## CLAIMS

What is claimed is:

1. A gas turbine engine comprising:

a fan rotor, a first compressor rotor and a second compressor rotor, said second compressor rotor compressing air to a higher pressure than said first compressor rotor;

a first turbine rotor, said first turbine rotor driving said second compressor rotor, and a second turbine rotor, said second turbine driving said first compressor rotor;

a fan drive turbine positioned downstream of said second turbine rotor, said fan drive turbine driving said fan rotor through a gear reduction; and

said first compressor rotor and said second turbine rotor rotating as an intermediate speed spool, and said second compressor rotor and said first turbine rotor rotating together as a high speed spool, with said high speed spool rotating in the same direction as said intermediate speed spool, and said fan drive turbine rotating in an opposed direction as said intermediate speed spool; wherein

a power density of the engine is greater than or equal to about 1.5 $lbf/in^3$, and less than or equal to about 5.5 $lbf/in^3$;

said power density is defined as a ratio of thrust produced by said engine expressed in pounds force to a volume of a turbine section incorporating each of said first turbine rotor, said second turbine rotor and said fan drive turbine rotor, expressed in cubic inches;

said ratio is greater than or equal to about 4.0; and

said thrust is sea level take-off flat-rated static thrust.

2. The engine as set forth in claim 1, wherein said fan rotor is driven by said gear reduction to rotate in the same direction as said intermediate speed spool.

3. The engine as set forth in claim 1, wherein said fan rotor delivering a portion of air into a bypass duct and a portion of air into said first compressor rotor as core flow.

4. The engine as set forth in claim 3, wherein a mid-turbine frame is positioned between said first and second turbine rotors.

5. The engine as set forth in claim 4, wherein a vane is positioned between said mid-turbine frame and said second turbine rotor.

6. The engine as set forth in claim 5, wherein a turning vane is positioned between said second turbine rotor and said fan drive turbine.

7. The engine as set forth in claim 3, wherein a turning vane is positioned between said second turbine rotor and said fan drive turbine.

8. The engine as set forth in claim 1, wherein a mid-turbine frame is positioned between said first and second turbine rotors.

9. The engine as set forth in claim 8, wherein a vane is positioned between said mid-turbine frame and said second turbine rotor.

10. The engine as set forth in claim 9, wherein a turning vane is positioned between said second turbine rotor and said fan drive turbine.

11. The engine as set forth in claim 1, wherein a turning vane is positioned between said second turbine rotor and said fan drive turbine.

12. A gas turbine engine comprising:

a fan rotor, a first compressor rotor and a second compressor rotor, said second compressor rotor compressing air to a higher pressure than said first compressor rotor;

a first turbine rotor, said first turbine rotor driving said second compressor rotor, and a second turbine rotor, said second turbine driving said first compressor rotor;

a fan drive turbine positioned downstream of said second turbine rotor, said fan drive turbine driving said fan rotor through a gear reduction;

said first compressor rotor and said second turbine rotor rotating as an intermediate speed spool, and said second compressor rotor and said first turbine rotor rotating together as a high speed spool, with said high speed spool rotating in the same direction as said intermediate speed spool, and said fan drive turbine rotating in an opposite direction as said intermediate speed spool;

said fan rotor being driven by said speed reduction to rotate in the same direction as said intermediate speed spool;

a power density of the engine being greater than or equal to about 1.5 $lbf/in^3$, and less than or equal to about 5.5 $lbf/in^3$; and

said power density defined as a ratio of thrust produced by said engine expressed in pounds force to a volume of a turbine section incorporating each of said first turbine rotor, said second turbine rotor and said fan driving turbine rotor, expressed in cubic inches; wherein

said ratio is greater than or equal to about 4.0; and

said thrust is sea level take-off flat-rated static thrust.

13. A gas turbine engine comprising:

a fan rotor, a first compressor rotor and a second compressor rotor, said second compressor rotor compressing air to a higher pressure than said first compressor rotor;

a first turbine rotor, said first turbine rotor driving said second compressor rotor, and a second turbine rotor, said second turbine driving said first compressor rotor;

a fan drive turbine positioned downstream of said second turbine rotor, said fan drive turbine driving said fan rotor through a gear reduction; and

said first compressor rotor and said second turbine rotor rotating as an intermediate speed spool, and said second compressor rotor and said first turbine rotor rotating together as a high speed spool, with said high speed spool rotating in the same direction as said intermediate speed spool, and said fan drive turbine rotating in an opposed direction as said intermediate speed spool; wherein

a mid-turbine frame is positioned between said first and second turbine rotors; and

a vane is positioned between said mid-turbine frame and said second turbine rotor.

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What is claimed is:

1. A gas turbine engine comprising:

a fan rotor, a first compressor rotor and a second compressor rotor, said second compressor rotor compressing air to a higher pressure than said first compressor rotor;

a first turbine rotor, said first turbine rotor driving said second compressor rotor, and a second turbine rotor, said second turbine driving said first compressor rotor;

a fan drive turbine positioned downstream of said second turbine rotor, said fan drive turbine driving said fan rotor through a gear reduction; and

said first compressor rotor and said second turbine rotor rotating as an intermediate speed spool, and said second compressor rotor and said first turbine rotor rotating together as a high speed spool, with said high speed spool rotating in the same direction as said intermediate speed spool, and said fan drive turbine rotating in an opposed direction as said intermediate speed spool; wherein

a power density of the engine is greater than or equal to 1.5 $lbf/in^3$, and less than or equal to 5.5 $lbf/in^3$;

said power density is defined as a ratio of thrust produced by said engine expressed in pounds force to a volume of a turbine section incorporating each of said first turbine rotor, said second turbine rotor and said fan drive turbine rotor, expressed in cubic inches;

said ratio is greater than or equal to 4.0; and

said thrust is sea level take-off flat-rated static thrust.

2. The engine as set forth in claim 1, wherein said fan rotor is driven by said gear reduction to rotate in the same direction as said intermediate speed spool.

3. The engine as set forth in claim 1, wherein said fan rotor delivering a portion of air into a bypass duct and a portion of air into said first compressor rotor as core flow.

4. The engine as set forth in claim 3, wherein a mid-turbine frame is positioned between said first and second turbine rotors.

5. The engine as set forth in claim 4, wherein a vane is positioned between said mid-turbine frame and said second turbine rotor.

6. The engine as set forth in claim 5, wherein a turning vane is positioned between said second turbine rotor and said fan drive turbine.

7. The engine as set forth in claim 3, wherein a turning vane is positioned between said second turbine rotor and said fan drive turbine.

8. The engine as set forth in claim 1, wherein a mid-turbine frame is positioned between said first and second turbine rotors.

9. The engine as set forth in claim 8, wherein a vane is positioned between said mid-turbine frame and said second turbine rotor.

10. The engine as set forth in claim 9, wherein a turning vane is positioned between said second turbine rotor and said fan drive turbine.

11. The engine as set forth in claim 1, wherein a turning vane is positioned between said second turbine rotor and said fan drive turbine.

12. A gas turbine engine comprising:

a fan rotor, a first compressor rotor and a second compressor rotor, said second compressor rotor compressing air to a higher pressure than said first compressor rotor;

a first turbine rotor, said first turbine rotor driving said second compressor rotor, and a second turbine rotor, said second turbine driving said first compressor rotor;

a fan drive turbine positioned downstream of said second turbine rotor, said fan drive turbine driving said fan rotor through a gear reduction;

said first compressor rotor and said second turbine rotor rotating as an intermediate speed spool, and said second compressor rotor and said first turbine rotor rotating together as a high speed spool, with said high speed spool rotating in the same direction as said intermediate speed spool, and said fan drive turbine rotating in an opposite direction as said intermediate speed spool;

said fan rotor being driven by said speed reduction to rotate in the same direction as said intermediate speed spool;

a power density of the engine being greater than or equal to 1.5 lbfin$^3$, and less than or equal to 5.5 lbf/in$^3$; and

said power density defined as a ratio of thrust produced by said engine expressed in pounds force to a volume of a turbine section incorporating each of said first turbine rotor, said second turbine rotor and said fan driving turbine rotor, expressed in cubic inches; wherein

said ratio is greater than or equal to 4.0; and

said thrust is sea level take-off flat-rated static thrust.

13. A gas turbine engine comprising:

a fan rotor, a first compressor rotor and a second compressor rotor, said second compressor rotor compressing air to a higher pressure than said first compressor rotor;

a first turbine rotor, said first turbine rotor driving said second compressor rotor, and a second turbine rotor, said second turbine driving said first compressor rotor;

a fan drive turbine positioned downstream of said second turbine rotor, said fan drive turbine driving said fan rotor through a gear reduction; and

said first compressor rotor and said second turbine rotor rotating as an intermediate speed spool, and said second compressor rotor and said first turbine rotor rotating together as a high speed spool, with said high speed spool rotating in the same direction as said intermediate speed spool; and said fan drive turbine rotating in an opposed direction as said intermediate speed spool; wherein

a mid-turbine frame is positioned between said first and second turbine rotors; and

a vane is positioned between said mid-turbine frame and said second turbine rotor.