of**	**8**	**Attorney Docket No:** 104US2

		WO 94/04100	Mar 3, 1994	Mazda, et al.		
		WO 94/10928	May 26, 1994	Hopf, Christoph		
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OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	**Cite No [1]**	**Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.**	**T[2]**
		ALLEYNE, CARGILL, H., et al., "Current and future approaches to lumbar disc surgery: A literature review", Medscape Orthopedics & Sports Medicine, 1, [www.medscape.com/Medscape/OrthoSportsMed/1997/v01.n11/…/mos3057], (1997)	
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EXAMINER **DATE CONSIDERED**

Substitute Disclosure Statement Form (PTO-1449)
* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional) [2] Applicant is to place a check mark here if English language Translation is attached

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PTO/SB/08a (01-08)
Approved for use through 05/31/2008. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet	**8**	**of**	**8**	**Attorney Docket No:**	104US2

Complete if Known	
Application Number	13/079,645
Filing Date	April 4, 2011
First Named Inventor	Matthew Curran
Art Unit	3733
Examiner Name	Stuart Samuel Bray

OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS			
		KEMP, H. B. S., "Anterior fusion of the spine for infective lesions in adults", Journal of Bone & Joint Surgery, 55B(4):715-734 (1973)	
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EXAMINER /Stuart Bray/ **DATE CONSIDERED** 04/05/2012

Substitute Disclosure Statement Form (PTO-1449)
[1] EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional) [2] Applicant is to place a check mark here if English language Translation is attached

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BIB DATA SHEET

CONFIRMATION NO. 1151

SERIAL NUMBER	FILING or 371(c) DATE RULE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
13/079,645	04/04/2011	623	3733	104US2

APPLICANTS

Matthew Curran, Carlsbad, CA;
Mark Peterson, Medford, OR;

**** CONTINUING DATA ***************************

This application is a CON of 11/093,409 03/29/2005 PAT 7,918,891
which claims benefit of 60/557,536 03/29/2004

**** FOREIGN APPLICATIONS ***************************

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ****

04/13/2011

Foreign Priority claimed	35 USC 119(a-d) conditions met	Verified and Acknowledged	Met after Allowance	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
☐ Yes ☑ No	☐ Yes ☐ No	/STUART SAMUEL BRAY/ Examiner's Signature	☐ Initials	CA	20	26	2

ADDRESS

FISH & RICHARDSON P.C. (TC)
PO BOX 1022
MINNEAPOLIS, MN 55440-1022
UNITED STATES

TITLE

System and Methods for Spinal Fusion

FILING FEE RECEIVED		
1700	FEES: Authority has been given in Paper No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit

BIB (Rev. 05/07).

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	: Matthew Curran et al.	Art Unit	: 3733
Serial No.	: 13/079,645	Examiner	: STUART SAMUEL BRAY
Filed	: April 4, 2011	Conf. No.	: 1151
Title	: SYSTEMS AND METHODS FOR SPINAL FUSION		

MAIL STOP AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

Please consider the references listed on the enclosed PTO-1449 form. Non-patent literature is enclosed; cited U.S. patents and patent application publications will be provided on request.

This statement is being filed within three months of the filing date of the application or before the receipt of a first Office Action on the merits. Please apply any necessary charges or credits to Deposit Account 06-1050, referencing the above attorney docket number.

Respectfully submitted,

Date: March 29, 2012

/Michael T. Hawkins/
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Substitute Form PTO-1449 (Modified)	U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No. 13958-0099001	Application No. 13/079,645
Information Disclosure Statement by Applicant (Use several sheets if necessary)		Applicant Matthew Curran et al.	
(37 CFR §1.98(b))		Filing Date April 4, 2011	Group Art Unit 3733

U.S. Patent Documents

Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
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	2	5,942,698	8/24/1999	Stevens			
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Foreign Patent Documents or Published Foreign Patent Applications

Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Class	Subclass	Translation Yes	Translation No

Other Documents (include Author, Title, Date, and Place of Publication)

Examiner Initial	Desig. ID	Document
	12	CoRoent™ Marketing Brochure (9004001 A.0), NuVasive, Inc., 2004, 2 pages
	13	CoRoent™ Marketing Brochure (9004001 C.0), NuVasive, Inc., 2005, 2 pages
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	15	CoRoent® XL & XLR Marketing Brochure (9004225 B.0), NuVasive, Inc., 2006, 2 pages
	16	CoRoent® XL & XLR Marketing Brochure (9004225 C.0), NuVasive, Inc., 2007, 2 pages
	17	CoRoent® XL Marketing Brochure (9500039 A.0), NuVasive, Inc., 2006, 8 pages

Examiner Signature	/Stuart Bray/	Date Considered	04/05/2012

EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Substitute Disclosure Form (PTO-1449)

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /S.B./

Issue Classification

Application/Control No.	Applicant(s)/Patent Under Reexamination
13079645	CURRAN ET AL.
Examiner	**Art Unit**
STUART S BRAY	3733

ORIGINAL		INTERNATIONAL CLASSIFICATION										
CLASS	SUBCLASS	CLAIMED					NON-CLAIMED					
623	17.16	A	6	1	F	2 / 44 (2006.01.01)						

CROSS REFERENCE(S)					
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
	1		17	4	33	25	49								
	2		18	18	34	26	50								
	3		19	19	35	27	51								
	4		20	20	36	14	52								
	5		21	21	37	15	53								
	6		22	22	38	28	54								
	7		23	23	39										
	8		24	6	40										
	9		25	7	41										
	10		26	8	42										
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	12	16	28	10	44										
	13	17	29	11	45										
	14	2	30	12	46										
	15	5	31	13	47										
	16	3	32	24	48										

/STUART S BRAY/ Examiner.Art Unit 3733	04/05/2012	**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	28	
/EDUARDO C ROBERT/ Supervisory Patent Examiner.Art Unit 3733	04/06/2012	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	27	2

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13079645	CURRAN ET AL.
	Examiner	Art Unit
	STUART S BRAY	3733

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	03/13/2012	04/05/2012							
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19	35		=							
20	36		=							

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13079645	CURRAN ET AL.
	Examiner	**Art Unit**
	STUART S BRAY	3733

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	03/13/2012	04/05/2012							
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28	54		=							

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13079645	CURRAN ET AL.
	Examiner	Art Unit
	STUART S BRAY	3733

SEARCHED			
Class	Subclass	Date	Examiner
623	17.11-17.16	4/5/2012	SSB

SEARCH NOTES		
Search Notes	Date	Examiner
reviewed office actions of allowed parent case 11/093409	4/5/2012	SSB
reviewed allowed claims for double patenting	4/5/2012	SSB

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner
	Interference search printout	4/5/2012	SSB

/STUART S BRAY/ Examiner.Art Unit 3733	

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	199	("20020058950" | "20030105528" | "3486505" | "3518993" | "3604487" | "3745995" | "3848601" | "3867728" | "4026304" | "4026305" | "4454374" | "4501269" | "4646738" | "4657550" | "4743256" | "4781591" | "4834757" | "4877020" | "4878915" | "4932975" | "4950296" | "4961740" | "4962766" | "5015247" | "5026373" | "5047055" | "5055104" | "5062845" | "5071437" | "5092572" | "5133717" | "5133755" | "5171278" | "5192327" | "5217497" | "5263953" | "5269785" | "5284153" | "5290494" | "5300076" | "5304210" | "5306307" | "5306309" | "5322505" | "5334205" | "5336223" | "5364400" | "5395372" | "5397363" | "5397364" | "5405391" | "5413602" | "5425772" | "5431658" | "5443514" | "5443515" | "5445639" | "5454811" | "5458638" | "5484403" | "5484437" | "5489307" | "5489308" | "5514180" | "5522879" | "5522899" | "5524624" | "5527312" | "5534030" | "5540688" | "5545222" | "5562736" | "5565005" | "5571190" | "5571192" | "5593409" | "5609636" | "5611800" | "5611810" | "5632747" | "5645598" | "5653731" | "5653762" | "5658336" | "5658337" | "5662710" | "5665122" | "5669909" | "5676703" | "5683394" | "5683400" | "5683464" | "5690629" | "5700264" | "5700291" | "5700292" | "5702449" | "5702451" | "5702453" | "5702454" | "5702455" | "5703451" | "5707373" | "5711957" | "5716415" | "5720748" | "5720751" | "5728159" | "5741253" | "5741261" | "5755797" | "5766252" | "5772661" | "5775331" | "5779642" | "5782830" | "5782919" | "5785710" | "5797909" | "5800549" | "5800550" | "5814084" | "5851208" | "5860973" | "5865845" | "5865848" | "5885299" | "5888219" | "5888224" | "5893890" | "5904719" | "5910315" | "5954769" | "5968098" | "5993474" | "6004326" | "6008433" | "6015436" | "6033405" | "6039761" | "6042582" | "6045580" | "6048342" | "6059829" | "6063088" | "6083225" | "6096080" | "6102948" | "6120503" | "6120506" | "6132472" | "6159211" | "6159215" | "6193756" | "6200347" | "6224607" | "6224631" | "6241769" | "6241771" |	US-PGPUB; USPAT; USOCR	OR	OFF	2012/04/05 11:08

		"6251140" | "6258125" | "6277149" | "6319257" | "6371989" | "6383221" | "6409766" | "6432140" | "6440142" | "6442814" | "6454806" | "6468311" | "6491724" | "6527773" | "6547823" | "6595998" | "6626905" | "6635086" | "6648895" | "6672019" | "6676703" | "6706067" | "6743255" | "6746484" | "6755841" | "6761739" | "6824564" | "6942698" | "6964687" | "6979353" | "6984245" | "6986788" | "6989031" | "7018416" | "D472634" | "D473650" | "D503801" | "D530423").PN.				
L2	2626	(623/17.16).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/04/05 11:43
L3	2626	(623/17.16).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/04/05 12:41
L4	1	("20020116008").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/04/05 13:36
L5	1	(11/093409).APP.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/04/05 13:39
L6	5706	(623/17.11-17.16).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/04/05 13:39

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L7	0	(implant and upper and lower and anti-migration and surface and radiopaque and length and central).clm.	US-PGPUB	OR	OFF	2012/04/05 13:52
L8	1	(implant and upper and lower and surface and radiopaque and length and central).clm.	US-PGPUB	OR	OFF	2012/04/05 13:52

4/5/2012 1:55:26 PM
C:\Users\sbray1\Documents\EAST\Workspaces\13079645.wsp

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	: Matthew Curran et al.	Art Unit	: 3733
Serial No.	: 13/079,645	Examiner	: STUART SAMUEL BRAY
Filed	: April 4, 2011	Conf. No.	: 1151
Title	: SYSTEMS AND METHODS FOR SPINAL FUSION		

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

PRELIMINARY AMENDMENT

Prior to examination, please amend the application as indicated on the following pages.

CERTIFICATE OF (A) MAILING BY FIRST CLASS MAIL OR (B) TRANSMISSION
I hereby certify under 37 CFR §1.8(a) that this correspondence is either (A) addressed as set out in 37 CFR §1.1(a) and being deposited with the United States Postal Service as first class mail with sufficient postage, or (B) being transmitted by facsimile in accordance with 37 CFR § 1.6(d) or via the Office electronic filing system in accordance with 37 CFR § 1.6(a)(4), on the date indicated below.

April 4, 2012
Date of Deposit or Transmission

/Anne Roy?
Signature

Anne ROy
Typed or Printed Name of Person Signing Certificate

Amendments to the Specification:

Please replace the paragraph beginning at page 4, line 13 with the following amended paragraph:

The spinal fusion implant of the present invention may be provided in any number of suitable shapes and sizes depending upon the particular surgical procedure or need. The spinal fusion implant of the present invention may be dimensioned for use in the cervical and/or lumbar spine without departing from the scope of the present invention. For lumbar fusion, the spinal fusion implant of the present invention may be dimensioned, by way of example only, having a width ~~length~~ ranging between 9 and 18 mm, a height ranging between 8 and 16 mm, and a length ~~width~~ ranging between 25 and 45 mm. For cervical fusion, the spinal fusion implant of the present invention may be dimensioned, by way of example only, having a width ~~length~~ about 11 mm, a height ranging between 5 and 12 mm, and a length ~~width~~ about 14 mm.

Please replace the paragraph beginning at page 5, line 1 with the following amended paragraph:

The spinal fusion implant of the present invention may be provided with any number of additional features for promoting fusion, such as apertures extending between the upper and lower vertebral bodies which allow a boney bridge to form through the spinal fusion implant of the present invention. Such fusion-promoting apertures may be dimensioned to receive any number of suitable osteoinductive agents, including but not limited to bone morphogenic protein (BMP) and bio-resorbable polymers, including but not limited to any of a variety of poly (D,L-lactide-co-glycolide) based polymers~~, such as disclosed in U.S. Patent No. 6,013,853~~. The spinal fusion implant of the present invention is preferably equipped with one or more lateral openings which aid it provides in visualization at the time of implantation and at subsequent clinical evaluations.

Please add the following new paragraph after the paragraph ending at page 5, line 19:

The spinal fusion implant of the present invention may be provided with any number of features for enhancing the visualization of the implant during and/or after implantation into a

spinal target site. According to one aspect of the present invention, such visualization enhancement features may take the form of the spike elements used for anti-migration, which may be manufactured from any of a variety of suitable materials, including but not limited to a metal, ceramic, and/or polymer material, preferably having radiopaque characteristics. The spike elements may also take any of a variety of suitable shapes, including but not limited to a generally elongated element disposed within the implant such that the ends thereof extend generally perpendicularly from the upper and/or lower surfaces of the implant. The spike elements may each comprise a unitary element extending through upper and lower surfaces or, alternatively, each spike element may comprise a shorter element which only extends through a single surface (that is, does not extend through the entire height of the implant). In any event, when the spike elements are provided having radiodense characteristics and the implant is manufactured from a radiolucent material (such as, by way of example only, PEEK and/or PEKK), the spike elements will be readily observable under X-ray or fluoroscopy such that a surgeon may track the progress of the implant during implantation and/or the placement of the implant after implantation.

Please add the following new paragraphs after the paragraph ending at page 9, line 13:

Figures 18 and 19 are perspective and side views, respectively, illustrating the "enhanced visualization" feature of the present invention as employed within a lumbar fusion implant according to one embodiment of the present invention;

Figures 20 and 21 are perspective and side views, respectively, illustrating the "enhanced visualization" feature of the present invention as employed within a lumbar fusion implant according to one embodiment of the present invention; and

Figures 22 and 23 are perspective and side views, respectively, illustrating the "enhanced visualization" feature of the present invention as employed within a cervical fusion implant according to one embodiment of the present invention.

Please replace the paragraph beginning at page 10, line 4 with the following amended paragraph:

FIG. 1 illustrates, by way of example only, a spinal fusion system 5 for performing spinal fusion between adjacent lumbar vertebrae, including an exemplary spinal fusion implant 10 and an exemplary insertion instrument 20 provided in accordance with the present invention. The spinal fusion implant 10 may be comprised of any suitable non-bone composition having suitable radiolucent characteristics, including but not limited to polymer compositions (e.g. poly-ether-ether-ketone (PEEK) and/or poly-ether-ketone-ketone (PEKK)) or any combination of PEEK and PEKK. The spinal fusion implant 10 of the present invention may be dimensioned, by way of example only, having a width ~~length~~ ranging between 9 and 18 mm, a height ranging between 8 and 16 mm, and a length ~~width~~ ranging between 25 and 45 mm.

Please replace the paragraph beginning at page 10, line 14 with the following amended paragraph:

As will be described in detail below, the insertion instrument 20 is configured to releasably maintain the exemplary spinal fusion implant 10 in the proper orientation during insertion into a lumbar disc space and thereafter release to deposit the implant 10. The exemplary spinal fusion implant 10, having been deposited in the disc space, facilitates spinal fusion over time by maintaining a restored disc height as natural bone growth occurs through and/or past the implant 10, resulting in the formation of a boney bridge extending between the adjacent vertebral bodies. The implant 10 is particularly suited for introduction into the disc space via a lateral (trans-psoas) approach to the spine, but may be introduced in any of a variety of approaches, such as posterior, anterior, antero-lateral, and postero-lateral, without departing from the scope of the present invention (depending upon the sizing of the implant 10).

Please replace the paragraph beginning at page 10, line 22 with the following amended paragraph:

The spinal fusion implant 10 of the present invention may be provided with any number of additional features for promoting fusion, such as apertures 2 extending between the upper and

lower vertebral bodies which allow a boney bridge to form through the spinal fusion implant 10. According to a still further aspect of the present invention, this fusion may be facilitated or augmented by introducing or positioning various osteoinductive materials within the apertures 2 and/or adjacent to the spinal fusion implant 10. Such osteoinductive materials may be introduced before, during, or after the insertion of the exemplary spinal fusion implant 10, and may include (but are not necessarily limited to) autologous bone harvested from the patient receiving the spinal fusion implant 10, bone allograft, bone xenograft, any number of non-bone implants (e.g. ceramic, metallic, polymer), bone morphogenic protein, and bio-resorbable compositions, including but not limited to any of a variety of poly (D,L-lactide-co-glycolide) based polymers~~, such as disclosed in U.S. Patent No. 6,013,853~~.

Please replace the paragraph beginning at page 12, line 1 with the following amended paragraph:

FIGS. 2-5 depict various embodiments of the exemplary spinal fusion implant 10. Some common attributes are shared among the various embodiments. More specifically, each spinal fusion implant 10 has a top surface 31, a bottom surface 33, lateral sides 14, a proximal side 22, and a distal side 16. In one embodiment, the top and bottom surfaces 31, 33 are generally parallel. It can be appreciated by one skilled in the art that although the surfaces 31, 33 are generally parallel to one another, they may be provided in any number of suitable shapes, including but not limited to concave and/or convex. When provided as convex shapes, the top and bottom surfaces 31, 33 may better match the natural contours of the vertebral end plates. Although not shown, it will be appreciated that the top and bottom surfaces 31, 33 may be angled relative to one another to better match the natural lordosis of the lumbar and cervical spine or the natural kyphosis of the thoracic spine

Please replace the paragraph beginning at page 12, line 10 with the following amended paragraph:

The exemplary spinal fusion implant 10 also preferably includes anti-migration features designed to increase the friction between the spinal fusion implant 10 and the adjacent contacting

surfaces of the vertebral bodies so as to prohibit migration of the spinal fusion implant 10 after implantation. Such anti-migration features may include ridges 6 provided along the top surface 31 and/or bottom surface 33. Additional anti-migration features may also include a pair of spike elements 7 disposed within the proximal region of the implant 10, a pair of spike elements 8 disposed within the distal region of the implant 10, and a pair of spike elements 9 disposed within the central region of the implant 10. Spike elements 7, 8, 9 may extend from the top surface 31 and/or bottom surface 33 within the respective proximal, distal and central regions of the implant 10. The spike elements 7, 8, 9 may be manufactured from any of a variety of suitable materials, including but not limited to a metal, ceramic, and/or polymer material, preferably having radiopaque characteristics. The spike elements 7, 8, 9 may also take any of a variety of suitable shapes, including but not limited to a generally elongated element disposed within the implant 10 such that the ends thereof extend generally perpendicularly from the upper and/or lower surfaces 31, 33 of the implant 10. As best appreciated in FIG. 4, the spike elements 7, 8, 9 may each comprise a unitary element extending through upper and lower surfaces 31, 33. Alternatively, each spike element 7, 8, 9 may comprise a shorter element which only extends through a single surface 31, 33 (that is, does not extend through the entire height of the implant 10). In any event, when the spike elements 7, 8, 9 are provided having radiodense characteristics and the implant 10 is manufactured from a radiolucent material (such as, by way of example only, PEEK and/or PEKK), the spike elements 7, 8, 9 will be readily observable under X-ray or fluoroscopy such that a surgeon may track the progress of the implant 10 during implantation and/or the placement of the implant 10 after implantation.

Please replace the paragraph beginning at page 14, line 13 with the following amended paragraph:

FIGS. 6-9 detail the exemplary insertion instrument 20 according to one embodiment of the invention. The exemplary insertion instrument 20 includes an elongate tubular element 28 and an inserter shaft 44. The elongate tubular element 28 is constructed with a distal head 26 at its distal end, ~~a~~ distal head ridges 62, 63 ~~slot 62 at its~~ on the distal end of the distal head 26, a thumbwheel housing 38 at its proximal end and a handle 42 at its proximal end. The elongate

tubular element 28 is generally cylindrical and of a length sufficient to allow the device to span from the surgical target site to a location sufficiently outside the patient's body so the handle 42 and thumbwheel housing 38 can be easily accessed by a clinician or a complimentary controlling device.

Please replace the paragraph beginning at page 15, line 18 with the following amended paragraph:

FIG. 6 details the distal head ridge ~~slot~~ of the exemplary insertion instrument 20 coupled to the spinal fusion implant 10 through the purchase regions 60, 61. The distal head slots 62, 63 are dimensioned to fit slidably into the purchase regions 60, 61 with low friction to allow accurate engagement of the threaded connector 24 to the receiving aperture 12 of the spinal fusion implant 10. In the presented embodiment, the outer dimension of the threaded connector 24 is smaller than the largest outer dimension of the distal head 26 and elongate tubular element 28. Alternatively, other methods of creating a gripping surface are contemplated including but not limited to knurling or facets.

Please replace the paragraph beginning at page 16, line 16 with the following amended paragraph:

A clinician can utilize the secured system in either an open or minimally invasive spinal fusion procedure. In either type of procedure, a working channel ~~would be~~ is created in a patient that reaches the targeted spinal level. After the creation of that channel, the intervertebral space ~~would~~ may be prepared via any number of well known preparation tools, including but not limited to kerrisons, rongeurs, pituitaries, and rasps. After preparation, the insertion instrument 20 ~~the secured device~~ is used to place a spinal fusion implant 10 into the prepared intervertebral space. Once the implant 10 is inserted into the prepared space, the implant 10 is released from the insertion instrument 20 by rotating the thumbwheel 34 to disengage the threaded connector 24 from the receiving aperture 12. That motion removes the compressive force on the purchase regions 60, 61 between the distal head 26 and the distal head ridges ~~slots~~ 62, 63 of the spinal fusion implant 10 and allows the insertion instrument to be slidably removed from the implant

10. After the threaded connector 24 is disengaged from the implant 10, the insertion instrument 20 is removed from the working channel and the channel is closed. As previously mentioned, additional materials may be included in the procedure before, during or after the insertion of the spinal fusion implant 10 to aid the natural fusion of the targeted spinal level.

Please replace the paragraph beginning at page 19, line 8 with the following amended paragraph:

The exemplary cervical fusion implant 110 also preferably includes anti-migration features such as anti-migration teeth 6 along the top surface 31 and bottom surface 33. Additional anti-migration features may include a plurality of proximal anti-migration spikes 68 and/or distal anti-migration spikes 70 integrated vertically through the cervical fusion implant 110. The anti-migration features increase the friction between the cervical fusion implant 110 and the adjacent contacting surfaces of the vertebral bodies. That friction prohibits migration of the cervical fusion implant 110 during the propagation of natural bony fusion. It should be appreciated by one skilled in the art that such anti-migration teeth 6 can be oriented in ~~a~~ any manner other than generally vertically (as shown) without departing from the scope of the present invention. Moreover, as described above, the spikes 68, 70 may be constructed from any of a variety of radiopaque materials, including but not limited to a metal, ceramic, and/or polymer material. When the spike elements 68, 70 are provided having such radiodense characteristics, and the implant 110 is manufactured from a radiolucent material (such as, by way of example only, PEEK and/or PEKK), the spike elements 68, 70 will be readily observable under X-ray or fluoroscopy such that a surgeon may track the progress of the implant 110 during implantation and/or the placement of the implant 110 after implantation ~~particular direction which will stabilize the cervical fusion implant 110 in several degrees of rotation during placement~~.

Please replace the paragraph beginning at page 21, line 1 with the following amended paragraph:

A clinician can utilize the secured system in either an open or minimally invasive spinal fusion procedure. In either type of procedure, a working channel is ~~would be~~ created in a patient that reaches the targeted spinal level. After the creation of that channel, the intervertebral space would be prepared (via known instruments as described above). After preparation, the insertion instrument 120 ~~the secured device~~ is used to place a cervical fusion implant 110 into the prepared intervertebral space. Once the cervical fusion implant 110 is inserted into the prepared space, the implant 110 is released from the cervical insertion instrument 120 by retracting the tubular lock member 21 from the elongate fork member 11 by rotating the tubular lock member 21 with respect to the elongate fork member 11 in the opposite direction from that used to initially secure the implant 110. That motion removes the compressive force on the purchase region 39 between the apertures 12 of the cervical fusion implant 110 and allows the engagement features 17 to be slidably removed from the apertures 12. After the engagement features 17 are disengaged from the cervical fusion implant 110, the cervical inserter instrument 120 is removed from the working channel and the channel is closed. As previously mentioned, additional materials may be included in the procedure before, during or after the insertion of the cervical fusion implant 110 to aid the natural fusion of the targeted spinal level.

Please add the following new paragraph after the paragraph ending at page 22, line 22:

The enhanced visualization features of the implants 10, 110 are explained in greater detail with reference to FIGS. 18-23. FIG. 18 illustrates an implant 10 dimensioned particularly for use in a posterior approach (PLIF) having (by way of example only) a width ranging between 9 and 11 mm, a height ranging between 8 and 14 mm, and a length ranging between 25 and 30 mm. FIG. 19 illustrates the implant 10 of FIG. 18 from a side perspective via as taken via X-ray or fluoroscopy techniques, clearly showing the location of the spike elements 7 and 8 (there is no central spike element 9 as with FIG. 1) relative to the implant 10 and visualization apertures 4. FIG. 20 illustrates an implant 10 dimensioned particularly for use in a lateral approach (XLIF™ by NuVasive) having (by way of example only) a width of approximately 18 mm, a height ranging between 8 and 16 mm, and a length ranging between 40 and 45 mm. FIG. 21 illustrates the implant 10 of FIG. 20 from a side perspective via as taken via X-ray or fluoroscopy

techniques, clearly showing the location of the spike elements 7, 8, 9 relative to the implant 10 and visualization apertures 4. FIG. 22 illustrates an implant 110 dimensioned particularly for use in the cervical spine having (by way of example only) a width of approximately 11 mm, a height ranging between 5 and 12 mm, and a length of approximately 14 mm. FIG. 23 illustrates the implant 110 of FIG. 22 from a side perspective via as taken via X-ray or fluoroscopy techniques, clearly showing the location of the spike elements 66 relative to the implant 110 and visualization apertures 4. In this fashion, a surgeon may easily track the progress of the implant 10, 110 during implantation and/or after implantation by visualizing the spike elements 7,8,9 and 66, respectively, under X-ray and/or fluoroscopy according to the present invention.

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1.-26. (Cancelled)

27. (Currently Amended) A spinal fusion implant of non-bone construction positionable ~~via a lateral trans-psoas surgical approach to the spine into a position~~ within an interbody space between a first vertebra and a second vertebra~~, said interbody space being at least partially defined by a posterior aspect, an anterior aspect, and opposing lateral aspects~~, said implant comprising:

an upper surface including anti-migration elements to contact said first vertebra when said implant is positioned within the interbody space, a lower surface including anti-migration elements to contact said second vertebra when said implant is positioned within the interbody space, a distal wall, a proximal wall, a first sidewall ~~to face said anterior aspect of said disc space when said implant is positioned within the interbody space~~ and a second sidewall ~~to face said posterior aspect of said disc space when said implant is positioned within the interbody space~~, said distal wall, proximal wall, first sidewall, and second sidewall comprising a radiolucent material;

wherein said implant has a longitudinal length extending from a proximal end of said proximal wall to a distal end of said distal wall;

wherein a central region of said implant includes portions of the first and second sidewalls positioned generally centrally between the proximal wall and the distal wall, at least a portion of the central region defining a maximum lateral width of said implant extending from said first sidewall to said second sidewall, wherein said longitudinal length is at least two and half times greater than said maximum lateral width;

at least a first fusion aperture extending through said upper surface and lower surface and configured to permit bone growth between the first vertebra and the second vertebra when said implant is positioned within the interbody space, said first fusion aperture having: a longitudinal aperture length extending generally parallel to the longitudinal length of said implant, and a lateral aperture width extending between said first sidewall to said second sidewall, wherein the longitudinal aperture length is greater than the lateral aperture width; and

at least three radiopaque markers; wherein a first of the at least three radiopaque markers is at least partially positioned in said distal wall, a second of said at least three radiopaque markers is at least partially positioned in said proximal wall, and a third of said at least three radiopaque markers is at least partially positioned in said central region.

28. (Previously Presented) The spinal fusion implant of claim 27, further comprising a fourth radiopaque marker situated within said implant, said fourth radiopaque marker positioned in said central region at a position spaced apart from said third radiopaque marker.

29. (Previously Presented) The spinal fusion implant of claim 27, wherein said first radiopaque marker has an elongate body oriented generally perpendicular to said longitudinal length and extending entirely through a height of said distal wall, and wherein said second radiopaque marker has an elongate body oriented generally perpendicular to said longitudinal length and entirely through a height of said proximal wall.

30. (Previously Presented) The spinal fusion implant of claim 27, further including at least one receiving aperture position is said proximal wall.

31. (Previously Presented) The spinal fusion implant of claim 30, wherein said receiving aperture is configured to releasably mate with an inserter tool.

32. (Previously Presented) The spinal fusion implant of claim 31, wherein said receiving aperture comprises a threaded receiving aperture extending into said proximal wall and having a central axis generally parallel to said longitudinal length of said implant.

33. (Previously Presented) The spinal fusion implant of claim 32, further comprising a pair of lateral grooves positioned in said proximal wall and extending laterally of said threaded receiving aperture.

34. (Previously Presented) The spinal fusion implant of claim 27, wherein said maximum lateral width of said implant is approximately 18 mm.

35. (Previously Presented) The spinal fusion implant of claim 27, wherein said radiolucent material comprises PEEK.

36. (Previously Presented) The spinal fusion implant of claim 27, wherein said implant includes at least one visualization aperture extending through at least one of said first sidewall and said second sidewall.

37. (Previously Presented) The spinal fusion implant of claim 27, wherein said upper and lower surfaces are generally parallel to one another.

38. (Previously Presented) The spinal fusion implant of claim 27, wherein said upper and lower surfaces are generally angled relative to one another to approximately correspond to lordosis of a lumbar spine when said implant is positioned within the interbody space.

39. (Previously Presented) The spinal fusion implant of claim 27, wherein said first fusion aperture is one of generally rectangular and generally oblong in shape.

40. (Previously Presented) The spinal fusion implant of claim 27, further comprising a medial support extending between the first and second sidewalls

41. (Previously Presented) The spinal fusion implant of claim 40, wherein said medial support is positioned along said central region.

42. (Previously Presented) The spinal fusion implant of claim 27, further including a second fusion aperture extending through said upper surface and lower surface and configured to permit bone growth between the first vertebra and the second vertebra when said implant is positioned within the interbody space.

43. (Previously Presented) The spinal fusion implant of claim 42, wherein said second fusion aperture is separated from said first fusion aperture by a medial support.

44. (Previously Presented) The spinal fusion implant of claim 27, wherein said anti-migration elements of said upper surface comprise a plurality of ridges.

45. (Previously Presented) The spinal fusion implant of claim 44, wherein said plurality of ridges extend generally perpendicular to said longitudinal length.

46. (Previously Presented) The spinal fusion implant of claim 27, wherein said anti-migration elements of said upper surface comprise spike elements.

47. (Previously Presented) The spinal fusion implant of claim 46, wherein said spike elements protrude to pointed tips configured to engage said first vertebra.

48. (Previously Presented) The spinal fusion implant of claim 27, wherein said maximum lateral width of said implant is greater than a lateral width of the distal end of said distal wall and is greater than a lateral width of the proximal end of said proximal wall.

49. (Previously Presented) The spinal fusion implant of claim 27, wherein said implant has a height extending from said upper surface to said lower surface, wherein said maximum lateral width is greater than said height.

50. (Previously Presented) The spinal fusion implant of claim 27, wherein said central region includes a maximum height of said implant extending from said upper surface to said lower surface, wherein said maximum height is greater than a height of said distal wall and is greater than a height of said proximal wall.

51. (Previously Presented) The spinal fusion implant of claim 27, wherein the lateral aperture width of said first fusion aperture is more than two time greater than a lateral thickness of said first sidewall and is more than two time greater than a lateral thickness of said second sidewall.

52. (Previously Presented) The spinal fusion implant of claim 27, wherein at least one of said three radiopaque markers comprises an elongate body extending generally perpendicular to said longitudinal length.

53. (Previously Presented) The spinal fusion implant of claim 52, wherein aid elongate body of at least one of said three radiopaque markers is shorter than a height extending from said upper surface to said lower surface.

54. (Previously Presented) The spinal fusion implant of claim 54, further comprising an osteoinductive material positioned with said first fusion aperture.

REMARKS

The specification has been amended so as to bring the present specification into conformity with that of related application no. 11/093,409 (now patent no. 7,918,891), which was expressly incorporated by reference into the present application as indicated on page 2, lines 4-8 of the original specification. Accordingly, no new matter has been added.

Also, independent claim 27 has been amended to remove a number of functional recitations. No new matter has been added.

Applicant asks that all claims be examined in view of the amendment to the claims.

No fee is believed to be due at this time. If necessary, please apply any charges or credits to Deposit Account 06-1050, referencing the above attorney docket number.

Respectfully submitted,

Date: April 4, 2012

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Electronic Acknowledgement Receipt

EFS ID:	12471514
Application Number:	13079645
International Application Number:	
Confirmation Number:	1151
Title of Invention:	System and Methods for Spinal Fusion
First Named Inventor/Applicant Name:	Matthew Curran
Customer Number:	26191
Filer:	Michael T. Hawkins/Anne Roy
Filer Authorized By:	Michael T. Hawkins
Attorney Docket Number:	104US2
Receipt Date:	04-APR-2012
Filing Date:	04-APR-2011
Time Stamp:	18:08:12
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		139580099001pa.pdf	110719 180547cd47662ede102a50014578811bcd762501	yes	16

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Preliminary Amendment	1	1
	Specification	2	10
	Claims	11	15
	Applicant Arguments/Remarks Made in an Amendment	16	16
Warnings:			
Information:			
	Total Files Size (in bytes):	110719	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
13/079,645	04/04/2011	

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY ☐ RATE ($)	SMALL ENTITY ☐ FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
			TOTAL			TOTAL	

* If the difference in column 1 is less than zero, enter "0" in column 2.

APPLICATION AS AMENDED – PART II

AMENDMENT 04/04/2012	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 28	Minus	** 28	= 0	X $ =		OR	X $60=	0
Independent (37 CFR 1.16(h))	* 1	Minus	***3	= 0	X $ =		OR	X $250=	0
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0

AMENDMENT	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/NICOLLE L. SCRIVNER/

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	: Matthew Curran et al.	Art Unit	: 3733
Serial No.	: 13/079,645	Examiner	: STUART SAMUEL BRAY
Filed	: April 4, 2011	Conf. No.	: 1151
Title	: SYSTEMS AND METHODS FOR SPINAL FUSION		

MAIL STOP AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

Please consider the references listed on the enclosed PTO-1449 form. Non-patent literature is enclosed; cited U.S. patents and patent application publications will be provided on request.

This statement is being filed within three months of the filing date of the application or before the receipt of a first Office Action on the merits. Please apply any necessary charges or credits to Deposit Account 06-1050, referencing the above attorney docket number.

Respectfully submitted,

Date: March 29, 2012

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60761381.doc

Substitute Form PTO-1449 (Modified)	U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No. 13958-0099001	Application No. 13/079,645
Information Disclosure Statement by Applicant (Use several sheets if necessary) (37 CFR §1.98(b))		Applicant Matthew Curran et al.	
		Filing Date April 4, 2011	Group Art Unit 3733

U.S. Patent Documents

Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	1	5,775,797	7/7/1998	Henstra			
	2	5,942,698	8/24/1999	Stevens			
	3	6,003,426	12/21/1999	Kobayashi et al.			
	4	6,143,033	11/7/2000	Paul et al.			
	5	6,425,772	7/30/2002	Bernier et al.			
	6	6,447,547	9/10/2002	Michelson			
	7	6,923,814	8/2/2005	Hildebrand et al.			
	8	2003/0139812	7/24/2003	Garcia et al.			
	9	2004/0153155	8/5/2004	Chung et al.			
	10	2005/0197702	9/8/2005	Coppes et al.			
	11	2007/0191945	8/16/2007	Yu et al.			

Foreign Patent Documents or Published Foreign Patent Applications

Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Class	Subclass	Translation Yes	Translation No

Other Documents (include Author, Title, Date, and Place of Publication)

Examiner Initial	Desig. ID	Document
	12	CoRoent™ Marketing Brochure (9004001 A.0), NuVasive, Inc., 2004, 2 pages
	13	CoRoent™ Marketing Brochure (9004001 C.0), NuVasive, Inc., 2005, 2 pages
	14	CoRoent™ XL & XLR Marketing Brochure (9004225 A.0), NuVasive, Inc., 2005, 2 pages
	15	CoRoent® XL & XLR Marketing Brochure (9004225 B.0), NuVasive, Inc., 2006, 2 pages
	16	CoRoent® XL & XLR Marketing Brochure (9004225 C.0), NuVasive, Inc., 2007, 2 pages
	17	CoRoent® XL Marketing Brochure (9500039 A.0), NuVasive, Inc., 2006, 8 pages

Examiner Signature	Date Considered
EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

Substitute Disclosure Form (PTO-1449)

Electronic Acknowledgement Receipt

EFS ID:	12423102
Application Number:	13079645
International Application Number:	
Confirmation Number:	1151
Title of Invention:	System and Methods for Spinal Fusion
First Named Inventor/Applicant Name:	Matthew Curran
Customer Number:	26191
Filer:	Michael T. Hawkins/Beth Bauer
Filer Authorized By:	Michael T. Hawkins
Attorney Docket Number:	104US2
Receipt Date:	29-MAR-2012
Filing Date:	04-APR-2011
Time Stamp:	13:56:16
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	099ids.pdf	158717 b1d4611fd8ccb6a4d6a113bacf76e25db15590a6	no	2

Warnings:	
Information:	

This is not an USPTO supplied IDS fillable form					
2	Non Patent Literature	BR1.pdf	174434 6b46ba8d96b86b5e93c2c01fb90d561a53fba4d1	no	2
Warnings:					
Information:					
3	Non Patent Literature	BR2.pdf	229290 861f0c65a5a0f38dc5538176305161d45e811589	no	2
Warnings:					
Information:					
4	Non Patent Literature	BR3.pdf	442694 e78ba2264a3af54101f3b8749a5f539d5810f35f	no	2
Warnings:					
Information:					
5	Non Patent Literature	BR4.pdf	349916 f3462467c8efbf4c1f74dc4898eb6aaff07830e1	no	2
Warnings:					
Information:					
6	Non Patent Literature	BR5.pdf	2617599 68899ba4b7826795ad283bdee02067c91ffe12ad	no	2
Warnings:					
Information:					
7	Non Patent Literature	BR6.pdf	2195450 da8868d1130c5a0f7c322ce28adaf4c041dcbe72	no	8
Warnings:					
Information:					
			Total Files Size (in bytes):	6168100	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/079,645	04/04/2011	Matthew Curran	104US2

CONFIRMATION NO. 1151

POA ACCEPTANCE LETTER

26191
FISH & RICHARDSON P.C. (TC)
PO BOX 1022
MINNEAPOLIS, MN 55440-1022

OC00000053354174

Date Mailed: 03/28/2012

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 03/21/2012.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/hgray/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/079,645	04/04/2011	Matthew Curran	104US2	1151

30328 7590 03/23/2012

NuVasive
c/o CPA Global
P.O. Box 52050
Minneapolis, MN 55402

EXAMINER	
BRAY, STUART SAMUEL	
ART UNIT	PAPER NUMBER
3733	

MAIL DATE	DELIVERY MODE
03/23/2012	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Applicant-Initiated Interview Summary	Application No.	Applicant(s)	
	13/079,645	CURRAN ET AL.	
	Examiner	Art Unit	
	STUART S. BRAY	3733	

All participants (applicant, applicant's representative, PTO personnel):

(1) *STUART S. BRAY*.

(3) *Michael Hawkins*.

(2) _____.

(4) _____.

Date of Interview: *21 March 2012*.

Type: ☒ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☒ No.
If Yes, brief description: _____.

Issues Discussed ☐101 ☐112 ☐102 ☐103 ☒Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: _____.

Identification of prior art discussed: *N/A*.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

Atty Hawkins called to discuss the preliminary amendment replacing a prior claim set, which was filed around the time a restriction on the prior set of claims was mailed. The examiner suggested to respond to the pending restriction noting that the new claim set has only one independent claim. The Examiner also suggested that the Applicant respond to the species election and whether all the new claims are readable on the elected species. .

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

/STUART S BRAY/ Examiner, Art Unit 3733	

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews
Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:

1) A brief description of the nature of any exhibit shown or any demonstration conducted,
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
   (The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

PTO/SB/08a (01-08)
Approved for use through 05/31/2008. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Complete if Known	
Application Number	13/079,645
Filing Date	April 4, 2011
First Named Inventor	Matthew Curran
Art Unit	3733
Examiner Name	Stuart Samuel Bray

Sheet	**1**	**of**	**8**	**Attorney Docket No:** 104US2

US PATENT DOCUMENTS

Examiner Initial *	Cite No	Document Number	Publication Date	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		2002/0058950	May 16, 2002	Winterbottom, et al.	
		2003/0105528	Jun 5, 2003	Shimp, et al.	
		3,486,505	Dec 30, 1969	Morrison, Gordon M.	
		3,518,993	Jul 7, 1970	Blake, Lawrence W.	
		3,604,487	Sep 14, 1971	Gilbert, Richard S.	
		3,745,995	Jul 17, 1973	Kraus	
		3,848,601	Nov 19, 1974	Ma, et al.	
		3,867,728	Feb 25, 1975	Stubstad, et al.	
		4,026,304	May 31, 1971	Levy	
		4,026,305	May 31, 1971	Brownlee, et al.	
		4,454,374	Oct 8, 1985	Jacobson	
		4,501,269	Feb 26, 1985	Bagby	
		4,646,738	Mar 3, 1987	Trott, Arthur F.	
		4,657,550	Apr 14, 1987	Daher	
		4,743,256	May 10, 1988	Brantigan	
		4,781,591	Nov 1, 1988	Allen	
		4,834,757	May 30, 1989	Brantigan	
		4,877,020	Oct 31, 1989	Vich	
		4,878,915	Nov 7, 1989	Brantigan	
		4,932,975	Jun 12, 1990	Main, et al.	
		4,950,296	Aug 21, 1990	McIntyre, J. L.	
		4,961,740	Oct 9, 1990	Ray, et al.	
		4,962,766	Oct 16, 1990	Herzon, G.D.	
		5,015,247	May 14, 1991	Michelson	
		5,026,373	Jun 25, 1991	Ray, et al.	
		5,047,055	Sep 10, 1991	Bao et al.	
		5,055,104	Oct 8, 1991	Ray	
		5,062,845	Nov 5, 1991	Kuslich, et al.	
		5,071,437	Dec 10, 1991	Steffee	
		5,092,572	Mar 3, 1992	Litwak, et al.	
		5,133,717	Jul 28, 1992	Chopin	
		5,133,755	Jul 28, 1992	Brekke	
		5,171,278	Dec 15, 1992	Pisharodi	
		5,192,327	Mar 9, 1993	Brantigan, John W.	
		5,217,497	Jun 8, 1993	Mehdian	
		5,263,953	Nov 23, 1993	Bagby	
		5,269,785	Dec 14, 1993	Bonutti	

EXAMINER **DATE CONSIDERED**

Substitute Disclosure Statement Form (PTO-1449)
* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional) 2 Applicant is to place a check mark here if English language Translation is attached

PTO/SB/08a (01-08)
Approved for use through 05/31/2008. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Application Number	13/079,645
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Art Unit	3733
Examiner Name	Stuart Samuel Bray

Sheet	**2**	**of**	**8**

Attorney Docket No: 104US2

US PATENT DOCUMENTS

Examiner Initial *	Cite No	Document Number	Publication Date	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		5,284,153	Feb 8, 1994	Raymond, S.A., et al.	
		5,290,494	Mar 1, 1994	Coombes, et al.	
		5,300,076	May 5, 1994	Lerich	
		5,304,210	Apr 19, 1994	Crook	
		5,306,307	Apr 26, 1994	Senter, et al.	
		5,306,309	Apr 26, 1994	Wagner, et al.	
		5,322,505	Jun 21, 1994	Krause, Kenneth W., et al.	
		5,334,205	Aug 2, 1994	Cain	
		5,336,223	Aug 9, 1994	Rogers	
		5,364,400	Nov 15, 1994	Rego, Jr., et al.	
		5,395,372	Mar 7, 1995	Holt, et al.	
		5,397,363	Mar 14, 1995	Gelbard	
		5,397,364	Mar 14, 1995	Kozak	
		5,405,391	Apr 11, 1995	Henderson, et al.	
		5,413,602	May 9, 1995	Metz-Stavenhagen	
		5,425,772	Jun 20, 1995	Brantigan	
		5,431,658	Jul 11, 1995	Moskovich	
		5,443,514	Aug 22, 1995	Steffee	
		5,443,515	Aug 22, 1995	Cohen, et al.	
		5,445,639	Aug 29, 1995	Kuslich, et al.	
		5,454,811	Oct 3, 1995	Huebner	
		5,458,638	Oct 17, 1995	Kuslich, et al.	
		5,484,403	Jan 16, 1996	Yoakum, et al.	
		5,484,437	Jan 16, 1996	Michelson, Gary K.	
		5,489,307	Feb 6, 1996	Kuslich, et al.	
		5,489,308	Feb 6, 1996	Kuslich, et al.	
		5,514,180	May 7, 1996	Heggeness, M.H., et al.	
		5,522,879	Jun 4, 1996	Scopelianos	
		5,522,899	Jun 4, 1996	Michelson	
		5,524,624	Jun 11, 1996	Tepper, et al.	
		5,527,312	Jun 18, 1996	Ray	
		5,534,030	Jul 9, 1996	Navarro, et al.	
		5,540,688	Jul 30, 1996	Navas, Fernand	
		5,545,222	Aug 13,1996	Bonutti	
		5,562,736	Oct 8, 1996	Ray, et al.	
		5,565,005	Oct. 15, 1996	Erickson, et al.	
		5,571,190	Nov 5, 1996	Ulrich	

EXAMINER **DATE CONSIDERED**

Substitute Disclosure Statement Form (PTO-1449)
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First Named Inventor	Matthew Curran
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Sheet	**3**	**of**	**8**	**Attorney Docket No:** 104US2

US PATENT DOCUMENTS

Examiner Initial *	Cite No	Document Number	Publication Date	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		5,571,192	Nov 5, 1996	Schonhoffer	
		5,593,409	Jan 14, 1997	Michelson, G. K.	
		5,609,636	Mar 11, 1997	Kohrs, et al.	
		5,611,800	Mar 18, 1997	Davis, et al.	
		5,611,810	Mar 18, 1997	Arnold, et al.	
		5,632,747	May 27, 1997	Scarborough, et al.	
		5,645,598	Jul 8, 1997	Brosnahan, et al.	
		5,653,761	Aug 5, 1997	Pisharodi	
		5,653,762	Aug 5, 1997	Pisharodi	
		5,658,336	Aug 19, 1997	Pisdharodi	
		5,658,337	Aug 19, 1997	Kohrs, et al.	
		5,662,710	Sep 2, 1997	Bonutti	
		5,665,122	Sep 9, 1997	Kambin, Parviz	
		5,669,909	Sep 23, 1997	Zdeblick, et al.	
		5,676,703	Oct 14, 1997	Gelbard	
		5,683,394	Nov 4, 1997	Rinner	
		5,683,400	Nov 4, 1997	McGuire, David A.	
		5,683,464	Nov 4, 1997	Wagner, et al.	
		5,690,629	Nov 25, 1997	Asher, et al.	
		5,700,264	Dec 23, 1997	Zucherman, et al.	
		5,700,291	Dec 23, 1997	Kuslich, et al.	
		5,700,292	Dec 23, 1997	Marguiles	
		5,702,449	Dec 30, 1997	McKay, W. F.	
		5,702,451	Dec 30, 1997	Biedermann, et al.	
		5,702,453	Dec 30, 1997	Rabbe, et al.	
		5,702,454	Dec 30, 1997	Baumgartner	
		5,702,455	Dec 30, 1997	Saggar, R.	
		5,703,451	Dec 30, 1997	Yamamichi, et al.	
		5,707,373	Jan 13, 1998	Sevrain, et al.	
		5,711,957	Jan 27, 1998	Patat, et al.	
		5,716,415	Feb 10, 1998	Steffee	
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		5,720,751	Feb 24, 1998	Jackson	
		5,728,159	Mar 17, 1998	Stroever, B. W., et al.	
		5,741,253	Apr 21, 1998	Michelson, Gary K.	
		5,741,261	Apr 21, 1998	Moskovitz, et al.	
		5,755,797	May 26, 1998	Baumgartner	

EXAMINER **DATE CONSIDERED**

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Sheet	**4**	**of**	**8**	**Attorney Docket No:** 104US2

US PATENT DOCUMENTS

Examiner Initial *	Cite No	Document Number	Publication Date	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		5,766,252	Jun 16, 1998	Henry, et al.	
		5,772,661	Jun 30, 1998	Michelson	
		5,775,331	Jul 7, 1998	Raymond, S. A., et al.	
		5,779,642	Jul 14, 1998	Nightengale, Christopher	
		5,782,830	Jul 21, 1998	Farris, Robert A.	
		5,782,919	Jul 21, 1998	Zdeblick, et al.	
		5,785,710	Jul 28, 1998	Michelson	
		5,797,909	Aug 25, 1998	Michelson	
		5,800,549	Sep 1, 1998	Bao, et al.	
		5,800,550	Sep 1, 1998	Sertich	
		5,814,084	Sep 29, 1998	Grivas, et al.	
		5,851,208	Dec 22, 1998	Trott	
		5,860,973	Oct 30, 1996	Michelson, Gary K.	
		5,865,845	Feb 2, 1999	Thalgott, John S.	
		5,865,848	Feb 2, 1999	Baker	
		5,885,299	Mar 23, 1999	Winslow, et al.	
		5,888,219	Mar 30, 1999	Bonutti	
		5,888,224	Mar 30, 1999	Beckers et al.	
		5,893,890	Apr 13, 1999	Pisharodi	
		5,904,719	May 18, 1999	Errico, et al.	
		5,910,315	Jun 8, 1999	Stevenson, et al.	
		5,954,769	Sep 21, 1999	Rosenlicht	
		5,968,098	Oct 19, 1999	Winslow	
		5,993,474	Nov 30, 1999	Ouchi, Teruo	
		6,004,326	Dec 21, 1999	Castro, et al.	
		6,008,433	Dec 28, 1999	Stone, K. R.	
		6,015,436	Jan 18, 2000	Schunhuffer	
		6,033,405	Mar 7, 2000	Winslow, et al.	
		6,039,761	Mar 21, 2000	Li, et al.	
		6,042,582	Mar 28, 2000	Ray	
		6,045,580	Apr 4, 2000	Scarborough, et al.	
		6,048,342	Apr 11, 2000	Zucherman, et al.	
		6,059,829	May 9, 2000	Schlapfer, F., et al.	
		6,063,088	May 16, 2000	Winslow	
		6,083,225	Jul 4, 2000	Winslow, et al.	
		6,096,080	Aug 1, 2000	Nicholson, et al.	
		6,102,948	Aug 15, 2000	Brosnahan, III	

EXAMINER **DATE CONSIDERED**

Substitute Disclosure Statement Form (PTO-1449)
* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional) 2 Applicant is to place a check mark here if English language Translation is attached

PTO/SB/08a (01-08)
Approved for use through 05/31/2008. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Complete if Known	
Application Number	13/079,645
Filing Date	April 4, 2011
First Named Inventor	Matthew Curran
Art Unit	3733
Examiner Name	Stuart Samuel Bray

Sheet	**5**	**of**	**8**	**Attorney Docket No:** 104US2

US PATENT DOCUMENTS

Examiner Initial *	Cite No	Document Number	Publication Date	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		6,120,503	Sep 19, 2000	Michelson, Gary K.	
		6,120,506	Sep 19, 2000	Kohrs, et al.	
		6,132,472	Oct 17, 2000	Bonutti	
		6,159,211	Dec 12, 2000	Boriani, Stefano, et al.	
		6,159,215	Dec 12, 2000	Urbahns, et al.	
		6,193,756	Feb 27, 2001	Studer, et al.	
		6,200,347	Mar 13, 2001	Anderson	
		6,224,607	May 1, 2001	Michelson, Gary K.	
		6,224,631	May 1, 2001	Kohrs	
		6,241,769	Jun 5, 2001	Nicholson, et al.	
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		6,251,140	Jun 26, 2001	Marino, et al.	
		6,258,125	Jul 10, 2001	Paul, et al.	
		6,277,149	Aug 21, 2001	Boyle, et al.	
		6,319,257	Nov 20, 2001	Carignan, et al.	
		6,371,989	Apr 16, 2001	Chauvin, et al.	
		6,383,221	May 7, 2002	Scarborough, N. L., et al.	
		6,409,766	Jun 25, 2002	Brett, D. C.	
		6,432,140	Aug 13, 2002	Lin, Chih-I	
		6,440,142	Aug 27, 2002	Ralph, et al.	
		6,442,814	Sep 3, 2002	Landry, et al.	
		6,454,806	Sep 24, 2002	Cohen, et al.	
		6,468,311	Oct 22, 2002	Boyd, L. M., et al.	
		6,491,724	Dec 10, 2002	Ferree, B.	
		6,527,773	Mar 4, 2003	Lin, et al.	
		6,547,823	Apr 15, 2004	Scarborough, N. L., et al.	
		6,595,998	Jul 22, 2003	Johnson, et al.	
		6,626,905	Sep 30, 2003	Schmiel, D. G., et al.	
		6,635,086	Oct 21, 2003	Lin, Paul S.	
		6,648,895	Nov. 18, 2003	Burkus, et al.	
		6,672,019	Jan 6, 2004	Wenz, J. O.	
		6,676,703	Jan 13, 2004	Biscup, R. S.	
		6,706,067	Mar 16, 2004	Shimp, L. A., et al.	
		6,743,255	Jun 1, 2004	Ferree, B.	
		6,746,484	Jun 8,2004	Liu, M., et al.	
		6,755,841	Jun 29, 2004	Fraser, R. D., et al.	
		6,761,739	Jul 13, 2004	Shepard, Y. D.	

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Substitute Disclosure Statement Form (PTO-1449)
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Application Number	13/079,645
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First Named Inventor	Matthew Curran
Art Unit	3733
Examiner Name	Stuart Samuel Bray

Sheet	**6**	**of**	**8**	**Attorney Docket No:** 104US2

US PATENT DOCUMENTS

Examiner Initial *	Cite No	Document Number	Publication Date	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		6,824,564	Nov 30, 2004	Crozet, Y.	
		6,942,698	Sep 13, 2005	Jackson, R. P.	
		6,964,687	Nov 15, 2005	Bernard, P. M., et al.	
		6,979,353	Dec 27, 2005	Bresina, S.	
		6,984,245	Jan 10, 2006	McGahan, T. V., et al.	
		6,986,788	Jan 17, 2006	Paul, D. C., et al.	
		6,989,031	Jan 24, 2006	Michelson, G. K.	
		7,018,416	Mar 28, 2006	Hanson, D. A., et al.	
		D472,634	Apr 1, 2003	Anderson, B. G.	
		D473,650	Apr 22, 2003	Anderson, B. G.	
		D503,801	Apr 5, 2005	Jackson, R. P.	
		D530,423	Oct 17, 1006	Miles, P., et al.	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No	Foreign Patent Document	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[2]
		CA 2015507	Jan 5, 1999	Kuslich, et al.		
		EP 0369603	May 23, 1990	Ray		
		EP 0517030	May 19, 1992	Siebels		
		EP 0667127	Aug 16, 1995	Sanders		
		EP 0706876	Apr 17, 1996	McMillin		
		EP 0716840	Jun 19, 1996	Pavlov, et al.		
		EP 0737448	Oct 16, 1996	Jackson, et al.		
		EP 0796593	Sep 24, 1997	Mitchell, et al.		
		EP 0809974	Apr 15, 1998	Benzel, et al.		
		EP 0809975	Apr 15, 1998	Benzel, et al.		
		EP 0811356	Apr 15, 1998	Glascott, et al.		
		EP 0880938	Feb 12, 1998	Castro, et al.		
		WO 00/45712	Aug 10, 2000	Steiner, et al.		
		WO 00/45713	Aug 10, 2000	Steiner, et al.		
		WO 01/41681	Jun 14, 2001	Corwall, et al.		
		WO 01/49333	Jul 12, 2001	Shimp, et al.		
		WO 90/00037	Jan 11, 1990	Michelson		
		WO 91/06261	May 16, 1992	Ray, Charles, et al.		
		WO 92/14423	Sep 3, 1992	Pisharodi		

EXAMINER **DATE CONSIDERED**

Substitute Disclosure Statement Form (PTO-1449)

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Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

	Complete if Known
Application Number	13/079,645
Filing Date	April 4, 2011
First Named Inventor	Matthew Curran
Art Unit	3733
Examiner Name	Stuart Samuel Bray

Sheet	**7**	**of**	**8**	**Attorney Docket No:** 104US2

		WO 94/04100	Mar 3, 1994	Mazda, et al.		
		WO 94/10928	May 26, 1994	Hopf, Christoph		
		WO 95/01810	Jan 19, 1995	Wolowacz, et al.		
		WO 96/08205	Mar 21, 1996	Pavlov, et al.		
		WO 96/17564	Mar 13, 1996	Rabbe, et al.		
		WO 96/41582	Dec 27, 1996	David, et al.		
		WO 97/20513	Jun 12, 1997	Taddia		
		WO 97/33525	Sep 18, 1997	Winslow, Charles A.		
		WO 97/37620	Oct 16, 1997	Benezech, et al.		
		WO 98/09586	Mar 12, 1998	Webb, et al.		
		WO 98/14142	Apr 9, 1998	Larsen, et al.		
		WO 98/17208	Apr 30, 1998	Winslow, Charles		
		WO 98/25539	Jun 18, 1998	Spath, Volker		
		WO 99/08627	Feb 25 ,1999	Gresser, et al.		
		WO 99/38461	Aug 5, 1999	Paul, David, et al.		

OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	**Cite No [1]**	**Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.**	**T[2]**
		ALLEYNE, CARGILL, H., et al., "Current and future approaches to lumbar disc surgery: A literature review", Medscape Orthopedics & Sports Medicine, 1, [www.medscape.com/Medscape/OrthoSportsMed/1997/v01.n11/…/mos3057], (1997)	
		BAULOT, et al., "Complementary anterior spondylodesis by thoracoscopy. Technical note regarding an observation", Lyon Surg., 90(5):347-351 (1994)	X
		BENINI, et al., "Undercutting decompression and posterior fusion with translaminar facet screw fixation in degenerative lumbar spinal stenosis: Technique and results", Neuro-Orthopedics, 17/18, 159-172 (1995)	
		BERRY, et al., "A morphometric study of human lumbar and selected thoracic vertebrae, study of selected vertebrae" Spine 12(4):362-367 (1996)	
		CROCK. H. V., "Anterior Lumbar Interbody Fusion" Clinical Orthopaedics & Related Research, Marshall R. Urist, Editor-in-Chief, J. B. Lippincott Company (1982)	
		CROCK, H. V., "A Short Practice of Spinal Surgery", Second, revised edition, published by Springer-Verlag/Wein, New York (1993)	
		EDELAND, H.G., "Some additional suggestions for an intervertebral disc prosthesis", Journal of Biomedical Engineering, 7:57-62 (1985)	
		KAMBIN, et al., "History and current status of percutaneous arthroscopic disc surgery", Spine, 21(24S):57S-61S (1996)	

EXAMINER **DATE CONSIDERED**

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Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet	**8**	**of**	**8**	**Attorney Docket No:**	104US2

Complete if Known	
Application Number	13/079,645
Filing Date	April 4, 2011
First Named Inventor	Matthew Curran
Art Unit	3733
Examiner Name	Stuart Samuel Bray

OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS			
		KEMP, H. B. S., "Anterior fusion of the spine for infective lesions in adults", Journal of Bone & Joint Surgery, 55B(4):715-734 (1973)	
		NUVASIVE, INC., Corrected Final Invalidity Contentions Regarding US 5,860,973, US 6,592,586 and US 6,945,933 filed in the United States District Court, Southern District of California on June 14, 2010 (and 23 appendices)	
		STEIN, et al., "Percutaneous facet joint fusion: Preliminary experience", Journal of Vascular and Interventional Radiology, 4:69-74 (1993)	
		VAMVANIJ, et al., "Surgical treatment of internal disc disruption: An outcome study of four fusion techniques", Journal of Spinal Disorders, 11(5):375-382 (1998)	

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Substitute Disclosure Statement Form (PTO-1449)
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Electronic Acknowledgement Receipt

EFS ID:	12385629
Application Number:	13079645
International Application Number:	
Confirmation Number:	1151
Title of Invention:	System and Methods for Spinal Fusion
First Named Inventor/Applicant Name:	Matthew Curran
Customer Number:	30328
Filer:	Rory A. Schermerhorn/Marjorie Jarvis
Filer Authorized By:	Rory A. Schermerhorn
Attorney Docket Number:	104US2
Receipt Date:	23-MAR-2012
Filing Date:	04-APR-2011
Time Stamp:	19:46:25
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	2012-03-23_IDS_Letter_140US2.pdf	14637 c30377142dba8e19e43e043819e9186e96c8b4ff	no	1

Warnings:	
Information:	

2	Information Disclosure Statement (IDS) Form (SB08)	2012-03-23_IDS_Form1449_104US2.pdf	98285 7d45d92d75bce2af3c089155aa48f0ed45b5bbc4	no	8

Warnings:

Information:

This is not an USPTO supplied IDS fillable form

Total Files Size (in bytes):	112922

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Matthew Curran et al.	Art Unit:	3733
Serial No.:	13/079,645	Examiner:	Stuart Samuel Bray
Filing Date:	April 4, 2011	Conf. No:	1151
Title:	SYSTEMS AND METHODS FOR SPINAL FUSION		

Mail Stop Amendment
Commissioner for Patents
PO Box 1450
Alexandria VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

Please consider the references listed on the enclosed PTO-1449 form. All other non-patent literature documents and foreign references cited herein were previously submitted to the USPTO in an information disclosure statement complying with paragraphs (a)-(c) of 37 CFR 1.98 in connection with US Patent Application 11/093,409 which this application relies on for an earlier filing date under 35 USC 120. As such, submission of copies of these non-patent literature and foreign references is not believed necessary, pursuant to 37 CFR 1.98(d). Cited U.S. patents, patent application publications, and the above referenced non-patent literature and foreign references will be provided upon request.

This statement is being filed before a first Office Action on the merits; accordingly, no fee or separate requirements are believed required. However, please apply any other charges or credits to Deposit Account 50-2040, referencing Attorney Docket No. 140US2.

Respectfully submitted,

Date: March 23, 2012

/Rory Schermerhorn/ _____
Rory Schermerhorn, Esq.
Registration No. 58,148

Customer Number 30,328
NuVasive
c/o CPA Global
P.O. Box 52050
Minneapolis, MN 55402
Telephone: (858) 909-1845

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	: Matthew Curran et al.	Art Unit	: 3733
Serial No.	: 13/079,645	Examiner	: STUART SAMUEL BRAY
Filed	: April 4, 2011	Conf. No.	: 1151
Title	: SYSTEMS AND METHODS FOR SPINAL FUSION		

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RESPONSE TO RESTRICTION REQUIREMENT

In response to the restriction requirement made in the action mailed March 21, 2012, Applicant notes that the Preliminary Amendment filed on March 20, 2012 cancels all of the identified claim groups (claims 1-13 and claims 14-26). As such, none of the identified claim groups can be elected for examination on the merits. As shown in the March 20, 2012 Preliminary Amendment, the single claim group of claims 27-54 is currently pending.

Regarding the species restriction, Applicant elects identified Species A (Figures 1-9 and 18-21) is elected for examination. The election is made without traverse. Currently, all pending claims 27-54 read on the elected Species A.

The Applicant respectfully requests prompt consideration and a Notice of Allowance. **In the event that no Notice of Allowance will be provided in the next communication, Applicant requests that the Examiner telephone the undersigned attorney (612-337-2569) prior to the next communication so that prosecution on the merits may be expedited**.

Please apply any necessary charges or credits to Deposit Account No. 06-1050, referencing the above attorney docket number.

Respectfully submitted,

Date: March 22, 2012

/Michael T. Hawkins/
Michael T. Hawkins
Reg. No. 57,867

Customer Number 26191
Fish & Richardson P.C.
Telephone: (612) 335-5070
Facsimile: (877) 769-7945

60759700.doc

Electronic Acknowledgement Receipt

EFS ID:	12364795
Application Number:	13079645
International Application Number:	
Confirmation Number:	1151
Title of Invention:	System and Methods for Spinal Fusion
First Named Inventor/Applicant Name:	Matthew Curran
Customer Number:	30328
Filer:	Michael T. Hawkins/Jodi Budge
Filer Authorized By:	Michael T. Hawkins
Attorney Docket Number:	104US2
Receipt Date:	22-MAR-2012
Filing Date:	04-APR-2011
Time Stamp:	10:20:40
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Response to Election / Restriction Filed	ResponseRR.pdf	71218 bda2017cf19373e0d2c1c0028969a23cca931d89	no	1

Warnings:	
Information:	

Total Files Size (in bytes):	71218

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

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If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

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UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/079,645	04/04/2011	Matthew Curran	104US2	1151

30328 7590 03/21/2012

NuVasive
c/o CPA Global
P.O. Box 52050
Minneapolis, MN 55402

EXAMINER	
BRAY, STUART SAMUEL	
ART UNIT	PAPER NUMBER
3733	

MAIL DATE	DELIVERY MODE
03/21/2012	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	13/079,645	CURRAN ET AL.	
	Examiner	Art Unit	
	STUART S. BRAY	3733	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *1* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 April 2011*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

5)☒ Claim(s) *1-26* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☐ Claim(s) _____ is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☒ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

12)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-13, drawn to a system, classified in class 606, subclass 90.

II. Claim 14-26, drawn to a method of spinal fusion, classified in class 623, subclass 17.16.

The inventions are distinct, each from the other because of the following reasons:

Inventions II and I are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another and materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the process can be used to distract adjacent vertebrae.

Restriction for examination purposes as indicated is proper because all these inventions listed in this action are independent or distinct for the reasons given above and there would be a serious search and/or examination burden if restriction were not required because at least the following reason(s) apply:

Restriction for examination purposes as indicated is proper because all these inventions listed in this action are independent or distinct for the reasons given above and there would be a serious search and/or examination burden if restriction were not required because at least the following reason(s) apply the inventions require a different

field of search (e.g., searching different classes /subclasses or electronic resources, or employing different search strategies or search queries).

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a invention to be examined even though the requirement may be traversed (37 CFR 1.143) **and (ii) identification of the claims encompassing the elected invention**.

The election of an invention may be made with or without traverse. To reserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the restriction requirement, the election shall be treated as an election without traverse. Traversal must be presented at the time of election in order to be considered timely. Failure to timely traverse the requirement will result in the loss of right to petition under 37 CFR 1.144. If claims are added after the election, applicant must indicate which of these claims are readable upon the elected invention.

Should applicant traverse on the ground that the inventions are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the inventions to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

This application contains claims directed to the following patentably distinct species

A) Figures 1-9, 18-21

B) Figures 10-17, 22-23

The species are independent or distinct because claims to the different species recite the mutually exclusive characteristics of such species. In addition, these species are not obvious variants of each other based on the current record.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species, or a single grouping of patentably indistinct species, for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, no claims are generic.

There is a search and/or examination burden for the patentably distinct species due to their mutually exclusive characteristics. The species require a different field of search (e.g., searching different classes/subclasses or electronic resources, or employing different search queries); and/or the prior art applicable to one species would not likely be applicable to another species; and/or the species are likely to raise different non-prior art issues under 35 U.S.C. 101 and/or 35 U.S.C. 112, first paragraph.

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a species or a grouping of patentably indistinct species to be examined even though the requirement may be traversed (37 CFR 1.143) **and (ii) identification of the claims encompassing the elected species or grouping of**

patentably indistinct species, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

The election may be made with or without traverse. To preserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the election of species requirement, the election shall be treated as an election without traverse. Traversal must be presented at the time of election in order to be considered timely. Failure to timely traverse the requirement will result in the loss of right to petition under 37 CFR 1.144. If claims are added after the election, applicant must indicate which of these claims are readable on the elected species or grouping of patentably indistinct species.

Should applicant traverse on the ground that the species, or groupings of patentably indistinct species from which election is required, are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing them to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the species unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other species.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which depend from or otherwise require all the limitations of an allowable generic claim as provided by 37 CFR 1.141.

A telephone call was made to Jennifer Russell on 3/13/2012 to request an oral election to the above restriction requirement, but did not result in an election being made.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to STUART S. BRAY whose telephone number is (571)270-7648. The examiner can normally be reached on Mon-Thurs 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, ***please contact the examiner's supervisor, Eduardo C. Robert, at* 571-272-4719**. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

If there are any inquiries that are not being addressed by first contacting the Examiner or the Supervisor, you may send an email inquiry to TC3700_Workgroup_D_Inquiries@uspto.gov.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/STUART S BRAY/
Examiner, Art Unit 3733
/EDUARDO C. ROBERT/
Supervisory Patent Examiner, Art Unit 3733

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13079645	CURRAN ET AL.
	Examiner	Art Unit
	STUART S BRAY	3733

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	03/13/2012								
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PTO/SB/81 (01-09)
Approved for use through 11/30/2011. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

POWER OF ATTORNEY OR REVOCATION OF POWER OF ATTORNEY WITH A NEW POWER OF ATTORNEY AND CHANGE OF CORRESPONDENCE ADDRESS

Application Number	13/079,645
Filing Date	April 4, 2011
First Named Inventor	Curran
Title	System and Methods for Spinal Fusion
Art Unit	3733
Examiner Name	Bray, Stuart S.
Attorney Docket Number	104US2

I hereby revoke all previous powers of attorney given in the above-identified application.

☐ A Power of Attorney is submitted herewith.

OR

☒ I hereby appoint Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s) to prosecute the application identified above, and to transact all business in the United States Patent and Trademark Office connected therewith: **26191**

OR

☐ I hereby appoint Practitioner(s) named below as my/our attorney(s) or agent(s) to prosecute the application identified above, and to transact all business in the United States Patent and Trademark Office connected therewith:

Practitioner(s) Name	Registration Number

Please recognize or change the correspondence address for the above-identified application to:

☐ The address associated with the above-mentioned Customer Number.

OR

☒ The address associated with Customer Number: **26191**

OR

☐ Firm or Individual Name					
Address					
City		State		Zip	
Country					
Telephone		Email			

I am the:

☐ Applicant/Inventor.

OR

☒ Assignee of record of the entire interest. See 37 CFR 3.71.
Statement under 37 CFR 3.73(b) (Form PTO/SB/96) submitted herewith or filed on _____.

SIGNATURE of Applicant or Assignee of Record

Signature		Date	March 20, 2012
Name	Jonathan Spangler	Telephone	(858) 909-1800
Title and Company	Vice President and Chief Patent Counsel, NuVasive Inc.		

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☐ *Total of _____ forms are submitted.

STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Matthew Curran et al.

Application No./Patent No.: 13/079,645 Filed/Issue Date: 4/4/2011

Entitled: System and Methods for Spinal Fusion

NuVasive, Inc., a corporation
(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

1. ☒ the assignee of the entire right, title, and interest; or
2. ☐ an assignee of less than the entire right, title and interest.
The extent (by, percentage) of its ownership interest is _____%

in the patent application/patent identified above by virtue of either:

A. ☐ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel (), Frame (), or for which a copy thereof is attached.

OR

B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as shown below:

1. From: _____ To _____
The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

2. From: _____ To _____
The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

3. From: _____ To _____
The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet.

☒ As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.
[NOTE: A separate copy (*i.e.*, a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, if the assignment is to be recorded in the records of the USPTO. See MPEP 302.8]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Michael T. Hawkins/	March 21, 2012
Signature	Date
Michael T. Hawkins , 57,867	(612) 335-5070
Printed or Typed Name	Telephone Number
Attorney for Applicant	
Title	

60759550.doc

NUVASIVE™
Creative Spine Technology

Fax

To:	Shelley Cape	**From:**	Alonzo Branch
Company:	US Patent Office		858-909-1902
Fax:	612-677-3572	**Pages:**	6
Phone:	619-522-8134	**Date:**	07/29/05
Re:		**CC:**	

- **Comments:**

Hi Shelly,

Sorry for the PDF's. I'm faxing everything now. Standby!!!

Pls give me a call or email when you get this.

Thanks, Al

NuVasive™, Inc.
4545 Towne Centre Court
San Diego, CA 92121
t: 858.909.1878
f: 858.909-2078
Toll Free: 800.455.1476
www.nuvasive.com

Form PTO-1595 (Rev. 07/05)
OMB No. 0651-0027 (exp. 6/30/2008)

U.S. DEPARTMENT OF COMMERCE
United States Patent and Trademark Office

RECORDATION FORM COVER SHEET
PATENTS ONLY

To the Director of the U.S. Patent and Trademark Office: Please record the attached documents or the new address(es) below.

1. Name of conveying party(ies)

Matthew Curran
Mark Peterson

Additional name(s) of conveying party(ies) attached? ☐ Yes ☑ No

2. Name and address of receiving party(ies)

Name: NuVasive, Inc.
Internal Address:
Street Address: 4545 Towne Centre Court
City: San Diego
State: CA
Country: United States Zip: 92121

Additional name(s) & address(es) attached? ☐ Yes ☑ No

3. Nature of conveyance/Execution Date(s):

Execution Date(s) 26-Jul-2005

☑ Assignment ☐ Merger
☐ Security Agreement ☐ Change of Name
☐ Joint Research Agreement
☐ Government Interest Assignment
☐ Executive Order 9424, Confirmatory License
☐ Other

4. Application or patent number(s): ☐ This document is being filed together with a new application.

A. Patent Application No.(s)
11/093,409

B. Patent No.(s)

Additional numbers attached? ☐ Yes ☑ No

5. Name and address to whom correspondence concerning document should be mailed:

Name: Jonathan Spangler
Internal Address: NuVasive, Inc.
Street Address: 4545 Towne Centre Court
City: San Diego
State: CA Zip: 92121
Phone Number: 858-243-0029
Fax Number: 858-909-2007
Email Address: jspangler@nuvasive.com

6. Total number of applications and patents involved: 1

7. Total fee (37 CFR 1.21(h) & 3.41) $ 40.00

☐ Authorized to be charged by credit card
☑ Authorized to be charged to deposit account
☐ Enclosed
☐ None required (government interest not affecting title)

8. Payment Information

a. Credit Card Last 4 Numbers
Expiration Date

b. Deposit Account Number 50-2040

Authorized User Name Jonathan Spangler

9. Signature:

August 1, 2005
Signature Date

Jonathan Spangler
Name of Person Signing

Total number of pages including cover sheet, attachments, and documents: 4

Documents to be recorded (including cover sheet) should be faxed to (571) 273-0140, or mailed to:
Mail Stop Assignment Recordation Services, Director of the USPTO, P.O.Box 1450, Alexandria, V.A. 22313-1450

Application No. 11/093,409
Attorney Docket No. 104US1

ASSIGNMENT OF PATENT APPLICATION

WHEREAS, *Matthew Curran*, of 3218 Rancho Quartillo, Carlsbad CA, 92009; and *Mark Peterson, M.D.*, of 840 Royal Avenue Suite #1, Medford OR, 97504; hereinafter referred to as "Assignors," are the inventors of the invention described and set forth in the below-identified application for United States Letters Patent:

Title of Invention: SYSTEMS AND METHODS FOR SPINAL FUSION

Date(s) of execution of Declaration: 7-26-05

Filing Date: March 29, 2005

Application No.: 11/093,409

WHEREAS, *NuVasive, Inc.*, a Corporation of the State of Delaware, located at 4545 Towne Centre Court, San Diego, CA, 92121, hereinafter referred to as "Assignee," is desirous of acquiring an interest in the invention and application and in any U.S. Letters Patent and Registrations which may be granted on the same;

For good and valuable consideration, receipt of which is hereby acknowledged by Assignors, Assignors have assigned, and by these presents do assign to Assignee all right, title and interest in and to the invention and application and to all foreign counterparts (including patent, utility model and industrial designs), and in and to any Letters Patent and Registrations which may hereafter be granted on the same in the United States and all countries throughout the world, and to claim the priority from the application as provided by the Paris Convention. The right, title and interest is to be held and enjoyed by Assignee and Assignee's successors and assigns as fully and exclusively as it would have been held and enjoyed by Assignors had this Assignment not been made, for the full term of any Letters Patent and Registrations which may be granted thereon, or of any division, renewal, continuation in whole or in part, substitution, conversion, reissue, prolongation or extension thereof.

Assignors further agree that they will, without charge to Assignee, but at Assignee's expense, (a) cooperate with Assignee in the prosecution of U.S. Patent applications and foreign counterparts on the invention and any improvements, (b) execute, verify, acknowledge and deliver all such further papers, including patent applications and instruments of transfer, and (c) perform such other acts as Assignee lawfully may request to obtain or maintain Letters Patent and Registrations for the invention and improvements in any and all countries, and to vest title thereto in Assignee, or Assignee's successors and assigns.

Assignors hereby authorize and request Jonathan Spangler, Esq. 4545 Towne Centre Court, San Diego, CA, 92121, to insert herein above the application number and filing date of said application when known.

IN TESTIMONY WHEREOF, Assignors have signed their names on the dates indicated.

Dated: 7/26/05

Matthew Curran

Dated: _____

Mark Peterson, M.D.

Application No. 11/093,409
Attorney Docket No. 104US1

ASSIGNMENT OF PATENT APPLICATION

WHEREAS, *Matthew Curran*, of 3218 Rancho Quartillo, Carlsbad CA, 92009; and *Mark Peterson, M.D.*, of 840 Royal Avenue Suite #1, Medford OR, 97504; hereinafter referred to as "Assignors," are the inventors of the invention described and set forth in the below-identified application for United States Letters Patent:

Title of Invention: SYSTEMS AND METHODS FOR SPINAL FUSION

Date(s) of execution of Declaration: 7-26-05

Filing Date: March 29, 2005

Application No.: 11/093,409

WHEREAS, *NuVasive, Inc.*, a Corporation of the State of Delaware, located at 4545 Towne Centre Court, San Diego, CA, 92121, hereinafter referred to as "Assignee," is desirous of acquiring an interest in the invention and application and in any U.S. Letters Patent and Registrations which may be granted on the same;

For good and valuable consideration, receipt of which is hereby acknowledged by Assignors, Assignors have assigned, and by these presents do assign to Assignee all right, title and interest in and to the invention and application and to all foreign counterparts (including patent, utility model and industrial designs), and in and to any Letters Patent and Registrations which may hereafter be granted on the same in the United States and all countries throughout the world, and to claim the priority from the application as provided by the Paris Convention. The right, title and interest is to be held and enjoyed by Assignee and Assignee's successors and assigns as fully and exclusively as it would have been held and enjoyed by Assignors had this Assignment not been made, for the full term of any Letters Patent and Registrations which may be granted thereon, or of any division, renewal, continuation in whole or in part, substitution, conversion, reissue, prolongation or extension thereof.

Assignors further agree that they will, without charge to Assignee, but at Assignee's expense, (a) cooperate with Assignee in the prosecution of U.S. Patent applications and foreign counterparts on the invention and any improvements, (b) execute, verify, acknowledge and deliver all such further papers, including patent applications and instruments of transfer, and (c) perform such other acts as Assignee lawfully may request to obtain or maintain Letters Patent and Registrations for the invention and improvements in any and all countries, and to vest title thereto in Assignee, or Assignee's successors and assigns.

Assignors hereby authorize and request Jonathan Spangler, Esq. 4545 Towne Centre Court, San Diego, CA, 92121, to insert herein above the application number and filing date of said application when known.

IN TESTIMONY WHEREOF, Assignors have signed their names on the dates indicated.

Dated: _____

Matthew Curran

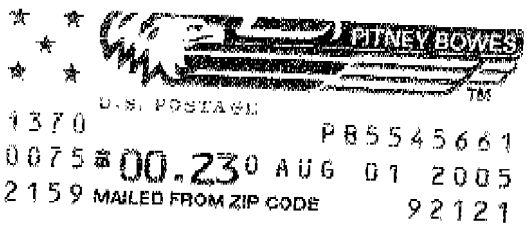
Dated: 7/26/05

Mark Peterson

Mark Peterson, M.D.

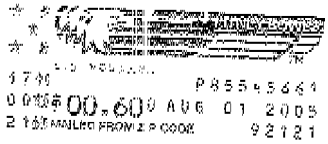
Please date stamp this postcard evidencing receipt by the US Patent and Trademark Office of the following materials deposited in First Class Mail on August 1, 2005 regarding App. Ser. No. 11/093,409 (104US1):

1. Recordation Form Cover Sheet, Patents (1 pg);
2. Assignment of Patent Application (2 pgs); and
3. Return Postcard (1 pg).



Jonathan Spangler, Esq.
Chief Patent Counsel
NuVasive, Inc.
4545 Towne Center Court
San Diego, CA 92121

NUVASIVE®
4545 Towne Centre Court
San Diego, CA 92121



MAIL STOP ASSIGNMENT RECORDATION SERVICES
DIRECTOR OF THE USPTO
PO BOX 1450
ALEXANDRIA VA 22313-1450

Creative Spine Technology®

Electronic Acknowledgement Receipt

EFS ID:	12353692
Application Number:	13079645
International Application Number:	
Confirmation Number:	1151
Title of Invention:	System and Methods for Spinal Fusion
First Named Inventor/Applicant Name:	Matthew Curran
Customer Number:	30328
Filer:	Michael T. Hawkins/Jodi Budge
Filer Authorized By:	Michael T. Hawkins
Attorney Docket Number:	104US2
Receipt Date:	21-MAR-2012
Filing Date:	04-APR-2011
Time Stamp:	10:45:17
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	104US2POA.PDF	53035 64570f722921cbbefab6f46b5f5608809893d755	no	1

Warnings:

The page size in the PDF is too large. The pages should be 8.5 x 11 or A4. If this PDF is submitted, the pages will be resized upon entry into the Image File Wrapper and may affect subsequent processing

Information:

2	Assignee showing of ownership per 37 CFR 3.73(b).	373Statement.pdf	265651 3f3cdca8d6c3fd02e677bb735266ae5fb67fb286	no	8

Warnings:

Information:

Total Files Size (in bytes):	318686

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Matthew Curran	Art Unit:	3733
Serial No.:	13/079,645	Examiner:	Bray, Stuart Samuel
Filing Date:	April 4, 2011	Conf. No.:	1151
Title:	System and Method for Spinal Fusion		

Mail Stop Amendment
Commissioner for Patents
PO Box 1450
Alexandria VA 22313-1450

PRELIMINARY AMENDMENT

Prior to commencing examination of the above-captioned application, please amend the application as follows:

Amendments to the Claims

1.-26. (Cancelled)

27. (New) A spinal fusion implant of non-bone construction positionable via a lateral trans-psoas surgical approach to the spine into a position within an interbody space between a first vertebra and a second vertebra, said interbody space being at least partially defined by a posterior aspect, an anterior aspect, and opposing lateral aspects, said implant comprising:

an upper surface including anti-migration elements to contact said first vertebra when said implant is positioned within the interbody space, a lower surface including anti-migration elements to contact said second vertebra when said implant is positioned within the interbody space, a distal wall, a proximal wall, a first sidewall to face said anterior aspect of said disc space when said implant is positioned within the interbody space and a second sidewall to face said posterior aspect of said disc space when said implant is positioned within the interbody space, said distal wall, proximal wall, first sidewall, and second sidewall comprising a radiolucent material;

wherein said implant has a longitudinal length extending from a proximal end of said proximal wall to a distal end of said distal wall;

wherein a central region of said implant includes portions of the first and second sidewalls positioned generally centrally between the proximal wall and the distal wall, at least a portion of the central region defining a maximum lateral width of said implant extending from said first sidewall to said second sidewall, wherein said longitudinal length is at least two and half times greater than said maximum lateral width;

at least a first fusion aperture extending through said upper surface and lower surface and configured to permit bone growth between the first vertebra and the second vertebra when said implant is positioned within the interbody space, said first fusion aperture having: a longitudinal aperture length extending generally parallel to the longitudinal length of said implant, and a lateral aperture width extending between said

first sidewall to said second sidewall, wherein the longitudinal aperture length is greater than the lateral aperture width; and

at least three radiopaque markers; wherein a first of the at least three radiopaque markers is at least partially positioned in said distal wall, a second of said at least three radiopaque markers is at least partially positioned in said proximal wall, and a third of said at least three radiopaque markers is at least partially positioned in said central region.

28. (New) The spinal fusion implant of claim 27, further comprising a fourth radiopaque marker situated within said implant, said fourth radiopaque marker positioned in said central region at a position spaced apart from said third radiopaque marker.

29. (New) The spinal fusion implant of claim 27, wherein said first radiopaque marker has an elongate body oriented generally perpendicular to said longitudinal length and extending entirely through a height of said distal wall, and wherein said second radiopaque marker has an elongate body oriented generally perpendicular to said longitudinal length and entirely through a height of said proximal wall.

30. (New) The spinal fusion implant of claim 27, further including at least one receiving aperture position is said proximal wall.

31. (New) The spinal fusion implant of claim 30, wherein said receiving aperture is configured to releasably mate with an inserter tool.

32. (New) The spinal fusion implant of claim 31, wherein said receiving aperture comprises a threaded receiving aperture extending into said proximal wall and having a central axis generally parallel to said longitudinal length of said implant.

33. (New) The spinal fusion implant of claim 32, further comprising a pair of lateral grooves positioned in said proximal wall and extending laterally of said threaded receiving aperture.

34. (New) The spinal fusion implant of claim 27, wherein said maximum lateral width of said implant is approximately 18 mm.

35. (New) The spinal fusion implant of claim 27, wherein said radiolucent material comprises PEEK.

36. (New) The spinal fusion implant of claim 27, wherein said implant includes at least one visualization aperture extending through at least one of said first sidewall and said second sidewall.

37. (New) The spinal fusion implant of claim 27, wherein said upper and lower surfaces are generally parallel to one another.

38. (New) The spinal fusion implant of claim 27, wherein said upper and lower surfaces are generally angled relative to one another to approximately correspond to lordosis of a lumbar spine when said implant is positioned within the interbody space.

39. (New) The spinal fusion implant of claim 27, wherein said first fusion aperture is one of generally rectangular and generally oblong in shape.

40. (New) The spinal fusion implant of claim 27, further comprising a medial support extending between the first and second sidewalls

41. (New) The spinal fusion implant of claim 40, wherein said medial support is positioned along said central region.

42. (New) The spinal fusion implant of claim 27, further including a second fusion aperture extending through said upper surface and lower surface and configured to permit

bone growth between the first vertebra and the second vertebra when said implant is positioned within the interbody space.

43. (New) The spinal fusion implant of claim 42, wherein said second fusion aperture is separated from said first fusion aperture by a medial support.

44. (New) The spinal fusion implant of claim 27, wherein said anti-migration elements of said upper surface comprise a plurality of ridges.

45. (New) The spinal fusion implant of claim 44, wherein said plurality of ridges extend generally perpendicular to said longitudinal length.

46. (New) The spinal fusion implant of claim 27, wherein said anti-migration elements of said upper surface comprise spike elements.

47. (New) The spinal fusion implant of claim 46, wherein said spike elements protrude to pointed tips configured to engage said first vertebra.

48. (New) The spinal fusion implant of claim 27, wherein said maximum lateral width of said implant is greater than a lateral width of the distal end of said distal wall and is greater than a lateral width of the proximal end of said proximal wall.

49. (New) The spinal fusion implant of claim 27, wherein said implant has a height extending from said upper surface to said lower surface, wherein said maximum lateral width is greater than said height.

50. (New) The spinal fusion implant of claim 27, wherein said central region includes a maximum height of said implant extending from said upper surface to said lower surface, wherein said maximum height is greater than a height of said distal wall and is greater than a height of said proximal wall.

51. (New) The spinal fusion implant of claim 27, wherein the lateral aperture width of said first fusion aperture is more than two time greater than a lateral thickness of said first sidewall and is more than two time greater than a lateral thickness of said second sidewall.

52. (New) The spinal fusion implant of claim 27, wherein at least one of said three radiopaque markers comprises an elongate body extending generally perpendicular to said longitudinal length.

53. (New) The spinal fusion implant of claim 52, wherein aid elongate body of at least one of said three radiopaque markers is shorter than a height extending from said upper surface to said lower surface.

54. (New) The spinal fusion implant of claim 54, further comprising an osteoinductive material positioned with said first fusion aperture.

REMARKS

Claims 1-26 have been cancelled without prejudice. New claims 27-54 have been added. Written description support for these amendments is found throughout the original specification. No new subject matter has been added.

Claims 27-54 are believed to be patentable over all the prior art references cited in the record and favorable consideration and allowance of the claims is respectfully requested. **Applicant respectfully requests that the Examiner telephone the undersigned attorney prior to mailing the next communication so as to expedite prosecution and avoid unnecessary delays (unless the next communication is a Notice of Allowance).**

Applicants authorize the $120.00 fee for 2 excess claims to be charged to Deposit Account 50-2040. No other fees are believed due at this time, nevertheless, please apply any necessary charges or credits to Deposit Account 50-2040.

Respectfully submitted,

Date: March 20, 2012

/Rorv Schermerhorn/

Rory Schermerhorn, Esq.
Registration No. 58,148

Customer Number 30328
NuVasive
c/o CPA Global
P.O. Box 52050
Minneapolis, MN 55402
Telephone: (858) 909-1845

Electronic Patent Application Fee Transmittal

Application Number:	13079645
Filing Date:	04-Apr-2011
Title of Invention:	System and Methods for Spinal Fusion
First Named Inventor/Applicant Name:	Matthew Curran
Filer:	Rory A. Schermerhorn
Attorney Docket Number:	104US2

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Claims in excess of 20	1202	2	60	120
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
			Total in USD ($)	**120**

Electronic Acknowledgement Receipt

EFS ID:	12352743
Application Number:	13079645
International Application Number:	
Confirmation Number:	1151
Title of Invention:	System and Methods for Spinal Fusion
First Named Inventor/Applicant Name:	Matthew Curran
Customer Number:	30328
Filer:	Rory A. Schermerhorn
Filer Authorized By:	
Attorney Docket Number:	104US2
Receipt Date:	20-MAR-2012
Filing Date:	04-APR-2011
Time Stamp:	23:19:09
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$120
RAM confirmation Number	7131
Deposit Account	502040
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		2012-03-20_PreliminaryAmendment_104US2.pdf	36206 f65239ba025527c2453a2ba719af1b9f031e7a5d	yes	7

Multipart Description/PDF files in .zip description		
Document Description	**Start**	**End**
Preliminary Amendment	1	1
Claims	2	6
Applicant Arguments/Remarks Made in an Amendment	7	7

Warnings:

Information:

2	Fee Worksheet (SB06)	fee-info.pdf	29669 4a369640af3b5edfb46064b38f6114a924943261	no	2

Warnings:

Information:

Total Files Size (in bytes):	65875

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
13/079,645	04/04/2011	

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY ☐ RATE ($)	SMALL ENTITY ☐ FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
			TOTAL			TOTAL	

* If the difference in column 1 is less than zero, enter "0" in column 2.

APPLICATION AS AMENDED – PART II

AMENDMENT	03/20/2012	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 28	Minus	** 26	= 2	X $ =		OR	X $60=	120
	Independent (37 CFR 1.16(h))	* 1	Minus	***3	= 0	X $ =		OR	X $250=	0
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	120

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/MAMYE WAGSTAFF/

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/079,645	04/04/2011	Matthew Curran	104US2

CONFIRMATION NO. 1151

PUBLICATION NOTICE

30328
NuVasive
c/o CPA Global
P.O. Box 52050
Minneapolis, MN 55402

OC000000052361257

Title: System and Methods for Spinal Fusion

Publication No.US-2012-0029641-A1
Publication Date:02/02/2012

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently http://www.uspto.gov/patft/.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently http://pair.uspto.gov/. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Managment, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 13/079,645

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	380
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	620
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	250
TOTAL CLAIMS (37 CFR 1.16(i))	26 minus 20 =	* 6			OR	x 60 =	360
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2 minus 3 =	*				x 250 =	0.00
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	1610

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)		RATE($)	ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
13/079,645	04/04/2011	3733	1580	104US2	26	2

CONFIRMATION NO. 1151

UPDATED FILING RECEIPT

30328
NuVasive
c/o CPA Global
P.O. Box 52050
Minneapolis, MN 55402

OC000000050570005

Date Mailed: 10/26/2011

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Applicant(s)

Matthew Curran, Carlsbad, CA;
Mark Peterson, Medford, OR;

Power of Attorney: None

Domestic Priority data as claimed by applicant

This application is a CON of 11/093,409 03/29/2005 PAT 7,918,891
which claims benefit of 60/557,536 03/29/2004

Foreign Applications (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.)

If Required, Foreign Filing License Granted: 04/13/2011

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/079,645**

Projected Publication Date: 02/02/2012

Non-Publication Request: No

Early Publication Request: No

Title

System and Methods for Spinal Fusion

Preliminary Class

623

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as

set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Matthew Curran	Art Unit:	3733
Serial No.:	13/079,645	Examiner:	Unknown
Filing Date:	April 4, 2011		
Title:	System and Methods for Spinal Fusion		

Certificate of Transmission: I hereby certify that this correspondence is being transmitted to the United States Patent and Trademark Office, via EFS-Web, on **October 18, 2011.**

/Jennifer Russell/

Jennifer Russell, Reg. No. 60,059

RESPONSE TO NOTICE TO FILE MISSING PARTS

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to a Notice to File Missing Parts mailed on April 18, 2011, having a two-month period for response that expired June 18, 2011, the applicants respectfully submit the Oath from the parent application, as required by the Notice to File Missing Parts.

Applicants authorize the payment of $2470 in fees for a late filed declaration, excess claims fees and a 4-month extension of time. However, in the event that there are any additional fees to be charged or payments to be credited, the Applicants hereby request that any charges or credits be made to Deposit Account No.: 50-2040 for Customer No.: 30,328. In the event that there are any questions concerning the remarks above or the application in general, the Examiner is cordially invited to telephone the undersigned attorney so that prosecution may be expedited.

Respectfully submitted,
NUVASIVE, INC.

Date: October 18, 2011

/Jennifer Russell/
Jennifer Russell, Esq.
Registration No. 60,059

NuVasive, Inc.
7475 Lusk Boulevard
San Diego, CA 92121
Tel.: (858) 320-4537

PTO/SB/01 (04-05)
Approved for use through 07/31/2006. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63)

☐ Declaration Submitted With Initial Filing **OR** ☑ Declaration Submitted after Initial Filing (surcharge (37 CFR 1.16 (e)) required)

Attorney Docket Number	104US1
First Named Inventor	Matthew Curran
COMPLETE IF KNOWN	
Application Number	11/093,409
Filing Date	March 29, 2005
Art Unit	3738
Examiner Name	n/a

I hereby declare that:

Each inventor's residence, mailing address, and citizenship are as stated below next to their name.

I believe the inventor(s) named below to be the original and first inventor(s) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

Systems and Methods for Spinal Fusion

(Title of the Invention)

the specification of which

☐ is attached hereto

OR

☑ was filed on (MM/DD/YYYY) 03/29/2005 as United States Application Number or PCT International Application Number 11/093,409 and was amended on (MM/DD/YYYY) _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or (f), or 365(b) of any foreign application(s) for patent, inventor's or plant breeder's rights certificate(s), or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent, inventor's or plant breeder's rights certificate(s), or any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached? YES	NO
			☐	☐	☐
			☐	☐	☐
			☐	☐	☐
			☐	☐	☐

☐ Additional foreign application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

PTO/SB/01 (04-05)
Approved for use through 07/31/2006. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

DECLARATION — Utility or Design Patent Application

Direct all correspondence to: ☑ The address associated with Customer Number: 30,328 OR ☐ Correspondence address below

Name		
Address		
City	State	ZIP
Country	Telephone	Email

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further 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 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

NAME OF SOLE OR FIRST INVENTOR: ☐ A petition has been filed for this unsigned inventor

Given Name (first and middle [if any])	Family Name or Surname
Matthew	Curran

Inventor's Signature [signature] Date 7/26/05

Residence: City	State	Country	Citizenship
Carlsbad	CA	USA	US

Mailing Address: 3218 Rancho Quartillo

City	State	Zip	Country
Carlsbad	CA	92009	USA

NAME OF SECOND INVENTOR: ☐ A petition has been filed for this unsigned inventor

Given Name (first and middle [if any])	Family Name or Surname
Mark	Peterson

Inventor's Signature | Date

Residence: City	State	Country	Citizenship
Medford	OR	USA	US

Mailing Address: 840 Royal Avenue Suite #1

City	State	Zip	Country
Medford	OR	97504	USA

☐ Additional inventors or a legal representative are being named on the _____ supplemental sheet(s) PTO/SB/02A or 02LR attached hereto.

PTO/SB/01 (04-05)
Approved for use through 07/31/2006. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

DECLARATION — Utility or Design Patent Application

Direct all correspondence to: ☑ The address associated with Customer Number:	30,328	OR ☐	Correspondence address below

Name		
Address		
City	State	ZIP
Country	Telephone	Email

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further 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 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

NAME OF SOLE OR FIRST INVENTOR: ☐ A petition has been filed for this unsigned inventor

Given Name (first and middle [if any])	Family Name or Surname		
Matthew	Curran		
Inventor's Signature		Date	
Residence: City	State	Country	Citizenship
Carlsbad	CA	USA	US
Mailing Address			
3218 Rancho Quartillo			
City	State	Zip	Country
Carlsbad	CA	92009	USA

NAME OF SECOND INVENTOR: ☐ A petition has been filed for this unsigned inventor

Given Name (first and middle [if any])	Family Name or Surname		
Mark	Peterson		
Inventor's Signature	Mark Peterson	Date	7/26/05
Residence: City	State	Country	Citizenship
Medford	OR	USA	US
Mailing Address			
840 Royal Avenue Suite #1			
City	State	Zip	Country
Medford	OR	97504	USA

☐ Additional inventors or a legal representative are being named on the ____ supplemental sheet(s) PTO/SB/02A or 02LR attached hereto.

Electronic Patent Application Fee Transmittal

Application Number:	13079645
Filing Date:	04-Apr-2011
Title of Invention:	System and Methods for Spinal Fusion
First Named Inventor/Applicant Name:	Matthew Curran
Filer:	Jennifer Lynn Risser
Attorney Docket Number:	104US2

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Claims in excess of 20	1202	6	60	360
Miscellaneous-Filing:				
Late filing fee for oath or declaration	1051	1	130	130
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Extension - 4 months with $0 paid	1254	1	1980	1980
Miscellaneous:				
			Total in USD ($)	**2470**

Electronic Acknowledgement Receipt

EFS ID:	11215105
Application Number:	13079645
International Application Number:	
Confirmation Number:	1151
Title of Invention:	System and Methods for Spinal Fusion
First Named Inventor/Applicant Name:	Matthew Curran
Customer Number:	30328
Filer:	Jennifer Lynn Risser
Filer Authorized By:	
Attorney Docket Number:	104US2
Receipt Date:	18-OCT-2011
Filing Date:	04-APR-2011
Time Stamp:	23:57:46
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$2470
RAM confirmation Number	6456
Deposit Account	502040
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)

1	Extension of Time	2011-10-18-MPR-EOT104US2.pdf	285597 781de69562be376f9a55ec811791f78e234d184e	no	2
Warnings:					
Information:					
2	Applicant Response to Pre-Exam Formalities Notice	2011-10-18-MissingPartsResponse104US2.pdf	19168 82a95d83906991cb3c652bc78cc046487b4d4280	no	2
Warnings:					
Information:					
3	Oath or Declaration filed	2005-08-04-OathDecFromParent104US2.pdf	149435 b988f2f64960b1170dc5c3b906601238090d2afd	no	3
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	33214 6324bb2b060f7a7e0f0660fcd3053de9e421d73f	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	487414		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/22 (09-11)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARMENT OF COMMERCE

PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)	Docket Number (Optional) 104US2
Application Number 13/079,645	Filed April 4, 2011
For System and Methods for Spinal Fusion	
Art Unit 3733	Examiner

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

	Fee	Small Entity Fee	
☐ One month (37 CFR 1.17(a)(1))	$150	$75	$
☐ Two months (37 CFR 1.17(a)(2))	$560	$280	$
☐ Three months (37 CFR 1.17(a)(3))	$1270	$635	$
☑ Four months (37 CFR 1.17(a)(4))	$1980	$990	$ 1980
☐ Five months (37 CFR 1.17(a)(5))	$2690	$1345	$

☐ Applicant claims small entity status. See 37 CFR 1.27.

☐ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account.

☑ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 50-2040.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

I am the

☐ applicant/inventor.

☐ assignee of record of the entire interest. See 37 CFR 3.71.
Statement under 37 CFR 3.73(b) is enclosed (Form PTO/SB/96).

☐ attorney or agent of record. Registration Number _____

☐ attorney or agent under 37 CFR 1.34.
Registration number if acting under 37 CFR 1.34 _____

/Jennifer Russell/ — Signature

October 18, 2011 — Date

Jennifer Russell — Typed or printed name

858-320-4537 — Telephone Number

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.

☑ Total of 1 forms are submitted.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 13/079,645

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	330
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	540
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	220
TOTAL CLAIMS (37 CFR 1.16(i))	26 minus 20 =	* 6			OR	x 52 =	312
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2 minus 3 =	*				x 220 =	0.00
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $270 ($135 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	1402

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)		RATE($)	ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
13/079,645	04/04/2011	3733	1090	104US2	26	2

CONFIRMATION NO. 1151

30328
NuVasive
c/o CPA Global
P.O. Box 52050
Minneapolis, MN 55402

FILING RECEIPT

OC000000047142350

Date Mailed: 04/18/2011

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Applicant(s)

Matthew Curran, Carlsbad, CA;
Mark Peterson, Medford, OR;

Power of Attorney: None

Domestic Priority data as claimed by applicant

This application is a CON of 11/093,409 03/29/2005 PAT 7,918,891
which claims benefit of 60/557,536 03/29/2004

Foreign Applications (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.)

If Required, Foreign Filing License Granted: 04/13/2011

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/079,645**

Projected Publication Date: To Be Determined - pending completion of Missing Parts

Non-Publication Request: No

Early Publication Request: No

Title

System and Methods for Spinal Fusion

Preliminary Class

623

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as

set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/079,645	04/04/2011	Matthew Curran	104US2

CONFIRMATION NO. 1151

30328
NuVasive
c/o CPA Global
P.O. Box 52050
Minneapolis, MN 55402

FORMALITIES LETTER

OC000000047142351

Date Mailed: 04/18/2011

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

Items Required To Avoid Abandonment:

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The oath or declaration is unsigned.

The applicant needs to satisfy supplemental fees problems indicated below.

The required item(s) identified below must be timely submitted to avoid abandonment:

- Additional claim fees of $**312** as a non-small entity, including any required multiple dependent claim fee, are required. Applicant must submit the additional claim fees or cancel the additional claims for which fees are due.
- A surcharge (for late submission of filing fee, search fee, examination fee or oath or declaration) as set forth in 37 CFR 1.16(f) of $**130** for a non-small entity, must be submitted.

SUMMARY OF FEES DUE:

Total fee(s) required within **TWO MONTHS** from the date of this Notice is $**442** for a non-small entity
- $**130** Surcharge.
- Total additional claim fee(s) for this application is $**312**
  - $**312** for **6** total claims over 20.

Items Required To Avoid Processing Delays:

The item(s) indicated below are also required and should be submitted with any reply to this notice to avoid further processing delays.

- A new oath or declaration, identifying this application number is required. The oath or declaration does not comply with 37 CFR 1.63 in that it:
- does not identify the complete mailing or post office address of each inventor.

Replies should be mailed to:

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web.
https://sportal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html

For more information about EFS-Web please call the USPTO Electronic Business Center at **1-866-217-9197** or visit our website at http://www.uspto.gov/ebc.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

/bzewdie/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

PTO/SB/05 (08-08)
Approved for use through 09/30/2010. OMB 0651-0032
U.S. Patent and Trademark Office. U.S. DEPARTMENT OF COMMERCE

UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.	104US2
First Inventor	Matthew Curran
Title	Systems and Methods for Spinal Fusi
Express Mail Label No.	

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

1. ☑ **Fee Transmittal Form** (e.g., PTO/SB/17)
2. ☐ **Applicant claims small entity status.** See 37 CFR 1.27.
3. ☑ **Specification** [*Total Pages* 32]
   Both the claims and abstract must start on a new page
   (For information on the preferred arrangement, see MPEP 608.01(a))
4. ☐ **Drawing(s)** (*35 U.S.C. 113*) [*Total Sheets* 20]
5. **Oath or Declaration** [*Total Sheets* 2]
   a. ☐ Newly executed (original or copy)
   b. ☑ A copy from a prior application (37 CFR 1.63(d))
   (for continuation/divisional with Box 18 completed)
   i. ☐ DELETION OF INVENTOR(S)
   Signed statement attached deleting inventor(s) name in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b).
6. ☐ **Application Data Sheet.** See 37 CFR 1.76
7. ☐ **CD-ROM or CD-R** in duplicate, large table or Computer Program *(Appendix)*
   ☐ Landscape Table on CD
8. **Nucleotide and/or Amino Acid Sequence Submission**
   (if applicable, items a. – c. are required)
   a. ☐ Computer Readable Form (CRF)
   b. Specification Sequence Listing on:
      i. ☐ CD-ROM or CD-R (2 copies); or
      ii. ☐ Paper
   c. ☐ Statements verifying identity of above copies

ADDRESS TO: **Commissioner for Patents**
P.O. Box 1450
Alexandria VA 22313-1450

ACCOMPANYING APPLICATION PARTS

9. ☐ **Assignment Papers** (cover sheet & document(s))
   Name of Assignee_____
10. ☐ **37 CFR 3.73(b) Statement** *(when there is an assignee)* ☐ **Power of Attorney**
11. ☐ **English Translation Document** *(if applicable)*
12. ☐ **Information Disclosure Statement** (PTO/SB/08 or PTO-1449)
    ☐ Copies of citations attached
13. ☐ **Preliminary Amendment**
14. ☐ **Return Receipt Postcard** (MPEP 503)
    (*Should be specifically itemized)*
15. ☐ **Certified Copy of Priority Document(s)**
    (if foreign priority is claimed)
16. ☐ **Nonpublication Request** under 35 U.S.C. 122(b)(2)(B)(i). Applicant must attach form PTO/SB/35 or equivalent.
17. ☐ Other:_____

18. If a CONTINUING APPLICATION, *check appropriate box, and supply the requisite information below and in the first sentence of the specification following the title, or in an Application Data Sheet under 37 CFR 1.76:*

☑ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No.: 11/093,409

Prior application information: *Examiner* Elana Beth Fisher *Art Unit:* 3733

19. CORRESPONDENCE ADDRESS

☑ The address associated with Customer Number: 30328 ***OR*** ☐ Correspondence address below

Name					
Address					
City		State		Zip Code	
Country		Telephone		Email	

Signature	/Jennifer Risser/	Date	April 4, 2011
Name (Print/Type)	Jennifer Risser	Registration No. (Attorney/Agent)	60,059

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

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2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

NON-PROVISIONAL APPLICATION

FOR UNITED STATES LETTERS PATENT

SYSTEMS AND METHODS FOR SPINAL FUSION

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SYSTEMS AND METHODS FOR SPINAL FUSION

CROSS-REFERENCE TO RELATED APPLICATION

This application is continuation of United States Patent Application Serial Number 11/093,409 filed March 29, 2005, now pending, which claims the benefit of the filing date under 35 USC 119(e) of United States Provisional Application entitled "Systems and Methods for Spinal Fusion," serial No. 60/557,536 filed March 29, 2004, the entire contents of which are incorporated herein by reference.

BACKGROUND OF THE INVENTION

I. Field of the Invention

The present invention relates generally to spinal surgery and, more particularly, to a system and method for spinal fusion comprising a spinal fusion implant of non-bone construction releasably coupled to an insertion instrument dimensioned to introduce the spinal fusion implant into any of a variety of spinal target sites.

II. Discussion of the Prior Art

Currently there are nearly 500,000 spine lumbar and cervical fusion procedures performed each year in the United States. Such procedures are commonly performed to correct problems, such as chronic back or neck pain, which result from degenerated intervertebral discs or trauma. Generally, spinal fusion procedures involve removing some or all of the diseased or damaged disc, and inserting one or more intervertebral implants into the resulting disc space. Introducing the intervertebral implant serves to restore the height between adjacent vertebrae

("disc height"), which reduces if not eliminates neural impingement commonly associated with a damaged or diseased disc.

Autologous bone grafts are widely used intervertebral implant for lumbar fusion. Autologous bone grafts are obtained by harvesting a section of bone from the iliac crest of the patient and thereafter implanting the article of autologous bone graft to effect fusion. While generally effective, the use of autologous bone grafts suffers certain drawbacks. A primary drawback is the morbidity associated with harvesting the autologous graft from the patient's iliac crest. Another related drawback is the added surgical time required to perform the bone-harvesting.

Allograft bone grafts have been employed with increased regularity in an effort to overcome the drawbacks of autologous bone grafts. Allograft bone grafts are harvested from cadaveric specimens, machined, and sterilized for implantation. While allograft bone grafts eliminate the morbidity associated with iliac crest bone harvesting, as well as decrease the overall surgical time, they still suffer certain drawbacks. A primary drawback is supply constraint, in that the tissue banks that process and produce allograft bone implants find it difficult to forecast allograft given the inherent challenges in forecasting the receipt of cadavers. Another related drawback is that it is difficult to manufacture the allograft with consistent shape and strength characteristics given the variation from cadaver to cadaver.

The present invention is directed at overcoming, or at least improving upon, the disadvantages of the prior art.

SUMMARY OF THE INVENTION

The present invention overcomes the drawbacks of the prior art by providing a spinal fusion system and related methods involving the use of a spinal fusion implant of non-bone construction. The non-bone construction of the spinal fusion implant of the present invention overcomes the drawbacks of the prior art in that it is not supply limited (as with allograft) and does not require harvesting bone from the patient (as with autograft). The spinal fusion implant of the present invention may be comprised of any suitable non-bone composition, including but not limited to polymer compositions (e.g. poly-ether-ether-ketone (PEEK) and/or poly-ether-ketone-ketone (PEKK)), ceramic, metal or any combination of these materials.

The spinal fusion implant of the present invention may be provided in any number of suitable shapes and sizes depending upon the particular surgical procedure or need. The spinal fusion implant of the present invention may be dimensioned for use in the cervical and/or lumbar spine without departing from the scope of the present invention. For lumbar fusion, the spinal fusion implant of the present invention may be dimensioned, by way of example only, having a length ranging between 9 and 18 mm, a height ranging between 8 and 16 mm, and a width ranging between 25 and 45 mm. For cervical fusion, the spinal fusion implant of the present invention may be dimensioned, by way of example only, having a length about 11 mm, a height ranging between 5 and 12 mm, and a width about 14 mm.

The spinal fusion implant of the present invention may be provided with any number of additional features for promoting fusion, such as apertures extending between the upper and lower vertebral bodies which allow a boney bridge to form through the spinal fusion implant of the present invention. Such fusion-promoting apertures may be dimensioned to receive any number of suitable osteoinductive agents, including but not limited to bone morphogenic protein (BMP) and bio-resorbable polymers, including but not limited to any of a variety of poly (D,L-lactide-co-glycolide) based polymers, such as disclosed in U.S. Patent No. 6,013,853. The spinal fusion implant of the present invention is preferably equipped with one or more lateral openings which aid it provides in visualization at the time of implantation and at subsequent clinical evaluations.

The spinal fusion implant of the present invention may be provided with any number of suitable anti-migration features to prevent spinal fusion implant from migrating or moving from the disc space after implantation. Suitable anti-migration features may include, but are not necessarily limited to, angled teeth formed along the upper and/or lower surfaces of the spinal fusion implant and/or spike elements disposed partially within and partially outside the upper and/or lower surfaces of the spinal fusion implant. Such anti-migration features provide the additional benefit of increasing the overall surface area between the spinal fusion implant of the present invention and the adjacent vertebrae, which promotes overall bone fusion rates.

The spinal implant of the present invention may be introduced into a spinal target site through the use of any of a variety of suitable instruments having the capability to releasably engage the spinal implant. In a preferred embodiment, The insertion instrument permits quick,

direct, accurate placement of the spinal implant of the present invention into the intervertebral space. According to one embodiment, the insertion instrument includes a threaded engagement element dimensioned to threadably engage into a receiving aperture formed in the spinal fusion implant of the present invention. According to another embodiment, the insertion instrument includes an elongate fork member and a generally tubular lock member.

BRIEF DESCRIPTION OF THE DRAWINGS

Many advantages of the present invention will be apparent to those skilled in the art with a reading of this specification in conjunction with the attached drawings, wherein like reference numerals are applied to like elements and wherein:

Figure 1 is a perspective view of a spinal fusion system of the present invention, including a lumbar fusion implant releasably coupled to an insertion instrument according to one embodiment of the present invention;

Figure 2 is a perspective view of the lumbar fusion implant of FIG. 1, illustrating (among other things) fusion apertures extending between top and bottom surfaces, a plurality of visualization apertures extending through the side walls, and a variety of anti-migration features according to one embodiment of the present invention;

Figure 3 is a top view of the lumbar fusion implant of FIG. 1, illustrating (among other things) the fusion apertures and the anti-migration features according to one embodiment of the present invention;

Figure 4 is a side view of the lumbar fusion implant of FIG. 1, illustrating (among other things) the visualization apertures, the anti-migration feature, and a receiving aperture for releasably engaging the insertion instrument of FIG. 1 according to one embodiment of the present invention;

Figure 5 is an end view of the lumbar fusion implant of FIG. 1, illustrating (among other things) the receiving aperture formed in the proximal end, the anti-migration features, and the visualization apertures according to one embodiment of the present invention;

Figure 6 is an enlarged side view of the lumbar fusion implant of FIG. 1 releasably coupled to the distal end of the insertion instrument of FIG. 1 according to one embodiment of the present invention;

Figure 7 is a perspective view of the insertion instrument of FIG. 1 in a fully assembled form according to one embodiment of the present invention;

Figure 8 is an enlarged perspective view of the distal region of the insertion instrument of FIG. 1 according to one embodiment of the present invention;

Figure 9 is a perspective exploded view of the insertion instrument of FIG. 1, illustrating the component parts of the insertion instrument according to one embodiment of the present invention;

Figure 10 is a perspective view of a spinal fusion system of the present invention, including a cervical fusion implant releasably coupled to a cervical insertion instrument according to one embodiment of the present invention;

Figure 11 is a perspective view of the proximal side of the cervical fusion implant of FIG. 10, illustrating (among other things) fusion apertures extending between top and bottom surfaces, a plurality of visualization apertures extending through the lateral walls, a plurality of receiving apertures, and a variety of anti-migration features according to one embodiment of the present invention;

Figure 12 is a perspective view of the distal side cervical fusion implant of FIG. 10, illustrating (among other things) the visualization apertures and anti-migration features;

Figure 13 is a top view of the cervical fusion implant of FIG. 10, illustrating (among other things) the fusion apertures and anti-migration features according to one embodiment of the present invention;

Figure 14 is a side view of the cervical fusion implant of FIG. 10, illustrating (among other things) the visualization apertures, the anti-migration features, and one of two receiving

apertures provided in the proximal end for releasably engaging the cervical insertion instrument of FIG. 10 according to one embodiment of the present invention;

Figure 15 is a perspective view of the cervical fusion implant of the present invention just prior to attachment to the cervical insertion device according to one embodiment of the present invention;

Figure 16 is a perspective view of the insertion instrument of FIG. 10 in a fully assembled form according to one embodiment of the present invention;

Figure 17 is a perspective exploded view of the insertion instrument of FIG. 10, illustrating the component parts of the insertion instrument according to one embodiment of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Illustrative embodiments of the invention are described below. In the interest of clarity, not all features of an actual implementation are described in this specification. It will of course be appreciated that in the development of any such actual embodiment, numerous implementation-specific decisions must be made to achieve the developers' specific goals, such as compliance with system-related and business-related constraints, which will vary from one implementation to another. Moreover, it will be appreciated that such a development effort might be complex and time-consuming, but would nevertheless be a routine undertaking for those of ordinary skill in the art having the benefit of this disclosure. The system to facilitate

bone fusion and related methods disclosed herein boasts a variety of inventive features and components that warrant patent protection, both individually and in combination.

FIG. 1 illustrates, by way of example only, a spinal fusion system 5 for performing spinal fusion between adjacent lumbar vertebrae, including an exemplary spinal fusion implant 10 and an exemplary insertion instrument 20 provided in accordance with the present invention. The spinal fusion implant 10 may be comprised of any suitable non-bone composition having suitable radiolucent characteristics, including but not limited to polymer compositions (e.g. poly-ether-ether-ketone (PEEK) and/or poly-ether-ketone-ketone (PEKK)) or any combination of PEEK and PEKK. The spinal fusion implant 10 of the present invention may be dimensioned, by way of example only, having a length ranging between 9 and 18 mm, a height ranging between 8 and 16 mm, and a width ranging between 25 and 45 mm.

As will be described in detail below, the insertion instrument 20 is configured to releasably maintain the exemplary spinal fusion implant 10 in the proper orientation during insertion into a lumbar disc space and thereafter release to deposit the implant 10. The exemplary spinal fusion implant 10, having been deposited in the disc space, facilitates spinal fusion over time by maintaining a restored disc height as natural bone growth occurs through and/or past the implant 10, resulting in the formation of a boney bridge extending between the adjacent vertebral bodies.

The spinal fusion implant 10 of the present invention may be provided with any number of additional features for promoting fusion, such as apertures 2 extending between the upper and

lower vertebral bodies which allow a boney bridge to form through the spinal fusion implant 10. According to a still further aspect of the present invention, this fusion may be facilitated or augmented by introducing or positioning various osteoinductive materials within the apertures 2 and/or adjacent to the spinal fusion implant 10. Such osteoinductive materials may be introduced before, during, or after the insertion of the exemplary spinal fusion implant 10, and may include (but are not necessarily limited to) autologous bone harvested from the patient receiving the spinal fusion implant 10, bone allograft, bone xenograft, any number of non-bone implants (e.g. ceramic, metallic, polymer), bone morphogenic protein, and bio-resorbable compositions, including but not limited to any of a variety of poly (D,L-lactide-co-glycolide) based polymers, such as disclosed in U.S. Patent No. 6,013,853.

The spinal fusion implant 10 of the present invention is preferably equipped with one or more visualization apertures 4 situated along the lateral sides, which aid in visualization at the time of implantation and at subsequent clinical evaluations. More specifically, based on the generally radiolucent nature of the implant 10, the visualization apertures 4 provide the ability to visualize the interior of the implant 10 during X-ray and/or other suitable imaging techniques which are undertaken from the side (or "lateral") perspective of the implant 10. If fusion has taken place, the visualization apertures 4 will provide a method for the surgeon to make follow up assessments as to the degree of fusion without any visual interference from the spinal fusion implant 10. Further, the visualization apertures 4 will provide an avenue for cellular migration to the exterior of the spinal fusion implant 10. Thus the spinal fusion implant 10 will serve as additional scaffolding for bone fusion on the exterior of the spinal fusion implant 10.

FIGS. 2-5 depict various embodiments of the exemplary spinal fusion implant 10. Some common attributes are shared among the various embodiments. More specifically, each spinal fusion implant 10 has a top surface 31, a bottom surface 33, lateral sides 14, a proximal side 22, and a distal side 16. In one embodiment, the top and bottom surfaces 31, 33 are generally parallel. It can be appreciated by one skilled in the art that although the surfaces 31, 33 are generally parallel to one another, they may be provided in any number of suitable shapes, including but not limited to concave and/or convex. When provided as convex shapes, the top and bottom surfaces 31, 33 may better match the natural contours of the vertebral end plates.

The exemplary spinal fusion implant 10 also preferably includes anti-migration features designed to increase the friction between the spinal fusion implant 10 and the adjacent contacting surfaces of the vertebral bodies so as to prohibit migration of the spinal fusion implant 10 after implantation. Such anti-migration features may include ridges 6 provided along the top surface 31 and/or bottom surface 33. Additional anti-migration features may also include a pair of spike elements 7 disposed within the proximal region of the implant 10, a pair of spike elements 8 disposed within the distal region of the implant 10, and a pair of spike elements 9 disposed within the central region of the implant 10. Spike elements 7, 8, 9 may extend from the top surface 31 and/or bottom surface 33 within the respective proximal, distal and central regions of the implant 10. The spike elements 7, 8, 9 may be manufactured from any of a variety of suitable materials, including but not limited to a metal, ceramic, and/or polymer material, preferably having radiopaque characteristics. The spike elements 7, 8, 9 may also take any of a variety of suitable shapes, including but not limited to a generally elongated element disposed within the implant 10 such that the ends thereof extend generally perpendicularly from the upper and/or

lower surfaces 31, 33 of the implant 10. As best appreciated in FIG. 4, the spike elements 7, 8, 9 may each comprise a unitary element extending through upper and lower surfaces 31, 33. Alternatively, each spike element 7, 8, 9 may comprise a shorter element which only extends through a single surface 31, 33 (that is, does not extend through the entire height of the implant 10).

The spinal fusion implant 10 has two large fusion apertures 2, separated by a medial support 50, extending in a vertical fashion through the top surface 31 and bottom surface 33. The fusion apertures 2 function primarily as an avenue for bony fusion between adjacent vertebrae. The fusion apertures 2 may be provided in any of a variety of suitable shapes, including but not limited to the generally rectangular shape best viewed in FIG. 3, or a generally circular, oblong and/or triangular shape or any combination thereof. The spinal fusion implant 10 may have a plurality of visualization apertures 4 which allow a clinician to make visual observations of the degree of bony fusion un-obscured by the lateral side 14 to facilitate further diagnosis and treatment. The visualization apertures 4 may be provided in any of a variety of suitable shapes, including but not limited to the generally oblong shape best viewed in FIG. 4, or a generally circular, rectangular and/or triangular shape or any combination thereof.

The spinal fusion implant 10 may be provided with any number of suitable features for engaging the insertion instrument 20 without departing from the scope of the present invention. As best viewed in FIGS. 4-6, one engagement mechanism involves providing a threaded receiving aperture 12 in the proximal sidewall 22 of the spinal fusion implant 10 of the present invention. The threaded receiving aperture 12 is dimensioned to threadably receive a threaded

connector 24 on the insertion instrument 20 (as will be described in greater detail below). The receiving aperture 12 extends inwardly from the proximal side 22 in a generally perpendicular fashion relative to the proximal side 22. Although shown as having a generally circular cross-section, it will be appreciated that the receiving aperture 12 may be provided having any number of suitable shapes or cross-sections, including but not limited to rectangular or triangular. In addition to the receiving aperture 12, the spinal fusion implant 10 is preferably equipped with a pair of grooved purchase regions 60, 61 extending generally horizontally from either side of the receiving aperture 12. The grooved purchase regions 60, 61 are dimensioned to receive corresponding distal head slots 62, 63 on the insertion instrument 20 (as will be described in greater detail below), which collectively provide an enhanced engagement between the implant 10 and instrument 20.

FIGS. 6-9 detail the exemplary insertion instrument 20 according to one embodiment of the invention. The exemplary insertion instrument 20 includes an elongate tubular element 28 and an inserter shaft 44. The elongate tubular element 28 is constructed with a distal head 26 at its distal end, a distal head slot 62 at it s distal end, a thumbwheel housing 38 at its proximal end and a handle 42 at its proximal end. The elongate tubular element 28 is generally cylindrical and of a length sufficient to allow the device to span from the surgical target site to a location sufficiently outside the patient's body so the handle 42 and thumbwheel housing 38 can be easily accessed by a clinician or a complimentary controlling device.

The elongate tubular element 28 is dimensioned to receive a spring 46 and the proximal end of the inserter shaft 44 into the inner bore 64 of the elongate tubular element 28. The inserter

shaft 44 is dimensioned such that the threaded connector 24 at the distal end of the inserter shaft 44 just protrudes past the distal head slots 62, 63 to allow engagement with the receiving aperture 12 of the spinal fusion implant 10. It should be appreciated by one skilled in the art that such a construction allows the inserter shaft 44 to be able to rotate freely within the elongate tubular element 28 while stabilized by a spring 46 to reduce any slidable play in the insertion instrument 20.

The handle 42 is generally disposed at the proximal end of the insertion instrument 20. The handle 42 is fixed to the thumbwheel housing 38 allowing easy handling by the clinician. Because the handle 42 is fixed the clinician has easy access to the thumbwheel 34 and can stably turn the thumbwheel 34 relative to the thumbwheel housing 38. Additionally, the relative orientation of the thumbwheel housing 38 to the handle 42 orients the clinician with respect to the distal head 26 and distal head slot 62. By way of example, the thumbwheel housing 38 holds a thumbwheel 34, a set screw 32, and a spacer 36. The inserter shaft 44 is attached to the thumbwheel 34 and is freely rotatable with low friction due to the spacer 36. One skilled in the art can appreciate myriad methods of assembling a housing similar to the above described.

FIG. 6 details the distal head slot of the exemplary insertion instrument 20 coupled to the spinal fusion implant 10 through the purchase regions 60, 61. The distal head slots 62, 63 are dimensioned to fit slidably into the purchase regions 60, 61 with low friction to allow accurate engagement of the threaded connector 24 to the receiving aperture 12 of the spinal fusion implant 10. In the presented embodiment, the outer dimension of the threaded connector 24 is smaller than the largest outer dimension of the distal head 26 and elongate tubular element 28.

Alternatively, other methods of creating a gripping surface are contemplated including but not limited to knurling or facets.

In order to use the system to perform a spinal fusion procedure, the clinician must first designate the appropriate implant size. After the spinal fusion implant 10 is chosen, the distal head slots 62, 63 of the inserter shaft 44 are inserted into the purchase regions 60, 61 of the spinal fusion implant 10. At that time the spinal fusion implant 10 and insertion instrument 20 are slidably engaged with one another. Before the clinician can manipulate the combined spinal fusion implant 10 and insertion instrument 20, they must be releasably secured together. In order to secure the spinal fusion implant 10 onto the threaded connector 24 of the inserter instrument 20, the clinician employs the thumbwheel 34 to rotate the inserter shaft 44 and threaded connector 24. The rotation of the threaded connector 24 will releasably engage the receiving aperture of the spinal fusion implant 10 and stabilize the insertion instrument 20 relative to the spinal fusion implant 10.

A clinician can utilize the secured system in either an open or minimally invasive spinal fusion procedure. In either type of procedure, a working channel would be created in a patient that reaches the targeted spinal level. After the creation of that channel, the intervertebral space would be prepared. After preparation the secured device is used to place a spinal fusion implant 10 into the prepared intervertebral space. Once the implant 10 is inserted into the prepared space, the implant 10 is released from the insertion instrument 20 by rotating the thumbwheel 34 to disengage the threaded connector 24 from the receiving aperture 12. That motion removes the compressive force on the purchase regions 60, 61 between the distal head 26 and the distal head

slots 62, 63 of the spinal fusion implant 10 and allows the insertion instrument to be slidably removed from the implant 10. After the threaded connector 24 is disengaged from the implant 10, the insertion instrument 20 is removed from the working channel and the channel is closed. As previously mentioned, additional materials may be included in the procedure before, during or after the insertion of the spinal fusion implant 10 to aid the natural fusion of the targeted spinal level.

FIG. 10 illustrates a spinal fusion system 105 for performing spinal fusion between adjacent cervical vertebrae, including an exemplary spinal fusion implant 110 and an exemplary cervical insertion instrument 120 provided in accordance with the present invention. The spinal fusion implant 110 may comprise of any suitable non-bone composition having suitable radiolucent characteristics, including but not limited to polymer compositions (e.g. poly-ether-ether-ketone (PEEK) and/or poly-ether-ketone-ketone (PEKK)) or any combination of PEEK and PEKK. The spinal fusion implant 110 may be provided in any number of suitable sizes, such as, by way of example only, a length ranging between 11 to 14 mm, a height ranging between 5 and 12 mm, and a width ranging from 14 and 16 mm.

As will be described in detail below, the cervical insertion instrument 120 is configured to releasably maintain the exemplary cervical fusion implant 110 in the proper orientation for insertion. The cervical fusion implant 110 may be simultaneously introduced into a disc space while locked within the cervical insertion instrument 120 and thereafter released. The exemplary cervical fusion implant 110, having been deposited in the disc space, effects spinal

fusion over time as the natural bone healing process integrates and binds the implant with the adjacent vertebral bodies. This fusion may be facilitated or augmented by introducing or positioning various materials in a space created within or adjacent to the cervical fusion implant 110. Those materials may be introduced before, during, or after the insertion of the exemplary cervical fusion implant 110. The additional material may include bone autograft harvested from the patient receiving the spinal fusion implant 10, one or more additional bone allograft, bio-resorbables or xenograft implants, any number of non-bone implants, and any number of fusion promoting compounds such as bone morphogenic protein.

FIGS. 11-14 depict various embodiments of the exemplary cervical fusion implant 110. Some common attributes are shared among the various embodiments. More specifically, each cervical fusion implant 110 has a top surface 31, a bottom surface 33, lateral sides 14, a proximal side 22, and a distal side 16. In one embodiment, the top and bottom surfaces 31, 33 are generally parallel. It can be appreciated by one skilled in the art that although the surfaces are generally parallel, that the top 31 and bottom 33 surfaces may be angled with respect to one another to match the natural curve of the spine (i.e. lordosis or kyphosis). By way of example, implants for the cervical or lumbar regions of the spine will have anterior height greater than the posterior height to match the natural lordosis in those regions. Inversely, the implants designed for implantation into the thoracic region will be manufactured with a posterior height greater than the anterior height to match the natural kyophosis in that region. Additionally, the angled surface can aid in overall fit within the vertebral disc space.

The cervical fusion implant 110 preferably includes two receiving apertures 12 which are centrally aligned on the proximal side 22. The receiving apertures 12 extend inwardly from the proximal side 22 in a generally perpendicular fashion relative to the proximal side 22. Although shown as having a generally circular cross-section, it will be appreciated that the receiving aperture 12 may be provided having any number of suitable shapes or cross-sections, including but not limited to rectangular or triangular.

The exemplary cervical fusion implant 110 also preferably includes anti-migration features such as anti-migration teeth 6 along the top surface 31 and bottom surface 33. Additional anti-migration features may include a plurality of proximal anti-migration spikes 68 and/or distal anti-migration spikes 70 integrated vertically through the cervical fusion implant 110. The anti-migration features increase the friction between the cervical fusion implant 110 and the adjacent contacting surfaces of the vertebral bodies. That friction prohibits migration of the cervical fusion implant 110 during the propagation of natural bony fusion. It should be appreciated by one skilled in the art that such anti-migration teeth 6 can be oriented in a particular direction which will stabilize the cervical fusion implant 110 in several degrees of rotation during placement.

The cervical fusion implant 110 has one large fusion aperture 2, extending in a vertical fashion through the top surface 31 and bottom surface 33 which will function primarily as the avenue for bony fusion between adjacent vertebrae. The cervical fusion implant 110 may have a plurality of visualization apertures 4 which can also serve as an avenue of bony fusion on the lateral sides 14 via cell migration or additional adjuvants. The visualization apertures 4 serve an

additional function of allowing a clinician to make visual observations of the degree of bony fusion un-obscured by the lateral side 14 to facilitate further diagnosis and treatment.

FIG. 15 illustrates, by way of example, the orientation of the cervical fusion implant 110 prior to attachment to the cervical insertion instrument 120 by a clinician. One skilled in the art would appreciate that although the current embodiment shows a slidable engagement, various other methods of engagement are contemplated; such as, threadable or hooking features.

FIGS. 16-17 detail the tubular lock member 21 of the exemplary cervical inserter instrument 110. The tubular lock member 21 includes a central bore 25 dimensioned to receive the proximal end of the elongate fork member 11 therein. The internal dimension of the central bore 25 is smaller than the largest freestanding outer dimension of the taper feature 19. As a result, the portion of the elongate fork member 11 that may be received by the central bore 25 of the tubular lock member 21 is limited by interference between the distal end of the tubular lock member 21 and the taper feature 19 of the elongate fork member 11. In the present embodiment, the outer dimension of the threaded feature 13 of the elongate fork member 11 is smaller than the largest outer dimension of the taper feature 19 on the elongate fork member 11. A thread feature 23 (not shown) at the proximal end of the tubular lock member 21 is situated inside the central bore 25. The thread feature 23 matches the thread feature 13 on the elongate fork member 11 so that they can be threadably attached to one another. To ease the rotation of the tubular lock member 21 by hand, two semi-circular wings 27 may be provided protruding laterally outward from either side of the tubular lock member 21. Alternatively, other methods of creating a gripping surface are contemplated including but not limited to knurling or facets.

A clinician can utilize the secured system in either an open or minimally invasive spinal fusion procedure. In either type of procedure, a working channel would be created in a patient that reaches the targeted spinal level. After the creation of that channel, the intervertebral space would be prepared. After preparation the secured device is used to place a cervical fusion implant 110 into the prepared intervertebral space. Once the cervical fusion implant 110 is inserted into the prepared space, the implant 110 is released from the cervical insertion instrument 120 by retracting the tubular lock member 21 from the elongate fork member 11 by rotating the tubular lock member 21 with respect to the elongate fork member 11 in the opposite direction from that used to initially secure the implant 110. That motion removes the compressive force on the purchase region 39 between the apertures 12 of the cervical fusion implant 110 and allows the engagement features 17 to be slidably removed from the apertures 12. After the engagement features 17 are disengaged from the cervical fusion implant 110, the cervical inserter instrument 120 is removed from the working channel and the channel is closed. As previously mentioned, additional materials may be included in the procedure before, during or after the insertion of the cervical fusion implant 110 to aid the natural fusion of the targeted spinal level.

In order to use the system to perform a spinal fusion procedure, the clinician must first designate the appropriate implant size. After the cervical fusion implant 110 is chosen, the engagement features 17 of the elongate fork member 11 are inserted into the apertures 12 on the implant 110. At that time the cervical fusion implant 110 and elongate fork member 11 are

slidably engaged with one another. Before the clinician can manipulate the combined cervical fusion implant 110 and elongated fork member 11, they must be releasably secured together. In order to secure the cervical fusion implant 110 onto the elongate fork member 11, the clinician would next employ the tubular lock member 21. The clinician would insert the proximal end of the elongate fork member 11 into the central bore 25 of the tubular lock member 21 at its distal end. The tubular lock member 21 would then be advanced over the elongate fork member 11 until the thread feature 13 of that member and the thread feature 23 of the tubular lock member 21 become engaged.

Once engaged, advancement of the tubular lock member requires rotation of the tubular lock member 21 with respect to the elongate fork member 11. Preferably, after only a small amount of engagement of the thread features the distal end of the tubular lock member 21 would contact the taper feature 19 of the elongate fork member 11. The tubular lock member 21 would be advanced creating greater interference as the distal end approaches the distal end of the taper feature 19 which has the larger outer dimension. The increasing interference would laterally displace the clamping arms 15 of the elongate fork member 11 towards each other. Since the engagement features 17 of the elongate fork member 11 were initially inserted into the apertures 12 of the exemplary cervical fusion implant 110, the displacement of the clamping arms 15 would create a compressive force on the purchase region 39 separating the apertures 12 of the exemplary cervical fusion implant 110. That compressive force allows a clinician to manipulate the system without the exemplary cervical fusion implant 110 becoming disengaged from the cervical inserter instrument 120.

While the invention is susceptible to various modifications and alternative forms, specific embodiments thereof have been shown by way of example in the drawings and are herein described in detail. It should be understood, however, that the description herein of specific embodiments is not intended to limit the invention to the particular forms disclosed, but on the contrary, the invention is to cover all modifications, equivalents, and alternatives falling within the spirit and scope of the invention as defined by the appended claims.

For example, while described herein primarily with reference to the lumbar and cervical spinal surgery, it is to be readily appreciated that the spinal fusion implants of the present invention may be suitable for accomplishing fusion in the thoracic spine without departing from the scope of the present invention. Moreover, it is to be readily appreciated that the insertion tools described herein may be employed with implants of any number of suitable constructions, including but not limited to metal, ceramic, plastic or composite.

CLAIMS

What is claimed is:

1. A spinal fusion system comprising;

an interbody spinal fusion implant, including at least in part a top surface for contacting a first vertebral endplate, a bottom surface for contacting a second vertebral endplate, at least one fusion aperture extending between the top surface and the bottom surface to allow bony fusion between the first vertebral end plate and the second vertebral endplate, a distal side, a proximal side having at least one receiving aperture for engaging an insertion instrument, and two lateral sides; and

an insertion instrument, including a generally elongated tubular member having a distal opening and a proximal opening, a generally elongated shaft member having a distal end and a proximal end and being generally dimensioned to be inserted through the elongated tubular member such that the distal end extends beyond the distal opening and the proximal end extends beyond the proximal opening, and the distal end including an implant engagement feature; and

a means for releasably securing the engagement feature in one or more receiving apertures of the implant.

2. The spinal fusion system of Claim 1, wherein the implant is substantially radiolucent and composed of non-bone material.

3. The spinal fusion system of Claim 1, wherein the implant includes at least one visualization aperture extending through at least one of the lateral sides.

4. The spinal fusion system of Claim 1, wherein the top and bottom surfaces of the implant are at least one of generally parallel with respect to each other, and generally angled with respect to each other to better match the natural curvature of the spine.

5. The spinal fusion system of Claim 1, wherein the implant further includes anti-migration features to increase friction between the implant and vertebral endplate minimizing unwanted movement, the anti-migration features including at least one of ridges formed in the top surface, ridges formed in the bottom surface, one or more spike elements protruding from the top surface, one or more spike elements protruding from the bottom surface, and one or more spike elements protruding from the top and bottom surface.

6. The spinal fusion system of Claim 1, wherein the receiving aperture of the implant comprises a singular threaded aperture.

7. The spinal fusion system of Claim 6, wherein the insertion instrument engagement feature comprises a threaded connector dimensioned to engage the threaded receiving aperture of the implant.

8. The spinal fusion system of Claim 7, wherein the means for releasably securing the threaded connector to the threaded receiving aperture of the implant includes, at least in part, a rotation device attached near the proximal end of the generally elongated shaft member such that turning the rotation device causes the generally elongated shaft member to turn, and wherein turning the elongated shaft member in relation to the implant threadably engages the threaded connector and threaded receiving aperture, releasably securing the implant to the insertion instrument.

9. The spinal fusion system of Claim 8, wherein the proximal end of the implant further includes at least one purchase region adjacent to the receiving aperture and wherein the distal opening of the generally elongated tubular member is situated in a distal head, the distal head including at least one distal head slot, adjacent to the distal opening, for engaging the purchase region on the implant and enhancing the engagement between the implant and the insertion instrument.

10. The spinal fusion system of Claim 1, wherein the implant includes two receiving apertures positioned adjacent to each other on the proximal side of the implant.

11. The spinal fusion system of Claim 10, wherein the generally elongated tubular member comprises a tubular lock member, the generally elongated shaft member comprises an elongated fork member, and the engagement feature comprises two prongs extending from a pair of clamping arms and dimensioned to engage the two receiving apertures of the implant.

12. The spinal fusion system of Claim 11, wherein the elongate fork member includes a taper feature situated between the clamping arms and the proximal end of the elongate fork member and the tubular lock member includes a central bore having an internal dimension smaller than the largest outer dimension of the taper feature.

13. The spinal fusion system of Claim 12, wherein the means for releasably securing engagement features in the receiving apertures of the implant include, at least in part, a threaded region situated near the proximal end of the elongated fork member, and a complimentary threaded region near the proximal opening of the tubular lock member within the central bore, such that inserting the proximal end of the elongated fork member into the distal end of the tubular lock member will cause the complimentary threaded regions to meet as the tapered region enters the central bore at the distal opening, wherein rotating the tubular lock member in relation to the elongated fork member engages the threaded regions, advancing the central bore over the tapered region and laterally displacing the clamping arms and engagement prongs to create a compressive force on the interior surface of the receiving aperture and releasably securing the implant to the insertion device.

14. A method of spinal fusion, comprising the steps of:

(a) releasably securing a spinal fusion implant to an insertion instrument, the spinal fusion implant including a top surface for contacting a first vertebral endplate, a bottom surface for contacting a second vertebral endplate, at least one fusion aperture

extending between the top surface and the bottom surface to allow bony fusion between the first vertebral end plate and the second vertebral endplate, a distal side, a proximal side having at least one receiving aperture for engaging an insertion instrument, and two lateral sides, and the insertion instrument including a generally elongated tubular member having a distal opening and a proximal opening, a generally elongated shaft member having a distal end and a proximal end and being generally dimensioned to be inserted through the elongated tubular member such that the distal end extends beyond the distal opening and the proximal end extends beyond the proximal opening, and the distal end including an implant engagement feature

(b) introducing the spinal fusion implant to a prepared space between adjacent vertebral end plates and properly positioning the implant within the space;

(c) releasing the insertion instrument from the properly positioned implant and withdrawing the insertion instrument from the surgical corridor.

15. The spinal fusion method of Claim 14, wherein the implant is substantially radiolucent and composed of non-bone material

16. The spinal fusion method of Claim 14, wherein the implant includes at least one visualization aperture extending through at least one of the lateral sides.

17. The spinal fusion method of Claim 14, wherein the top and bottom surfaces of the implant are at least one of generally parallel with respect to each other, and generally angled with respect to each other to better match the natural curvature of the spine.

18. The spinal fusion method of Claim 14, wherein the implant further includes anti-migration features to increase friction between the implant and vertebral endplate minimizing unwanted movement, the anti-migration features including at least one of ridges formed in the top surface, ridges formed in the bottom surface, one or more spike elements protruding from the top surface, one or more spike elements protruding from the bottom surface, and one or more spike elements protruding from the top and bottom surface.

19. The spinal fusion method of Claim 14, wherein the receiving aperture of the implant comprises a singular threaded aperture.

20. The spinal fusion method of Claim 19, wherein the insertion instrument engagement feature comprises a threaded connector dimensioned to engage the threaded receiving aperture of the implant.

21. The spinal fusion method of Claim 20, wherein the means for releasably securing the threaded connector to the threaded receiving aperture of the implant includes, at least in part, a rotation device attached near the proximal end of the generally elongated shaft member such that turning the rotation device causes the generally elongated shaft member to turn, and wherein turning the elongated shaft member in relation to the implant threadably engages the threaded connector and threaded receiving aperture, releasably securing the implant to the insertion instrument.

22. The spinal fusion method of Claim 21, wherein the proximal end of the implant further includes at least one purchase region adjacent to the receiving aperture and wherein the distal opening of the generally elongated tubular member is situated in a distal head, the distal head including at least one distal head slot, adjacent to the distal opening, for engaging the purchase region on the implant and enhancing the engagement between the implant and the insertion instrument.

23. The spinal fusion method of Claim 14, wherein the implant includes two receiving apertures positioned adjacent to each other on the proximal side of the implant.

24. The spinal fusion method of Claim 23, wherein the generally elongated tubular member comprises a tubular lock member, the generally elongated shaft member comprises an elongated fork member, and the engagement feature comprises two prongs extending from a pair of clamping arms and dimensioned to engage the two receiving apertures of the implant.

25. The spinal fusion method of Claim 24, wherein the elongate fork member includes a taper feature situated between the clamping arms and the proximal end of the elongate fork member and the tubular lock member includes a central bore having an internal dimension smaller than the largest outer dimension of the taper feature.

26. The spinal fusion method of Claim 25, wherein the means for releasably securing the engagement features in the receiving apertures of the implant include, at least in part, a threaded region situated near the proximal end of the elongated fork member, and a complimentary threaded region near the proximal opening of the tubular lock member within the central bore, such that inserting the proximal end of the elongated fork member into the distal end of the tubular lock member will cause the complimentary threaded regions to meet as the tapered region enters the central bore at the distal opening, wherein rotating the tubular lock member in relation to the elongated fork member engages the threaded regions, advancing the central bore over the tapered region and laterally displacing the clamping arms and engagement prongs to create a compressive force on the interior surface of the receiving aperture and releasably securing the implant to the insertion device.

ABSTRACT

A system and method for spinal fusion comprising a spinal fusion implant of non-bone construction releasably coupled to an insertion instrument dimensioned to introduce the spinal fusion implant into any of a variety of spinal target sites.

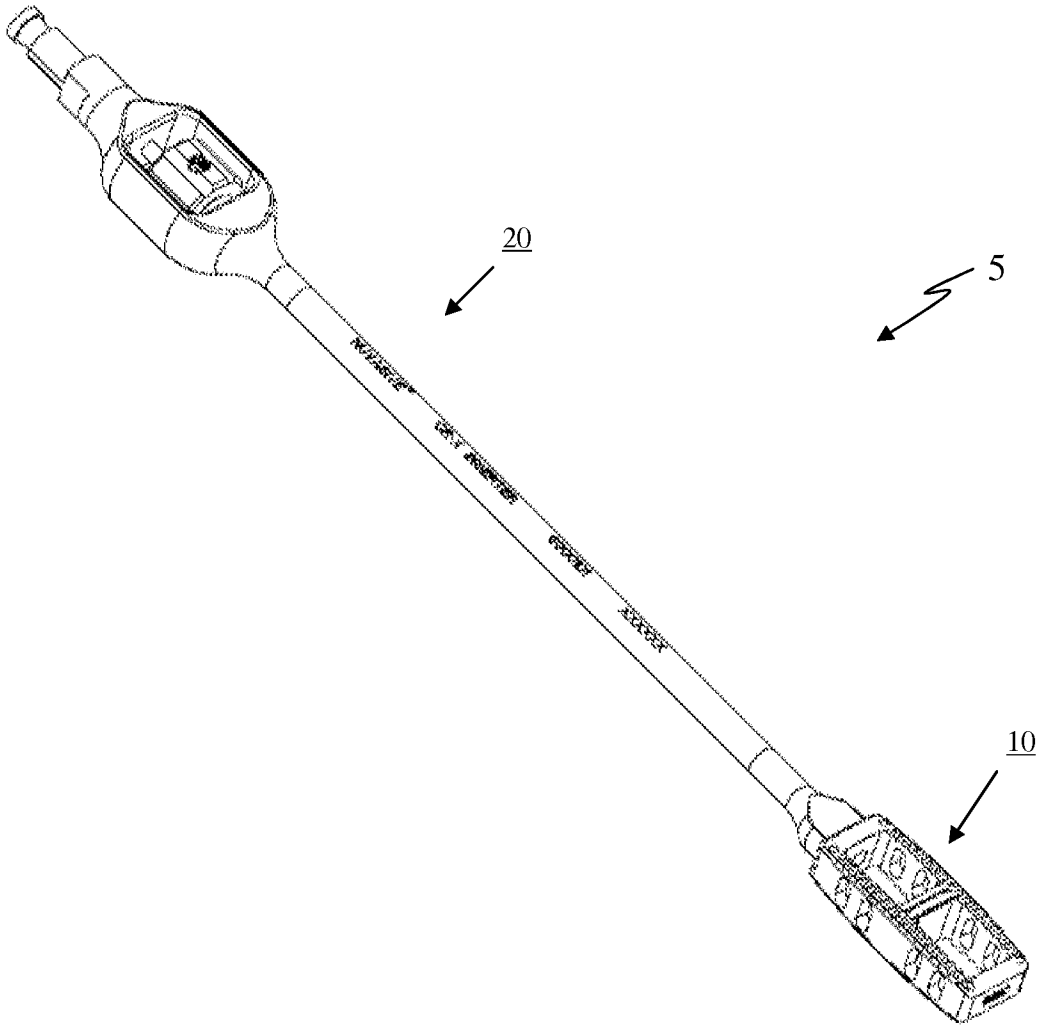


FIG. 1

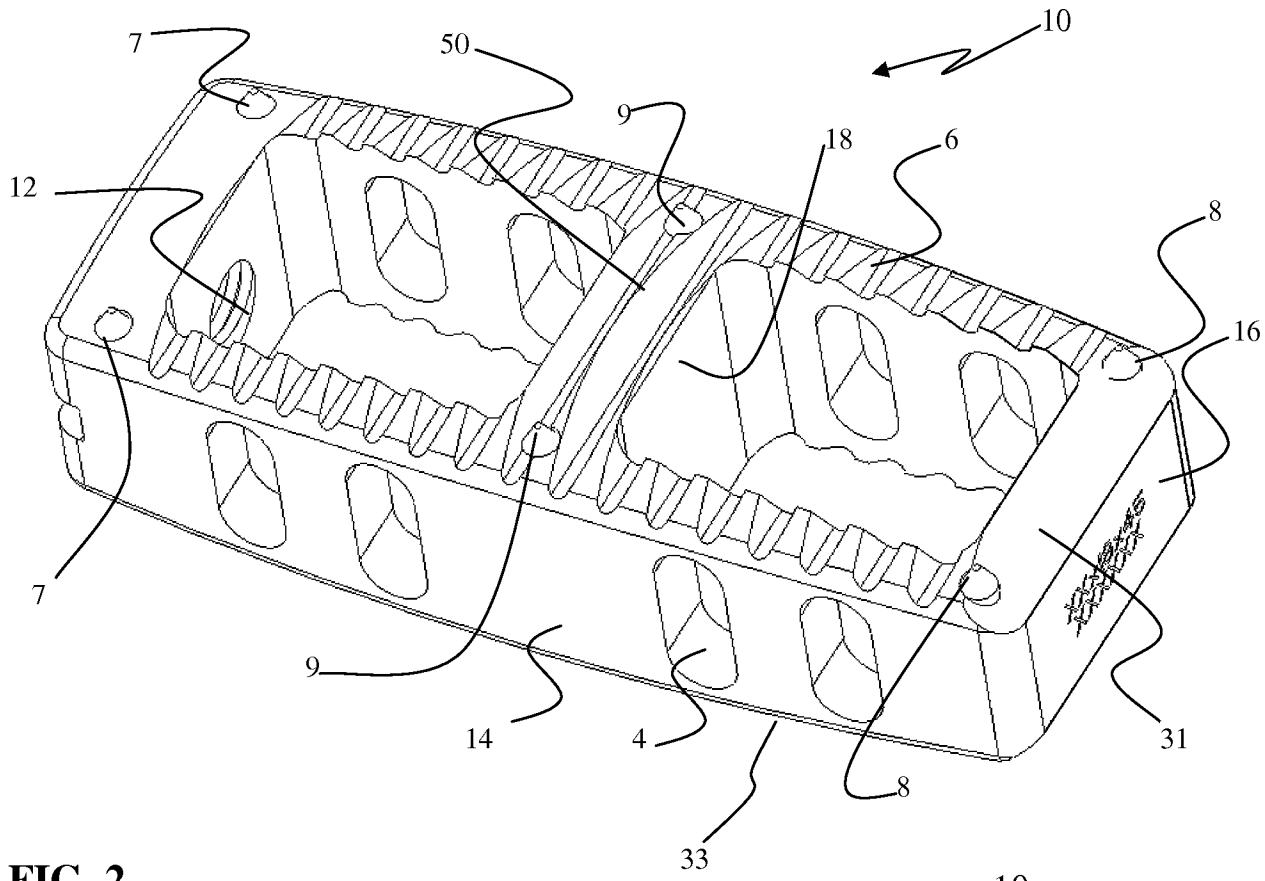


FIG. 2

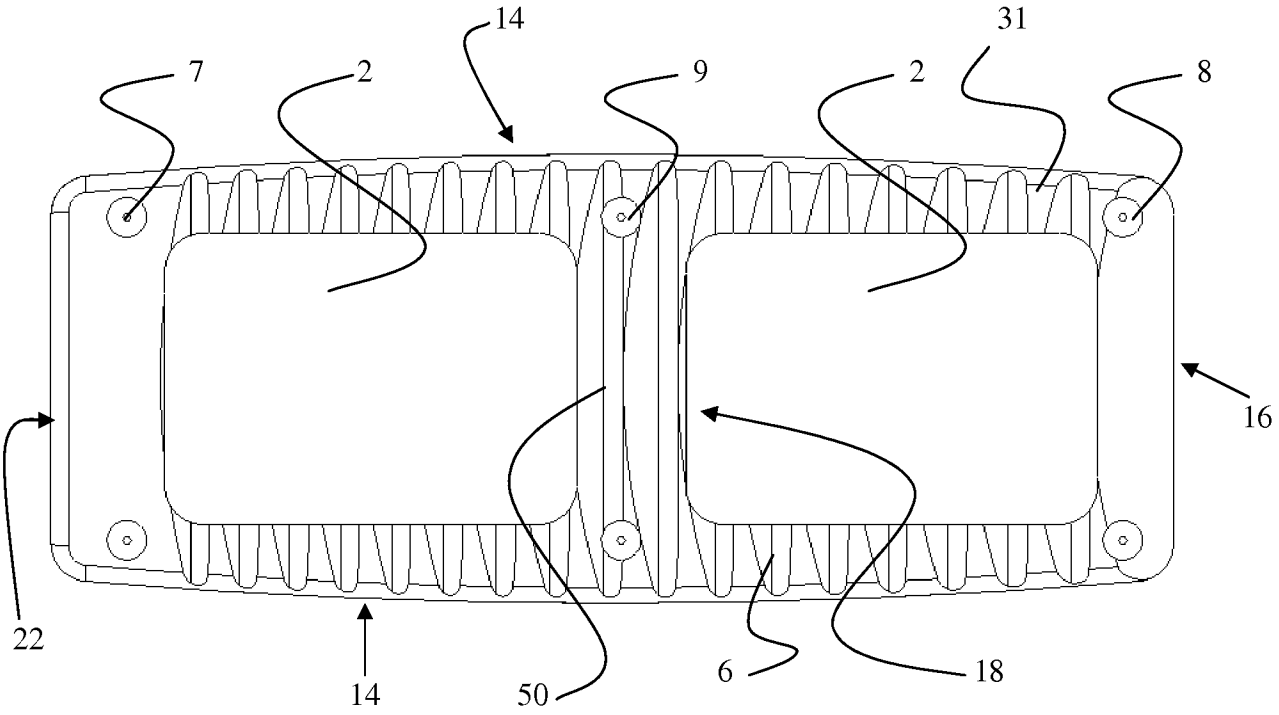


FIG. 3 10

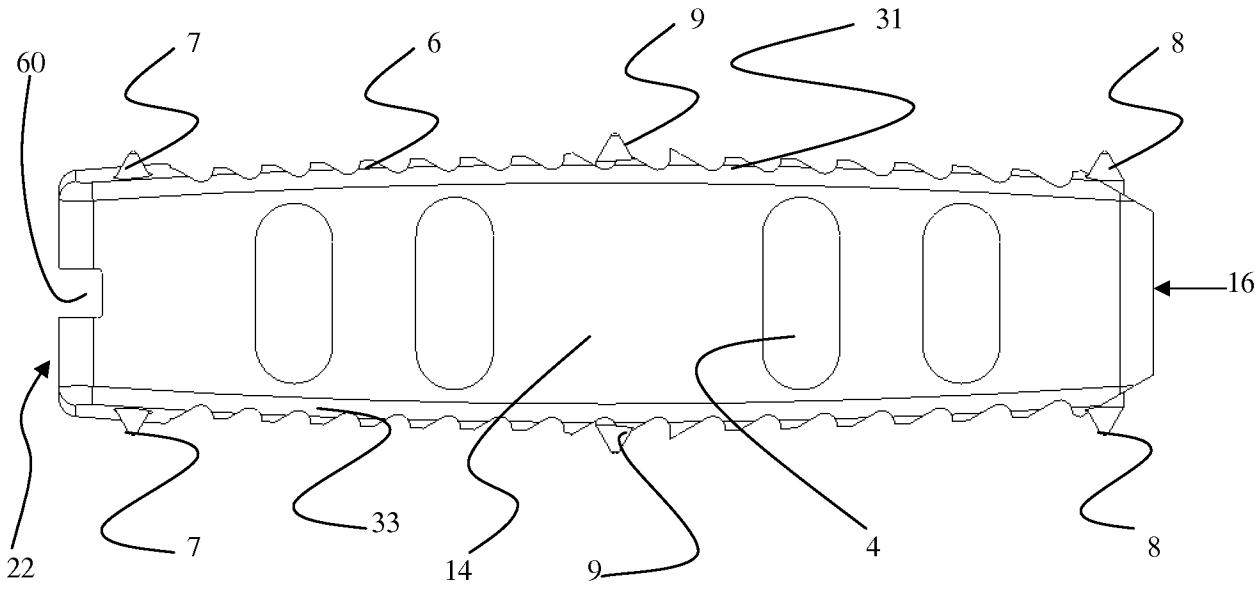


FIG. 4 10

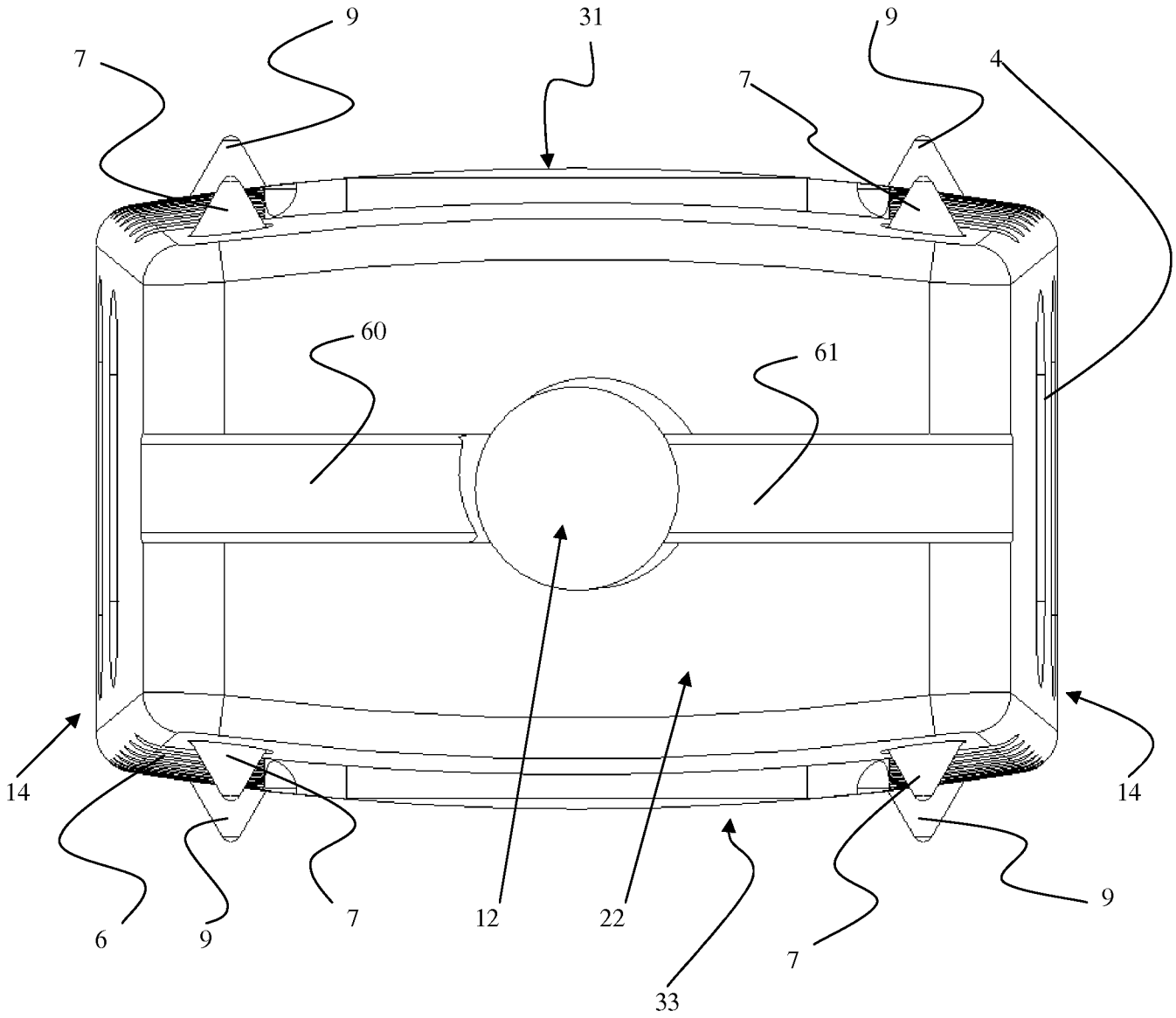


FIG. 5

10

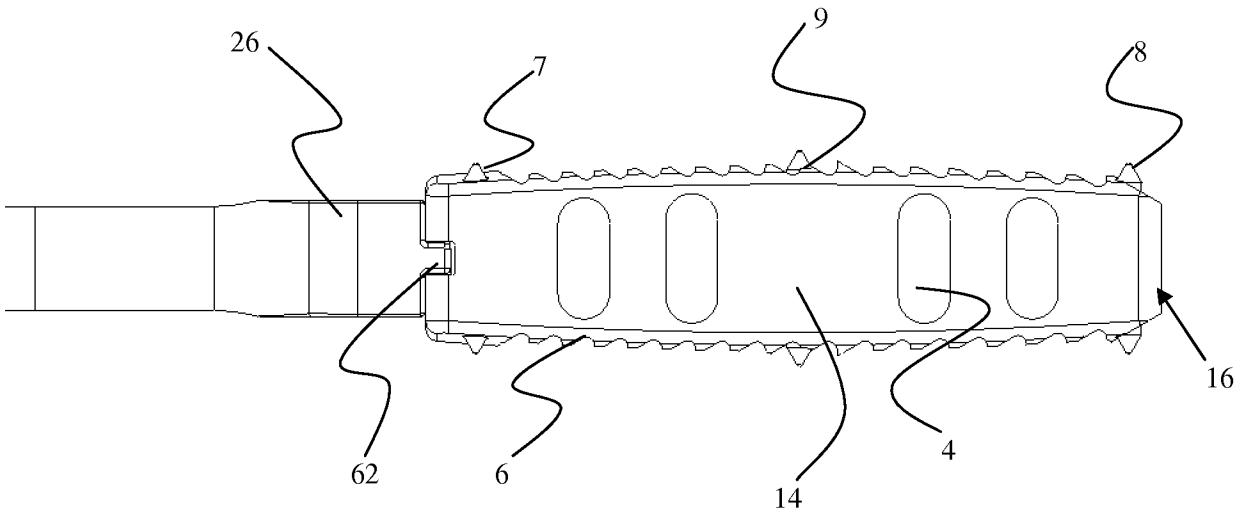


FIG. 6

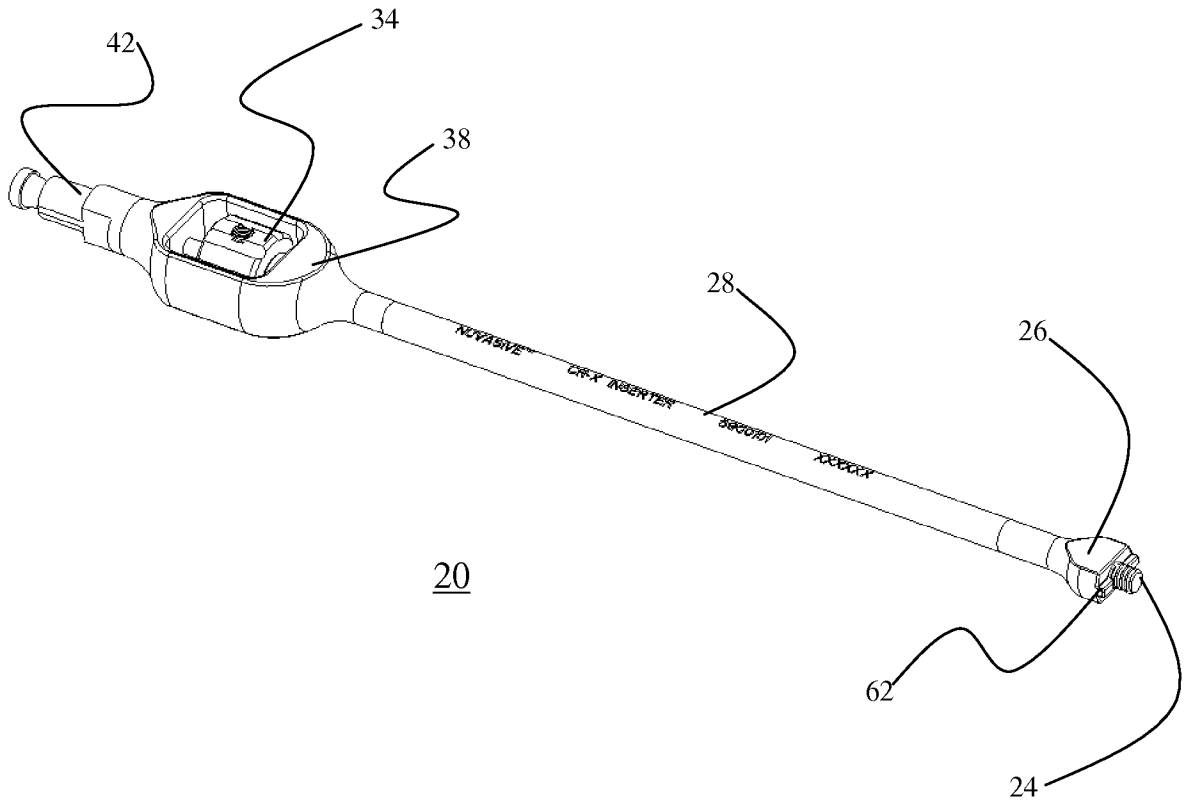


FIG. 7

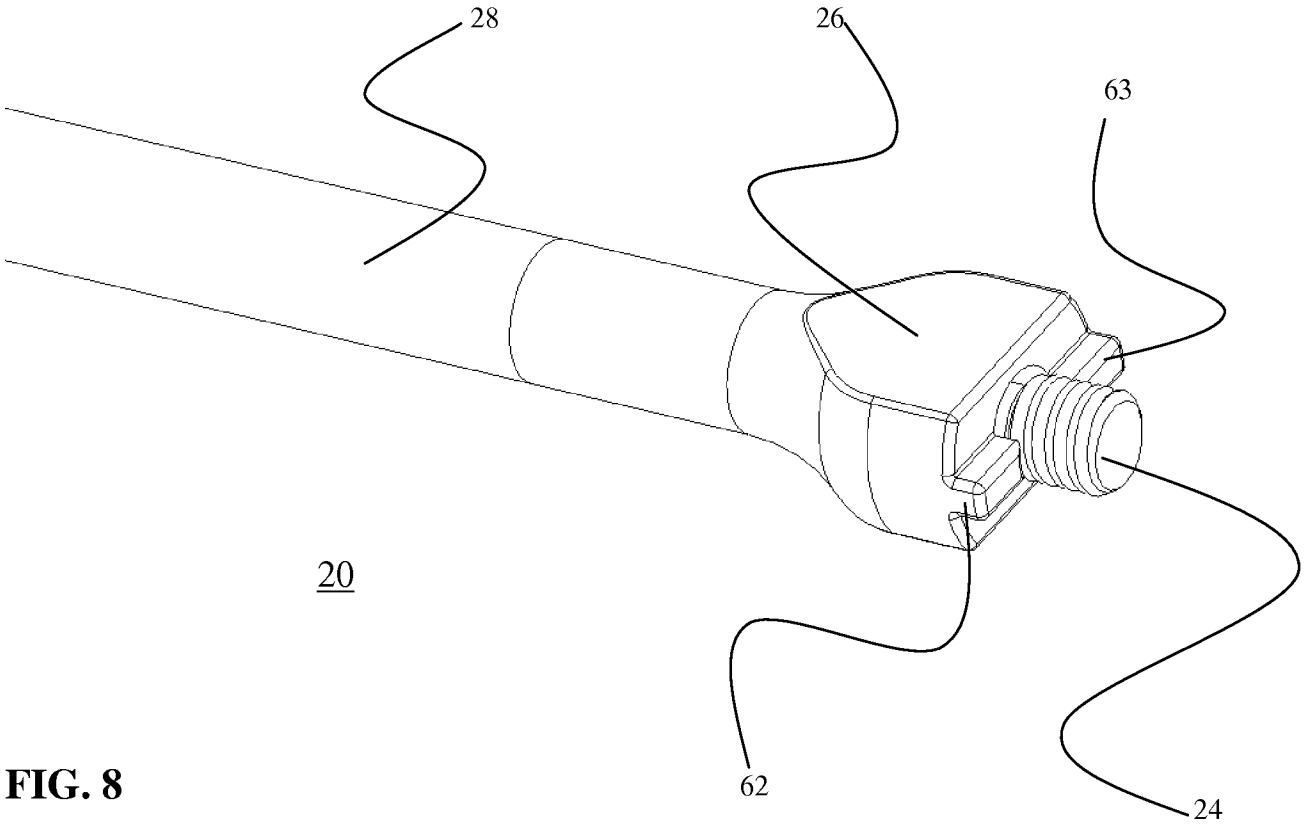


FIG. 8

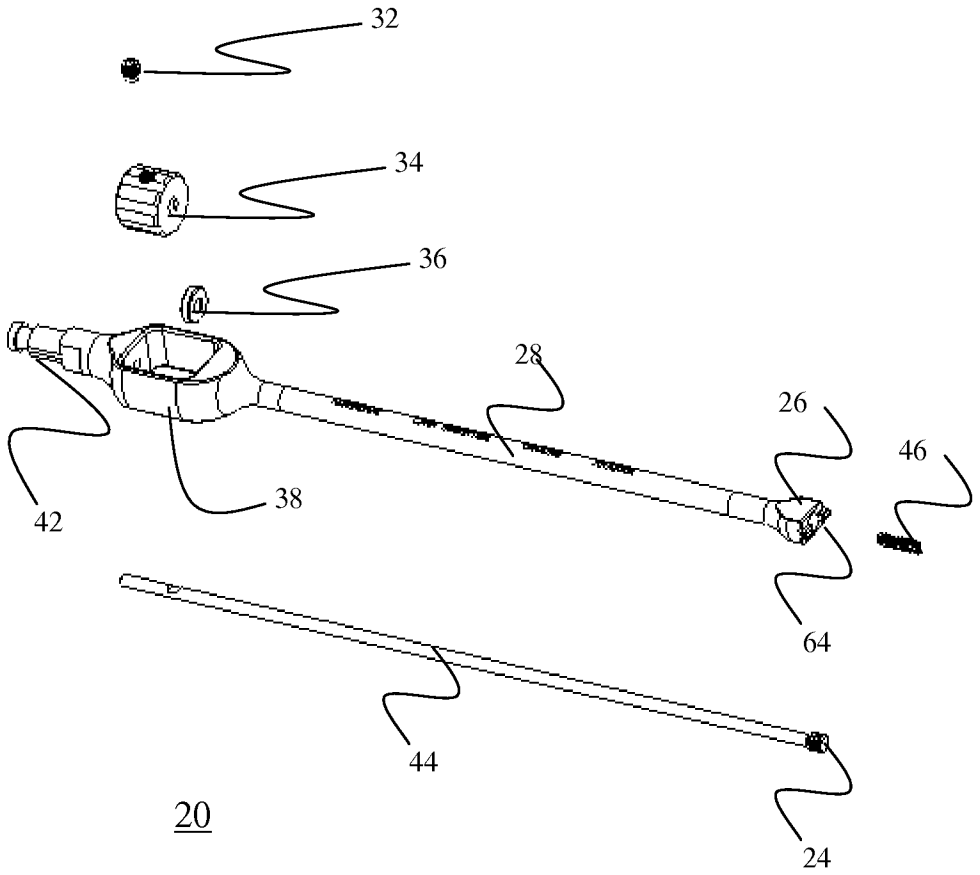


FIG. 9

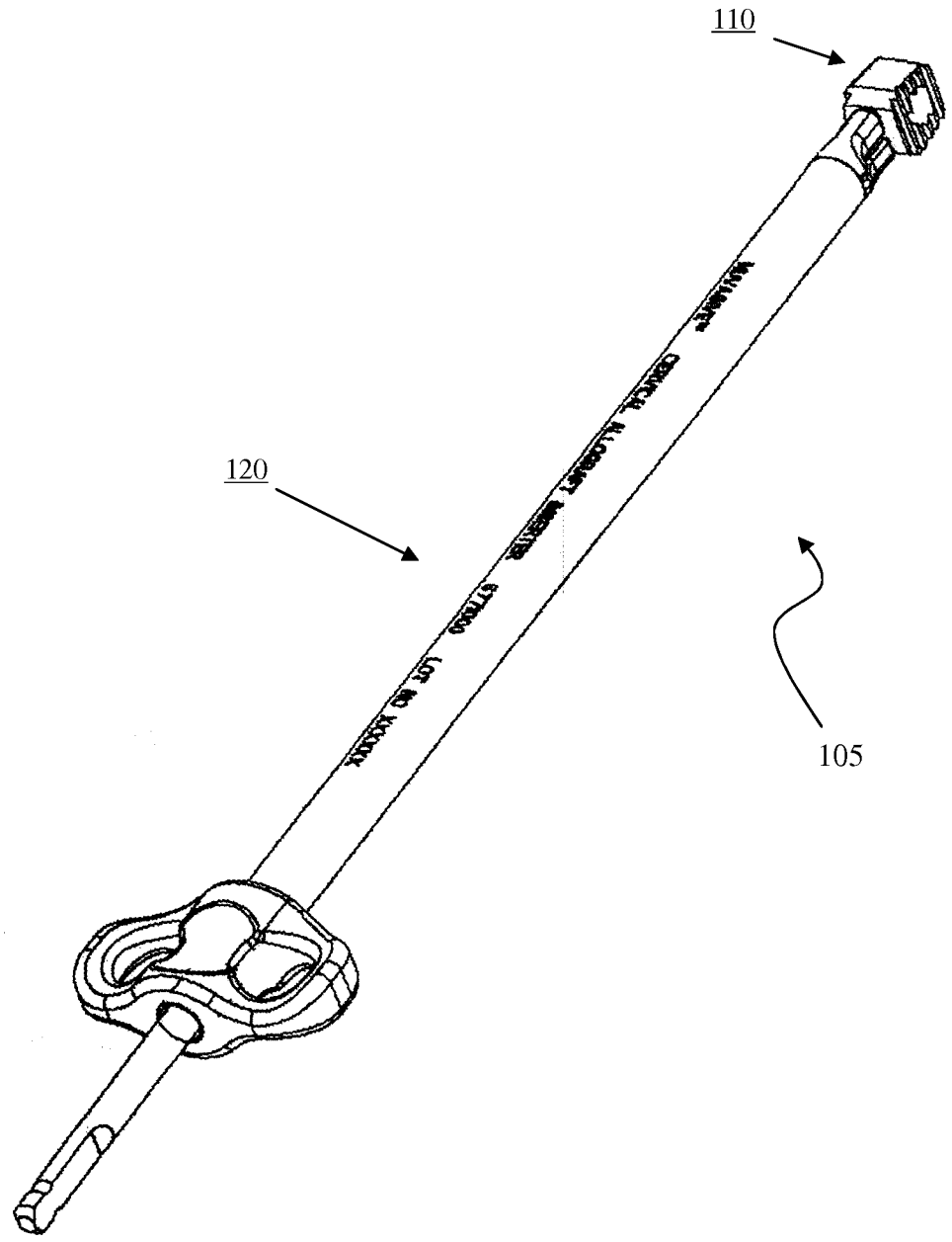


FIG. 10

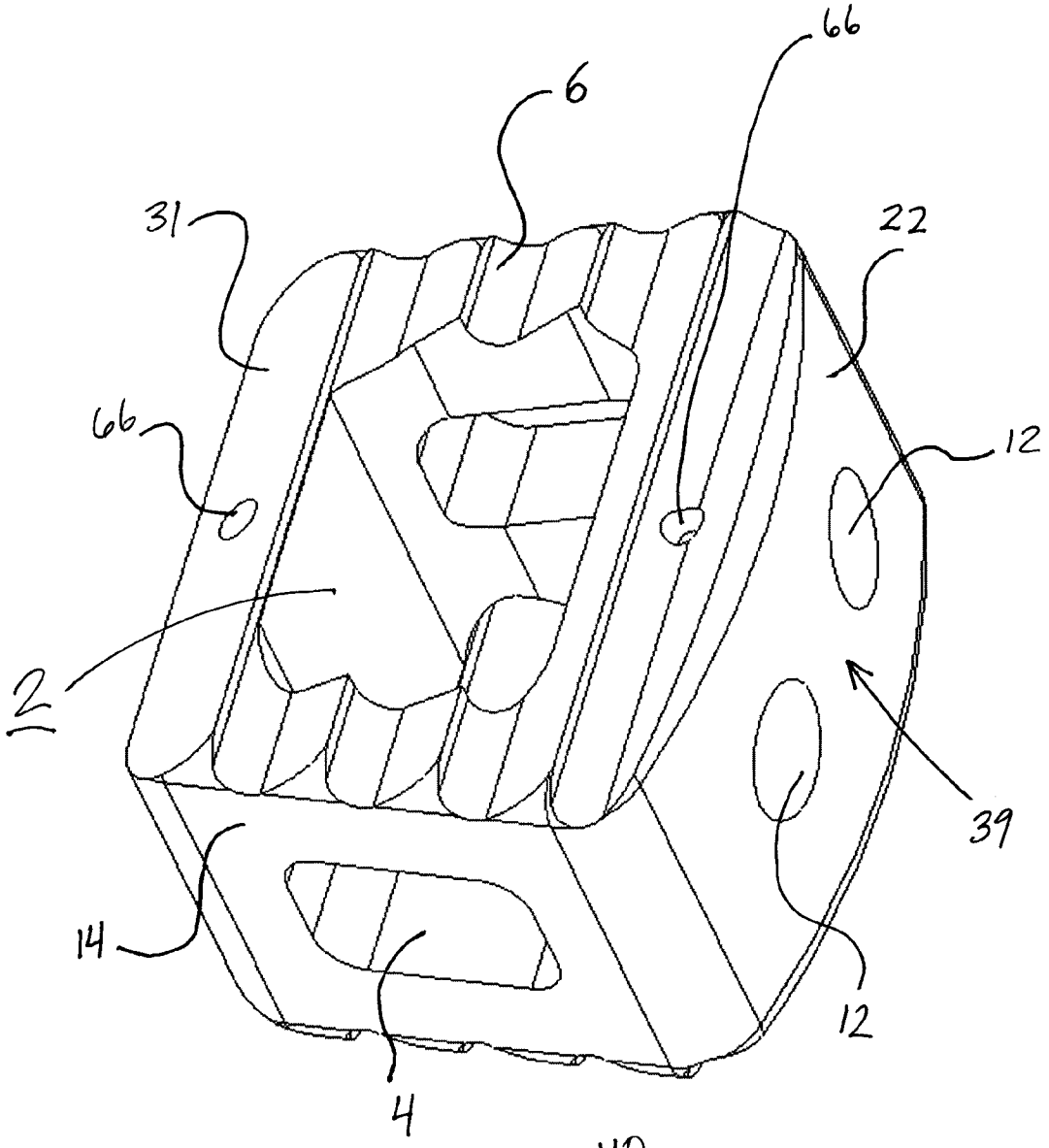


Fig. 11

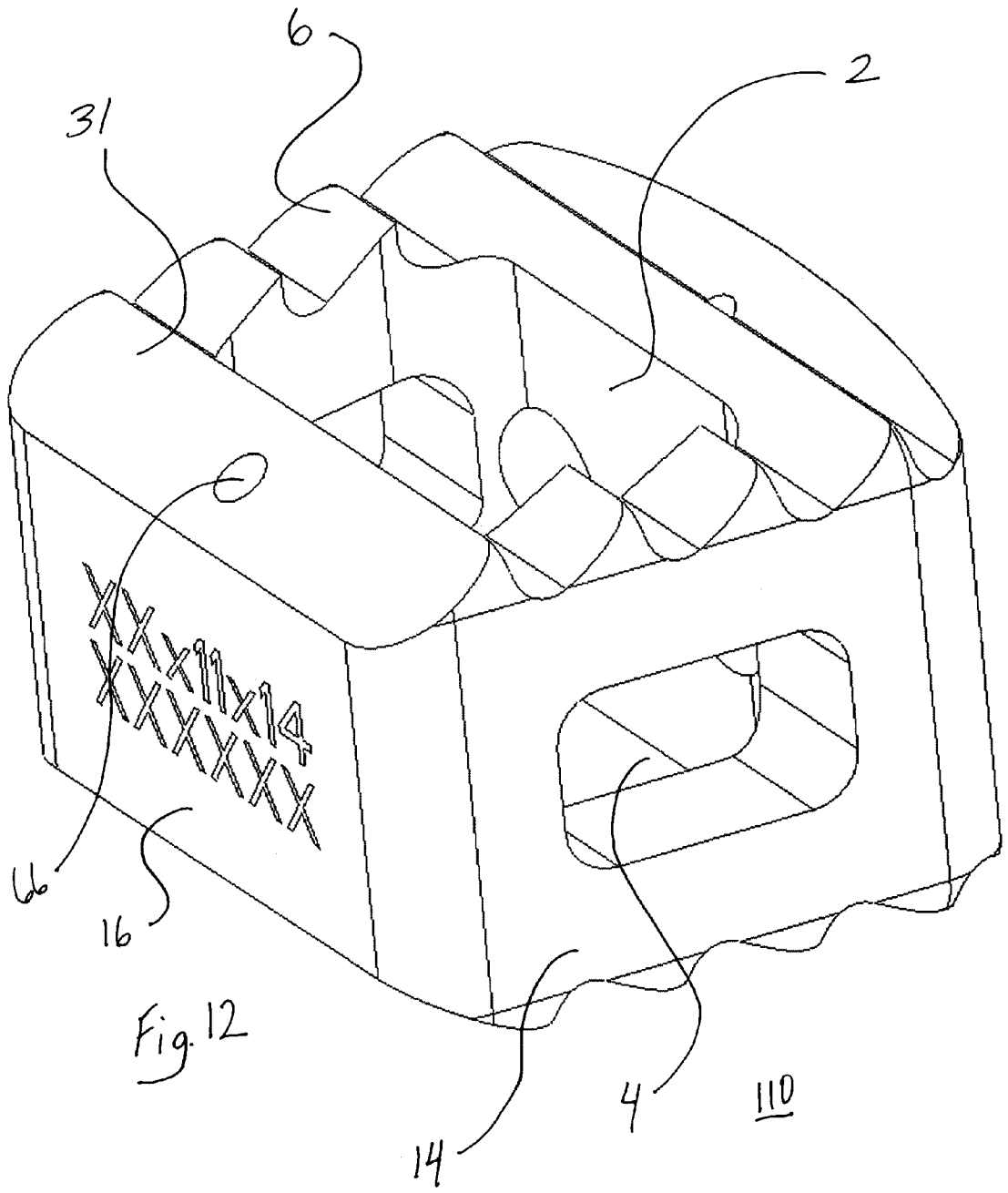


Fig. 12

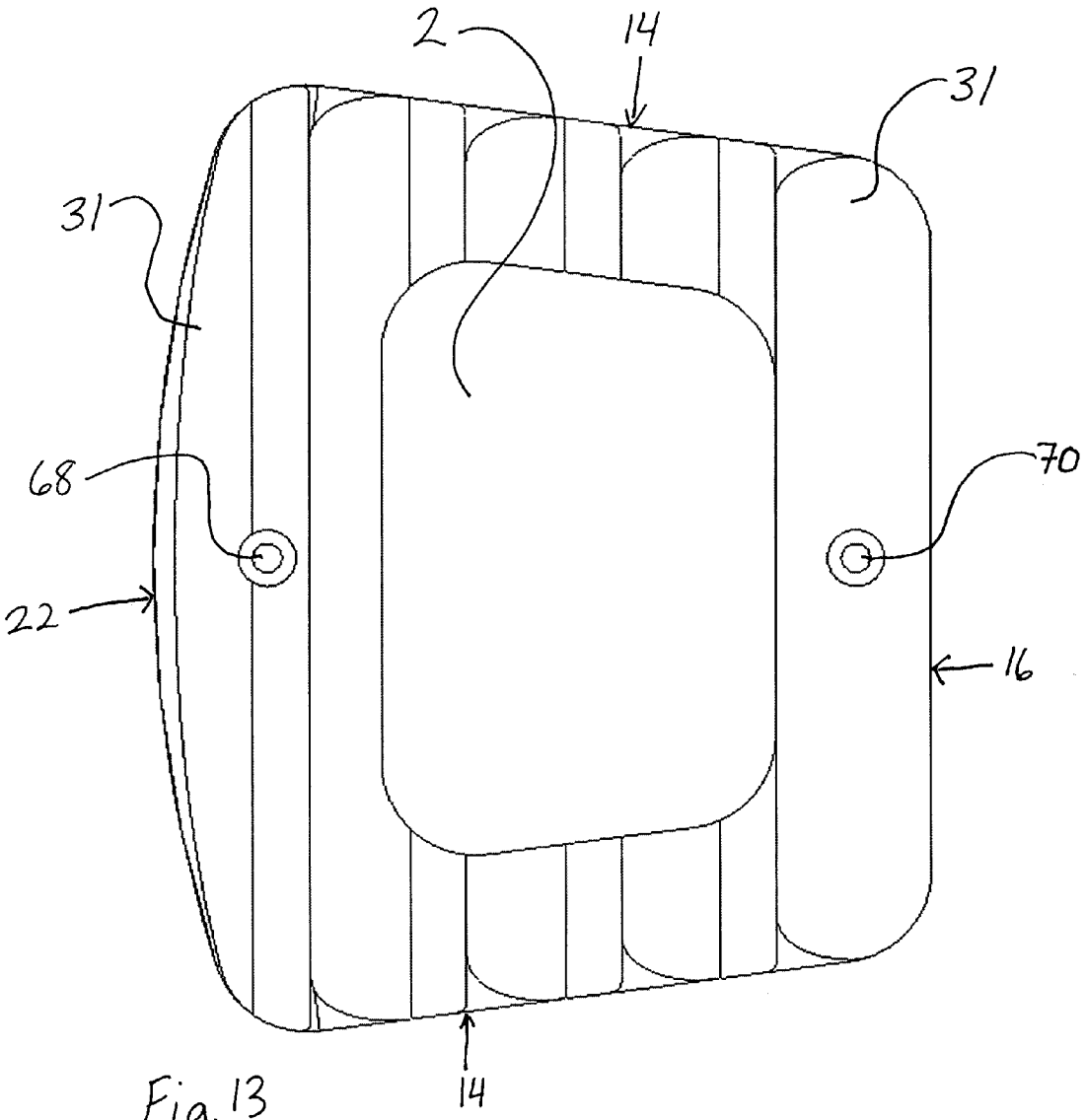


Fig. 13

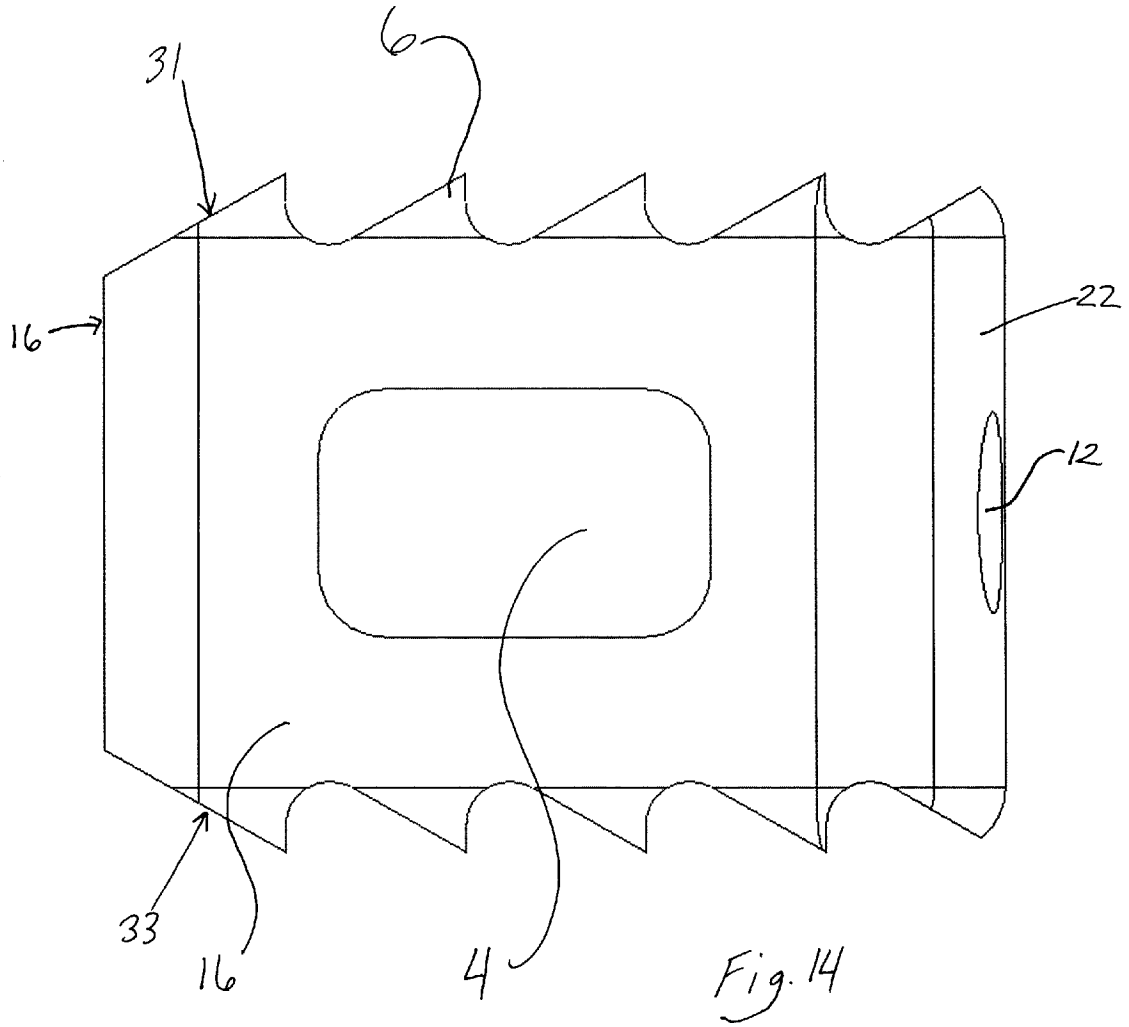


Fig. 14

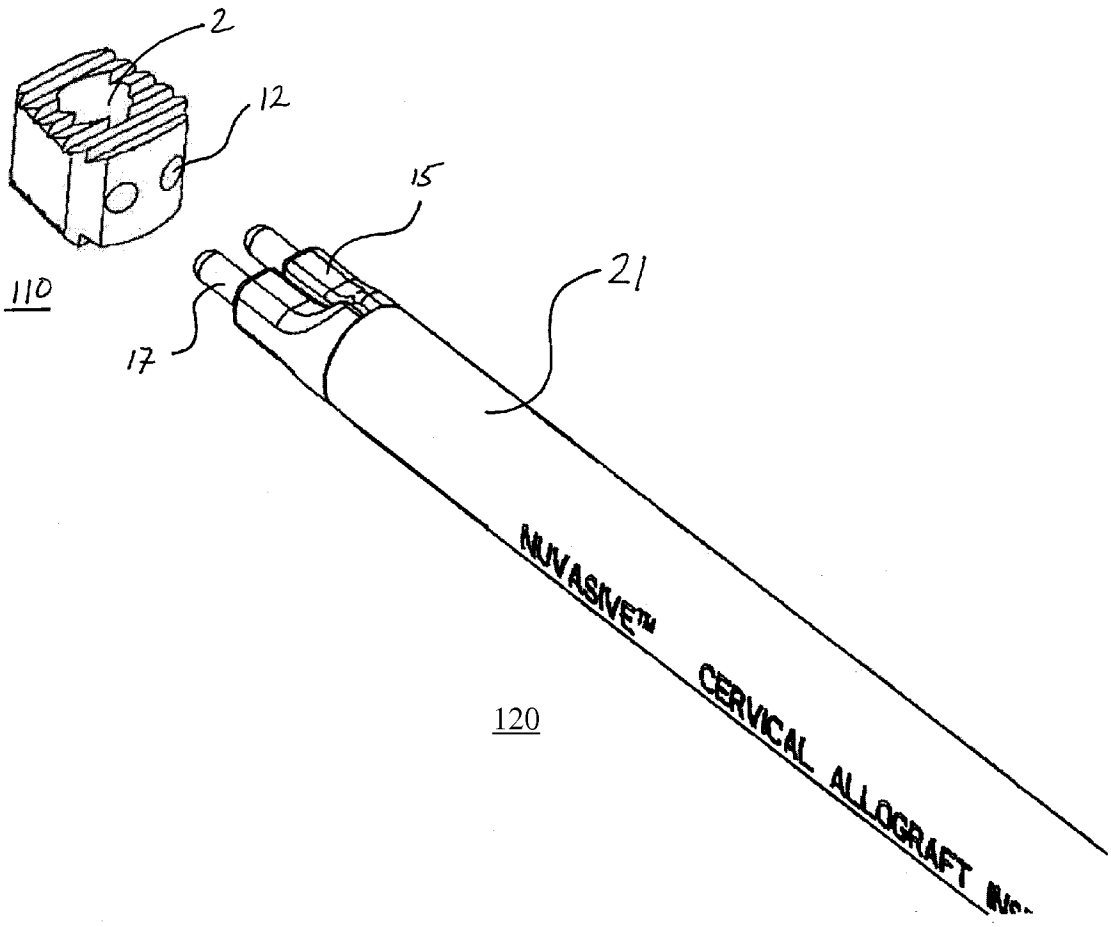
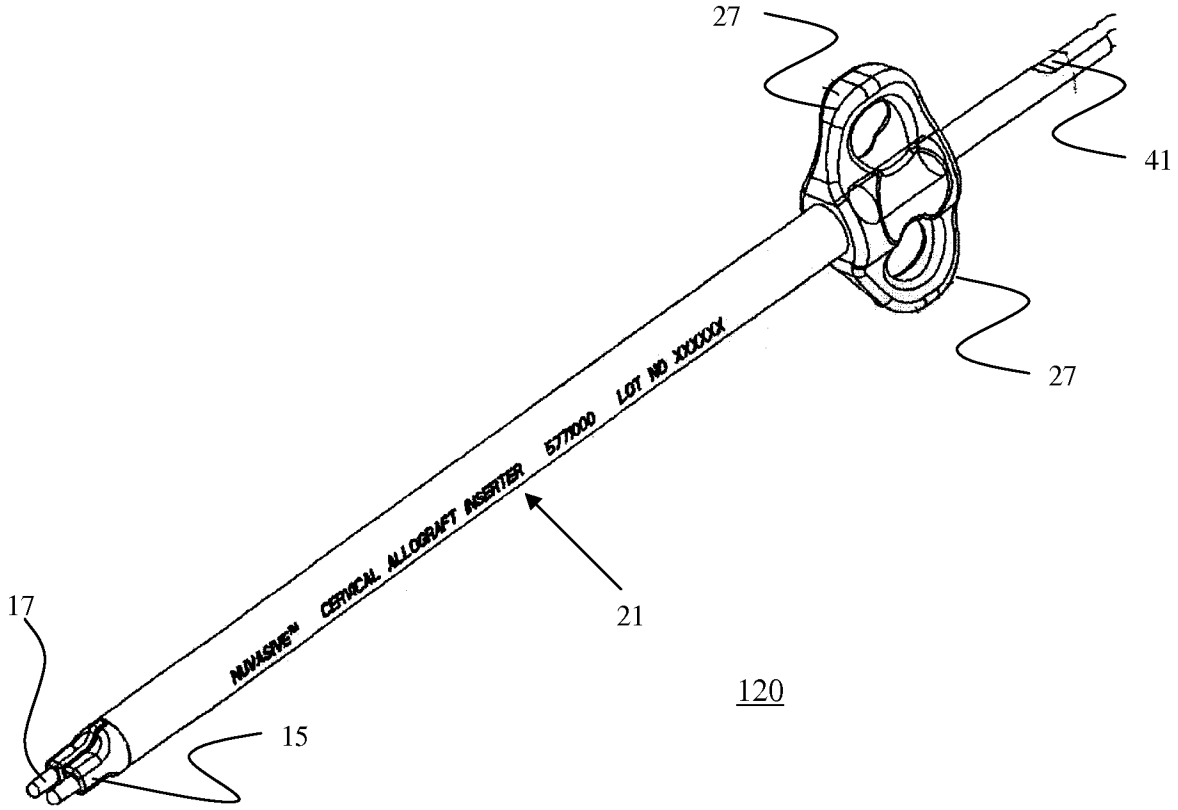


FIG. 15



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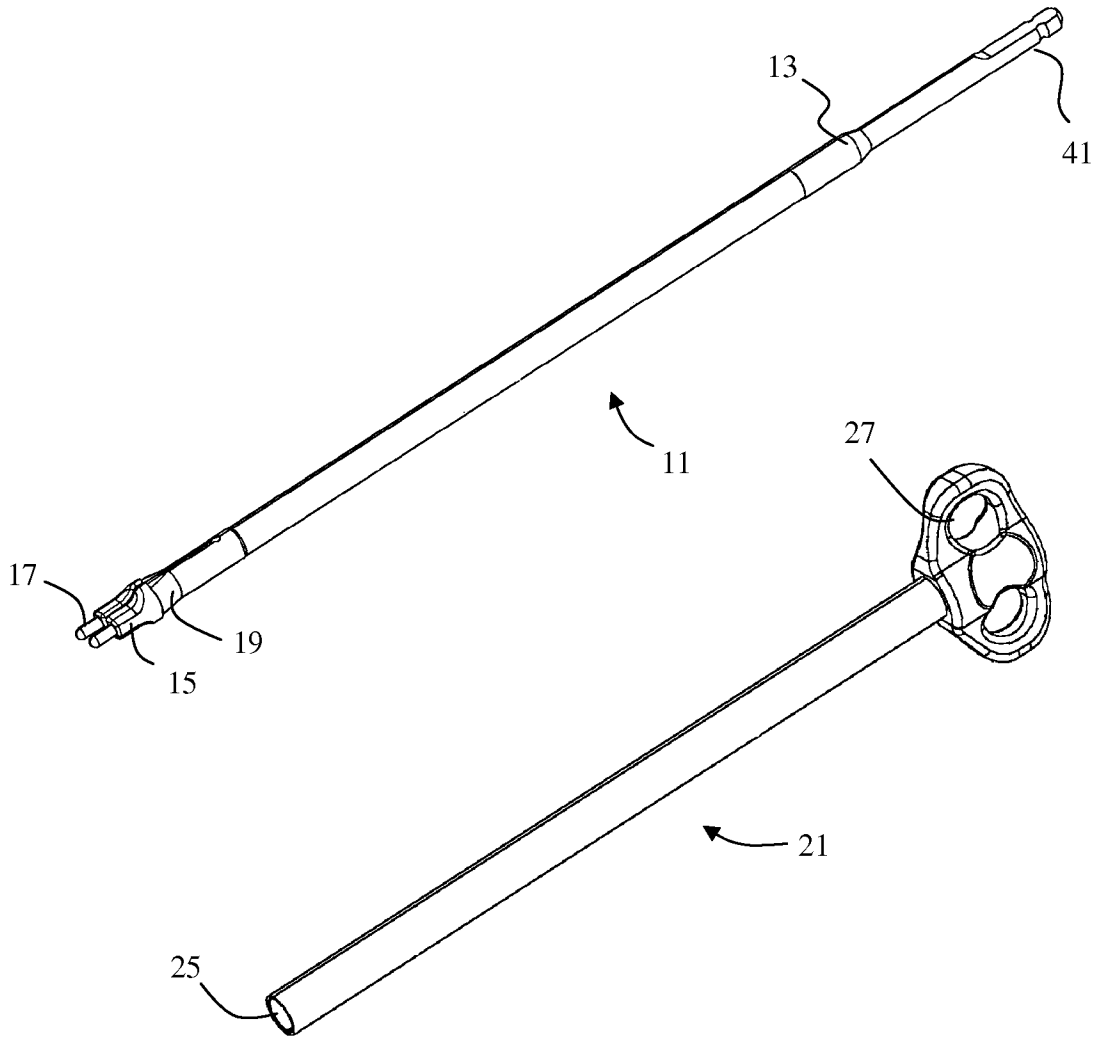


FIG. 17

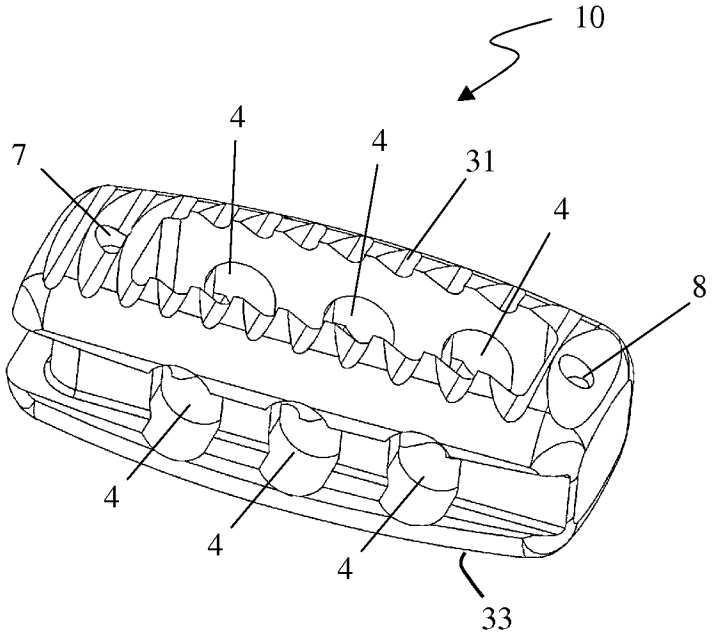


FIG. 18

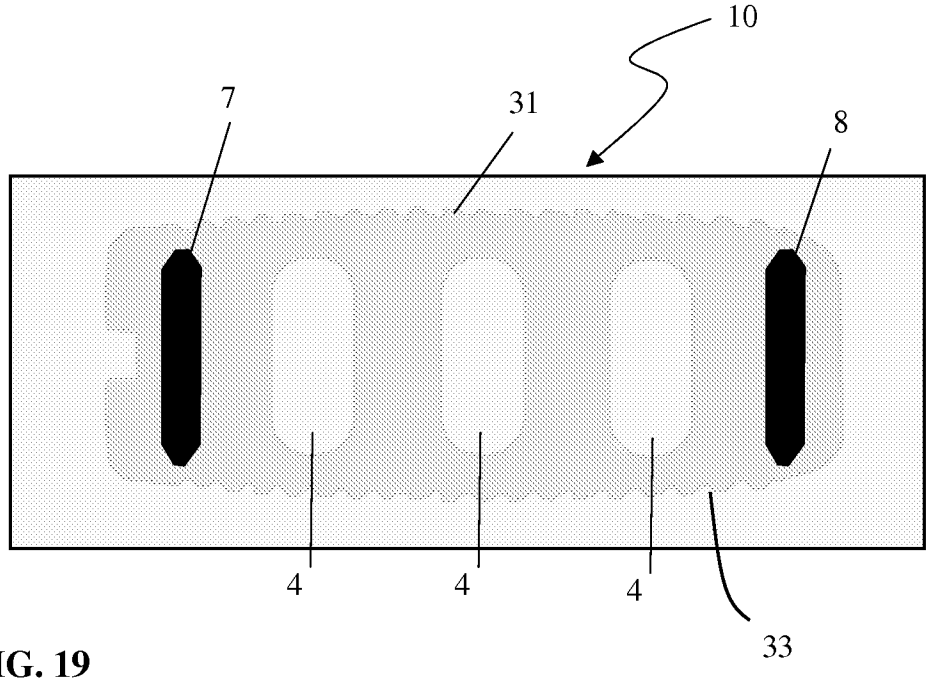
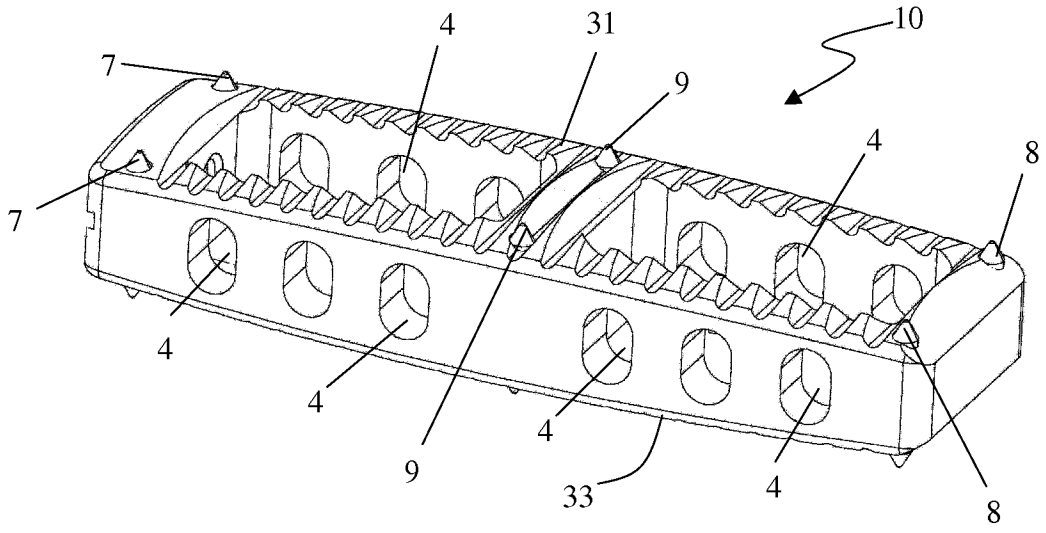


FIG. 19

FIG. 20



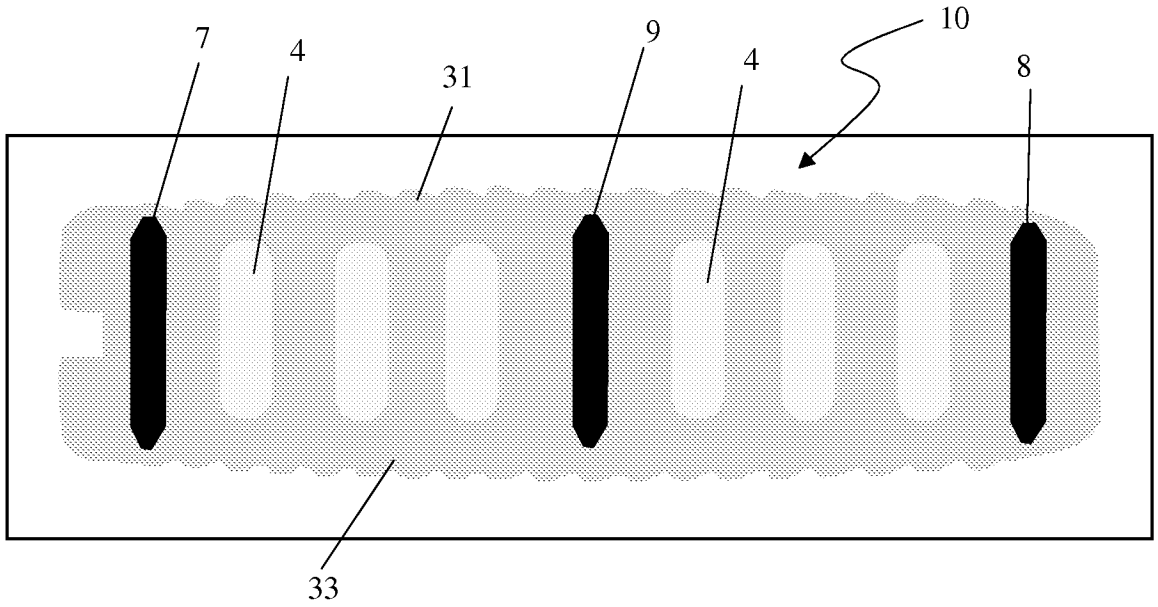


FIG. 21

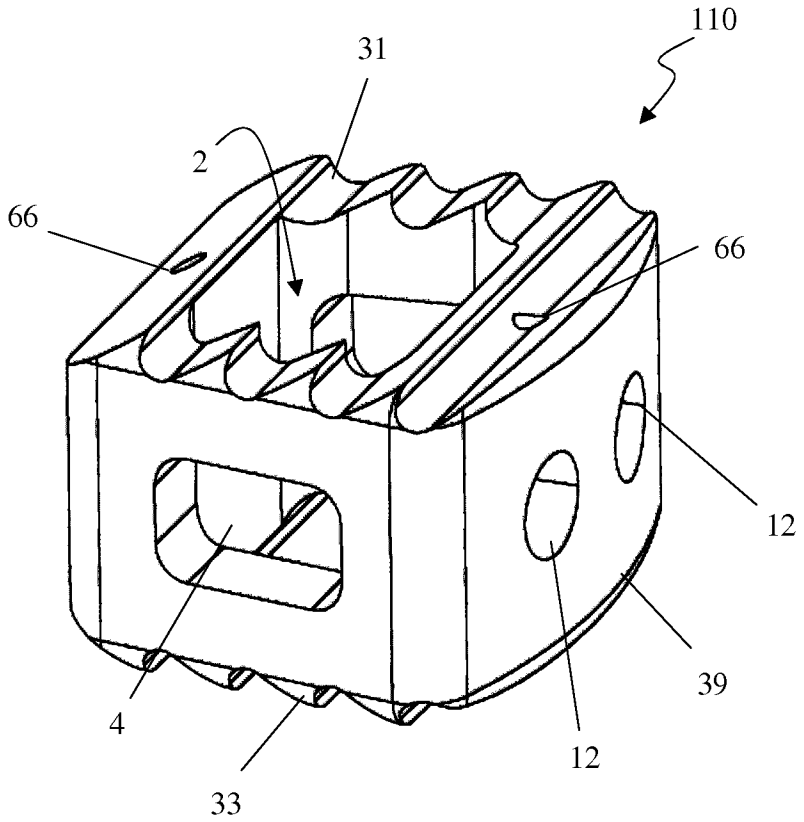


FIG. 22

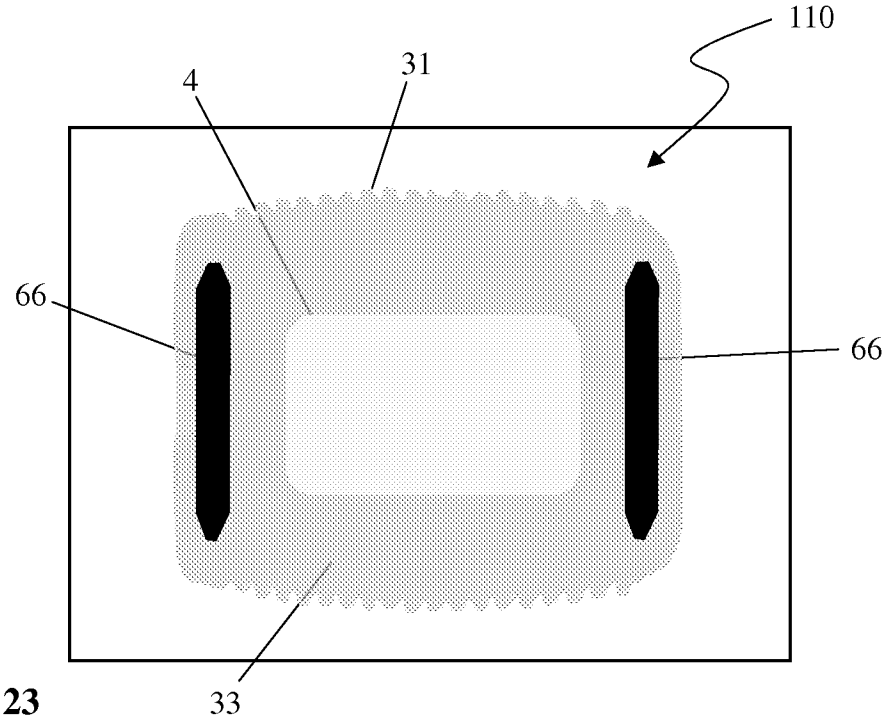


FIG. 23

PTO/SB/01 (09-04)
Approved for use through 07/31/2006. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63)

☑ Declaration Submitted With Initial Filing *OR* ☐ Declaration Submitted after Initial Filing (surcharge (37 CFR 1.16 (e)) required)

Attorney Docket Number	104US1
First Named Inventor	Matthew Curran
COMPLETE IF KNOWN	
Application Number	N/A
Filing Date	N/A
Art Unit	N/A
Examiner Name	N/A

I hereby declare that:

Each inventor's residence, mailing address, and citizenship are as stated below next to their name.

I believe the inventor(s) named below to be the original and first inventor(s) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

Systems and Methods for Spinal Fusion

(Title of the Invention)

the specification of which

☑ is attached hereto

OR

☐ was filed on (MM/DD/YYYY) ☐ as United States Application Number or PCT International Application Number ☐ and was amended on (MM/DD/YYYY) ☐ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or (f), or 365(b) of any foreign application(s) for patent, inventor's or plant breeder's rights certificate(s), or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent, inventor's or plant breeder's rights certificate(s), or any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached? YES	NO
			☐	☐	☐
			☐	☐	☐
			☐	☐	☐
			☐	☐	☐

☐ Additional foreign application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

PTO/SB/01 (09-04)
Approved for use through 07/31/2006. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

DECLARATION — Utility or Design Patent Application

Direct all correspondence to:	☑ The address associated with Customer Number:	30,328	OR	☐	Correspondence address below

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Address		
City	State	ZIP
Country	Telephone	Fax

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further 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 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

NAME OF SOLE OR FIRST INVENTOR: ☐ A petition has been filed for this unsigned inventor

Given Name (first and middle [if any])	Family Name or Surname
Matthew	Curran

Inventor's Signature	Date
	March 29, 2005

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Mailing Address
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City	State	Zip	Country
Carlsbad	CA	92009	USA

NAME OF SECOND INVENTOR: ☐ A petition has been filed for this unsigned inventor

Given Name (first and middle [if any])	Family Name or Surname
MARK	PETERSON

Inventor's Signature	Date

Residence: City	State	Country	Citizenship
MEDFORD	OREGON		US

Mailing Address

City	State	Zip	Country

☐ Additional inventors or a legal representative are being named on the _____ supplemental sheet(s) PTO/SB/02A or 02LR attached hereto.

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	System and Methods for Spinal Fusion
First Named Inventor/Applicant Name:	Matthew Curran
Filer:	Jennifer Lynn Risser
Attorney Docket Number:	104US2

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Utility application filing	1011	1	330	330
Utility Search Fee	1111	1	540	540
Utility Examination Fee	1311	1	220	220
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**1090**

Electronic Acknowledgement Receipt

EFS ID:	9806663
Application Number:	13079645
International Application Number:	
Confirmation Number:	1151
Title of Invention:	System and Methods for Spinal Fusion
First Named Inventor/Applicant Name:	Matthew Curran
Customer Number:	30328
Filer:	Jennifer Lynn Risser
Filer Authorized By:	
Attorney Docket Number:	104US2
Receipt Date:	04-APR-2011
Filing Date:	
Time Stamp:	18:36:30
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$1090
RAM confirmation Number	5324
Deposit Account	502040
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)

1	Transmittal of New Application	2011-04-04-Transmittal104US2.pdf	274669 22dfc261eada117c7f33badc240996c3fdbacf10	no	2
Warnings:					
Information:					
2		2011-04-04-SpecificationasFiled104US2.pdf	104535 94a1d8649d9fef9a8d363fe2fe35aaa7cccf3467	yes	32
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Specification		1	23	
	Claims		24	31	
	Abstract		32	32	
Warnings:					
Information:					
3	Drawings-only black and white line drawings	2011-04-04-FiguresasFiled104US2.pdf	1480015 43b626205fac356d39447131ffe21aeedcd9192b	no	20
Warnings:					
Information:					
4	Oath or Declaration filed	2005-03-29-OathDecFromParent104US2.pdf	99398 2b2e5b3be07ee25ed9d4b3a7836297fd3ae3549d	no	2
Warnings:					
Information:					
5	Fee Worksheet (PTO-875)	fee-info.pdf	32095 8b36d4f1e492b031528c21bdc3bc58ce29edc71e	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1990712		

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.