Patent Owner's Demonstratives

Alphatec Holdings, Inc. and Alphatec Spine, Inc. v. NuVasive, Inc.

IPR2019-00361, IPR2019-00362, IPR2019-00546

U.S. Patent Nos. 8,187,334 and 8,361,156

- Representative citations to IPR2019-00361 unless otherwise indicated.

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APRIL 3, 2020

The Challenged Claims

IPR2019-00361: The '334 Patent

- Claims 6-9 and 18

IPR2019-00362: The '156 Patent

- Claims 1-3, 5, 9-10, 12-21, 23-24, and 27

IPR2019-00546: The '334 Patent

- Claim 16

Each Challenged Claim Must Be Evaluated As a Whole

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 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.

6. The spinal fusion implant of claim **1**, further comprising a medial support extending between the first and second sidewalls.

7. The spinal fusion implant of claim **6**, wherein said medial support is positioned along said central region.

8. The spinal fusion implant of claim **1**, 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.

9. The spinal fusion implant of claim **8**, wherein said second fusion aperture is separated from said first fusion aperture by a medial support.

16. The spinal fusion implant of claim **1**, 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.

18. The spinal fusion implant of claim **1**, wherein said maximum lateral width of said implant is approximately 18 mm.

- EX1001; Paper 28, Patent Owner Response ("POR"), 20-24; Paper 41, Patent Owner Sur-Reply, 4-5

Challenged Claims of the '156 Patent

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 generally opposite from the first sidewall, wherein said distal wall, proximal wall, first sidewall, and second sidewall comprise 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, said implant has a maximum lateral width extending from said first sidewall to said second sidewall along a medial plane that is generally perpendicular to said longitudinal length, and said longitudinal length is 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 first and second radiopaque markers oriented generally parallel to a height of the implant, wherein said first radiopaque marker extends into said first sidewall at a position proximate to said medial plane, and said second radiopaque marker extends into said second sidewall at a position proximate to said medial plane.

2. The spinal fusion implant of claim 1, wherein the first and second radiopaque markers are substantially equally spaced apart from said proximal end of said proximal wall by a first longitudinal distance.

3. The spinal fusion implant of claim 1, further comprising a third radiopaque marker that extends into said distal wall, and a fourth radiopaque marker that extends into said proximal wall.

5. The spinal fusion implant of claim 1, further including at least one receiving aperture position at said proximal wall wherein said longitudinal length is greater than 40 mm.

9. The spinal fusion implant of claim 1, wherein said maximum lateral width of said implant is approximately 18 mm.

10. The spinal fusion implant of claim 1, wherein said radiolucent material comprises PEEK.

12. The spinal fusion implant of claim 1, wherein said upper and lower surfaces are generally parallel to one another.

13. The spinal fusion implant of claim 1, 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.

14. The spinal fusion implant of claim 1, wherein said first fusion aperture is one of generally rectangular and generally oblong in shape.

15. The spinal fusion implant of claim 1, further comprising a medial support extending between the first and second sidewalls.

16. The spinal fusion implant of claim 15, wherein said medial support is positioned along said medial plane.

17. The spinal fusion implant of claim 1, 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.

18. The spinal fusion implant of claim 17, wherein said second fusion aperture is separated from said first fusion aperture by a medial support.

19. The spinal fusion implant of claim 1, wherein said anti-migration elements of said upper surface comprise a plurality of ridges.

20. The spinal fusion implant of claim 19, wherein said plurality of ridges extend generally perpendicular to said longitudinal length.

21. The spinal fusion implant of claim 1, wherein said anti-migration elements of said upper surface comprise spike elements.

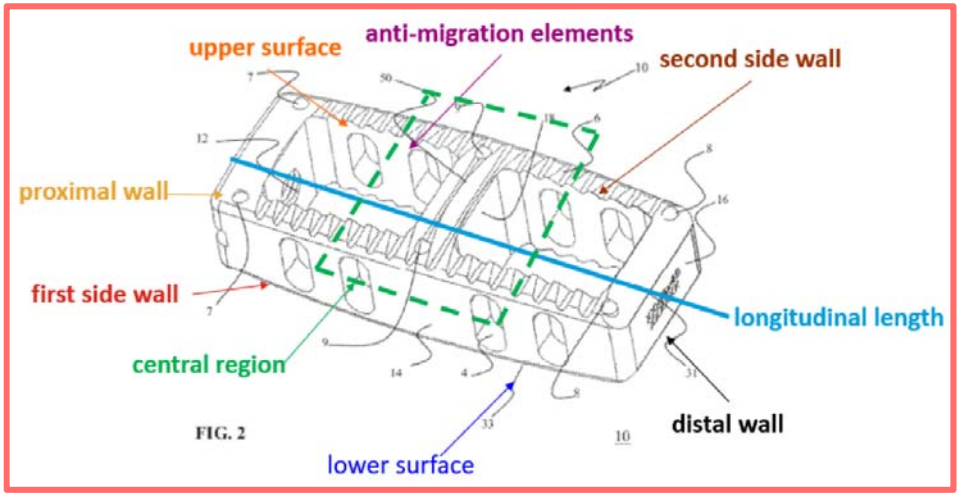
23. The implant of claim 1, wherein said maximum lateral width of said implant is greater than a lateral width of the distal end of said distal wall and is greater than a lateral width of the proximal end of said proximal wall.

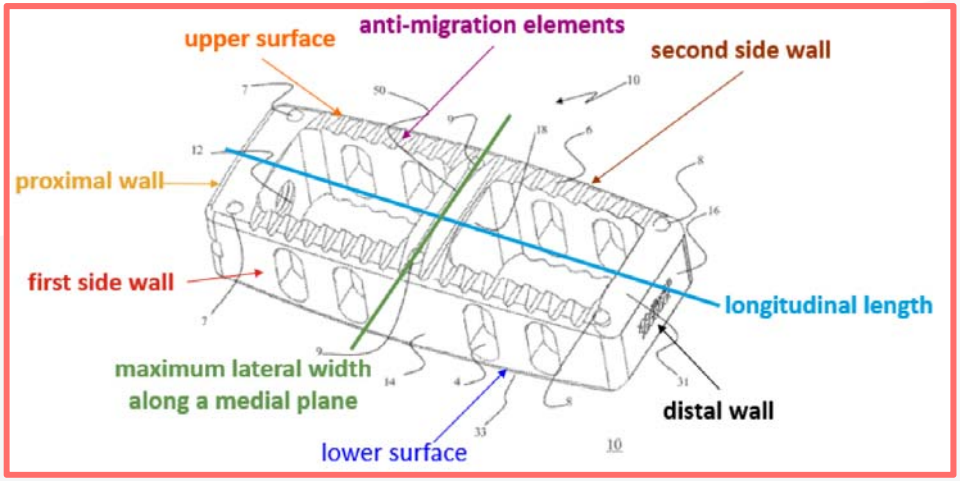
24. The implant of claim 1, wherein said implant has a height extending from said upper surface to said lower surface, wherein said maximum lateral width is greater than said height.

27. The spinal fusion implant of claim 1, further comprising an osteoinductive material positioned with said first fusion aperture.

- IPR2019-00362 EX1001

Exemplary Lumbar Fusion Implants





- EX1001, Fig. 2; Pet. (Paper 2) 7; 362 IPR Pet. 5

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