CLAIMS

1. A gas turbine engine comprising:

a casing, a bonding patch (10, 22) bonded to a surface of the casing, and a liner attached to the bonding patch, the bonding patch comprising:

a bonding region (12) configured to receive an adhesive for bonding the patch (10, 22) to a surface;

a plurality of de-bonding elements (16) configured to be movable relative to the bonding region (12) in response to an energising signal.

2. The gas turbine engine according to claim 1, wherein the de-bonding elements are configured to vibrate in response to the energising signal.

3. The gas turbine engine according to claim 1 or 2, wherein the energising signal is an electrical signal or a sound wave.

4. The gas turbine engine according to claim 3, wherein the frequency of the energising signal is in the ultrasonic range.

5. The gas turbine engine according to any one of the preceding claims, wherein the de-bonding elements include one or more transducers configured to be movable relative to the bonding region in response to the energising signal.

6. The gas turbine engine according to claim 5, wherein the one or more transducers includes one or more piezoelectric transducers configured to be suppliable with an electrical signal suitable for causing the one or more piezoelectric transducers to move relative the bonding region.

7. The gas turbine engine according to any one of the preceding claims, having a first group of de-bonding elements (16) and a respective second group of de-bonding elements (16), wherein the de-bonding elements of the first group are configured to move resonantly in response to a first energising signal of a first frequency, and wherein the de-bonding elements of the second group are configured to move resonantly in response to a second energising signal at a respectively different second frequency.

8. The gas turbine engine according to any one of the preceding claims, wherein the bonding region is at least partially defined by a floor of the patch.

9. The gas turbine engine to claim 8, wherein the de-bonding elements are configured as an array of mutually spaced apart fingers projecting into the bonding region from the floor.

10. The gas turbine engine according to claim 8, wherein the de-bonding elements are configured as an array of dimples formed in the floor to be thinner than the surrounding region of the floor, and to be movable relative to the bonding region in response to the energising signal.

11. The gas turbine engine according to any one of the previous claims, wherein the casing is a fan casing.

12. The gas turbine engine according to any one of the previous claims, wherein the panel is a fan track liner and/or an impact liner.

13. A method of de-bonding a bonding patch from a surface of a casing of a gas turbine engine, the bonding patch including a bonding region containing an adhesive bonding the patch to the surface, and a plurality of de-bonding elements configured to be movable relative to the bonding region in response to an energising signal, the method comprising:

applying the energising signal to the bonding patch to move the movable de-bonding elements relative to the bonding region;

removing the bonding patch from the surface.

14. A method of de-bonding a bonding patch according to claim 13 comprising: applying a first energising signal to the bonding patch at a first frequency to move a first group of the de-bonding elements, and applying a respective second energising signal to the bonding patch at a respective second frequency to move a respective second group of the de-bonding elements.

15. A method of de-bonding a bonding patch according to claim 14 comprising: applying the first energising signal to the bonding patch at the first frequency to move resonantly the first group of de-bonding elements; and applying the second energising signal to the bonding patch at the second frequency to move resonantly the second group of de-bonding elements.

16. A method of de-bonding a bonding patch according to any one of claims 13 to 15, wherein applying the energising signal to the bonding patch includes generating a sound wave in the bonding patch to move the movable de-bonding elements.

17. A method of de-bonding a bonding patch according to any one of the claims 13 to 15, wherein the de-bonding elements include one or more transducers configured to be movable relative to the bonding region in response to the energising signal, and wherein the method includes supplying the one or more transducers with a suitable electrical energising signal to move the transducers relative to the bonding region.

18. A method of de-bonding a bonding patch according to claim 17, wherein the transducers are piezoelectric transducers.

19. A method of de-bonding a bonding patch according to any one of claims 13 to 18, wherein the de-bonding elements are configured to vibrate in response to the energising signal.

20. A method of de-bonding a bonding patch according to any one of the claims 13 to 19, wherein the surface is provided by a fan casing of a gas turbine engine, and the bonding patch is further attached to a fan track liner and/or impact liner to bond the fan track liner and/or impact liner to the fan casing.