CLAIMS

WHAT IS CLAIMED IS:

1. A tooling assembly for fixing a relative position of a plurality of components, the tooling assembly comprising:

an alignment plate for receiving the plurality of components;

one or more biasing members for urging each of the plurality of components upward to ensure contact between a repair surface of each of the plurality of components and the alignment plate;

a plurality of walls surrounding the alignment plate to define a reservoir; and

a fill assembly for dispensing a fill material into the reservoir, the fill material fixing a relative position of the plurality of components when solidified, wherein the fill material is solidified when the plurality of components are positioned on the alignment plate to form a fixed component assembly;

a cleaning device for removing a top layer of the fill material from the fixed component assembly proximate the repair surface of each of the plurality of components, the cleaning device comprising a heat source for melting the top layer of the fill material or a material removal device, the material removal device being a device configured for grinding, machining, or etching the top layer of the fill material.

2. The tooling assembly of claim 1, wherein the one or more biasing members comprise one or more springs, one or more magnet pairs, or one or more piezoelectric actuators.

3. The tooling assembly of claim 1, wherein the one or more biasing members comprise one or more electromagnets.

4. The tooling assembly of claim 1, wherein the one or more biasing members comprise one or more permanent magnets.

5. The tooling assembly of claim 1, wherein the plurality of components are positioned such that the repair surface of each of the plurality of components is face down on the alignment plate.

6. The tooling assembly of claim 1, wherein the cleaning device comprises the heat source for melting the top layer of the fill material.

7. The tooling assembly of claim 1, wherein the plurality of components are positioned such that the repair surface of each of the plurality of components is face up toward a bottom surface of the alignment plate.

8. The tooling assembly of claim 1, wherein the fill material is selected from a group consisting of a potting material, a wax, a photopolymer resin, or molten glass.

9. The tooling assembly of claim 1, wherein the plurality of components comprise at least one airfoil of a gas turbine engine.

10. The tooling assembly of claim 1, wherein the cleaning device comprises the material removal device, the material removal device being the device configured for grinding.

11. A tooling assembly for fixing a relative position of a plurality of components, the tooling assembly comprising:

an alignment plate for receiving the plurality of components such that a repair surface of each of the plurality of components contacts the alignment plate;

one or more biasing members for urging each of the plurality of components upward to ensure contact between the repair surface of each of the plurality of components and the alignment plate;

a plurality of walls surrounding the alignment plate to define a reservoir; and

a fill assembly for dispensing a fill material into the reservoir, the fill material fixing a relative position of the plurality of components when solidified.

12. The tooling assembly of claim 11, wherein the one or more biasing members comprise one or more springs, one or more magnet pairs, or one or more piezoelectric actuators.

13. The tooling assembly of claim 11, wherein the plurality of components are positioned such that the repair surface of each of the plurality of components is face down on the alignment plate.

14. The tooling assembly of claim 11, wherein the fill material is solidified when the plurality of components are positioned face down on the alignment plate to form a fixed component assembly, the tooling assembly further comprising:

a cleaning device for removing a top layer of the fill material from the fixed component assembly proximate the repair surface of each of the plurality of components.

15. The tooling assembly of claim 14, wherein the cleaning device comprises a heat source for melting the top layer of fill material.

16. The tooling assembly of claim 14, wherein the cleaning device comprises a material removal device.

17. The tooling assembly of claim 16, wherein the material removal device comprises a device configured for grinding, machining, or etching the top layer of the fill material.

18. The tooling assembly of claim 11, wherein the plurality of components are positioned such that the repair surface of each of the plurality of components is face up toward a bottom surface of the alignment plate.

19. The tooling assembly of claim 11, wherein the fill material is selected from a group consisting of a potting material, a wax, a photopolymer resin, or molten glass.

20. The tooling assembly of claim 11, wherein the plurality of components comprise at least one airfoil of a gas turbine engine.