Claims

What is claimed is:

1. A turbine component, comprising:

a turbine blade configured to be incorporated into a rotor of a turbine, the turbine blade comprising:

a distal end; and

a proximal end closer to an axis of rotation of the rotor than the distal end when the turbine blade is incorporated into the rotor;

wherein the turbine blade has a longitudinal dimension extending from the proximal end to the distal end;

wherein the turbine blade is configured such that, when incorporated into the rotor, fluid flow along the longitudinal dimension induces rotation of the rotor; and

wherein at least 35% of the mass and/or volume of the turbine blade is within 25% of a distance from the proximal end to the distal end of the turbine blade.

2. The turbine component of claim 1, wherein the turbine blade has a thickness dimension, and wherein the turbine blade has at least one cross-section, taken along a plane parallel to the thickness dimension and the longitudinal dimension, that is in the shape of a foil.

3. The turbine component of claim 1, wherein the turbine blade has a thickness dimension and a lateral dimension perpendicular to the thickness dimension and the longitudinal dimension, and wherein the turbine blade has at least one cross-section, taken along a plane parallel to the thickness dimension and the lateral dimension, that is in the shape of a foil.

4. The turbine component of claim 1, wherein the turbine blade is incorporated into the rotor, wherein the rotor comprises a hub, and wherein the hub is hollow.

5. The turbine component of claim 1, wherein the turbine blade is incorporated into the rotor, wherein the rotor comprises a hub having an exterior surface, and wherein less than or

equal to 90% of a volume bound by the exterior surface of the hub is occupied by solid material.

6. The turbine component of claim 1, wherein the turbine blade is configured to undergo autorotation in at least one fluid.

7. The turbine component of claim 1, wherein the turbine blade has a thickness dimension and a lateral dimension perpendicular to the thickness dimension and the longitudinal dimension, and wherein at least 50% of cross-sections of the turbine blade within 10% of a distance from the proximal end to the distal end of the turbine blade, taken along a plane parallel to the thickness dimension and the lateral dimension of the turbine blade, have a positive camber.

8. A turbine component, comprising:

a turbine blade configured to be incorporated into a rotor of a turbine, the turbine blade comprising:

a distal end; and

a proximal end closer to an axis of rotation of the rotor than the distal end when the turbine blade is incorporated into the rotor;

wherein the turbine blade has a thickness dimension, a longitudinal dimension extending from the proximal end to the distal end, and a lateral dimension perpendicular to the thickness dimension and the longitudinal dimension;

wherein the turbine blade is configured such that, when incorporated into the rotor, fluid flow along the longitudinal dimension induces rotation of the rotor; and

wherein at least 90% of cross-sections, taken along a plane parallel to the thickness dimension and the lateral dimension at 1% increments across the longitudinal dimension, have one or more of a chord length, maximum thickness, camber, or pitch angle that is at least 0.1% different than that of a directly adjacent cross-section.

9. The turbine component of claim 8, wherein at least 90% of cross-sections, taken along a plane parallel to the thickness dimension and the longitudinal dimension at 1% increments across the lateral dimension, have one or more of a chord length, maximum thickness, camber, or pitch angle that is at least 0.1% different than that of a directly adjacent cross-section.

10. The turbine component of claim 8, wherein the turbine blade is configured such that, when incorporated into the rotor, fluid flow along the lateral dimension induces rotation of the rotor.

11. The turbine component of claim 8, wherein the turbine blade is incorporated into the rotor, wherein the rotor comprises a hub, and wherein the turbine blade is attached to and extends from the hub.

12. The turbine component of claim 8, wherein the turbine blade comprises a leading edge and a rib along at least a portion of the leading edge.

13. The turbine component of claim 12, wherein the turbine blade further comprises a trailing edge and a vane extending from the leading edge to the trailing edge, wherein the vane has a first width at a first distance and a second width at a second, greater distance along an axis of the vane from the leading edge toward the trailing edge, wherein the first width is greater than the second width.

14. The turbine component of claim 12, wherein the turbine blade further comprises a trailing edge and a vane extending from the leading edge to the trailing edge, wherein a width of the vane decreases monotonically along an axis of the vane from the leading edge toward the trailing edge.

15. The turbine component of claim 8, wherein the turbine blade comprises a leading edge, a trailing edge, and a vane extending from the leading edge to the trailing edge.

16. The turbine component of claim 8, wherein the turbine blade comprises a ratio of a largest chord and a smallest chord on a proximal side of the largest chord in the lateral dimension that is greater than or equal to 1.1.

17. The turbine component of claim 8, wherein the turbine blade is in the shape of a maple seed.

18. The turbine component of claim 8, wherein the turbine blade has a root portion having an ovoid cross-section.

19. The turbine component of claim 8, wherein the fluid flow is water flow.

20. A method, comprising exposing the turbine component of claim 8 to water.

21. A turbine component, comprising:

a turbine blade configured to be incorporated into a rotor of a turbine, the turbine blade comprising:

a distal end; and

a proximal end closer to an axis of rotation of the rotor than the distal end when the turbine blade is incorporated into the rotor;

wherein the turbine blade has a thickness dimension, a longitudinal dimension extending from the proximal end to the distal end, and a lateral dimension perpendicular to the thickness dimension and the longitudinal dimension;

wherein the turbine blade is configured such that, when incorporated into the rotor, fluid flow along the longitudinal dimension induces rotation of the rotor; and

wherein at least 90% of cross-sections, taken along a plane parallel to the thickness dimension and the longitudinal dimension at 1% increments across the lateral dimension, have one or more of a chord length, maximum thickness, camber, or pitch angle that is at least 0.1% different than that of a directly adjacent cross-section.