

WHAT IS CLAIMED IS:

1. An aircraft configured for vertical takeoff and landing, the aircraft comprising:
 - a fuselage;
 - a pair of wings coupled to opposite sides of the fuselage;
 - a plurality of lift fan assemblies coupled to the pair of wings, wherein the plurality of lift fan assemblies are configured to create a vertical lift;
 - a plurality of tilting fan assemblies configured to move between a vertical lift position and a forward flight position; and
 - a control system configurable to control the plurality of tilting fan assemblies between the vertical lift position and the forward flight position.
2. The aircraft of claim 1, further comprising:
 - one or more battery units including a plurality of battery cells configured to power the plurality of tilting fan assemblies and the plurality of lift fan assemblies.
3. The aircraft of claim 1 further comprising: a tailplane in form of a V-tail coupled to a rear end of the fuselage.
4. The aircraft of claim 1, wherein the pair of wings are coupled to the fuselage in a high-wing configuration.
5. The aircraft of claim 1, wherein the plurality of lift fan assemblies are mounted in a fixed position relative to the pair of wings to move the aircraft in a vertical direction.
6. The aircraft of claim 5, wherein one or more of the plurality of lift fan assemblies are configurable to stop operating during a forward flight of the aircraft.
7. The aircraft of claim 5, wherein each of the plurality of lift fan assemblies comprise an electric motor-driven rotor.

8. The aircraft of claim 5, wherein at least three lift fan assemblies are coupled to each of the pair of wings.

9. The aircraft of claim 1, wherein the plurality of tilting fan assemblies are coupled to at least one of the pair of wings via one or more tilting mechanisms.

10. The aircraft of claim 9, wherein at least three tilting fan assemblies are coupled to each of the pair of wings.

11. The aircraft of claim 1, wherein a combined number of lift fan assemblies and tilting fan assemblies is at least 12.

12. The aircraft of claim 1, further comprising:
a plurality of support structures coupled to an underside of the pair of wings, wherein a lift fan assembly among the plurality of lift fan assemblies is coupled to a first end of each support structure.

13. The aircraft of claim 12, wherein at least one of the plurality of tilting fan assemblies is coupled to a second end of a first support structure among the plurality of support structures via a tilting mechanism.

14. The aircraft of claim 12, wherein a tilting fan assembly among the plurality of tilting fan assemblies is coupled to a second end of each support structure.

15. The aircraft of claim 12, wherein a second lift fan assembly is coupled to a second end of at least one support structure among the plurality of support structures.

16. The aircraft of claim 1, further comprising:
one or more lateral support structures coupled to the fuselage, wherein the plurality of tilting fan assemblies are coupled to the one or more lateral support structures.

17. The aircraft of claim 16, wherein the one or more lateral support structures are tilting around an axis parallel to a lateral axis of the aircraft.

18. The aircraft of claim 16, wherein the one or more lateral support structures are coupled to the fuselage forward of the pair of wings.

19. The aircraft of claim 1, wherein the plurality of lift fan assemblies are provided at a trailing edge of the pair of wings and the plurality of tilting fan assemblies are provided at a leading edge of the pair of wings.

20. The aircraft of claim 1, wherein the control system is configurable to:
receive a flight instruction;
determine a position of the plurality of tilting fan assemblies;
control one or more of the plurality of tilting fan assemblies between the vertical lift position and the forward flight position based on the flight instruction; and
continuously monitor the position of the plurality of tilting fan assemblies in view of the flight instruction.

21. The aircraft of claim 20, wherein the control system is configurable to:
control the position of the tilting fan assemblies based on flight data received by sensors coupled to the aircraft.

22. The aircraft of claim 20, wherein the control system is configurable to:
control the position of the tilting fan assemblies automatically.

23. The aircraft of claim 20, wherein the control system is configurable to:
control the position of the tilting fan assemblies based on a signal received from a remote entity.

24. The aircraft of claim 20, wherein the control system is configurable to:
control a first tilting fan assembly and a second tilting fan assembly among the plurality of tilting fan assemblies independently from each other.

25. The aircraft of claim 20, wherein the control system is configurable to control:
at least a subset of the plurality of tilting fan assemblies simultaneously.

26. An aircraft comprising:
a fuselage;
a pair of wings coupled to opposite sides of the fuselage;

a plurality of tilting fan assemblies coupled to the pair of wings, wherein the plurality of tilting fan assemblies are configured to move between a vertical lift position and a forward flight position, wherein the plurality of tilting fan assemblies are configured to create a vertical lift when in the vertical lift position;

one or more battery units including a plurality of battery cells configured to power the plurality of tilting fan assemblies; and

a control system configured to control the plurality of tilting fan assemblies between the vertical lift position and the forward flight position.

27. The aircraft of claim 26, further comprising:

a plurality of support structures coupled to an underside of the pair of wings, wherein at least one of the plurality of tilting fan assemblies is coupled to an end of a first support structure among the plurality of support structures via a tilting mechanism.

28. The aircraft of claim 26, further comprising:

a plurality of support structures coupled to an underside of the pair of wings, wherein a tilting fan assembly among the plurality of tilting fan assemblies is coupled to an end of each support structure.

29. The aircraft of claim 26, wherein the plurality of tilting fan assemblies are coupled to a leading edge of the pair of wings via one or more tilting mechanisms.

30. The aircraft of claim 26, wherein at least three tilting fan assemblies are coupled to each of the pair of wings.

31. The aircraft of claim 26, wherein the control system is configurable to control a first tilting fan assembly and a second tilting fan assembly among the plurality of tilting fan assemblies independently from each other.

32. The aircraft of claim 26, wherein the control system is configurable to control at least a subset of the plurality of tilting fan assemblies simultaneously.

33. The aircraft of claim 26, wherein the control system is configurable to control a position of the tilting fan assemblies based on flight data received by sensors coupled to the aircraft.

34. The aircraft of claim 26, wherein the control system is configurable to control a position of the tilting fan assemblies automatically.

35. The aircraft of claim 26, wherein the control system is configurable to control a position of the tilting fan assemblies based on a signal received from a remote entity.

36. The aircraft of claim 26, further comprising:
a tailplane in form of a V-tail coupled to a rear end of the fuselage.

37. A method for controlling one or more tilting fan assemblies of an aircraft, the method comprising:

receiving, by a control system coupled to an aircraft, a flight instruction;
determining, by the control system, a position of a plurality of tilting fan assemblies coupled to the aircraft, wherein the aircraft is configured for vertical takeoff and landing;

controlling, by the control system, one or more of the plurality of tilting fan assemblies between a vertical lift position and a forward flight position based on the flight instruction; and

continuously monitoring, by the control system, the position of the plurality of tilting fan assemblies in view of the flight instruction.

38. The method of claim 37, further comprising:

controlling, by the control system, a first tilting fan assembly and a second tilting fan assembly among the plurality of tilting fan assemblies independently from each other.

39. The method of claim 37, further comprising:

controlling, by the control system, at least a subset of the plurality of tilting fan assemblies simultaneously.

40. The method of claim 37, further comprising:

controlling, by the control system, the position of the plurality of tilting fan assemblies automatically.

41. The method of claim 37, further comprising:

controlling, by the control system, a position of the plurality of tilting fan assemblies based on a signal received from a remote entity.

42. The method of claim 37, wherein the flight instruction is a takeoff instruction, and wherein controlling the one or more of the plurality of tilting fan assemblies comprises:

determining whether each of the plurality of tilting fan assemblies is in a vertical lift position; and

controlling the one or more of the plurality of tilting fan assemblies to the vertical lift position.

43. The method of claim 37, wherein the flight instruction is a hover instruction or a landing instruction, and wherein controlling the one or more of the plurality of tilting fan assemblies comprises:

controlling the one or more of the plurality of tilting fan assemblies to the vertical lift position.

44. The method of claim 37, wherein the flight instruction is an instruction to switch to forward flight, and wherein controlling the one or more of the plurality of tilting fan assemblies comprises:

controlling the one or more of the plurality of tilting fan assemblies to the forward flight position.

45. The method of claim 44, further comprising:

controlling one or more of a plurality of lift fan assemblies to stop operating during a forward flight of the aircraft.

46. The method of claim 37, further comprising:

receiving, by the control system, flight data from one or more sensors coupled to the aircraft; and

controlling the position of the plurality of tilting fan assemblies based on the flight data received from the one or more sensors coupled to the aircraft.