CLAIMS

1. A method of debonding a first layer from a second layer, wherein the first layer is bonded to the second layer by an adhesive located between the first layer and the second layer, the method comprising:

inserting a blade of a cleaving tool between the first layer and the second layer, the blade being formed of a flexible material, and during insertion of the blade, the blade flexes from a first shape to conform to a second shape being a curvature of the first layer and the second layer;

applying heat, using a heating component, to a portion of the adhesive to heat the adhesive to a pre-determined temperature;

exerting a controlled force on the cleaving tool to move and flex the cleaving tool from the first shape to the second shape that conforms to the shape of the curvature of the first layer and the second layer, so as to de-bond the first layer and the second layer in a region that includes the heated portion of the adhesive, the controlled force exerted is set to match a debonding force calculated for the region based on the pre-determined temperature to which the adhesive is heated; and

upon the movement of the cleaving tool stooping due to the calculated controlled force being less than a force required to move the cleaving tool, maintaining the calculated controlled force while continuing to apply heat to the portion of the adhesive, such that the cleaving tool resumes movement upon the adhesive reaching the pre-determined temperature and the controlled force being at least equal to the force required to move the cleaving tool.

2. The method of claim 1, wherein the exerting the controlled force exerted is performed by a control system including one or more processors.

3. The method of claim 2, wherein the cleaving tool is mounted on a robot, and the robot performs the exerting of the controlled force on the cleaving tool.

4. The method of claim 1, further comprising varying input power to the heating component in order to maintain a pre-determined temperature, on a surface of the first layer, and the pre-determined temperature of the surface is equal to the set temperature of the adhesive.

5. The method of claim 1, wherein the calculated debonding force is a function of position along the first layer and the second layer, and the controlling of the force on the cleaving tool includes adjusting the exerted force as the cleaving tool moves.

6. The method of claim 1, wherein the first layer is a metallic layer and the second layer is a carbon fibre reinforced polymer layer.

7. The method of claim 1, wherein the first layer is a wing of leading-edge metalwork of a fan blade and the second layer is a composite portion of the fan blade.

8. The method of claim 1, wherein the exerting the force on the cleaving tool to move the cleaving tool includes pulling the cleaving tool by a handle of the cleaving tool

9. A cleaving tool arranged to debond a first layer from a second layer, wherein the first layer is bonded to the second layer by an adhesive located between the first layer and the second layer, the cleaving tool comprising:

a blade arranged to be inserted between the first layer and the second layer, the blade being formed of a flexible material, and during insertion of the blade, the blade flexes from a first shape to conform toa second shape being a curvature of the first layer and the second layer;

control circuitry arranged to exert a set controlled force so as to move the blade so as to de-bond the first layer and the second layer in a region that includes the heated portion of the adhesive, the controlled force exerted being set to match a de-bonding force calculated for the region based on the pre-determined temperature to which the adhesive is heated, and upon the movement of the cleaving tool stopping due to the calculated controlled force being less than a force required to move the cleaving tool, the calculated controlled force is maintained while continuing to apply heat to the portion of the adhesive, such that the cleaving tool resumes movement upon the adhesive reaching the pre-determined temperature and the controlled force being at least equal to the force required to move the cleaving tool.

10. The cleaving tool of claim 9, further comprising a heating component arranged to heat a portion of adhesive to the set temperature at which the adhesive softens, and wherein the debonding force calculated for the region is calculated using the set temperature as the temperature of the adhesive.

11. The cleaving tool of claim 9, further comprising a wedge-shaped member having a narrower forward region relative to a wider rear region, the blade being located on the narrower forward region of the wedge-shaped member, and the wedge-shaped member has an angle of between 3° and 30°.

12. The cleaving tool of claim 9, wherein the cleaving tool is arranged to be mounted on, and moved by, a robot.

13. The cleaving tool of claim 9, wherein the blade has a thickness less than a thickness of the adhesive, and the blade is serrated.

14. A debonding assembly arranged to debond a first layer from a second layer, wherein the first layer is bonded to the second layer by an adhesive located between the first layer and the second layer, the debonding assembly comprising:

a cleaving tool including a blade arranged to be inserted between the first layer and the second layer, the blade being formed of a flexible material, and during insertion of the blade, the blade flexes from a first shape to conform to a second shape being a curvature of the first layer and the second layer;

a robot arranged to move the cleaving tool so as to de-bond the first layer and the second layer in a region that includes the heated portion of the adhesive; and

a control system arranged to control the robot to exert a set controlled force on the cleaving tool to move the cleaving tool, the controlled force exerted being set to match a debonding force calculated for the region based on a pre-determined temperature to which the

adhesive is heated, and upon the movement of the cleaving tool stopping due to the calculated controlled force being less than a force required to move the cleaving tool, the calculated controlled force is maintained while continuing to apply heat to the portion of the adhesive, such that the cleaving tool resumes movement upon the adhesive reaching the pre-determined temperature and the controlled force being at least equal to the force required to move the cleaving tool.

15. The debonding assembly of claim 14, wherein the cleaving tool includes a heating component arranged to heat a portion of the adhesive to the pre-determined temperature to soften the adhesive, and wherein the de-bonding force calculated for the region is calculated using the set temperature as the temperature of the adhesive.

16. The debonding assembly of claim 15, further comprising a power supply configured to provide varying input power to the heating component in order to maintain a pre-determined temperature on a surface of the first layer, and wherein the pre-determined temperature of the surface is equal to the pre-determined temperature for the adhesive.

17. The debonding assembly of claim 16, wherein the calculated debonding force is a function of position along the first layer and the second layer, and the controlling the force on the cleaving tool includes adjusting the exerted force with position as the cleaving tool moves.