Claims

1. A modular, rotisserie type tooling fixture assembly for use in multiple different coating related operations, the tooling fixture assembly comprising:

a positioning ring having a plurality of anchor members configured to receive a plurality of workpieces; and

a retaining base defining a central aperture and a plurality of retaining members configured to be in locking engagement with the anchor members of the positioning ring to retain the plurality of workpieces in a fixed orientation;

wherein the engagement of the positioning ring with the retaining base is adapted to receive one or more components for the multiple different coating related operations without disassembling and re-assembling the plurality of workpieces from the tooling fixture assembly.

2. The fixture assembly of claim 1, wherein the retaining base further comprises a platform, where the plurality of retaining members rise from a surface of the platform.

3. The fixture assembly of claim 1, wherein the retaining members are disposed in a radial orientation from a central axis of the tooling fixture assembly.

4. The fixture assembly of claim 1, wherein the positioning ring comprises a plurality of alignment pegs configured to extend through corresponding alignment holes of the retaining base.

5. The fixture assembly of claim 1, wherein the anchor members are configured to engage a root section of at least one of the plurality of workpieces.

6. The fixture assembly of claim 1, wherein the tooling fixture assembly is characterized by a reduced ratio of thermal mass of the fixture assembly to thermal mass of the workpieces to be coated.

7. The fixture assembly of claim 1, further comprising an arbor operatively coupled to the retaining base through the central aperture, wherein the arbor is selectively guided to align and engage with the one or more components.

8. The fixture assembly of claim 1, wherein the one or more components is a grit blast cover, the grit blast cover disposed over the positioning ring.

9. The fixture assembly of claim 1, wherein the one or more components is a unitary masking cap structure, the masking cap structure disposed over and in engagement with the retaining base and positioning ring, the mask cap structure including a plurality of solid walls or surfaces adapted to cover portions of the plurality of workpieces in a masking relationship.

10. The fixture assembly of claim 9, wherein the cap structure has an opening through which an arbor extends.

11. The fixture assembly of claim 1 further comprising an auxiliary retention means for securing the retaining base to the positioning ring.

12. The fixture assembly of claim 1, wherein the plurality of workpieces is 12 and each anchor member is configure to receive one workpiece.

13. The tooling fixture assembly of claim 9, wherein a top portion of the cap structure is characterized by contoured surfaces conforming to the curvature of backsides of each of the workpieces.

14. The tooling fixture assembly of claim 9, wherein a bottom portion of the cap structure is a housing structure that contains corresponding openings that expose portions of the workpieces to be coated.

15. The tooling fixture assembly of claim 9, wherein a bottom portion of the cap structure is configured to mask a portion of the platform and root regions of a plurality of airfoil workpieces.

16. A method for performing a plurality of coating related steps comprising:

loading a plurality of workpieces into anchor members disposed in a prescribed radial orientation from a central aperture on a positioning ring, the anchor members configured to retain the plurality of workpieces to be coated;

engaging the positioning ring with the retaining base into a locked tooling fixture assembly;

locking the retaining base and the unitary masking cap together to form a tooling fixture assembly;

operatively connecting an arbor or process shaft through a central aperture of the retaining base and upward through the positioning ring;

operatively connecting a proximal section of the arbor or shaft to a first coating related station;

processing exposed surface portions of the plurality of workpieces; and

removing the tooling fixture assembly from the coating related station without disassembling and re-assembling the plurality of workpieces from the tooling fixture assembly prior to use of the fixture assembly at a second coating related station.

17. The method of claim 16, further comprising placing a unitary cover over the positioning ring, the cover having a plurality of solid walls or surfaces adapted to cover portions of the plurality of workpieces.

18. The method of claim 17, wherein the cover is a masking cap.

19. The method of claim 17, wherein the cover is a grit blast cover.

20. The method of claim 16, wherein the first coating related station is a grit blasting station and the second coating related station is a coating station.

Claims

1. A modular, rotisserie type tooling fixture assembly for use in multiple different coating related operations, the tooling fixture assembly comprising:

a positioning ring having a plurality of anchor members configured to receive a plurality of workpieces during the multiple different coating related operations, wherein said workpieces remain fixed relative to a plurality of retaining members, and said plurality of retaining members remain fixed relative to the positioning ring; and

a retaining base defining a central aperture extending therethrough wherein the retaining base is configured to rotate to allow locking engagement of said plurality of retaining members with the anchor members of the positioning ring to retain the plurality of workpieces in a fixed manner relative to the anchor members, and the anchor members remain fixed relative to the positioning ring during the multiple different coating related operations, said retaining members disposed in a prescribed radial orientation from a central axis of said tooling fixture assembly, said central axis extending through said central aperture;

wherein the retaining base further comprises a platform, where the plurality of retaining members rise from a surface of the platform;

wherein the engagement of the positioning ring with the retaining base is configured to receive one or more components for the multiple different coating related operations without disassembling and re-assembling the plurality of workpieces from the tooling fixture assembly.

2. The fixture assembly of claim 1, wherein the positioning ring comprises a plurality of alignment pegs configured to extend through corresponding alignment holes of the retaining base.

3. The fixture assembly of claim 1, wherein the anchor members are configured to engage a root section of at least one of the plurality of workpieces.

4. The fixture assembly of claim 1, further comprising an arbor operatively coupled to the retaining base through the central aperture, wherein the arbor is selectively guided to align and engage with the one or more components.

5. The fixture assembly of claim 1, wherein the one or more components is a grit blast cover, the grit blast cover disposed over the positioning ring.

6. The fixture assembly of claim 1, wherein the one or more components is a unitary masking cap structure, the masking cap structure is disposed over and in engagement with the retaining base and positioning ring, the mask cap structure including a plurality of solid walls or surfaces adapted to cover portions of the plurality of workpieces in a masking relationship.

7. The fixture assembly of claim 6, wherein the cap structure has an opening through which an arbor extends.

8. The fixture assembly of claim 1 further comprising an auxiliary retention means for securing the retaining base to the positioning ring.

9. The fixture assembly of claim 1, wherein the plurality of workpieces is 12 and each anchor member is configure to receive one workpiece.

10. The tooling fixture assembly of claim 6, wherein a top portion of the cap structure is characterized by contoured surfaces conforming to the curvature of backsides of each of the workpieces.

11. The tooling fixture assembly of claim 6, wherein a bottom portion of the cap structure is a housing structure that contains corresponding openings that expose portions of the workpieces to be coated.

12. The tooling fixture assembly of claim 6, wherein a bottom portion of the cap structure is configured to mask a portion of the platform and root regions of a plurality of airfoil workpieces.