WHAT IS CLAIMED IS:

1. An improved barrel assembly for a minigun, the barrel assembly comprising:

a tube having a front end, a rear end, and a plurality of longitudinal openings extending along a portion of the length of the tube between the front end and the rear end; and

an impeller mounted to and positioned inside the tube between the tube front end and the tube rear end;

wherein the impeller is configured so that when the tube is rotated, the impeller moves surrounding air through the plurality of longitudinal openings to cool barrels disposed within the tube.

2. The improved barrel assembly of claim 1 wherein the impeller comprises a plurality of impeller blades spaced around a periphery of the impeller and projecting generally perpendicularly from a flange portion of the impeller.

3. The improved barrel assembly of claim 1 wherein the impeller comprises a plurality of impeller blades that define a plurality of air channels.

4. The improved barrel assembly of claim 1 further comprising:

a flash suppressor mounted to the front end of the tube; and

a barrel collar mounted to the rear end of the tube;

wherein the impeller is mounted inside the tube between the flash suppressor and the collar.

5. The improved barrel assembly of claim 1 further comprising a flash suppressor mounted to the front end of the tube, wherein the flash suppressor includes a generally tubular body having a plurality of longitudinal slots and wherein the slots have diverging sidewalls.

6. The improved barrel assembly of claim 1 wherein the impeller comprises an impeller body including:

a peripheral attachment portion adapted for attaching to the tube;

a flange portion projecting inwardly from the peripheral attachment portion; and

a plurality of curved blades disposed near the peripheral attachment portion and projecting perpendicularly from the flange portion;

wherein each of the plurality of blades is curved inwardly; and

wherein for each pair of adjacent blades of the plurality of blades, each blade of the pair is spaced with respect to the other blade of the pair to form an air flow channel between the pair of the blades.

7. An improved barrel assembly for a minigun, the barrel assembly comprising:

a single-piece tubular body having a front end, a rear end, and a plurality of longitudinal openings extending along a portion of the length of the tubular body between the front end and the rear end; and

an impeller mounted to and positioned inside the tubular body between the front end and the rear end;

wherein the impeller is configured so that, when the tubular body is rotated, the impeller moves surrounding air through the plurality of longitudinal openings to cool barrels disposed within the tubular body.

8. The improved barrel assembly of claim 7 wherein the impeller comprises a plurality of impeller blades spaced around a periphery of the impeller and projecting generally perpendicularly from an inwardly projecting flange portion of the impeller.

9. The improved barrel assembly of claim 7 wherein the impeller comprises a plurality of impeller blades that define a plurality of air channels.

10. The improved barrel assembly of claim 7 further comprising:

a flash suppressor mounted to the front end of the tubular body; and

a barrel clamp collar mounted to the rear end of the tubular body; and

wherein the impeller is mounted inside the tubular body between the flash suppressor and the barrel collar.

11. The improved barrel assembly of claim 7 further comprising a flash suppressor mounted to the front end of the tubular body, wherein the flash suppressor includes a generally tubular body having a plurality of longitudinal slots and wherein the slots have diverging sidewalls.

12. The improved barrel assembly of claim 7 wherein the impeller comprises an impeller body including:

a peripheral attachment portion adapted for attaching to the tubular body;

a flange portion projecting inwardly from the peripheral attachment portion; and

a plurality of curved blades disposed near the peripheral attachment portion and projecting perpendicularly from the flange portion;

wherein each of the plurality of blades is curved inwardly; and

wherein each pair of adjacent blades of the plurality of blades forms an air flow channel between the pair of the blades.

13. A Gatling-type minigun comprising:

a barrel assembly including a plurality of circumferentially positioned gun barrels, wherein each of the plurality of gun barrels is disposed, at least in part, within a barrel tube having a front end, a rear end, and a plurality of longitudinal openings extending along a portion the length of the barrel tube between the front end and the rear end;

a motor adapted to rotate the barrel assembly; and

a delinking feeder rotationally coupled to the motor and adapted to receive a belt of linked cartridges, separate the linked cartridges from the belt, and feed the separated cartridges to a firing mechanism;

wherein the barrel assembly includes:

an impeller mounted to and positioned inside the barrel tube between the barrel tube front end and the barrel tube rear end; and

wherein the impeller is configured so that when the barrel tube is rotated, the impeller moves surrounding air through the plurality of longitudinal openings to cool the barrels.

14. The improved minigun of claim 13 wherein the impeller comprises a plurality of impeller blades that are spaced around a periphery of the impeller and that project generally perpendicularly from a flange portion of the impeller.

15. The improved minigun of claim 13 wherein the impeller comprises a plurality of impeller blades that define a plurality of air channels.

16. The improved minigun of claim 13 further comprising:

a flash suppressor mounted to the front end of the barrel tube; and

a barrel collar mounted to the rear end of the barrel tube; and

wherein the impeller is mounted inside the barrel tube between the flash suppressor and the barrel collar.

17. The improved minigun of claim 13 further comprising a flash suppressor mounted to the front end of the barrel tube, wherein the flash suppressor includes a generally tubular body having a plurality of longitudinal slots and wherein the slots have diverging sidewalls.

18. The improved minigun of claim 13 wherein the impeller comprises an impeller body including:

a peripheral attachment portion adapted for attaching to the barrel tube;

a flange portion projecting inwardly from the peripheral attachment portion; and

a plurality of curved blades disposed near the peripheral attachment portion and projecting perpendicularly from the flange portion;

wherein each of the plurality of blades is curved inwardly; and

wherein, for each pair of adjacent blades of the plurality of blades, each blade of the pair is spaced with respect to the other blade of the pair to form an air flow channel between the pair of the blades.

WHAT IS CLAIMED IS:

1. An improved barrel assembly for a minigun, the barrel assembly comprising:

a tube having a front end, a rear end, and a plurality of longitudinal openings extending along a portion of the length of the tube between the front end and the rear end, wherein the tube is configured to receive a plurality of barrels disposed therein; and

an impeller mounted to and positioned inside the tube between the tube front end and the tube rear end;

wherein the impeller is configured so that when the tube is rotated, the impeller moves surrounding air through the plurality of longitudinal openings to cool barrels disposed within the tube.

2. The improved barrel assembly of claim 1 wherein the impeller comprises a plurality of impeller blades spaced around a periphery of the impeller and projecting generally perpendicularly from a flange portion of the impeller.

3. The improved barrel assembly of claim 1 wherein the impeller comprises a plurality of impeller blades that define a plurality of air channels.

4. The improved barrel assembly of claim 1 further comprising:

a flash suppressor mounted to the front end of the tube; and

a barrel collar mounted to the rear end of the tube;

wherein the impeller is mounted inside the tube between the flash suppressor and the collar.

5. The improved barrel assembly of claim 1 further comprising a flash suppressor mounted to the front end of the tube, wherein the flash suppressor includes a generally tubular body having a plurality of longitudinal slots and wherein the slots have diverging sidewalls.

6. The improved barrel assembly of claim 1 wherein the impeller comprises an impeller body including:

a peripheral attachment portion adapted for attaching to the tube;

a flange portion projecting inwardly from the peripheral attachment portion; and

a plurality of curved blades disposed near the peripheral attachment portion and projecting perpendicularly from the flange portion;

wherein each of the plurality of blades is curved inwardly; and

wherein for each pair of adjacent blades of the plurality of blades, each blade of the pair is spaced with respect to the other blade of the pair to form an air flow channel between the pair of the blades.

7. An improved barrel assembly for a minigun, the barrel assembly comprising:

a single-piece tubular body having a front end, a rear end, and a plurality of longitudinal openings extending along a portion of the length of the tubular body between the front end and the rear end, wherein the tubular body is configured to receive a plurality of barrels disposed therein; and

an impeller mounted to and positioned inside the tubular body between the front end and the rear end;

wherein the impeller is configured so that, when the tubular body is rotated, the impeller moves surrounding air through the plurality of longitudinal openings to cool barrels disposed within the tubular body.

8. The improved barrel assembly of claim 7 wherein the impeller comprises a plurality of impeller blades spaced around a periphery of the impeller and projecting generally perpendicularly from an inwardly projecting flange portion of the impeller.

9. The improved barrel assembly of claim 7 wherein the impeller comprises a plurality of impeller blades that define a plurality of air channels.

10. The improved barrel assembly of claim 7 further comprising:

a flash suppressor mounted to the front end of the tubular body; and

a barrel clamp collar mounted to the rear end of the tubular body; and

wherein the impeller is mounted inside the tubular body between the flash suppressor and the barrel collar.

11. The improved barrel assembly of claim 7 further comprising a flash suppressor mounted to the front end of the tubular body, wherein the flash suppressor includes a generally tubular body having a plurality of longitudinal slots and wherein the slots have diverging sidewalls.

12. The improved barrel assembly of claim 7 wherein the impeller comprises an impeller body including:

a peripheral attachment portion adapted for attaching to the tubular body;

a flange portion projecting inwardly from the peripheral attachment portion; and

a plurality of curved blades disposed near the peripheral attachment portion and projecting perpendicularly from the flange portion;

wherein each of the plurality of blades is curved inwardly; and

wherein each pair of adjacent blades of the plurality of blades forms an air flow channel between the pair of the blades.

13. A Gatling-type minigun comprising:

a barrel assembly including a plurality of circumferentially positioned gun barrels, wherein each of the plurality of gun barrels is disposed, at least in part, within a barrel tube having a front end,

a rear end, and a plurality of longitudinal openings extending along a portion the length of the barrel tube between the front end and the rear end;

a motor adapted to rotate the barrel assembly; and

a delinking feeder rotationally coupled to the motor and adapted to receive a belt of linked cartridges, separate the linked cartridges from the belt, and feed the separated cartridges to a firing mechanism;

wherein the barrel assembly includes:

an impeller mounted to and positioned inside the barrel tube between the barrel tube front end and the barrel tube rear end; and

wherein the impeller is configured so that when the barrel tube is rotated, the impeller moves surrounding air through the plurality of longitudinal openings to cool the barrels.

14. The improved minigun of claim 13 wherein the impeller comprises a plurality of impeller blades that are spaced around a periphery of the impeller and that project generally perpendicularly from a flange portion of the impeller.

15. The improved minigun of claim 13 wherein the impeller comprises a plurality of impeller blades that define a plurality of air channels.

16. The improved minigun of claim 13 further comprising:

a flash suppressor mounted to the front end of the barrel tube; and

a barrel collar mounted to the rear end of the barrel tube; and

wherein the impeller is mounted inside the barrel tube between the flash suppressor and the barrel collar.

17. The improved minigun of claim 13 further comprising a flash suppressor mounted to the front end of the barrel tube, wherein the flash suppressor includes a generally tubular body having a plurality of longitudinal slots and wherein the slots have diverging sidewalls.

18. The improved minigun of claim 13 wherein the impeller comprises an impeller body including:

a peripheral attachment portion adapted for attaching to the barrel tube;

a flange portion projecting inwardly from the peripheral attachment portion; and

a plurality of curved blades disposed near the peripheral attachment portion and projecting perpendicularly from the flange portion;

wherein each of the plurality of blades is curved inwardly; and

wherein, for each pair of adjacent blades of the plurality of blades, each blade of the pair is spaced with respect to the other blade of the pair to form an air flow channel between the pair of the blades.