CLAIMS:

1. A spray cleaning device for cleaning an auxiliary power unit (APU) located inside the body of an aircraft, said cleaning device comprising:

one or more spray nozzles;

a water tube for supplying water to said nozzles, said nozzles being attached to a distal end portion of said water tube; and

positioning means rigidly connected to said water tube for positioning the nozzles with respect to the APU.

2. The spray cleaning device of claim 1, wherein said positioning means comprises a clamping member adapted to engage with a structure on the aircraft body to clamp the spray cleaning device in a desired position.

3. The spray cleaning device of claim 1, wherein said positioning means comprises a support member adapted to be held against a selected part of the aircraft body for holding the spray cleaning device firmly in a desired position without clamping it to the aircraft body.

4. The spray cleaning device of claim 1, wherein said positioning means is connected to a distal rigid portion of the water tube.

5. The spray cleaning device of claim 1, wherein said water tube is removably connectable to at least one of a rigid elongated tube and a flexible hose.

6. The spray cleaning device of claim 5, wherein said rigid elongated tube is telescopically extendable.

7. The spray cleaning device of claim 1, wherein said distal end portion of the water tube is curved so as to direct the spray nozzles to a desired location in the APU to be cleaned.

8. The spray cleaning device of claim 1, wherein the water tube is branched to provide at least two rigid distal end portions, each comprising at least one spray nozzle.

9. The spray cleaning device of claim 8, wherein the at least two rigid end portions are adapted for independent positioning of the nozzles.

10. The spray cleaning device of claim 2, wherein the clamping member comprises two arms in a V-configuration, at least one of said arms being spring-loaded.

11. The spray cleaning device of claim 10, wherein both arms are spring-loaded.

12. The spray cleaning device of claim 10, wherein spring force resulting from the spring loaded arms urges said arms apart.

13. The spray cleaning device of claim 12, further comprising means for urging the arms towards each other against the spring force.

14. The spray cleaning device of claim 10, wherein each arm comprises friction reducing means.

15. The spray cleaning device of claim 10, further comprising a remote control means for urging the arms towards each other.

16. The spray cleaning device of claim 15, wherein said remote control means comprises a wire fixedly attached to a first of the arms and looped around a pulley attached to a second of the arms, wherein downward tension on the wire causes the first and second arms to move towards each other.

17. The spray cleaning device of claim 15, wherein said remote control means comprises at least one gear attached to at least one of the arms, and a motor attached to the at least one gear for driving said gear, wherein operating the motor drives the at least one gear such that the arms are urged together.

18. A system for cleaning an auxiliary power unit (APU) in aircrafts, comprising:

a spray cleaning device, comprising:

one or more spray nozzles;

a water tube for supplying water to said nozzles, said nozzles being attached to a distal end portion of said water tube; and

a positioning means rigidly connected to said water tube for positioning the nozzles with respect to the APU;

and

a supply system for providing pressurized and temperature controlled washing fluid to the spray cleaning device.

19. The system of claim 18, wherein the supply system delivers washing fluid at a pressure of 30 - 85 Bar, a temperature of ambient - 70 °C, and with a spray droplet mean size of 40 - 250 μm.

20. A method for cleaning an auxiliary power unit (APU) located inside the body of an aircraft, the method comprising:

providing a spray cleaning device comprising one or more nozzles, a water tube for supplying washing fluid to said nozzles, and a positioning means for positioning the one or more nozzles in a desired orientation, said positioning means comprising a clamping member adapted to engage an air inlet structure of the aircraft;

engaging the clamping member onto an air inlet structure; and

supplying washing fluid to the one or more nozzles via the water tube at a desired spray pressure, spray temperature, and spray droplet size.

21. The method of claim 20, wherein the spray cleaning device further comprises a support member, the method further comprising:

manually holding the support member against a selected portion of the aircraft body for maintaining the positioning of the spray cleaning device.

22. The method of claim 20, wherein the clamping member comprises two arms in a V-configuration, at least one of said arms being spring-loaded, the method further comprising:

urging the two arms together;

positioning the spray cleaning device within a portion of the aircraft; and

releasing the two arms, wherein force provided by the spring-loading urges the two arms apart and against portions of the aircraft.

23. The method of claim 22, wherein at least one of the arms is spring loaded.

24. The method of claim 22, wherein a remote control means is used for urging the arms together.

25. The method of claim 24, wherein the remote control means comprises a wire fixedly attached to a first of the arms and looped around a pulley attached to a second of the arms, wherein downward tension on the wire causes the first and second arms to move towards each other, the method further comprising:

applying downward tension on the wire to urge the two arms together;

positioning the spray cleaning device; and

releasing the tension on the wire to force the two arms apart and against portions of the aircraft.

26. The method of claim 24, wherein the remote control means comprises at least one gear attached to at least one of the arms, and a motor attached to the at least one gear for driving said gear, wherein operating the motor drives the at least one gear such that the arms are urged together, the method further comprising:

cranking the motor to drive the gears such that the two arms are urged together;

positioning the spray cleaning device; and

driving the gears in an opposite direction to force the two arms apart and against portions of the aircraft.

27. The method of claim 20, wherein said positioning means is connected to a distal rigid portion of the water tube.

28. The method of claim 20, wherein said water tube is removably connectable to at least one of a rigid elongated tube and a flexible hose.

29. The method of claim 28, wherein said rigid elongated tube is telescopically extendable.

30. The method of claim 20, wherein said water tube comprises a distal end portion that is curved to direct spray from the nozzles to a desired location in the APU.

31. The method of claim 20, wherein said water tube is branched to provide at least two rigid distal end portions, each comprising at least one nozzle.

32. The method of claim 31, wherein the at least two rigid distal end portions are adapted for independent positioning of the nozzles, the method further comprising positioning each nozzle with respect to one or more APUs being cleaned.

CLAIMS:

1. A spray cleaning device (230) for cleaning an auxiliary power unit (APU) located inside the body of an aircraft (100), said cleaning device comprising:

one or more spray nozzles (232) arranged to spray into an air intake of the APU;

a water tube (238) for supplying water to said nozzle(s) (232), said nozzle(s) being attached to a distal end portion of said water tube (238); and

positioning means (236) rigidly connected to said water tube and adapted to engage with a structure (301) on the aircraft body for positioning the nozzle(s) inside the aircraft body with respect to the APU.

2. The spray cleaning device of claim 1, wherein said positioning means comprises a clamping member adapted to engage with the structure (301) on the aircraft body to clamp the spray cleaning device in a desired position.

3. The spray cleaning device of claim 1, wherein said positioning means comprises a support member adapted to be held against the structure (301) on the aircraft body for holding the spray device firmly in a desired position without clamping it to the aircraft body.

4. The spray cleaning device of claim 1, wherein said positioning means is connected to a distal rigid portion of the water tube.

5. The spray cleaning device of claim 1, wherein said water tube is removably connected to at least one of a rigid elongated tube and a flexible hose.

6. The spray cleaning device of claim 5, wherein said rigid elongated tube is telescopically extendable.

7. The spray cleaning device of claim 1, wherein said distal end portion of the water tube is curved so as to direct the spray nozzle(s) to a desired location in the APU to be cleaned.

8. The spray cleaning device of claim 1, wherein the water tube is branched to provide at least two rigid distal end portions, each comprising at least one spray nozzle.

9. The spray cleaning device of claim 8, wherein the at least two rigid end portions are adapted for independent positioning of the nozzle(s).

10. The spray cleaning device of claim 2, wherein the clamping member comprises two arms (450) in a V-configuration, at least one of said arms being spring-loaded (451).

11. The spray cleaning device of claim 10, wherein both arms are spring-loaded.

12. The spray cleaning device of claim 10, wherein spring force resulting from the spring loaded arms urges said arms apart.

13. The spray cleaning device of claim 12, further comprising means for urging the arms towards each other against the spring force.

14. The spray cleaning device of claim 10, wherein each arm comprises friction reducing means.

15. The spray cleaning device of claim 10, further comprising a remote control means (600; 660, 664, 670) for urging the arms towards each other.

16. A system for cleaning APU's in aircrafts, comprising:
a spray cleaning device as claimed in any of claims 1-15; and
a supply system for providing pressurized and temperature controlled washing fluid to the spray cleaning device.