CLAIMS

1 A method of repairing a metallic component by powder feeding laser deposition, the metallic component being formed from a first material, the first material being provided as a powder having a first mean particle size, and a second material being provided as a powder having a second mean particle size, the method comprising the step of:

depositing a plurality of first repair layers onto a repair surface of the component to form a first repair zone, the first of the plurality of first repair layers comprising a mixture of A/B by weight of the first material and a second material, each nth successive one of the plurality of first repair layers comprising a change in the proportion of the second material in the mixture, 'n' being an integer, the last of the plurality of first repair layers comprising a mixture of C/D by weight of the first material and the second material,

wherein if a melting temperature of the first material is greater than a melting temperature of the second material, then the first mean particle size is selected to be smaller than the second mean particle size, otherwise

if the melting temperature of the second material is greater than the melting temperature of the first material, then the second mean particle size is selected to be smaller than the first mean particle size.

2 The method as claimed in Claim 1, wherein the integer 'n' is selected from the range comprising 10 to 1,000.

3 The method as claimed in Claim 1 or Claim 2, wherein the ratio A/B is selected from the range comprising 80/20 to 5/95, such that the sum (A + B) equals 100%.

4 The method as claimed in any one of Claims 1 to 3, wherein the ratio C/D is selected from the range comprising 0/100 to 40/60, such that the sum (C + D) equals 100%.

5 The method as claimed in any one of Claims 1 to 4, wherein the change in the proportion of the second material in the mixture comprises an increase in the proportion of the second material in the mixture.

6 The method as claimed in any one of Claims 1 to 5, the method comprising the additional step of:

depositing a plurality of second repair layers of the second material onto the first repair zone to form a second repair zone.

7 The method as claimed in any one of Claims 1 to 6, the method comprising the additional step of:

depositing a plurality of third repair layers of a third material onto the second repair zone to form a third repair zone.

8 The method as claimed in Claim 7, wherein the third material is metallurgically compatible with both the first material and the second material.

9 The method as claimed in any one of Claims 1 to 8, wherein the first repair material and the second repair material have the same metallurgical composition.

10 The method as claimed in any one of Claims 1 to 8, wherein the first repair material is metallurgically compatible with the second material.

11 The method as claimed in any one of Claims 1 to 10, wherein the metallic component is a bladed disc for a gas turbine engine.

12 The method as claimed in any one of Claims 7 to 11, the third material being provided as a powder having a third mean particle size, and

wherein if a melting temperature of the second material is greater than a melting temperature of the third material, then the second mean particle size is selected to be smaller than the third mean particle size, otherwise

if the melting temperature of the third material is greater than the melting temperature of the second material, then the third mean particle size is selected to be smaller than the second mean particle size.

13 A metallic component comprising:

a base region formed from a first material; and

a first repair zone superposed on the base region,

the first repair zone being formed from a plurality of first repair layers deposited by powder feeding laser deposition, the first of the plurality of first repair layers comprising a mixture of A/B by weight of the first material and a second material, each nth successive one of the plurality of first repair layers comprising a change in the proportion of the second material in the mixture, 'n' being an integer, the last of the plurality of first repair layers comprising a mixture of C/D by weight of the first material and the second material.

14 The metallic component as claimed in Claim 13, wherein the integer 'n' is selected from the range comprising 10 to 1,000.

15 The metallic component as claimed in Claim 13 or Claim 14, wherein the ratio A/B is selected from the range comprising 80/20 to 5/95, such that the sum (A + B) equals 100%.

16 The metallic component as claimed in any one of Claims 13 to 15, wherein the ratio C/D is selected from the range comprising 0/100 to 40/60, such that the sum (C + D) equals 100%.

17 The metallic component as claimed in any one of Claims 13 to 16, wherein the change in the proportion of the second material in the mixture comprises an increase in the proportion of the second material in the mixture.

18 The metallic component as claimed in any one of Claims 13 to 17, further comprising:

a second repair zone superposed on the first repair zone,

the second repair zone comprising a plurality of second repair layers of the second material.

19 The metallic component as claimed in any one of Claims 13 to 18, further comprising:

a third repair zone superposed on the second repair zone,

the third repair zone comprising a plurality of third repair layers of a third material.