Claims

What is claimed is:

1. Implant ~~(16, 33, 52, 61, 62)~~ for insertion into a patient, wherein the implant comprises:

a three-dimensionally (3D) printed structure of layers ~~(71, 72, 101),~~, wherein each layer ~~(71, 72)~~ comprises an infill pattern ~~(76, 77)~~ of the three-dimensionally printed structure, the infill pattern ~~(76, 77)~~ of each layer comprising a set of infill lines~~; and~~, wherein the layers are arranged on top of one another such that a plurality of adjacent tilted hollow channels comprising walls are formed within the implant,

~~a plurality of~~wherein the adjacent tilted hollow channels ~~(21) comprising walls,~~

~~wherein the layers (71, 72)~~ are ~~arranged on top of~~ separated from one another ~~such that~~by the ~~plurality of hollow channels (21) are formed within the implant, wherein the walls of each~~ walls, wherein a wall of a first hollow channel ~~(21) are~~is a wall of a second adjacent hollow channel, and

wherein each tilted channel comprises slanted walls, wherein a slanted wall is formed by sections of the infill lines of a plurality of alternate layers of the printed structure of layers,

~~wherein at least~~ wherein the sections of infill lines are oriented in a first direction, and arranged above one ~~hollow channel (21)~~another with a lateral offset, wherein the lateral offset is a dimension in a direction parallel to a first outer surface of the implant, wherein the lateral offset is larger than zero and less than 50% of a lateral channel dimension,

wherein the plurality of tilted hollow channels ~~(21)~~ extends between a first outer surface of the implant and a second outer surface of the implant,

wherein ~~the at least one~~a tilted hollow channel ~~(21)~~ is oriented in a direction ~~(53)~~ which is tilted with respect to a reference axis perpendicular to the first outer surface of the implant.

2. Implant of claim 1, wherein the first outer surface of the implant and the second outer surface are opposite-facing surfaces.

3. Implant of claim 1, wherein the first outer surface is parallel to a two-dimensional plane formed by a first layer of the three-dimensional (3D) printed structure.

4. Implant of claim 1, wherein the first outer surface is the largest planar surface of the implant.

5. Implant of claim 1, wherein an angle between a longitudinal axis of a channel and the reference axis lies between 10 degrees and 85 degrees.

6. Implant of claim 1, wherein the three-dimensionally (3D) printed structure of layers ~~(71, 72, 101)~~ comprises a first batch of layers and a second batch of layers,

wherein the first batch of layers comprises odd-numbered layers of the three-dimensionally (3D) printed structure of layers, and

wherein the second batch of layers comprises even-numbered layers of the three-dimensionally (3D) printed structure of layers,

wherein the infill lines of the first batch of layers are oriented in a first direction, and wherein the infill lines of the second batch of layers are oriented in a second direction different to the first direction,

wherein portions of the infill pattern of the odd-numbered layer of the first batch of layers are shifted with respect to portions of the infill pattern of a first infill layer of the first batch of layers.

7. Implant of claim 6, wherein portions of the infill pattern of the even-numbered layers of the second batch of layers are shifted with respect to portions of the infill pattern of a first infill layer of the second batch of layers.

8. Implant of claim 6 or 7, wherein a lateral offset value between a first infill line ~~(102_{11})~~ of a first odd-numbered layer and a first infill line ~~(102_{31})~~ of a second odd-numbered layer lies between 0% and 50% of a distance between the first infill line ~~(102_{11})~~ of the first odd-numbered layer and a second adjacent infill line ~~(102_{12})~~ of the first odd-numbered layer.

9. Implant of claim 6 or 7, wherein a lateral offset value between a first infill line ~~(102_{11})~~ of a first odd-numbered layer and a first infill line ~~(102_{31})~~ of a second odd-numbered layer lies between 50% and 100% of a distance between the first infill line ~~(102_{11})~~ of the first odd-numbered layer and a second adjacent infill line ~~(102_{12})~~ of the first odd-numbered layer.

10. Implant of claim 1, wherein the plurality of tilted hollow channels converges towards a predefined region ~~(97)~~ at the first outer surface or at the second outer surface of the implant.

11. Implant of claim 10, wherein the predefined region ~~(97)~~ is a point of a convergence located beyond the first outer surface or beyond the second outer surface of the implant.

12. Implant of claim 1 or 10, wherein at least one hollow channel is a tapered channel.

13. Implant of claim 12, wherein the tapered channels are configured such that a size of openings of the channels on a bottom surface of the implant is in the range of 5-10 mm and the size of the openings of the channels on a top surface of the implant is in the range of 0.5-5 mm.

14. Implant of claim 1, wherein at least one hollow channel of the plurality of tilted hollow channels comprises a first opening at the first outer surface of the implant and a second opening at the second outer surface of the implant.

15. Implant of claim 1, wherein at least one hollow channel of the plurality of tilted hollow channels comprises a tilted portion and at least one non-tilted portion, wherein the non-tilted portion of the channel comprises one or more outer-most layers of the implant.

16. Implant of claim 15, wherein the non-tilted portion of the at least one hollow channel is located between an opening of the channel at the first outer surface of the implant or at the second outer surface of the implant, and the tilted portion of the at least one hollow channel.

17. Implant of claim 1, wherein more than two tilted hollow channels of the plurality of tilted hollow channels may be tilted with respect to the reference axis by the same angle.

18. Implant of claim 1, wherein at least 10% of the tilted hollow channels of the plurality of tilted hollow channels may be tilted with respect to the reference axis by the same angle.

19. Implant of claim 1, wherein the three-dimensionally (3D) printed structure of layers ~~(71, 72, 101)~~ comprises a first batch of layers and a second batch of layers,

wherein the first batch of layers comprises odd-numbered layers of the three-dimensionally (3D) printed structure of layers, and

wherein the second batch of layers comprises even-numbered layers of the three-dimensionally (3D) printed structure of layers,

wherein a first wall of a hollow channel is formed by sections of a plurality of odd-numbered layers of the first batch of layers, and

wherein a second wall of the hollow channel is formed by sections of a plurality of even-numbered layers of the ~~first~~second batch of layers.

20. Implant of claim 1, wherein the ~~infill pattern of each layer is bound by a perimeter (78), such that when the layers are arranged on top of one another, the~~ implant ~~has~~is a ~~3D form.~~breast implant.

21. Implant of claim 1, wherein the infill pattern of each layer comprises a print material meandering continuously from a start point ~~(74)~~ of the layer to an end point of the layer ~~(75).~~.

22. A method for forming an implant, the method comprising:

sequential printing layers to form a three-dimensionally (3D) printed structure,

wherein each layer is printed according to an infill pattern, the infill pattern of each layer comprising a set of infill lines,

wherein the layers ~~(71, 72)~~ are printed on top of one another such that a plurality of adjacent tilted hollow channels ~~(21)~~ comprising walls are formed within the implant, wherein ~~the walls of~~ each tilted channel ~~(21) are~~comprises slanted walls, wherein a slanted wall is formed by sections of the infill lines of a plurality of alternate layers of the printed structure of layers, wherein the sections of infill lines are oriented in a first direction, and arranged above one another with a lateral offset, wherein the lateral offset is a dimension in a direction parallel to a first outer surface of the implant, wherein the lateral offset is larger than zero and less than 50% of a lateral channel dimension,

wherein the tilted hollow channels are separated from one another by the walls, wherein a wall of a first hollow channel is a wall of a second directly adjacent hollow channel,

wherein at least one tilted hollow channel ~~(21)~~ of the plurality of hollow channels extends between a first outer surface of the implant and a second outer surface of the implant,

wherein ~~the at least one~~a tilted hollow channel ~~(21)~~ is oriented in a direction ~~(53)~~ which is tilted with respect to a reference axis perpendicular to the first outer surface of the implant.

23. The method of claim 22, further comprising:

providing a channel direction vector defining a tilt of the channels to be formed;

specifying a pore dimension of a first pore of a layer to be formed at a first height, wherein the first pore is represented by a first line segment; and

specifying a pore dimension of a second pore of a layer to be formed at a second height, wherein the second pore is represented by a second line segment, the first pore and the second pore belonging to the same channel to be formed.

~~24. The method of claim 23, further comprising determining a point of convergence of the channels to be formed by~~

~~calculating a first orientation line by connecting left end points of a first line segment and a second line segment;~~

~~calculating a second orientation line by connecting right end points of the first line segment and the second line segment, the direction vector lying on the second orientation line; and~~

~~calculating an intersection of the first and second orientation lines to determine the point of convergence of the channels to be formed.~~

~~25. The method of claim 24, wherein the point of convergence lies outside the first outer surface or outside the second outer surface of the implant to be formed.~~