CLAIMS

1. A method comprising:

identifying an engine-run tip position (TP') for an airfoil (10) having a tip section (18) and a root section (16), the engine-run tip position (TP') having a displacement and a rotation with respect to an original tip position (TP), wherein the original tip position (TP) is defined with respect to the root section before engine running;

forming a airfoil tip on the tip section (18) of the airfoil;

defining a machining datum adjacent the airfoil tip, wherein the machining datum is spaced from the root section;

translating and rotating the airfoil to locate the airfoil tip in the original tip position (TP), independent of a position of the root section; and

machining the airfoil tip along a machining path to restore a tip profile on the engine-run airfoil, wherein the machining path is defined with respect to the machining datum adjacent the tip section and is independent of the displacement and rotation of the engine-run tip position, and independent of the position of the root section.

2. The method of claim 1, wherein forming the airfoil tip comprises forming a weldment on the tip section to restore an original height of the airfoil, as defined before engine running, and optionally further comprising grinding the tip section to remove wear features prior to forming the weldment.

3. The method of claim 2, wherein restoring the tip section comprises machining the weldment along the machining path to restore the tip profile at the original height of the airfoil.

4. The method of claim 3, further comprising machining a seal feature onto the airfoil tip.

5. The method of claim 3 or 4, further comprising machining the airfoil tip to produce an elliptic cross section.

6. The method of any preceding claims, wherein machining the airfoil tip restores the original tip profile within a machining tolerance, and wherein the displacement distance is at least twice the machining tolerance.

7. The method of claim 6, wherein:
the machining tolerance is 0.254 mm or less; and/or
the displacement is at least 0.508 mm.

8. The method of claim 6 or 7, wherein the rotation is at least one half degree (0.5°).