experience the problem of a single-boom tanker in which refueling operations have to be aborted if the single-boom tanker suffers a boom failure. The multiple booms available on the tanker according to an embodiment provide redundancy to ensure that refueling operations can always be carried out.

According to an aspect of the present invention, there is provided a trailing boom system for aerial refueling, the system comprising a parent pod capable of being connected to a wing or a body of a tankeran aircraft and a detachable pod releasable from the parent pod, the detachable pod comprising an extendible boom for refueling a receiver aircraft in flight, the extendible boom being pivotable about a first pivot for movement in an up/down direction and pivotable about a second pivot for movement in a left/right direction.

A tether/fuel hose may connect the parent pod and the detachable pod.

The system may further comprise a fuel transfer system for transferring fuel from the aircraft through the parent pod, the tether/fuel hose, the detachable pod and the extendible boom to a receiver aircraft.

The system may further comprise a flight control system to control the positioning of the detachable pod.

The system may further comprise an automatic collision avoidance system for preventing the detachable pod from colliding with the receiver aircraft.

The system may further comprise a refueling operation control system for monitoring and controlling various aspect of the refueling operation.

The parent pod may comprise director lights for guiding the receiver aircraft into a position for connection with the extendible boom.

The detachable pod may comprise control surfaces for maneuvering the detachable pod.

The detachable pod may comprise sensors for monitoring the receiver aircraft.

The parent pod may comprise a semi-recessed configuration for housing the detachable pod.

A gimbal mechanism may actuate the boom.

The boom may comprise a telescoping tube within an outer tube.

According to another aspect of the present invention, there is provided a detachable pod for an aerial refueling system, the detachable pod comprising a booman extendible from the detachable pod, the boom suitable for refueling a receiver aircraft in flight, the boom being pivotable about a first pivot for movement in an up/down direction and pivotable about a second pivot for movement in a left/right direction, and a flight control modulesystem for controlling flight control surfaces on the detachable pod to maneuver the detachable pod in flight.

The detachable pod may further comprise sensors for monitoring the receiver aircraft.

A gimbal mechanism may actuate the boom.

The boom may comprise a telescoping tube within an outer tube.

The detachable pod may further comprise an automatic collision avoidance system.

According to another aspect of the present invention, there is provided a method for aerial refueling, the method comprising refueling a receiver~~an~~ aircraft in flight via a boom extendible from a detachable pod, the boom being pivotable about a first pivot for movement in an up/down direction and pivotable about a second pivot for movement in a left/right direction, the detachable pod is releasable from a parent pod, and the parent pod is capable of being connected to a wing or a body of a tanker aircraft~~trailing boom system for aerial refueling, wherein the system comprises a parent pod capable of being connected to a wing or a body of an aircraft and a detachable pod comprising an extendible boom for refueling aircraft in flight~~.

CLAIMS

1. A trailing boom system for aerial refueling, the system comprising:

a parent pod capable of being connected to a wing or a body of an aircraft and

a detachable pod comprising an extendible boom for refueling aircraft in flight.

2. The system as claimed in claim 1, wherein a tether/fuel hose connects the parent pod and the detachable pod;

3. The system as claimed in any of claim 2 further comprising a fuel transfer system for transferring fuel from the aircraft through the parent pod, the tether/fuel hose, the detachable pod and the extendible boom to a receiver aircraft.

4. The system as claimed in any of the preceding claims further comprising a flight control system to control the positioning of the detachable pod.

5. The system as claimed in any of the preceding claims further comprising an automatic collision avoidance system for preventing the detachable pod from colliding with the receiver aircraft.

6. The system as claimed in any of the preceding claims further comprising a refueling operation control system for monitoring and controlling various aspect of the refueling operation.

7. The system as claimed in any of the preceding claims, wherein the parent pod comprises director lights for guiding the receiver aircraft into a position for connection with the extendible boom.

8. The system as claimed in any of the preceding claims, wherein the detachable pod comprises control surfaces for maneuvering the detachable pod.

9. The system as claimed in any of the preceding claims, wherein the detachable pod comprises sensors for monitoring the receiver aircraft.

10. The system as claimed in any of the preceding claims, wherein the parent pod comprises a semi-recessed configuration for housing the detachable pod.

11. The system as claimed in any of the preceding claims, wherein a gimbal mechanism actuates the boom.

12. The system as claimed in any of the preceding claims, wherein the boom comprises a telescoping tube within an outer tube.

13. A detachable pod for an aerial refueling system, the detachable pod comprising:

an extendible boom for refueling aircraft in flight; and

a flight control system for controlling flight control surfaces on the detachable pod to maneuver the detachable pod in flight.

14. The detachable pod as claimed in claim 13 further comprising sensors for monitoring the receiver aircraft.

15. The detachable pod as claimed in claim 13 or 14, wherein a gimbal mechanism actuates the boom.

16. The detachable pod as claimed in any of claims 13-15, wherein the boom comprises a telescoping tube within an outer tube.

17. The detachable pod as claimed in any of claims 13-16, further comprising an automatic collision avoidance system.

18. A method for aerial refueling, the method comprising:

refueling an aircraft in flight via a trailing boom system for aerial refueling, wherein the system comprises a parent pod capable of being connected to a wing or a body of an aircraft and a detachable pod comprising an extendible boom for refueling aircraft in flight.

19. The method as claimed in claim 18, wherein a tether/fuel hose connects the parent pod and the detachable pod;

20. The method as claimed in any of claim 19, wherein the system further comprises a fuel transfer system for transferring fuel from the aircraft through the parent pod, the tether/fuel hose, the detachable pod and the extendible boom to a receiver aircraft.

21. The method as claimed in any of claim 18-20, wherein the system further comprises a flight control system to control the positioning of the detachable pod.

22. The method as claimed in any of claim 18-21, wherein the system further comprises an automatic collision avoidance system for preventing the detachable pod from colliding with the receiver aircraft.

23. The method as claimed in any of claim 18-22, wherein the system further comprises a refueling operation control system for monitoring and controlling various aspect of the refueling operation.

24. The method as claimed in any of claim 18-23, wherein the parent pod comprises director lights for guiding the receiver aircraft into a position for connection with the extendible boom.

25. The method as claimed in any of claim 18-24, wherein the detachable pod comprises control surfaces for maneuvering the detachable pod.

26. The method as claimed in any of the claim 18-25, wherein the detachable pod comprises sensors for monitoring the receiver aircraft.

27. The method as claimed in any of claim 18-26, wherein the parent pod comprises a semi-recessed configuration for housing the detachable pod.

28. The method as claimed in any of claim 18-27, wherein a gimbal mechanism actuates the boom.

29. The method as claimed in any of claim 18-28, wherein the boom comprises a telescoping tube within an outer tube.

30. The method as claimed in any of claim 18 to 29 wherein the step of refueling an aircraft in flight via the trailing boom system for aerial refueling comprises the steps of :

reeling out the detachable pod from the parent pod to a predefined deployed position;

guiding the receiver aircraft into a position for connection;

flying the detachable pod to a contact position;

lowering and extending the boom for connecting to the receiver aircraft; and

commencing fuel transfer.

CLAIMS

1. A trailing boom system for aerial refueling, the system comprising:

a parent pod capable of being connected to a wing or a body of a tanker aircraft and

a detachable pod releasable from the parent pod, the detachable pod comprising an extendible boom for refueling a receiver aircraft in flight, the extendible boom being pivotable about a first pivot for movement in an up/down direction and pivotable about a second pivot for movement in a left/right direction.

2. The system as claimed in claim 1, further comprising a tether/fuel hose connecting the parent pod and the detachable pod.

3. The system as claimed in claim 2 further comprising a fuel transfer module for transferring fuel from the tanker aircraft through the parent pod, the tether/fuel hose, the detachable pod and the extendible boom to the receiver aircraft.

4. The system as claimed in any of the preceding claims further comprising a flight control module to control the positioning of the detachable pod.

5. The system as claimed in any of the preceding claims further comprising an automatic collision avoidance module for preventing the detachable pod from colliding with the receiver aircraft.

6. The system as claimed in any of the preceding claims further comprising a refueling operation control station for a user to interact with the various monitoring and controlling modules of the refueling operation.

7. The system as claimed in any of the preceding claims, wherein the parent pod comprises guidance means for guiding the receiver aircraft into a position for connection with the extendible boom.

8. The system as claimed in any of the preceding claims, wherein the detachable pod comprises control surfaces for maneuvering the detachable pod.

9. The system as claimed in any of the preceding claims, wherein the detachable pod further comprises a spoiler adapted to generate a thrust for engaging a nozzle of the extensible boom with a receiver aircraft receptacle.

10. The system as claimed in any of the preceding claims, wherein the detachable pod comprises sensors for monitoring the position of the receiver aircraft with respect to the detachable pod.

11. The system as claimed in any of the preceding claims, wherein the parent pod comprises a housing for receiving the detachable pod when retracted.

12. The system as claimed in any of the preceding claims, further comprising a gimbal mechanism for actuating the boom in the up/down direction about the first pivot and in the left/right direction about the second pivot, wherein the boom is connected to a member of the gimbal mechanism at the first pivot and the member of the gimbal mechanism is connected to the detachable pod at the second pivot.

13. The system as claimed in any of the preceding claims, wherein the boom comprises a telescoping tube within an outer tube.

14. The system as claimed in any of the preceding claims, wherein the detachable pod further comprises a backflow reservoir.

15. A detachable pod for an aerial refueling system, the detachable pod comprising:

a boom extendible from the detachable pod, the boom suitable for refueling a receiver aircraft in flight, the boom being pivotable about a first pivot for movement in an up/down direction and pivotable about a second pivot for movement in a left/right direction; and

a flight control module for controlling flight control surfaces on the detachable pod to maneuver the detachable pod in flight.

16. The detachable pod as claimed in claim 15, further comprising a gimbal mechanism actuating the boom in the up/down direction about the first pivot and in the left/right direction about the second pivot, wherein the boom is connected to a member of the gimbal mechanism at the first pivot and the member of the gimbal mechanism is connected to the detachable pod at the second pivot.

17. The detachable pod as claimed in claim 15 or 16, wherein the boom comprises a telescoping tube within an outer tube.

18. The detachable pod as claimed in any of claims 15 to 17, further comprising a backflow reservoir.

19. The detachable pod as claimed in any of claims 15 to 18, further comprising a spoiler adapted to generate a thrust for engaging a nozzle of the extensible boom with a receiver aircraft receptacle.

20. The detachable pod as claimed in any of claims 15 to 19, further comprising an automatic collision avoidance module.

21. A method for aerial refueling, the method comprising:

refueling a receiver aircraft in flight via a boom extendible from a detachable pod, the boom being pivotable about a first pivot for movement in an up/down direction and pivotable about a second pivot for movement in a left/right direction, the detachable pod is releasable from a parent pod, and the parent pod is capable of being connected to a wing or a body of a tanker aircraft.

22. The method as claimed in claim 21, wherein refueling comprises transferring fuel from the tanker aircraft through the parent pod, the detachable pod and the extendible boom to the receiver aircraft.

23. The method as claimed in claim 22, wherein transferring fuel from the tanker aircraft through the parent pod to the detachable pod comprises transferring fuel via a tether/fuel hose connecting the parent pod and the detachable pod.

24. The method as claimed in any of claims 20 to 23, wherein prior to the step of refueling, the method further comprises the steps of:

reeling out the detachable pod from the parent pod to a predefined deployed position;

guiding the receiver aircraft into a position for connection;

flying the detachable pod to a contact position;

lowering and extending the boom for connecting to the receiver aircraft; and

commencing fuel transfer.