WHAT IS CLAIMED IS:

1. A method (200) of machining an abradable material of a gas turbine engine utilizing a system (100) including a frame (102), a first arm (106) extending from a central location (108) of the frame (102), and a cutting apparatus (112) coupled to a first distal end (110) of the first arm (106) and including a rotating shaft (114) and a plurality of cutting disks (116) coupled to the rotating shaft (114) such that the cutting disks (116) define a helical cutting profile (120), the first arm (106) further comprising ~~the first distal end (110) and~~ a central location end, the first distal end (110) being at the opposite end of the first arm (106) as the central location end, the gas turbine engine extending along a first longitudinal centerline axis, the rotating shaft (114) extending along a second longitudinal centerline axis disposed substantially parallel to the first longitudinal centerline axis, wherein a motor is coupled to the plurality of cutting disks (116) to form a combination and the combination of the motor and the cutting disks (116) is disposed so as to extend along a second longitudinal centerline axis direction, the method (200) comprising:

(202) securing the frame (102) of the system (100) to at least a fan rotor (38) of the gas turbine engine utilizing an attachment structure (122) of the system (100) thereby allowing the system (100) to be rotated along a circumferential direction C about the first longitudinal centerline axis of the gas turbine engine when the at least fan rotor is rotating, the attachment structure (122) coupled to the frame (102) at the central location ~~(108)~~end of the first arm (106);

(204) adjusting the cutting apparatus (112) in an axial direction A of the gas turbine engine utilizing an axial adjuster (136) coupled between the first distal end (110) of the first arm (106) and the cutting apparatus (112) such that the cutting apparatus (112) is axially aligned with the abradable material;

(206) driving the rotating shaft (114) of the cutting apparatus (112) such that the plurality of cutting disks (116) rotates about an axis parallel to the axial direction A; and

(208) adjusting the cutting apparatus (112) in a radial direction R of the gas turbine engine utilizing a radial adjuster (138) coupled between the first distal end (110) of the first arm (106) and the cutting apparatus (112) such that only an outer

circumferential periphery ~~at least one~~ of multiple ones of the plurality of cutting disks (116) contact~~s~~ the abradable material simultaneously ~~in order to machine the abradable material~~.

2. The method (200) of claim 1, further comprising:

rotating the system (100) around ~~a~~the circumferential direction C of the gas turbine engine such that the cutting apparatus (112) machines at least a portion of the abradable material along the circumferential direction.

3. The method (200) of claim 1, wherein the system (100) further includes a second arm (130) extending from the central location (108) of the frame (102) and an axially aligned measurement assembly (132) including a measurement probe (160) coupled to a second distal end (134) of the second arm (130), the method (200) further comprising:

inspecting a contour of the abradable material by adjusting a position of the measurement probe (160) along the axial direction A.

4. The method (200) of claim 3, wherein adjusting the position of the measurement probe (160) comprises rotating an adjustment wheel (164) coupled to a threaded rod (162) operable with the measurement probe (160) in order to adjust the measurement probe (160) axially forward or aft.

5. The method (200) of claim 1, wherein adjusting the cutting apparatus (112) in the axial direction A comprises rotating an axial adjustment wheel (140) drivingly coupled to a threaded rod (142) of the axial adjuster (136) extending at least partially along the axial direction A, the threaded rod (142) operable with the cutting apparatus (112) such that the cutting apparatus (112) is adjusted at least partially in the axial direction A.

6. The method (200) of claim 1, wherein adjusting the cutting apparatus (112) in the radial direction R comprises rotating a radial adjustment wheel (146) operable with one or more jacks (148) of the radial adjuster (138), the one or more jacks (148) configured to extend and retract the cutting apparatus (112) at least partially in the radial direction R of the gas turbine engine.

7. The method (200) of claim 1, wherein the abradable material comprises a repaired portion (118).

8. A system (100) for machining an abradable material of a gas turbine engine having a first longitudinal centerline axis extending along an axial direction A and a radial direction R extending perpendicular from the first longitudinal centerline axis, the system (100) comprising:

a frame (102) including a first arm (106) extending from a central location (108),

wherein the first arm (106) comprises a first distal end (110) and a central location end, the first distal end (110) being at an opposite end of the first arm (106) as the central location end;

an attachment structure (122) coupled to the frame (102) at the central location (108) end of the first arm (106), the attachment structure (122) configured to couple to at least a fan rotor (38) of the gas turbine engine in such a manner that the system (100) can be rotated along a circumferential direction C about the first longitudinal centerline axis of the gas turbine engine when the fan rotor (38) is rotating; ~~and~~

a cutting apparatus (112);

an adjustment mechanism (128) coupled between the first distal end of the first arm (106) and the cutting apparatus (112), wherein the adjustment mechanism (128) is configured to adjust a position of the cutting apparatus (112) along an axial direction A and a radial direction R of the gas turbine engine, the adjustment mechanism (128) not encompassing the first arm (106); and

a motor;

wherein the cutting apparatus (112) includes a rotating shaft (114) extending along a second longitudinal centerline axis disposed substantially parallel to the first longitudinal centerline axis, and driven by the motor and a plurality of cutting disks (116) coupled to the rotating shaft, ~~coupled to a first distal end (110) of the first arm (106) opposite the central location (108), the cutting apparatus (112) including a rotating shaft (114) and plurality of cutting disks (116) coupled to the rotating shaft (114~~), wherein the plurality of cutting disks (116) define a helical cutting profile (120) and wherein the motor is coupled to the plurality of cutting disks (116) to form a combination and the combination of the motor and the cutting disks (116) is disposed so as to extend along the second longitudinal centerline axis direction such that only

an outer circumferential periphery of the plurality of cutting disks (116) contact the abradable material simultaneously;

wherein the helical cutting profile (120) is configured to machine a contour within the abradable material complementary to at least one fan blade (44) of the gas turbine engine.

9. The system (100) of claim 8, wherein the plurality of cutting disks (116) are configured to extend along a total length of the abradable material in ~~an~~the axial direction A of the gas turbine engine.

10. The system (100) of claim 8, wherein the frame (102) further includes a second arm (130) extending from the central location (108), the system (100) further comprising:

a measurement assembly (132) coupled to a second distal end (134) of the second arm (130) opposite the central location (108), wherein the measurement assembly (132) is configured to inspect the contour of the abradable material.

11. The system (100) of claim 10, wherein the measurement assembly (132) comprises a threaded rod (162) configured to extend at least partially along ~~an~~the axial direction A of the gas turbine engine, a measurement probe (160) extending from and operable with the threaded rod (162), and an adjustment wheel (164) configured to rotate the threaded rod (162) such that the measurement probe (160) is adjusted at least partially in the axial direction A of the gas turbine engine.

~~12. The system (100) of claim 8, further comprising:~~

~~an adjustment mechanism (128) coupled between the first distal end (110) of the first arm (106) and the cutting apparatus (112), wherein the adjustment mechanism (128) is configured to adjust a position of the cutting apparatus (112) along an axial direction and a radial direction of the gas turbine engine.~~

~~13~~12. The system (100) of claim ~~12~~8, wherein the adjustment mechanism (128) comprises an axial adjuster (136) including a threaded rod (142) operable with the cutting apparatus (112) and configured to extend at least partially along ~~an~~the axial direction A of the gas turbine engine and an axial adjustment wheel (140) configured to rotate the threaded rod (142) such that the cutting apparatus (112) is adjusted at least partially in the axial direction A .

~~14~~13. The system (100) of claim ~~12~~8, wherein the adjustment mechanism (128) comprises a radial adjuster (138) including at least one jack (148) operable with the cutting apparatus (112) and a radial adjustment wheel (146) configured to extend and retract the cutting apparatus (112) at least partially in the radial direction R of the gas turbine engine.

~~15~~14. The system (100) of claim 8, wherein the rotating shaft (114) includes a key (154) extending along a length of the rotating shaft (114), and wherein each cutting disk (116) of the plurality of cutting disks (116) includes a notch operable with the key (154) such that the plurality of cutting disks (116) define the helical cutting profile (120).

15. The system (100) of claim 8, wherein the plurality of cutting disks (116) comprises two or more cutting disks defining different diameters.

16. The system (100) of claim 8, wherein the plurality of cutting disks (116) comprises between 18 and 46 cutting disks.

17. The system (100) of claim 8, wherein the plurality of cutting disks (116) include one or more teeth.

18. The system (100) of claim 8, wherein the attachment structure comprises a support ring (124) configured to be coupled to at least the fan rotor of the gas turbine engine.

19. The system of claim 8, wherein the motor is an air motor (126).