CLAIMS

1. A method for defining the shape of an edge of an aerofoil, the method comprising the following steps:

obtaining a starting value for the thickness of the edge;

defining a distance from the edge of the aerofoil in terms of the thickness;

over the defined distance, defining a space S in terms of normalised camberline and normalised thickness;

transforming the space S to a new space S';

parameterising the new space S' to obtain new values for normalised camberline and normalised thickness;

defining a new shape for the edge using the new parameter values.

2. A method as claimed in claim 1, in which the transforming step comprises applying a parabolic function to the space S.

3. A method as claimed in claim 1, in which the transforming step comprises applying a function of the form

$S'(\psi) = \frac{\varsigma(\psi) - \psi\varsigma(1)}{\sqrt{\psi(1-\psi)}}$ to the space S, where $\psi = \frac{camberline}{Kt_{LE}}$ and $\varsigma = \frac{thickness}{Kt_{LE}}$, and where K is a predetermined constant.

4. A method as claimed in claim 3, in which the value of K is 2.5.

5. A method as claimed in any preceding claim, in which the space S' is parameterised using 10th order Bernstein polynomials.

6. A method as claimed in any preceding claim, in which the edge is a leading edge.

7. A method as claimed in any preceding claim, in which the aerofoil is a compressor blade for a gas turbine

engine.

8. An aerofoil including an edge defined by a method as claimed in any of claims 1 to 7.

9 A method for defining the shape of an edge of an aerofoil substantially as described in this specification, with reference to and as shown in Figures 3 to 5 of the accompanying drawings.

10. An aerofoil including an edge substantially as described in this specification, with reference to and as shown in Figures 3 to 5 of the accompanying drawings.

Claims

1. A method for defining the shape of a leading or trailing edge (33) of an aerofoil, **characterised in that** the method comprises the following steps:

   obtaining a starting value for the thickness (34) of the selected edge;
   defining a distance from the selected edge in terms of the thickness;
   over the defined distance, defining a space S in terms of normalised camberline and normalised thickness, where camberline and thickness are normalised with respect to the leading edge thickness;
   transforming the space S to a new space S';
   parameterising the new space S' to obtain new values for normalised camberline and normalised thickness;
   defining a new shape (48) for the selected edge using the new parameter values.

2. A method as claimed in claim 1, in which the transforming step comprises applying a parabolic function to the space S.

3. A method as claimed in claim 1, in which the transforming step comprises applying a function of the form $S'(\psi) = \frac{\varsigma(\psi) - \psi\varsigma(1)}{\sqrt{\psi(1-\psi)}}$ to the space S, where

$\psi = \frac{camberline}{Kt_{LE}}$ and $\varsigma = \frac{thickness}{Kt_{LE}}$, and

where K is a predetermined constant.

4. A method as claimed in claim 3, in which the value of K is 2.5.

5. A method as claimed in any preceding claim, in which the space S' is parameterised using 10th order Bernstein polynomials.

6. A method as claimed in any preceding claim, in which the aerofoil is a compressor blade for a gas turbine engine.

7. A method as claimed in any preceding claim, in which the aerofoil is a compressor stator for a gas turbine engine.