CLAIMS

1. A gas turbine engine comprising:

a propulsion unit including a fan, and a free turbine connected to drive said fan about a first axis;

a core engine, said core engine including at least a compressor, a combustion section, and a turbine, said core engine turbine connected to drive said compressor, and said compressor and said core engine turbine rotating about a second axis; and

said first and second axes being non-parallel to each other.

2. The gas turbine engine as set forth in claim 1, wherein a gear reduction is provided between said free turbine and said fan.

3. The gas turbine engine as set forth in claim 1, wherein an angle is defined between said first and second axes, with said angle having a component extending in a direction that will approach an aircraft wing which is to mount said gas turbine engine.

4. The gas turbine engine as set forth in claim 1, wherein an angle is defined between said first and second axes, and a range of said angle being greater than zero and less than or equal to about 90°°.

5. The gas turbine engine as set forth in claim 1, wherein said fan delivering air into a main duct, and said main duct having an inlet tapping a portion of the air from said main duct into a turning duct which feeds air into said compressor.

6. The gas turbine engine as set forth in claim 5, wherein said turning duct generally reverses a direction of flow of air from the main duct into the compressor.

7. The gas turbine engine as set forth in claim 6, wherein an outlet of gas downstream of said free turbine extends back into said main duct.

8. The gas turbine engine as set forth in claim 7, wherein said outlet extends into said main duct through struts extending across said main duct.

9. The gas turbine engine as set forth in claim 8, wherein said struts are positioned upstream of the location where said turning duct taps air from said main duct.

10. The gas turbine engine as set forth in claim 9, wherein said struts which have said outlet of gas downstream of said free turbine are circumferentially spaced from said inlet into said turning duct.

11. The gas turbine engine as set forth in claim 1, wherein a connecting duct connects said core engine turbine to said free turbine.

12. The gas turbine engine as set forth in claim 11, wherein said connecting duct is a mount location for mounting said core engine to an aircraft.

13. The gas turbine engine as set forth in claim 1, wherein there are two turbine stages and two compressor stages in said core engine.

14. The gas turbine engine as set forth in claim 1, wherein the propulsion unit is positioned such that its free turbine and fan are in a forward end of the gas turbine engine, and the core engine is spaced rearwardly, and is separate from the propulsion unit.

15. An aircraft including:

a wing and a pylon mounting a gas turbine engine to said wing; and

said gas turbine engine including a propulsion unit including a fan, and a free turbine connected to drive said fan about a first axis, a core engine, said core engine including at least the compressor, a combustion section, and a turbine, said core engine turbine connected to drive said compressor, and said compressor and said core engine turbine rotating about a second axis, said first and second axis being non-parallel to each other.

16. The aircraft as set forth in claim 15, wherein an angle may be defined between said first and second axes, with said angle having a component extending in a direction that will approach an aircraft wing which is to mount said gas turbine engine.

17. The aircraft as set forth in claim 15, wherein a connecting duct connects said core engine turbine to said free turbine.

18. The aircraft as set forth in claim 15, wherein said connecting duct is a mount location for mounting said core engine to said wing.

19. The aircraft as set forth in claim 18, wherein a strut extends from said pylon to be connected to said connecting duct.

20. The aircraft as set forth in claim 15, wherein there are two turbine stages and two compressor stages in said core engine.

21. A gas turbine engine comprising:

a propulsion unit including a fan, and a free turbine connected to drive said fan; and

a core engine including at least a compressor, a combustion section and a turbine, said core engine turbine connected to drive said compressor, and said compressor and said core engine turbine being positioned toward an outlet end of the gas turbine engine relative to said propulsion unit, and said core engine being separate from said propulsion unit.

22. The gas turbine engine as set forth in claim 21, wherein said core engine compressor receiving air from a main air duct, said fan delivering air into said main air duct, and said air delivered into said core engine compressor being compressed, passed into the combustion section, and products of combustion passing over turbine rotors heading in a direction back toward said fan, and said free turbine receiving the products of combustion downstream of said core engine turbine, and a connecting duct connecting said core engine to said free turbine.

23. The gas turbine engine as set forth in claim 21, wherein said core engine rotates on an axis which is co-linear with a rotation axis of said free turbine and said fan.

24. The gas turbine engine as set forth in claim 21, wherein said fan is positioned at an inlet end of a main air duct, and said free turbine is positioned between said inlet end and said core engine relative to an axial dimension extending along a rotational axis of said fan, and from said inlet end toward an outlet end of said main duct.

25. A method of mounting a gas turbine engine to an aircraft wing, comprising:

providing a propulsion unit including a fan and a free turbine connected to drive said fan about a first axis, and connecting a core engine to said free turbine, said core engine including at least a compressor, a combustion section, and a turbine, said core engine turbine connected to drive said compressor, and said compressor and said core engine turbine rotating about a second axis, wherein the first and second axes being non-parallel to each other, and said second axis being selected to move a disk burst zone forwardly relative to an aircraft wing such that a gas turbine engine incorporating said propulsion unit and said core engine can be mounted further rearwardly on the aircraft wing.

26. The method as set forth in claim 25, wherein an angle between said first and second axes being selected to control the desired amount of movement of the disk burst zone.

CLAIMS

1. A gas turbine engine comprising:

a propulsion unit including a fan, and a free turbine connected to drive said fan about a first axis;

a core engine, said core engine including at least a compressor, a combustion section, and a turbine, said core engine turbine connected to drive said compressor, and said compressor and said core engine turbine rotating about a second axis; and

said first and second axes being non-parallel to each other;

wherein an angle is defined between said first and second axes, with said angle having a component extending in a direction that will approach an aircraft wing which is to mount said gas turbine engine.

2. The gas turbine engine as set forth in claim 1, wherein a gear reduction is provided between said free turbine and said fan.

3. The gas turbine engine as set forth in claim 1, wherein an angle is defined between said first and second axes, and a range of said angle being greater than zero and less than or equal to about 90°°.

4. The gas turbine engine as set forth in claim 1, wherein said fan delivering air into a main duct, and said main duct having an inlet tapping a portion of the air from said main duct into a turning duct which feeds air into said compressor.

5. The gas turbine engine as set forth in claim 4, wherein said turning duct generally reverses a direction of flow of air from the main duct into the compressor.

6. The gas turbine engine as set forth in claim 5, wherein an outlet of gas downstream of said free turbine extends back into said main duct.

7. The gas turbine engine as set forth in claim 6, wherein said outlet extends into said main duct through struts extending across said main duct.

8. The gas turbine engine as set forth in claim 7, wherein said struts are positioned upstream of the location where said turning duct taps air from said main duct.

9. The gas turbine engine as set forth in claim 8, wherein said struts which have said outlet of gas downstream of said free turbine are circumferentially spaced from said inlet into said turning duct.

10. The gas turbine engine as set forth in claim 1, wherein a connecting duct connects said core engine turbine to said free turbine.

11. The gas turbine engine as set forth in claim 10, wherein said connecting duct is a mount location for mounting said core engine to an aircraft.

12. The gas turbine engine as set forth in claim 1, wherein there are two turbine stages and two compressor stages in said core engine.

13. The gas turbine engine as set forth in claim 1, wherein the propulsion unit is positioned such that its free turbine and fan are in a forward end of the gas turbine engine, and the core engine is spaced rearwardly, and is separate from the propulsion unit.

14. An aircraft including:

a wing and a pylon mounting a gas turbine engine to said wing; and

said gas turbine engine including a propulsion unit including a fan, and a free turbine connected to drive said fan about a first axis, a core engine, said core engine including at least the compressor, a combustion section, and a turbine, said core engine turbine connected to drive said compressor, and said compressor and said core engine turbine rotating about a second axis, said first and second axis being non-parallel to each other;

wherein an angle may be defined between said first and second axes, with said angle having a component extending in a direction that approaches the aircraft wing.

15. The aircraft as set forth in claim 14, wherein a connecting duct connects said core engine turbine to said free turbine.

16. The aircraft as set forth in claim 14, wherein said connecting duct is a mount location for mounting said core engine to said wing.

17. The aircraft as set forth in claim 16, wherein a strut extends from said pylon to be connected to said connecting duct.

18. The aircraft as set forth in claim 14, wherein there are two turbine stages and two compressor stages in said core engine.

19. A gas turbine engine comprising:

a propulsion unit including a fan, and a free turbine connected to drive said fan; and

a core engine including at least a compressor, a combustion section and a turbine, said core engine turbine connected to drive said compressor, and said compressor and said core engine turbine being positioned toward an outlet end of the gas turbine engine relative to said propulsion unit, and said core engine being separate from said propulsion unit;

wherein said core engine compressor receiving air from a main air duct, said fan delivering air into said main air duct, and said air delivered into said core engine compressor being compressed, passed into the combustion section, and products of combustion passing over turbine rotors heading in a direction back toward said fan, and said free turbine receiving the products of combustion downstream of said core engine turbine, and a connecting duct connecting said core engine to said free turbine and wherein the outlet gas from the free turbine is directed through struts into the main air duct.

20. The gas turbine engine as set forth in claim 19, wherein said core engine rotates on an

axis which is co-linear with a rotation axis of said free turbine and said fan.

21. The gas turbine engine as set forth in claim 19, wherein said fan is positioned at an inlet end of a main air duct, and said free turbine is positioned between said inlet end and said core engine relative to an axial dimension extending along a rotational axis of said fan, and from said inlet end toward an outlet end of said main duct.

22. A method of mounting a gas turbine engine to an aircraft wing, comprising:

providing a propulsion unit including a fan and a free turbine connected to drive said fan about a first axis, and connecting a core engine to said free turbine, said core engine including at least a compressor, a combustion section, and a turbine, said core engine turbine connected to drive said compressor, and said compressor and said core engine turbine rotating about a second axis, wherein the first and second axes being non-parallel to each other, and said second axis being selected to move a disk burst zone forwardly relative to an aircraft wing such that a gas turbine engine incorporating said propulsion unit and said core engine can be mounted further rearwardly on the aircraft wing.

23. The method as set forth in claim 22, wherein an angle between said first and second axes being selected to control the desired amount of movement of the disk burst zone.