CLAIMS

What is claimed is:

1. A fan section of a gas turbine engine comprising:

a fan containment case assembly including:

an outer case of an aluminum alloy, wherein the outer case extends circumferentially around an axial centerline;

a thermally conforming liner assembly located inwardly of the outer case, wherein the thermally conforming liner assembly includes a circumferential liner of an aluminum alloy; and

a ballistic liner located between the outer case and the thermally conforming liner assembly.

2. The fan section as recited in claim 1 wherein the ballistic liner is made of an aramid fiber.

3. The fan section as recited in claim 1 including a plurality of fan blades located radially about the axial centerline within the fan containment case assembly.

4. The fan section as recited in claim 3 wherein the ballistic liner circumferentially surrounds the plurality of fan blades and is located in a fan blade region of the fan containment case assembly.

5. The fan section as recited in claim 3 wherein the circumferential liner includes a first section located forward of the fan blade region, a second section located in the fan blade region, and a third section located aft of the fan blade region, and the thermally conforming liner assembly includes a forward acoustic liner located inwardly of and adjacent to the first section of the circumferential liner, a face sheet located inwardly of the forward acoustic liner, a honeycomb core located inwardly of and adjacent to the second section of the circumferential liner, and an inboard liner located inwardly of the honeycomb core.

6. The fan section as recited in claim 5 wherein the forward acoustic liner, the face sheet, the honeycomb core, and the inboard liner are made of an aluminum alloy.

7. The fan section as recited in claim 5 including an abradable rub material located inwardly of the second section of the circumferential liner in the fan blade region.

8. The fan section as recited in claim 7 wherein the abradable rub material is an aramid honeycomb filled with epoxy.

9. The fan section as recited in claim 1 wherein an elastomeric material bonds the ballistic liner to the outer case.

10. The fan section as recited in claim 9 wherein the elastomeric material is polysulfide or silicone rubber.

11. The fan casing as recited in claim 1 wherein the outer case is attached to the thermally conforming liner assembly with a plurality of fasteners.

12. A gas turbine engine comprising:

a fan containment case assembly including an outer case of an aluminum alloy, wherein the outer case extends circumferentially around an axial centerline, a thermally conforming liner assembly located inwardly of the outer case, wherein the thermally conforming liner assembly includes a circumferential liner of an aluminum alloy, and a ballistic liner located between the outer case and the thermally conforming liner assembly, wherein the ballistic liner is made of an aramid fiber and is located in a fan blade region of the fan containment case assembly; and

a plurality of fan blades located radially about the axial centerline within the fan containment case assembly, wherein the ballistic liner circumferentially surrounds the plurality of fan blades, the plurality of fan blades are located in the fan blade region of the fan containment case assembly, and the ballistic liner circumferentially surrounds the plurality of fan blades.

13. The gas turbine engine as recited in claim 12 wherein the circumferential liner includes a first section located forward of the fan blade region, a second section located in the fan blade region, and a third section located aft of the fan blade region, and the thermally conforming liner assembly includes a forward acoustic liner located inwardly of and adjacent to the first section of the circumferential liner, a face sheet located inwardly of the forward acoustic liner, a honeycomb core located inwardly of and adjacent to the second section of the circumferential liner, and an inboard liner located inwardly of the honeycomb core.

14. The gas turbine engine as recited in claim 13 wherein the forward acoustic liner, the face sheet, the honeycomb core, and the inboard liner are made of an aluminum alloy.

15. The gas turbine engine as recited in claim 13 including an abradable rub material located inwardly of the second section of the circumferential liner in the fan blade region.

16. The gas turbine engine as recited in claim 15 wherein the abradable rub material is an aramid honeycomb filled with epoxy.

17. The gas turbine engine as recited in claim 12 wherein an elastomeric material bonds the ballistic liner to the outer case.

18. The gas turbine engine as recited in claim 17 wherein the elastomeric material is polysulfide or silicone rubber.

19. The gas turbine engine as recited in claim 12 wherein the outer case is attached to the thermally conforming liner assembly with a plurality of fasteners.

CLAIMS

1. A fan section of a gas turbine engine comprising:

a fan containment case assembly including:

an outer case of an aluminum alloy, wherein the outer case extends circumferentially around an axial centerline;

a plurality of fan blades located radially about the axial centerline within the fan containment case assembly, wherein the plurality of fan blades are made of aluminum alloy;

a thermally conforming liner assembly located inwardly of the outer case, wherein the thermally conforming liner assembly includes a circumferential liner of an aluminum alloy, wherein the circumferential liner includes a first section located forward of a fan blade region and a second section located in the fan blade region, the thermally conforming liner assembly including a forward acoustic liner located inwardly of and adjacent to the first section of the circumferential liner and a honeycomb core located inwardly of and adjacent to the second section of the circumferential liner; and

a ballistic liner located between the outer case and the thermally conforming liner assembly.

2. The fan section as recited in claim 1 wherein the ballistic liner is made of an aramid fiber.

3. The fan section as recited in claim 2 wherein the ballistic liner circumferentially surrounds the plurality of fan blades and is located in the fan blade region of the fan containment case assembly.

4. The fan section as recited in claim 2 wherein the circumferential liner includes a third section located aft of the fan blade region, and the thermally conforming liner assembly includes a face sheet located inwardly of the forward acoustic liner, and an inboard liner located inwardly of the honeycomb core.

5. The fan section as recited in claim 4 wherein the forward acoustic liner, the face sheet, the honeycomb core, and the inboard liner are made of an aluminum alloy.

6. The fan section as recited in claim 4 including an abradable rub material located inwardly of the second section of the circumferential liner in the fan blade region.

7. The fan section as recited in claim 6 wherein the abradable rub material is an aramid honeycomb filled with epoxy.

8. The fan section as recited in claim 1 wherein an elastomeric material bonds the ballistic liner to the outer case.

9. The fan section as recited in claim 8 wherein the elastomeric material is polysulfide or silicone rubber.

10. The fan casing as recited in claim 1 wherein the outer case is attached to the thermally conforming liner assembly with a plurality of fasteners.

11. A gas turbine engine comprising:

a fan containment case assembly including an outer case of an aluminum alloy, wherein the outer case extends circumferentially around an axial centerline, a thermally conforming liner assembly located inwardly of the outer case, wherein the thermally conforming liner assembly includes a circumferential liner of an aluminum alloy, and a ballistic liner located between the outer case and the thermally conforming liner assembly, wherein the ballistic liner is made of an aramid fiber and is located in a fan blade region of the fan containment case assembly, wherein the circumferential liner includes a first section located forward of a fan blade region and a second section located in the fan blade region, the thermally conforming liner assembly including a forward acoustic liner located inwardly of and adjacent to the first section of the circumferential liner and a honeycomb core located inwardly of and adjacent to the second section of the circumferential liner; and

a plurality of fan blades located radially about the axial centerline within the fan containment case assembly, wherein the ballistic liner circumferentially surrounds the plurality of fan blades, the plurality of fan blades are located in the fan blade region of the fan containment case assembly, wherein the plurality of fan blades are made of aluminum alloy

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12. The gas turbine engine as recited in claim 11 wherein the circumferential liner includes a third section located aft of the fan blade region, and the thermally conforming liner assembly includes a face sheet located inwardly of the forward acoustic liner, and an inboard liner located inwardly of the honeycomb core.

13. The gas turbine engine as recited in claim 12 wherein the forward acoustic liner, the face sheet, the honeycomb core, and the inboard liner are made of an aluminum alloy.

14. The gas turbine engine as recited in claim 12 including an abradable rub material located inwardly of the second section of the circumferential liner in the fan blade region.

15. The gas turbine engine as recited in claim 14 wherein the abradable rub material is an aramid honeycomb filled with epoxy.

16. The gas turbine engine as recited in claim 11 wherein an elastomeric material bonds the ballistic liner to the outer case.

17. The gas turbine engine as recited in claim 16 wherein the elastomeric material is polysulfide or silicone rubber.

18. The gas turbine engine as recited in claim 11 wherein the outer case is attached to the thermally conforming liner assembly with a plurality of fasteners.

19. The fan section as recited in claim 1 wherein the forward acoustic liner and the honeycomb core are both located inwardly of the outer case and adjacent to each other.