CLAIM

1. A fan blade comprising:

a root including a front surface, a rear surface, a first side surface connected to the front surface and the rear surface, and a second side surface connected to the front surface and the rear surface, wherein a first front curved surface connects the front surface to the first side surface, a second front curved surface connects the front surface to the second side surface, a first rear curved surface connects the rear surface to the first side surface, and a second rear curved surface connects the rear surface to the second side surface, and the front surface is substantially perpendicular to both the first side surface and the second side surface, and the rear surface is substantially perpendicular to both the first side surface and the second side surface, and

wherein, in a cross-section of the root taken in a plane perpendicular to all of the front surface, the rear surface, the first side surface, and the second side surface, the first front curved surface, the second front curved surface, the first rear curved surface, and the second rear curved surface are curved; and

a blade extending from the root.

2. The fan blade as recited in claim 1 wherein the front surface and the rear surface are substantially flat.

3. The fan blade as recited in claim 1 wherein a cross-section of the root taken substantially parallel to a bottom surface of the root includes no angles.

4. The fan blade as recited in claim 1 wherein each of the curved surfaces has a radius.

5. The fan blade as recited in claim 4 wherein the radius is between about 0.1 inch to about 0.6 inch.

6. The fan blade as recited in claim 1 wherein each of the curved surfaces is an ellipse.

7. The fan blade as recited in claim 1 wherein the front surface and the rear surface are curved.

8. The fan blade as recited in claim 1 wherein the first side surface and the second side surface are substantially straight.

9. The fan blade as recited in claim 1 wherein the first side surface and the second side surface are substantially curved.

10. The fan blade as recited in claim 1 wherein the fan blade is made of at least one of aluminum and titanium.

11. The fan blade as recited in claim 1 wherein the root includes a portion having substantially parallel walls defining a width therebetween, wherein a distance is defined between an outer edge of the portion of the root and a line that extends substantially parallel to the outer edge, wherein the line passes through a point where the front surface and a first curved surface meet and a point where the rear surface and a second curved surface meet, and wherein a ratio of the distance to the width is between about 0.15 to about 0.50.

12. A turbine engine comprising:

a compressor section;

a combustor in fluid communication with the compressor section;

a turbine section in fluid communication with the combustor; and

a fan including a fan rotor and a plurality of fan blades, wherein the fan rotor includes a plurality of slots, each of the plurality of fan blades includes a root and a blade, and the root of each of the plurality of fan blades is received in one of the plurality of slots of the fan rotor,

wherein each root includes a front surface, a rear surface, a first side surface connected to the front surface and the rear surface, and a second side surface connected to the front surface and the rear surface, wherein the front surface engages the first side surface and the second side surface by one or more blunted surfaces, and the rear surface engages the first side surface and the second side surface by one or more blunted surfaces that extend to a bottom surface of the root,

wherein a first front curved surface connects the front surface to the first side surface, a second front curved surface connects the front surface to the second side surface, a first rear curved surface connects the rear surface to the first side surface, and a second rear curved surface connects the rear surface to the second side surface, and the front surface is substantially perpendicular to both the first side surface and the second side surface, and the rear surface is substantially perpendicular to both the first side surface and the second side surface, and

wherein, in a cross-section of the root taken in a plane perpendicular to all of the front surface, the rear surface, the first side surface, and the second side surface, the first front curved surface, the second front curved surface, the first rear curved surface, and the second rear curved surface are curved.

13. The turbine engine as recited in claim 12 wherein the front surface and the rear surface are substantially flat.

14. The turbine engine as recited in claim 12 wherein a cross-section of the root taken substantially parallel to a bottom surface of the root includes no angles.

15. The turbine engine as recited in claim 12 wherein each of the curved surfaces has a radius.

16. The turbine engine as recited in claim 15 wherein the radius is between about 0.1 inch to about 0.6 inch.

17. The turbine engine as recited in claim 12 wherein each of the curved surfaces is an ellipse.

18. The turbine engine as recited in claim 12 wherein the front surface and the rear surface are curved.

19. The turbine engine as recited in claim 12 wherein at least one of the fan blades is made of at least one of aluminum and titanium.

20. The turbine engine recited in claim 12 wherein the root includes a portion having substantially parallel walls defining a width therebetween, wherein a distance is defined between an outer edge of the portion of the root and a line that extends substantially parallel to the outer edge, wherein the line passes through a point where the front surface and a first curved surface meet and a point where the rear surface and a second curved surface meet, and wherein a ratio of the distance to the width is between about 0.15 to about 0.50.

21. The fan blade as recited in claim 1 including an axis extending from the root to the blade, and the curved surface is curved relative to the axis of the fan blade.

22. The fan blade as recited in claim 1 wherein both of the first side surface and the second side surface of the root includes the curved surface.

23. The fan blade as recited in claim 1 wherein the first side surface and the second side surface have a length that is greater than a width of the front surface and the rear surface.

24. The turbine engine as recited in claim 12 including an axis extending from the root to the blade, and the curved surface is curved relative to the axis of the fan blade.

25. The turbine engine as recited in claim 12 wherein both of the first side surface and the second side surface of the root includes the curved surface.

26. The turbine engine as recited in claim 12 wherein the first side surface and the second side surface have a length that is greater than a width of the front surface and the rear surface.

27. The fan blade as recited in claim 1 wherein the first front curved surface directly connects the front surface to the first side surface, the second front curved surface directly connects the front surface to the second side surface, the first rear curved surface directly connects the rear surface to the first side surface, and a second rear curved surface directly connects the rear surface to the second side surface.

28. The fan blade as recited in claim 1 wherein the radius extends about a center line that is substantially parallel to the first side surface and the second side surface and substantially parallel to the front surface and the rear surface.

29. The turbine engine as recited in claim 12 wherein the first front curved surface directly connects the front surface to the first side surface, the second front curved surface directly connects the front surface to the second side surface, the first rear curved surface directly connects the rear surface to the first side surface, and a second rear curved surface directly connects the rear surface to the second side surface.