CLAIMS

What is claimed is:

1. A method of polishing an integrally bladed rotor, the method comprising the steps of:

positioning a mask on an integrally bladed rotor such that a portion of the integrally bladed rotor is unmasked to define an exposed portion; and

polishing the exposed portion of the integrally bladed rotor.

2. The method as recited in claim 1 including the step of creating the mask employing selective laser sintering.

3. The method as recited in claim 2 wherein the step of creating the mask includes directing a laser towards a powder of particulates based on a three dimensional computer model programmed into a computer to fuse the powder of particulates together.

4. The method as recited in claim 3 wherein the powder of particulates are glass reinforced nylon powder.

5. The method as recited in claim 3 wherein the laser is a carbon dioxide laser.

6. The method as recited in claim 3 wherein the laser is pulsed.

7. The method as recited in claim 3 wherein the step of directing the laser includes fusing the powder of particulates with the laser to form a layer having a thickness, fusing the powder of particulates with the laser to form another layer having the thickness, and fusing the layer and the another layer with the laser.

8. The method as recited in claim 7 wherein the thickness is about .004 inch.

9. The method as recited in claim 1 wherein the exposed portion of the integrally blade rotor is an outer circumferential surface of a rotor hub and a plurality of blades that extend from the outer circumferential surface of the rotor hub.

10. The method as recited in claim 1 wherein the step of polishing the exposed portion of the integrally bladed rotor includes positioning the mask and the integrally bladed rotor in a slurry including an abrasive media.

11. The method as recited in claim 10 including the step of agitating the slurry to move the abrasive media towards the exposed portion of the integrally bladed rotor to polish the exposed portion of the integrally bladed rotor.

12. A mask for covering and masking areas of an integrally bladed rotor, the mask comprising:

a first portion located on a first side of an integrally bladed rotor, the first portion including a first projection that is received in a first side of an opening of the integrally bladed rotor;

a second portion located on a second side of the integrally bladed rotor; and

a third portion including a second projection that is received in a second side of the opening in the integrally bladed rotor.

13. The mask as recited in claim 12 wherein the first portion, the second portion, and the third portion are formed by a selective laser sintering

14. The mask as recited in claim 12 wherein the mask is made of glass reinforced nylon.

15. The mask as recited in claim 12 wherein the first portion includes a circumferential surface, a radial surface, and a surface located therebetween.

16. The mask as recited in claim 15 wherein the circumferential surface is a substantially flat circumferential surface and the radial surface is a substantially flat radial surface.

17. The mask as recited in claim 15 wherein the surface is angled about 45° relative to the circumferential surface and the radial surface.

18. The mask as recited in claim 12 wherein the first portion is substantially hollow.

19. The mask as recited in claim 12 wherein the second portion includes a circumferential surface, a radial surface, and a surface located therebetween.

20. The mask as recited in claim 19 wherein the circumferential surface is a substantially flat circumferential surface and the radial surface is a substantially flat radial surface.

21. The mask as recited in claim 19 wherein the surface is angled about 45° relative to the circumferential surface and the radial surface.

22. The mask as recited in claim 12 wherein the second portion is substantially hollow.

23. The mask as recited in claim 12 wherein the second portion includes two identical portions that are positioned on the integrally bladed rotor to define the second portion of the mask.

Claims

1. A method of polishing an integrally bladed rotor, the method comprising the steps of:

positioning a mask on an integrally bladed rotor such that a portion of the integrally bladed rotor is unmasked to define an exposed portion, wherein the step of positioning the mask includes positioning a first projection of a first portion of the mask in an opening of the integrally bladed rotor; and

polishing the exposed portion of the integrally bladed rotor.

2. The method as recited in claim 1 including the step of creating the mask employing selective laser sintering.

3. The method as recited in claim 2 wherein the step of creating the mask includes directing a laser towards a powder of particulates based on a three dimensional computer model programmed into a computer to fuse the powder of particulates together.

4. The method as recited in claim 3 wherein the powder of particulates are glass reinforced nylon powder.

5. The method as recited in claim 3 wherein the laser is a carbon dioxide laser.

6. The method as recited in claim 3 wherein the laser is pulsed.

7. The method as recited in claim 3 wherein the step of directing the laser includes fusing the powder of particulates with the laser to form a layer having a thickness, fusing the powder of particulates with the laser to form another layer having the thickness, and fusing the layer and the another layer with the laser.

8. The method as recited in claim 7 wherein the thickness is about .004 inch.

9. The method as recited in claim 1 wherein the exposed portion of the integrally blade rotor is an outer circumferential surface of a rotor hub and a plurality of blades that extend from the outer circumferential surface of the rotor hub.

10. The method as recited in claim 1 wherein the step of polishing the exposed portion of the integrally bladed rotor includes positioning the mask and the integrally bladed rotor in a slurry including an abrasive media.

11. The method as recited in claim 10 including the step of agitating the slurry to move the abrasive media towards the exposed portion of the integrally bladed rotor to polish the exposed portion of the integrally bladed rotor.

12. A mask for covering and masking areas of an integrally bladed rotor, the mask comprising:

a first portion located on a first side of an integrally bladed rotor, the first portion including a first projection that is received in a first side of an opening of the integrally bladed rotor;

a second portion located on a second side of the integrally bladed rotor; and

a fourth portion including a second projection that is received in a second side of the opening in the integrally bladed rotor.

13. The mask as recited in claim 12 wherein the first portion, the second portion, and the third portion are formed by a selective laser sintering.

14. The mask as recited in claim 12 wherein the mask is made of glass reinforced nylon.

15. The mask as recited in claim 12 wherein the first portion includes a circumferential surface, a radial surface, and a surface located therebetween.

16. The mask as recited in claim 15 wherein the circumferential surface is a substantially flat circumferential surface and the radial surface is a substantially flat radial surface.

17. The mask as recited in claim 15 wherein the surface is angled about 45° relative to the circumferential surface and the radial surface.

18. The mask as recited in claim 12 wherein the first portion is substantially hollow.

19. The mask as recited in claim 12 wherein the second portion includes a circumferential surface, a radial surface, and a surface located therebetween.

20. The mask as recited in claim 19 wherein the circumferential surface is a substantially flat circumferential surface and the radial surface is a substantially flat radial surface.

21. The mask as recited in claim 19 wherein the surface is angled about 45° relative to the circumferential surface and the radial surface.

22. The mask as recited in claim 12 wherein the second portion is substantially hollow.

23. The mask as recited in claim 12 wherein the second portion includes two identical portions that are positioned on the integrally bladed rotor to define the second portion of the mask.

24. The method as recited in claim 1 wherein the step of positioning the mask includes positioning a second projection of a second portion of the mask in the opening of the integrally bladed rotor

25. The method as recited in claim 24 wherein the first portion of the mask is located on a first side of the integrally bladed rotor, the second portion of the mask is located on a second side of the integrally bladed rotor, and the step of positioning includes locating a third portion of the mask on the second side of the integrally bladed rotor.

26. A mask for covering and masking areas of an integrally bladed rotor, the mask comprising:

a first portion located on a first side of an integrally bladed rotor, wherein the first portion includes a first projection that is received in an opening of the integrally bladed rotor; and

a second portion located on a second side of the integrally bladed rotor.

27. The mask as recited in claim 24 wherein the second portion includes a second projection that is received in the opening in the integrally bladed rotor.